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IMPACT OF POPULATION GROWTH AND UNEMPLOYMENT ON ECONOMIC IN NIGERIA

Paschal Kem Ojimadu[1] & Callistus Ogu[2]*

[1]Department of Economics, Madonna University, Nigeria.

[2]Department of Economics, Imo State University, Owerri, Nigeria.

*callistuogu@imsu.edu.ng

ABSTRACT: The study examined effect of population growth and unemployment rate on economic growth in Nigeria. The objective of the study is to determine how population growth rate and unemployment rate have affected economic growth for the period of 1981 to 2021. the variables used in the study are; Gross Domestic Product Growth Rate, which serves as the dependent variable while population growth rate, unemployment rate, gross fixed capital formation and total government revenue serves as the independent variable. Data were obtained from United Nations World Population Prospects (2022) and WDI (2022); for the period of 1981 to 2021. due to the mixed order of integration in the model, Auto Regressive Distributed Lag (ARDL) approach was applied in analyzing the data. However, from the result, jointly shows that Population growth and unemployment have significant impact on Economic growth in Nigeria. But individually tested, it shows that, Population growth has a positive and significant impact on economic growth in Nigeria, while unemployment has a positive insignificant relationship with economic growth in Nigeria. It was concluded that, to evaluate the impact of the population policy, promoting access to reproductive health services and to bring the problems of population to the Nigerian populace require thorough knowledge of challenges of rapid population growth and unemployment and its impact in Nigeria.it was recommended that Since Population growth has a positive and significant impact on economic growth in Nigeria, it is recommended that that certain strategies must necessarily be instituted within the framework of the Nigerian society so as to constitute incentives for attracting and committing individuals, especially those considered in this exposition, to embrace the need for serious and practical involvement in population control measures and check

Keywords: Population Growth Rate, Unemployment Rate, Gross Fixed Capital Formation, Total Government Revenue Serves, Economic Growth Rate

INTRODUCTION

Population growth has remained a key issue facing developing economies in the world. While developed countries are experiencing diminished or negative population growth, many countries in sub-Saharan Africa including Nigeria are having population growth above the economic growth rate (Zahonogo, 2016; Saghir and Santoro, 2018). With the deadline for the sustainable development goals (SDGs) fast approaching, attention is increasingly being focused on population growth and human capital development (United Nations, 2015; Swain, 2018). The population growth has its benefits which include: (1) large consumer market for both domestic and foreign products which can lead to an inflow of foreign direct investments (Bell et al., 2015; Erdogan and Unver, 2015; Nauman et al., 2016). (2) Increase in labour force

which will increase output and economic growth (Jha and Saritha, 2019; Yakubu et al., 2020). The negative effect of population growth can include: pressure on employment opportunities; pressure on infrastructure, overcrowding and standard of living; and Balance of payment problems as they may depend on imports or need to divert products for the export market for local consumption (Pandya and Sisombat, 2017).

Some countries especially developed nations have challenges with diminishing population growth. They have had to set up a scheme to encourage a certain type of professionals and individuals with certain skill sets to migrate into their country to improve their population growth rate (Turner, 2018). They are also putting in place incentives to encourage procreation and childbirth. A country such as Spain, for example, has a minister of Sex. Although they are largely capital intensive and technology savvy, they still need a reasonable population for balance (Ahmed, 2017). Population growth has been of interest to scholars as early as the 19th century. Malthus theory had raised concern about possible famine and the world not being able to support itself based on population growth (Hendrixson et al., 2020). Fortunately, industrial advancement in agriculture and other areas did not allow the fears to materialize. The argument by scholars on the impact of population growth on development is inconclusive as outcomes from various scholars are at opposing ends. Adewole (2012) found a positive relationship between population and growth in Nigeria on one hand while Onwuka (2006) found a negative relationship between population and growth in Nigeria. In another vein, the dilution effect of population growth was considered in the study by Bucci et al. (2019) and different outcomes were found for both developing and developed countries. Even at that, development is a broad and multidimensional construct and the human capital utilization aspect needs to be further explored. Human development is a key determinant of firm performance and an economy at large (Adewole, 2012; Ali et al., 2018; Cunningham, 2010; Okoye and Ezejiofor, 2013). It identifies the efficiency of growth and development in the country, in varying sectors; and also reveals advancement in social norms. Nigeria, like most developing nations in the world, has put in place many economic policies in her numerous attempts to use her human development and provide employment opportunities to enhance economic growth (Isiaka and Oghenekevwe, 2019; Uneke, et al., 2017). It has a very positive effect on economic growth and economic development. Again, the United Nations calculation of 2016 put the Nigerian total population at 185,989,600. As such, the country is currently the most populous in Africa (World Bank, 2016). For a country with such a huge population size, it is imperative to incorporate or consider human development in any feasible economic development plan because the achievement of developmental goals and realization of its objectives highly depends on the effective utilization of qualified and committed human development as drivers of other resources.

In spite of the rising population, numerous problems exist which hinder the productivity of human development in the country. Ineffective human development utilization in Nigeria results from the inability to organize, sensitize and equip the human development for the achievement of developmental goals.

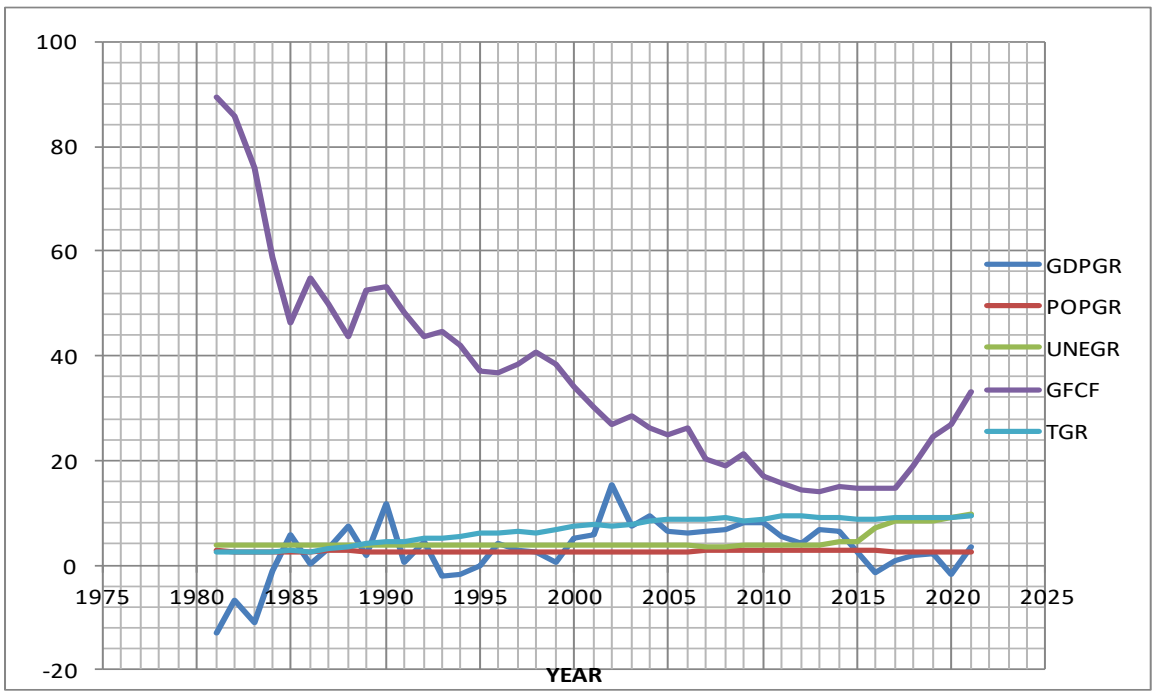
Although a huge amount of resources has since independence been invested by numerous bodies, government departments and institutions for the purpose of training and enhancing human development (which by extension, was to lead to poverty alleviation); however, investment has not been commensurate with the development of human development in Nigeria (Aliyu et al., 2014; Jaiyeoba, 2015). The increasing unemployment situation has been

worrisome (5.31% in 2015, 6.03% in 2018) while industrial output has been on the decline (Adeomola & Badiru, 2016; Adelowokan et al., 2019). The infrastructure deficiency such as epileptic electricity, bad roads and heavy traffic has furthermore contributed to the productivity and human capital output challenges (Ajide & Ridwan, 2018; Afolayan et al., 2019). Rural-urban migration has also tilted the population growth in favour of urban centres with villages left to an ageing population and short of able-bodied people to farm. This has led to congested city centres and the development of urban slums. The detrimental trend of migration is an addition to the identified problems of human capital utilization in the country. Nyoni and Bonga (2018) asserted that migration may drain away valuable talents, as educated and motivated people are in most cases likely to migrate in search of opportunities. They asserted further that in 2014, about 10.7% of the highly proficient population, trained in the country will be abroad working mostly in Organizations for Economic Cooperation and Development (OECD) nations. While numerous moves have been made by the successive Nigerian Government at various times to tackle these problems, only negligible success has been attained (Adepoju, 2007; Emeh, 2012) and yet, Nigeria continues to experience population growth.

Statement of the Problem

High population growth rate is a serious problem that is ravaging many countries across the world. This dilemma is more common among the Third World Countries than the already developed countries. However, the figure below shows the relationship among gross domestic product growth, population growth rate, unemployment rate, gross fixed capital formation and government revenue;

Figure 1.1 Trends in Gross Domestic Product Growth, Population Growth Rate, Unemployment Rate, Gross Fixed Capital Formation and Government Revenue



Source:United Nations World Population Prospects (2022) and WDI (2021)

The figure above explained the trends in the selected component of population growth as against unemployment growth rate in Nigeria from 1981 to 2021. According to United Nations World Population Prospects (2022) & WDI (2021), Nigeria unemployment rate for 2020 was 9.01%, a 0.48% increase from 2019. The unemployment rate for 2019 was 8.53%, a 0.08% increase from 2018; while unemployment rate for 2018 was 8.45%, a 0.06% increase from 2017. The rate of unemployment has been less than single digit. However, population growths have been on single digit increase overtime this is seen in the analysis below; the projected current population of Nigeria in 2022 is 216,746,934, a 2.53% increase from 2021 which was 211,400,708**,** a 2.55% increase from 2020 which was 206,139,589**,** a 2.58% increase from 2019 which was 200,963,599**,** a 2.6% increase from 2018, United Nations World Population Prospects (2022) and WDI (2021). The GDP growth rate also have not been consistent over the years. In any case, the above illustration shows that both population growth and unemployment have been on the rise recently and the need to estimate their relationships economic growth becomes imperative especially identifying how selected population growth rate and unemployment affect economic growth in Nigeria.

Objective of the Study

The broad objective of the study is to examine the impact of population growth and unemployment on economic in Nigeria. The specific objectives are as follows;

1. To investigate the impact of population growth rate on economic growth in Nigeria.
2. To examine the impact of unemployment growth rate on economic growth in Nigeria.

Conceptual Literature

Economic Growth

Economic growth is regarded as a major goal of national policy in any given economy. Ayres and Warr (2006) define economic growth as 'a rise in the total output (goods or services) produced by a country'. It represents an increase in the capacity of an economy to produce goods and services, compared from one period of time to another. Economic growth refers only to the quantity of goods and services produced. Economic growth can be measured in nominal terms including inflation, or in real terms, which are adjusted for inflation like by the percent rate of increase in the gross domestic product (GDP). Economic growth measures growth in monetary terms and looks at no other aspects of development (Illyas & Siddiqi, 2010). Economic growth can be either positive or negative. Negative growth can be referred to by saying that the economy is shrinking. Negative growth is associated with economic recession and economic depression (King & Levine, 1993).

Jhingan (2005) conceptualized economic growth as a gradual and steady change in the long-run which comes about by a general increase in the rate of savings and population. It has also been described as a positive change in the level of production of goods and services by a country over a certain period of time. Economic growth is measured by the increase in the amount of goods and services produced in a country.

Concept of Population Growth

Generally, the population is the sum total of people living in a certain topographical region in a precise period of time. In statistics and economics, populations the total group from which a statistical sample is drawn. In another word, a population may refer to a whole assembly of persons, objects, or measurements. A population can thus be said to be a summative reflection of subjects congregated together by a collective feature. Scholars argue that population growth has been problematical to the economy as more people without doubt use more of the available limited resources, thereby reducing long-term potential growth (Linden, 2017). Similarly, population growth affects the age structure of a country's population, global migration, economic inequity, and the size of a country's workforce. These factors both affect and are affected by overall economic growth.

Concept of Unemployment Rate

World Bank defines the unemployed as the records of the economically dynamic inhabitants who are devoid of work but are available for and seeking for work, including those who have lost their jobs and who have voluntarily left work. To the International Labour Organization (ILO), unemployment is simply seen as the share of labour force without work but are available for and seeking employment (ILO, 2010). Similarly, Gbosi (2015) averred that unemployment is a situation whereby those who are willing and able to work cannot find jobs at the prevailing wage rate. In other words, it is a situation whereby some people who fall within the ages of the working population, capable and willing to work, are unable to obtain befitting work to do. In the words of Tamuno and Kalu (2009), the unemployment rate as the proportion of the labour force (or working population) which is not employed at any given period of time. There are financial, mental and physical under-employment. It is financial when the workers are not getting equal pay from the work they are doing, but mental when there is mismatch between the work and qualification; and physical when the workers are not well-utilized. The problem of unemployment is one of the worst problems of the less developed countries.

THEORETICAL REVIEW

Malthusian Theory

Malthusian theory of population was used as the theoretical underpinning of the study. The theory was propounded by Thomas Robert Malthus in 1798. It was further developed by other scholars such as: Adam Smith, David Ricardo and many other mercantile economists. Malthus revolted against the prevailing optimism shared by his father, Godwin that a perfect state could be attained if human restraints could be removed. Malthus objection was that the pressure of increasing population on the food supply would destroy perfection and there would be misery in the world (Griffin, 2001). Malthus was severely criticized for the pessimistic views which had led him to travel on the continent of Europe to gather data in support of his thesis. He incorporated his research in the second edition of his essay published in 1803

The Malthusian theory explains the relationship between the growth in food supply and population. It states that population increase faster than food supply and if unchecked leads to vice or misery (Amin, 2008). The theory stressed further that if people fail to check growth of

population by the adoption of preventive checks, positive check operate in the form of vice, misery, famine, war, disease, pestilence, flood and other natural calamities which tend to reduce population and thereby bring balance with food supply. According to Malthus, preventive checks are always in operation in a civilized society, for positive checks are crude. Malthus appealed to his countrymen to adopt Preventive checks in order to avoid vice or misery resulting from the positive checks. The theory has the following tenets:

(a) unchecked population can lead to poverty
(b) underdeveloped society encountered short food supply with increase in population growth
(c) societies with rapid population growth are prone to vices such as conflicts and war
(d) Population explosion can expose a society to environment degradation
(e) Unchecked population can expose the society to act such as pestilence, disease and criminalities

The theory is applicable to the study in three directions. Rapid population growth in Nigeria is a menace that for long has continued to expose the country to the hydra headed monster known as poverty. The country for long has been rated as one of the poorest nations in the world. The United Nations Development index in 2018 rated the country as 157 out of 171 nations battling with poverty. The Amnesty international in 2017 and 2018 also stressed that the country is also among the worse nations battling with poverty. The population outburst that is ravaging the country is a setback to agricultural practice. It has led to the challenges of land fragmentation and degradation. Agriculture which is the mainstay of the society is practice on subsistence level. Tools are still primitive and there is repeated pressure on the land. This has spurred the rise of poverty in the country.

Another aspect which the theory is applicable to the study is on the issue of conflict which is so common in the country. Population outburst has led to pressure on land and this has encouraged unnecessary competition. The country is bedevilled with challenges of conflicts. There is the presence of inter and intra conflict, ethnic and religious conflict, communal conflicts, conflicts of herders and farmers, violence and attacks of militia groups and religious sect and many others. These are anomalies that are associated with the challenges of population explosion in the country

The theory is also related in the study in the area of degradation. The land which is a veritable tool is over use and abused in a lot of ways. It has been subjected to abuses in the form of oil spillages, erosion from mining activities, deforestation and a lot of others. These are stimulant to the growth of poverty in the country.

Empirical Review

Akinbode, Okeowo, and Azeez, (2017), examined The Dynamics of Population and Economic Growth in Nigeria, using yearly data obtained from Central Bank of Nigeria Statistical Bulletin from 1970 to 2014. The ADF test found that the two series were only differenced stationery and Johansen Co-integration test revealed that both variables had long-run relationship. The VECM revealed that economic growth adjusts to its long-run equilibrium at the rate of 6 percent annually. Impulse Response Functions and Forecast Error Variance Decomposition

revealed that population growth played significant role in the growth of Nigerian economy. Contingent on the results of ADF, Toda-Yamamoto VAR model was estimated in order to carryout Granger non-causality test. Unidirectional causality flowing from population growth to economic growth was found thereby buttressing the earlier results.

Aidi, Emecheta, and Ngwudiobu (2017) investigated the causal relationship between these aforementioned variables (i.e. population growth and economic growth) in Nigeria using annual time series data covering the period of 1970 to 2013. The study relied on the Granger-Causality technique to capture the objective of the study. The result of the neither Granger-Causality test showed that neither economic growth (GDPGR) caused population growth (POPGR) nor population growth (POPGR) caused economic growth (GDPGR) during the period under-studied.

Ogunjimi and Oladipupo, (2018), evaluated the impact of demographic structure on Nigeria's economic growth over the period between 1981 and 2016. Employing the Autoregressive Distributed Lag ARDL) framework and granger causality test, this study confirms the existence of a long-run relationship between the dependent and independent variables. The results further showed that aged population has a negative impact on economic growth while children population as well as labour force stimulates the growth of the Nigerian economy both in the short-run and long-run thereby support the existence of the demographic dividend hypothesis. On the other hand, whereas a bidirectional relationship exists between aged population and economic growth in Nigeria and a unidirectional causality runs from children population and labour force to real GDP, economic growth engenders gross fixed capital formation (investment) and school enrolment. Hence, this study concludes that aged population, children population, labour force, gross fixed capital formation and secondary school enrolment constitute important determinants of economic growth in Nigeria.

Olusogo, Oluwarotimi, and Muazu (2018) explored on the effect of population growth on the economic growth of Nigeria over the period of 1981 to 2015. Data on GDP and exchange rate were obtained from Central Bank of Nigeria Statistical bulletin, while data on Population growth rate, fertility rate, and crude death rate, were obtained from the World Bank World Development indicators. Ordinary least squares regression was used to analyze data in this study. The findings of the study revealedthat population growth has a positive and significant effect on economic growth of Nigeria, while fertility was negative and significant for economic growth in Nigeria. Exchange rate and crude death rate are however insignificant for economic growth of Nigeria.

Ogbuabor, Udo, and Onuigbo, (2018), examined Population Growth and Economic Development in Nigeria. The study used annual time series data for the period 1980 to 2016 and adopted the OLS regression technique. The results indicate that population growth retards economic development in Nigeria. However, the results further show that credit to the private sector is an important driver of economic development in Nigeria both in the short-run and long-run. Among others, the study concludes that policies that can control the escalating population; ensure that the existing population becomes more productive; and deepen the availability of credits for the private sector will enhance economic development in Nigeria.

Olusegun and Eke, (2019), examined Nigeria's Population Explosion and Its Underdevelopment Imperatives, the objective of the paper is to show that over population is the reason for high level of illiteracy, wide spread unemployment, poverty and violent crime. The study reveals that with the rate of population increase in Nigeria if nothing is done, time will come when it will result to environmental hazards, malnutrition and other infectious diseases. It observed that while other countries of the world like China and India with increasing rate of population like Nigeria are making serious efforts through Laws and legislation to combat this population increase. The Nigerian leaders are not putting any effort to fight this menace rather what is taking centre stage in Nigeria is this issue of corruption and embezzlement of government funds. The paper was of the opinion that this attitude of our leaders is what has resulted to unemployment armed robbery, kidnapping, underdevelopment and crises of killing and marginalization. It concluded by suggesting a way forward which includes reduction in early marriages which leads to increase in child bearing, corruption and poverty.

Amaefule and Tella, (2020), explores the effect of population growth and manufacturing sector output on the economic growth of Nigeria over the period of 1985 to 2018. The ARDL result revealed that fertility rate and lagged population growth have a significant positive effect on the real GDP, while the lagged fertility rate, and population growth rate have a significant negative effect on the real GDP. The fertility rate has a long run there is a negative relationship between fertility rate and the real GDP. It was also revealed that the manufacturing sector output has a significant effect on the real GDP, both at the short and long run.

Alimi, Fagbohun, and Abubakar, (2021), investigate the links among population growth, growth in output and income per capita growth for the periods of 1981–2018. The study employs both ARDL bound testing approach to cointegration and fully modified least square methods to evaluate the parameter estimates. We found that there exists a long-run relationship between population growth and economic growth in Nigeria. Further, the study found that the statistical and significant effect of population growth is more on long-run income growth than long-run income per capita growth. Meanwhile, in the short-run, an adverse effect is reported from population growth to economic growth, implying that the former has a detrimental effect on the latter. The reason for the adverse effects of population growth in the short-run results from the high number of dependents, whereas, in the long-run, there is a chance of demographic dividend that makes the young people becomes productive in their adulthood.

Bala, Ibrahim, and Hadith, (2020), examined Impact of Population Growth, Poverty and Unemployment on Economic Growth using Auto Regressive Distributed Lag (ARDL). The study employed an econometric procedure; unit root test which involved the use of Augmented Dickey Fuller test (ADF) and Phillip-Perron test (PP). The cointegration test technique used in the study is Auto Regressive and Distributed Lag (ARDL). The study variables are real GDP, population, poverty, unemployment and foreign direct investment has control variable. The null hypothesis stated that there is presence of a unit root was failed to be rejected at levels but rejected at first difference according to the two tests (ADP and PP) employed. The study found that some of the variables are stationary at level I(0) while others are stationary at first difference I(1).The results of the cointegration test showed that there exist cointegrating equation between explanatory variables and economic growth. The ECT speed of adjustment to the normal equilibrium confirms their long run relationship of the variables. Finally, the

study found that population and FDI have a positive impact while poverty and unemployment have negative impact on GDP.

Afolabi and Bobola, (2020), examined the relationship between population growth and unemployment in Nigeria. The paper employed data from secondary sources which covered the period of 1991-2016, sourced from the World Bank data base. The method of analysis was the Johansen Cointegration and Error correction model. ADF unit root test was used to establish the order of integration of the variables. Granger causality test was used to examine the direction of causality among the variables. A positive relationship was found to exist between population growth and unemployment. The result of the regression analysis shows that population plays a major role in the increased level of unemployment in Nigeria. The findings showed that population growth has a strong impact on unemployment in Nigeria. This means that a rise in population growth leads to a rise in unemployment. The study concluded that to combat the acute unemployment in the country, the Government should ensure there is job creation especially in the agricultural and manufacturing sectors. Private sectors employers should be given subsidies so as to encourage them to employ more people

Adeosun and Popogbe, (2021), examined the effect of population growth and human resource utilization in Nigeria, using secondary data for the period 1990-2018, the study conducted unit root test and co-integration analyses to determine the stationarity and correlation in the long-run in the variables. The study used the error correction model to ascertain the speed at which shocks can be corrected in the long-run. Granger causality test was also carried out to ascertain the direction of causality among the variables. The empirical results revealed that population growth has a negative and significant effect on human resource utilization. The study also revealed that unidirectional causality runs from employment rate to population growth rate and a unidirectional causality runs from employment growth rate to expected years of schooling. The Nigerian Government needs to not only control population growth but also focus on the quality of education.

Young, (2021), investigated Cohort Size and Unemployment Rate: New Insights from Nigeria, over the period 1970–2019, using multivariate and dynamic framework, Employing Bounds testing procedure, the article finds that both the short-run and long-run impacts of cohort size on overall unemployment rate are positive and statistically significant. This suggests that aggregate unemployment rate tends to be higher when many young people supply labour. In view of these findings, the article recommends that government should collaborate with private sector to develop and implement functional microcredit schemes. Such schemes should be flexibly structured to avert institutional bottlenecks and enhance accountability and transparency in their management.

Summary of Reviewed Literature

The empirical work above, shows to the best of my knowledge that though some work have be done on effect of population growth and unemployment rate, on economic growth, with little on the challenges of rapid population growth in Nigeria. Most of the reviewed works used total population as an indices of population growth without taking cognizance of the rate at which the population is growing. Any conscious efforts to militate against rapid population growth thereby improving the quality of live and standard of living of the people of Nigeria can only

be effective if the challenges of rapid population growth are known. In addition, to evaluate the impact of the population policy, promoting access to reproductive health services and to bring the problems of population to the Nigerian populace require thorough knowledge of challenges of rapid population growth and its impact in Nigeria. In any case, this study adopts Alimi, Fagbohun, and Abubakar, (2021) model that investigate the links among population growth, growth and economic growth for the periods of 1981–2018

METHODOLOGY

Theoretical Framework

Following the theoretical foundation of the neoclassical growth model, this study adapts and modifies the models of Alimi, Fagbohun, and Abubakar, (2021) that specify the relationship between population growth and economic growth as follows:

$$GDPdp_t = \phi_0 + \phi_1 GFCF_t + \phi_2 POPG_t + \phi_3 GCON_t + \phi_4 TOPEN_t + \mu_t \quad 3.1$$

where;

GDP = a vector of economic growth measured by both growth rate of real gross domestic product;

GFCF = capital investment as a ratio of GDP;

POPG = Population Growth Rate

GCON = Government Consumption to GDP

TOPEN = Total Trade to GDP

ϕ_0 , $\phi_{1\text{-}4}$ are parameters

t = time and μ is the error term

Modifying the above equation, we have equation 3.2

Model Specification

$$GDPGR_t = f(POPGR_t\ UNEGR_t\ GFCF_t,\ TGR_t) \quad \ldots 3.2$$

where;

$GDPGR_t$ = Gross Domestic Product Growth Rate, a proxy for economic growth in Nigeria during period t;

$POPGR_t$ = Population Growth Rate during period t

$UNEGR_t$ =is Unemployment rate to be used at time t,

$GFCF_{t,}$ = Gross Fixed Capital Formation to be used at time t

TGR_t = Government revue rate to be used at time t

Both Models are to be estimated is of the following linear form;

The econometric form of the model is;

$GDPGR_t = b_0 + b_1\ POPGR_t + b_2\ UNEGR_t + b_3\ GFCF_t + b_4 TGR_t + U$……(3.3)

Further, the work set out to present an Autoregressive Distributed Lag (ARDL) model of the relationship between selected components of population growth rate and unemployment in Nigeria. The ARDL (p, q) model is stated as:

$$\Delta GDPGR_t = \sum_{i=1}^{p} \alpha_i \Delta GDPGR_{t\text{-}i} + \sum_{i=0}^{q} \alpha_i \Delta POPDGR_{t-i} + \sum_{i=0}^{q} \alpha_i \Delta UNEGR_{t-i} + \sum_{i=0}^{q} \alpha_i \Delta GFCF_{t-i} + \sum_{i=0}^{q} \alpha_i \Delta TGR_{t-i} +$$
$$\sum_{i=1}^{p} \beta_i GDPGR_{t\text{-}i} + \sum_{i=0}^{q} \beta_i POPDGR_{t-i} + \sum_{i=0}^{q} \beta_i UNEGR_{t-i} + \sum_{i=0}^{q} \beta_i GFCF_{t-i} + \sum_{i=0}^{q} \beta_i TGR_{t-i} + \phi ECT + \varepsilon_t \text{.....(3.4)}$$

Where $ECT_t = Y_t - \alpha_0 - \sum_{i=1}^{p} \gamma_1 \Delta Y_{t-i} - \sum_{i=0}^{p} \beta_i \Delta X_{t-i}$ and $\phi = 1 - \sum_{i=1}^{p} \gamma_1 \Delta Y_{t-i}$.....(3.5)

The Bound test procedure used equations 3.3 and 3.4 into 3.5 as:

$$\Delta Y_t = -\sum_{i=1}^{p-1} \gamma_1 Y * \Delta Y_{t-i} + \sum_{i=0}^{p} \beta_i \Delta X_{t-i} - \rho Y_{t-1} - \alpha - \sum_{i=0}^{p} \delta X_{t-i} + \mu_{it} \text{.....(3.6)}$$

Then we test the existence of level relationship as $\rho = 0$ and $\delta_1 = \delta_2 = ... = \delta_k = 0$

where Δ = difference operator, α = the short-term coefficient, β = the long run coefficients μ = white noise error term.

Diagnostic Test of the Model

Diagnostic test of the model was carried out using, unit root test, co integration, error correction, coefficient of multiple determination, R^2 analysis of variance and Durbin Watson statistics

Unit Root Test

To fully explore the data generating process, we first examined the time series properties of model variables using the Augmented Dickey- Fuller test.

The ADF test regression equations with constant are:

$$\Delta Y_T = \alpha_0 + \alpha_1 Y_{T-1} + \sum_{j=1}^{k} a_j \ \Delta Y_{T-1} + \varepsilon_T ... \qquad (3.7)$$

where Δ is the first difference operator ε_T is random error term that is iid k = no of lagged differences Y = the variable. The unit root test is then carried out under the null hypothesis α = 0 against the alternative hypothesis of α < 0. Once a value for the test statistics

$$ADF_\tau = \frac{\hat{\alpha}}{SE(\alpha)} .....(3.8)$$ is computed we shall compare it with the relevant critical value for the Dickey-Fuller Test. If the test statistic is greater (in absolute value) than the critical value at 5% or 1% level of significance, then the null hypothesis of α = 0 is rejected and no unit root is present. If the variables are non-stationary at level form and integrated of the same order, this implies evidence of co-integration in the model.

Test of Significance

The significance test were tested at 5% level of significance using the coefficients of the independent variables and following the Rule: Reject the Null hypothesis if the t-prob is less than 0.05, otherwise accept the Null hypothesis when t-prob is greater than 0.05 i.e. Reject if t-prob <0.05, Accept if t-prob > 0.05

Test of Hypotheses

The Hypotheses were tested using the probability of t-statistics: Reject the Null hypothesis if the probability of t-statistics is less than the critical value (0.05), otherwise accept the Null hypothesis when critical value (0.05) exceeds probability of t-statistics.

Data Source

The data for this study was sourced from United Nations World Population Prospects (2022) and WDI (2022); for the period of 1981 to 2021.

Data Presentation, Analysis and Interpretation

Data Presentation

Unit Root Test

Table 4.1: Summary of ADF test results at 5% critical value

VARIABLE	ADF TEST STATISTICS	CRITICAL VALUE 5%	ORDER OF INTEGRATION	DECISION RULE
GDPGR	-3.135326	-2.938987	I (0)	Reject Ho
POPDGR	-5.016486	-2.938987	I (1)	Reject Ho
UNEGR	-4.607357	-2.938987	I (1)	Reject Ho
GFCF	-3.776135	-2.936942	I (0)	Reject Ho
TGR	-6.314842	-2.938987	I (1)	Reject Ho

Source: Authors computation with E-views 9

From table 4.1 above, Gross Domestic Product Growth Rate (GDPGR) and Gross Fixed Capital Formation was integrated of order zero (I ~ (0)) as it was stationary at level form. While Population Growth Rate (POPGR), unemployment rate (UNEGR), and Total Government Revenue (TGR) weren't not stationary at level form, but became stationary after first difference which implies that the variables (POPGR, UNEGR, and TGR) were integrated of order one (I ~ (1)). The decision is based on the fact the ADF statistics that is greater than the ADF critical values at 5%, we reject H_0 and conclude that the variables are stationary. Since the variables are integrated of order one and zero and none of the variables is integrated of order two. We therefore, apply the ARDL bound co-integration test.

ARDL Bound Co-integration Test

A necessary condition for testing for ARDL bound co-integrating test is that each of the variables be integrated of either of order one or zero or both (Pesaran, Shin and Smith, 2001). Since all the variables are integrated of order one and zero, we proceeded to estimate the ARDL bound test. The null hypothesis of ARDL bound co-integration is that the variables are not cointegrated as against the alternative that they are cointegrated. The decision rule is to reject the null hypothesis if the F-statistics is greater than the upper bound critical values at chosen level of significance.

Table 4.2: ARDL Bound Co-integration (5% critical value) Test Result for the models

Model	F-Statistics	K	Significance level	Critical Bound Value	
				10 (Lower Bound)	11 (Upper Bound)
	4.822497	4	5%	2.86	4.01

Source: Author's Computation with E-views 9

From table 4.2 the F-statistics for the model is 4.822497 and is greater than the upper (I1) bound of 4.01 at 5% level of significance. Thus, we reject the null hypothesis and conclude that there is a long run relationship between population growth rate, unemployment economic growth in Nigeria. Since there is a long run relationship, we therefore estimate the short run and long run ARDL analysis.

Test for Short Run Relationship

Having ascertained that there exists a co-integrating relationship between population growth, unemployment and economic growth in Nigeria, the short run relationship needs to be ascertained.

Table 4.3: Summary of Parsimonious Short Run Relationship Result between Population Growth Rate and Unemployment in Nigeria

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDPGR(-1))	0.224926	0.211822	1.061864	0.2993
D(GDPGR(-2))	0.397893	0.178176	2.233144	0.0356
D(DPOPGR)	110.878401	59.736232	1.856133	0.0763
D(DPOPGR(-1))	-121.609898	55.444742	-2.193353	0.0387
D(DUNEGR)	-0.652238	1.409707	-0.462677	0.6479
D(GFCF)	-0.150805	0.068633	-2.197260	0.0383
D(DTGR)	2.138243	2.065927	1.035004	0.3114
D(DTGR(-1))	-1.485285	2.171159	-0.684098	0.5007
D(DTGR(-2))	-4.578524	1.940504	-2.359451	0.0272
CointEq(-1)	-1.152498	0.226935	-5.078543	0.0000
Cointeq = GDPGR - (86.0553*DPOPGR + 0.0319*DUNEGR -0.1309*GFCF + 10.7444*DTGR + 6.3476)				

Source: Author's Computation with E-views 9

From table 4.3 above; the coefficient of the error correction term (cointEQ) is statistically significant and carries the expected negative sign at 5% level of significant; revealing that a short run relationship exist between Population Growth Rate, Unemployment and economic growth in Nigeria. The speed of adjustment is -1.152498 that is 1.15% of the adjustment to equilibrium of the economic growth is expected to occur in short run.

Test for Long Run Relationship

It's imperative to ascertain the long run relationship that exists between Population Growth Rate, Unemployment and economic growth in Nigeria.

Table 4.4: Summary of Long Run Relationship between Population Growth Rate, Unemployment Rate and Economic growth in Nigeria Result

Long Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
DPOPGR	86.055316	32.729437	2.629294	0.0150
DUNEGR	0.031894	1.844799	0.017289	0.9864
GFCF	-0.130850	0.052516	-2.491606	0.0204
DTGR	10.744353	5.250986	2.046159	0.0523
C	6.347562	1.573393	4.034315	0.0005

Source: Author's Computation with E-views 9

Interpretation of Log Run ARDL Result

POPGR = 6.347562 + 86.055316POPGR + 0.031894UNEGR – 0.130850GFCF

+ 10.744353TGR

The long run coefficient from table 4.4 above shows that the joint impact of all exogenous variables (POPGR, UNEGR, GFCF, and TGR) on the endogenous variable will amount to 6.347562 units; this is on the basis that they are all held at constant. In other word if all the exogenous variables are held at constant it will amount to 6.4 unit contribution to economic growth rate (GDPGR).

Population Growth Rate (POPGR) possessed a significant positive coefficient value of 86.1; this implies that it shares a positive relationship with economic growth rate in Nigeria. Entailing that on the long run, as Population Growth Rate increases by one percent, it causes 86.1 percent increase in Economic Growth (GDPGR) in Nigeria.

Unemployment Rate (UNEGR) has a positive insignificant coefficient of **0.03**; this implies that as Unemployment Rate of Nigeria increases by one percent, it will cause a 0.03 percent increase in Nigeria's economic growth and this did not conform to apriori expectation.

Gross Fixed Capital Formation (GFCF) had a negative significant coefficient of – 0.13 suggesting that on the long run, as the percentage of Gross Fixed Capital Formation increases by 1 percent, it causes the economic growth in Nigeria to fall by – 0.13 percent.

Government Revenue Rate (TGR) had a positive insignificant coefficient of 10.75 suggesting that on the long run, as the percentage of Government Revenue Rate increases by 1 percent, it

causes economic growth in Nigeria to increase by 10.75 percent. This conforms to apriori expectation.

Test of Hypotheses

The individual test was carried out to test for joint significance of the independent variables on the dependent variable at 5% level using t-probability and t-statistic shown in table 4.4. The rule applied was: If t-probability is greater than the prescribed level of 5% or 0.05, accept the null hypothesis, otherwise reject the null hypothesis when f-probability is less than 0.05.

Ho_1: Population Growth Rate has no statistically significant relationship with Economic Growth Rate in Nigeria

Conclusion

From table 4.4 above, the probability of t-stat of POPGR was 0.0150, and less than 0.05 critical values. Thus, we reject the null hypothesis and conclude that Population Growth Rate have a statistically significant relationship with Economic Growth Rate in Nigeria

H_{02}: Unemployment Rate has no statistically significant relationship with Economic Growth Rate in Nigeria

Conclusion

From table 4.4 above, the probability of t-stat of UNEGR was 0.9864, and greater than 0.05 critical values. Thus, we accept the null hypothesis and conclude that Unemployment Rate has no statistically significant relationship with Economic Growth Rate in Nigeria

Discussion of Findings

This study examined the effect of population growth, and unemployment rate on economic growth in Nigeria from 1981 to 2021; a period of 41 years; from the analysis it was discovered that population growth rate, have a positive significant relationship with economic growth in Nigeria. However, the above buttress the fact that the issues of population growth cannot be over emphasized. This result conforms to apriori expectations. The result also agreed with the study of Alimi, Fagbohun, and Abubakar, (2021), who carried out research on the relationship between population growth and economic growth in Nigeria from 1981 2018. Their result shows that population growth positively and significantly impacts the economic growth measured by both the growth rate of real GDP and GDP per capita. However, the impact of population growth is more on the former than the latter. The economic implication of the result is that the population growth of the country has immensely improved economic growth.

Secondly, it was discovered from the result that unemployment rate have positive insignificant relationship with economic growth rate in Nigeria. However, this did not conform to apriori expectations. The unconformity in the result may be attributed to inconsistencies of the authorities involve in collation of data. If data are not properly collated and documented by the authorities involve, it will send negative impression on the outlook of the system.

Summary of Findings

The study examined effect of population growth and unemployment rate on economic growth in Nigeria, using data from the period of 1981 to 2021. The findings of the study may be summarized as follows:

1. Population growth has a positive and significant impact on economic growth in Nigeria.

2. Unemployment rate has a positive and insignificant impact on economic growth in Nigeria.

Conclusion

The study examined effect of population growth and unemployment rate on economic growth in Nigeria. The objective of the study is to determine how population growth rate and unemployment rate have affected economic growth for the period of 1981 to 2021. the variables used in the study are; Gross Domestic Product Growth Rate, which serves as the dependent variable while population growth rate, unemployment rate, gross fixed capital formation and total government revenue serves as the independent variable. Data were obtained from United Nations World Population Prospects (2022) and WDI (2022); for the period of 1981 to 2021. due to the mixed order of integration in the model, Auto Regressive Distributed Lag (ARDL) approach was applied in analyzing the data. However, from the result, jointly shows that Population growth and unemployment have significant impact on Economic growth in Nigeria. But individually tested, it shows that, Population growth has a positive and significant impact on economic growth in Nigeria, while unemployment has a positive insignificant relationship with economic growth in Nigeria. It was concluded that, to evaluate the impact of the population policy, promoting access to reproductive health services and to bring the problems of population to the Nigerian populace require thorough knowledge of challenges of rapid population growth and unemployment and its impact in Nigeria.

Recommendations

From the foregoing, we recommend as follows;

1. Since Population growth has a positive and significant impact on economic growth in Nigeria, it is recommended that that certain strategies must necessarily be instituted within the framework of the Nigerian society so as to constitute incentives for attracting and committing individuals, especially those considered in this exposition, to embrace the need for serious and practical involvement in population control measures and check.

2. Since unemployment rate has positive and no significant impact on economic growth in Nigeria, it is recommended that, government should as a matter of urgency, create avenue for improved investment climate in order to encourage entrepreneurial development in the economy; this will in the long run reduce unemployment rate in the country.

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