www.ijmae.com

Population Growth and Economic Growth in Nigeria: An Appraisal

Olusogo Olamide Ogunleye[1]

Department of Economics, Accounting and Finance, College of management sciences, Bells University of Technology, Ota, Ogun State, Nigeria

Oluwarotimi Ayokunnu Owolabi

Department of Economics, Accounting and Finance, College of management sciences, Bells University of Technology, Ota, Ogun State, Nigeria

Muazu Mubarak

Department of Economics, Accounting and Finance, College of management sciences, Bells University of Technology, Ota, Ogun State, Nigeria

Abstract

This research explores 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 reveals that 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. The study recommends amongst other recommendations that the Nigeria government should ensure that Nigeria's rising population are channeled into areas of the economy where they may more fully utilized in bringing about high rates of economic growth for the country. In addition, the Nigeria government should increase access to affordable health care services so as to reduce death rates in order for Nigeria to achieve increased economic growth.

Keywords: Population Growth, Economic Growth, Ordinary Least Squares.

[1] Corresponding author's email:olusogo.ogunleye@yahoo.com

www.ijmae.com

Introduction

Several decades ago, agriculture seemed to be the major source of livelihood and as a result population growth was positively linked to production. It was believed that more people imply greater productivity and security since more workers or laborers working efficiently would be expected to immensely improve productivity and the overall output of the nation (Tartiyus, Dauda & Peter, 2015). When the societies and economies began to flourish, success was dependent upon a productive agricultural sector and attributed to large population. The economy inevitably expanded and the society reaped the financial benefits with more efficient labor. The high fertility rates allowed for increased laborers, enhanced productivity, facilitated economic activities and helped overcome the previously recorded exorbitant death rates as a result of combined effects of famine, disease, malnutrition, plague and war (Latimer & Kulkarni, 2008).

The modernization and technological expansion recorded in today's world allowed societies to gain control of the ailments which was rampant and previously killed large percentages of the population. Societies have now become equipped to overcome famine, malnutrition, and other life threatening diseases. Rapid technological advances in modern medicine and sanitation drastically reduced global mortality rates. Increased technology also improved labor productivity. This combination of both technological and medical improvements set the conditions for unprecedented booms in world population growth,

Despite conclusions that population growth accounts for long term economic growth, there are other contradictory views in theories and literatures. Tartiyus, Dauda and Peter (2015) for example stated that as the global fertility rates continue to outweigh mortality rate, and currently with almost 7 billion people, the world's natural resources are being placed under a huge strain. This in turn, gives rise to negative consequences through the different aspects of human lives which are being hampered, especially in developing nations.

Nigeria is one of the fastest growing countries in the world with a population growth rate of about 2.44 % as at 2016 according to the Central Bank of Nigeria, is the most populous country in Africa endowed with wide range of natural resources, and accounts for one in five of Sub-Sahara Africa's people. Nigeria's population according to the National Population commission as at 2016 was 182.2 Million. Further given Nigeria's high population growth rate which is not peculiar to Nigeria but is a significant feature of a developing country, Nigeria's population is set to increase even more in the future. This is likely to have implications for Nigeria's economic growth as it affects a whole range of socio-economic variables. This present study will therefore examine the effect of the population growth on economic growth of Nigeria. In particular in examining population growth, the study focus on population growth rate which is a major contributor to the speed by which population size grows especially in the context of Nigeria where population size continues to rise at a fast rate as it has been over the past years. Further in examining economic growth in the present study, the economic growth measure employed is log of Real Gross domestic product (GDP) consistent with previous studies on economic growth.

www.ijmae.com

Statement of the Research Problem

In the world's economic history, Nigeria became significant as a result of abundant natural resources, ranging from crude petroleum (oil and gas), to rich water resources, massive fertile arable land and rich forest resources (Ekpebu & Ukpong, 2012). For a developing country, Nigeria has achieved significant growth rates in terms of their economic growth rates with the highest being 9.19% in the third quarter of 2015, although it may be argued that Nigeria's GDP rebasing in August 2014 may have contributed to that but Nigeria's large and fast growing population suggests that it may have played a role and needs to be continuously explored in research if Nigeria is to achieve higher growth rates in light of its vast resources.

Existing theories have not provided a clear cut generalization as to the effect of population growth on economic growth of developing nations such as Nigeria and therefore it is difficult to make a pronouncement on Nigeria's future economic growth prospects on account of its rising population. Some theories started with the Malthusian Population trap in their statements showing that high population growth exerts pressure on the natural resources available, reduces private and public capital formation and diverts additions to capital resources to maintaining rather than increasing the stock of capital per worker thereby inhibiting economic growth, while other theories believed that high population would result to high number of labour force, productivity and even positive effects such as economies of scale and specializations which leads to economic growth and development. Thus, there is divergence of opinion regarding the desirability of population growth as some researchers view rapid population growth a real problem while others assert that it is not a matter of grave concern (Afzal, 2009).

Further, findings as regards the effect of population growth on economic growth based on empirical studies are mixed. While a significant number of studies such as Adewole (2012), Shaari, Rahim and Rashid (2013) and Tartiyus, Dauda and Peter (2015) find population growth to have a positive effect on economic growth, the adverse implications of rising population for economic growth on account of poverty, pollution and unemployment amongst a number of challenges and social ills resulting from increasing populations in developing countries as Nigeria are popularly acknowledged, and from that perspective population growth may negatively affect economic growth. Studies such as Dao (2012) and Okwori, Ajegi, Ochinyabo, and Abu (2015) however argue that population growth has no significant effect on economic growth.

Given the contrasting findings regarding population growth and economic growth therefore, the reality of high poverty and unemployment in Nigeria which as at 2014 were 7.2% and 7.8% respectively as highlighted by Central Bank of Nigeria (2014), and inspite of this, the announcement of Nigeria as the largest economy in Africa in 2014 on account of Nigeria's GDP rebasing in 2014, suggests that clearly there is need for more research on the trends and effect of population growth on economic growth of Nigeria. This is more so as Nigeria continues to experience high population growth rate with no evident sign of a decline in economic growth rates in sight.

Research Objective

The objective of this present research study is to investigate the effect of population growth on Nigeria's economic growth

Literature Review and Theoretical Framework

This section discusses population growth and economic growth in Nigeria. It presents the theoretical as well as the empirical framework for the study.

Theoretical Framework

Many studies have examined the relationship between population growth and economic growth such as Klasen and Lawson(2007); Mohsen and Chua(2015); Guga, Alikaj and Zeneli (2015); Shah, Sargani, Ali and Siraj (2015) and Aidi, Emecheta and Ngwudiobu (2016) have identified various theories that explain the relationship between population growth and economic growth. These include the liberal theory, the Marxist theory, the Malthusian theory, the Harrod-Domar model, Rostow's stages of Growth model, Endogenous Growth theory and the Romer model. However, the endogenous growth theory was used for the purpose of this study.

Endogenous Growth Theory

The endogenous growth theory argues that economic growth is generated by forces within a system rather than external forces. It specifically argues that economic growth is a result of policies, internal processes and investment in human capital. Economic growth of a country therefore on the basis of endogenous growth is on account of government policies promoting innovation, investment in human capital and acquisition of knowledge which constitutes internal technology driving economic growth. In the context of the present study therefore, Nigeria government policies on population growth controlling population growth through birth rates and death rates, will affect achievement of significant levels of economic growth of Nigeria. Hence, the endogenous growth theory is appropriate as the framework of the present study.

Empirical Studies on Population Growth and Economic Growth

A review of literature on population and economic growth suggests that a number of studies have been performed in Nigeria and other countries of the world.

Tartiyus, Dauda and Peter (2015) evaluated the impact of population growth on economic growth in Nigeria from 1980 to 2010 given that the impact of population growth on economic growth has always been a subject of disagreement among economists and given Nigeria's high rate of population growth. The data were analyzed using descriptive statistics as well as regression analysis. The result revealed that there is a positive relationship between economic growth (proxy by GDP growth) and population, fertility and export growth while negative relationships were found between economic growth (proxy by GDP growth) and life expectancy, and crude death rate. It was

recommended among others that the average population growth rate of Nigeria should be maintained since it is found to impact positively on economic growth in Nigeria within the period of study and that measures should be adopted to check the crude death rate of Nigeria as it affects economic growth negatively.

Considering the case of Mexico, Garza-Rodriguez, Andrade-Velasco, Martinez-Silva, Renteria-Rodriguez & Vallejo-Castillo (2016) analyze the dynamic relationship between population growth and economic growth, through a structural break cointegration analysis for the period 1960-2014. The Gregory-Hansen cointegration test confirmed the existence of a long run equilibrium. Based on the results of this test, using 1985 as the year in which the structural break occurs in the cointegrating equation and therefore the inclusion of a dummy variable for this year in the VECM developed in the paper, results obtained suggested that in the short run, economic growth has a negative effect on population growth, while in the long run, population has a positive effect on per capita GDP and per capita GDP also positively affects population.

Dao (2012) examines the economic effects of the demographic transition in developing countries. Based on data from the World Bank and using a sample of forty-three developing countries, the least-squares estimation technique in a multivariate linear regression was applied. The findings suggest that the growth rate of per capita GDP is linearly dependent upon population growth, both the young and old dependency ratios, the mortality rate, and whether or not the rate of population growth is less than 1.2 percent per year. Using interaction variables in light of the severe degree of multicollinearity among explanatory variables, it was found that per capita GDP growth linearly depends on population growth, the old dependency ratio, the mortality rate, and the interactions between population growth and both the young and old dependency ratios, between population growth and whether or not the rate of population growth is less than 1.2 percent per year, and the interaction term between the young dependency ratio and whether or not the rate of population growth is less than 1.2 percent per year.

Shaari, Rahim and Rashid (2013) examined relationship among population, energy consumption and economic growth in Malaysia from 1991 to 2011. The study applied Unit Root Test, Co-integration Test, Granger Causality Test and the results indicated that one co-integrating equation exists, suggesting the long-term relationship among population, energy consumption and economic growth in Malaysia. Results of Granger causality performed suggested that population has an effect on energy consumption and energy consumption contributes to economic growth in Malaysia A reduction in energy consumption can harm the economic growth. Therefore any policy to reduce energy consumption should be revised.

Ewugi and Yakubu (2012) examined Malthusian Population theory and the Nigerian Economy: A Political Economy Approach from 1766 -1834 and the study applied Regression analysis and The Malthusian population theory was proved to be far from empirical reality, especially in the developed world. But more than two hundred years after his work, indices show that the theory's predictions in some ways apply to Nigeria. Nigeria is currently experiencing rapid population growth, has experienced civil war and its people are yet to adopt modern and advanced technology in the area of agriculture.

There is poverty, malnutrition and food crises, Nigeria is a home to a variety of social ills, the likes of ethnic and religious crises, unwanted babies experiences, etc. All these can be summed up as the characteristics that Malthus referred to as "misery" or "vice" that would claim the lives of many. These „miseries" and „vices" are actually claiming lives directly and indirectly in Nigeria. The work therefore, recommend that Nigeria government should be committed to the pledge of the twenty-seven per cent (27%) education budgetary allocation standard of the United Nation Education, Scientific and Cultural Organization (UNESCO). This would go a long way in improving the standard of living of the people in Nigeria.

Okwori, Ajegi, Ochinyabo, and Abu (2015), empirically examined the Malthusian Population Theory in Nigeria from 1982 -2012. The study applied vector error correction model and the result shows that Population Growth has no significant impact on Economic Development in Nigeria. This is in line with the works of Dao (2012) and Thirwal (1973). In other words, the Malthusian population theory is relevant when applied to the Nigeria economy. Therefore, if we posit that population growth is detrimental to economic development it is tantamount to averring that overpopulation and poverty are correlated which portends danger. This combination is associated with increased vices, disease and death. This could be attributed to so many reasons chief amongst which is economic backwardness that basically depicts the inadequacy of social welfare programmes, infrastructure or the wherewithal to support the existing population. Also communal and religious laws further influences population growth contradicting the axiom of moral restraint as enunciated by Malthus. The effect of population on the economy in Nigeria is much more than the food problems enunciated by Malthus. Some of these consequences are congestion, high dependency ratio and mounting social problems, emigration, higher unemployment and/or underemployment, inequality including the current acts of insurgency and terrorism. Thus appropriate measures should be taken to curb this growing menace which may become endemic in the Nigerian economy resulting in pervasive poverty, and portends danger to sustainable development.

Ali, Ali, and Amin (2013) empirically test the impact of Population growth on Economic Development of Pakistan for period of 1975-2008 using the ARDL technique. The result of the model shows that the impact of population is positive and significant but the problem associated with huge population growth is the flood of newly produce work force, its management and providing different facilities even basic needs become a challenge for government and policy makers. To tackle the issue this study incorporated unemployment rate and expenditure made on health and education to the model in-order to investigate the impact of population growth directly and indirectly on economic growth in Pakistan. The results of the study indicate that Population growth has positively and significantly contributed to economic development but negatively affected by unemployment rate. HRD is although positive but insignificant. What can be concluded is that the direct impacts of population growth is positive on development of the economy but reverse is the case when indirect analysis is made and that leads to unemployment. Now although on one hand population growth increases economic growth but on the other hand it creates a problem of unemployment and leads to lacking of educational and health facilities. The government is advised to utilize this additional workforce efficiently as a policy tool to achieve high and desired level of growth.

www.ijmae.com

In Uganda, Klasen and Lawson (2007) examine the link between population and per capita economic growth, and poverty by combining both a macro and microeconometric approach, using panel data. Uganda is argued to have one of the highest population growth rates in the world. The findings of the study suggest that both theoretical considerations and strong empirical evidence suggest that the currently high population growth puts a considerable break on per capita growth prospects in Uganda. Moreover, it contributes significantly to low achievement in poverty reduction and is associated with households being persistently poor and moving into poverty. This is therefore likely to make substantial improvements in poverty reduction, and per capita growth, very difficult.

Aidi, Emecheta, and Ngwudiobu (2016) investigated the relationship between population dynamics and economic growth in Nigeria using time series data spanning from 1970 to 2014. The data were analyzed using ordinary least square estimation technique. The result revealed among other that all the core variables (i.e. fertility, mortality and net-migration) of the study are inversely related to economic growth during the investigated period. The study further revealed that gross fixed capital formation (GFCF) and savings are strong drivers of economic growth in Nigeria. Sequel to the findings, the Nigerian government is advised to make direct efforts toward checking the alarming fertility rate in Nigeria. Also efforts should be made to improve the quality of Nigerian labour force through more substantial investment in education and skills acquisition programmes so as to improve productivity in Nigeria

Mohsen and Chua (2015) examined Effects of Trade Openness, Investment and Population on the Economic Growth: A Case Study of Syria from 1980-2010.the study applied cointegration test and The Granger causality test and the result indicates bidirectional short-run causality relationships between trade openness, investment, population and GDP. There are also bidirectional long-run causality relationships between investment, population and GDP, and unidirectional long-run causality relationship running from trade openness to GDP. The study result indicates that population has the biggest effect on the GDP, thus it was suggested improving the quality of the human capital in the country. It is essential for the Syrian Government to upgrade the quality of human capital in the country by improving the quality of the education system, health services, the standard of living, and the quality of life.

Guga, Alikaj and Zeneli (2015) examined Population, Economic Growth and Development in The Emerging Economies from 1994-2010 the study applied regression analysis model and the result shows that Economic development is the primary objective of the majority of nations in the world, one of the key factors to be taken into consideration when analyzing the dynamics of population growth. Human capital development and economic growth are related to each other. Economic growth provides the conditions for human development and human development provides opportunities for economic growth. Developing countries are unable to afford an increase of such rapid population (as is currently happening and is expected to happen in the coming years). This will negatively affect quality of life and slow economic growth.

Shah, Sargani, Ali and Siraj (2015) examined The Effect of Increase in Population on the Economic Growth of Bangladesh from 1980 and 2005.the study adopted multiple linear regression model. The result of the study confirmed that population growth has negative consequences on the process of economic growth as far as Bangladesh is concerned. Two different equations have been employed one for the relationship between GDP growth and population also including FDI and exports, the other equation used GNI per capita as a function of population. Both the models were found significant, the relationship between economic growth and GNI per capita with population were significantly different from zero. According to Shah, Sargani, Ali and Siraj (2015) it can be concluded from the literature that large size of population and its fast rate of growth increases the consumption needs of people and so consumption expenditure will increase. There is lesser money left for saving and so capital formation and investment remains low. The part of scarce resources which is mobilized by such developing economies is eaten away by the fast growing population. It is found that increase in population makes it difficult to absorb the high number of people entering into the labor market every year. There are fewer job opportunities at home, about 70% expatriate workers are working in Middle East and oil rich countries, if the population increases at higher rate it will be a problem for the government so large increase in population is more a liability than an asset in the developing country like Bangladesh.

Mahmud (2015) examined Econometric Model on Population Growth and Economic Development in India from 1980 to 2013.the study employed Johansen Cointegration Test and Vector Error Correction Model and Granger Causality Test and The result of the study shows that the variables are cointegrated and the VECM shows the speed of adjustment toward the long run equilibrium from the deviation in the short run. The short run influence on the dependent variable (GDP) by the independent variables (population, rate of Urbanization and employment) were tested using a Wald Test which indicated that each independent variable influence the dependent variable in the short run. The study also discovered a unidirectional causality running from GDP to Population growth; a unidirectional causality running from GDP to employment; a unidirectional causality running Population to employment; a bidirectional causality or feedback influence between GDP and rate of urbanization; bidirectional causality between urbanisation and employment; and finally, bidirectional causality between population and rate of urbanisation. Conclusively, the relationship between population growth and economic growth is found to be positive in this study. In other words, the variables are found to have long run positive relationship or equilibrium.

Lachisa and Yirdaw (2012) examined population and economic development in Ethiopia from 1981 to 2012. The study employed vector error correction model and Granger causality and The result shows existence of high population growth in Ethiopia. This is evidenced by persistent and large gap between birth rate and death rate where the birth rate is on average was greater by around 27 per 1,000 Population. In addition, the doubling time of the population is declining. Based on the trend of population and economic growth while there exists a persistence increment in population size and real GDP, there is slight fluctuation in the real GDP overtime. To get a robust econometric analysis, the study employed different tests such as unit root, cointegration, and Granger causality tests. The unit root test indicates that the variables considered are stationary at

first difference. The cointegration test using Johansen test (trace and maximum eigenvalue tests) reveals that population and real GDP drifts together in the long run. Based on this, a VECM with an optimal lag length of four were estimated considering real GDP and Population as dependent variables in two different models. This model is valid in terms of the normality, homosekedasticity, and no serial correlation of the residual term. According to the estimation result, though population Granger causes real GDP in the long run, there is no Granger causality from real GDP to population. The short run result is also consistent with the long run result in the sense that jointly coefficients of lagged population (as indicated by Wald test) cause real GDP, where the reverse scenario is not valid. On the other hand, the short run speed of adjustment as measured by the coefficient of error correction term dictate that a previous year shock (disequilibrium) adjusts by 0.16 percent per annum in the model where population is the dependent variable. Therefore, considering the significant and negative impact of population on economic development, the concerned body has to device sound population policy that reduces the growth of population so as to reap the fruit of blossom economy.

Orumie, and Cynthia (2016) examined the effect of unemployment rate and population growth rate on gross domestic product in Nigeria from 1970-2005.the result applied multiple regression model and the study revealed that since 1970, the rate of unemployment and population has been on the increase amidst declining gross domestic product. The result also reveal that unemployment and population growth contribute commeasurably to gross domestic product. Furthermore, the result showed that unemployment contributes more to the national gross domestic product during this period in line with existing work and the result further shows that unemployment rate has an inverse relationship on gross domestic product in tandem with Okun's law (1962). That is, the study shows that unemployment rate account for about 12.9 percent decrease of the national gross domestic product. In the same vain, population growth rate account for negligible or no negative effect on the gross domestic products. This is due to non-involvement of the large percentage of the labour force and the non-labour force in the economic sector owing to ranking unemployment rate in Nigeria and the estimate from the analysis on the target population indicates that there is an inverse relationship between the dependent variable, (GDP) and the independent variables (UPR and PGR). That is, increase in GDP will cause a corresponding decrease in UPR and PGR. However, the population data shows that the overall effects of population growth and unemployment rate is negligible since it only contributes 3.4 percent to the Nigeria economic during this period.

Ilegbinosa, Moses and Praise (2013) examined population and its impact on level of unemployment in least developed countries. The study applied ordinary least square and the result found Clearly, employment problems can be created only if the government does not set up adequate measures to control population and to distribute resources equitably giving a sense of belonging to all citizens. Therefore, to provide the teeming controlled population the needed employment opportunities, there is need to efficiently allocate resources and initiate projects towards employment generation. This is needed to avoid a "worst case scenario" as postulated by The Next Generation Team, "In worst case, Nigeria will see growing numbers of restless young people frustrated by lack of opportunity; increased competition for jobs, land, natural resources, and political

patronage; cities that are increasingly unable to cope with the pressures placed on them; ethnic and religious conflict and radicalization; and a political system discredited by its failure to improve lives.

Ukpong, Ekpebu and Ofem (2013) examined Cointegration inferences on issues of poverty and population growth in Nigeria. The study applied ordinary least squares and regression analysis model and the result found that an increase in population can result to poverty and that increase in GDP of a country can reduce poverty especially when accompanied with improvement in other factors that would improve the wellbeing of the people. Hence, this paper supports the fact that, although poverty has a multi-dimensional measure, and could be attributed to a number of causes, it is obvious that where a country's population continues to increase without efficient investment in human capital development, and adequate development in economic sectors, such as agriculture that would improve the livelihoods of the people, then, any increase in population could result to increase in poverty in the economy. Hence, in the quest for poverty reduction in the developing countries, including Nigeria, there is a need for substantial investment in technology and agriculture to promote food sufficiency; increased income and employment. It is important that suitable policies are made to reduce the country's population growth by controlling family size, especially in the rural areas where poor families raise large number of children. The population should be encouraged to developed useful skills in science and technology to meet the country's need for employment and greater productivity. More so, there is need to develop the industrial sector and promote rural development supported with a functional power sector; while targeting industrial growth and agricultural development to enhance improved wellbeing for the people, especially those of the rural areas. Particularly, policies should be made to stipulate an average family size; especially number of children, and such policies should be made to gain support and collaboration of religious groups, cultural organizations and political institutions in the country. Moreover, Nigeria has great potentials for development, but there is need for concerted effort to tackle corruption, income inequality and poor resource management in the country to enhance poverty reduction and economic recovery.

Heady and Hodge (2009) analyzes 471 statistical regressions from 29 prominent economic growth studies using meta-regression analysis to identify the effect of alternative methodologies on key population growth results. This study finds that a broad set of methodological factors explains more than half of the variation in the population growth effects observed from this literature, including the types of variables used to measure population growth, the countries selected, the time frame of the analysis, and the nature of the control variables specified. The study also yields results that have implications for policymakers, especially insofar as several policy factors seem to influence the population change–economic growth nexus. Particularly strong is the evidence in support of the increasingly adverse effects of population growth in the post-1980 period, suggesting that demographic issues should warrant greater attention than they currently receive from the policymaking community.

Nwosu, Dike and Okwara, (2014) examined The Effects of Population Growth on Economic Growth in Nigeria from 1960 to 2008. The study applied Augmented Dickey-

Fuller (ADF) stationarity test combined with Granger Causality and Cointegration tests and The study found that there is a sustainable long run equilibrium relationship between economic growth and population growth. There is also the evidence of unidirectional causality between population growth and economic growth. Policy implications of the study are provided and economic growth formed a significant relationship with population growth.

Adewole (2012) examined effect of population on economic development in Nigeria from 1981 to 2007 using ordinary least square method of analysis. The result reveals that population growth exert positive and significant effect on economic growth measured as Per Capita Income (PCI) and Real Gross Domestic Product (RGDP) in Nigeria between 1981 and 2007.

Afzal (2009) examined Population Growth and Economic Development in Pakistan from 1981 to 2005.using ordinary least squares regression analysis. They examined the relationship between population growth and economic development. The result shows a highly significant and negative coefficient of population growth demonstrating that population growth is a real problem in Pakistan because it adversely affects the economic growth. Resources instead of being directed to productive channels are consumed by the exploding population. Positive and highly significant investment coefficient implies that investment growth will considerably contribute to economic growth which in turn depends on high saving rate. Pakistan has the highest dependent population that hinders economic growth because this population encompasses non-productive members of the society.

Given the potential indirect effects of population growth on economic growth a number of studies relating to population growth on social indicators were performed. In that vein, Edet, Samuel, Etim, and Titus (2014) examined impact of Overpopulation on the biological diversity Conservation in Boki Local Government Area of Cross River State, Nigeria and the Ex-post facto research design was adopted and the result of the findings reveals that overpopulation significantly influences biological diversity conservation. The result of the study support the assertion of Coleman (2011) which states that many environmental problems, such as rising levels of atmospheric carbon dioxide, biological diversity loss, global warming, and pollution, are aggravated by the population expansion. Other problems associated with overpopulation include the increased demand for resources such as fresh water and food, starvation and malnutrition, consumption of natural resources (such as fossil fuels) faster than the rate of regeneration, and deterioration in living conditions and Despite the increase in population density within cities (and the emergence of megacities), UN Habitat states in its reports that urbanization may be the best compromise in the face of global population growth. Cities concentrate human activity within limited areas, limiting the breadth of environmental damage. But this mitigating influence can only be achieved if urban planning is significantly improved and city services are properly maintained.

Michael, Usang, Nelson, Etim, Onah and Chukwudi (2014) examined the effect of population explosion on family standard of living in Calabar, Nigeria, and the study applied descriptive statistics and the study is able to discover that the following factors –

www.ijmae.com

poor family planning, illiteracy, poverty, ignorance, culture, religion, migration, and urbanization – causes population explosion and this is influenced by factors like: war, disaster, search for jobs and education, polygamy and early marriage, climate change, and inflation. There is need for mass education on population issues at least annually to serve as a reminder to the public on the effects of large families above the family resources. Better awareness on efficient and effective family planning methods, making them accessible, affordable and feasible in order to encourage its practice. There is need to encourage monogamy as against polygamy and a check on early marriage, equity in resources distribution to both the rural/urban areas including man power, creation of more jobs in the rural settings as this will mean rural development and encouraging agricultural practice as part of entrepreneurship to empower the people.

Abdulrahaman (2013) examined population growth and food security in Nigeria from 2010-2012.the study applied linear regression model and from the analysis using relevant data, the study noted that, Nigeria is witnessing population expulsion, where population moves substantially. Some of the factors identified includes; early marriage, poverty and illiteracy, religious beliefs, improved sanitary condition, availability of medical facilities and low mortality rate. The study also learnt that food production within the period of study increased at marginal level, this is why people are vulnerable to hunger as well as hunger related diseases. The study concludes that population expulsion due to in efficiencies in agricultural sector out run food supply, Nigeria therefore is in full spank of food insecurity.

The empirical literature reviewed has thrown up a number of interesting findings in the literature on population growth and economic growth. In general, population growth has popularly been found to have a positive effect on economic growth. This may on face value indicate positive prospects for Nigeria economic growth on account of Nigeria's large population and with a significant number of studies on Nigeria finding positive effect of population growth on economic growth. However, the argument by few studies as Shah, Sargani, Ali and Siraj (2015) and Guga, Alikaj and Zeneli (2015) that population growth may have a negative effect on economic growth should be taken seriously. This is so as population growth is argued to contribute to unemployment, poverty, environmental problems (such as rising levels of atmospheric carbon dioxide, biological diversity loss, global warming, and pollution) and other social ills, and through these economic growths will suffer a decline. The further finding of long run relationship between population growth and economic growth as found by a number of studies performing cointegration tests further suggests the need for consideration of the implications of population growth for economic growth over the long term.

Methodology

In light of the objective of this study to determine the effect of population growth on economic growth, the ordinary least squares (OLS) regression was employed to estimate our model specified.. The OLS regression under ideal conditions results in coefficients of independent variables which are unbiased, consistent and have minimum variance (i.e, they are efficient). Hence, OLS is the model estimation technique of choice for estimating regression models in empirical studies.

The Secondary data comprising time series observations from 1981 to 2015 was employed in performing the present study. 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 online Database.

Model Specification

The model adopted by the present study is a modification of the model of Tartiyus, Dauda and Peter (2015) in which life expectancy is excluded from the model while exchange rate replaces export growth in the model. The model therefore employed in the present study is specified as in equation (1) below

$$Log\ RGDP_t = \alpha_0 + \alpha_1 POPG_t + \alpha_2 FER_t + \alpha_3 CDR_t + \alpha_4 EXCHR_t + \alpha_5 Log\ RGDP_{t-1} + \varepsilon_t \ (1)$$

Where;

RGDP = Real Gross Domestic Product

POPG = Population growth rate

FER = Fertility Rate

CDR = Crude Death Rate

EXCHR = Exchange Rate

α_0 is the constant term of the model and the intercept of the estimated regression line. The coefficients $\alpha_1 \ldots \alpha_4$ are the coefficients of the respective independent variables affecting the dependent variable (economic growth). The coefficients of the respective independent variables indicate the effect on economic growth of a unit increase in the respective independent variables. The subscripts t refers to the time period of observations which in the case of the present study is from 1981 – 2015. The lagged log of RGDP is to correct our model for serial correlation.

A priori Expectations

The A-priori expectations for explanatory variables in the present study are as follows:

$A_0 > 0,\ \alpha_1 > 0;\ \alpha_2 > 0;\ \alpha_3 < 0;\ \alpha_4 > 0;\ \alpha_5 > 0$

Estimation Technique

Ordinary least squares regression is employed in estimating the model specified for this present study in achieving the research objectives of the study.

Results

Variable Descriptive Statistics

The descriptive statistics of the dependent variable and independent variables employed in the model estimated are as presented in Table 1 below.

Table 1: Summary Variable Descriptive Statistics

Variables	Real GDP (In Billions of Naira)	Population Growth (In %)	Exchange Rate (N/US$)	Fertility Rate (Per 1000 of Population)	Crude Death Rate (Per 1000 of Population)
Mean	30723.60	2.59	71.54	6.21	16.86
Median	22332.87	2.58	22.05	6.16	17.91
Maximum	69023.93	2.72	193.28	6.78	18.96
Minimum	13779.26	2.50	0.610	5.63	12.92
Std. Dev.	17308.63	0.07	66.29	0.35	1.95
Skewness	0.95	0.21	0.23	0.14	-0.82
Kurtosis	2.52	1.72	1.35	1.85	2.12
Observations	35	35	35	35	35

Source: Author's Computation (2018)

The above Table 1 highlights generally high values of all variables on average while the standard deviations of respective variables indicate variability in the data employed for this study. While all variables are positively except for Crude Death rate, all variables have flat distributions as evidenced by their kurtosis which is less than three.

Ordinary Least Squares Regression Model Estimation results

The results of ordinary least square regression obtained following estimation of our model specified in equation (1) are presented in Table 2 below:

Table 2: Ordinary Least Squares Regression Results

Dependent Variable: Log Rgdp				
Variables	Coefficient	Standard Error	T-Statistic	Prob.
C	3.949604	1.764266	2.238667	0.0333
Population Growth (Popg)	0.574968	0.202120	2.844687	0.0082
Fertility (Fer)	-0.336816	0.087432	-3.852321	0.0006
Crude Death Rate (Cdr)	-0.007964	0.021901	-0.363630	0.7189
Exchange Rate (Exchr)	0.000403	0.000248	1.626001	0.1152
Log Rgdp(-1)	0.685323	0.102739	6.670503	0.0000
R-Squared= 0.997029				
Adjusted R-Squared= 0.996498				
F-Statistic= 1879.274				

Prob(F-Statistic) = 0.000000
Durbin-Watson Stat= 1.516985
***, **, Represents Significance At 1% And 5% Levels Of Significance

Source: Author's Computation (2018)

The above regression results are the results of ordinary least squares regression. The diagnostics of the estimated model are used to assess if the model estimated is correctly specified and the data fits the model well. These diagnostic are the R-squared, adjusted R-squared, Durbin Watson Statistic and F-statistic. The R-squared of 0.9970 indicates that 99.70 percent of variation in economic growth (as measured by log of GDP) from one period to the next consecutive period, are a result of variations in the independent variables. The adjusted R-squared however provides a more realistic value of model fit and this is observed to be 0.9964 which is approximately equal to the R-squared. The value of adjusted R-squared is high and further confirms that the model fits our data well. Serial correlation in our model – the correlation of current period residual with previous period residual, as measured by the Durbin-Watson statistic is 1.51 which is approximately 2, and therefore implies the absence of serial correlation in the residuals of our above estimated model. Further the F-statistic which measures the joint statistical significance of the coefficients of our model is 1879.274 and is statistically significant at the 1% level implying that the coefficients of our specified model are jointly statistically significant. Therefore, based on the diagnostics of our OLS regression model, i.e, adjusted r-squared, Durbin-Watson statistic and F-statistic which all appear acceptable, we conclude that our estimated model is well estimated. We can therefore proceed to interpret our OLS regression results.

The constant term in our specified model is 3.949604 and is positive and statistically significant at the one percent level of significance. The constant term refers to the value of economic growth when the value of all independent variables is simultaneously zero.

The coefficient of population growth (POPG) is 0.574968 and is positive and statistically significant at the 1% level of statistical significance. This means that a one-unit increase in population growth will result in a 57.4% (0.574968*100) increase in GDP. Thus, increase in population growth has a significant positive effect on economic growth in Nigeria and therefore is important in contributing to the economic growth of Nigeria. Interestingly, our finding goes against our a priori expectation of the study. The finding of positive and significant effect of population growth on Nigeria's economic growth from our regression results in Table 2 above is consistent with findings of studies as Tartiyus, Dauda and Peter (2015), Adewole (2012), Shaari, Rahim, and Rashid (2013), Ali et al (2013), Mahmud (2015) and Mohsen and Chua (2015) who argue population growth to have a positive and significant impact on economic growth. However, our findings contrast with those of Okwori, Ajegi, Ochinyabo, and Abu (2015), Dao (2012), Abdullah et al (2015), Afzal (2009) and Guga et al (2015) who find a negative impact of population growth on economic growth. Therefore, in the case of Nigeria, Nigeria's increased GDP over the years may be attributed to Nigeria's high population growth, and thus suggesting that Nigeria has benefitted from its huge population in contrast to popular arguments that Nigeria's economic challenges are on account of its huge population. Nigeria may benefit from its high population growth rate by the increased population

adding to the labour force and hence the resultant increased population boosts Nigeria's economic growth as they contribute to productive activity in the economy. Alternatively, Nigeria's increased population on account of its increased population growth rate may provide a large domestic market which may purchase produced goods locally which contributes to Nigeria's increased economic growth. Further evidence in support of performing economies or those with impressive rates of economic growth with larger populations than Nigeria is provided by China and India where populations are in their billions compared to that of Nigeria which was 182.2 Million as at 2016 and is probably higher at present. Therefore, Nigeria with increased population growth on the basis of our regression results will attain yet higher levels of economic growth and for years to come may remain the largest economy in Africa.

Further found to be statistically significant are Fertility rate with a coefficient of -0.336816, and lagged real economic growth (Log RGDP (-1)) with a coefficient of 0.685323. On the other hand, Crude death rate and exchange rate are found to be insignificant for economic growth in Nigeria.

Conclusion and Recommendations

The present study has been an examination of the effect of population growth on the economic growth of Nigeria from 1981 to 2015. This is on account of Nigeria's economy being the largest in Africa and the need to explore the contribution of its large population through the population growth rate to Nigeria's large economy. The study finds that Nigeria's population growth rate has contributed positively and significantly to Nigeria's economic growth. Thus, Nigeria has benefitted from its large population standing as at 2016 at 182.2 Million and therefore can be optimistic of higher growth in the future on account of a continuous rise in its population. On this basis there is little doubt that Nigeria will remain Africa's largest economy for the foreseeable future.

On the basis of the findings of the present study, a number of policy recommendations are made. Firstly, the Nigeria government should ensure that Nigeria's rising population are channeled into areas of the economy where they may more fully utilized in bringing about high rates of economic growth for the country. Secondly, the Nigeria government should increase access to affordable health care services so as to reduce death rates since it negatively affects population and therefore will negatively affect Nigeria's efforts to achieve increased economic growth. Thirdly, efforts at providing reproductive health services should be doubled and intensified to meet the increasing needs of the increasing population as increased population contributes to economic growth. Finally, sufficient infrastructure including health and education should be provided by the Nigeria government for a growing population as the population increases and makes a valued contribution to economic growth.

References

Abdullah, Shah, T, Sargani, G, Ali, A &Siraj, W, (2015). The Effect of Increase in Population on the Economic Growth of Bangladesh (1980-2005). Developing

Country Studies ISSN 2224-607X (Paper) ISSN 2225-0565 (Online) Vol.5, No.17, 2015

Abdulrahaman, S. (2013). Population growth and food security in Nigeria (2010-2012). *Nigerian Chapter of Arabian Journal of Business and Management Review*, 1(3), 41-53.

Afzal, M., (2009). Population Growth and Development in Pakistan, *The Open Demography Journal*, 2: 1-7.

Ali, S., Ali, A. & Amin, A (2013). The Impact of Population Growth on Economic Development in Pakistan. *Middle-East Journal of Scientific Research* 18 (4): 483-491.

Dao, M. Q. (2012). Population and economic growth in developing countries. International *Journal of Academic Research in Business and Social Sciences*, 2(1), 6.

Enilolobo O.S (2017). Unpublished Demography Lecture Note.

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.

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.

Guga, K., Alikaj, L., & Zeneli, F. (2015). Population, Economic Growth and Development in the Emerging Economies. *European Scientific Journal*, ESJ, 11(10).

Gujarati, D. (2008), *Basic Econometrics* (5th Edition), McGraw Hill, New York.

Headey, D. D., & Hodge, A. (2009). The Effect of Population Growth on Economic Growth: A Meta-Regression Analysis of the Macroeconomic Literature. *Population and Development Review*, 35(2), 221-248.

Klasen, S., & Lawson, D. (2007). The impact of population growth on economic growth and poverty reduction in Uganda. DiskussionsbeiträgeausdemVolkswirtschaftli chen Seminar der UniversitätGöttingen.

Latimer, A. & Kulkarni, K. (2008) Population and Economic Development: A Comparative Analysis of Brazil and Mexico. Being a Paper Presentation Kelly, A. C. (2009) Population and Economic Development. Being a Paper Presentation.

Michael, G., Usang, E., Nelson, C., Etim, J., Onah, A. I., & Chukwudi, E. (2014). The Effect of Population Explosion on Family Standard of Living in Calabar, Nigeria. *European Scientific Journal*, 10(20).

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.

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 (JETEMS),* 6(8), 367-375.

Shaari, M S, Rahim, H.A, &Rashid I.M; (2013). Relationship among Population, Energy Consumption and Economic Growth in Malaysia. *The International Journal of Social Science,* Vol: 13, No: 1, 39-45.

Shah, T., Sargani, G. R., Ali, A., & Siraj, W. (2015). The Effect of Increase in Population on the Economic Growth of Bangladesh.

Tartiyus, E.H., Dauda, M.I & Peter, A (2015). Impact of Population Growth on Economic Growth in Nigeria (1980-2010). *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, Volume 20, Issue 4, Ver. V, PP 115-123

Todaro, M. P & Smith, S. C (2011) Economic Development (11th ed.); Addison-Wesley, London.

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.