

RAPID POPULATION GROWTH AND ECONOMIC DEVELOPMENT IN NIGERIA

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ABSTRACT

The human race is faced with an increasing number of resource management and environmental problems. Population growth, particularly in the developing world, has become a significant part of these environmental problems. Simply put a major problem of lasting significance facing the world in this century, may well be the sudden and unprecedented expansions of its population.

Studies have shown that the recent population growth in all regions of the world is the consequence not of increased birth rates per se, but of unprecedented worldwide decrease in the death rate especially in developed economies. (Ayeni and Adewale, 1996).

Reasons adduced have been that, since the 20th century human race had begun to declare victory over famine-related and infant mortality problems and at the same time significant advances in public health and medicine have been applied. These advances, although felt around the world, did not happen in the same way in today's richer and poorer nations. Death rates are declining more in developed countries, basically due to changes in preference for smaller family size compared to the rather large ones which is still common in less developed countries. (Ayeni and Adewale, 1996).

The relationship between population growth and economic development has occupied an important position in demographic studies, since Malthus drew the attention of the world to the fact that world population was increasing at a geometric rate while the means of subsistence was increasing at an arithmetic rate and he posited that if this is left unchecked it may lead to an adverse consequence on the world economy.

Though in recent years, technological advancement has made increase in productivity possible, this however, applies only to developed economies. The economic difficulties being experienced by most of the LDC's in recent times could serve as an indication that these countries have not really benefited from rapid population growth. The population of most LDC's are generally characterized by high dependency ratio, high illiteracy rate, unemployment, low manpower development, high urbanization, low income per capita and serious environmental problems caused as a result of urban congestion and pollution.

This study aims to analyze the impact of population growth on the development of the Nigerian economy and will aim at suggesting possible policy measures that can be put in place to translate the high population growth rate to an advantage for the country.

Keywords: Rapid Population Growth, Economic Development and Developing Countries.

I. INTRODUCTION

The phenomenon of population growth is said to have had so much impact on the growth of the economy such that the growth of the economy cannot be analyzed without a good understanding of the trend of population growth. It is further generally believed that there is a positive relationship between population growth and the growth of the economy. However, the growing belief among academic economists of the present day is that population growth rate is not a sufficient determinant of the growth of the economy, but rather the composition and distribution of the population is what actually determines the growth rate of the economy.

Economists have worked extensively to get a better understanding of the relationship between population growth and growth of the economy. In as much as countries with high population would have a higher work force, it however does not automatically mean there would be a growth in the economy or that the economy would grow faster than other countries that are less populated. A look into the population trend of nations around the world has shown that a lot of well populated countries, such as Nigeria, are still under-developed or developing, while some less-populated countries, such as France are already developed. It should also be said that there are countries that are highly populated but at the same time developed, countries like China and India, readily come to mind. Likewise, we have less populated countries, such as Togo, which are still under developed.

It is therefore obvious that to get a good understanding of the factors responsible for the growth of the economy, we have to look beyond population size and focus our attention more on the composition and distribution of the population. The issues of population growth and its effect on

the economy is such a critical one that countries pass bills into law either to curtail the growth of population or to promote its growth. Governments of countries around the world are trying to improve on the quality of their population through the emphasis they lay on education. This is all in a bid to have tangible proportion of the population, being either skilled or semi-skilled as is the emerging trend in the third world countries.

However, there is little systematic research, examining whether economic growth is affected by population growth. This study fills the void by examining whether the composition and distribution of the population affects the growth of the economy.

Population growth and the growth of the economy are issues that have drawn the attention of economists the world over. It is therefore not surprising that so much attention is given to it by international bodies such as the World Bank. This study examines the relationship between population growth and its effect on the growth of the Nigerian economy.

This study basically is significant because of the need to address the population problems, and find a lasting solution to the various inter related problems created by population explosions.

II. LITERATURE REVIEW

Economic implications, according to the report of population crisis committee Washington (1985), a group of Western economists have recently argued that "population growth is often the driving force behind economic expansion and technological change". Citing historical precedents in Western countries and post-war economic successes in Japan, Taiwan, South Korea and elsewhere, they make three general points,

- i. That an expanding labour force, an expanding market, and other consequences of population growth spur economic progress.
- ii. That population growth is the natural result of improvements in human condition, especially improved health,
- iii. That economic progress in and of itself, will lead to population stabilization through changes in desired family size. Direct interventions to reduce birth rates are therefore unnecessary or counterproductive.

The foregoing reasoning according to Idele (1997) implies that "nature together with modernization and development nexus, will eventually become her own contraceptive and that in any case, since in the new liberal thinking, large populations have become a blessing rather than a curse, they are to be preferred and indeed encouraged". The absolute size of a country and the population density per unit of area does influence the volume and efficiency of economic activities in a variety of ways.

According to Birdsall (1997), population growth exerts the following pressures on economic development:

- i. It tends to overuse the countries natural resources, hence exacerbating the problem of poverty in most LDCs
- ii. Rapid population makes it difficult to invest in social infrastructure such as roads, public services and agricultural infrastructure needed to tap the natural resources.
- iii. Rapid population growth creates serious problems of urbanization and environmental problems, thereby making it difficult to manage the adjustments that accompany economic and social changes.

The absolute size of a country and the population density per unit influences the volume and efficiency of economic activities in the following ways.

First and foremost, rapid population growth affects the economic development of both the LDCs and DCs in different ways. The consequences of rapid population growth on the development of LDCs are not the same with that of DCs. While rapid population growth in developed countries has had a positive impact on the industrial development and economic development of the developed economies, the same cannot be said of LDCs where the economies are poor and where there exist a labour abundance and scarce resources.

Secondly, a rapidly growing population exerts a significant impact on per capita income. This basically occurs in three ways.

- a) By increasing the pressure of population on land
- b) By raising the cost of consumption goods because of the scarcity of such goods.
- c) Increasing the dependency ratio and thereby decreasing the rate of capital accumulation because of the high economic cost of bringing up children.

Rapid population growth in the last few decades has led to a very high proportion (in some cases over 40 percent) of LDC populations being in the under 15 category. As Birdsall (1997) notes, "This entails a large proportion of available resources being tied up in looking after the health and well being of children, and also high cost of education and schooling". To achieve comparable school and higher education enrolment rates, to those found in industrialized countries, LDCs would need to spend a much higher proportion of GNP on education than that spent by developed countries, (Zymelman, 1976). The proportion of young people therefore, poses a problem of cost at the macro level for LDCs.

Thirdly, a rapidly increasing population plunges the economy into mass unemployment and under employment. As the population increases, the labour force also increases thereby creating

problem of unemployment and under employment. Large population therefore implies an increase in workforce, especially in the long run. In the very short run, a fast growing population which implies the existence of increasing fertility and therefore, high dependency ratio exerts great pressure on scarce resources. But if the country concerned pursues progressive demographic and educational policies, there is the possibility that an efficient human resource base would crystallize in the long run, and the larger the population, the larger would be the labour force.

Fourthly, large population implies a bigger market. This has for a long time underlined the thinking of economists since the days of Adam Smith and David Ricardo. In turn, an extensive market implies large scale production and utilization of heavy productive input with all the attendant advantages of economies of scale which are not available under small scale production (Idele, 1997). The large market therefore support the production and consumption of a wider variety of services, a process which generates better utilization of human and material resources and consequently the enhancement of employment opportunities in the true Keynesian model of the expression.

Large population growth generally retards capital formation. Capital formation, implies net investment in fixed assets, i.e. addition to the stock of real capital. As population increases, this in turn have an adverse impact on private savings by causing consumption to rise and savings per capita to fall. Rapid population growth is also said to bring about "capital deepening" (Spreading resources over more and more people).

According to Jhingan (1998), "to maintain income, capital per person must be raised in the form of expenditure on a person's education, health and skills. So the rapid increase in population leads to the diversion of capital investment directly from production activities to social overhead capital".

Finally, rapid population exerts a negative impact on the environment in the form of air, water and noise pollution in cities and towns. Macroeconomic policies aimed at poverty alleviation are usually targeted to ease the problems of the vulnerable poor who may suffer from market oriented allocation of resources due basically to a rapid growth in population. Often economic policies are geared towards input supply subsidies in the form of fertilizer subsidies, provision of water, education, health facilities and feeder roads, but this often times are delayed and even slowed down when rapid population growth is not accompanied by increase in technological advancement and human resource development. The consequences of rapidly increasing population are therefore to retard all development efforts in an under developed economy unless it is accompanied by high rate of capital accumulation and technological advancement.

III. STRUCTURE AND COMPONENTS OF NIGERIA'S POPULATION

In Nigeria, population has been a rather sensitive and controversial issue because of its implications for shaping regional (now geopolitical), state and ethnic relations and balance of power. It is the attitude towards the population question, in terms of its absolute size, as it affects the states and the sub-regions that constitute the background to the census controversies which the country has been associated with (PAN, 1990; Ottong, 1983).

The controversies have been responsible for the rather chequered history of census taking in Nigeria. It is however salutary to note that the phenomenon now appears to be a thing of the past, especially with the successful conduct of the 2006 census.

The 2006 census began with threats of boycott from many quarters and controversies, especially on the issue of whether to include religion and ethnicity. Not surprisingly, the results were received, with uproar in some quarters. In keeping with our character, it just shows that more than forty-six years after our independence, you would still find some Nigerians defending local interests rather than being true patriots who have out-grown local or state sentiments and are ready to at all times to advance and promote the overall interests of the entire country.

According to the released provisional result of the 2006 census, the country has 140,003,542 people, made up of 71,709,859 males and 68,293,683 females. No country on the continent is near the 100,000,000 mark, not to talk of coming close to us. Egypt, the second most populated country in Africa has about 70,000,000 people, about half our size. There are fewer things we can use to our advantage as the size of our population.

This census also shows the dramatic rate of our population growth. In the 1991 head count, the country had about 88.5 million people. By 2006, fifteen years later, the country's population had ballooned to over 140 million, a phenomenal increase of over 55 million people over a period of just fifteen years, indicating that Nigeria has one of the highest fertility rates in the world.

Obviously, the population of Nigeria is large, which makes it a "giant" relative to the other African countries. The large population implies a large market for goods and services as well as a large pool of human resources for development. However, the impact of population on development depends not only on the absolute size but also on its quality.

Population growth rate is influenced by the interplay of the three main demographic processes of fertility, mortality and migration. Nigerian population is believed to have risen steadily from an estimated 2.8 per cent in the 1960s to around 3.3 per cent in the 1985 to 1990 period. Although a steady decline in the growth rate is believed to have been in progress in the 2000s, the rate is still relatively high for (economic) comfort.

For instance, a growth rate of 3.3 per cent per annum suggests a population doubling time of 22 years.

The reality of this scenario might not necessarily be with the absolute size of the population but, more importantly, with the implications of the growth rate for the future size of the population, and the ability of the economy to grow commensurately with and, therefore, cope with the increase in population size.

The relatively low mortality rate of about 13 to 14 per 1000 (crude death rate) and a declining infant mortality rate, as well as the increasing life expectancy in the population, all suggest higher survival chances and therefore, a swell in the size of future population.

The major factor responsible for the rapid increase in the population of the country is the relatively high fertility level which according to the Nigerian fertility survey during 1981/1982 put the average number of child birth per woman (i.e. total fertility rate) at 6.4, but by 1990 had dropped to 6.0. Although the data here suggest a slight decline, the level is still relatively high. It seems an appreciable fall in fertility level in the country would depend on achieving a significant change in the cultural, socio psychological and economic attitude of Nigerians towards children.

A frontal approach was taken in pursuance of this goal when, in 1988, Nigeria adopted a National Population Policy which seeks to reduce population growth rate through voluntary fertility regulation, and to promote the health and welfare of mothers and children to improve the quality of life of all Nigerians. The main thrust of the policy is the recommendation to young couples not to have more than four children per family (or per woman) and to attain a reduction of the population of women bearing more than four children by 80 per cent by the year 2000.

Nigeria has the largest population in Africa and the highest rates of natural increase as well. It offers an excellent example of the issues faced by nearly every African nation to maintain a good quality of life for their people when resources have to be stretched to accommodate more and more people. Issues of family planning and contraceptive use, childhood immunization and adult vaccinations, and adequacy of medical facilities are important social issues that can be researched using Nigeria.

IV. METHODOLOGY/RESULTS

The study will use multivariate time series model to analyse the impact of population growth on the development of the Nigerian economy. Theoretical evidence shows that rapid population growth exerts a negative impact on an economy, while a highly enlightened and educated growing labour force contributes positively to economic development (Todaro,1997). This

theoretical position is adopted in this study as a guide to apriori expectation. The model for this study can be expressed thus,

$$GDP = f(POP, RUMP, TEXP) \dots\dots\dots(1)$$

The function above states that the Gross Domestic Product is a function of Population, Registered Unemployed and Total Expenditure. The function is expanded as shown below

$$\text{Log GDP} = c + \beta_1 \text{Log POP} + \beta_2 \text{Log RUMP} + \beta_3 \text{Log TEXP} + \varepsilon_t \dots\dots\dots(2)$$

Where:

GDP = Gross Domestic Product

POP = Population

RUMP = Registered Unemployed

TEXP = Total Expenditure

β_1, \dots, β_3 = Coefficients

ε_t = error term.

4.1 A Priori Expectation: From the model above, theoretically, both population and total expenditure should impact positively on the gross domestic product. Conversely, the registered unemployed should impact negatively on the gross domestic product. Mathematically, $\beta_1 > 0, \beta_2 < 0, \beta_3 > 0$.

This study first tests that the variables are I(1), using the Augmented Dickey-Fuller (ADF) test on each process:

$$\Delta_1 y_t = \alpha + \beta t + \rho y_{t-1} + \sum_{i=1}^k \theta_i \Delta_1 y_{t-i} + \varepsilon_t \quad (1)$$

Most time series variables are non-stationary and, in the literature, using non-stationary variables in the model could lead to nonsense regressions. According to Ramanathan (1992), the first or second differenced terms of most variables will usually be stationary.

Next is Johansen & Juselius (1990) co-integration test. Since it incorporates a parametric correction for serial correlation and the estimates are robust to simultaneity bias as well as

departure from normality (Johansen, 1995), this method produces asymptotically optimal estimates. By detecting a number of co-integrating vectors in non-stationary time series, Johansen procedure is useful in identifying a long-run relationship.

In estimating the long-run co-integrating equation, an error-correction model is established in order to capture the short-run deviations. The Error Correction Model (ECM) model is set up in the form:

$$\Delta_1 y_t = \beta_0 + \beta_1(\hat{u}_{t-1}) + \sum_{i=1}^k \beta_{2,i} \Delta_1 y_{t-i} + \sum_{i=1}^l \beta_{3,i} \Delta_1 x_{t-i} + \varepsilon_t \tag{2}$$

Where β_1 is the error correction term (lagged residual of static regression), the speed of adjustment towards equilibrium and the speed of convergence to equilibrium once the equation is shocked. ‘ Δ ’ stands for first difference. Note that the number of optimal lags k and l is determined by the Akaike Information Criterion (AIC).

Considering the variables of this study, the dynamic error correction model in (2) becomes:

$$\Delta_1 \log GDP_t = \beta_0 + \beta_1(\hat{u}_{t-1}) + \sum_{i=1}^k \beta_{2,i} \Delta_1 \log GDP_{t-i} + \sum_{i=1}^l \beta_{3,i} \Delta_1 \log POP_{t-i} + \sum_{i=1}^m \beta_4 \Delta_1 \log RUMP_{t-i} + \sum_{i=1}^n \beta_5 \Delta_1 \log TEXP_{t-i} + \varepsilon_t$$

The empirical data for the analysis has been extracted from the Central Bank of Nigeria’s *Statistical Bulletin*, and The International Financial Statistics webpage of the IMF.

4.2 EMPIRICAL RESULTS AND SENSITIVITY ANALYSES

4.2.1 Unit Root Tests

Table 4.2.1 shows ADF tests for the levels of the variables and the differenced variables.

Table 4.2.1: Unit Root Test Using Augmented Dickey Fuller (ADF)

		Levels			First Differences (Δ_1)		
Variable	Type	Rho	Tau	Pr < Tau	Rho	Tau	Pr < Tau
LogGDP	Zero Mean	0.24	2.47	0.91	-9.86	-2.32**	0.02
	Single Mean	-1.21	-1.17	0.57	-19.31	-3.41**	0.03

	Trend	-9.52	-2.05	0.40	-20.79	-3.22*	0.08
LogPOP	Zero Mean	0.34	1.12	0.86	-8.71	-2.31**	0.03
	Single Mean	-3.76	-1.97	0.20	-11.12	-2.17	0.14
	Trend	-9.38	-2.18	0.34	-12.82	-2.34	0.26
LogRUMP	Zero Mean	-0.92	-2.55	0.01	-7.62	-1.79**	0.04
	Single Mean	-0.51	-0.49	0.79	-19.54	-3.31**	0.03
	Trend	-7.56	-1.79	0.54	-19.70	-2.80	0.12
LogTEXP	Zero Mean	-0.61	-0.62	0.38	-23.68	-3.34***	0.00
	Single Mean	-9.69	-2.11	0.16	-23.80	-3.44**	0.02
	Trend	-12.87	-2.16	0.35	-24.36	-3.44*	0.06

*significant at 10%, ** significant at 5%, ***Significant at 1%

All the variables are I(1). In other words, the variables are all integrated of the same order. The variables can now be checked for co-integration.

4.2.2 Co-integration Test

The study uses the the Johansen & Juselius (1990) cointegration Test in order to establish long-run relationships between the dependent variable LogGDP and the independent variables: LogPOP, LogRUMP and LogTEXP.

Table 4.2.2. Johansen Cointegration Tests (Trace)

Null	Alternative	Statistic	95% Critical Value	Probability
$r = 0$	$r = 1$	78.17**	69.82	0.01
$r \geq 1$	$r = 2$	46.45	47.85	0.08

** indicates that the presence of a cointegrating vector at 5%.

Table 4.2.3. Johansen Cointegration Test (Maximum Eigenvalue)

Null	Alternative	Statistic	95% Critical Value	Probability
$r = 0$	$r = 1$	40.83**	33.87	0.01
$r \geq 1$	$r = 2$	22.78	27.58	0.18

Both Tables 4.2.2 and 4.2.3 shows that there is only one co-integrating vector. Thus, the Johansen & Juselius (1990) co-integrating test indicates that the variables are co-integrated, showing that the dependent and independent variables have long run relationship with one another.

4.2.3 Error-Correction Model (ECM)

The coefficients of the ECM and the logPOP is an essential feature to notice. The null hypothesis for the ECM is that its coefficient should lie between -1 and 0. The coefficient of the ECM is -0.52; it is appropriately negative and statistically significant at 1 percent level. This value means that the speed of convergence to equilibrium is 52 per cent (see Table 4.2.4), there is a long run relationship between the variables, and GDP is adjusted by 52 percent of the past year’s deviation from equilibrium.

Table 4.2.4: Parsimonious Error Correction Model

Dependent Variable: D(logGDP,1)				
Method: Least Squares				
Sample(adjusted): 1973 2013				
Included observations: 41 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	1.36	1.36	0.91	0.57
ECM(-1)	-0.52	0.25	-5.20	0.00
$\Delta(\logGDP(-1),1)$	0.27	0.16	1.54	0.29
$\Delta(\logPOP,1)$	1.07	0.56	1.74	0.06
$\Delta(\logPOP(-1),1)$	-2.01	0.82	-2.22	0.02

$\Delta(\log RUMP(-2),1)$	-0.45	0.17	-2.33	0.04
$\Delta(\log TEXP,1)$	2.55	0.87	2.66	0.01
Adjusted R-squared	0.63			
Durbin-Watson stat	2.02			

Notes: *significant at 10%, ** significant at 5%, ***Significant at 1%

Population shows a positive but insignificant effect on economic growth (at first difference) and a negative but significant effect on economic growth (at first difference lagged) in Nigeria. Also, unemployment (at second difference) has a negative impact on economic growth while total government expenditure (at first difference) has a positive impact.

On the whole, this study has shown that a growing economy such as Nigeria needs a growing population, that is, an increased supply of workers and consumers, though the exact nature of this relationship is complicated {i.e. population shows a positive but insignificant effect on economic growth (at first difference) and a negative but significant effect on economic growth (at first difference lagged) in Nigeria}. The incredible feats of Western countries in the past 200 years can be associated with high population growth; nonetheless population growth becomes tricky if it outstrips rises in productivity (Gamble, 2014), such as in Nigeria. This study strongly believes that, though Nigeria stagnates, the aggregate GDP growth could be worse without population growth.

V. CONCLUSION

Although several bodies of empirical research have tried to establish the relationship between rapid population growth and economic development, this paper has analyzed the impact of population growth on the development of the Nigerian economy.

Unlike the previous studies, this paper argues that the role of the composition and the distribution of population, besides the rate of population growth, on the economic development of the Nigerian economy cannot be over emphasized. Four factors have been cited to justify this argument.

The size of the population in Nigeria is increasing but this is being dominated by the youths. Although the youths may be regarded as the future of the nation, more is expected to be done in order to make them more responsible, socially, economically and morally. The size of this youth-dominated population is not enough; efforts should be geared towards promoting development

and skilled oriented youths with a view to promoting quality growth and development of the Nigerian economy.

The number of the idle labour potential is rising, amidst scarce resources in Nigeria. It is obvious that unemployment and underemployment looms in the Nigerian economy. Although the empirical analysis conducted in this study shows that a positive relationship exists between the registered unemployed and economic growth in Nigeria, the government of the Federal Republic of Nigeria need not relent in its effort at promoting employment creation in the country.

The public expenditure on social services in Nigeria is on the increase. Although the empirical analysis reveals that this contributes positively to economic growth in Nigeria, the proportion of this total expenditure, which is being expended in order to maintain the under 15 category of the population calls for concern. The role of education in moulding the future goals and aspirations of this category of the population cannot be over emphasized. Thus, more investment in quality educational and demographic policies needs to be promoted.

Finally, the expansion of the home markets in Nigeria is consumption driven. Opportunities that will promote the creation of goods and services locally, abound in several sectors of the Nigerian economy. Some of these sectors include; agriculture, manufacturing and processing, petroleum and gas, building and construction, hotel and tourism, transport, information and communication, education, health and utility sectors, etc. The focus of the Federal Government of Nigeria should be expanded to include quality empowerment programmes aimed at promoting entrepreneurial development in the country. This would, in turn, boost the production of goods and services locally. Thus, it would contribute immensely to the growth and development of the Nigerian economy.

REFERENCES

Ayeni, O. O. and Adewale O. S. (1996): GIS Queries for Population Data Analysis and Management. TS3.9 Spatial Information for Health Monitoring and Population Management.

Birdsall .N. and J. L. Londno (1997): “Asset Inequality Matters: An Assessment of the World Banks’ Approach to Poverty Reduction” *American Economic Review* 87: 32 - 37.

Dougherty C.(1992) Introduction to Econometrics, New York, Oxford University Press.

Gamble, A. (2014). The Conservative Nation (Routledge Revivals). Routledge.Johansen, S.,

Idele, S. I. (1997): On the Economics and Politics of Large Population: Nigeria in the New Policy Debate. The CBN Economic and Financial Review.

Jhinghan .D. R. (1998): *Development Economics*, Princeton University Press, Princeton, U.S.A.

Johansen, S. (1995), *Likelihood-based Inference in Co-integrated Vector Autoregressive Models*, Oxford, Oxford University Press.

Juselius, K. (1990), "Maximum Likelihood Estimation and Inference on Co-integration - With Applications to the Demand for Money". *Oxford Bulletin of Economics and Statistics*, 52, pp.169-210.

Ottong J. G. (1983): *Population Dynamics in Nigeria. Observations from Recent Case Studies*, Commissioned Paper for the National Seminar on Nigeria's Population Dynamics (28th January – 4th March 1983) Ahmadu Bello University Zaria.

Population Crisis Committee (1985): *Country Rankings of the Status of Women: Poor, Powerless and Pregnant Population Briefing Paper 20*, Washington D.C.

Ramanathan, R. (1992). *Introductory Econometrics with Applications*, Second Edition, Harcourt New York, Brace Jovanovich.

Zymelman M. (1976): *Pattern of Educational Expenditures*, World Bank Staff Working Paper No. 246, Washington DC.