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Impact of Population Growth Rate on Unemployment in Nigeria

Amana Samuel Abu Ph.D

Department of Banking and Finance, Nasarawa State University, Keffi
amanaaugustine2223@gmail.com

Grace Ubon Akpan Ph.D

Department of Economics, University of Abuja, P.M.B 117 Abuja
graceakpan141@yahoo.com

Unyime A. Okon Ph.D

University of Uyo, Uyo
unyimeokon@gmail.com

Aigbedion I. Marvelous Ph.D

Department of Economics, Bingham University, Karu P.M.B 005, Karu
marvelousaigbedion@gmail.com

Abstract

The study focuses on the impact of Population growth rate on Unemployment rate in Nigeria. While the specific objectives are to examine the causal effects between population growth rates and unemployment in Nigeria; ascertain the relationship between population growth rates and unemployment in Nigeria; and investigate the impact of population growth rate on unemployment in Nigeria. The source of data for this study is secondary sources and they were mainly from National Bureau of Statistics and Central Bank of Nigeria Statistical Bulletin. The analyses involved; descriptive statistics, graph and trend analysis. In addition, Granger Causality test was carried out to determine the direction of causation between Unemployment Rates (UNEMPR), and Population Rate (PGR), the Autoregressive Distributed Lagged (ARDL) and the Error Correction Model (ECM) were used in the analysis. From the result of causality test it is established that there is causal relationship between Population Growth Rate (PGR) and Life Expectancy in Nigeria (LEN). From the regression result there is a strong relationship between Unemployment Rate and the Independent Variables (Population Growth Rate (PGR), Life Expectancy in Nigeria (LEN) and Per Capita Income (PCY) both in the long and short run. Therefore, the study recommends that government should adopt a mechanism like family planning program and migration control in order to control population growth and reduce unemployment rate since the population rate increase the level of unemployment in Nigeria.



Keyword: Population, Unemployment, Growth Rate, Life Expectancy, Jobs

INTRODUCTION

At the beginning of the twenty first century, the world's population was estimated to be 6.1 billion people. The United Nations projected that the world's population will be 9.2 billion by the year 2050 and will reach the maximum of 11 billion by 2200. Over 90% of that population will inhabit the developing world (Todaro and Smith, 2006). "Two thousand years ago, population growth and production were positively correlated. More people meant greater productivity and security." The current modernization and technological advancement of today's world is highly attributable to centuries of rapid population growth and economic expansion. Hundreds of years ago, when societies and economies initially began to flourish, success was dependent upon a productive agricultural sector (Todaro and Smith, 2006).

As the population grows, the overall output will increase due to rise in workforce. With more productive labourers, the economy inevitably expanded and society reaped the financial benefits. Centuries ago, population booms were positive indications of the potential for long term economic growth. High fertility rates during these times allowed for increased labourers and also helped overcome the correspondingly exorbitant death rates. The combined effects of "famine, disease, malnutrition, plague and war" resulted in high death rate, exacerbated by lack of modern medicine and health care facilities in most affected parts of the world (Latimer and Kulkarni, 2008).

Reverend Thomas Malthus, in his "Essay on the principles of population" postulated the threshold population level at which population increase was bound to stop because life-sustaining resources, which increase at an arithmetic rate, would be insufficient to support human population, which increases at a geometric rate. Consequently, there is the tendency for population to outrun the means of subsistence, if nothing is done to check population growth rate, job opportunities will decline while unemployment will rise ((Todaro and Smith, 2006).

Nigeria is one of the fastest growing countries in the world, with an estimated population of 140 million and an annual population growth rate of 2.9% (National Population Commission, 2009), Nigeria is the most populous nation in Sub-Sahara Africa and the tenth most populous in the world. However, the composition of this population is mainly in the youthful category with 49% being youths below the age of 2, with a dependency ratio estimated at 89%. A large proportion of this population are those living in the rapidly growing urban area (United Nation Development Programm, 2007). One of the key findings of the report states: "Nigeria stands on the threshold of what could be the greatest transformation in its history. By 2030, it will be one of the few countries in the world with massive youth population. Youth not oil will be the country's most valuable resource in the 21st century". This sounds interesting, but the question is 'how would this happen given the deplorable state of our human capital.' Realistically, most youth lack mental skills and practicability (UNDP, 2007).

In a bid to control the population rate and unemployment in Nigeria, government made the first serious effort to influence the population variables in 1988 during the Buhari administration. The policy, "Nigeria Policy on Population for Unity, Progress and Self-reliance" was introduced after the approval of the Armed Forces Ruling Council (AFRC). This policy was a proof of government seriousness and concern for family planning as part of the overall socio-economic development of the country. The Head of State and Government emphasized the need for the policy (Federal Ministry of Health, 2004).

Furtherance to this, another policy was introduced by Olusegun Obasanjo Administration. This was called “Nigeria Policy on Population for Sustainable Development”. The growth rate of the population needs to be monitored and managed properly with conscious efforts. If not, it can militate against all the efforts of government to fulfill its commitment to improving the quality of life and standard of living of the people of the country and also for sustained economic growth, poverty eradication, protection and preservation of the environment, and provision of quality social services, balance between the rate of population growth, available resources, and the social and economic development of the country and complete demographic transition to a reasonable growth in birth rates and low death rates and also that of Millennium Goals, population management is desirable (Nigeria Demographic Health Survey (NDHS), 2009).

Despite government effort and programmes for Population for Sustainable Development in Nigeria, Uddin (2014) findings revealed that unemployment in Nigeria increased from 21.1% in 2010 to 23.9% in 2011 with youth unemployment at over 50%. From 2011 to 2013, there is an increase of 16% unemployment growth rate, also the unemployment rate in Nigeria stood at 12% in 2016. Significantly, the impact of this paper is that government should create labour market that work better for youth employment and recommends that the government should invest heavily on education to enable the youths become self-reliance instead of job seekers through skills development and training. Therefore, the main objective of this study is to examine the impact of population growth on unemployment in Nigeria.

LITERATURE REVIEW

Conceptual Review

According to the oxford living dictionary, population refers to all the inhabitants of a particular place. Merriam-Webster defines population to be a body of persons or individuals having a quality or characteristic in common or the organisms inhabiting a particular locality. In biology, a population is all the organism of the same group of species, which live in a particular geographical area, and have the capability of inter-breeding. In sociology, population refers to the collection of human beings. The concept of population growth can be seen as an important indicator used to describe the change in population and play a focal point in the economic development of a country. Population growth is important in any country, but when the population growth exceeds the available resources, then it becomes catastrophic for that country, and that is exactly what Nigeria has experienced over the years.

The International Labor Organization (ILO), (2014) defines the unemployed persons as numbers of the economically active population who are without work but available for and seeking work, including people who have lost jobs and those who have voluntarily left work. Unemployment is conceptualised as a situation where a worker or workers are involuntarily out of work. This means that workers are willing and able to work but could not find any work (Balami, 2006). The classical economists define unemployment as the excess supply of labour over the demand for labour which is cause by adjustment in real wage. The Classical or real-wage unemployment occurs when real wages for job are set above the market-clearing level, causing number of job-seekers to exceed the number of vacancies (Balami, 2006).

Finally, According to Bello, (2003), the consequences of unemployment in Nigeria are very severe and threatening to the citizenry and the economy as a whole. The unemployment episode has continued to pose so many challenges to the survival of the Nigerian nation. While some of these consequences bother directly on the unemployed, others like epidemics are limitless in effects.

Empirical Review

A number of empirical studies have been done on population and unemployment and economic growth, among them are the work of Nwosu, Dike and Okwara, (2014) which investigated the role of population growth on economic growth in Nigeria. The study employed annual secondary observation from 1960 to 2008. Empirical results support that population growth has a significant impact on economic growth. The study also found that there is a sustainable long run equilibrium relationship between economic growth and population growth. There is also the evidence of uni-directional causality between population growth and economic growth. Policy implications of the study are provided.

Similarly, Akinwande, Salaudeen and Olorunfemi (2012), examined the precise relationship between population growth and per capita income from 1980 and 2010. This paper examined the comparative trend review of population growth determinants between developing countries (Bangladesh, Ethiopia, Indonesia, Mexico and Nigeria) and developed nations (Germany and United States). The trend analysis revealed that fertility rate, crude death rate, birth rate, mortality rate, and life expectancy are the major determinants of rapid population growth rate, while youth dependency ratio of young people below age 15 has also been attributed as one of the leading causes of population growth and growth threat in developing countries.

While, Weing and Zimmerman (2012) used a Cobb-Douglas economy wide production function to investigate the impact of population growth on the steady rate of per capita income as well as on economic growth in the transition to the steady state. They revealed that an increase in the population growth rate of 10% (e.g. 3% to 3.3%) would reduce per capita income in the steady rate by 5%. However, human capital is considered to be an additional factor of production, and then the negative impact of population growth is larger as population growth now forces economies to use their scarce savings to equip young people as physical and human capital. As a result, 1% increase in population growth will decrease per capita income by 2%.

Again, Imoisi, & Ubi-Abai, (2013) observed the population growth and the problem of unemployment in Nigeria. The economies of the less developed countries (LDCs) are characterized by high population growth. They are facing a great challenge in generating adequate job opportunities for their teeming population. Many facts and data from notable authors, agencies, websites and organizations were analyzed and discussed in this paper regarding this problem. Furthermore, Okwori, Ajegi, Ochinyabo, and Abu (2015) investigated the potency of increasing population on economic development in Nigeria. Using the Vector Error Correction Mechanism (VECM) to estimate a time series covering a 31 year period of 1982 - 2012, the study found out that population growth has no significant impact on economic development in Nigeria within the study period giving credence to theoretical underpinning.

Finally, Orumie, Ukamaka Cynthia (2016) study applied the multiple regression model whose estimation co integrate the inverse relationship between unemployment rate and gross domestic product considering population growth as well. The results estimated by the model developed in this research study revealed that since 1970, the rate of unemployment and population has been on the increase amidst declining gross domestic product. The result also revealed that unemployment and population growth contributes commensurably 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.

The previous literature reviewed by the researcher on population growth on unemployment rate, empirical analysis are not current; the gap this study intends to fill is to bring it up to date and add to the already existing literature and enlightens students on the impact of population growth rate on unemployment in Nigeria.

Theoretical Framework

The Classical Theory of Unemployment has nothing to do with the classical view of employment as expounded by most relevant economists in the 18th century like Adam Smith or David Ricardo. They advocated for a full-employment labor market. However, in this essay we will see it from another perspective: The first ingredient is the labor demand. Its schedule determines the amount of labor that firms employ at a given real wage. The way to get the labor demand is by means of the neoclassical function of production: Economic theory says production of goods and services (Y) have basically two factors: labor demand (L) and capital stock (K): $Y = f(L, K)$.

The second ingredient is the labor supply curve basically determines the size of the labor force: total individuals willing to work at a particular real wage. Therefore, we can consider as part of this labor force all individuals whose opportunity costs in terms of consumption of goods are lower than the real wage. The last ingredient of the Classical Theory of Unemployment is the wage schedule or wage equation. This equation explains how the salaries are set up by external agents (like labor unions) and employees through collective or individual bargaining over the competitive level. Consequently, the slope of this curve depends merely on the situation of the labor market and the ability of these agents to influence in the level of real wages. Generally, wages are fixed according to a given level of unemployment but they are also subject to other measures of the labor market like labor taxes or unemployment insurance. Specifically, Blanchard (1998) remarked several key factors in the process of configuring a wage equation: the wage itself, productivity, reservation wage (minimum wage a worker is willing to accept) and the labor market conditions.

METHODOLOGY

The study makes use of time series data and they were mainly from National Bureau of Statistics and Central Bank of Nigeria statistical Bulletin. The method that will be employed to analyze the behaviour of the data is the use of both descriptive and inferential statistics. The variables used to determine the impact of population rate on unemployment rate in Nigeria are: the dependent variable is unemployment rate and the independent variables are Population Rate (PGR), Life Expectancy (LEX) and Per Capita Income (PCY) in Nigeria.

In addition, Granger Causality test was carried out to determine the direction of causation between the variables. The static long-run model will be derived, applying Autoregressive Distributed Lagged (ARDL) - Bounds test procedure to examine the co-integration relationship between unemployment rate and population growth rate in Nigeria. This procedure was developed by Pesaran and Shin (1999), which was later expanded by Pesaran, Shin and Smith (2001) and the procedure allow researcher to use variables which are not integrated in the same order. Also, the error correction model (ECM) will be used to establish the short-run and long run causal relations between unemployment rate and population growth rate in Nigeria.

The model to be used for this study is based on Weeks (2002) work. In his work he adopted the Malthusian theory of population (1798) which explains the relationship between population growth and the level of resources available in an economy that is if population growth is not controlled, it will come to a point where it will exceed the subsistence resources (shortage of

resources). The model was modified to incorporate population rate, life expectancy and per capita income as the independent variables while Unemployment as the dependent variable.

Assuming a linear relationship between the Rate of Unemployment (UNEMPR) and Population Rate and also adding two control variables; life expectancy in Nigeria (LEX) and per capita income in Nigeria (PCY), the functional form of the model is specified as:

$$UNEMPR_t = (PGR_t, LEX_t, PCY_t) \tag{3.1}$$

Therefore, explicitly the model becomes:

$$UNEMPR_t = \beta_0 + \beta_1 PGR_t + \beta_2 LEX_t + \beta_3 PCY_t + \mu_t \tag{3.2}$$

Where;

UNEMPR_t is unemployment rate at time t, PGR_t is Population growth rates at time t, LEX is the Life Expectancy in Nigeria, PCY is the Per Capita Income in Nigeria and β₀, β₁, β₂, and β₃ are parameters to be estimated, μ_t is white noise error term. The Autoregressive Distributed Lagged (ARDL) model that will be used in this study is specified as follows:

$$\begin{aligned} \Delta UNEMPR_t = \alpha_0 + \sum_{g=1}^k \alpha_{1i} \Delta UNEMPR_{t-i} + \sum_{h=1}^l \alpha_{2i} \Delta PGR_{t-i} + \sum_{i=1}^m \alpha_{3i} LEX_{t-i} + \sum_{j=0}^n \alpha_{4i} \Delta PCY_{t-j} \\ + \alpha_5 UNEMPR_{t-i} + \alpha_6 PGR_{t-i} + \alpha_7 LEX_{t-i} + \alpha_8 PCY_{t-i} + \varepsilon_t \end{aligned} \tag{3.3}$$

Where: UNEMPR = unemployment rate; PGR = Population growth rate; LEX= Life expectancy in Nigeria and PCY= Per capita income. Equation (3.3) will be used to examine the short-run and long-run relationship between unemployment rate and population growth rate in Nigeria.

While the Error Correction Model (ECM) used in this study is specified as follows:

$$\begin{aligned} \Delta UNEMPR_t = \beta_0 + \sum_{g=1}^k \beta_{1i} UNEMPR_{t-i} + \sum_{h=1}^l \beta_{2i} \Delta PGR_{t-i} + \sum_{i=1}^m \beta_{3i} \Delta LEX_{t-i} + \sum_{j=0}^n \alpha_{4i} \Delta PCY_{t-j} \\ + \beta ECM_{t-1} + \varepsilon_t \end{aligned} \tag{3.4}$$

The model above is used to adjust the estimation until the ECM turned negative. The negative sign of coefficient of the error correction term ECM (-1) shows the statistical significance of the equation in terms of its associated t-value and probability value.

The a priori expectation is that β₁>< 0 indicating a positive or negative relationship between Unemployment Rate (UNEMPR) and Population Rate (PGR), that is, increase/decrease in Population Rate (PGR) will leads to decrease/ increase in Unemployment Rate (UNEMPR). Similarly, β₂>< 0 indicating a positive or negative relationship between Life Expectancy in Nigeria and Unemployment Rate (UNEMPR), that is, increase/decrease in Life Expectancy in Nigeria will lead to decrease/ increase in Unemployment Rate (UNEMPR), *ceteris paribus*. However, β₃>< 0 meaning an increase/decrease in Per Capita Income (PCY) is expected to have negative or positive relationship with Unemployment Rate (UNEMPR).

PRESENTATION AND DISCUSSION OF RESULTS

Descriptive Analysis of Variables

Table 4.1: Descriptive Analysis of Variables

	UNEMPR	PGR	LEN	PCY
Mean	6.478387	2.612581	48.32903	968.4903
Median	4.500000	2.620000	46.90000	377.5000
Maximum	13.20000	2.710000	52.80000	3203.300
Minimum	1.800000	2.520000	46.10000	153.1000
Std. Dev.	3.923851	0.071413	2.554759	982.9274
Skewness	0.582149	-0.026330	0.665771	1.116803
Kurtosis	1.721581	1.418906	1.792953	2.677479
Jarque-Bera	3.862011	3.232567	4.172041	6.578477
Probability	0.145002	0.198636	0.124180	0.037282
Sum	200.8300	80.99000	1498.200	30023.20
Sum Sq. Dev.	461.8982	0.152994	195.8039	28984385
Observations	31	31	31	31

Source: Authors computation from E-views 9.0, (2018)

Table 4.1 shows the descriptive analysis of the variables used in the study. From the table the highest value for unemployment rate during the period of study is 13.2 percent this occurred in 2015 as shown in the table of data presentation. Also, peak value for Population Rate (PGR), Life Expectancy (LEX) and Per Capita Income (PCY) are 2.71 percent, 52 percent and 3203 dollar respectively. However, the lowest value for unemployment rate during the period of study is 1.8 percent. While, the lowest value for Population Rate (PGR), Life Expectancy (LEX) and Per Capita Income (PCY) are 2.52 percent, 46 percent and 153 dollar respectively. On the average the values of unemployment rate is 6.28 percent. Population Rate (PGR), Life Expectancy (LEX) and Per Capita Income (PCY) also have average value of 2.61 percent, 48.3 percent and 968 dollar respectively as indicated by their mean values.

Stationarity Test

Table 4.2: Summary of Unit Root Test

Variables	5% level	Critical ADF	Order of Integration
UNEMPR	-2.9677	-5.531672	I (1)
PGR	-2.9762	-3.048811	I (1)
LEN	-2.9677	0.544510	I (0)
PCY	-2.9677	-5.956088	I (1)

Source: Authors computation from E-views 9.0, (2018)

Table 4.2 shows stationarity test of the variables used in the study and from the table Augmented Dickey-Fuller Test results revealed that Unemployment Rate in Nigeria, Population Growth Rate and Life Expectancy in Nigeria are stationary at first difference of 5 percent level of significance. While the Per Capita Income stationary at level of 5 percent level of significance.

Causality Test

Table 4.3: The Causality Test Result

Null Hypothesis:	Obs	F-Statistic	Prob.
PGR does not Granger Cause LEN		3.40564	0.0499
PCY does not Granger Cause PGR	29	3.74865	0.0383
PGR does not Granger Cause PCY		3.45912	0.0479
LEN does not Granger Cause PCY		6.22007	0.0067

Source: Authors computation from E-views 9.0, (2018)

Table 4.3 above shows Pairwise Granger Causality tests. From the results, all the listed pair of variables has causal relationships among them. That is, there is a causal relationship among the variables given the probability values of the variables at 5 percent level of significance. Therefore, the null hypotheses which state that, there are no causal relationships among variables are rejected.

Co-integration Test Results

Table 4.4: ARDL Bounds Test of Co-integration

Test Statistic	Value	K
F-statistic	4.912473	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Source: Authors computation from E-views 9.0, (2018)

The Co-integration test was done using the ARDL Bound test equation in table 4.4. This became necessary to avoid a spurious regression result. Using the ARDL Bound test with critical value from Narayan (2005), the variables were co-integrated at 1per cent level of significance since the Wald F- statistics is greater than the critical lower and upper bound.

Presentation and Interpretation of Regression Results

Table 4.5: Long run regression results

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	-214.636930	24.269788	-8.843791	0.0000
PGR	18.580267	7.161349	2.594521	0.0196
LEN	3.744833	0.680883	5.499968	0.0000
PCY	-0.008032	0.001509	-5.323710	0.0001

Source: Authors computation from E-views 9.0, (2018)

From the long-run regression results obtained in Table 4.5, the following interpretation can be inferred; a unit increase in Population Growth Rate (PGR) and Life Expectancy in Nigeria (LEN) on the average, holding other independent variables constant will lead to 18.58 and 3.74 unit increase in Unemployment Rate in Nigeria respectively. A unit increase Per Capita Income (PCY) on the average holding other independent variables constant will lead to 0.008 unit decrease in Unemployment Rate in Nigeria. Finally, based on the probability value, the Population Growth Rate (PGR), Life Expectancy in Nigeria (LEN) and Per Capita Income (PCY) were statistically significant in explaining the variation in Unemployment Rate in Nigeria. This implies that Population Growth Rate (PGR), Life Expectancy in Nigeria increase the level of unemployment rate in Nigeria while the negative impact of the Per Capita Income (PCY) reduces the level of unemployment rate in Nigeria.

Table 4.6: The Error Correction Model Results

Selected Model: ARDL(1, 2, 2, 1, 2)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PGR)	24.997725	11.866281	2.106618	0.0500
D(LEN)	-2.080222	2.377127	-0.875099	0.3945
D(LEN(-1))	-4.985032	2.847185	-1.750864	0.0991
D(PCY)	-0.002947	0.001114	-2.646289	0.0176
D(PCY(-1))	-0.003019	0.001931	-1.563621	0.1375
D(PCY(-2))	0.007388	0.002235	3.305029	0.0045
ECM(-1)	-0.345391	0.341302	-3.941941	0.0012

Source: Authors computation from E-views 9.0, (2018)

From the short-run regression results obtained in Table 4.6 the following interpretation can be inferred; Since the variables were found to be cointegrated implying that they have longrun equilibrium relationship, it is necessary to test for shortrun relationship. From table 4.7, the ECM parameter is negative (-) and significant which is -0.25, this shows that 25 percent disequilibrium in the previous period is being corrected to restore equilibrium in the current period. It has been established that the variables are cointegrated and also have short run relationship established from the ECM. All the independent variables were positively related to Unemployment Rate in Nigeria except Per Capita Income as lag one. Finally, all the independent variables were statistically significant in explaining the variation in Unemployment Rate in Nigeria while the Life Expectancy in Nigeria (LEN) at current and lag periods and Per Capita Income (PCY) at lag one were statistically insignificant in explaining the variation in Unemployment Rate in Nigeria. This implies that both in the long and short run Per Capita Income (PCY) reduce the level of unemployment rate in Nigeria.

CONCLUSION AND RECOMMENDATIONS

In conclusion, the study revealed that population growth rate has a positive impact on unemployment rate in Nigeria. That is, population growth rate is positively related to unemployment rate in Nigeria. This implies that for Nigerian government to reduce unemployment one of the factors to consider is population growth rate. Government must use effective mechanism to control population growth rate in such away it can lead to effective unemployment control in Nigeria.

Finally, the per capita income which is one of the determinants of population growth rate was negatively related to unemployment rate in Nigeria, meaning that increase in per capita income will reduce unemployment rate in Nigeria. Therefore, there is the need for appropriate policy recommendations in order to have effective population growth rate control that will help to reduce the level of unemployment in Nigeria.

The following recommendations were raised from the research findings:

- i. Government should adopt a mechanism like family planning program and migration control in order to control population growth and reduce unemployment rate since population rate increases the level of unemployment in Nigeria.
- ii. Per capita income is negatively related to unemployment; therefore, government should improve the level of per capita income through controlled population, which in turn will increase the gross domestic product in Nigeria.
- iii. Since Life Expectancy Rate is positively related to unemployment, government should ensure that its retirement policy is well implemented to enable retirees pave way for new recruit so as to reduce the level of unemployment among massive unemployed youths in Nigeria.

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