



EFFECT OF POPULATION AND UNEMPLOYMENT GROWTH RATE ON NIGERIA ECONOMIC GROWTH

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Abstract

This study examines the effect of population and unemployment growth rate on the Nigerian economic growth 1990-2019. The study employed Johansen cointegration technique, Pairwise Granger Causality test, and Fully Modified Ordinary Least Squares (FMOLS) to determine the existence of a long-run relationship, the direction of causality between the key variables and the effect of population and unemployment on the Nigerian economic growth. The study made use of annual time series data on population, unemployment, inflation, broad money supply, and economic growth. The results of the Johansen cointegration test revealed that there is a long-run relationship among the data series. The Granger causality test showed that the variable granger causes one another. The FMOLS revealed that out of all the variables, only inflation has a negative effect on the Nigerian economy. Therefore the study concludes that the government of the country should invest in production that involves labour intensive techniques rather than capital intensive because Nigeria is a country that is labour abundant also, the government should reduce the rate of importation of goods and services in order to encourage local industries in order to reduce unemployment and inflation in the country. Finally, there should be a policy that ensures continuation of plans by the government so as to combat the problems caused by unemployment and population increase on the growth of the Nigerian economy.

Keywords: Population, Unemployment, Economic growth, Nigeria

1.0 INTRODUCTION

The high population growth rate in Nigeria has become a significant concern for policymakers and economic analysts, especially when accompanied by inadequate resources. This has led to a high rate of unemployment in the country. According to the Nigerian Bureau of Statistics, as of Q2 2020, Nigeria's labour force was 80.2 million, with approximately 21.7 million Nigerians unemployed. This figure surpasses the population of 35 out of Africa's 54 countries. The unemployment rate is even higher among young Nigerians aged 25 to 34, reaching 33.3%. Despite the high population growth in recent years, unemployment continues to be a pressing issue.

Historically, Nigeria has experienced significant population growth. Prior to the 2006 census, conducted after a series of previous attempts, the population was estimated to be 56 million in 1963, with 31 million in the northern region alone. A census conducted in 1991, under the military regime of General Ibrahim Babangida, revealed an official population of 89 million. After a delay in announcing the results, it was reported in 1992. Another census conducted in 2006 indicated that the population had grown by over 50% to reach 140 million.

Analysing the relationship between population growth and unemployment, it was observed that in 1991, when the population was 89 million, the unemployment rate increased by 3.64%. Similarly, in 2006, with a population of 140 million, the unemployment rate stood at 3.65%. This significant increase in population has had a negative impact on the Nigerian economy.

Nigeria's high population growth rate, accompanied by inadequate resources, has resulted in a substantial unemployment problem. Despite the population increase, unemployment rates have



risen, particularly among young Nigerians. Historical census data indicates the significant growth in the country's population over the years. However, the correlation between population growth and unemployment highlights the negative consequences for the Nigerian economy.

The questions arising from these macroeconomic issues in this study are; is there any relationship between population growth, unemployment, and economic growth? In what way can unemployment and increased population rate impact the Nigerian economic growth?

2.0 LITERATURE REVIEW

Several authors have focused on the relationship between population growth, unemployment, and their impact on the Nigerian economy. O'Nwachukwu (2016) employed the Ordinary Least Squares (OLS) method to analyse the determinants of unemployment in Nigeria. The study utilised variables such as government expenditure, inflation rate, lagged unemployment, population, and real gross domestic product. The results indicated that government expenditure, inflation rate, and population were significant factors in explaining changes in unemployment. However, the first lag of unemployment and real gross domestic product were not statistically significant. The authors recommended increased allocation of funds to capital expenditure, effective monitoring of ongoing projects, and the introduction of labour-intensive technologies.

In a separate study, Mai Jama'a (2019) examined the impact of population growth on unemployment in Nigeria using annual time series data from 1991 to 2017. The study conducted unit root tests, including ADF, PP, and KPSS, on variables such as population, unemployment, consumer price index, trade price, and Foreign Direct Investment (FDI).

Overall, these studies shed light on the relationship between population growth, unemployment, and the Nigerian economy. O'Nwachukwu (2016) emphasised the significance of government expenditure, inflation rate, and population in explaining unemployment, while Mai Jama'a (2019) focused on analysing the effects of population growth on unemployment. In various studies, the relationship between population growth, unemployment, and the Nigerian economy was analysed. Luka (2016) utilised secondary statistics to examine the correlation between population and unemployment rates in Nigeria, finding that as population growth rate decreased, unemployment rate increased exponentially. Kemi (2014) investigated the connection between unemployment rate and economic growth, confirming both short-term and long-term relationships between the variables. The study emphasised the need for economic measures and increased foreign direct investment to reduce unemployment. Babatunde (2020) explored the relationship between population growth and unemployment, using co-integration and error correction models. The findings revealed a positive association between population growth and unemployment, indicating that an increase in population leads to higher unemployment rates. The study recommended the creation of jobs, particularly in the agricultural and manufacturing sectors, to combat severe unemployment.

Bola (2020) conducted a study to examine the impact of unemployment on economic growth in Nigeria from 1999 to 2015. The variables considered in the study were Gross Domestic Product (GDP), unemployment rate, government expenditure, and money supply. The findings suggested that policy makers should focus on increasing output levels and improving productivity to reduce unemployment and control inflation. The study also recommended implementing labour-intensive production methods and promoting industries near the border as measures to decrease unemployment, inflation, and enhance domestic output (GDP).

3.0 METHODOLOGY

This section of the research work contains the methodology employed in examining the theoretical relationship between the effect of population growth rate, unemployment rate and economic growth in Nigeria. This section shall specify the model specifications, the estimation techniques, and sources of data

3.1 Model specification

The main objective of this study is to examine the causal relationship between population and unemployment growth rate on the Nigerian economy and the second objective is to examine the effect of population growth and unemployment on the economic growth in Nigeria. To effectively capture this, the study uses two models denoted Model 1 and Model 2. Model 1 examines the causality between population and unemployment growth rate on the Nigerian economy in order to achieve the first objective of the study, while Model 2 examines the effect of population growth and unemployment on the economic growth in Nigeria.

Model 1- Causality between Population, Unemployment, and Economic growth

$$GDP_{it} = \sigma_0 + \sum_{k=1}^m \sigma_1 GDP_{it-k} + \sum_{k=1}^m \sigma_2 POP_{it-k} + \sum_{k=1}^m \sigma_3 UNE_{it-k} + \mu_{it} \dots\dots\dots (1)$$

$$POP_{it} = \pi_0 + \sum_{k=1}^m \pi_1 POP_{it-k} + \sum_{k=1}^m \pi_2 UNE_{it-k} + \sum_{k=1}^m \pi_3 GDP_{it-k} + \mu_{it} \dots\dots\dots (2)$$

$$UNE_{it} = \varphi_0 + \sum_{k=1}^m \varphi_1 UNE_{it-k} + \sum_{k=1}^m \varphi_2 POP_{it-k} + \sum_{k=1}^m \varphi_3 GDP_{it-k} + \mu_{it} \dots\dots\dots (3)$$

Where: *GDP*= Gross Domestic Product; *POP*= Population Rate; *UNE*= Unemployment Rate.

Model Two

This model adapts the empirical models developed by Iloabuchi (2019) in his work “The effect of Unemployment on the Economic Growth of Nigeria”. The specification of the model 2 involves adding two other important variables (Inflation and Broad Money Supply) to the independent variables because there are other factors that contribute to the growth of an economy besides population and unemployment which also helps tackle the problem of multicollinearity when carrying out the econometric analysis.

Functional Specification of the Model 2:

$$EG = f(POP, UNE, INF, MS) \quad (4)$$

Where;

EG= Economic Growth

POP= Population

UNE= Unemployment

INF= Inflation

MS= Money Supply

Linear Form of the Model:

$$GRR_t = \beta_0 + \beta_{1t}POP + \beta_{2t}UNE + \beta_{3t}INF + \beta_{4t}BMS + \varepsilon \quad (5)$$



Where: GRR = GDP growth Rate (Dependent Variable)

POP = Population Growth,

UNE = Unemployment Rate,

BMS = Broad Money Supply,

INF = Inflation rate

(POP , UNE , INF , BMS are the independent variables of the model), U = Stochastic error or disturbance term and t = time trend. Gross Domestic Product refers to the sum total of goods and services produced in a particular country over a period of time usually a year. Population Growth Rate refers to the rate at which the total number of people are increasing over time usually a year in a particular area. The relationship between population and economic growth can be direct or indirect according to the Paul Romer growth theory where the increase in the population of a country does not necessarily imply a negative effect on the economic growth of such a country. Unemployment rate indicates the total number of able bodied citizens of a country that are unable to secure employment in a country over a period of time. The relationship between unemployment and economic growth can also be direct or indirect as the situation of the country may be according to the jobless growth theory where the economy can grow despite the fact that the rate of employment is decreasing in such an economy. Inflation rate is the percentage increase or decrease in the prices of goods and services over a period of time usually a month or a year. The percentage of inflation indicates how quickly prices of commodities increase during a particular period. Broad Money Supply is a measure of the amount of money supply in an economy including both highly liquid “narrow money” and less liquid forms over a period of time.

Method of Data Analysis

Regression analysis was used for this study and Eviews version 9 was to compute the regression analysis, Augmented Dickey Fuller t-statistic was used to estimate the time series data in this study, Johansen cointegration was used to test the long run relationship between unemployment, population, and economic growth of Nigeria in this study. Finally, the conclusion of the study was drawn from the result obtained from estimating using the Fully Modified Ordinary Least Squares (FMOLS). The Granger Causality Technique will be used to analyse the causal relationship between population, unemployment, and economic growth from Model (1). The essence of Granger Causality is to determine whether one-time series is useful in forecasting another.

Sources and Method of Data Collection

This research work made use of secondary sources of data that engaged the review of challenges of increase in Population and Unemployment on the Nigerian Economic Growth. The data was drawn from published and unpublished sources such as textbooks, journals, periodicals from the National Bureau of Statistic (NBS), National Population Commission (NPC), World Bank report, World Health Organization (WHO), National Demographic and Health Survey (NDHS), and so on from 1990 to 2019 a period of 30 years. The reason for this period is because the Nigerian economy experienced a series of phases as regards population and unemployment which affected the economic growth of the country. Regression analysis was used for this study and Eviews version 9 was used to compute the regression analysis, Fully Modified Ordinary Least Square (FMOLS) method, Johansen Cointegration test, Augmented Dickey Fuller (ADF) was also used in this study.

RESULTS AND DISCUSSION

Table 1: Descriptive Statistics

Descriptive Statistics	<i>GRR</i>	<i>POP</i>	<i>UNE</i>	<i>INF</i>	<i>BMS</i>
Mean	4.547000	2.609000	4.216667	18.25900	16.39700
Median	4.825000	2.605000	3.765000	12.39000	14.88000
Maximum	15.33000	2.720000	8.390000	72.84000	25.45000
Minimum	-2.040000	2.520000	0.000000	5.390000	0.000000
Std. Deviation	3.987180	0.072319	1.662904	16.89446	6.305320
Skewness	0.429885	0.152634	1.080241	2.076190	-0.246928
Kurtosis	3.312932	1.510609	5.484936	6.157927	2.611282
Jarque-Bera	1.046414	2.899344	13.55324	34.01846	0.493743
Probability	0.592617	0.835823	0.001140	0.000000	0.781241
Sum	136.4100	78.27000	126.5000	547.7700	491.9100
Sum. Sq. Deviation	461.0304	0.151670	80.19227	8277.258	1152.955
Observation	30	30	30	30	30

Source: Author's computation (2022)

The table above shows the descriptive statistic of the estimated variable selected. Descriptive statistics is important because it enables us to present the data set in a more meaningful way that allows simpler interpretation of the data set. *GRR* is used to capture the GDP growth rate from 1990 to 2019 in Nigeria which had -2.04% as the minimum value and 15.33% as the maximum value. The mean value of the data is 4.55% while the standard deviation is 3.98%. The implication of this is that GDP has been moderately dispersed because the mean is greater than the standard deviation. The same way, the skewness of the data set is positive while the kurtosis is 3.3%, which makes the data to satisfy the assumption of symmetrical distribution.

Consequently, population growth has a minimum value of 2.52% and a maximum value of 2.72%. The mean value of this variable is 2.60% and a standard deviation of 0.07%, which implies that the data is moderately dispersed because the mean is greater than the standard deviation. The same way, the skewness of the data set is positive while the kurtosis is 1.5%, which is far from 3 therefore, the data not satisfy the assumption of symmetrical distribution. Also, the minimum value for unemployment is 0% and minimum value is 8.4%. The mean value is 4.23% while the standard deviation.

Table 2: Pairwise Granger causality Results

Pairwise Granger Causality Tests Sample: 1990-2019 Lag: 2				
Null Hypothesis	F-Statistic	Probability	Decision	Causality
POP does not Granger Cause GDP	2.66417	0.0911	Reject	No Causality
GDP does not Granger Cause POP_	1.46595	0.2516	Reject	No Causality
UNE does not Granger Cause GDP	0.05808	0.9437	Reject	No Causality
GDP does not Granger Cause UNE	0.42828	0.6567	Reject	No Causality
UNE does not Granger Cause POP	0.44788	0.6444	Reject	No Causality
POP does not Granger Cause UNE	3.08409	0.0651	Reject	No Causality

Source: Author's Computation (2022)

The result obtained above indicates that Population granger caused Gross Domestic Product (GDP) in Nigeria from 1990-2019. Also, Unemployment increased Gross Domestic Product (GDP) in Nigeria from 1990-2019. Furthermore, Unemployment increased in Nigeria between the periods of 1990 to 2019.

Table 3: Unit Root Test

Variables	ADF Test						
	Level	Prob.	1 st Dif.	Prob.	2 nd Dif.	Prob.	Decision
GRR	-2.967767	0.0169					I(0)
POP	-2.976263	0.0112					I(0)
UNE	-2.986225	0.9459	-7.2182	0.0000			I(1)
INF	-2.967767	0.2740			-2.976263	0.0000	I(2)
BMS	-2.967767	1.0000			-2.976263	0.0000	I(2)

Source: Author's computation (2022)

Unit root test is one of the pre-tests in time series data analysis. This test is important because it could minimise the presence of spurious or nonsense results in an analysis. This study therefore used the Augmented Dickey Fuller test (ADF) to determine whether the data set has a unit root or not. The estimated result above indicated that Population rate and economic growth rate in their original forms were stationary at level which implies I0 while unemployment growth rate were stationary at first difference which is I1.

However, Inflation and Broad Money Supply were stationary at the second difference, which indicates I2. This study therefore used data with the mixture of various levels of integration, which implies that different variables possess some level of divergence in the short run. A multivariate cointegration test by Johansen (1990) was later used in the table below because the

divergence of the variables could return to equilibrium in the long run hence, the test for the long run relationship between the variables.

Table 4: Johansen Co-integration Test

Hypothesized No. Of CE(s)	Eigenvalue	Trace Statistic	P-Value	Max Eigen statistic	P-Value
None *	0.814617	110.7554	0.0000	47.18923	0.0000
At most 1 *	0.575316	63.56615	0.0000	23.97948	0.0065
At most 2 *	0.529705	39.58667	0.0002	21.12307	0.0321
At most 3 *	0.463034	18.46360	0.0018	17.41096	0.0249
At most 4 *	0.036897	1.052644	0.0041	1.052644	0.0041

Source: Author's computation (2022) Note: * represents rejection at 5% significance

Table 4 above shows the estimated result of the long run relationship between unemployment, population growth and economic growth in Nigeria using the Johansen co- integration test. It could be said that there are four (4) cointegration vectors among the variables. Hence, there is a long run convergence between unemployment and population in the Nigerian economy.

Table 5: Fully Modified Ordinary Least Squares

Regressors	Coefficient	T-statistics	Prob. Value
POP	855.6231	12.36344	0.0000
UNE	21.89591	4.945881	0.0000
INF	-0.355972	-2.493607	0.0199
BMS	0.010566	10.91039	0.0000
R-Squared	0.987266		

Source: Author's computation (2022)

The table 5 above is a table showing the estimate of the long run relationship between unemployment, population and economic growth using the Fully Modified Ordinary Least Squares (FMOLS). It is seen that only inflation did not bear the expected sign, taking note of the R-squared value of 0.98 shows that POP, UNE and BMS jointly explained about 98% of the systematic variations in the GDP growth rate which means that the model is very good in running the analysis. Inflation therefore had a negative but significant relationship with GDP in Nigeria. However, population, unemployment, broad money supply, and GDP growth rate had positive and significant relationships.



Conclusion

This research study investigated the effects of population and unemployment growth rate on the Nigerian economic growth and also the relationship between population, unemployment, and economic growth of Nigeria. The Granger Causality test was used to examine the causal relationship between the key variables. The Augmented Dickey Fuller (ADF) test for stationarity was used, Fully Modified Ordinary Least Squares (FMOLS). Johansen cointegration test was used to check the long run relationship between the variables in the model.

The main result showed that there was a positive relationship between populations, unemployment, and broad money supply in the economy while inflation had a negative relationship between economic growth. Also, the Johansen cointegration revealed that there was a long run relationship between unemployment, population, and the Nigerian economic growth. The Granger Causality Test revealed that there were causal relationships between population growth rate, unemployment growth rate, and also the economic growth rate.

The population and unemployment rate in Nigeria has been at increasing rates which has resulted into various economic and social problems such as increased brain drain as a result of low or no job opportunities, high rate of poverty, terrorism, and insecurity to mention but a few consequences. Although, there had been policies and measures put in place by the Nigerian government to curb the problems caused by unemployment and increasing population but there are some factors that contributed to the inadequacies of such policies and measures such as, corruption, lack of continuity of policies, lack of proper funding of regulatory bodies, inadequate development plans, and so on.

Recommendations

Therefore, based on this study and findings in it, the following have been recommended:

- i. The government of the country should invest in production that involves labour intensive techniques rather than capital intensive because Nigeria is a country that is labour abundant.
- ii. Government should reduce the rate of importation of goods and services in order to encourage local industries in order to reduce unemployment and inflation in the country.
- iii. There should be a policy that ensures continuation of plans by the government so as to combat the problems caused by unemployment and population increase on the growth of the Nigerian economy.
- iv. The government and the Central Bank of Nigeria (CBN) should implement monetary policies to regulate the Broad Money Supply (BMS) and also Inflation in the country.

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