Economic Growth Impact of Population Dynamics and Unemployment in Nigeria

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ABSTRACT

This study assessed the impact of population dynamics and unemployment on economic growth in Nigeria, with gross domestic product (GDP) serving as the dependent variable. The explanatory variables included population, birthrate, unemployment, labor force, and gross fixed capital formation (GFCF). To capture the relationships among the variables, the Autoregressive Distributed Lag (ARDL) bounds co-integration approach was applied, as it accommodates variables that are stationary at both level and first difference. Stationarity was verified through the Augmented Dickey-Fuller (ADF) unit root test, which confirmed a mix of I(0) and I(1) series. The bounds test established the existence of a long-run relationship between GDP and the independent variables. The findings revealed that in the short run, labor force and GFCF had positive but insignificant effects on GDP, whereas population, birthrate, and unemployment exerted negative and insignificant impacts. In the long run, population, birthrate, GFCF, and labor force were positive and significant, with the exception of labor force, which remained insignificant. Unemployment, however, was negative and significant to GDP in the long run. The causality test also confirmed a unidirectional relationship from the independent variables to economic growth. The study recommends the implementation of skill acquisition and entrepreneurship programs to equip the growing population with employable skills, thereby enhancing productivity, creating jobs, and fostering sustainable economic growth.

Keywords: birthrate, economic growth, labor force, population, unemployment.

INTRODUCTION

The debate over the intrinsic relationship between population growth and unemployment on economic growth has been on for long time among economists. The starting point of this debate could be specifically traced back to Malthus (1803) who posited that "population growth would lower the standard of living of the people" in the long-run. The direction of the argument then was that given that land is fixed in supply, population growth will eventually reduce the amount of resources available to individuals leading to starvation. The assertion did not make reference to the influence of technology which may raise production and possibly standard of living beyond the perceived negative effect of population. According to Marsiglio (2012) population growth affect technical progress by providing a higher number of researchers. Earlier, economists believed that high birth rates and rapid growth in population in poor countries would divert scarce capital away from saving and investment thereby placing a drag on development. This view was contingent on the fact that parents would have to spend more on education and healthcare expenses of the newly born and the children rather than saving and investment. On the contrary, some later assertions such as Kuznets (1967) and Simon (1981) could not establish any significant relationship between population growth and per capital income growth. Other studies reported positive relationship in the long-run.

Nigeria at the present has the highest population in Africa and the 10th in the world ranking. It was reported that the Nigerian population is associated with three factors namely; fertility, migration and mortality. It was noticed that the population growth increases at 3% which implies a doubling time of 22 years (Evans, 2011). This also means that the country is growing at a geometric progression. The problem with this is the capacity of the country's economy to also grow proportionately that it will cope and accommodate the increased population. The low mortality of 14 per 1,000 decreased infant mortality rate and higher life expectancy signifies a problem because it indicates higher chance of survival (Evans, 2011).

The population of Nigeria has been growing astronomically over the years. The country's population rises from 16.60 million in 1911 to 30.42 million in 1953; it increases further to 89 million in 1991, 170 million in 2014, and over 200 million in 2020 (World Bank, 2020). This has brought the country into limelight as it is tagged the 'giant of Africa' being the most populated country in the Africa continent (World Bank, 2014). With an estimated population of 200 million ranked that is 7th in the world and a growth rate of 2.58%, it is projected that the population will almost double in 2050 with a growth rate of 1.93% (United Nations World Population Prospects, 2020). Although the country is richly endowed in terms of human and natural resources, the benefits of these resources remains a mirage and paradox to her economic development as it has not been able to harness full potential of the resources. Few decades ago, the agricultural sector was the main source of livelihood and export earnings and population growth rate was linked to productive activities. According to Tartiyus, Dauda and Peter (2015), it was believed that increased productivity was a result of greater number of workers or laborers working efficiently and contributing to the overall economic output of the nation. Therefore, Nigeria's population growth witnessed a surge before and after independence. It has been argued that the annual growth rate of the population in the country has skyrocketed from the 1950s through the 1980s. An estimate of 2% population growth rate was recorded by the government between 1953 and 1962. However, between 1965 and 1973, the World Bank estimated Nigeria's growth rate at 2.5%, increasing to 2.7% between 1973 and 1983 (World Bank, 2014). Furthermore, Bloom and Canning (2001) posits the emergence of poverty trap and high unemployment through the interaction of economic growth with population dynamics. Therefore, economists have conceptualized the poor as the segment of the population that is unable to meet or satisfy basic nutritional needs (Reutlinger and Selowsky, 1976; Ojha, 1970), others like Singer (1975) view poverty partly as a function of education and/or health: life expectancy, child mortality rate among others. On the other hand, others have a wider perspective on poverty as inability to meet "basic needs"- physical (food, health care, education, shelter, and etc.) and non-physical (participation, identity, and etc.) requirements for leading a "meaningful life" (Streeton, 1979; Blackwood and Lynch, 1994). Undoubtedly, abject poverty has eaten deep into the fabric of the society for five decades despite the economic boom of the 1970s in Nigeria (Mohammed-Hashim, 2008; Obi, 2007; Anyanwu, 1997) as the country's growth is simply tagged a jobless growth (Maku and Alimi, 2018).

The unemployment rate conveys the percentage of persons in the labor force who do not have a job but are available and looking for one, where the labor force is the sum of employed persons and unemployed persons. The unemployment rate provides a good depiction of the extent to which people who are ready to work are actually able to find and start a job. In other words, it expresses the labor market's ability to satisfy people's explicit demand for jobs, which is certainly useful and valuable information, but as this brief will show, it is not enough to paint a full picture of the extent of labor underutilization and the overall state of the labor market. In fact, the unemployment rate focuses on a very specific population (the unemployed) and says nothing about the situation of persons in employment or about persons outside the labor force. Persons employed managed to escape unemployment. Labor underutilization refers to mismatches between labor supply and demand, leading to an unmet need for employment among the population. Unemployment is naturally at the core of labor underutilization (the unemployed are, after all, those with the clearest, most explicit unmet need for employment), and so, despite its limitations, the unemployment rate is often used as the sole measure of labor underutilization (ILO, 2018).

Due to above discussion about population growth and unemployment on economic growth in Nigeria, many researchers have contributed greatly to this particular research topic. But this research topic tends to go further and farther in regards to this research papers given a critical and analytical means of explaining this research topic. There is also an extension in the years used in analysis the research topic. The objective of this research topic is to see to the economic growth impact of population dynamics in Nigeria.

LITERATURE REVIEW

Conceptual Review

Population refers to the number of people living in a particular place at a given time. In Nigeria, there has been a phenomenal growth in population in the last few decades with high growth rate of population between 2.8 percent and 3 percent. It is now established that the population of Nigeria is very large, young and is increasing very rapidly. Where as in 1931 the population was 20.06 million, in 1953 the population was estimated at 30.4 million. In 1991 and 2006, it increased to 88.5 million and 140 million respectively. Demographic report showed that the nation's population rose to 211,401,000 million in 2021, with a population growth rate of 2.70% (CBN 2021). Nigeria is the most densely populated country in Africa and endowed with abundant natural resources. The central authority typically quantifies the size of the resident population within their jurisdiction using a census, a process of collecting, analyzing, compiling, and publishing data regarding a population. Population refers to the number of people in a single district, whether it is a city or town, region, country, continent, or the world. The central authority typically quantifies the size of the resident population within their jurisdiction using a census, a process of collecting, analyzing, compiling, and publishing data regarding a population.

Unemployment is generally defined as a situation in which persons who are willing and able to work are not employed. Unemployment is the most serious economic danger a worker has to face in any society. Unemployment may not necessarily arise out of lack of vacancies in the economy but essentially that the unemployed may not possess the right skills for the available jobs or that he is unaware that the vacancies exist somewhere for his type of skill. The unemployment rate is simply the percentage of the labor force which is unemployed. Unemployment, according to the Organization for Economic Co-operation and Development (2020), is defined as the total number of people that are above the working age who are not in paid employment or self-employment but currently available for work during a specific period. Unemployment is proxy by the rate of unemployment which entails the number of people who are unemployed as a percentage of the labor force.

Population in Nigeria

Nigeria is one of the most densely populated countries in Africa, with approximately 218.5 million people in an area of 923,768 km2 (356,669 sq mi), and is also the country with the largest population in Africa and the sixth largest population in the world. Approximately 50% of Nigerians are urban dwellers, with the rate of urbanization being estimated at 4.3% Nigeria is home to over 250 ethnic groups, with over 500 languages, and the variety of customs, and traditions among them gives the country great cultural diversity. The three largest ethnic groups are the Hausa, 25% of the population; along with the Yoruba, 21%; and Igbo, 18%. The Ijaw, Efik, Ibibio, Annang, and Ogoni constitute other Southern populations. The Tiv, Urhobo-Isoko, Edo and Itsekiri constitute Nigerian's Midwest. Over 1 million people living in Nigeria (0.5% of its total population, or 1 in every 200 people living in Nigeria) are from a continent other than Africa. 800,000 people living in Nigeria are from India, 100,000 people from the United States,[15] 75,000 people from Lebanon,[16] 60,000 people from China[17] and 16,000 people from the United Kingdom.

Most of the population is a young population, with 42.54% between the ages of 0.14. There is also a very high dependency ratio of the country at 88.2 dependants per 100 non-dependants. Three of the main religious groups are Muslim estimated at 45%, Christian at 45% and other indigenous beliefs at 10%. [20] The predominantly Christian Igbo are found in the southeast. Roman Catholicism is the largest Christian denomination in Igbo land, but Anglicanism is also strong, as are Pentecostal and other Evangelical denominations.

Persons of different ethnic backgrounds most commonly communicate in English, although knowledge of two or more Nigerian languages is widespread. Hausa, Igbo and Yoruba are the most widely used Nigerian languages. Nigerian Pidgin is used widely as an unofficial medium of communication especially in the Nigerian cities of Warri, Sapele, Ughelli, Benin and Port

Population growth in Nigeria. From 1960 to 2021 the population of Nigeria increased from 45.14 million to 211.40 million people. This is a growth of 368.3 percent in 61 years. The highest increase in Nigeria was recorded

in 1978 with 3.08 percent. The smallest increase in 1961 with 2.05 percent. In the same period, the total population of all countries worldwide increased by 158.5 percent. The average age in Nigeria rose by 0.76 years from 2012 to 2020 om 17.84 to 18.60 years (median value). The average age in Nigeria rose by 0.76 years from 2012 to 2020 from 17.84 to 18.60 years (median value).

Unemployment in Nigeria: Causes and effects

Oyebade (2003) has categorized unemployment into – "those who have been in one employment; but lost the jobs as a result of lay off or downsizing, and those youths who have not got any appointment before. Similarly, scholars such as Oluseyi and Elegbede (2012); Adawo, Essien, and Ekpo, (2012); Adesina (2013); Gbagolo and Eze (2014) in their different studies have identified some key causes of unemployment in Nigeria, among which are:

Population Growth: There is rapid growth in Nigeria's population. The high population growth rate has given rise to the rapid growth of the labor force. Nigeria account for about 47% of West Africa's population and has one of the largest populations of youth in the world (ADB, 2020)."

Nigeria Educational Curriculum: The types of Nigeria educational curriculum is tailored towards white-collar jobs. Nigeria's type of education has always raised the youths' expectations that they will easily get government or corporate jobs after their education. Therefore, most of the youths lack skills needed for self-employment but are only pursuing paper certificates that qualify them for office jobs.

Economic Recession: This is a period of general economic decline vis- a-vis drop in the stock market; an increase in unemployment, etc. The economic recession normally bites hard on the citizenry as it generally affects all the areas of the national economy. The question that could be asked in this regard is, what has Nigeria done or how has Nigeria affected the lives of the unemployed youths during the economic boom? What has been Nigeria's preparation for a time like this?

Corruption: Corruption is one of Nigeria's major problems, and it plays a critical role in the problem of unemployment that the nation is experiencing. Illegally acquired funds by political office holders could have been used in transforming the economy far better than their European counterparts where Nigerians resort to for green pasture.

Insurgency: This is another problem of unemployment in Nigeria. When people are ready to work and the work is not available, they mingle with bad people and vices and start fighting the government. In Nigeria, the south was granted amnesty and given jobs both vocation. This helped to check the rate of insurgency and terrorism.

Capital formation

The determinants of capital formation Capital formation is the main key to economic growth. It reflects effective demand and, on the other hand, it creates productive efficiency for future production. However, the level of impact of capital formation on economic growth depends on the intensity of its determinants. Thus, these determinants could be savings, foreign direct investment (FDI), gross domestic product (GDP), interest rate, population growth, money supply, exchange rate In the opinion of most economists, it is believed that changes in any of these factors, affect capital formation either positively or negatively, which in turn affect the economy as a whole.

THEORETICAL REVIEW

Malthusian Theory of Population

English clergyman & economist, Thomas Malthus (1766-1834) enunciated his view about population in his famous book, Essay on the Principle of Population as it affects the future improvement of society. "The Malthusian theory explains the relationship between the growth in food supply & in population. It states that population increases faster than food supply and if unchecked, leads to vice or misery". In his theory, he states

that population increases at a geometrical progression while food supply rises at a slow arithmetical progression due to the operation of the law of diminishing returns. This growth would lead to an imbalance which leads to over population.

Marxian theory of Unemployment (Marx, Theory of Surplus Value)

It is in the very nature of the capitalist mode of production to overwork some workers while keeping the rest as a reserve army of unemployed paupers. “Marxists share the Keynesian viewpoint of the relationship between economic demand and employment, but with the caveat that the market system's propensity to slash wages and reduce labor participation on an enterprise level causes a requisite decrease in aggregate demand in the economy as a whole, causing crises of unemployment and periods of low economic activity before the capital accumulation (investment) phase of economic growth can continue. According to Karl Marx, unemployment is inherent within the unstable capitalist system and periodic crises of mass unemployment are to be expected. He theorized that unemployment was inevitable and even a necessary part of the capitalist system, with recovery and regrowth also part of the process. The function of the proletariat within the capitalist system is to provide a "reserve army of labour" that creates downward pressure on wages. This is accomplished by dividing the proletariat into surplus labour (employees) and under-employment (unemployed).

Efficiency Wage Theory

Renowned economist Alfred Marshall introduced the term “efficiency-wages” in his 1890 book “Principles of Economics” to indicate the equivalent wage per efficiency unity of labor. Proponents of this preliminary concept argued that employers should pay their workers differently based on their efficiency. In other words, a more efficient worker should have a higher wage than a less efficient worker.

The Marshallian concept evolved until it became the efficiency wage theory. It argues that businesses can operate more efficiently and become more productive if they provide wages above the equilibrium level. To be specific, increasing wages beyond the current labor benchmark could lead to better efforts from the employees, decrease employee turnover, attract highly competent employees, and promote the wellbeing of employees.

Keynesian Theory of Unemployment

Keynesian economics provides an alternative theory of unemployment. John Maynard Keynes and adherents of the Keynesian school of thought have explained that unemployment occurs when there is not enough aggregate demand in the economy. After all, if demands for goods and services decrease, then there is a lesser need for production and consequently, lesser needs for workers.

Take note that Keynesian economics also argues that market economies or capitalist economic systems naturally undergo a boom-and-bust cycle. Low aggregate demand and unemployment characterize the bust phase of the economy. Employment rate will normalize if the economy manages to reenter the boom phase. Hence, the Keynesian theory of unemployment serves as the basis for explaining cyclical unemployment because it describes the effects of frequent shifts in business and economic cycle on the labor market.

Because of the cyclical nature of unemployment and based on one of the primary tenets of Keynesian economics about the importance of government interventions, the Keynesian theory of unemployment recommends government-driven aggregate demand to reduce unemployment, promote consumer confidence, and revitalize production during economic recessions. Government intervention was demonstrated during the Great Depression and the 2008 Financial Crisis.

Empirical Review

It is significant to note that there is a dearth of related literature (especially at the local and international levels) on the subject, and that there is also a lack of agreement among the studies' findings and conclusions.

Ogunjinmi, O. O. (2022), examined the population, poverty, and unemployment growth impacts in Nigeria from 1980 to 2018. It uses the fully modified ordinary least square method (FMOLS) to calculate the population,

poverty, and unemployment long run coefficients of economic growth. The empirical findings indicate that Nigeria's economic growth is positively but marginally impacted by the population growth rate. Additionally, the per capita income is positively and significantly impacted by the poverty rate. Additionally, unemployment has a profoundly adverse effect on economic expansion. The economic conclusion is that because persons who are qualified and able to work cannot find employment and make a substantial contribution to production processes, the level of economic growth has gotten worse. According to the findings of the causality test, there is no feedback causation between Nigeria's population increase, poverty, unemployment, and economic growth.

Ogungbade (2021), investigate the trend analysis of population growth, unemployment and economic growth in Nigeria, impact of population growth on unemployment, it also analyzed the effect of population growth and unemployment on economic growth in Nigeria. Graphs and econometric methods, specifically the Autoregressive Distributed Lag (ARDL) Model, were used to examine the data acquired. Unit root test, Augmented Dickey-Fuller test, Phillip and Perron (PP) test, ARDL lag order, models employing VAR lag order selection criteria, and bound test were all used in the analysis. According to trend research, population increase and unemployment have positive and negative trends on economic growth, respectively. Population and unemployment are also favorably correlated with one another. The findings demonstrated that whereas population expansion has a positive and statistically significant long-term impact on unemployment, it has a negative and statistically inconsequential short-term impact.

Another researchers Umar et al (2020) also critically examined the Impact of Population Growth, Poverty and Unemployment on Economic Growth. This research explores the impact of population growth, poverty and unemployment on economic growth in Nigeria using Auto Regressive Distributed Lag (ARDL). Foreign direct investment has control over other variables used to examine this study which are: poverty, population and unemployment, FDI plays an important role in measuring the research work. The null hypothesis stated that there is presence of a unit root was failed to be rejected at levels but rejected at first difference according to the two tests (ADP and PP) employed. Finally, the study found that population and FDI have a positive impact while poverty and unemployment has negative impact on GDP. Based on these findings recommend that policy makers should grow the real economic sectors to improve and enhance productivity, exports, job creation, curb inflation and reduce poverty and rapid economic growth and substitute the non-productive imports with domestic products and develop enabling environment to attract foreign private investors.

In another important research titles ‘’Impact of Population Growth on Unemployment in Nigeria: Dynamic OLS Approach’’, Maijama et al (2019) also reviewed the study which applied annual time series data from 1991 to 2017. The data on population, unemployment, consumer price index, exchange rate and foreign direct investment were tested for unit root using ADF, PP and KPSS unit root tests. The results from the ADF and PP tests revealed that all the variables were stationary at first difference except CPI that is stationary at level. While the KPSS units root test result shows that all the variables are stationary at level. The variables were co-integrated as shown by the Johansen Juselius test for co-integration. The Dynamic Ordinary Least Squares (DOLS) were used in the process of estimating the model. It was shows that population and exchange rate impacted positively with unemployment. Whereas consumer price index, GDP per capita and foreign direct investment impacted negatively thereby reducing the rate of unemployment in the long-run. In summary of their work they suggested that Government should focus more on attracting foreign direct investment, increasing GDP per capita and the desired rate of consumer price index in order to control the rate of unemployment in the country.

Moreover another researchers, Talla Fokam et al (2019) also examined the Economic Growth and Poverty in Cameroon: the role of Employment. This study critically examine the empirically the effect of employment in the transmission of economic growth to poverty change in Cameroon. Using data covering the period 1991 to 2017. We estimate two models: the employment intensity of growth model of Kapsos; and the Loayza and Raddatz model, which assesses the impact of sectoral employment intensity of economic growth to the change in poverty. It was shows that economic growth positively affects employment and negatively affects poverty rates and, there is transmission of economic growth through employment is not effective in reducing poverty in Cameroon. These results show that in recent decades, economic growth has propelled the creation of employment in Cameroon. However, these employments, which are mostly precarious, generated by the informal sector, have not significantly reduced poverty.

In addition, Kehinde et al (2021) examined the impact of income inequality and population dynamics on poverty on the one hand, and the impact of population dynamics on income inequality on the other hand in Nigeria between 1980 and 2019. Autoregressive Distributed Lag (ARDL) technique was adopted after ascertaining that the variables are combination of I(1) and I(0) series through Augmented Dicker Fuller unit root test. The result showed that inequality and population dynamics are important determinants of poverty in Nigeria, and that increased income inequality, and increased population growth increased poverty in the country during the period of the study. The results also showed that the population dynamics significantly determined inequality in Nigeria, and that increased population growth increased inequality in the long run in Nigeria during the period of the study. In conclusion the study therefore recommends that government 's efforts and programs at reducing the rate of growth of the population in the country should be intensified and Government should equally make effort in the area of improving her social services to bridge the gap between the rich and the poor. In following these above suggestions will mitigate the incidence of poverty in the country.

Moreover, Oluwaseyi et al (2019) also examined and investigates the links between unemployment, poverty and economic growth in Nigeria between the periods, 1985-2015. The paper employed the Augment Dickey Fuller test for unit root test, Johansen co-integration for co-integration, Ganger causality for causality test and Error Correction Model to establish the short-run links between the variables. The unit root test result revealed that the variables trend with time indicating their failure of integration at level. However, they were found to be stationary at first difference. The causality result revealed that there is no causal relationship between unemployment, poverty and growth in Nigeria. Similarly, the co-integration results showed that there is no long-run relationship between unemployment, poverty and economic growth in Nigeria. The short-run parameter estimates indicated that unemployment has a negative and significant relationship with growth. However, the coefficient of the interaction between unemployment and poverty is positive and significant at the conventional level.

The relationship between population growth and unemployment in Nigeria was established by Babatunde et al. in 2020. Numerous economic ills have substantially hampered the Nigerian economy, which is why growth has been slow and development has suffered greatly. This study used secondary data from the World Bank data base that spanned the years 1991 through 2016. The Johansen Cointegration and Error correction model was used as the analysis technique. The sequence of the variables' integration was determined using an ADF unit root test. The direction of causation between the variables was investigated using the Granger causality test. Population growth and unemployment were found to be positively correlated. Regression analysis's findings demonstrate that the population in Nigeria. The findings showed that population growth has a strong impact on unemployment in Nigeria. This means that a rise in population growth leads to a rise in unemployment. The study concluded that to combat the acute unemployment in the country, the Government should ensure there is job creation especially in the agricultural and manufacturing sectors.

Obayori et al (2020), investigate the dynamic effect of population growth on unemployment rate in Nigeria. The paper is of the highest import as it discourses one of the strategic phases of the Nigerian economy and also bearing in mind that the country has been subjected to a slow growth rate and alarming unemployment rate. A dynamic ordinary least square (DOLS) was used to analyze the link between population growth and unemployment rate. Meanwhile, both the Augmented Dickey-Fuller unit root test and Johansen cointegration preceded the DOLS test in order to ascertain both the stationarity and long run equilibrium relationship of the variables. The empirical results showed that the variable was stationary at I(0) and I(1) and have long run equilibrium relationship. It was hypothesized from the DOLS result that the coefficient of determination is 61%, thus, the model is a good fit. Also, a direct relationship exists between population growth and unemployment rate. While an indirect relationship exists between per capital income and unemployment rate.

Another researchers Abina a P. And Mogbeyiteren O B. (2021) examined the capital formation and economic growth in Nigeria: an econometric analysis. Foreign direct investment, government expenditure, gross fixed capital formation and savings rate were used to proxy capital formation while the gross domestic product was used to measure economic growth. Johansen co integration test was employed to determine the order of integration while error correction model was employed to determine the speed of adjustment to equilibrium. The empirical findings suggest that foreign direct investment has a negative and significant relationship with gross

domestic product, government expenditure has a positive but an insignificant relationship with gross domestic product, gross fixed capital formation has a negative and significant relationship with gross domestic product and finally, savings rate has a negative and insignificant relationship with gross domestic product in the long-run. The study therefore recommends that there is need for policies that will make a reasonable substantial portion of foreign investors' profit to be retained and re-deployed to other productive investment in the home country.

MODEL SPECIFICATION

The model specified in this section is based on the research design of the study that considers growth as a function of labor, capital and other efficiency factors. Moreover, real economic growth in this study is considered as overall economic performance, hence growth is captured by three variables: real GDP growth rate, population growth rate and unemployment. These are the main indicators of economic performance for a developing country (Todaro and Smith, 2006). Based on this, the current study employed descriptive statistics and an ex-post facto research design. Ex-post facto research design is a technique that compares the independent variables with the dependent variable, while descriptive statistics is employed to explain the data set by generating summaries about the data sample.

Taking cognizance of the demographic factors that affect population which in turn affects

Economic growth, the model of economic growth equation is specified. The functional form of the model that will be used in study this is stated as:

logRGDP=f(logPOP, UNEMP ,BRATE, LogLFORCE, LogGFCF) ……..model 1

Where:

logRGDP: logarithm of Real gross domestic product (proxy for Economic growth)

logPOP: logarithm of Population

UNEM = Unemployment rate

BRATE= Birth rate

logLFORCE = logarithm of Labor force

logGFCF= logarithm of gross fixed capital formation

In order to determine the effect of population growth on economic growth, a second equation is specified as:

Where all variables are as earlier defined. In the ARDL form the model is specified as:

$$\Delta logRGDP_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta \text{logPOP}_{t-1} + \sum_{i-0}^{p} \alpha_2 \text{UNEMP}_{t-1} + \sum_{i-0}^{p} \alpha_3 \text{BRATE}_{t-1} + \sum_{i=0}^{p} \alpha_4 \Delta \text{logLFORCE}_{t-1} + \sum_{i=0}^{p} \alpha_5 \Delta \text{logGFCF}_{t-1} + \varepsilon_t \quad (model\ 2)$$

Where:

α_0 is the intercept parameter

α_1 – α_4 = are the coefficients of the independent variables

Δ = change and

ε = a stochastic error term, assumed to be independently and normally distributed

Estimation Technique and Data Sources

The statistical analysis involves the use of descriptive statistics of the main variables used in the analysis thereby presenting the background characterization of the data used in the analysis. The econometric analysis is essentially the estimation and analysis of the models specified in the above methodology. Essentially, the dynamics effect of population growth and unemployment could present more than one round of effect in the economy. However, Augmented Dickey Fuller (ADF) was used to test the unit root test Thus, as demonstrated in the previous Chapter, the autoregressive distributed lags (ARDL) approach is employed to estimate the dynamic relationships.

Justification of the Autoregressive Distributed Lag (ARDL)

There are numerous methods used for testing the existence of a long run relationship between time series variables. The most used co-integration techniques are the two- steps residual based on the procedure by Engle and Granger (1987) and the system based reduced rank regression technique. Overall, the ARDL model provides a flexible and robust framework for analyzing relationships between variables with different orders of integration. Its simplicity, intuitive interpretation, and ability to capture short-run dynamics and long-run equilibrium make it a valuable tool for empirical analysis in various fields of research. (Haug,2002).

RESULT AND DISCUSSION

Descriptive Statistics

The summary statistics of all variables used in this study are show in Table 4.1. The mean, standard deviation, minimum and maximum values of each variable are display.

Table 4.1: Descriptive Statistics

	LGDP	LGFCF	LLFORCE	LPOP	BRATE	UNEMP
Mean	12.471	24.803	3.718	18.658	42.484	4.726
Median	12.387	24.779	3.651	18.653	43.083	3.931
Maximum	12.845	25.429	4.342	19.178	46.741	10.8
Minimum	12.202	24.405	3.274	18.135	37.117	3.2
Std. Dev.	0.237	0.214	0.333	0.314	2.598	1.800

Source: Author's Computation

Given that gross domestic product as the indicator of economic growth which is the dependent variable and population, labor force, birthrate, gross domestic product and unemployment are indicators for explanatory variables.

The summary of the statistics of these variables alongside that of the dependent variable GDP and others control variables are briefly described as follows.

Table 4.1 shows that the average of gross domestic product over the years is 12.471 with the maximum value of 12.845. The average value of Population during this period is 18.658 which indicate that there is increases in the population. There is 19.178 as the maximum value of population during this period. However, labor force indicator show that there is 43.56% average of over the year with the maximum values of 76.94%. 42.48% show the average percentage of the birth rate over the year with the maximum rate of 46.74%. Over the year the average of unemployment is 4.72% with the maximum percentage of 10.8%. In addition, the average of gross fixed capital formation is 24.803 with the maximum value of 24.405.

Augmented Dickey Fuller Unit Root Test Results and Interpretation

TABLE 4.2: Augmented Dickey Fuller (ADF) UNIT ROOT TEST

	LEVEL			**FIRST DIFFERENCE**			
Variables	**ADF Statistics**	**Critical Values 5%**	**P-Values**	**ADF Statistics**	**Critical Values 5%**	**P-Values**	**Order of Integration**
LGDP	-1.17265	-2.94115	0.6762	-4.04472	-2.93899	0.0032	I(1)
LLFORCE	2.850283	-2.93694	1	-3.84916	-2.93899	0.0053	I(1)
LPOP	-5.20381	-3.55297	0.0009	----------	----------	---------	I(0)
LGFCF	-2.25004	-2.94115	0.1929	-5.19628	-2.94115	0.0001	I(1)
UNEMP	-5.88833	-2.93899	0	----------	----------	---------	I(0)
BRATE	-1.528387	-3.536601	0.8013	-3.657646	-2.943427	0.0091	I(1)

Source: Author's Computation

Note: * indicates signifies at 5 percent; 95% critical values are reported in parentheses below each test value.

Table 4.2 show the ADF results. From above we can see that GDP is not stationary at level at 5% level of significance because the statistics value of -1.17265 is less than the critical value of 5% -2.94115 in absolute term and the probability values is greater than 5% which is 0.6762. However, GDP is stationary at first difference because the statistics value of -4.04472 is greater than 5% of the critical value which is -2.93899 in absolute term and the probability values is less than 5% which is 0.0032. Labor force is not stationary at level at 5% level of significance because the statistics values of 2.850283 is less than 5% of the critical values of -2.93694 in absolute term and the probability value is greater than 5% which is 1. However, labor force is stationary at first different because the statistics value of -3.84916 is greater than 5% of the critical value of -2.93899 and the probability value is less than 5% which is 0.0484. Moreover, the ADF results show that is population is stationary at level at 5% level of significance because the statistics value of -5.20381 is greater than 5% of the critical values of -3.55297 in absolute term and the probability value is less than 5% which is 0.0009 level of significance. Gross fixed capital results also show that is not stationary at level at 5% level of significance because the statistics value of -2.25004 is less than 5% critical value of -2.93115 in absolute term and the probability value is 0.1929 which is greater than 5% level of significant. However, gross fixed capital formation is stationary at first different because the statistics value of -5.19628 is greater than the 5% critical value of -2.94115 in absolute term with the probability value of 0.0001 which is less than 5% level of significance. Birthrate is not stationary at level at 5% level of significance because the statistics value of -1.528387 is less than 5% of the critical value of -3.536601 in absolute term and the probability value is 0.8013 which is greater than 5%. However, birthrate is stationary at first difference because the statistics value of -3.657646 is greater than 5% of the critical value of -2.943427 in absolute term and 0.0091 probability value which is less than the

5% level of significance. Unemployment is stationary at first difference at 5% level of significant because the statistics value of -5.88833 is greater than -2.93899 in absolute term with 0 probability value. In conclusion of ADF unit root test, gross domestic product, labor force, birthrate and gross fixed capital formation are stationary at first difference I(1), while population and unemployment are stationary at level I(0).

The unit roots examine the stationarity of the variables, as was previously discussed, to show the level of integration of the variables. Some variables are stationary at the level of analysis, according to the results, while others are stationary at the first difference. For this reason, ARDL will be employed as a method to examine Economic Growth Impact of Population Dynamics and Unemployment in Nigeria

Research Objectives and Inference from Estimates

The short and long run coefficient of the ARDL result is use to suggest the economic growth impact of population growth in Nigeria. The economic and statistical significance, magnitude and signs of the estimates is rely upon to do justice to the objectives.

Table 4.3 ARDL Short run Coefficients (Gross domestic product, labor force, population, gross fixed capital formation, birthrate and unemployment)

Variable	Coefficient	t-Statistic	Prob.*
LGDP(-1)	-0.177009	-0.875672	0.4102
LGDP(-2)	-0.012956	-0.075229	0.9421
LGDP(-3)	-0.472694	-3.874886	0.0061
LGDP(-4)	-0.269675	-2.107438	0.0731
LGFCF	0.093006	1.849099	0.1069
LGFCF(-1)	0.074886	1.008089	0.347
LGFCF(-2)	0.183964	3.246377	0.0141
LGFCF(-3)	0.126371	2.303884	0.0547
LGFCF(-4)	0.117123	3.010498	0.0196
LLFORCE	0.264346	0.727752	0.4904
LLFORCE(-1)	0.331995	1.53068	0.1697
LLFORCE(-2)	-0.319025	-1.569493	0.1605
LLFORCE(-3)	0.358601	1.734259	0.1265
LLFORCE(-4)	-0.132687	-0.641793	0.5414
LPOP	-7.444098	-0.427515	0.6818
LPOP(-1)	64.61556	1.875399	0.1029
LPOP(-2)	-18.60722	-1.200719	0.2689
LPOP(-3)	14.18832	0.711408	0.4998
LPOP(-4)	-51.78965	-3.721985	0.0074
UNEMP	-0.00608	-0.28587	0.7833
UNEMP(-1)	-0.005678	-0.229365	0.8251

UNEMP(-2)	-0.021808	-1.037536	0.334
UNEMP(-3)	0.015568	1.031387	0.3367
UNEMP(-4)	-0.024288	-1.638611	0.1453
BRATE	-0.059477	-0.833187	0.4322
BRATE(-1)	0.14032	2.464688	0.0432
BRATE(-2)	0.009636	0.015695	0.9879
BRATE(-3)	-1.615176	-1.538347	0.1679
BRATE(-4)	1.625456	3.094305	0.0175
C	-18.62486	-3.329324	0.0126

Source: Author's Computation

Table 4.5 show the results of ARDL short run analysis, here we can see that gross domestic product as the dependent variable while population, labor force, gross fixed capital formation, birthrate and unemployment as the explanative or independent variable. Labor force in the short run do not define the dependent variable in a good way because the probability value is greater than 5% level of significant which is 0.404. Thus, there is a positive relationship between them because the value of co-efficient is 0.264346. The t-statistics for labor force which is 0.727752 show that the variable is insignificant. However, gross fixed capital formation in the short run show that there is a positive relationship with the dependent variable which is gross domestic product because the co-efficient is 0.093006 and the result of t-statistics which is 1.849099 show that the variable is insignificant to the dependent variable. On the other hand, population show that in the long run there is no good relationship with the dependent variable because the probability value is greater than 5% level of significant which is 0.6818. The t-statistics result which is 0.427515 also confirmed that the variable is insignificant and there is a negative relationship with the dependent variable. Birthrate show that there is a negative relationship with the dependent variable which is gross domestic product. However, birthrate do not define the dependent variable in a good way because the probability value which is 0.4322 is greater than 5% level of significant. The t-statistics value which -0.833187 also supported that birthrate is insignificant to gross domestic product. Moreover, the result of unemployment in the short run show that there is a negative relationship with the dependent variable. Thus, the variable is not stationary at 5% level of significant which is 0.7833. The t-statistics which is -0.28587 show that the variable is insignificant to the dependent variable.

Table 4. 4: Ardl Long Run Coefficients (Labor Force, Population, Gross Fixed Capital Formation, Birthrate and Unemployment)

Variable	**Coefficient**	**t-Statistic**	**Prob.**
LGFCF	0.308099	4.203091	0.004
LLFORCE	0.260426	1.085209	0.3138
LPOP	0.498311	2.190307	0.0646
UNEMP	-0.021883	-2.365324	0.0499
BRATE	0.052144	2.702225	0.0305
C	-9.638528	-3.433303	0.0109

Source: Author's Computation

EC = LGDP - (0.3081*LGFCF + 0.2604*LLFORCE + 0.4983*LPOP -0.0219

*UNEMP + 0.0521*BRATE -9.6385)

Table 4.4 show the results of ARDL long run analysis, here we can see that gross domestic product as the dependent variable while population, labor force, gross fixed capital formation, birthrate and unemployment as the explanative or independent variable. Labor force in the long run do not define the dependent variable in a good way because the probability value is greater than 5% level of significant which is 0.3138. Thus, there is a positive relationship between them because the value of co-efficient is 0.260426. The t-statistics for labor force which is 1.08509 show that the variable is insignificant. However, gross fixed capital formation in the long run show that there is a positive relationship with the dependent variable which is gross domestic product because the co-efficient is 0.308099 and the result of t-statistics which is 4.203091 show that the variable is significant to the dependent variable. On the other hand, population show that in the long run there is a positive relationship with the dependent variable because the co-efficient value is 0.498311. However, probability value is greater than 5% level of significant which is 0.0636. The t-statistics result which is 2.190307 show that the variable is significant. Birthrate show that there is a positive relationship with the dependent variable which is gross domestic product because the co-efficient value is 0.052144. However, birthrate define the dependent variable in a good way because the probability value which is 0.0109 is less than 5% level of significant. The t-statistics value which -3.433303 also supported that birthrate is significant to gross domestic product. Moreover, the result of unemployment in the long run show that there is a negative relationship with the dependent variable. Thus, the variable is stationary at 5% level of significant which is 0.0499. The t-statistics which is –2.190307 show that the variable is significant to the dependent variable.

Table 4.5: F-Bound Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	12.66126	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Source: Author's Computation

The outcome of the bound co-integration test confirmed that an equilibrium long-run relationship exists between the dependent variable which is gross domestic product and gross fixed capital formation, population, birthrate, labor and unemployment in Nigerian which are the independent variables, as the F-statistic for the equation is greater than the I(0) bound and I(1) bound. Moreover, the estimated bounds and F-test results are summarized in table 4.7. Based on the results, the computed F-statistic value of 12.66126 is greater than the upper bound and lower bound critical value of 3.38 and 2.39 respectively at 5% significance level describing that there exists a unique co-integration relationship between economic growth and other dependent variables.

In this case, the study proceeds to estimate the short run and long run using the autoregressive distributive lag model designed by Pesaran et al (2001) with the specific objective.

SUMMARY OF FINDINGS

The study investigated the economic growth impact of population dynamics in Nigeria. The result of the findings affirmed that some variables were stationary at level, but after first differencing, all the variables became stationary. Also, the result confirmed that there was long-run equilibrium relationship existed among variables. Regarding the empirical findings, the study confirmed that population, birthrate and gross fixed capital formation

asserts a positive impact on economic growth. This result is with the agreement of Umar and Aminu (2020) and Kehinde and Bosede (2021). This study also revealed that unemployment and labor force have a negative impact on the economic growth. Maijama and Yakubu (2019) results is also with agreement with this finding.

CONCLUSION

Today, population is increasing in a geometric progression just as Malthusian theory of population said without corresponding increase in the food supply. Various things happen whenever there is increase in population with increase in others important sectors of the society. This had led to various crime like robbery, corruption, drugs addict, poverty, etc. Unemployment on the other hand has being increasing over the year.

Employment is increasingly a top priority for many developing countries since it is considered as capable of delivering poverty-reduction effects. This consideration is much more relevant when distributive economic opportunities are considered. In this study, we set out to establish the dynamic relationship between population growth, unemployment and economic in Nigeria. The study has highlighted two challenges that have serious implications for economic growth in general. First, is that no measurement have been put in place in order for the control of the population system in which has great impact of the economic growth. Second, there is the dynamic effect of unemployment on the economic growth in the country. There is need for proper measurement to be put in place in order to control population growth. Such as sex education, family planning, etc. However, in considering the unemployment in the country, there is need for provision of employment to the unemployed people. The need to get the more young people into employment, and reducing informality and vulnerability in employment.

A broad highlight from the study indicated that population changes could also provide strong background for analyzing how economic growth changes over time in Nigeria. Birthrate also contributed to the growth of the economy. Moreover, changes in the unemployment of the country will cause of change in the economic growth of the country. Major consequences of the nature of employment changes in the country have been shown to include incessant rural-urban migration (with consequences for agricultural output and productivity), dual and segregated labor markets, and the increasing informalities in the urban sector. The study empirically demonstrated that such demographic ramifications have effectively affected the pattern of employment in Nigeria.

RECOMMENDATIONS

The general and particular findings in this study suggest some policy directions which may provide a basis for useful recommendations for the policy authorities. First, there is need to evolve policies that ensure the influence of population growth on the economic growth population in Nigeria. There is clear indication that birthrate has a great role to play toward the population growth in the country in which will lead to the increasing in the economic growth. For effectiveness programs like sex education, family planning etc can be put in place for proper follow up of the economic growth.

There is need for proactive health systems and policy planning in the country. There is also need for comprehensive integration of population factors into development planning at all levels, including mechanisms to promote coordination of various intervention efforts undertaken by all institutions and the private sector. In this manner, the patterns of population changes, especially age and gender structures as well as birthrates will be incorporated into economic policies in Nigeria. In the long run such integration will ensure that the search for more employment drives down population growth rates in the country.

The negative effects of population on economic growth can also be considered from the perspective of the type of employment that people engage in – which is mostly low-productivity, traditional sector-based jobs. These jobs usually require more family member participation to drive its prosperity. Thus, there is need to evolve means to ensure that the traditional sector jobs are transformed into modern jobs. This can be done by ensuring that government and the private sector increase market demand and economic opportunities through increased investments targeted at labor-intensive industries and labor-surplus areas, supportive trade policies that protect

these industries, as well as provide more and better linkages between formal firms, informal firms and informal workers.

Whether or not a nation's population benefits (in terms of employment) from any kind of economic expansion depends in large part on education. The results of the study demonstrate that education has a significant favorable impact on employment regardless of the direction of population expansion. Therefore, more people ought to receive training in programs that could lead to an increase in employment opportunities in the nation. Moreover, it is important to support initiatives aimed at reducing the gender gap in women's access to education and work.

An additional crucial measure that might significantly contribute to the decrease in unemployment is the Entrepreneurship Program. The program should be specifically designed to make sure that more people take full use of the funding and training options for entrepreneurship in order to increase employment in the modern industry. Fostering entrepreneurship will encourage and permit self-employment, which will result in the creation of jobs for other people.

Lastly, there should be a resurgence of the rapid and stable growth patterns that result in long-term employment. For the intended outcomes, industries that produce more jobs, such modern services and agriculture, should be picked out and given additional funding.

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