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POPULATION GROWTH RATE AND UNEMPLOYMENT: THE NIGERIAN PERSPECTIVE

ABSTRACT

The study examines the impact of population growth on unemployment in Nigeria, using time series data from 1980 to 2023. The study employed the ordinary least squares (OLS) regression method in estimating the specified equation. The empirical results obtained showed that birth rate had a negative and insignificant impact on unemployment in Nigeria, foreign direct investment has a positive and significant impact on unemployment in Nigeria, gross domestic investment had a negative and insignificant impact on unemployment in Nigeria, government expenditure had a positive and significant impact on unemployment, while immigration had a negative and significant impact on unemployment and money supply had a positive and insignificant impact on unemployment in Nigeria. Based on the findings, it was recommended that government should put in place measures such as the use of contraceptives, condoms and pills aimed at controlling the population rate in the country. It also recommended that government should put in place measures to increase foreign direct investment and other investment that comes into the country. It was finally recommended that the government should put in place measures aimed at boosting the growth of the domestic economy which will in turn make resources available for the provision of employment opportunities for the unemployed.

Keywords: Population, Growth Rate, Unemployment and Nigeria

The Introduction

Population growth has remained a key issue facing developing economies in the world. While developed countries are experiencing diminished or negative population growth, many countries in sub-Saharan Africa including Nigeria are having population growth above the economic growth rate (Zahonogo, 2016; Saghir and Santoro, 2018). With the deadline for the Sustainable Development Goals (SDGs) fast approaching, attention is increasingly being focused on population growth and human capital development (United Nations, 2015; Swain, 2018). The population growth has its benefits which includes large consumer market for both domestic and foreign products which can lead to an inflow of foreign direct investments (Bell et al., 2015; Erdogan and Unver, 2015; Nauman et al., 2016).

After the independence in 1960, a successful population census was carried out in Nigeria in 1964, with an estimated population of 55.6 million people was taken into account. Since then, it becomes obvious that Nigeria's population was leading to a rapid population growth.

In 1991, a population census was held and the country's population increased to an approximated 88.5 million people. The analysis helped the National Development Planning to gain more insight and enable them to improve and developed more on their policies and planning (Evans, 2011). The UNDP reported in 2007 that the Nigerian population continuously increased at 3% per annum with birth rate of 40 per 1,000 and also death rate of 15 per 1,000 (Gideon, 2016). It was also estimated that an educated Nigerian woman gives birth to a lesser number of 3 children compared to an average Nigerian woman who gives birth to 6 children in life lifetime (Evans, 2011). From analysis of the past census and reports, it is evident that the population has been rapidly growing at a high rate of 250% from 1964 to present. This makes it problematic to match the population growth rate and development of the country (Evans, 2011).

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 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).

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 laborers 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).

Unemployment rate conveys the percentage of persons in the labour force who do not have a job but are available and looking for one, where the labour 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 labour 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 labour underutilization and the overall state of the labour 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 labour force. Persons employed managed to escape unemployment.

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).

The Literature

Population growth is the rise in the number of individuals in a population (Wikipedia, 2019). According to the Business Dictionary population growth is an increase in the number of both citizens and non-citizens that reside in a country, state, country, or city at a given period of time usually a year. Population growth rate is the rise in a country’s population in a year expressed as percentage of the population at the commencement of the year. It reflects the differences between fertility rate and mortality rate plus net migration. The average of several years is more representative than any single year. The level at which population grows depends on the birth rate, death rate, immigration and migration which are further conceptualized below; i) Birth rate: This is the aggregate number of individuals born into a population in a given period of time usually one year.

- ❖ Birth rate: This is the aggregate number of individuals born into a population in a given period of time usually one year.
- ❖ Death rate: This is the aggregate amount of deaths per thousand people in a specific time period, generally a year
- ❖ Immigration: This can be defined as the aggregate number of people that enters a country of which one is not native born with the goal of establishing a permanent residence.
- ❖ Emigration: This is the movement of a person out of a country with the intention of relocating permanently.
- ❖ Net Migration: This is the disparity between the number of people entering a country and the number leaving it. Mathematically, $\text{Net Migration} = \text{Emigration} - \text{Immigration}$.

Having defined all this terms, the primary factor causing population growth is birth rate. Birth rate has influenced the population growth in so many ways and it is due to the fact that there is good and improved medical facilities and services. Child mortality has drastically reduced because unlike ages ago there were not advanced health services like better drugs and immunization that will reduce mortality; there are improved medical services which reduce medical services which reduce child, infant and even mother mortality (Odusina, 2006). Access to basic necessities of life (shelter, food and clothing), sex distribution, and reduction in the infant mortality rate also contribute to the population growth.

Mathematically, population growth is the subtraction of the sum of the death rate and emigration from the sum of birth rate and immigration. $\text{Population Growth} = (\text{Birth Rate} + \text{Immigration}) - (\text{Death rate} + \text{Emigration})$. This implies that rise in birth rate and increase in the number of immigrants has the tendency to increase population and a decrease leads to a decrease in population. Also, an increase in the total number of death and the number of emigrants leads to a decrease in population and population growth whereas a decrease increases population and population growth. It should be noted that high population growth rate is not synonymous with over population. Overpopulation is a problem that occurs when the number of people is higher than the carrying capacity of available resources. It can be caused by a decline in mortality rate, better medical facilities, poverty alleviation, and technical advancements in fertility treatment, immigration

and lack of family planning. Population can therefore grow at the rate that does not exceed the available resources. If population growth rate is equal to the growth rate of output, then we have optimum population.

Causes of Population Growth in Nigeria.

I. Falling mortality rate

The primary (and perhaps most obvious) cause of population growth is an imbalance between births and deaths. The infant mortality rate has decreased globally, with 4.1 million infant deaths in 2017 compared to 8.8 million in 1990, according to the World Health Organization (WHO). This is welcome public health news, of course.

At the same time, lifespan are increasing around the world. Those of us who are alive today will likely live much longer than most of our ancestors. Global average life expectancy has more than doubled since 1900, thanks to advancements in medicine, technology, and general hygiene. Falling mortality rates are certainly nothing to complain about either, but widespread longevity does contribute to the mathematics of increasing population numbers.

II. Underutilized contraception

The global fertility rate has fallen steadily over the years, down from an average of 5 children per woman in 1950 to 2.4 children per woman today, according to the UN Population Division. Along with that promising trend, contraceptive use has slowly but steadily increased globally, rising from 54% in 1990 to 57.4% in 2015. Yet, on the whole, contraceptive use is still underutilized. For example, according to the WHO, an estimated 214 million women in developing countries who want to avoid pregnancy are not using modern contraceptives.

III. Lack of female education

Increasing and encouraging education among women and girls can have a number of positive ripple effects, including delayed childbearing, healthier children, and an increase in workforce participation. Plenty of evidence suggests a negative correlation between female education and fertility rates. If increased female education can delay or decrease fertility and provide girls with opportunities beyond an early marriage, it could also help to mitigate current population trends.

Unemployment

Literally, most people think of unemployment in the same way they think of persons who are unemployed. Unemployment, on the other hand, is a lot more complicated idea than the one just given. Unemployment happens because of lack of jobs to commensurate with the rapid population growth, even those who are now employed are fearful of losing their jobs due to the insecurity of the job, economic recession and retrenchment of workers Akiri (2016). Unemployment is the idleness of a person who relies on employment for a livelihood but not able to find the type of job for which he is qualified, even though he desires and is qualified for it. W.H. Beveridge (1931).

Investopedia (2018) defines unemployment as a situation in which a person is who is employable and actively seeking for employment and is not employed. Unemployment is frequently to gauge of economy's health. Unemployment takes place when workers who wish to employed are unable to find jobs, which result in reduction in economic output. Unemployment can be seen as a significant economic indicator since it reveals the ability (or inability) of workers to find gainful work and impact on the economy's productive output According to International Labour Organization, unemployment can be referred to as the proportion of people in the labour force (unit in the entire economic active population, not the entire Nigerian population) who were actively searching for job but were unable to find it for less than 20 hours during the reference period to the total currently active (Labor force) population. Unemployment refers to individuals who are employable and actively seeking for job but can't find one.

Unemployment rate can be defined as the total percentage of labour force that are unemployed. Wikipedia (2021). The unemployment rate can be expressed as a percentage, and is calculated as follows: $\text{Unemployment rate} = \frac{\text{unemployed}}{\text{Labor force}} \times 100\%$ Unemployment is caused by variety of factors on both the demand (employer) and supply (employee) sides. High interest rates, a worldwide recession, and a financial crisis may all contribute to demand-side cutbacks. Frictional and structural unemployment play a significant effect on the supply side.

The Framework

Malthusian Theory of Population

Thomas Robert Malthus (1766-1834) was the key figure to analyze the population statistics. His formulation on population was a landmark in the history of population theories. He generalized the relationship between population factors and social change. In his *Essay on the Principle of Population* (1798) Malthus argued that because of the strong attraction of the two sexes, the population could increase by multiples, doubling every twenty-five years. He contended that the population would eventually grow so large that food production would be insufficient. Human capacity for reproduction exceeded the rate at which subsistence from the land can be increased. Malthus further wrote 'Population when unchecked increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio.' Malthus contended that the world's population was growing more rapidly than the available food supply. He argued that the food supply increases in an arithmetic progression (1, 2, 3, 4, and so on), whereas the population expands by a geometric progression (1, 2, 4, 8, and so on). According to him, the population could increase by multiples, doubling every twenty-five years. He said the gap between the food supply and population will continue to grow over time. Even though food supply will increase, it would be insufficient to meet the needs of expanding population. Moreover, the famine and other natural calamities cause widespread sufferings and increase the death rate, which is nature's check against population. Malthus argued that continued population growth would eventually hinder a country's ability to support itself and lead to increasing poverty rates (Mankiw, 2010). The result is a high dependency burden associated with a rapidly growing population, leading to low savings, lower economic growth, and lower GDP per capita. As a result, a Malthusian trap emerges, in which falling GDP per capita leads to higher unemployment rates as the influence of savings and investment in supporting economic growth declines ultimately leading to a decline in wages (Mankiw, 2010). Therefore, it is important to

control population growth to avoid falling into the Malthusian trap. Malthus predicted that real wages would still fall to subsistence levels if population growth was not controlled, leading to lower nominal wages and a larger labor supply, possibly leading to unemployment (Mankiw, 2010). The objective of this study is to empirically examine the correlation between population growth and unemployment in Nigeria. This work specifically examines the applicability of the Malthusian model, which is relevant to developing countries such as Nigeria, and confirms that population growth has a significant influence on national unemployment rates. (Oyakhilome & Akarue, 2021). The three major assumptions provided the basis to Malthus' theory of population: food is necessary to human existence; passion between man and woman is necessary and will continue nearly in its present state; and the power of population is indefinitely greater than the earth's power to produce subsistence for humans.

The Malthusian theory was criticized on the basis of the following

Malthus was of the view that food production increases in a very slow manner. It is so slow that at some point of time it will not be able to feed the growing population. But this is not correct in case of many developed nations. With the help of pesticides, HYV seeds, modern technology food can be produced in a huge quantity. Secondly, Malthus gave no proof of his assertion that population increased exactly in geometric progression and food production increased exactly in arithmetic progression. It has been rightly pointed out that population and food supply does not change in accordance with these mathematical series. Thirdly, According to Cannan, “a baby comes to the world not only with but also industrial production and thus makes the country rich by an equitable distribution of wealth and income. Lastly, The Malthusian theory was criticized on the basis of being one sided. It takes a mouth and a stomach, but also with a pair of hands.” This implies that an increase in population means an increase in manpower which may tend to increase not only agricultural the increase in population as the result of a rising birth rate, whereas population has grown considerably the world over due to a decline in death rate. Malthus could not foresee the marvelous advancements in the field of medical sciences which have controlled fatal diseases and made human life longer

The Marxist theory of population

Marx was a socialist writer who disagrees with Malthusian theory of population growth. Marx and Engels saw that the theory of Malthus was outrageous and against humanity. This led to their writing called Marxist theory. The highpoint of opposition to Malthus ideas come in the middle of the nineteenth century with the writings of Karl Mark (capital, 1867) and Friedrich Engels (outlines of a critique of political economy, 1844), who argued that Who argued that what Malthus saw as the problem of the pressure of the means of production on population? They thus viewed in terms of their concept to the labour reserve army. In other words the seemingly excess of population that Malthus attributed to the seemingly innate disposition. The poor to reproduce beyond their means were actually a product of the very dynamic of capitalist economy. Hence Engels called Malthus's hypothesis “the crudest, most barbarous theory that ever existed, a system of despair which struck down all those beautiful phrases about love thy neighbor and world citizenship. Excess of population that Malthus attributed to the seemingly innate disposition. The poor to reproduce beyond their means were actually a product of the very dynamic of capitalist economy. Hence

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Theory of Demographic Transition:

Demographic transition is a term, first used by Warren S. Thompson (1929), and later on by Frank W. Notestein (1945), referring to a historical process of change which accounts the trends in births, deaths and population growth that occurred in today’s industrialized societies, especially European societies. This process of demographic change began for the most part in the later 18th century. Demographic transition should not be regarded as a ‘law of population growth’, but as a generalized description of the evolutionary process. In simple terms, it is a theory which attempts to specify general laws by which human populations change in size and structure during industrialization. It is frequently accepted as a useful tool in describing the demographic history of a country. The theory postulates a particular pattern of demographic change from a high fertility and high mortality to a low fertility and low mortality when a society progresses from a largely rural agrarian and illiterate society to a dominant urban, industrial, literate and modern society.

Typically, the theory is viewed in three-stages

- i. That the decline in mortality comes before the decline in fertility,
- ii. That the fertility eventually declines to match mortality, and
- iii. That socio-economic transformation of a society takes place simultaneously with its demographic transformation.

The demographic transition theory is characterized by conspicuous transition stages. The transition from high birth and death rates to low rates can be divided into three stages (some scholars like Haggett, 1975 have divided into four or five stages):

- i. High birth rates and declining death rates with rapid population growth.
- ii. High birth rates and declining death rates with rapid population growth.
- iii. Birth and death rates both decline appreciably leading to zero population growth. The theory holds that pre-industrial societies were characterized by stable populations which had both a high death rate and birth rate. It postulates a little and slows population growth. The theory states that the high mortality rates characteristic of undeveloped areas will decline before fertility rates which are also high.
- iv. The diffusion of knowledge and cheap medical technology has brought many non-industrial societies into this stage of the demographic transition however; these societies have been unable to enter the third stage. The result has been very high rates of population growth in countries that are not experiencing corresponding economic growth
- v. Last stage of demographic transition birth and death rates decline appreciably which eventually becomes approximately equal, and in time it will result in zero population growth. Before this stage begins, there can be one more stage in which low birth and death rates lead to slow population growth. The populations of advanced, urban industrial societies, which have entered the last stage, are now stable with low birth and death rates. In some cases (e.g., Eastern and

Central Europe) birth rates have fallen so slow that the rate of natural increase was actually zero or negative. In this stage, the technical know-how is abundant, the deliberate controls on family planning are common and the literacy and education levels are also very high.

Criticism of the theory

Firstly, this theory is merely based upon the empirical observations or the experiences of Europe, America and Australia.

Secondly, it is neither predictive nor its stages are segmental and inevitable.

Thirdly, the role of man's technical innovations cannot be underrated, particularly in the field of medicine, which can arrest the rate of mortality.

Finally, it does not hold good for the developing countries of the world, which have recently experienced unprecedented growth in population due to drastic decline in death rates. In spite of these criticisms and shortcomings, the demographic transition theory does provide an effective portrayal of the world's demographic history at macro level of generalizations. As an empirical generalization developed on the basis of observing the demographic trend in the West, the transition process for any country can easily be understood.

Classical theory of unemployment

Pigou (1933), McDonald and Solow (1981) examined the classical theory of unemployment and made a case that the labor market comprises of the demand for and supply of labour. Demand for labor is a derived demand, gotten from the falling off of the marginal product of labor. The demand curve is an inverse relationship of the real wage in the sense that if real wages increase, the quantity demanded for labor will fall and vice versa. The supply of labor is gotten from employee's decision whether to spend part of their time working or not working. Supply of labor has a direct relationship with the real wage, because if the real wage increases, employees supply more labor hours. At equilibrium, the demand for and supply of labor intersects at a point that determines the equilibrium real wage rate as well as full employment. The classicalists were of the view that involuntary unemployment was a short term occurrence stemming from a discrepancy between the wage level and the price level. Unemployment was the outcome of excessive high real wages. The classicalists opined that occasionally wages would decrease and there would be no unemployment except for frictional unemployment which is caused by time delay between leaving one job and starting another. This school of thought proposes that urban unemployment problem can be traced to the fault of employees and the numerous trade unions power. They believed strongly in market forces. Thus, insisting that urban unemployment is caused by inadequate supply of labour of more than the capacity of the economy. As a result, the classicalist school contended that demand for excessive high wages of workers without a corresponding productivity increase makes the product expensive in that way discouraging competitiveness amongst indigenous industries and foreign industries. The impact of these trends is sales reduction, which inevitably leads to mass employees' retrenchment resulting to unemployment.

Keynesian theory of unemployment

The Cyclical, demand deficient unemployment or Keynesian unemployment happens when there is inadequate aggregate demand in the economy. It derives its name because it varies with the business cycles, although it can also be lasting as during the great depression of the 1930s. Cyclical unemployment increases during economic down turns and reduces when the economy improves. Keynes opines that this type of unemployment occurs as a result of inadequate effective demand. When demand for most goods and services falls, less production is required; wages do not fall to meet the equilibrium level and mass unemployment results. The Keynesian framework, as assessed by Thirwill (1979), Grill and Zanalda (1995) and Hussain and Nadol (1997), suggest that increase in capital stock, employment and technological change are mainly endogenous. Therefore, the growth of employment is demand determined and that the basic determinants of long term growth of output also have an impact on the growth of employment. According to Keynes (1936), employment relies upon effective demand which brings about increased output, output generates income and income creates employment. He considers employment as a function of income. Effective demand is determined by aggregate demand and supply functions. The aggregate supply function depends on the technical or physical state which in the short run does not change, thus remaining stable. Keynes focused on aggregate demand function to deal with depression and unemployment. Therefore, employment relies on aggregate demand which in turn is influenced by consumption and investment demand respectively. Keynes (1936) was of the opinion that an increase in employment can occur by increasing consumption and/or investment. Consumption depends on income and when income increases, savings increases. Consumption can be raised by increasing the propensity to consume so as to increase income and employment. Thus, if the propensity to consume is stable, employment will depend on investment.

Efficiency wage theory

The theoretical explanation on the nexus between population and unemployment in Nigeria is anchored on the Efficiency wage theory. The main theoretical argument of this theory is that as put forward by Schlicht in (2011) is that Efficiency in wage plays a part in understanding the range of diverse and empirically significant labour market phenomena in a unified manner. The underlying principle behind the theory is as follows; Suppose employees have different qualities, not only abilities but in the likelihood to shrink, in other words, some employees are more lazy than others and thus are less probable to work harder. The effort is a function of costly monitoring

The Design

This study attempts to show the causes and effect relationship between the variables adopted in the research. To do this, the study specifically employs ex-post facto design. This involves observing a single group at different times (Ndiyo, 2005). This design allows the researcher to assess the impact of the exogenous variables on the endogenous variable within the period of analysis in order to draw meaningful conclusion. The study adopted an econometric approach involving the ordinary least square (OLS) multiple regression technique.

The Model

The model for this research is anchored on the Malthusian theory of population by Thomas Robert Malthus (1766-1834) who analyze key figure to analyze the population statistics. His formulation on population was a landmark in the history of population theories.. Malthus argued that continued population growth would eventually hinder a country's ability to support itself and lead to increasing poverty rates (Mankiw, 2010). Based on the theory, the result is a high dependency burden associated with a rapidly growing population, leading to low savings, lower economic growth, and lower level of unemployment. As a result, a Malthusian trap emerges, in which falling GDP per capita leads to higher unemployment rates as the influence of savings and investment in supporting economic growth declines ultimately leading to a decline in wages (Mankiw, 2010).

Therefore the empirical model for this study can be expressed functionally as:

$$UNEMP=f(BIR, IMMR, GEXP, FDI, GDI, MS) \text{ _____ } 3.1$$

Where:

UNEMP= Unemployment (in rates)

BIR = Birth rate (in rates)

IMM = Immigrants (in numbers)

GEXP= Government expenditure (in billions)

FDI= Foreign Direct investment (in billions)

GDI= Gross Domestic investment (in billions)

PGDP= Per capita gross domestic product

Econometrically, equation 3.1 can be expressed in its linear form as:

$$UNEMP= \beta_0 + \beta_1 BIR+ \beta_2 IMM + \beta_3 GEXP+ \beta_4 FDI + \beta_5 GDI + B_6 MS \mu \text{ ----- } 3.2$$

Where:

B0 to B6 are the parameters to be estimated

$$\beta_0 \beta_1 > \beta_2 > \beta_3 < \beta_4 > \beta_5 > \beta_6 < 0$$

μ = Stochastic error term

t= time dimension of the variables

This study employs the Ordinary Least square Method of estimation (OLS) in modeling the equations for the study.

The Estimation techniques and justification of the model

The study adopts the Quantitative Econometrics Analysis using the Scientific Method of Ordinary Least Square (OLS) regression technique to determine the impact of population growth and unemployment in Nigeria from 1980 – 2023. The reason for employing the Classical Ordinary Least Squares (OLS) is that of all classes of estimators, the Ordinary Least Squares (OLS) is the Best Linear Unbiased Estimator (BLUE) and it has minimum error.

Therefore, the empirical findings of this study will be analyzed using three criteria, namely, economic a priori criteria, statistical criteria and econometric criteria:

Economic a Priori criteria

This is determined by the principles of economic theory and refers to the sign and the size of the parameters of economic relationship. In other words, it has to do with determining whether the estimates conform to the slated expected signs as predicted by the relevant economic theory. However, if the estimates of the parameters turn up with signs or size not conforming to economic theory, they should be rejected, unless there is good reason to believe that in that particular instance the principles of economic theory do not hold.

ii Statistical Criteria (First – Order Test)

The statistical criteria are otherwise known as the first - order test. The statistical criteria are determined by statistical theory and aims at the evaluation of the statistical reliability of the estimates of the parameters of the model. The statistical measures used for this study to test the statistical significance of parameters include:

The t-Statistics

The t-test is used to test for the statistical significance of individual parameter estimates in the model before accepting or rejecting the null hypothesis (HO).

The R-Squared and Adjusted R-squared

These are used to measure the goodness of fit of the estimated regression model. They measure the proportion of the total variations in the dependent variable that is explained by the independent variables.

F – Statistics

The F - ratio is a test for the existence of a significant linear relationship between the explanatory variables taken together with the dependent variable. The F – Statistic is used to test the overall statistical significance of the estimated regression model.

Econometric Criteria (Second – Order Test)

Econometric criteria are set by the theory of econometrics and aim at the investigation of whether the assumptions of the econometric method employed are satisfied or not in any particular case. The econometric criteria serve as second – order test.

In other words, the econometric criteria determine the reliability of the statistical criteria, and in particular of the standard errors of the parameter estimates. They help us establish whether the estimate have the desirable properties of unbiased consistency, etc for the purpose of this study, since the OLS technique is employed to obtain the estimates of the model, the test for the absence of autocorrelation is conducted using the Durbin – Watson statistics.

The Results

Utilizing annual time series data for the period covering from 1980 to 2023, we present the empirical results of the estimated model is presented as in table 4.1 as follows:

Table 4.1 Empirical results

Dependent Variable: UNEMP

Method: Least Squares

Date: 05/03/24 Time: 09:46

Sample: 1980 2022

Included observations: 43

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	934.7690	157.5730	5.932293	0.0000
BIR	-0.267524	0.145590	-1.837520	0.0744
FDI	2.441472	0.754684	3.235093	0.0026
LOG(GDI)	-1.283918	2.436438	-0.526965	0.6015
LOG(GEXP)	2.209304	0.484450	4.560439	0.0001
IMMR	-4.35E-06	9.00E-06	-0.483668	0.6316
LOG(MS)	1.571513	0.562715	2.792734	0.0083
R-squared	0.771354	Mean dependent var	13.98675	
Adjusted R-squared	0.733247	S.D. dependent var	10.51633	
S.E. of regression	5.431494	Akaike info criterion	6.370206	
Sum squared resid	1062.041	Schwarz criterion	6.656913	
Log likelihood	-129.9594	Hannan-Quinn criter.	6.475934	
F-statistic	20.24146	Durbin-Watson stat	2.410736	
Prob(F-statistic)	0.000000			

Analysis of Results

The empirical results presented in Table 4.2 showed that all the variables turned out with their a priori signs. The estimated regression line has a positive intercept represented by a constant term. This result means that holding all the independent variable constant, unemployment will still increase by 934.7 per cent.

The result shows that a negative relationship exist between birth rates on unemployment in Nigeria. The result as given is in line with a priori expectation implying that a percentage increase in birth rate will lead to a fall in unemployment by 0.2 per cent. The P-value of (0.07) indicates that birth rate was not statistically significant in influencing unemployment in Nigeria in the period under review.

The result also revealed that foreign direct investment has a positive relationship with unemployment in Nigeria. The result is not in line with a priori expectation indicating that a percentage increase in foreign direct investment will lead to an increase in unemployment by 2.441 per cent. The P-value of (0.026) indicates that foreign direct investment was statistically significant in influencing unemployment in Nigeria.

Further examination of the analysis indicates gross domestic investment has a negative relationship with unemployment in Nigeria. The result as given is in line with theoretical expectation, meaning that a

percentage increase in gross domestic investment will lead to a fall in unemployment by 1.28 per cent. The P-value of (0.60) indicates that gross domestic investment was not statistically significant in influencing unemployment in Nigeria in the period under review.

In addition, the result further revealed that government expenditure has a positive relationship with unemployment in Nigeria. The result as given is not in line with theoretical expectation, meaning that a percentage increase in government expenditure will lead to an increase in unemployment 2.2 percent. The P-value of (0.001) indicates that government expenditure was statistically significant in influencing unemployment in Nigeria in the period under review.

To also add to the result, it was shown that immigration had a negative relationship with unemployment in Nigeria. The result is in line with theoretical expectation meaning that an increase in immigration will lead to a fall in unemployment by 4.35 Nigeria. The P-value of (0.63) indicates that immigration was not statistically significant in influencing unemployment in Nigeria in the period under review.

Finally, the result revealed that money supply has a positive relationship with unemployment in Nigeria. The result is not in line with theoretical expectation meaning that an increase in money supply will lead to an increase in unemployment by 1.57 percent. The P-value of (0.008) indicates that money supply was not statistically significant in influencing unemployment in Nigeria in the period under review.

Statistically, the result showed that three variables which are (fdi, government expenditure and money supply) were statistically significant in influencing unemployment in Nigeria. This is because the T-statistics values calculated of foreign direct investment, government expenditure and money supply 2.989 were all greater than the critical values at 2.04 at five percent level of significance. This means that only these three variables were highly significant in influencing unemployment in Nigeria.

The high values of the R-squared of 0.77 and the adjusted R-squared of 0.73 respectively showed that the estimated regression line has a good fit on the data. Particularly, the adjusted R-squared of 0.73 mean that about 73 percent of variations in the dependent variables have been explained by variations in the independent variables. This means that the estimated regression line has a very high explanatory power.

Similarly, the high values of the F- statistics of 20.2 is greater than the critical value of 2.61 at five percent level of significance means that the independent variables have a joint impact on the dependent variables. The Durbin Watson value of 2.41 fell in the region of no auto correlation. This means that there is no autocorrelation in the model. Hence, the result of the study is stable and reliable and can be used for policy formulation and forecast in Nigeria.

Test of Hypotheses

This section conducts the test of hypothesis to validate or invalidate the earlier formulated hypothesis. The test is conducted using the T-test at five percent level of significance.

Hypotheses one

H₀: Birth rate has no significant impact on unemployment in Nigeria

From the results obtained, the T-statistic value calculated of 1.837 in absolute terms for birth rate is less than the critical value of 2.04 at five percent level of significance. Therefore, since the T-calculated value is less

than the critical value, we accept the null hypothesis and reject the alternative hypothesis and conclude that total health expenditure has no impact on human development index in Nigeria.

Hypotheses two

H0: Immigrant has no significant relationship on unemployment in Nigeria.

From the results obtained, the T- statistics value calculated of for 0.483668 immigrants on unemployment is greater than the critical values of 2.04 at five percent level of significance. Therefore, we accept the alternative hypothesis and accept the null and conclude that health expenditure has a significant impact on unemployment index in Nigeria.

Discussion of Findings

The negative and insignificant relationship between birth rate on unemployment in the study agrees with the findings of the study by Akinwande, Salaudeen and Olorunfemi (2012), which in their study found a negative and insignificant relationship birth rate and unemployment in Nigeria. The positive and insignificant relationship between foreign direct investment and unemployment is in line with study by Maijama'a Rabi, Nafisa (2019) who maintained that foreign direct investment had a positive relationship with unemployment in Nigeria

The Summary

This study investigated the impact of population growth rate on unemployment in Nigeria from 1980 to 2023. The study adopted the ordinary least's squares econometric technique in its analysis. From our estimated result, birth rate has a negative and insignificant impact on unemployment in Nigeria under the evaluation period, foreign direct investment has a positive and significant impact on unemployment in Nigeria under the evaluation period, gross domestic investment has a negative and insignificant impact on unemployment in Nigeria under the evaluation period, government expenditure has a positive and significant impact on unemployment, while immigration has a negative and significant impact on unemployment and money supply has a positive and insignificant impact on unemployment in Nigeria

The Adjusted- squared of the model depicts a good fit. This means that 77 per cent of the systematic change in economic growth is accounted for by the independent variables in the model. The other 23 per cent left unexplained is attributed to other factors not captured in the model, but represented by the error term.

The F – Statistics of 20.23 which is the calculated value signify that the overall estimated model is statistically significant while the Durbin – Watson statistics value of 2.410 indicate that there is no autocorrelation in our result estimates.

The Conclusion

Population growth has remained a key issue facing developing economies in the world. While developed countries are experiencing diminished or negative population growth, many countries in sub-Saharan Africa including Nigeria are having population growth above the economic growth rate (Zahonogo, 2016; Saghir and Santoro, 2018). With the deadline for the Sustainable Development Goals (SDGs) fast approaching, attention is increasingly being focused on population growth and human capital development (United Nations, 2015; Swain, 2018). From the findings of the study, it is concluded that birth rate has a negative and insignificant impact on unemployment in Nigeria under the evaluation period, foreign direct investment has a positive and significant impact on unemployment in Nigeria under the evaluation period, gross domestic investment has a negative and insignificant impact on unemployment in Nigeria under the evaluation period, government expenditure has a positive and significant impact on unemployment, while immigration has a negative and significant impact on unemployment and money supply has a positive and insignificant impact on unemployment in Nigeria

The Recommendations

- i. The negative and insignificant impact of birth rate on unemployment calls for the government to put in place measures such as the use of contraceptives, condoms and pills aimed at controlling the population rate in the country. By so doing, this will help the country control her birth rate, which will in turn reduce the level of unemployment.
- ii. The positive and significant impact of foreign direct investment calls for the government to put in place measure to increase foreign direct investment and other investment that comes into the country. By so doing, this will make resources available for the country, which will in turn reduce the level of unemployment in the country.
- iii. The negative relationship between gross domestic investment and unemployment calls for the government to put in place measures aimed at boosting the growth of the domestically economy which will in turn make resources available for the provision of employment opportunities for the unemployed.

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