AN INVESTIGATION INTO THE EFFECTS OF SOME DEMOGRAPHIC PARAMETERS ON ECONOMIC AND POPULATION GROWTHS IN NIGERIA

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ABSTRACT

The study aimed at investigating the effects of demographic parameters on both economic and population growth in Nigeria. Three models were employed in the study and results from model 1 depicted that economic growth has a positive effects to BR and negatively affected by DR, these results had demonstrated that increase in population growth in Nigeria is favorable to economic growth of the nation while death was found unfavorable to the economic growth in Nigeria. This result is an indication of the fact that Nigeria is not facing the problem of overpopulation; rather the capacities of Nigerian Government and responsible organizations to create a favorable economic environment by channeling the right resources into the right place. In the second model we also discovered that labor force was statistically significant with a P-value of *0.00328*. Thus, model 3 regressed GDP, labor force, health expenditure and corruption perception on population growth. The results depicted that all, except health expenditure with 0.82552 P-value, are statistically significant. The results have shown the influence of economic growth, labour force and corruption on the growth of population in Nigeria. The data in this work were of two types from three different sources; National Bureau of Statistics (NBS), African Development Bank (ADB) and World Bank (WB), first part ranges from 1995 to 2018 and second part ranges from 1985 to 2018.

Keywords: *ARDL, Unit Root, GDP, Death Rate (DR), Birth Rate (BR), Labor Force (LP), Health Expenditure (HE), Net Migration (NM), Corruption Perception (CP), and Population Growths (PG).*

1.1 Background of the Study

Nigeria was ranked as the most populous country in the African continent and emerged eight in the world with 182 million inhabitants (African development Bank Group, 2013). It was projected that by 2050 Nigeria will produce $1/10^{th}$ of the children worldwide with projection that by 2030 an estimate of 262 million and 398 by 2050 occupants (African Population Studies, 2014), the same source also revealed that in 2015 Nigeria accounted for 5% of births around the glove.

Statistical economic development in Nigeria has been inconsistent over the years despite the past efforts. Economic growth and development of Nigeria is good for a better and prosperous living of its citizens. In studying economic growth and development, a lot of predictors or determinants must be studied as well to have a comprehensive grip on the socio economic and demographic development of the nation. Studies on the relationship between economic growth (GDP), foreign aid, investment flows, and gross capital formation within a country have been previously conducted by Adebayo and Kalmaz (2020) as well as Pasara and Garidzirai (2020) among others.

However, the two most important cardinal factors influencing nations' socio economic development are Birth Rate (BR) and Death Rate (DR). The performance of the economy of any nation to a very large extent hinges on these two factors. Increases or decreases through birth or death rates which were identified to have serious implications on socio economic development of a country by different researchers (see; Amaral, 2018 and Menike, 2018) while other researchers have concluded that there is no relationship between economic growth and population growth in Nigeria; (see Samson, 2021 and David 2019), to this end we found these as a serious problem that need to be toughly investigated. Then we feel courageous to set some statistical techniques and explore the knowledge that gave us one mind with regard to relationship between economic and population growth. To expand the content of study we add more variables such as countries Labor Force (LF), Net Migration (NM) Corruption Perception (CP) and Health Expenditure (HE) apart from Death Rate (DR) and Birth Rate (BR) in relation to Gross Domestic Product GDP, Population Growth.

2.1 Literature Review

Folake and Olufemi (2017) examined the relationship between demographic changes and economic growth in Nigeria. The researchers explained that inflation, exchange rate and fixed capital formation were strong drivers of economic growth in Nigeria. Therefore they concluded that for population growth to ensure sustainable long run growth the economic productive capacity must be expanded and enabling macroeconomic stability should be ensure and maintained consistently overtime.

Amaral (2018) explained that development in a country without population growth causes problems. When the population increases, it is expected the savings and investments also increase. When the population decreases, the production, capital accumulation, employment, incomes and savings will also decrease, negatively affecting development. He also explained that the growth of population causes strong demand for goods, making it possible to establish

a good market as well as increase the demand for capital, he declared that population growth will speed up economic development.

Peter and Bakari (2019) focused on the consequences of population changes on the economic growth of the low-income countries. After some crucial statistical investigations they explained that, the higher the rate of population growth, the more capital accumulation is needed just to hold labor productivity constant. A study by (David 2019) results found no statistical evidence of the causal relationship between population growth and economic growth in Nigeria.

Although population growth has significant impact on economic growth, it does not in any way Granger causes economic growth and vice versa See also (Samson, 2021) study adopted the primary and secondary method of data collection, and he conclude that there is no significant relationship between population growth and economic development in Nigeria.

METHODOLOGY

3.1 Dickey-Fuller (DF) (1979) Test for Unit Roots

Assume that Y_t is random walk process, $Y_t = Y_{t-1} + \mu_t$, then the regression model becomes $Y_t = \rho Y_{t-1} + \mu_t$. Subtract Y_{t-1} from both sides of the equation,

$$Y_t - Y_{t-1} = \alpha_1 Y_{t-1} - Y_{t-1} + u_t \quad (3.1)$$

$$\Delta Y_t = (\alpha - 1) Y_{t-1} + u_t \quad (3.2)$$

$$\Delta Y_t = (\alpha - 1) Y_{t-1} + \alpha_2 T + u_t \quad (3.3)$$

Where $\alpha - 1 = p_1$, Δ is change in Y_t or first difference operator and t is the trend factor. u_t is a white nose residual.

$$\Delta Y_t = p_1 Y_{t-1} + u_t \quad (3.4)$$

With a drift we have;

$$\Delta Y_t = \alpha_0 + p_1 Y_{t-1} + u_t \quad (3.5)$$

In practice, we test the hypothesis that $p=0$. *If* $p=0$, *"*α*"* in equation 3.1 will be equal to 1, meaning that we have a unit root. Therefore, the series under consideration is non-stationary.

In the case where $p \geq 0$, that is, the time series is stationary with zero mean and in the case of 3.3, the series, Y_t is stationary around a deterministic trend. If $p \geq 1$, it means that the underlying variable will be explosive.

However, conducting the DF test as in (3.2) or (3.3), it is assumed that U_t is uncorrelated. But in the case the error terms (U_t) are correlated, the Augmented Dickey-Fuller (ADF) is resorted to, since it adjusts the DF test to take care of possible autocorrelation in the error terms (U_t), by adding the lagged difference term of the dependent variable, ΔY_t.

3.3 The Augmented Dickey-Fuller (ADF) (1981) tests for Unit Root

Restrictive ADF Model: $\Delta Y_t = p_1 Y_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-i} + u_t$ (3.6)

Restrictive ADF Model: $\Delta Y_t = p_1 Y_{t-1} + \alpha_2 T + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-i} + u_t$ (3.7)

General ADF Model: $\Delta Y_t = \alpha_0 + p_1 Y_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-i} + u_t$ (3.8)

General ADF Model: $\Delta Y_t = \alpha_0 + p_1 Y_{t-1} + \alpha_2 T + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-i} + u_t$ (3.9)

u_t is a pure white noise error term and $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$, $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$, etc. The number of lagged difference terms to be included is often determined empirically, the reason being to include enough terms so that the error term in (3.4) and (3.5) are serially uncorrelated. k is the lagged values of ΔY, to control for higher-order correlation assuming that the series follow an AP(p). In ADF *$p=0$ is still tested and follow the same asymptotic distribution as DF statistic.* $H_0: p_1$

$= 0 (p_1 \sim I(1))$, *against* $H_a : p_1 < 0 (p_1 \sim I(0))$.

3.4 ARDL APPROACH TO COINTEGRATION

An ARDL approach as introduced by Pesaran and shin. *(*1999) was adopted to explore the long-run relationship among the variables. An ARDL model is a regression of one variable on its own past and on the present and past values of a number of other variables. The ARDL has various practical advantages: first, this approach was used to test the existence of a relationship between the variables, and this is applicable regardless whether the underlying regressors are stationary. The variables are not required to be I(0) or I(1) or fractionally integrated. The ARDL model does not require a unique level of integration of the variables.

A stochastic process is said to be stationary if its mean and variance are constant over time, i.e. time invariant. By contrast, a non-stationary time series will have a time-varying mean or a time-varying variance or both which renders many alternative statistical tests invalid.

Second, the ARDL model takes sufficient numbers of lags into consideration to capture the data generating process in a general-to-specific modeling framework. In addition to the above two mentioned advantages, the ARDL co-integration model is efficient and unbiased and at the same time, is able to capture the short-run and long-run components of the model simultaneously. A dynamic Error Correction Model (ECM) can be derived from the ARDL through a simple linear transformation (**Banerjee** et al., 1993). The ECM integrates the short-run dynamics with the long-run equilibrium, without losing the long-run information. In order to determine the optimal lag-length incorporated into the model and select the ARDL model to be estimated, the study employs the information criteria.

The ADRL(p,q) model specification:

$$\Phi(\mathrm{L})y_t = \varphi + \theta(\mathrm{L})x_t + u_t \quad \ldots(3.10)$$

with

$$\Phi(\mathrm{L}) = I - \Phi_1\mathrm{L} - \ldots - \Phi_p\mathrm{L}^p$$

$$\theta(\mathrm{L}) = \beta_0 - \beta_1\mathrm{L} - \ldots - \beta_q\mathrm{L}^q$$

Hence, the general ARDL(p,q_1,q_2.....q_k) model;

$$\Phi(\mathrm{L}) = \Phi + \theta_1(L)x_{1t} + \theta_2(L)x_{2t} + \theta_k(L)x_{kt} \quad 3.11)$$

Using the lag operator L applied to each component of a vector, L^k y= y_{t-k}, is convenient to define the lag polynomial $\Phi(\mathrm{L},p)$ and the vector polynomial $\beta(\mathrm{L},q)$. As long as it can be assumed that the error term u_t is a white noise process, or more generally, is stationary and independent of x_t, x_{t-1}, … and y_t, y_{t-1}, …, the ARDL models can be estimated consistently by ordinary least squares.

3.5 MODEL SPECIFICATION

The study tested three models in order to be able to put the study in a proper perspective. The models for the study comprises of three different equations as described below:

3.5.1 Model 1

Model 1 measures the relationship between annual changes in gross domestic product (GDP) as dependent variable and annual changes as the independent variables which are changes in

birth and death rates. Thus, the model will try to predict how changes in birth and death rates cause changes in GDP.

$$\Delta GDP = \beta_1 + \beta_2 \Delta BR + \beta_3 \Delta DR + e \quad (3.12)$$

Where

ΔGDP =rate of change in gross domestic product is used to measure the economic growth of Nigeria.

ΔBR = birth rate

ΔDR = death rate

B_1 = is the equation's constant.

B_2= oefficient of birth rate.

B_3= the coefficient of death rate.

e= the error term of the equation

3.5.2 Model 2

Model 2 is an argumentation of model 1 after inclusion of additional variables to see how the model will perform after adding of other relevant variables. The variables that are included are annual net migration (difference between immigration and emigration), annual health expenditure in Nigeria, total labour force and corruption level. These are added because one, the level of development of the health sector in Nigeria has significant impact on what happen to death and birth rates, two, the level of corruption which is sign of poor governance level in Nigeria has significant impact on what happen to annual health expenditure (budget) and by extension what happen to development of the health sector. Corruption and poor governance have detrimental impacts to what happen to the entire economy. Labour force potential is affected by the size of the total population and labour force is also related to GDP, as active labour force contributes to the growth of GDP. Here in the study labour force potential is the entire working age population. Multiple regression were used in model (2 and 3) due to insufficient variables (not up to 30).

$$\Delta GDP = \beta_1 + \beta_2 \Delta BR + \beta_3 \Delta DR + \beta_4 \Delta NM + \beta_5 \Delta CP + \beta_6 \Delta LF + \beta_7 \Delta HE + \mathrm{e} \quad (3.13)$$

Where,

MN = net migration (difference between immigration and emigration)

LF = labour force potential means working age population

HE = annual health expenditure

CP = corruption level

3.5.3 Model 3

Model 3 tested the effects of changes in annual GDP, labour force, annual health expenditure and corruption level on annual changes in population. This will show how Nigerian population changes in relation to these variables. This is very important for demographic analysis by policy makers.

$$\Delta PG = \beta_1 + \beta_2 \Delta GDP + \beta_3 \Delta LF + \beta_4 \Delta HE + \beta_5 \Delta CP + e \quad (3.14)$$

Where, PG = population growth

DATA ANALYSIS RESULTS AND DISCUSSION

4.1 Descriptive Statistics and Visualization of the Data

The data were grouped into two categories; first data started from 1985 to 2018 and second started from 1995 to 2018 related to Nigerian recorded birth and death rate, labour force, GDP, health expenditure, corruption level and lastly economic and population growth.

Table 4.01: Descriptive Statistics of the data ranging from 1985 to 2018

Summary Statistics, using the observations 1995 - 2018
(missing values were skipped)

Variable	Mean	Median	Minimum	Maximum
Birth Rate (BR)	41.6479	42.2200	37.9100	43.4500
Death Rate (DR)	15.5133	15.6250	11.8600	18.4100
Net Migration(NM)	213195.	235000.	300000.	95027.0
Labour Force (LF)	58.4771	59.8700	53.8300	60.5100
Health Expenditure	3.56000	3.44500	2.49000	5.05000
Corruption (CP)	123.292	135.000	90.0000	152.000
Population Growth	2.61375	2.63000	2.50000	2.71000
GDP	2.53667e+011	2.55865e+011	5.04864e+010	5.68499e+011

Variable	Std. Dev.	C.V.	Skewness	Ex. kurtosis
Birth Rate (BR)	1.72651	0.0414550	-0.809522	60.7270
Death Rate (DR)	2.27106	0.146394	-0.156767	143.331
Net Migration(NM)	92582.9	0.434264	0.226237	173.171

Labour Force (LF)	2.51890	0.0430750	-1.07186	70.4801
Health Expenditure	0.591174	0.166060	0.708155	44.2715
Corruption (CP)	24.0009	0.194667	-0.527604	146.884
Population Growth	0.0768291	0.0293942	-0.258703	143.978
GDP	1.75572e+011	0.692135	0.223669	141.305

Data Sources: National Bureau of Statistics (NBS), African Development Bank (ADB) and World Bank (WB).

The descriptive results of the data have shown that all mean were positive, indicating that all the variables those not depreciate to the negative extents. A reasonable wide range between the minimum and maximum of the study variables give supportive evidence to existence of variability in the natural being of the data. The results for Net Migration, Health expenditure and GDP displayed a positive skewness, in other word the three mention variables are skewed to the right, which indicates that the variables have non-symmetric behaviour, whereas the remaining variables are skewed to the left. The variables also exhibit excess kurtosis and in this regard we says that all the variables have non-normal distributions with high kurtosis.

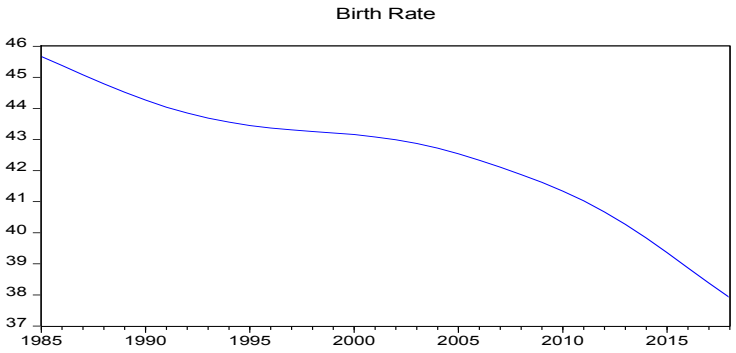

Figure 4.01: Time Plot of Nigerian Birth Rate 1985 to 2015

The plot in figure 4.01 revealed the visual representation of Nigeria Birth Rate from 1985 to 2015 it tended to show a parabolic down ward movement from 45.89 to 38.0, this might probably due to level of education and awareness on family planning among citizenry or populace.

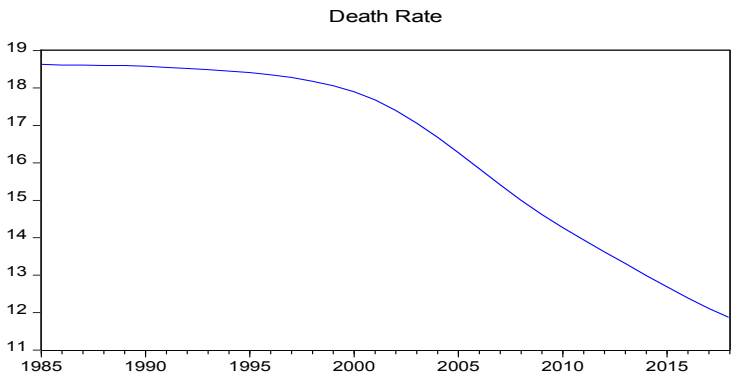

Figure 4.02: Time plot of death rate (1985 - 2015)

The plot in figure 4.02 revealed the visual represented of Nigeria death rate from (1985 - 2015), the plot showed a trapezoid like down ward movement from 16.78 to 11.82 it might also be due to the awareness and level of education.

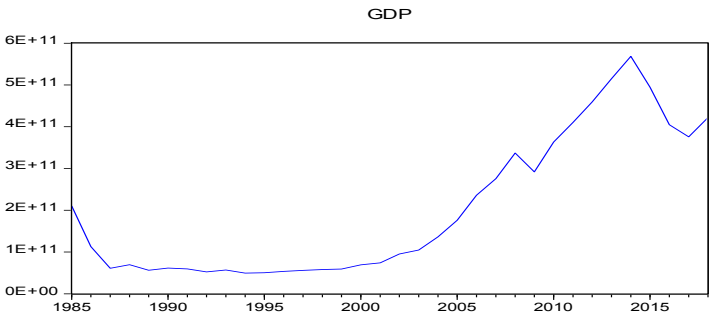

Figure 4.03: Time plot Nigeria GDP (1985 – 2015)

The result in figure 4.03 revealed the Nigeria gross domestic product (1985 – 2015) there was fairly stable level in gross domestic product from (1985 – 2000), then from (2000 – 2013) there was a rapid upward trend, thus there was a fairly drop between (2007 and 2009) after which there was increase. Never the less there was a drop after (2013 - 2015) which might probably related to the recession of Nigeria economy.

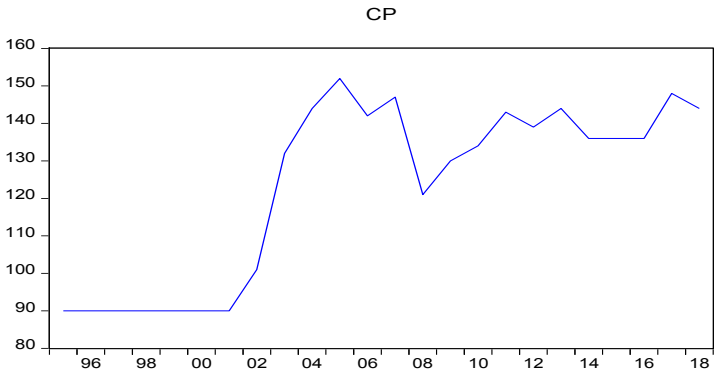

Figure 4.04: Time plot of Nigeria corruption level 1995 to 2(

2018), however there was a jump between (2000 - 2004) to which afterwards there was an irregular and unstable perception in Nigeria under the investigated period, this might due to the unemployment and those employed were not given their entitlement by the government, this may probably lead into corruption and crimes.

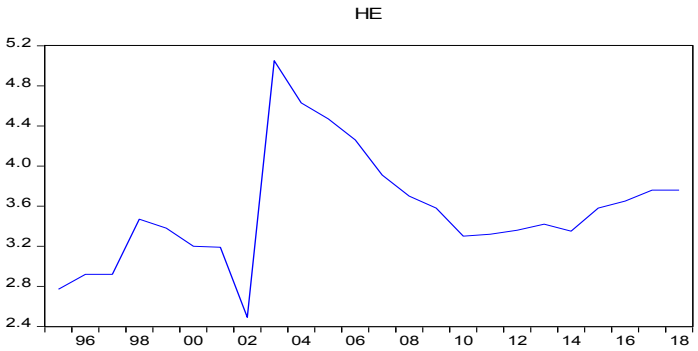

Figure 4.05: Time plot of Nigeria Health Expenditure

The figure 4.05 revealed irregular pattern for the period under investigation, this might be due to the government funding, attitude of health workers and attitude of the people living in the community.

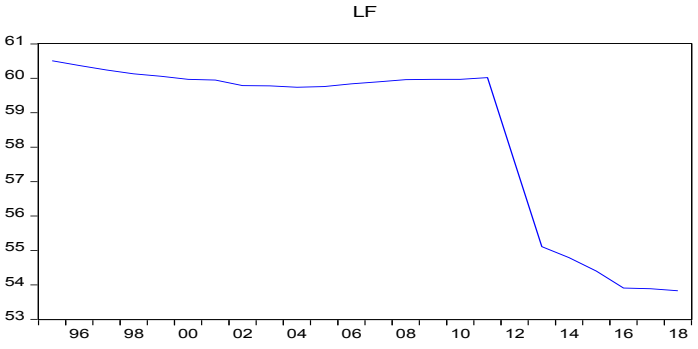

Figure 4.06: Time plot of Nigerian Labour Forces

The figure revealed that there was a fairly stable in labour forces between (1998 - 2012), after there was a sharp down ward movement between (2012 – 2018) ,these might probably due to the a lot of reason such as welfare, no entitlement, no promotion, no motivations, no incentive etc

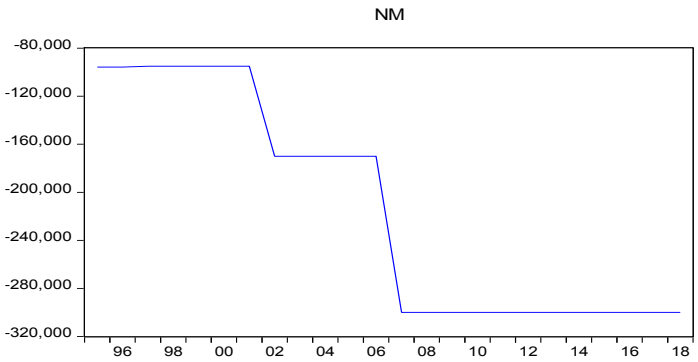

Figure 4.07: Time plot of Nigeria net migration

The figure 4.07 revealed a step-like down ward structure in net migration, i.e the net migration was seriously detorioted for the period under investigation, so also a rapid down ward movement between(2007 – 2018), these might be due to the poverty, unemployment, insecurity and also the economy was detoriated.

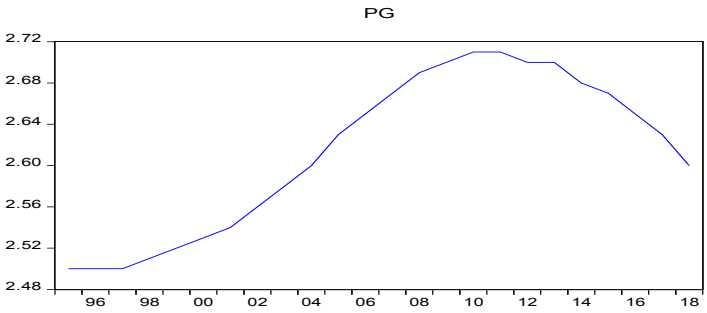

Figure 4.08: Time plot of Nigeria Production growth

The plot in Figure 4.08 revealed an upwards parabolic movement between (1995 - 2010), after which there was a down ward movement between (2010 - 2018), it might also due to the bad economy of Nigeria.

4.2 Unit root Tests

Table 4.02: Result of ADF after First Differencing from 1985 to 2018

Statistics	Lag Length	Critical value	Test comp	P Values
GDP	1	5% level (-2.95711)	-4.105485	0.0032
BR	2	5% level (-2.963972)	-3.620496	0.0113
DR	2	5% level (-1.952910)	-1.72423	0.0401

The results in Table: 4.02 revealed that GDP became stationary after first differencing while birth rate and death rate became stationary after second differencing.

Table 4.03: Result of the ARDL Bound Test for the Long-run relationship (GD, DR and BR)

Test statistics	Values		K
F statistic	4.611010		
	Significant	(0)Bound	(1)Bound
CValue	5%	3.1	3.87

Bound

The result in Table 4.03 showed the ARDL bound which revealed there exist long-run relationship between the GDP, BR and DR. This implies that GDP can be predicted from BR and DR in the long run.

Table 4.04: Results of Estimated Parameters in Model 1

Variables	Co-officient	Std error	t-stat	P value
Birth rate	6.444×10^{11}	0.018	3.591	.0014
Death rate	-1.28×10^{11}	0.0158	-8.07448	.0000
Constant	3.891×10^{10}	0.052	-0.7417	.4687

Model 1 measures the effects of birth rate and death rate on economic growth (GDP). The result showed that economic growth is positively affected by birth rate and negatively affected by death rate.

The results in Table 4.04 revealed that the two variables (.i.e BR and DR) are highly statistically significant. The impact of BR was enormous on GDP while that of DR was negatively large, such may be due to the criminal act of Book Haram and other acts that terrorized the nation. These results had demonstrated that so far continuous population growth in Nigeria is favorable to economic growth of the nation while death, as expected a priori, is unfavorable to economic growth in Nigeria. This result is an indication of the fact that Nigeria is not facing the problem of over population. There is still much scope for population growth in the country, considering the agricultural, natural resources and industrial potentials of Nigeria. India has population that is more than six times the size of Nigeria's but the size of its landmass is about three times the size of Nigeria. Despite all its economy continues to grow.

However, since it is not too viable to predict GDP from only birth rate and death rate of its state, the research also investigated other variables that are also vital to the prediction of GDP such as NM, CL, HE, BR, DR, and PG. These variables are of limited observations (i.e. 24 observations), this showed that multiple regression could be used against earlier method of time series.

4.3 MULTIPLE REGRESSION ESTIMATION

Table 4.05: Results of regression analysis on model 2

Model 3: using observations 1995-2018 (T = 24)
Dependent variable: GDP

Dependent variable: GDP	***Coefficient***	***Std. Error***	***t-ratio***	***p-value***	
Const	-2.44497e+012	6.92591e+011	-3.5302	**0.00278**	***
Birth Rate (BR)	6.06799e+011	2.61366e+011	2.3216	**0.03378**	**
Death Rate (DR)	-6.15984e+011	2.61906e+011	-2.3519	**0.03181**	**
Net Migration(NM)	221856	359023	0.6179	0.54531	
Labour Force (LF)	-3.34967e+010	9.70572e+09	-3.4512	**0.00328**	***
Health Expenditure	-2.55075e+010	2.21994e+010	-1.1490	0.26744	
Corruption (CP)	-1.09967e+09	1.00667e+09	-1.0924	0.29084	
Population Growth	-4.12619e+012	2.49705e+012	-1.6524	0.11793	

Key* at 10% **at 5% ***at 1%

Mean dependent var	2.54e+11		S.D. dependent var	1.76e+11
Sum squared resid	2.00e+22		S.E. of regression	3.54e+10
R-squared	0.971760		Adjusted R-squared	0.959404
F(7, 16)	78.65181		P-value(F)	3.37e-11
Log-likelihood	-612.1313		Akaike criterion	1240.263
Schwarz criterion	1249.687		Hannan-Quinn	1242.763
Rho	0.140113		Durbin-Watson	1.703804

Table 4.05 of Model 2, is a result of the estimation of relationship between GDP and BR, DR, NM, LF, CP, and PG using multiple regression analysis. To measure the effect of the independent variables such as net migration, labour force, health expenditure and corruption perceptions on economic growth within 1995 to 2018, the general model that test the effects of birth rate and death rate on economic growth, model 2 is regressed, the dependent variable is GDP.

The result depicted that in addition to death rate and birth rate which we found statistically significant in model 1, labour force is also statistically significant with a P-value of 0.00328 which is less than the required 0.05 for suitable and proper validation in statistical analysis. Labour force negatively affects the economic growth. This can be interpreted to mean economic growth is more favorably to use of modern technology and less useful compared to labour force. This has important implication for the use of modern technology in our work places across the country. Other variables were not found to be statistically significant with regard to GDP.

Table 4.06: Results of regression analysis on model 3
Model 3:, using observations 1995-2018 (T = 24)
Dependent variable: Population Growth

Dependent variable: Population Growth *PG*	***Coefficient***	***Std. Error***	***t-ratio***	***p-value***	
Const	1.36167	0.153062	8.8962	**<0.00001**	***
Labour Force (LF)	0.0170653	0.00249342	6.8441	**<0.00001**	***
Health Expenditure	0.00273313	0.012228	0.2235	0.82552	
Corruption Porce	0.00105679	0.000446107	2.3689	**0.02859**	**
GDP	4.49918e-013	0	7.6457	**<0.00001**	***

Key* at 10% **at 5% ***at 1%

Mean dependent var	2.613750		S.D. dependent var	0.076829
Sum squared resid	0.007258		S.E. of regression	0.019545
R-squared	0.946537		Adjusted R-squared	0.935281
F(4, 19)	84.09589		P-value(F)	8.25e-12
Log-likelihood	63.18940		Akaike criterion	-116.3788
Schwarz criterion	-110.4885		Hannan-Quinn	-114.8161
Rho	0.344729		Durbin-Watson	1.211866

Model 3 the model tests the effects of changes in annual GDP, labour force, annual health expenditure and corruption level on annual changes in population growth. The model result revealed how Nigerian population changes in relation to the other mention variables. This is very important for demographic analysis for private businesses and policy makers during their investments decisions. Thus, model 3 regressed GDP, labour force, health expenditure and corruption on population growth. The result shows that all, except health expenditure with 0.82552 P-vale, are statistically significant. The result shows the influence of economic growth, labour force and corruption on the growth of population in Nigeria.

Thus, population growth is positively affected by level of economic growth, labour force and the corruption perception in Nigeria. Economic growth has the implication of increasing wealth and making people more prosperous, increase in economic lay a tendency to reduce poverty which will ideally make people to marry more wives and increase number of children. Likewise, the level of corruption has significant impact on the population growth; this can be interpreted in different direction. It could be, the corrupt people tend to have more children with their wives or wife, or generally the prostitute might be eager to give birth to the corrupt people so, they can enjoy part of the looted wealth. More so, in whatever way, corruption perception tends to affect population growth. Labour is a source of getting income to feed oneself and family, thus as more people get into the workforce, some of these workers will get married. Those, that are already married will increase the number of wives under their custody or increase the number of children they give birth to.

Conclusions

This research aimed at investigating some of the demographic parameters that have significant effects on economic and population growths in Nigeria. Three models were used in the study where Model 1 measures the effects of birth rate and death rate on economic growth (GDP). The result showed that economic growth is positively affected by birth rate and negatively affected by death rate. This result had demonstrated that so far continuous population growth in Nigeria is favorable to economic growth of the nation while death, as expected a priori, is unfavorable to economic growth in Nigeria. This result is an indication of the fact that Nigeria is not facing the problem of overpopulation, precisely when compared with available resources.

To measure the effect of other variables such as net migration, labor force, health expenditure and corruption perception on economic growth, model 2 is regressed. The result shows that in addition to death rate and birth rate which we found statistically significant in model 1, labor force is also statistically significant with a P-value of 0.00328. Labor force negatively affects affect economic growth. This can be interpreted to mean economic growth is more favorably to use of modern technology than the labor force. All variables with the exception to Health expenditure were found to be statistically significant. Thus, model 3 regressed the relationship between Population Growth (PG) and other independent variables such as labor force, health expenditure and corruption. The result shows that all, except health expenditure, are statistically significant

Recommendation

The researchers recommend as follows:

i. Nigerian government should develop an effective demographic strategy to save good and enough data for researchers of this kind, solely this may end the long time argument among Nigerian demographers.
ii. Government should empower studies of this kind with effective policies and proper implementations should be given to its due.
iii. Researchers of relevant field should adopt more researches using different statistical techniques to explore more factors that negatively affect the Nigerian GDP and PG in general.

Contribution to Knowledge

This work has contributed immensely in studying the effect of some demographic parameters on economic and population growths in Nigeria. The standard study of this kind in Africa are rare in nature, most of the scholars in the related field tend to focus on other parameters fewer or lesser valuable as compared to the one considered in the study. The researchers have shown how powerful statistical tools can be adopted to explore both positive and negative relationship of some demographic parameters on economic and population growths in Nigeria which are also applicable to other countries. We finally, contributed negatively against studies by (Samson, 2021 and David 2019) who concluded that there is no relationship between population and economics growth in Nigeria and we positively support the studies by (Amaral, 2018 and Menike, 2018) who concluded that there exist a positive relationship between nations' population and economic growth.

Suggestion for Further Research

The researchers suggests the adaptation of more advanced statistical tools in the analysis of more relevant parameters that might have either positive or negative effects on economic and population growth of any given country should be employed. Also we suggest that the subsequent researchers should set more effort to find a reason behind positive relationship between population growth and Corruption perception as well as the existing problem which we supported by concluding that Nigerian population growth have a positive relationship with the nations' economic growth.

References

1. Adebayo, Kalmazomiwa Sunday, and Demet Beton Kalmaz. (2020). Ongoing debate between foreign aid and economic growth in Nigeria: A wavelet analysis. Social Science Quarterly 101: 2032–51

2. African development Bank Group (2013). Marital Status- Household Size and Poverty in Nigeria- Evidence from the 2009-2010 Survey Data

3. African Population Studies (2014). Perspectives on socio-cultural context of adolescent reproductive health in Nigeria

4. Amaral, E. F. L. (2018). Theories of demography. *Population and Society*. September 3–7, 2018, Texas A & M Universityand Economic Growth in Developing Countries, 1965 to1990.*America Sociological Review 62*(6):974. DOI: 10.2307/2657351

5. David Adugh Kuhe (2019) The Impact of Population Growth on Economic Growth and Development in Nigeria: An Econometric Analysis. Mediterranean Journal of Basic and Applied Sciences (MJBAS) (Peer Reviewed Journal), Volume 3, Issue 3, Pages 100-111, July-September 2019

6. Folake Adenola and Olufemi M. Saibu (2017). Does population change matter for long run economic growth in Nigeria?. University of Lagos, Akoka, Nigeria. International Journal of Development and Sustainability ISSN: 2186-8662 – www.isdsnet.com/ijds Volume 6 Number 12 (2017): Pages 1955-1965 ISDS Article ID: IJDS17101102.

7. Menike, H. R. A. (2018). A Literature Review on Population Growth and Economic Development. *International Journal of Humanities Social Sciences and Education*, 5(5), 67-74

8. Pasara, Michael Takudzwa, and Rufaro Garidzirai. (2020). Causality Effects among Gross Capital Formation, Unemployment and Economic Growth in South Africa. Economies 8: 26.

9. Pesaran, M.H. and Shin, Y. (1999).An Autoregressive Distributed Lag Modeling Approach to Co integration Analysis. In: Strom, S., Holly, A. and Diamond, P. (Eds.), *Centennial Volume of Rangar Frisch*. Cambridge University Press, Cambridge.

10. Peter, A. and Bakari, I. (2019).Impact of Population Growth on Economic Growth in Africa: A Dynamic Panel Data Approach (1980 -2015). Available at SSRN:

11. Peterson EWF. (2017). The Role of Population in Economic Growth. *SAGE Open*, October, doi:10.1177/2158244017736094.

12. Samson Erite Kulu (2021). Population Growth and Economic Development in Nigeria: Department of Political Science and Public Administration, Dr. Goodluck Jonathan, College of Arts and Social Sciences, Igbinedion University, Okada, Edo State, Nigeria.