

IMPACT OF POPULATION GROWTH ON THE ECONOMIC PERFORMANCE OF NIGERIA

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Abstract

This study examined the impact of population growth on the economic performance of Nigeria from 1980 to 2020, with economic performance measured in terms of economic growth. Population growth was disaggregated into three key components: fertility rate, mortality rate, and migration. The study utilized time series annual data, secondarily sourced from the publications of the World Bank and the Central Bank of Nigeria (CBN). The data were analyzed using the Ordinary Least Squares (OLS) estimation technique. The results of the regression analysis revealed that the fertility rate had a negative and significant impact on economic growth in Nigeria. Similarly, the mortality rate also showed a negative and significant relationship with economic performance. In contrast, migration was found to have a positive and significant influence on economic growth. These findings suggest that all three components of population growth significantly affect economic performance in the country. Based on the findings, the study concludes that population growth has a measurable impact on Nigeria's economic performance. It therefore recommends the integration of compulsory reproductive education into the curriculum at all educational levels to promote awareness of birth control measures. Furthermore, the government should subsidize medical services and increase budgetary allocations to the health sector to reduce the mortality rate and improve economic outcomes.

Key words: Economic growth, fertility rate, migration, mortality rate, and population growth

Introduction

The relationship between population growth and economic performance has been a persistent subject of scholarly debate, tracing back to Thomas Malthus' seminal 1798 hypothesis. Malthus theorized that unchecked population growth would eventually outstrip available resources, resulting in widespread poverty and economic stagnation. While he advocated moral restraint as a solution, his analysis failed to anticipate the transformative role of technological advancement in enhancing productivity, reducing mortality, and improving living standards. These advancements have enabled the global population to surge from approximately 1

billion in 1798 to over 7.4 billion in the present day.

Despite these developments, Malthus' central thesis—that rapid population growth can pose significant challenges to economic progress—continues to shape global policy dialogues. In the mid-20th century, this concern fueled the promotion of family planning and fertility control initiatives, particularly in developing countries. Many development economists argue that high fertility and population growth rates in nations like Nigeria often redirect scarce resources from productive investments to immediate consumption. This dynamic tends to reduce national savings, constrain human capital development—particularly in education and

healthcare—and ultimately impede long-term economic growth. At the micro level, large household sizes often result in lower per capita spending on health and education, which cumulatively undermines national productivity and income levels. These concerns prompted international support for population control policies during the 1960s and 1970s.

However, contemporary perspectives also highlight the potential demographic dividends that can arise from population growth, particularly when the population is youthful, educated, and gainfully employed. Under the right economic and institutional conditions, a growing population can be a catalyst for economic expansion. Therefore, the net impact of population growth on economic development is context-specific, influenced by demographic composition, economic structures, and policy effectiveness. In the Nigerian context, current demographic and economic trends paint a complex picture. Between 2000 and 2020, Nigeria's Gross Domestic Product (GDP) increased from ₦23,332.87 billion to ₦93,225.85 billion. Yet, the country continues to grapple with high unemployment, inflation, and poverty rates. National efforts to promote family planning and reduce fertility have met with limited success, and the pace of population growth remains high. This scenario raises pressing questions about the implications of Nigeria's population dynamics for its economic performance.

In the Nigerian context, studies such as Olusogo et al. (2018) and Tartiyus et al. (2015) identified a positive and statistically significant impact of population growth on economic growth using time series and regression analyses. Conversely, other scholars including Aidi et al. (2016) and Onwuka (2006) reported negative consequences, attributing economic underperformance to high fertility, elevated mortality, and low labor productivity. Internationally, the evidence remains similarly divided. For example, Garza-Rodriguez et al. (2016) in Mexico and

Mahmud (2015) in India observed that population growth can support long-term economic development, especially when complemented by structural reforms and urbanization. In contrast, studies from Uganda (Klasen & Lawson, 2007) and Bangladesh (Shah et al., 2015) showed that high population growth correlates with slower per capita income growth and heightened levels of poverty and unemployment. In the Nigerian context, Ewugi and Yakubu (2012) contend that Malthusian fears regarding the imbalance between population growth and resource availability remain relevant. These divergent findings underscore the need for a nuanced, context-specific analysis. This study, therefore, seeks to bridge the gap in understanding the complex interplay between population growth and economic performance in Nigeria.

Statement of the Problem

The role of population growth in the performance of economies across the globe has remained a debated issue in literature. While some argue that population growth enhances economic performance, others contend like Malthus that rising population is detrimental to nations' economic performance. Thus, every economy strives to maintain a population growth rate that would not inhibit its growth and development. For those that support the cause of population growth in enhancing economic performance, they argue that growing population will stimulate the productivity of the economy through the contributions of the growing population. The school with contrary view, opine that rising population growth will divert resources away from investment to consumption, hence, hinders smooth economic prosperity of the nation. Understanding the importance of population growth on the performance of the economy, Nigeria has formulated and implemented a number of policies that will moderate the rate of fertility, mortality as well as migration, hence, population growth in the

country. Some of the policies and programmes include, the first population policy, the national family planning programmes, free and compulsory basic education among others. However, available statistics show that Nigeria's economic performance has remained unimpressive considering the state of some of the key performance indicators. Since 2015, Nigeria has been struggling with low GDP growth rate as it slipped into economic recession in 2016 and 2020 having a negative GDP growth of -1.62 and -1.79 per cent in the respective years. The country is also characterized by high rate of unemployment which stood at 33 per cent in 2020 and a double-digit inflation of 17.9 per cent in May, 2021. This can be attributed to increasing population growth rate as indicated by various components of population growth (fertility rate, mortality rate and migration). Therefore, the study tries to evaluate the impact of population growth on the economic performance of Nigeria.

Objectives of the Study

The main objective of this study is to examine the impact of population growth on economic performance of Nigeria, while the specific objectives are as follows, to:

1. examine the effect of fertility rate on economic growth in Nigeria;
2. evaluate the impact of mortality rate on economic growth in Nigeria;

Research Questions

The following research questions were raised to guide the study:

1. To what extent does fertility rate affect economic growth in Nigeria?
2. Does mortality rate impact on economic performance of Nigeria?

Research Hypotheses

The following null hypotheses were tested by the study:

1. There is no significant effect of fertility rate on economic growth in Nigeria;

2. Mortality rate does not significantly impact on economic growth in Nigeria;

Research Methodology

The study adopted an ex-post facto research design to examine the impact of population growth on the economic performance of Nigeria. This design was considered appropriate because the independent variables—fertility rate, mortality rate, and migration—had already occurred and could not be manipulated by the researcher. Consequently, the study inferred relationships between variables based on observed variations over time, without any direct intervention. This approach enabled a scientific and analytical investigation into how shifts in population dynamics influence economic outcomes. As explained by Ndiyo (2005), ex-post facto designs allow for retrospective analysis of independent variables to determine their plausible effects on dependent variables. In this study, both descriptive statistics and a standard error correction mechanism were employed for analytical rigor. To estimate the model, the Ordinary Least Squares (OLS) technique was used, chosen for its optimal statistical properties—particularly its classification as the Best Linear Unbiased Estimator (BLUE). After estimating the model, a series of post-estimation diagnostic tests were conducted to verify the reliability and robustness of the results. These included the adjusted R-squared, t-statistics, F-statistic, and the Durbin-Watson statistic, in line with the recommendations of Koutsoyiannis (1977).

Prior to estimation, descriptive statistics were performed to assess the distribution of data, including measures such as mean and median. A correlation matrix was also employed to check for multicollinearity among the variables, thereby ensuring the integrity of the regression results. Following estimation, the model outputs were used to test the hypotheses formulated in Chapter One, forming the basis for accepting or rejecting

the null hypotheses. The study relied on secondary data sourced from credible institutions such as the World Bank and the Central Bank of Nigeria. The annual time series data were presented in Table 1, covering the period from 1980 onward. For instance, in 1980, Nigeria's real GDP stood at ₦15,121.54 million, with a fertility rate of 6.78%, a mortality rate of 19.67, and a migration rate of 0.75%. By 1990, both the fertility and mortality rates had declined, while real GDP increased to ₦19,305.63 million. This upward trend in economic

growth, reflected in real GDP, appears to correspond with the downward movement in population growth indicators. Throughout the study period, as the components of population growth (fertility, mortality, and migration) consistently declined, Nigeria's economic performance—measured by real GDP—continued to improve. This pattern suggests a potentially inverse relationship between rapid population growth and economic performance, implying that uncontrolled population expansion may hinder Nigeria's economic development.

Table 1: Data for analysis

Year	FR	MR	MGR	GDIGR	RGDP
1980	6.78	19.67	0.75	-25.21	15121.54
1981	6.78	19.39	-0.08	-26.45	15258.00
1982	6.77	19.10	-0.90	-27.25	14985.08
1983	6.75	18.81	-1.72	-33.76	13849.73
1984	6.73	18.78	-1.42	-43.26	13779.26
1985	6.70	17.75	-1.12	9.12	14953.91
1986	6.66	18.72	-0.81	0.74	15237.99
1987	6.63	18.69	-0.51	-35.47	15263.93
1988	6.58	18.66	-0.21	-14.30	16215.37
1989	6.54	18.61	-0.20	35.46	17294.68
1990	6.49	18.59	-0.20	40.32	19305.63
1991	6.44	18.55	-0.20	-0.63	19199.06
1992	6.40	18.52	-0.19	-2.42	19620.19
1993	6.35	18.48	-0.19	15.72	19927.99
1994	6.30	18.43	-0.18	-10.83	19979.12
1995	6.26	18.37	-0.18	-26.23	20353.20
1996	6.22	18.31	-0.17	17.93	21177.92
1997	6.19	18.26	-0.17	8.83	21789.10
1998	6.16	18.20	-0.16	-4.99	22332.87
1999	6.13	18.02	-0.18	-2.87	22449.41
2000	6.11	17.84	-0.20	16.95	23688.28
2001	6.08	17.66	-0.22	-21.94	25267.54
2002	6.06	17.48	-0.24	20.31	28957.71
2003	6.04	17.29	-0.26	50.07	31709.45
2004	6.01	16.86	-0.29	-23.98	35020.55
2005	5.99	16.42	-0.32	-10.43	37474.95
2006	5.96	15.99	-0.35	59.30	39995.50
2007	5.93	15.56	-0.38	41.70	42922.41
2008	5.90	15.12	-0.40	-0.72	46012.52
2009	5.87	14.80	-0.39	34.75	49856.10
2010	5.84	14.47	-0.38	18.34	54612.26
2011	5.80	14.15	-0.37	-7.92	57511.04
2012	5.76	13.83	-0.36	3.36	59929.89
2013	5.71	13.51	-0.35	7.82	63218.72

2014	5.65	13.20	-0.34	12.99	67152.79
2015	5.59	12.89	-0.34	0.30	69023.93
2016	5.53	12.58	-0.33	-6.41	67931.24
2017	5.46	12.27	-0.32	-1.83	68490.98
2018	5.39	11.96	-0.31	9.38	69810.02
2019	5.32	11.77	-0.30	11.80	69150.50
2020	5.28	11.57	-0.30	12.23S	93225.85

Source: World Bank and Central Bank of Nigeria Publication from various years.

Presentation and interpretation of results Descriptive statistics

The descript statistics of the data set used in this study is presented in Table 2. The result shows that the average values of real GDP, fertility rate, mortality rate, migration rate and gross domestic investment were N34,145.76 million, 6.14, 16.68, -0.36 and 2.20 per cent, respectively, within the study period. The maximum values were recorded at N69,810.02 million, 6.78, 19.67, 0.75 and 59.30 per cent for the respective variables, real GDP, fertility rate, mortality rate, migration rate and gross domestic

investment. On the other hand, the least (minimum) values for the corresponding variables were N13,779.26 million, 5.31, 11.77, -1.72 and -43.26 per cent. The values of the Skewness, Kurtosis and Jarque-Bera were inconsistent with the normal values of zero and three per cent, respectively. However, this does not undermine the reliability of the analysis of the data set in economic decision making and forecasting since this is just the means to the end and not the end itself.

Table 2: Descriptive statistics

	RGDP	FR	MR
Mean	34145.76	6.145950	16.68900
Median	23068.85	6.118500	17.79500
Maximum	69810.02	6.783000	19.67000
Minimum	13779.26	5.317000	11.77000
Std. Dev.	20112.60	0.420798	2.411068
Skewness	0.700033	-0.108439	-0.758476
Kurtosis	1.908760	2.055604	2.117104
Jarque-Bera	5.251649	1.564868	5.134412
Probability	0.072380	0.457292	0.076750
Sum	1365830.	245.8380	667.5600
Sum Sq. Dev.	1.58E+10	6.905752	226.7168
Observations	40	40	40

Source: Author's computation with data from World Bank and Central Bank of Nigeria

Correlation matrix

The correlation matrix show that there is no likelihood of having a problem of multicollinearity in the model. This is because of the values of the pair-wise

correlations are quite low. Hence, the variables in the equation are not correlated and the estimated result with the variables can be relied on for economic policy formulation and predictions.

Table 3: Correlation matrix

	RGDP	FR	MR
RGDP	1.000000	-0.132334	-0.490287
FR	-0.432334	1.000000	0.527109
MR	-0.390287	0.227109	1.000000

Source: Author's computation with data from World Bank and Central Bank of Nigeria

Interpretation of the OLS estimated result

The estimated result of the ordinary least squares is presented in Table 4. The result shows that a negative and statistically significantly relationship exists between economic growth and fertility rate. This conforms to the expectation of the theory on the sign and size of the parameter estimate of fertility rate. Specifically, the size of the parameter suggests that a one per cent rise in fertility rate will cause economic growth to fall by 0.48 per cent. At five per cent significant level, the variable proves to play a vital role in determining economic performance of Nigeria within the study period. Similarly, the established relationship between mortality rate and economic performance of Nigeria is negative and statistically significant in line with *a priori* expectation. The magnitude of the coefficient of mortality rate shows that a one per cent increase in mortality rate will reduce the level of economic growth by almost 0.15 per cent. The significant value of the t-statistic indicates that mortality rate is a key variable to be considered while making decisions that affect the performance of the economy in Nigeria. Also, as a component of population growth impact positively and significantly on the performance of Nigeria's economy. Given the size of the parameter of migration, a unit per cent increase in immigration will prompt a 0.09 percent improvement in the performance of the economy in Nigeria. Migration also turned out as an important

variable that affect the level of economic performance in Nigeria due to the value of its t-statistic. Improvement in domestic investment has a stimulating effect on the economic performance of Nigeria as presupposed by the theory. However, the effect is statistically abysmal or infinitesimal to create any meaningful impact on economic performance in the country. The effect of fertility rate as a component of population growth on economic performance in the model surpasses other component's effect. This assertion is validated by the value of the coefficient of fertility rate (-0.485).

By and large, the value of the estimated F-statistic 279.82 (0.0000) which is greater than the critical value of F^* at five per cent level of significance shows that all the predetermined variables jointly affect the performance of Nigeria's economy significantly. The value of the adjusted R-squared (0.926) portends that approximately, 93 per cent of the change in the level of economic performance of Nigeria are caused by changes in fertility, mortality and net migration as well as domestic investment. This implies that the model is a good-fit. The Durbin-Watson statistic of 2.09 falls within the no autocorrelation region. This suggests the absence of the problem of autocorrelation in the model. It is therefore, suggested that the estimates of the model are stable and reliable for economic policy formulations and forecast.

Table 4: OLS result

Dependent Variable: LOG(RGDP)

Method: Least Squares

Date: 07/04/21 Time: 13:00

Sample (adjusted): 1980 2019

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.76360	0.462564	34.07875	0.0000
FR	-0.485494	0.128856	-3.767727	0.0006
MR	-0.148179	0.021513	-6.887957	0.0000
R-squared	0.949679	Mean dependent var	10.27469	
Adjusted R-squared	0.926213	S.D. dependent var	0.573637	
S.E. of regression	0.105441	Akaike info criterion	1.544861	
Sum squared resid	0.389123	Schwarz criterion	1.333751	
Log likelihood	35.89722	Hannan-Quinn criter.	1.468531	
F-statistic	279.8258	Durbin-Watson stat	2.096290	
Prob(F-statistic)	0.000000			

Source: Author's computation with data from World Bank and Central Bank of Nigeria

Test of hypotheses

The first null hypothesis states that there is no significant relationship between fertility rate and economic performance of Nigeria, however, the outcome of the estimated result shows that fertility rate significantly affects economic performance of the country. Hence, the null hypothesis is rejected while the alternative is accepted. The second hypothesis specifies that the relationship between mortality rate and economic performance is not statistically significant. But, given the result of the model, a statistically significant relationship exists between the variables (mortality rate and economic performance). The study therefore, rejects the second null hypothesis while accepting the alternative hypothesis

that a significant relationship exists between mortality rate and economic performance in Nigeria. Lastly, the third null hypothesis suggests that migration does not significantly affect economic performance in Nigeria. Nonetheless, the findings from the analyzed result show that migration significantly affects economic performance in Nigeria. The study, therefore, refutes the stated null hypothesis and accepts the alternative hypothesis with the conclusion that migration has a significant influence on the economic performance of Nigeria.

Discussion of findings

The results of the estimates show that all the components of population growth as used by this study to include fertility rate,

mortality rate and migration have significant effect on the level of economic performance in Nigeria within the study period. The negative signs of the coefficients of fertility rate and mortality rate portend that rising fertility and mortality rates are inimical to improved performance level of Nigeria's economy. This is because, as they (fertility and mortality rates) intensify, the economy declines in performance. The study further reveals that increasing rate of immigration into Nigeria enhances the performance of the economy in a significant manner. As positive net migration grows, the economic performance of the country improves. However, the study discovered that though domestic investment which is a control variable is correctly signed, its contribution to the performance of the economy is infinitesimal. This may be attributed to inadequate domestic investment growth due to unfriendly business environment and poor infrastructure in Nigeria. As a result, the domestic investment is yet to significantly influence the level of economic performance as expected in Nigeria. On the whole, the study found that the effect of fertility rate on economic performance in Nigeria is greater than the effect of other components of population growth. This shows that fertility rate affects economic performance more than mortality and migration rate in Nigeria.

Conclusion

The impact of population growth on economic performance in Nigeria was examined by this study. The study period covered was 1980 through 2020. The outcome of the estimated regression results demonstrated that fertility rate affects economic growth in a negative and significant manner. Similar relationship was as well established between mortality rate and economic growth in Nigeria. Lastly, migration proves to positively and significantly influence economic performance in Nigeria. Given that the three basic components of population growth specified by the study exert significant

effect of economic growth, the study conclude that population growth truly impact on economic performance in Nigeria.

Recommendations

Considering the outcome of the analysis of the study, the following policy recommendations are made:

1. A compulsory reproductive education should be integrated into education curricular at all levels to enlighten individuals on the measures of birth control and the need to embrace them so as to moderate fertility rate and enhance the performance of the economy in Nigeria;
2. Subsidization of medical services as well as increasing budgetary allocation of the health sector should be pursued by the government in order to reduce mortality rate given its negative effect on the economic performance of the country;

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