



Impact of Inflation on Economic Growth in Nigeria

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ABSTRACT

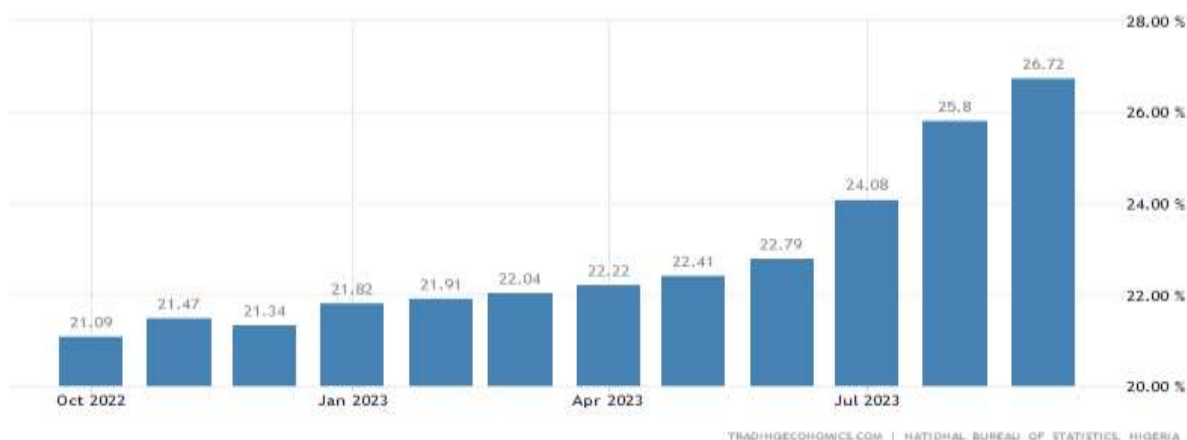
General Prices of goods and services in Nigeria have been consistently increasing for the past two decades while the performance of the economy remain dismal for a while, very far below expectation, despite the abundant human and natural resources in the country. Against this background, this paper investigated the impact of inflation on economic growth in Nigeria, using Time Series data for 32 years from 1990 to 2022. Cointegration and Granger Causality techniques have been applied. The result for the Cointegration showed negative long-run relationship between inflation and economic growth, while the results of Granger Causality indicated unidirectional causality running from economic growth to inflation in Nigeria. The paper concludes that persistent increase in prices cripples economic growth severely and the low performance of the economy triggers inflation in Nigeria. The paper recommends application of effective monetary and fiscal policies for stabilization of prices and acceleration of economic growth in the country.

Keywords: Inflation, fiscal policies, economic growth

INTRODUCTION

For the fast twenty years, general prices of goods and services have been consistently increasing year after year affecting the economic life of millions of people living in Nigeria. The country's annual inflation rate continued to accelerate to reach an over 20 years high of 26.70 percent in September 2023, mainly due to the effects of the removal of petrol subsidy in May, 2023 and the devaluation of the official exchange rate and security issues in food producing regions NBS (2023).

Moreover, Cost of food in Nigeria increased to 30.64 percent in September, 2023. Food Inflation in Nigeria averaged 12.86 percent from 1996 until 2023, reaching an all-time high of 39.54 percent in September 2001 and a record low of 17.50 percent in January of 2000. Additional upward pressure came from other CPI items, including transportation 27.20 percent, housing & utilities 22.5 percent and miscellaneous goods & services 21.90 percent. The annual core inflation rate, which excludes farm produce, climbed further to 22.10 percent in September, quickening from 21.2 percent in August. On a monthly basis, consumer prices rose by 2.1 percent in September, following a 3.2 percent surge in the prior month NBS (2023).

Inflation Rate in Nigeria from October, 2022 to September, 2023

Source: National Bureau of Statistics, Nigeria

The Bar Chart depicts persistent rise in the general prices of goods and services in Nigeria in twelve months, between October, 2022 (21.09) percent to September, 2023 (26.72) percent. This shows an increase of 5.63 percent in twelve months.

Nigeria's inflation has been higher than the average for African and Sub-Sahara Countries for years now, and even exceeded 16 percent in 2017 and a real significant decrease is nowhere in sight. The bigger problem is its unsteadiness, An inflation rate that is bouncing all over the place, like this one, is usually a sign of a struggling economy, causing prices to fluctuate, and unemployment and poverty to increase and more than half of its GDP is generated by the service sectors such as telecommunications and finances. Nigeria derives a significant share of its state revenues from oil. (O'Neill, 2023).

In Nigeria, even before the current inflationary time, poverty has been astronomically increasing. 63% are multidimensionally poor according to the National MPI (2022). Multidimensional poverty is higher in rural areas, where 72% of people are poor, compared to 42% of people in urban areas. The National Bureau of Statistics reported that 63% of persons living within Nigeria (133million people) are multidimensionally poor. 65% of the poor (86 million people) live in the North, while 35% (nearly 47 million) live in the South. Poverty levels across States vary significantly, with the incidence of multidimensional poverty ranging from a low of 27% in Ondo to a high of 91% in Sokoto. Over half of the population of Nigeria are multidimensionally poor and cook with dung, wood or charcoal, rather than cleaner energy. High deprivations are also apparent nationally in sanitation, healthcare, food insecurity, and housing. Moreover, Child poverty is prevalent in rural areas, with almost 90% of rural children experiencing poverty.

Moreover, the population of Nigeria has been rapidly increasing by an average of 5 million people per year, The National Population Commission NPC (2022) reported that Nigeria population increased from 206, 139, 589 to 211, 400, 708 and 216, 746, 940 in 2020, 2021 and 2022 respectively. The population is predicted to 250 million by the year 2028. Rapid population increase amidst high inflation rate in the country undermines the wellbeing of millions of people persistently.

However, the current inflationary trend in Nigeria has similarly affects prices of Agricultural implements, fertilizer, insecticide and cost of labour which are frequently patronized by the rural farmers. For many decades, farmers in Nigeria find it difficult to adequately finance agriculture due to high cost of farming implements and fertilizer. Agricultural activities provide livelihood for many Nigerians, whereas the wealth generated by oil reaches a restricted share of people. Nigeria's agricultural sector faces many challenges which impact on its productivity. These include; poor land tenure system, low level of irrigation farming, climate change and land degradation. Others are low technology, high production cost and poor distribution of inputs, limited financing, high post-harvest losses and poor access to markets. These challenges have stifled agricultural productivity affecting the sector's contribution to the country's GDP as well as increased food imports due population rise hence declining levels of food sufficiency. For instance, between 2016 and 2019 Nigeria's cumulative agricultural imports stood at N3.35 trillion, four times higher than the agricultural export of N803 billion within the same period.

Umaru and Zubairu (2012) stressed that Economic growth coupled with price stability continues to be the central objective of macroeconomic policies for most countries in the world today. In view of that, this paper however, investigates the impact of inflation on economic growth in Nigeria. Granger Causality and Cointegration was applied in determining the causal relationship between the two variables under investigation. Cointegration was applied to determine the long-run relationship between inflation and economic growth in Nigeria.

Endogenous Growth Model

The endogenous growth theory is also called new growth theory that was developed in the 1980s as a response to criticism of the neo-classical growth model. Romer (1986) developed the model of increasing returns in which there was a stable positive equilibrium growth rate that resulted from endogenous accumulation of knowledge. The most important work of this model that distinguishes itself from neoclassical growth by emphasizing that economic growth is an endogenous outcome of an economic system, not the result of forces that impinge from outside. Endogenous growth theory argues that economic growth is generated from within a system as a direct result of internal processes. Endogenous growth theory demonstrate that policy measure has an impact on the long run growth rate of an economy.

Literature Review

According to Ahmed (2010), the relationship between Inflation and Economic Growth has been debated in a number of economic literatures and the debates have differed in relation with the condition of world economy order. For instance, Barro (1996) conducted research using panel data of a hundred countries from 1960 to 1990. The study revealed that for a given starting level of real per capita GDP, the growth rate is enhanced by lower inflation. For some researchers, inflation is not a threat to economic growth while other believed that inflation dwindles economic growth. Some findings revealed t significant short-run relationship between inflation and economic growth (Datta and Kumar, 2011).

In another study, Suleiman and Idris (2019) investigated the impact of inflation on economic growth of Nigeria for a period between 1980 to 2017. The study applied Vector Error Correction Model The findings of the study showed significant negative long-run relationship between inflation and economic growth in Nigeria. Espinoza et al. (2010) examined threshold effect of inflation on GDP Growth by using a panel data of 165 countries, over the period of 1960-2007. Their study found that for all country groups' threshold level of inflation for GDP growth was the findings revealed that, about 10 percent (with the exclusion of industrialized countries where threshold level was much lower). Estimated results suggested that inflation from higher than 13 percent decreases real non-oil GDP by 207 percent per year.

Nell, (2000) examined whether inflation was detrimental to economic growth, using data for the period between 1960 to 1999. His results indicated that inflation within the single-digit zone had impact on economic growth, while inflation in the double-digit zone did not have economic growth. Andiroba et al. (2018) studied the impact of inflation on the economic growth of Nigeria using descriptive and ordinary least squares on the data between 1986 to 2015. The result revealed that there is positive relationship between inflation, and economic growth in Nigeria. Frimpong and Oteng-Abayie, (2010) found a threshold effect of inflation on economic growth of 11 percent in Ghana between 1960 to 2008. Aggregate labour force and money supply growth were found to be insignificant in the OLS model estimated. Mallik and Chowdhury, (2001) conducted similar study on the the relationship between inflation and economic growth, and found statistically significant positive results in Bangladesh, Pakistan, India and Sri Lanka.

Ziaul (2013) investigated the relationship between inflation and economic growth in Bangladesh, using time series data between 1976 to 2011. The result shows statistically significant negative relationship between inflation and economic growth in Bangladesh. The negative relationship between economic growth and inflation. Marbuah, (2010) also investigated the relationship between inflation and economic growth to ascertain whether a significant threshold effect existed in Ghana from 1955 to 2009. The study found evidence of significant threshold effect of inflation on economic growth. The evidence showed both a minimum and maximum inflation threshold levels of 6% and 10% respectively. Moreover, the study found that adjusting for structural break in the model increases the effect of inflation on economic growth at a robust threshold level of 10% by a factor of 1.8 or approximately 81%. In another research, Chimoio (2010) investigated the relationship between inflation and economic growth using annual time series data for the

period from 1970 to 2005. The study found no co-integrating between inflation and economic growth. The findings of the research revealed unidirectional causality running from inflation to economic growth.

METHODOLOGY

Type and Sources of Data

Secondary data will be used for this paper owing to the nature of its title. The data will be sourced from Central Bank of Nigeria (CBN) Statistical Bulletin 2022, African Development Bank (ADB) Selected Statistics on Africa 2002, National Population Commission and National Bureau of Statistics (NBS) Nigeria, The sample for the study covered a period of twenty-three (32) years, from 1990 to 2022. Non-probability sampling method in the form of availability sampling technique will be used in selecting the number of years that constitutes the sample size. This technique will be applied due to availability of the relevant data for the selected years.

Measurement of Variables

Natural log of real GDP per capita was used as a proxy for economic growth, which serves as the dependent variable. GDP has been used by Genevesi (1995) and Ariyo (1998) in their various researches while Inflation rate will be used as a measure of inflation in Nigeria.

Method of Data Analysis

The data collected for this paper was analysed using Johansen (1988) cointegration approach, with help of STATA statistical package. In applying this approach, certain diagnostics tests were carried out. Augmented Dickey-Fuller ADF (1987), Phillip Perron, (1989) and KPSS unit root test are widely used to test for stationarity of a series. The various tests were both applied, with hopes that the verdict of one will confirm that of the other (Baum, 2001). Cointegration is one of the most important developments in time series econometrics in the last quarter-century. A group of non-stationarity $I(1)$ time series is said to have cointegration relationships if a certain linear combination of these time series is stationary.

Model Specification

The relationship between inflation and economic growth was investigated using Vector Autoregressive (VAR) model:

$$RGDP_t = \beta_0 + \beta_1 RGDP_{t-1} + \beta_2 INF_{t-1} + U_{1t}$$

$$INF_t = \alpha_0 + \alpha_1 INF_{t-1} + \alpha_2 RGDP_{t-1} + U_{2t}$$

Where:

$RGDP_t$ = Dependent variable GDP

β_0 = constant parameter

$RGDP_{t-1}$ = Lag values of RGDP

β_1 = Coefficient of Lag Values of RGDP

INF_{t-1} = lag values of Inflation Rate

β_2 = coefficient of lag values of Inflation Rate

INF_t = the dependent variable Inflation Rate

α_0 = Constant parameter

α_1 = Coefficient of lag values of Inflation Rate

α_2 = coefficient of lag values of RGDP

U_{1t} = error term in equation (1)

U_{2t} = error term in equation (2)

Descriptive analysis of the Relationship between Inflation and Economic Growth

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Economic Growth	32	275.32b USD	201.98b USD	174.00b USD	477.38b USD
Inflation Rate	32	29.13%	28.03%	5.389%	57.16%

Source: Author's calculation using STATA Software

The data used in this paper have been summarized using descriptive analysis in form of mean, standard deviation, minimum and maximum. The number of observation (32) represents the number of years covered by the study. From the findings, 275.32b USD is the minimum GDP for the year 1990, while 477.38 billion USD is the maximum GDP for the year 2022. Thus, the country's GDP has been increasing year after year, that is why the first year selected for the study, 1990 got the minimum, while the maximum is observed in the last year sampled. Moreover, 275. 32b USD is the mean GDP and 201.98b USD is the standard deviation for the GDP with the sampled years. However, 5.389% is the minimum inflation rate while 57.16% is the maximum population rate and 29.13% is the mean for the inflation rate while 28.03% is the standard deviation from 1990 to the year 2022.

DF-GLS, Augmented DF-GLS and Phillip Perron Unit Root Tests

Variable	DF-GLS HO: a series variable is not stationary		Augmented DF HO: a series variable is not stationary		Phillip Perron HO: a series variable is stationary.	
	Test Statistics		Test Statistics		Test Statistics	
	Level Value	Differenced Value	Level Values	Differenced Value	Level Value	Differenced Value
Real GDP	-5.214(0) ***	-5.346 (1) ***	-0.194(0)	-2.190(1) **	-1.175 (0)	-8.557 (1) ***
Inflation Rate	-0.246 (0)	-4.982 (1) ***	3.078 (0)	-4.831 (1) ***	3842 (0)	-4.854 (1) ***

Source: Author's calculation using STATA software

Note: ** and *** indicate levels of significance at 5% and 1% respectively. In addition (0) and (1) represents level and differenced values of the Test Statistics

The table above presents the results of Dickey-Fuller Generalized Least Square, Augmented Dickey-Fuller, and Phillip Perron Unit root tests on the inflation rate and GDP at their level and first differenced values. The summary of the results of the variables at their level values indicates that all the variables are not stationary at 1% and 5% level of significance except the Real GDP in the results of the Dickey-Fuller Generalized unit root test, suggesting the acceptance of the null hypothesis that states a series variable is not stationary. At 1st difference, all the variables are found to be stationary at 1% and 5% level of significance; hence they are cointegrated of the same order.

Cointegration Results

Maximum Rank	Parms	LL	Eigen Value	Trace Statistics	5% Critical Value
0	28	-3368.1018	-----	50.3214	35.24
1	32	-3354.1713	0.47687	31.0531**	38.04
2	39	-3342.0164	0.43184	18.6755	29.68
3	46	-3336.26	0.23489	7.1628	15.41

Source: Author's calculation using STATA software

Result of Johansen tests for the number of cointegrating ranks are presented in Table 4.4. the result of the tests indicated the rejection of the null hypothesis which states there is no cointegrating vector, since the trace statistics 50.3214 is greater than its critical value at 35.24 5% level of significance. This suggests the acceptance of alternative hypothesis, that there exists cointegration among the variables captured in the cointegration regression. The results further indicate that there is no more cointegrating rank. This is because the value of the trace statistics at one rank 31.0531, which is less than the critical value 38.04at 1% level of significance. This gives room for running Vector Error Correction (VEC) regression to get the normalized cointegrating coefficients.

VEC Results

Beta	Coefficient	Standard Error	Z	P>/z/	95% Confidence Interval
Error Correction Term					
Per Capita Real GDP	1				
Inflation Rate	0.0088243	.0028633	-3.08	0.002	-.0144362 -.0032124

Source: Author's calculation using STATA software

The cointegrating coefficient is: $Ec_t = dRGDP_t - 0.034INF_{t-3} + 4356.28$

Since Real GDP (drgdp) as a measure of economic growth has been normalized to 1, it then becomes the dependent variable. Thus, the long run economic growth question is now:

$$dRGDP = 4356.28 - 0.065dINFR_{t-3} + Ec_t$$

t ratio: (4.80) ***

From the result of long run economic growth equation, it is clear that there is negative long run relationship between Inflation and economic growth in Nigeria. The coefficient of Inflation (0 - 0.065) has a negative sign with t ratio 4.80, suggesting significant negative relationship between Inflation and economic growth in Nigeria.

Results of Granger Causality Test

Dependent Variable	Independent Variable	Chi- Square Test Statistic	Remarks
Real GDP	Inflation Rate	0.2415 (0.436)	Causality not running from Inflation Rate to Economic Growth
Inflation Rate	Real GDP	6.2804 (0.056) **	Causality running from Economic Growth to Inflation Rate

Source: Author's calculation using STATA software version 11.1

The summarized results of Granger Causality test. The results indicate unidirectional causality running from Economic growth to Inflation rate in Nigeria, not the other way round.

DISCUSSION OF RESULTS

The results of Johansen Cointegration test indicate long-run Negative relationship between inflation and economic growth in Nigeria this result does not come as a surprise because inflation affects both cost of production, commerce and consumption of goods and services. In an inflationary society, increase in production cost arising from inflation discourage people from investing their capital because of fear of uncertainty. Several businesses collapsed while few others survive with little or no profit. On the other hand, inflation lead to cutting down of production scale and eventually retrenchment of workers, which invariably affects the aggregate demand. The volume of sales is also affected as well as profitability and wellbeing of business owners. Moreover, inflation reduces consumer's purchasing power, savings and general income. In general inflation cripples economic growth and productivity of Nigeria, hence the need to urgently apply effective measures for price stabilization.

However, the Granger Causality results shows unidirectional causality from economic growth to inflation in Nigeria. This shows that growth of the economy increases governments revenue, business firms' profitability as well as increase in wages and salaries,

CONCLUSION

This paper investigated the effect of inflation on economic growth in Nigeria between the year 2000 to 2023. Secondary data was used in the study. Granger Causality and Johansen Cointegration Tests were applied in

determining the causal and long run relationship between inflation and economic growth. The results of Johansen Cointegration indicate Long-run negative relationship between inflation and economic growth in Nigeria while the Granger Causality results shows unidirectional causality from economic growth to inflation in Nigeria. The paper concludes that persistent increase in prices cripples economic growth and the low performance of the economy triggers inflation in Nigeria.

RECOMMENDATIONS

Since there is negative long-run relationship between inflation and economic growth in Nigeria, government in collaboration with Central Bank of Nigeria should develop workable and effective monetary and fiscal policies that will help in stabilizing prices of goods and services in the country.

Since economic growth causes inflation in Nigeria, policies that promote economic growth and less inflation should be put in place to achieve robust growth at bearable inflation rate.

There is need for adequate planning to boost GDP in the long-run, this will increase domestic supply in the long- run and subsequently reduce the effect of aggregate demand on prices of consumer goods.

Effective monitoring mechanisms and trend evaluation techniques should be put in place to easily and timely detect areas of weaknesses of macroeconomic policies, with a view to respond proactively.

Households in Nigeria should be encouraged to subsistently produce greater portion of goods and services needed. This will reduce aggregate demand and subsequently

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