Does Inflationary Dynamics Impact on Nigeria's Economic Growth?

[*1]Hassan Paul Abdullahi
[2]Akeem Adetokun
[3]Ato Ibrahim Ndatsu
&
[4]Salawu Abdulkamaru
[1,3]Department of Economics, Air Force Institute of Technology, Kaduna
[2]Department of Banking and Finance, Air Force Institute of Technology, Kaduna
[4]Head of Internal Control Unit, Keystone Bank, Lagos
***Corresponding author Email: echmazconsult@gmail.com**

Abstract

Background: High inflation rate is one of the economic problems facing Nigeria. As the government is unable to provide a long-term solution to this issue, inflation in the economy is inevitable.
Objective: The study aimed at exploring the medium and longstanding interactions of inflationary dynamics on Nigeria's economic growth speed.
Methodology: Autoregressive Distribution Lag (ARDL) bound estimation procedure was utilised in the study. The researchers used the Augmented Dickey-fuller test (ADF) for the stationarity test on the variables.
Result: The study found that inflation has a detrimental long-term and short-term influence on Nigeria's economic growth. This demonstrates that when inflation is excessively high, an economy's currency loses buying power as a result of an increase in prices.
Unique Contribution to Knowledge: The study has demonstrated the link between inflation and Nigeria's economic growth.
Conclusion: The study concluded that inflation has a severe consequence on the Nigerian economy both in medium and longstanding periods.
Recommendations: Giving the study's findings, the study recommended stringent monetary policy.
Keywords: Inflation, Exchange rate, Interest rate, Economic growth

Introduction

The study of economic growth and price increases occasioned by inflation is a long and still contemporary subject of concern for many economists and policymakers. Economic growth is encouraged by low and steady inflation rates, but when inflation is at its maximum, it hinders productivity and growth (Anochiwa & Maduka, 2015). Macroeconomic theory has contested the link between inflation and economic growth (Onwubuariri, Bank-Ola, & Oladeji, 2021). As a result, structuralists and monetarists have engaged in a lengthy discussion (Onwubuariri et al, 2021). Contrary to the thinking of monetary economists' assertion that price rises are injurious to economic progress, the structuralists oppose that it is beneficial. Inflation's effects on short- and long-term savings and investment levels, respectively, will decide whether or not real output growth is harmed, claims Vinayagathasan (2013).

Eze and Nweke (2017) hypothesized that during an inflationary time, the local currency struggles to serve as a standard of exchange and a stock of value without unfavorably to the nation's output

level, income distribution, and employment level. Economic growth is impacted by both currency depreciation and an increase in the foreign exchange rate, both of which are consequences of inflation. The value of the Naira has undoubtedly declined over time when compared to the US dollar and other significant foreign currencies. For instance, the naira's exchange rate with the dollar fell to 2.0206 in 1986. It decreased to 9.9095 in 1991, and then to 305, 306, 306, and 403 in 2017, 2018, 2019, 2020, and 2021, respectively (Central Bank of Nigeria, 2021). In Nigeria, the inflation rate ranged from 20.8% in 1981 to 5.7% in 1986 to 7.360% in 1990. By 1996, inflation was 12.71 percent, and it was 13.2 percent in 2020 and 15.50 percent in 2021. (CBN, 2021). In addition, the real gross domestic product growth rate in 1981 was -13.12%, improved to 1.9% in 1986, and declined to 0.1% in 1991. The RGDP increased by 0.80%, 1.92%, 2.20%, 1.79%, and 3.64 percent in 2017, 2018, 2019, 2020, and 2021, respectively (World Bank, 2021).
In Nigeria, the inflation rate varied from 20.8% in 1981 to 5.7% in 1986 to 7.360% in 1990. 12.71 percent was the inflation rate high in 1996; it then increased to 13.2 percent in 2020 and 15.50 percent in 2021. (CBN, 2021). In addition, the rate of real gross domestic product growth in 1981, 1986, and 1991 was -13.12%, 1.9%, and 0.1%. The RGDP increased by 0.80%, 1.92%, 2.20%, 1.79%i, and 3.64 percent in 2017, 2018, 2019, 2020, and 2021, respectively (World Bank, 2021).

The Central Bank of Nigeria (CBN) regularly adopts monetary policies to guarantee price stability and sustained economic progress to reduce inflation in the nation. To achieve the government's overall inflation goal through effective monetary management, the monetary authorities create intermediate and operating objectives that are in line with the goals for GDP growth, inflation rate, and balance of payments (Okoye, Olokoyo, Ezeji, Okoh, and Evbuomwan, 2019). Notwithstanding all the monetary measures the monetary authorities have put in place to lower the high inflation there, the rate of price increase in Nigeria is still high, and the quality of living is steadily declining.

The literature has also shown the following gaps. First of all, the gross domestic product was the main economic growth measure utilized in the majority of earlier studies on the link between the inflation rate and economic growth. In this research, economic growth will be measured using gross domestic product per capita (GDP/capita), a measure of the quantity of total economic production to the population that reflects changes in the population's overall well-being. In order words, it correctly depicts the long-term upward trend in living standards. Second, the old research data did not include 2018 in it. Due to the possibility that certain economic developments and changes in the study nation may have influenced the results, the present study will extend the study period until 2021. This study's goal is to explore the medium and longstanding interaction effects of inflationary pressure on Nigeria's economic growth.

Literature Review

The study is built on Keynes' inflationary hypothesis. According to Keynes, a rise in aggregate demand is what drives demand-trigger inflation. Demand trigger inflation occurs when the economy's overall supply, as well as the availability of products and services, is less than its total demand for such goods and services. Aggregate demand is defined in this sense as the total government spending, investment, and consumption. Contrarily, demand-pull inflation refers to the pressure to raise prices as a result of a lack of inventory, or as "too much money chasing too few things" in economics (Keynes,1936).

The demand-pull for goods in Keynesian economists believed that general supply and demand imbalances may cause inflation, which was a hypothesis that was backed by the concept of inflation. Prices will rise in an economy where the balance between supply and demand is seriously out of whack. This causes inflation the most frequently. According to Keynesian economic theory, the overall demand for consumer goods increases as employment levels do. Businesses increase their workforces in response to customer demand to increase output. Employment grows when businesses hire more personnel. There comes a point where demand for consumer products outpaces supply.

The Keynesian theory disproved the monetarists' claim that straight and relational correlations exist between the circulating amount of money and the level of prices. This school of thought contends that there is always an indirect connection between changes in the money supply and the level of prices via the interest rate, never a proportionate one. The Keynesian theory is renowned for fusing the theories of output and employment with the idea of interest rates. According to Keynesian theory, when the amount of money resources in rotation rises, the rate of interest will fall. This will encourage more investment and general demand, which will boost the economy's production and employment. Therefore, the Keynesian theory of inflation will serve as the study's theoretical foundation (Keynes,1936).

Empirical Review

Onwubuariri, Oladeji, and Bank-Ola (2021) examined the influence of inflation on the economic growth of Nigeria from 1980 to 2019, using the Autoregressive Distribution Lag (ARDL) model. The study results demonstrated that inflation exerts a negative influence on the growth of Nigeria's economy. Therefore, while inflation and the currency rate were found to show detrimental influence on Nigerian economic growth, the rate of interest linger to be advantageous. To ensure that the rate of inflation is kept at an absolute minimum, the research advised CBN to take action through its Monetary Policy Committee.

In the same vein, Olugbenga and Oluwabunmi (2020) researched from 1980 to 2018 how inflation affected Nigeria's economic development prospect, using the Autoregressive Distributed Lag Model and the Granger Causality Test. Hence, the study's results demonstrated that whereas the rate of inflation and the rate of real exchange has a significant negative stimulus on economic development, money supply, and interest rates have a positive and huge impact. The causation result shows how the GDP and the rate of interest, currency amount, and government outflow spending are all correlated in a single direction. Yet, neither the rate of inflation nor the degree of openness shows a direct correlation with GDP.

Adaramola and Dada (2020) involve the examination of inflation influences on the growth prospects of the Nigerian economy using the Ordinary Least Square estimate method and the Granger causality test. The research's conclusions showed that actual exchange rates and inflation significantly harmed economic growth. The money stream and rate of interest, however, exert a significant and advantageous effect on economic growth. The one-directional causal relationships among the interest amount, currency amount, government outflow spending, and the gross domestic product are likewise shown by the causality finding, but not those between inflation or openness.

Idris and Bakar (2017) looked at Nigeria's proclivity toward inflation to see how it influenced the country's economic growth. The study adopted the expressive technique and extra graphics to emphasize the inflationary movement and GDP progress to more clearly comprehend how

Nigeria's inflation rates affect the desired level of economic growth. The results of the study show that Nigeria's present inflationary movement has a detrimental effect on sustainable growth and development; as a result, lowering the excessive inflation rate is one requirement for the country to reach the necessary growth level.

Using a two-stage least square estimator, Kenneth, Denis, and Okezie (2016) looked at the association between the inflation rate and economic progress in Nigeria between 1981 and 2014. The study reveals that growth is considered favorable to inflation and inflation is significantly beneficial to growth, but not dramatically. The results also show that money stock and trade liberalization are crucial elements of real GDP. According to the study, production should be more diverse for inflation to have the best effect on output while simultaneously having the best influence on inflation.

Methodology

The model is anchored on the Keynesian postulate. As such, a linear regression model is established as below:

GDPR = f(INFR, EXRT, INTR, GEXP) (3.1)

This is transformed into the econometric equation with logarithm as follows;

$$\ln GDPR = \beta_0 + \beta_1 \ln INFR_t + \beta_2 \ln EXRT_t + \beta_3 \ln INTR_t + \beta_4 \ln GEXP_t + \mu_t \quad (3.2)$$

Where, GDPR = Gross domestic product per capita (i.e. dependent variable can be GDP per capita)

INFR = Inflation Rate, EXRT = Exchange Rate, INTR=Interest Rate, GEXP = Government Expenditure

μ_t = Disturbance term, β_0= Intercept, $\beta_1 - \beta_4$ = Coefficient of the Independent Variables.

Techniques of Data Analysis

Because of the stability and dependability of the Autoregressive Distribution Lag (ARDL) bound test for analyzing time series data, it was used in this study. The benefit of the ARDL over the traditional Johannsen technique is that the unit root test for the stationarity of variables is not required, although it may be important to understand how data behaves. Whether the series is either at order 1 or order 0/I(1) or I, the ARDL estimation technique will analyze the dynamic interaction between the regressor and regressand (0). As a consequence, the technique can identify the necessary and desirable aspects that should be evaluated both in the short and long terms.

The F-test can be employed to determine the degree of cointegration, according to Pesaran et al. (2001) and Pesaran and Shin (1999). The F-test must exceed the lesser and higher bound critical values for this to occur.

Consequently, the ARDL equation for model 3.2 is given below:

$$\Delta lnRGDP_t = \beta_0 + \beta_1 lnRGDP_{t-i} + \beta_2 lnINFR_{t-i} + \beta_3 lnEXRT_{t-i} + \beta_4 lnINTR_{t-i} + \beta_5 lnGEXP_{t-i} + \sum_{i=0}^{p} \beta_6 \Delta lnRGDP_{t-i} + \sum_{i=0}^{p} \beta_7 \Delta lnINFR_{t-i} + \sum_{i=0}^{p} \beta_8 \Delta lnEXRT_{t-i} + \sum_{i=0}^{p} \beta_9 \Delta lnINTR_{t-i} + \sum_{i=0}^{p} \beta_{10} \Delta lnGEXP_{t-i} + ECM + \mu_t \quad (3.3)$$

A null hypothesis for no co-integration H_0: 1=2=3= 4= 5= 6 = 7= 0 is required to meet the long-run relationship in the ARDL bound test.

1. Presentation and Analysis of Regression Result

Table 1: Summary Statistics

	GDPR	GEXP	INFL	EXRT	INTR
MEAN	36107.21	17.39274	20.57358	101.6601	0.444224
MEDIAN	7538.630	2.123209	10.55185	103.7643	4.244393
MAXIMUM	134252.3	574.5318	211.0128	338.8118	18.14001
MINIMUM	136.3000	-23.14621	0.616093	0.632708	-65.93210
STD. DEV.	45823.51	90.64512	33.10151	100.4243	14.42128
SKEWNESS	1.344528	4.990160	4.430793	0.918737	-2.580326
KURTOSIS	3.251761	33.70998	26.44184	2.985775	12.58776
JARQUE-BERA	10.78680	1461.446	1034.597	5.163399	200.9950
PROBABILITY	0.002323	0.000000	0.000000	0.071281	0.000000
SUM	1253512.	679.6091	788.6431	3040.406	16.26898
SUM SQ. DEV.	8.21E+10	331082.7	47011.02	394701.7	8232.341
OBSERVATIONS	40	40	40	40	40

Source: authors computation, eviews 10, 2023

In Table 1 above, all the values are in their natural logarithm and the GDPR which is the study's dependent variable, reveals that the overall number of observations, as well as the average, the median, the maximum, the minimum, the standard deviation and the sum of square deviation. Hence, the GDPR, which is the dependent variable, shows a mean value of 36107.21 and a median of 7538.630, with a maximum of 134252.3 a and standard deviation of 45823.51 which is relatively higher compared to mean and median variables. Therefore, from the table 1, it could be seen that the value has a positive mean. Median value as well as the Standard deviation.

Table 2: Test of Stationarity using the Augmented Dickey Fuller Test

Variables	Level t-statistics	Test-critical value	P-value	Order of integration
INTR	-6.729542	-2.658977	0.0000	I(0)
GDPR	-4.511819	-3.565083	0.0051	I(1)
INFR	-15.61151	-2.741445	0.0000	I(1)
EXRT	-4.870537	-2.491145	0.0006	I(1)
GEXP	-7.975610	-2.773327	0.0000	I(1)

Source: authors computation, eviews 10, 2023

The unit root test shows that all the variables are stationary. Therefore, INTR showed to be stationary at levels 1(0) with a p-value of 0.0000. However, the GDPR, INFR, EXRT, and GDXP were found stationary only at the first difference 1(1), with p-values less than 5%. Given this outcome, it's imperative that a cointegration test be carried out.

Table 3: Co-integration using Johansen test Bound test

F-BOUNDS TEST		**NULL HYPOTHESIS: NO LEVELS RELATIONSHIP**		
TEST STATISTIC	Value	Signif.	I(0)	I(1)
F-STATISTIC	9.732491	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: authors computation, eviews 10, 2023

The ARDL Bound test revealed that the F- statistic of 9.732491, is greater than the lesser bound I(0) 2.56 and higher bound I(1) 3.49, at a 5% significant level. This outcome indicates there is cointegration and longstanding period interactions among the variables.

Table 4: ARDL Long-run Coefficient

VARIABLE	**COEFFICIENT**	**STD. ERROR**	**T-STATISTIC**	**P-VALUE.**
GEXP	-5.46E-05	0.000221	-0.331341	0.6521
DL(INFR)	-0.232324	0.145771	-1.730921	0.0526
DL(EXRT)	0.732040	0.355132	2.466303	0.0490
INTR	-0.071685	0.007938	-1.712208	0.0437
C	0.078119	0.081507	1.101119	0.1213

Source: authors computation, eviews 10, 2023

The long-run result revealed that the coefficients of (GEXP, INFR, and INTR) are negative. The result also showed that the coefficient of INFR and INTR are both statistically significant in the longstanding period given their respective p-values are less than 0.05%, while the coefficient of GEXP was found to be insignificant. The implication of this long-run interaction is such that, a 1% increase in GEXP, INFR, and INTR on average would bring about 5,.6%, 0.2% and 0.1% decrease in the rate of economic growth in the long run, therefore it confirms with the a priori expectation it also not statistically significant as the p-value is >0.05. The longstanding period result shows that a 1% increase in the exchange rate (DLEXRT) on average brings about a 0.837040 increase in economic growth in the longstanding period. More so, it is statistically significant as the p-value is <0.05. This implies that in the long-standing period, exchange rate rise would stimulate economic growth.

Table 5: Short-Run ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DLGDPR(-1))	-0.868851	0.091235	-7.024405	0.0000
D(DLGDPR(-2))	-0.338154	0.094249	-2.519537	0.0204
D(DLINFR)	-0.071260	0.007361	-2.179317	0.0421
D(DLINFR (-1))	0.093792	0.008440	3.529965	0.0022
D(DLEXRT)	-0.034462	0.017569	-1.961489	0.0646
D(DLEXRT(-1))	-0.209641	0.026080	-8.038274	0.0000
D(DLEXRT(-2))	-0.133661	0.016519	-8.091092	0.0000
D(INTR)	-0.080304	0.000337	-11.46204	0.0000
D(INTR(-1))	-0.009024	0.004053	-8.659865	0.0000
D(INTR(-2))	-0.002816	0.001348	-2.088916	0.0504
D(INTR(-3))	0.001557	0.000396	3.929041	0.0009
CointEq(-1)*	-0.505967	0.041489	-8.523193	0.0000
R-squared	0.857556	Mean dependent var		0.000281
Adjusted R-squared	0.849891	S.D. dependent var		0.104564
S.E. of regression	0.025085	Akaike info criterion		-4.221896
Sum squared resid	0.015102	Schwarz criterion		-3.744056
Log likelihood	88.89413	Hannan-Quinn criter.		-4.087666
Durbin-Watson stat	1.303577			

** p-value incompatible with t-Bounds distribution.*

Source: authors computation, eviews 10, 2023

Table 5, above showed the short-run estimation of the coefficients. The result discovered that in the medium-term period, the coefficients of INTR, INFR and EXRT, are negative and statistically significant, given that their respective p-values are < 0.5. This suggests that in the short run, a 1% rise in the coefficients of INTR, INFR, and EXRT would result in 0.1%, 0.1%, and 0.1% respectively decrease in economic growth in Nigeria for the time under study. This finding implies that, in the short run rise in the coefficients of INTR, INFR, and EXRT, will result to a sharp decline in economic growth. Furthermore, Inflation diminishes the volume of resources available to domestic investors for investment. Likewise, saving is discouraged, and a significant part of this saving is directed abroad, against local investment, while the flow of capital from abroad is discouraged. Consequently, the ecm coefficient is properly sign that is negative, thus revealing the speed of tuning to equilibrium. This suggests that, in a situation of distortions, the economy will restore itself back to equilibrium at the speed of 50%.

Discussion of Findings/Conclusion

The ARDL cointegration shows a long run relationship between the variables. The result of short-run shows that inflation is statistically significant. The long-run result revealed that the coefficients of (GEXP, INFR, and INTR) are negative. This implies that 1% increase in GEXP, INFR, and INTR on average would bring about 5,.6%, 0.2% and 0.1% decrease in the rate of economic growth

in the long run. The finding of this study, conforms with the result of Onwubuariri, Oladeji, and Bank-Ola (2021) , Olugbenga and Oluwabunmi (2020), Adaramola and Dada (2020), and Idris and Bakar (2017), whose findings revealed that rise in inflation exerts a detrimental influence on Nigerian economic growth. However, this study has been able to reveal the short-run and long-run implications of an increase in the inflation rate on the economic growth of Nigeria. While the majority of other study revealed seem to focus on the short-term implication of the inflationary dynamics on Nigeria's economic growth.

This study has proven that inflation has a detrimental longstanding and medium-term period influence on economic growth. This demonstrates that, when inflation is excessively high, an economy's currency loses buying power due to price increases. Based on this conclusion, the research suggested that the government implement stringent monetary policy measures to occasionally manage inflation. Moreover, infrastructures that would improve the viability of a cashless society should be aggressively pursued.

Conflict of Interest: Authors declared no conflict of interest.

References

Adaramola, A. O. & Dada, O. (2020). Impact of inflation on economic growth: evidence from Nigeria. *Investment Management and Financial Innovations*, *17*(2), 1–13.

Anochiwa, L. I., & Maduka, A. (2015). Inflation and Economic Growth in Nigeria: Empirical Evidence? *Journal of Economics and Sustainable Development*, *6*(20):113–121.

Central Bank of Nigeria (2021). Annual statistical bulletin. https://www.cbn.gov.ng/documents/statbulletin.asp

Eze, O. M. & Nweke, A. M. (2017). Assessment of the effect of inflation on Nigeria's economic growth: Vector Error Correction Model Approach. *European Journal of Business and Management, 9(15), 18-29*

Idris, M., & Bakar, R. (2017). The relationship between inflation and economic growth in Nigeria: A conceptual approach. *Asian research journal of Arts and Social Sciences, 3(1):1-15.*

Kenneth, O. O, Denis, N. Y. & Okezie, A. I. (2016). Inflation and growth nexus in Nigeria: an investigation into the simultaneous relationship. *International Journal of Development and Economic Sustainability, 4(3):25-32*

Okoye, L. U., Olokoyo, F. O., Ezeji, F. N., Okoh, J. I., & Evbuomwan, G. O. (2019). Determinants of behavior of inflation rate in Nigeria. *Investment Management and Financial Innovations*, *16*(2), 25–36.

Olugbenga, A. A. & Oluwabunmi, D. (2020). Impact of inflation on economic growth: evidence from Nigeria. *Investment Management and Financial Innovations, 17(2),* 1-13

Onwubuariri, S. Oladeji, S. & Bank-Ola, R. F. (2021). Inflation and economic growth in Nigeria: an ARDL bound testing approach. *Sapientia foundation journal of education, sciences and gender studies, 3(1): 277-290*

Pesaran, M.H, Shin, Y. & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationship. *Journal of applied econometrics, 16(3):289-326.*

Vinayagathasan, T. (2013). Inflation and economic growth: A dynamic panel threshold analysis for Asian economies. *Journal of Asian Economics*, *26*, 31–41. https://doi.org/10.1016/j.asieco.2013.04.001

World Bank (2021). World development indicator. https://databank.worldbank.org/source/world-development-indicators