

Original Article

Impact of Selected Macroeconomic Variables on Economic Growth in Nigeria

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Abstract: This study examines the influence of specific macroeconomic variables specifically the inflation rate, exchange rate, and level of transparency on economic growth in Nigeria, utilizing Gross Domestic Product (GDP) as a proxy for growth. The Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS) provided the secondary data. The study utilized time series econometric techniques, such as the Augmented Dickey-Fuller (ADF) unit root test, the Johansen cointegration test, and the Auto-Regressive Distributed Lag (ARDL) model, to evaluate the short-run and long-run dynamics among the variables. The findings indicated that inflation has a positive and statistically significant effect on GDP, implying that moderate inflation levels can encourage economic activity and investment. On the other hand, the exchange rate had a negative but not statistically significant effect on GDP. This shows how unstable the naira is and how much Nigeria relies on imports. The level of openness exhibited a positive and statistically significant correlation with GDP, emphasizing the growth-promoting potential of trade liberalization while also indicating vulnerability to external shocks. The results show that Nigeria's growth path is very sensitive to macroeconomic stability, and the way these factors affect each other means that strong and well-coordinated policy actions are needed. The study suggests keeping inflation in a moderate and stable range, making sure the exchange rate stays stable by diversifying and exporting non-oil goods, and strategically increasing trade openness to make the economy more competitive while maintaining domestic industries.

Keywords: Gross Domestic Product, Inflation, Exchange Rate, Trade Openness, Economic Growth, Nigeria.

I. BACKGROUND OF THE STUDY

Economic growth is an essential objective for all countries, but it's especially important for developing economies like Nigeria, where policy challenges include raising living standards, lowering unemployment, and finding new ways to make things. Macroeconomic factors, including the exchange rate, inflation rate, and trade openness, are critical determinants of economic performance, influencing investment decisions, consumption patterns, and the stability of the external sector. Gross Domestic Product (GDP) is a good way to measure economic growth because it gives a full picture of economic activity. It is often used to see how well Nigeria's macroeconomic management is working (Adeniran, Yusuf, & Adeyemi, 2014). One reason the Nigerian economy is so vulnerable to shocks from both inside and outside the country is that it depends on crude oil exports for foreign exchange and government revenue. Since the Structural Adjustment Programme (SAP) was put into place in 1986, which made the exchange rate framework more open, exchange rate instability has been a constant worry. Studies show that changes in the exchange rate have a big effect on Nigeria's trade balance, inflation, and output growth (Aliyu, 2011). This shows how important it is for the exchange rate to stay stable in order to keep the economy growing and competitive around the world.

Inflation has also been a big problem for Nigeria's economy as a whole. Moderate inflation can boost investment and production, but ongoing double-digit inflation has hurt people's ability to buy things, made it harder to save money, and messed up price signals in the economy (Umaru & Zubairu, 2012). Structural problems, changes in the exchange rate, and limits on the supply side are all things that can cause inflation in Nigeria. These things all make it harder for the economy to grow in a sustainable way. The ongoing battle to control inflation is still putting macroeconomic stability and growth opportunities at risk. Also, the level of freedom, which is usually shown by how open trade is, is very important for Nigeria's growth. Trade liberalization can help the economy grow by making it easier for businesses to compete, getting more access to international markets, and transferring technology (Lawal, 2014). However, Nigeria's heavy reliance on imports and weak industrial base has often made the economy vulnerable to outside shocks, which have caused trade imbalances and capital flight. Consequently, the relationship between trade openness and economic growth in Nigeria continues to be a subject of policy discourse and empirical investigation. Because of this, it's important to look into how the exchange rate, inflation, and trade openness affect GDP growth in order to make policies that will help the economy grow over time.



II. REVIEW OF LITERATURE

The impact of specific macroeconomic factors on Nigeria's economic growth has persistently been a significant subject for both policymakers and scholars. Gross Domestic Product (GDP) is often used to measure how well an economy is doing. It shows how healthy the economy is as a whole. The growth of Nigeria's GDP has been affected by a number of things, such as the country's dependence on crude oil exports, the way it manages its fiscal policies, and structural reforms. Changes in GDP show how sensitive the economy is to changes in other macroeconomic indicators, like the exchange rate, inflation rate, and trade openness level. So, GDP is a standard for figuring out how these factors help the economy grow (Adeniran, Yusuf, & Adeyemi, 2014). The exchange rate is very important for figuring out how Nigeria's economy is growing. Nigeria buys a lot of things from other countries, so changes in the value of the naira have a big effect on the cost of production, the choices investors make, and the balance of trade with other countries. A stable exchange rate can boost investor confidence and make local businesses more competitive, which can lead to growth. On the other hand, the naira's constant decline often leads to higher import costs, higher raw material prices, and inflationary pressures, all of which can slow down economic growth. So, keeping the exchange rate stable is very important for Nigeria's long-term economic growth (Aliyu, 2011).

The inflation rate is another important macroeconomic factor that has a direct impact on growth. While moderate inflation can encourage investment and consumption, high and sustained inflation erodes purchasing power, distorts price signals, and discourages savings and long-term investments. In Nigeria, inflation is mainly influenced by structural issues such as elevated energy costs, insecurity impacting food production, and fluctuations in the exchange rate. The persistence of double-digit inflation has limited real GDP growth by diminishing household welfare and constraining firms' expansion capabilities. Thus, effective management of inflation is crucial for promoting inclusive and sustainable economic growth (Umaru & Zubairu, 2012). The degree of economic freedom, often viewed as trade openness or economic liberalization, affects how Nigeria engages with the global economy. Increased trade and investment opportunities can lead to technology transfer, access to international markets, and enhanced resource allocation, potentially boosting growth. However, an over-reliance on imports and underdeveloped local industries can create vulnerabilities that impede sustainable development. Therefore, Nigeria's economic growth hinges on finding a balance between embracing economic competitiveness and establishing policies that bolster domestic production capabilities. This underscores the significance of macroeconomic stability, effective policy frameworks, and institutional reforms in capitalizing on the advantages of openness for long-term growth (Lawal, 2014).

A) Empirical Review

Omebere et al. (2024) carried out a study on the impact of selected macroeconomic variables on economic growth in Nigeria. In the estimated model used for the study, real gross domestic product was the dependent variable (used as a proxy for economic growth), while inflation rate, interest rate, exchange rate, unemployment rate and gross fixed capital formation were the independent variables. The aforesaid time series data covered the period 1980 – 2022. The statistical techniques used for the study include descriptive statistics, the augmented Dickey Fuller Test, the Autoregressive Distributed Lag (ARDL) bound test, as well as other post-model analysis to ascertain the reliability of the result. Findings from the study showed that the exchange rate and interest rate had a positive and statistically significant effect on economic growth in Nigeria, while the inflation rate had a negative and statistically significant effect on economic growth. In tandem with the findings, the study recommends that price stabilization is imperative for sustained economic growth. The fact that the outcome of the relationship between interest rate and gross domestic product is not in line with a priori expectations calls for an apt analysis of the dynamics of interests by policymakers. They concluded that exchange rate stability is critical for economic growth.

Nicholas & Maxwell (2023) carried out a study on the impact of selected macroeconomic variables of Nigeria from 1999 to 2021. Secondary data sourced from the Central Bank of Nigeria Statistical Bulletin and the National Bureau of Statistics were used for the study. The key variables of the study include exchange rate, interest rate, inflation rate, gross domestic product, and unemployment. They made use of the expost research design method. The multiple regression analysis, alongside other associated statistical techniques, was used in data analysis. Findings from the study show that there is a positive and statistically significant effect of exchange rate and unemployment rate on economic growth in Nigeria, whereas interest rate does not significantly affect economic growth. The study recommends that the government should be deliberate in promoting export strategies geared towards maintaining a positive balance of trade and ensuring a conducive environment to attract foreign investors.

Adahama I. (2024) studies the long-run impact of selected macroeconomic variables on economic growth. The variables used for the study include real gross domestic product, interest rate, exchange rate, and crude oil price. The aforesaid data were sourced from the Central Bank of Nigeria Statistical Bulletin and the National Bureau of Statistics. The Zivot-Andrew Unit Root and NARDL Bounds Test were used to test for data stationarity and the existence of a long-run relationship between the variables in the model. The Zivot-Andrew Unit root test shows that all the variables of the study are integrated at first difference. Findings show that the interest rate had a positive and statistically significant effect on gross domestic product.

Exchange rates had a negative effect on gross domestic products, inflation had a negative effect on gross domestic products, while oil prices had a positive effect on gross domestic products. In line with the findings, the following recommendations were proffered: Government and policy makers should be intentional about the formulation and implementation of policies geared towards exchange stabilization, interest rate, price stabilization, and crude oil price.

III. METHODOLOGY

A) Data Collection & Sources

The purpose of this paper is to examine how certain variables affect economic growth in Nigeria. The dependent variable in this study is gross domestic product, whereas the independent or explanatory variables include the inflation rate, exchange rate, and degree of openness. All the data mentioned were obtained from the Central Bank of Nigeria and the National Bureau of Statistics (NBS).

B) Model Specification

The specified mathematical model of the study is stated thus.

$$GDP = f(INF, ER, DOP) \dots\dots\dots (1)$$

The above equation can be stated Econometric form.

$$GDP = b_0 + b_1INF + b_2ER + b_3DOP + u_t \dots\dots\dots (2)$$

Where:

GDP = Gross Domestic Product

INF = Inflation Rate

ER = Exchange Rate

DOP = Degree of Openness

b_0 = Constants

b_1 , b_2 , and b_3 = coefficients of the econometric equations or slopes of the equations

u_t = Stochastic or error term

C) Data Analysis Approach

a. Unit Root Test

In econometric analysis, time series data frequently exhibit trends. This means that they are typically non-stationary. The consequence of utilizing such data is the potential for spurious or meaningless regression results. To prevent this issue, statisticians perform tests to determine if the datasets are stationary (Iyeli, 2010). There are several tests available to evaluate stationarity. Nonetheless, we have opted to utilize the Augmented Dickey Fuller Unit Root test in this research.

Mathematically, the unit root equation can be expressed thus.

$$\Delta(Y_t) = m_0 + m_1(X_{t-1}) + \sum_{i=1}^q \beta_i \Delta(x_{t-1}) + E_t$$

Where: Y = variable being tested for unit, m_1 and β_1 = parameter estimates, q = maximum order of lag, Δ = notation for first difference, E_t = Error term.

b. Cointegration Test

The concept of cointegration analysis was introduced by Johansen. The Johansen cointegration test will be conducted to determine if there exists a long-term relationship between the variables considered in this study. This method is also known as non-stationary time series modeling. If the test indicates a long-run association among the variables, we will implement error correction modeling. The algebraic specification of the model is thus.

$$J_{\text{trace}}(r) = -N \sum_{i=r+1}^n \text{Log}(1 - \lambda_i)$$

$$J_{\text{max}}(r, r+1) = -N \text{Log} \sum_{i=r+1}^n \text{Log}(1 - \lambda_{r+1})$$

Where $F_{\text{trace}}(r)$ and $F_{\text{max}}(r, r+1)$ denotes trace and max Eigen statistics, respectively.

λ = coefficient of characteristics root, N = Sample Size, r = co-integrating vectors

n = lag length and log = notation of logarithm transformation.

IV. RESULTS & DISCUSSION

A) Unit Root Test

Presents The Output of the Augmented Dickey-Fuller Unit Root Test.

Table 1: ADF Test Result

Variables	ADF Test	Critical Value			Order of integration
		1% Critical value	5% Critical value	10% Critical value	
D(GDP)	-1.6149	-1.9524	-1.2012	-2.0321	(1)=1 st Diff.
D(INF)	-2.3812	-3.6210	-2.8327	-1.6701	(1)=1 st Diff.
D(ER)	-1.8502	-2.8015	-1.9310	-1.5288	(1) =1 st Diff.
D(DOP)	-1.2142	-1.7464	-1.0652	-1.8954	(1) =1 st Diff.

Source: Author's Computer from E-view

The output of the ADF test shown in Table 1 shows that all the variables are stationary at first difference, though at various levels of significance.

B) Johansen Cointegration Test

The output of the Johansen cointegration test is shown in Table 2 below.

Table 2: Johansen Cointegration Test Result

Hypothesized No. of CE(s)	Trace Statistic	Prob. Value	Max-Eigen Statistic	Prob. Value
None *	42.121	0.0362	36.18382	0.0231
At most 1 *	16.9806	0.0217	10.281965	0.0013
At most 2 *	6.240976	0.0324	7.441730	0.0235
At most 3	3.213371	0.0631	11.14237	0.0741

Source: Author's Computer from E-view

As indicated in Table 2 above, both the trace statistics and the max-eigen statistics demonstrate that there are three (3) co-integrating equations present in the dataset. We have rejected the hypothesis stating that there is no cointegration at a significance level of 5%. This outcome suggests that a long-term relationship exists among the variables, thereby supporting the application of ARDL for estimating the specified model.

C) Auto-Regressive Distributed Lag (ARDL) Analysis

Table 3: ARDL Result

Variable	Coefficient	t-Statistic	Prob.*
GDP(-1)	1.432	1.690	0.450
INF (-2)	0.732	2.452	0.002
ER(-1)	-2.427	0.691	0.740
DOP(-1)	-0.092	3.831	0.009
C	5.341	2.528	0.033

Source: Author's Computer from E-view

The results of the ARDL analysis are presented in Table 3. The coefficient associated with the inflation rate indicates a positively significant relationship between inflation and gross domestic product. This finding aligns with the studies conducted by Shakhaawat (2015), Abdulaziz (2016), and Mohammed et al. (2021). While there is a lack of consensus among scholars regarding the relationship between GDP and inflation, the results often depend on whether growth is driven by productivity (supply-side factors) or excess demand. Growth driven by productivity can alleviate inflationary pressures by enhancing output capacity, whereas demand-driven growth might lead to sustained inflation. Empirical evidence supports the notion that the latter scenario has been the case, thus reflecting the findings. The coefficient for the exchange rate (-2.427) indicates a negative but statistically insignificant relationship with GDP. In certain developing nations, such as Nigeria, GDP growth can be linked to increased imports of raw materials, capital goods, and services; higher imports subsequently raise the demand for foreign currency, which puts pressure on the exchange rate to decline. This outcome illustrates that the Nigerian currency has been depreciating. The coefficient for DOP (-0.092) indicates a positive and statistically significant relationship with GDP. Although based on theoretical expectations, the DOP coefficient is anticipated to be positive, the impact of an open economy particularly in developing nations can be weaker or even negative if such openness results in dependency on imports, deindustrialization, or susceptibility to external shocks, as observed in the Nigerian scenario.

V, CONCLUSION

This study examined the impact of inflation rate, exchange rate, and degree of openness on Nigeria's economic growth, using Gross Domestic Product (GDP) as the proxy. The results showed that inflation had a positive and statistically significant effect on GDP, which means that moderate inflation might encourage investment and economic activity. On the other hand, the exchange rate had a negative but statistically insignificant effect on GDP. This is because Nigeria's exchange rate is always changing, and the country relies on imports, which makes the economy less stable. Moreover, the level of openness exhibited a positive and statistically significant correlation with GDP, emphasizing the prospective advantages of trade liberalization for economic growth, while also indicating the dangers of excessive dependence on imports and susceptibility to external disruptions. The study confirms that macroeconomic factors like inflation, the exchange rate, and trade openness are still very important for Nigeria's growth. But their effects are complicated, so strong policy frameworks are needed to find a balance between growth and long-term stability.

VI. RECOMMENDATIONS

Based on the results, this study suggests the following:

The government and monetary authorities should implement policies to maintain inflation within a moderate and stable range to promote investment, increase purchasing power, and facilitate long-term growth. Structural reforms to address supply-side constraints such as energy costs and agricultural productivity, are vital to controlling cost-push inflation.

- Exchange rate management should prioritize stability by diversifying the economy away from crude oil dependence, improving foreign exchange reserves, and encouraging non-oil exports.
- Policies that promote local production and reduce import dependence will lessen pressure on the naira and strengthen external competitiveness.
- Nigeria should strategically deepen its openness by promoting export-oriented industrialization, enhancing the capacity of local industries, and improving infrastructure to compete globally.
- Trade policies should focus on balancing liberalization with the protection of emerging domestic industries to mitigate vulnerabilities to external shocks.
- Strengthening institutional frameworks for macroeconomic management is essential to enhance credibility, investor confidence, and effective policy implementation.
- Coordinated fiscal and monetary policies are necessary to achieve sustainable growth while minimizing the destabilizing effects of external shocks.

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