A PUBLICATION OF WORD ASTRA
wordastrajournals@gmail.com
www.wordastrajournals.com

Transnational Journal of Finance,
Management and Governance (TJFMG)
Volume 1 Issue 2, August 2025 - ISSN: 3090-9423

Selected Macroeconomic Variables and Economic Growth in Nigeria

Oriji, Esther Chimekwa, Ph.D & Wasurum, Edward, Ph.D
[1&2]Department of Economics, Ignatius Ajuru University of Education
Rumuolumeni, Port Harcourt
chime.ogolosingha@gmail.com[1]; wasurum@iaue.edu.ng[2]

DOI: https://doi.org/10.5281/zenodo.16889330

Citation: Oriji, E. C., & Wasurum, E. (2025). Selected Macroeconomic Variables And Economic Growth In Nigeria. *Transnational Journal of Finance, Management and Governance,* 1(2).

Abstract

This study examines the impact of specific macroeconomic factors on economic growth in Nigeria from 1981 to 2024. Per capita income is used as an indicator of economic growth, with the Johansen cointegration method and an error correction model (ECM) employed to analyse the dynamic interrelationships among exchange rate, inflation, trade openness, and balance of payments. Unit root tests indicate that all variables are integrated of order one, validating the use of cointegration analysis. The Johansen test reveals three cointegrating vectors, signifying a long-term equilibrium relationship among the variables. Long-term estimates indicate that the exchange rate adversely affects economic growth, while inflation and trade openness have a positive influence. In the short term, the error correction term is correctly signed and significant, indicating convergence to long-run equilibrium at an annual adjustment rate of 24%. In addition, the lagged values of trade openness and balance of payments exert a favourable impact on short-term economic growth. The findings underscore the importance of macroeconomic stability, especially in exchange rate regulation, inflation management, and trade policy, for promoting sustained economic growth in Nigeria. The study advocates for measures that encourage trade liberalisation, maintain moderate inflation, and improve external sector performance to support long-term economic development.

Keywords: Macroeconomic variables, economic growth, Nigeria, per capita income

Introduction

Economic development and progress have long been central to human society. The subject remains a focal point of public discourse and a fundamental concern in the contemporary globalised landscape. Countries exhibiting remarkable growth and development are often lauded as "growth miracles." Nigeria faces a significant policy challenge in alleviating poverty by generating and sustaining high rates of economic development, while simultaneously ensuring environmental protection (Acemoglu, 2009; Barro et al., 2004; Heshmati et al., 2015; Kim and Heshmati, 2014).

The African continent confronts several challenges, including population growth, rapid urbanisation, inadequate infrastructure, insufficient social services, global economic crises, corruption and inefficiency, and climate change (Belshaw and Livingstone, 2002; Binns et al., 2012; Chitonge, 2014; Johnson, 2016; Robson and Lury, 2011). Nigeria has undergone various macroeconomic transformations since gaining independence, as noted in the Country Assistance Evaluation (CAE, 2001). Three significant economic phases can be identified. The first, from 1960 to 1986, was characterised by genuine economic expansion. The second, from 1986 to 1994, was marked by crisis, largely due to declining global commodity prices and domestic challenges. During this period, macroeconomic indicators deteriorated, and budget deficits widened despite numerous initiatives to reduce public expenditure and improve revenue generation.

Nigeria began to recover in 1995 and continues on this path; however, this recovery does not reflect the country's substantial economic resources and potential in the era of globalisation. This study identifies the key macroeconomic variables influencing Nigeria's economic growth and development, namely, unemployment, exchange rate, inflation, and balance of payments.

Nigeria is one of Africa's most resource-rich countries, exporting commodities such as crude oil, cocoa, coffee, and cotton. Between 1986 and 1994, its gross domestic output declined by 60%. Current account and fiscal deficits, as well as external debt, increased sharply. Despite these challenges, Nigeria's oil reserves and favourable agricultural conditions position it among the leading nations in sub-Saharan Africa (SSA).

Economists continue to debate the most effective policies for achieving sustained economic growth. De Long and Summers (1992) argue that macroeconomic policies are essential for long-term growth, while Anderson and Jodon (1968) suggest that monetary policy has a more immediate and significant impact. Accordingly, monetary interventions should take precedence over fiscal measures. Uniamikogbo and Enoma (2001) also maintain that monetary policy instruments exert greater influence than fiscal tools in promoting economic transformation. Others, such as Barro (1990), highlight the importance of human capital development, particularly through investment in education and training, as a key driver of long-term economic growth.

Molua (2010) asserted that the majority of Sub-Saharan African economies, including Nigeria, exhibit inefficient domestic production and trading frameworks. These inefficiencies stem from inadequate government regulations, which hinder competition and restrict economies of scale. Tambi (1984) notes that Nigeria adopted a developmental interventionist strategy, regulating exchange and interest rates from 1960 to 1961. The government imposed quantitative trade restrictions and regulated the private sector alongside all economic activities. In response to market volatility and price fluctuations, the marketing board was established to enable farmers to register their produce, secure their crops, and participate in the cash economy through uniform pricing of commodities across all regions.

According to Molua (2010), macroeconomic imbalances in the 1980s adversely affected demand, exchange rates, foreign investment, and overall production. The nation initiated structural reforms in the 1990s aimed at enhancing economic growth through macroeconomic stability and reducing budget deficits. During this period, Nigeria's GDP recorded an average growth rate of 4%, attributed to improvements in public finances. Despite efforts to recover from prolonged economic adversity, Nigeria continues to record trade deficits with countries such as Spain, Italy, France, the United Kingdom, the United States, and the Netherlands. It is therefore essential to analyse the impact of specific macroeconomic variables on the Nigerian economy.

Nigeria has experienced various macroeconomic transformations since gaining independence, as noted in the Country Assistance Evaluation (CAE, 2001). Three distinct economic phases can be identified. The initial phase, from 1960 to 1986, was marked by genuine economic expansion. The second phase, from 1986 to 1994, was defined by economic crisis, driven largely by declining global commodity prices and domestic inefficiencies. During this period, macroeconomic indicators deteriorated and the budget deficit widened, despite numerous efforts to curtail government expenditure and enhance revenue. Recovery efforts commenced in 1995 and continue to date; however, this progress remains inconsistent with Nigeria's economic potential in the globalised era. This study seeks to identify the most effective macroeconomic variables for promoting Nigeria's economic growth and development.

Twenty-five years after independence, Nigeria remained classified as a low-income country. Though once one of Africa's most resource-rich nations, the collapse of global prices for key exports like petroleum, cocoa, coffee, and cotton, during the 1980s led to currency overvaluation and economic mismanagement, resulting in a downturn. Between 1986 and 1994, gross domestic output fell by 60%, while current account deficits, fiscal deficits, and external debt rose sharply. Despite these difficulties, Nigeria retains substantial oil reserves and favourable agricultural conditions, positioning it among the leading nations in sub-Saharan Africa (SSA).

Despite various macroeconomic policy interventions, Nigeria's economic performance has remained weak since 1994, with low and inconsistent growth rates.

Figure 1 shows that GDP growth was 6% in 1986, falling to 2.14% in 1987, rising to 7.82% in 1988, then declining again to 1.82% in 1989. Growth was 6.10% in 1990, followed by 3.80% in 1991, 3.1% in 1992, and 7.93% in 1993. GDP increased from 2.12% in 1994 to 4.29% in 1999, dropped to 4.23% in 2002, rose to 6.7% in 2006, declined to 2.19% in 2009, and rebounded to 5.65% in 2015. This volatility complicates efforts to analyse the macroeconomic drivers and policy implications for Nigeria's economic growth in the 21st century.

While most studies in Nigeria focus on poverty and growth mechanisms, few have examined the macroeconomic indicators driving economic performance, despite their importance for effective public policy and poverty alleviation. Given that the goal of every nation is to improve the living standards of its citizens through economic growth and development, time series data provide a robust analytical framework for identifying the key macroeconomic determinants of growth. Many governments lack awareness of the fundamental macroeconomic indicators and strategies relevant to their economies. This study therefore examines the impact of macroeconomic variables on Nigeria's economy from 1981 to 2021.

Review of Literature

Clarification of Concepts

Economic Growth:

The expansion of an economy is characterised as a continuous process in which productive capacity is augmented over time to elevate the national income level. Jhingan (2007) defines economic growth as the continuous quantitative rise in a nation's per capita output or income, coupled with an increase in its labour force, consumption, capital, and trade volume. Akpakpan (1987) defines economic growth as the annual rise in both total and per capita production of goods and services. It pertains to the continuous rise in the tangible production of goods and services of the respective nation. It is evident that economic expansion focusses on the quantitative enhancement of both total and per capita production of goods and services.

Macroeconomic variables measure an economy's performance, structure, and behaviour. Understanding economic trends, policymaking, and policy efficacy depend on these elements. They are usually aggregated nationally or globally. Key macroeconomic factors include Gross Domestic Product, inflation rate, Unemployment Rate, Exchange Rate, Rate of Interest, Balance of payments, Trade Openness, Public debt

Theoretical review

This study is hinged on two theories - the theory of open economy and the big push theory.

The Theory Open Economy

This theory provides the foundational lens through which the interactions between domestic macroeconomic variables and external sector dynamics are examined. Rooted in classical trade theory and extended through models such as the Mundell-Fleming framework, it posits that in an open economy, economic outcomes are influenced not only by internal policies but also by global factors such as trade flows, capital mobility, and exchange rate movements. This framework is particularly relevant for time series analysis, as it allows for the investigation of how macroeconomic variables, such as interest rates, exchange rates, inflation, and output, etc., adjust over time in response to both domestic shocks and international developments. It also facilitates empirical assessment of the transmission mechanisms through which external shocks propagate within an economy, thereby informing policy choices in an increasingly globalised environment.

External sector modelling starts with a simple open economy model, where total spending in the domestic economy is divided into domestic and foreign components.

Y (C C*) (I I*) (G G*) EXP - 2.1

Where C is domestic consumption of goods and services,

C* is consumption of foreign goods and services,

I is domestic investment in goods and service and

I* is investment in foreign goods and services.

G and G* are government purchases of domestic and foreign goods and services, respectively. EXP is exports of domestic goods and services. Further re-arrangement of the identity gives:

Y =C+ G+ I +EXP -(C * +I *+ G*) - 2.2

(C *I *G*) represents total expenditure on imports (IMP), therefore, components of total output become:

Y C I G EXP IMP - 2.3

Interaction between EXP and IMP reflect the external sector performance, if EXP exceeds IMP, external sector is said to be in surplus, but where the reverse holds, external sector is said to be in deficit.

The Big Push Theory

The Big Push theory was proposed by Rosenstein-Rodan in 1944. It provides a framework for understanding how market failure necessitates coordinated (often governmental) intervention to accelerate economic growth (Todaro & Smith, 2011). The theory asserts that development depends on broad-based expansion. For growth to occur in any external sector of an economy, the sector that drives industrialisation must be actively developed. The hypothesis suggests that the advancement of the external sector will catalyse economic growth by increasing the domestic production of goods and services, thereby raising GDP per capita. These developments would, in turn, lead to overall economic development as the living conditions of the population improve.

The theory also posits that coordination failure may impede industrialisation in underdeveloped countries unless addressed through public intervention. The central argument is that coordination problems (under conditions of increasing returns) can create the potential for multiple equilibria. A disadvantaged country may become trapped in a low-level equilibrium or poverty threshold. Government intervention can help overcome these coordination failures, enabling a shift to a higher equilibrium and triggering a "take-off" into sustained economic growth.

However, the theory has been criticised, notably by Viner, for its excessive emphasis on investment in social overhead capital as the mechanism for generating external economies. Critics argue that it overlooks other important areas such as exports, marginal import substitutes, and agriculture. These sectors are equally vital in many developing economies, and neglecting them may hinder rather than promote progress.

Empirical Literature Review

Doytch and Narayan (2021) assessed the function of renewable energy in the relationship between the manufacturing sector and economic growth, as well as between the service sector and economic growth. The study analysed these interactions inside the endogenous growth model and observed that renewable energy promotes growth in the high-growth sector, significantly influenced by industrial energy use rather than residential usage.

Ehigiamusoe and Lean (2017) analyse the impact of macroeconomic variables and investment rates on Nigeria's economic development from 1980 to 2014. This study analyses the relationship between macroeconomic variables and investment to see if the impact of investment on economic development fluctuates with varying levels of macroeconomic indicators. Among the five macroeconomic variables identified from the Maastricht Criteria indicators that assess a nation's macroeconomic stability, the fiscal deficit relative to GDP and the real exchange rate positively influence economic development, whereas the inflation rate and government debt relative to GDP negatively affect economic development. The real interest rate exerts no statistically significant influence on economic development in Nigeria. Furthermore, the study uncovered substantial evidence indicating that the influence of investment rates on economic development fluctuates with the levels of four macroeconomic variables, excluding the real interest rate. The implication is that macroeconomic variables elucidate variations in economic development and investment rates, suggesting that superior macroeconomic performance and elevated investment rates are significantly more relevant to economic development than high investment rates in a deficient macroeconomic context.

Bhaskara-Rao and Hassan (2011) examined the factors influencing long-term economic growth in Bangladesh from 1970 to 2007. The study, utilising an

autoregressive distributed lag method, indicated that reforms initiated in the 1980s, foreign direct investment, money supply, and trade openness exhibited a positive and significant correlation with economic growth, whereas government expenditure and inflation demonstrated a negative and significant correlation with economic growth.

Chang and Mendy (2012) examined the empirical correlation between openness and economic growth in 36 African nations from 1980 to 2009. The panel fixed effects regression model indicated that foreign aid, exports, imports, labour employed, and trade openness exhibited a positive and significant correlation with economic growth; conversely, foreign direct investment, domestic investment, and gross national savings demonstrated a negative and significant correlation with economic growth. The research revealed that foreign aid demonstrated varied outcomes when analysed by area. In the Middle and North Africa regions, foreign aid exhibited a positive and substantial correlation with economic growth, whereas in the West and East Africa regions, foreign aid demonstrated a negative and significant correlation with economic growth.

Anyanwu (2014) analysed the determinants of economic growth in Africa and China through an empirical growth model. This study utilised cross-country panel data for African nations from 1996 to 2010, alongside time series data for China from 1984 to 2010. The findings indicated that, in Africa, increased domestic investment, net official aid, secondary school enrolment, metal price index, government effectiveness, and urban population were positively and significantly correlated with economic growth. In China, the study indicated that a selection of regressors revealed a positive and significant correlation between domestic investment and trade openness with economic growth, whereas official development aid, population growth, inflation, credit to the private sector, agricultural material prices, and oil price indices exhibited a negative and significant association with economic growth.

Acikgoz and Mert (2014) examined the correlation between investment and real GDP per capita in three Asian nations—Hong Kong, the Republic of Korea, and Taiwan—utilising an autoregressive distributed lag model and the Fully Modified Ordinary Least Squares approach. The analysis, utilising time series data from 1951 to 2007 for Taiwan, 1953 to 2007 for the Republic of Korea, and 1960 to 2007 for Hong Kong, revealed that, in the near term, the investment share exhibited a positive and substantial correlation with economic growth. Furthermore, it exhibited a positive and significant correlation with the long-term level of real GDP per capita. These findings were consistent across all three countries.

Checherita-Westphal and Rother (2012) investigated the correlation between elevated government debt and economic development in 12 Eurozone nations with a conditional convergence equation, spanning the years 1970 to 2008. The analysis indicated that, with per capita GDP growth rate as the dependent variable, government balance, private savings, and trade openness exhibited a positive and significant

correlation with economic growth, whereas population growth and real interest rates demonstrated a negative and significant correlation with economic growth. The analysis revealed a positive and substantial correlation between government debt and economic growth; however, the square of government debt exhibited a negative and significant correlation with economic growth, so verifying the presence of threshold effects.

Prochniak (2011) examined the demand- and supply-side factors influencing economic growth in ten Central and Eastern European economies from 1993 to 2009. The study, employing ordinary least squares estimation, identified several key determinants of economic growth that exhibited a positive and significant correlation with growth in the selected countries. These determinants include the investment rate, human capital development, financial sector development, a substantial service sector share in GDP, a considerable proportion of the working-age population, advancements in information and communication technology (ICT), a significant private sector contribution to GDP, economic freedom, and advancements in market and structural reforms. Budget deficits, public debt, interest rates, and inflation have shown a negative and strong correlation with economic growth.

Fetahi-Vehapi, Sadiku, and Petkovski (2015) examined the influence of trade openness on economic growth in ten South-Eastern European nations from 1996 to 2012. The study, employing additional regressors as control variables, revealed that trade openness, initial GDP per capita, human capital development, gross fixed capital formation, and foreign direct investment exhibited a positive and significant correlation with economic growth. Conversely, population demonstrated a negative and significant association with economic growth, as determined by a fixed effects panel regression estimation method.

Dan and Binh (2018) investigate the impact of macroeconomic variables on economic growth across 68 chosen developing nations using a panel framework. Panel data analysis was performed for the period 1996–2016 to assess the impact of macroeconomic variables on economic growth. The impact of macroeconomic variables was assessed within a dynamic framework utilising GMM (generalised method of moments). This paper's primary findings demonstrate that elevated levels of domestic investment, labour, and trade openness exert a favourable and significant influence on economic growth. Conversely, inflation, money supply, and interest rates adversely impact growth in developing nations.

Abubakr et al. (2021) observed that economic growth in Malaysia exhibits an unbalanced response to both positive and negative oil rents in the long term across all sectors. The study additionally observed that, whilst the agriculture and transportation sectors have a positive response to shocks, the manufacturing and wholesale sectors demonstrate a negative response. The findings of the non-linear autoregressive distributed lag indicate that comprehending the sectoral variations caused by oil rent shocks in each sector is essential for developing an effective diversification policy.

Lawal, Oseni, Lawal-Adedoyin, Ise-Olorunkanmi, Asaleye, and Inegbedion (2020) investigate the influence of macroeconomic variables alongside significant socio-economic and political factors on Nigeria's manufacturing sub-sector. They employ the autoregressive distributed lag methodology to analyse data from 1986 to 2019, framed within the paradigms of the Solow growth and endogenous growth theories. The study observed that both the Solow growth theory and the endogenous growth model are applicable in the short term for the examined economy; however, in the long term, only the endogenous growth model remains true. The study indicated that sustainable economic growth driven by a robust manufacturing sector requires alignment between macroeconomic variables and socio-political factors. The study's conclusions possess some policy implications.

Themba and Chirwa (2020) examined the causes of economic growth employing diverse econometric techniques; however, most of this research have failed to differentiate the factors that promote or impede economic growth in developing vs industrialised nations. The research indicates that the factors influencing economic growth vary when this distinction is used. In developing nations, the principal macroeconomic determinants of economic growth encompass foreign aid, foreign direct investment, fiscal policy, investment, trade, human capital development, demographics, monetary policy, natural resources, reforms, and geographic, regional, political, and financial factors. The analysis indicates that in industrialised nations, the primary macroeconomic determinants linked to economic growth encompass physical capital, fiscal policy, human capital, trade, demography, monetary policy, and financial and technical elements.

Moutinho et al. (2020) investigated the relationship between economic and environmental factors influencing sustainable economic growth, defined as a well-diversified portfolio, for a group of chosen OPEC nations in the framework of the environmental Kuznets curve theory. The study utilised many econometric techniques, including pooled mean group, mean group, and dynamic fixed effects methods. The findings indicated that the manufacturing sectors' contribution to the examined economy is negligible.

Sheng Wu, Liangpeng Wu, and Xianglian Zhao (2022) investigated the effects of green credit policy on foreign finance, economic development, and energy usage within China's manufacturing sector, employing the Difference-in-Differences (DID) methodology and system Generalised Method of Moments (GMM) to analyse data from 2003 to 2016. The research indicated that green credit financing adversely affects manufacturing in both the short term and the long term. The study observed a reciprocal causal relationship between energy consumption and economic growth, as well as between green financing and manufacturing.

Ismaila and Imoughele (2015) examine the macroeconomic factors influencing economic growth in Nigeria through a co-integration methodology. The research

indicates that Nigeria's economic expansion is positively affected by gross fixed capital formation, total government expenditure, and foreign direct investment. Inflation is inversely correlated with economic development. Therefore, macroeconomic stability is improved by effective monetary and fiscal policy. Phiri (2013) examines the correlation among economic growth, foreign direct investment, and inflation in Zambia utilising a threshold auto-regressive (TAR) methodology. Inflation correlates with enhanced economic growth while it remains below 22.5%; exceeding this threshold adversely affects growth, whereas foreign direct investment positively influences it.

Anyanwu (2014) analyses the primary microeconomic determinants of economic growth in Africa (1996–2010) and China (1984–2010) utilising cross-country panel data. Domestic investment, foreign aid, human capital development, metal price index, government effectiveness, and urban population have favourably and significantly influenced economic growth in Africa, whereas domestic investment and trade openness have positively affected economic growth in China. The private sector's credit, agriculture rate, and urban population adversely affected economic growth in China.

Zafar and Zahid (2013) analysed the impact of significant macroeconomic variables on economic growth by multiple regression analysis covering the period from 1959-1960 to 1996-1997. Primary education is an essential prerequisite for accelerated development. The augmentation of physical capital stock and the economy's openness facilitate growth. The results indicated that budget deficits and external debt are inversely correlated with economic growth. This indicates that dependence on domestic resources is the optimal strategy for financing growth and underscores the significance of long-term growth-oriented strategies for attaining sustainable development.

Biswas and Saha (2014) examine the factors influencing economic growth in India through time series analysis spanning from 1980 to 2011. The results indicated that gross domestic capital production positively influences GDP in the short term. Exports, the money supply, and foreign direct investment enhance growth, whereas inflation and fiscal deficits detrimentally affect it. India exhibited consistent economic growth during the research period due to meticulous and strategic control of macroeconomic growth factors.

Methodology

This study employs a quasi-experimental research methodology. To achieve its objectives, the researcher will use a combination of descriptive statistics and econometric techniques to analyse the impact of the external sector on the Nigerian economy. The descriptive research design aims to evaluate outcomes and identify potential relationships among various factors. The study relies on secondary data sourced from the 2021 edition of the Central Bank of Nigeria (CBN) Statistical Bulletin and Statement of Account. Additional data will be obtained from World Bank indices.

Per capita income is treated as the dependent variable, while balance of payments (BOP), unemployment (UNP), exchange rate (EXR), inflation (INFL), and trade openness (TOP) serve as explanatory variables for the period 1981 to 2021.

Time series data sourced from the World Development Indicators database are also considered. The study examines key macroeconomic indicators influencing Nigeria's economic growth and establishes the long-term causal relationship using the ordinary least squares method, while disregarding the stationarity requirement of the time series data. E-Views software will be used for data analysis. The Johansen approach is adopted for estimating long-run coefficients, given the presence of first-difference stationary variables, while short-run estimates are derived using the error correction mechanism (ECM).

Model Specification

The classical, neoclassical, and modern growth theories delineate the determinants of economic growth, including natural resources, institutional frameworks, foreign direct investment, capital investment, human capital, innovation, technology, economic policies, governmental influences, foreign aid, trade openness, political factors, socio-cultural elements, geography, and demography, as significant macroeconomic determinants (Antwi et al., 2013). The model specification for economic growth and macroeconomic indicators is presented as follows:

The equation is stated in the following functional form:

$$GDPt = F(GOVEXP_{it}, HCD_{it}, AIDS_{it}, TOP_{it,}, FDI_{it}, INVEST_{it}, M2_{it}, EXCHRATE_{it}, INFLA_{it}) + \mu t \quad 3.1$$

Where:

Dependent Variables

GDP_{it} = GDP_{it} per capita (current us$) … for Eqn (1).

Explanatory Variables

$GOVEXP_{it}$ = General government expenditure (% of GDP) of country *i* at time *t*.

HCD_{it} = Human capital development measured by school enrollment in secondary school (% of gross) of country *i* at time *t.*

$AIDS_{it}$ = Net official development assistance and official aid received (constant 2015 US$) of country *i* at time *t.*

TOP_{it} = Trade Openness (ratio of import plus exports to % of GDP) of country *i* at time *t.*

FDI_{it} = Foreign direct investment (% of GDP) of country *i* at time *t*.

$INVEST_{it}$ = Gross capital formation (% of GDP) of country *i* at time *t*.

$M2_{it}$ = Broad money (% of GDP) of country *i* at time *t*.

$EXCHRATE_{it}$ = Exchange rate (period average) of country *i* at time *t*.

$INFLA_{it}$ = Inflation, consumer prices (annual %) of country *i* at time *t*.

The modified version of the expression used per capita income as the proxy for economic growth while Inflation Rate, Exchange Rate and balance of payment as explanatory variable while trade openness served as the control variable.

The functional form of the equation is expressed as follows:
PCI=f(EXR, BOP, INFL, TOP)
The econometric form of the model is expressed as thus:
$PCIt= \alpha0+\alpha1EXRt+\alpha2BOP+\alpha3INFL+\alpha4TOP+\mu t$
Where:
PCI; Per Capita Income
EXR: Exchange Rate
BOP: Balance of Payment
INFL: Inflation Rate
TOP: Trade openness
$\alpha0$= Constance
$\alpha1$ TO $\alpha5$= Coefficient to be estimated.

Description of Variables in the Model
Per Capita Income (PCI) is a widely utilised economic metric that quantifies the average income generated per individual within a defined geographic area (such as a country, region, or city) over a certain timeframe, usually one year. It provides a preliminary assessment of the population's standard of living or economic welfare.

Explanatory variables:
Rate of Inflation: Inflation refers to the rate at which prices rise over a specified duration. Inflation is often a comprehensive indicator, reflecting the aggregate rise in prices or the escalation of living expenses within a nation.

Trade openness is a metric that indicates the degree to which a nation participates in the global trading system.

Balance of Payments: This is a periodic report that encapsulates the flow of economic transactions with foreign entities. It offers data on the country's exports, income from domestic assets held by foreign entities, international capital flows, and formal transactions conducted by the CBN and government (Nwanosike, Uzoechina, Ebenyi, and Ishiwu, 2014). The balance of payments is anticipated to exert either a favourable or unfavourable influence on economic development indicators, contingent upon the country's exports and imports.

Exchange rate (naira/US dollar) assessed on an annual basis? It is the quantity of naira required to acquire one unit of the US dollar. From a theoretical perspective, the exchange rate is anticipated to exert either a positive or negative influence on economic development indices, contingent upon the valuation of the home currency.

Results and Discussion

Descriptive Statistics

Table 1: Summary Statistics of the Variables

	PCI	BOP	EXR	INFL	TOP
Mean	1183.059	1055664.	113.4114	18.01273	57.21556
Median	1000.560	213508.0	119.5750	11.83500	55.25029
Maximum	2538.700	5822589.	445.4700	72.84000	70.19835
Minimum	180.7400	-7905599.	0.620000	5.390000	51.07766
Std. Dev.	775.0696	2574072.	110.4357	16.36138	4.765483
Skewness	0.292394	-0.534900	1.008648	1.968477	1.468654
Kurtosis	1.610887	4.872458	3.635327	5.749650	4.571704
Jarque-Bera	4.164621	8.526051	8.200727	42.27702	20.34640
Probability	0.124642	0.014080	0.016567	0.000000	0.000038
Sum	52054.61	46449198	4990.100	792.5600	2517.485
Sum Sq. Dev.	25831511	2.85E+14	524430.1	11510.87	976.5226
Observations	44	44	44	44	44

Source: EViews 10 output.

Table 1 presents the summary statistics of the variables used to examine the influence of specific macroeconomic indicators on economic growth in Nigeria from 1981 to 2024. The average values for the principal variables are as follows: Per Capita Income (PCI) – 1,183.059; Balance of Payments (BOP) – 1,055,664; Exchange Rate (EXR) – 113.4114; Inflation Rate (INFL) – 18.01273; Trade Openness (TOP) – 57.21556. The respective median values are 1,000.560 for PCI, 213,508.0 for BOP, 119.5750 for EXR, and 11.83500 for INFL.

The balance of payments and inflation exhibit substantial discrepancies between their mean and median values, suggesting a high degree of dispersion and the presence of outliers or structural anomalies. These significant gaps indicate underlying economic vulnerabilities and a limited capacity to absorb or withstand exogenous shocks, often associated with macroeconomic instability.

The skewness values show that most variables exhibit positive skewness, indicating extended right tails in their distributions. The balance of payments is an exception, with a negative skewness value of -0.534900, reflecting a longer left tail and a tendency for more frequent substantial negative values, indicative of historical deficits or external sector pressures. The kurtosis of per capita income is 1.610887, indicating a platykurtic distribution that is flatter than the normal distribution and suggests a scarcity of extreme values. In contrast, the other variables exhibit leptokurtic characteristics, with sharper peaks and heavier tails than the normal distribution. This implies a higher likelihood of significant deviations, potentially signalling macroeconomic shocks or volatility.

The Jarque-Bera (JB) test results indicate that per capita income does not significantly deviate from normality, as evidenced by a non-significant JB probability value. However, the JB statistics for the other variables are significant, suggesting non-normal distributions of their residuals. The lack of normality highlights the need to employ robust econometric techniques capable of addressing such anomalies in the data.

Unit Root Test

Table 2: Outcomes of the Stationarity

Variables	Level		First Differences		Order
	T.Stat	Crit. Value	T.Stat	Crit. Value	
BOP	-2.018724	-2.951125	-3.889938	-2.954021	I(1)
EXR	-1.677446	-2.931404	-8.051211	-2.933158	I(1)
INFL	-2.325261	-2.933158	-10.97103	-2.933158	I(1)
PCI	-0.354683	-2.931404	-5.051924	-2.933158	I(1)
TOP	-2.110903	-2.931404	-6.330567	-2.933158	I(1)

Author Compilation from EViews 10.05

Table 2 displays the outcomes of the stationarity or unit root tests performed to assess the time series characteristics of the macroeconomic variables utilised in this study, which investigates the correlation between specific macroeconomic indicators and economic growth in Nigeria from 1981 to 2024. Determining if a series is stationary or possesses a unit root is a crucial step in time series econometrics, since the existence or lack of stationarity dictates the suitable estimate methods to employ.

The outcomes of the unit root tests, utilising conventional methodologies such as the Augmented Dickey-Fuller (ADF) and/or Phillips-Perron (PP) tests, demonstrate that none of the variables exhibit stationarity at level. Subsequent to the application of first differencing to the variables, all series were determined to be stable, indicating they are integrated of order one, i.e., I(1). This result indicates that although the individual variables display stochastic patterns in their level forms, their initial differences remain stable over time, fulfilling the criteria for cointegration analysis.

Since all variables are integrated of the same order, the subsequent step is to examine the presence of a long-run equilibrium relationship among them by the Johansen cointegration test. The Johansen framework is especially applicable to instances where numerous time series are I(1), as it facilitates the identification and estimation of multiple cointegrating vectors in a multivariate context. Prior to estimating the Johansen cointegration model, it is essential to ascertain the ideal lag length for the underlying Vector Autoregressive (VAR) model, which underpins the Johansen technique. According to Wasurum (2022), selecting an adequate lag length is essential, since it guarantees that the model accurately reflects the data's dynamic structure while preventing overfitting or autocorrelation in the residuals. The lag length is generally determined by a variety of statistical measures, including the Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion (HQIC), Schwarz Bayesian Criterion (SBIC), and the Sequential Likelihood Ratio (LR) test. After determining the optimal lag length—typically via the criteria presented in Table 3 below, the Johansen cointegration test can be effectively performed to evaluate the number of long-term relationships among the variables, thereby informing the specification of the Error Correction Model (ECM) for dynamic analysis.

Table: Vector Autoregressive (VAR) Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1616.856	NA	9.67e+26	79.16369	79.41446	79.25501
1	-1484.420	219.6490	8.94e+24	74.45953	76.21489*	75.09874
2	-1437.548	64.02103	5.90e+24	73.92916	77.18913	75.11626
3	-1382.452	59.12739*	3.21e+24*	72.99765*	77.76222	74.73264*

** indicates lag order selected by the criterion*

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 3, which displays the Vector Autoregressive (VAR) lag selection criteria, is crucial for identifying the best lag length for the Johansen cointegration test. Choosing an adequate lag duration is essential in time series modelling, since it guarantees the precision of parameter estimations and the legitimacy of statistical inference. An under-specified model may neglect critical dynamics, whereas an over-specified model might introduce superfluous complexity and diminish efficiency. The information presented in Table 3 indicates that the ideal lag length for estimating is three. This result is derived

from the consistent signals across many lag selection criteria, particularly the sequential modified Likelihood Ratio (LR) test statistic, Final Prediction Error (FPE), Akaike Information Criterion (AIC), and Hannan-Quinn Information Criterion (HQIC).

Each criterion exhibits an asterisk (*) at lag 3, indicating the juncture at which the corresponding statistic reaches its minimal value (for FPE, AIC, and HQIC) or maximum value (for LR), thus designating it as the optimal lag length. The consensus across these several selection measures reinforces the selection of lag 3, indicating that the model effectively captures the inherent data dynamics without succumbing to overfitting.

The choice of lag 3 indicates that each equation in the VAR system will include three lagged values of all variables, so addressing the temporal dependencies and feedback mechanisms inherent in macroeconomic interactions. This is especially crucial in the context of Johansen cointegration analysis, which necessitates a well-described model in levels to produce trustworthy estimations of the cointegration rank and vectors.

Selecting a lag of 3 mitigates the risks of omitted variable bias and autocorrelated residuals, therefore enhancing the validity of the long-term association established in the Johansen test. Thus, this lag duration establishes a solid basis for later cointegration and error correction modelling.

Johansen Cointegration Test

	Trace		Max-Eigen		Trace	Max-Eigen
Hypothesised No. of CE(s)	Statistic	Critical Value	Statistic	Critical Value	Prob.**	Prob.**
None *	177.8577	95.75366	68.82171	40.07757	0.0000	0.0000
At most 1 *	109.0360	69.81889	48.10684	33.87687	0.0000	0.0006
At most 2 *	60.92911	47.85613	38.04349	27.58434	0.0019	0.0016
At most 3	22.88563	29.79707	15.72499	21.13162	0.2517	0.2413
At most 4	7.160639	15.49471	7.128262	14.26460	0.5591	0.4741
At most 5	0.032377	3.841466	0.032377	3.841466	0.8572	0.8572
Trace and maxeigen test indicates 3 cointegrating eqn(s) at the 0.05 level						

Sources: Autor Compilation from EViews 10.05

The Johansen cointegration test is a rigorous multivariate statistical method that enables researchers to ascertain the existence of a long-term equilibrium relationship among the variables in a vector autoregressive (VAR) model. In contrast to single-equation approaches, the Johansen test may detect numerous cointegrating vectors, rendering it especially advantageous in models with more than two endogenous variables. The Johansen test results in this study indicate the presence of three

cointegrating correlations among the examined variables. This conclusion is corroborated by both the trace statistic and the maximum eigenvalue (max-eigen) statistic, each offering independent validation of the quantity of cointegrating vectors. The trace statistics at different proposed ranks are as follows:

At rank 0 (indicating no cointegration), the trace statistic is 177.8577, above the 5% critical value of 95.75366. At rank 1 (with a maximum of one cointegrating vector), the trace statistic is 109.0360, exceeding the critical value of 69.81889. At rank 2 (with a maximum of two cointegrating vectors), the trace statistic is 60.92911, beyond the crucial value of 47.85613.

Likewise, the max-eigen statistics corroborate similar findings: The maximum eigenvalue statistic for the null hypothesis of no cointegration ($r = 0$) is 68.82171, exceeding the critical value of 40.07757. The maximum eigenvalue statistic for the null hypothesis of at most one cointegrating vector ($r \leq 1$) is 48.10684, above the crucial limit of 33.87687. The maximum eigenvalue statistic for the null hypothesis of at most two cointegrating vectors ($r \leq 2$) is 38.04349, exceeding the critical limit of 27.58434.

The results imply that the variables in the model exhibit a stable long-term relationship, hence offering a robust economic rationale for the implementation of the error correction model (ECM). Cointegration indicates that, despite short-term variations, the variables generally exhibit a synchronised movement over time, aligning with economic theory. Consequently, any divergence from the long-run equilibrium will be rectified over time, which is essential for the development of robust dynamic models of adjustment and policy response.

Table 4: Normalized Cointegration Result (Long Run)

PCI	EXR	BOP	INFL	TOP
1.000000	8.737588	0.000132	-46.32115	-430.5946
St. Error	(3.42387)	(8.5E-05)	(11.6753)	(65.0981)
T -values	2.551952	1.552941	-3.967448	6.614549

Table 4 displays the findings of the normalised cointegration test, which evaluates the long-term link between certain macroeconomic variables and economic growth in Nigeria, as indicated by per capita income. This table underpins the long-term estimation of the model, supplying coefficients essential for forecasting and policy development. The test confirms the existence of a long-run equilibrium relationship among the variables, hence validating the use of the cointegrating regression method. The coefficient of the exchange rate in the normalised equation is negative and statistically significant, indicating a long-term inverse association between exchange rate fluctuations and per capita income. The coefficient of -8.737588 indicates that, ceteris paribus, a unit appreciation in the exchange rate (i.e., an increase in the naira's value against foreign currencies) results in a decline in economic growth of 8.737588

units. This outcome indicates that the ongoing devaluation of the naira, particularly against significant foreign currencies such as the U.S. dollar, has imposed substantial downward pressure on per capita income in Nigeria. Fundamentally, foreign exchange volatility, particularly manifested as currency devaluation, is a principal factor contributing to diminishing economic welfare. This discovery corresponds with past expectations and mirrors actual situations in Nigeria, where reliance on imports and exchange rate volatility frequently result in inflationary pressures and diminished purchasing power. The calculated coefficient in the normalised equation regarding the balance of payments is negative yet statistically insignificant, as evidenced by a low t-value. This indicates that, over time, the balance of payments does not significantly influence Nigeria's per capita income. The insignificance may indicate the nation's structural current account deficits, the volatility of capital flows, or discrepancies in trade and foreign reserve management over the study period. It underscores the restricted explanatory capacity of the BOP in affecting long-term economic growth under existing macroeconomic conditions.

Conversely, the coefficient for inflation is positive and statistically significant in the long-term analysis. The findings demonstrate that a one-unit rise in inflation correlates with a 46.32115-unit increase in economic growth, assuming other variables remain unchanged. This seemingly paradoxical relationship is theoretically substantiated by Keynesian economics, which asserts that a modest inflation rate can enhance aggregate demand, particularly when the economy functions below full employment capacity. In Nigeria, this may indicate that inflation has been partially demand-driven, contributing to nominal rises in output and income. Nevertheless, this must be read with caution, as rampant inflation can distort investment, deplete savings, and hinder long-term prosperity. Nevertheless, the identified causation in this model highlights the intricate relationship between price levels and growth in a developing market context.

The coefficient for trade openness is positive and statistically significant, with the t-value beyond the critical threshold of 2. The computed coefficient of 430.5946 indicates that a one-unit rise in trade openness corresponds to a 430.5946-unit increase in per capita income, ceteris paribus. This robust and favourable link highlights the significance of external trade in Nigeria's growth trajectory. Trade openness boosts access to global markets, encourages technology transfer, increases competitiveness, and fosters efficiency among domestic manufacturers. The outcome aligns with contemporary growth theories, particularly endogenous growth models, which highlight the significance of openness in enhancing creativity and productivity.

The normalised cointegration results demonstrate strong evidence of long-term links between essential macroeconomic factors and economic growth in Nigeria. The results underscore the detrimental long-term effects of exchange rate appreciation, the unclear influence of the balance of payments, the growth-promoting capacity of moderate inflation, and the significant positive impact of trade openness on economic performance. These results have significant policy ramifications, especially concerning currency rate management, inflation targeting, and the liberalisation of trade policy.

Table 5: Parsimonious Encompassing ECM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	32.83078	21.14523	1.552633	0.1314
D(PCI(-2))	0.310439	0.171185	1.813469	0.0856
D(EXR)	-1.956960	0.481663	-4.062924	0.0003
D(EXR(-3))	1.995293	0.908526	2.196186	0.0362
D(INFL(-3))	2.257531	1.125844	2.005190	0.0544
D(BOP)	1.78E-05	9.08E-06	1.965420	0.0590
D(BOP(-1))	4.64E-05	1.37E-05	3.401771	0.0020
D(BOP(-3))	6.24E-05	1.50E-05	4.158114	0.0003
D(TOP(-1))	13.86488	6.265697	2.212823	0.0349
D(TOP(-3))	-12.39997	7.587937	-1.634169	0.1130
ECM(-1)	-0.237675	0.103600	2.294151	0.0292

R-squared	0.766642	Mean dependent var	44.59600
Adjusted R-squared	0.686174	S.D. dependent var	207.8404
S.E. of regression	116.4326	Akaike info criterion	12.58092
Sum squared resid	393139.6	Schwarz criterion	13.04536
Log likelihood	-240.6184	Hannan-Quinn criter.	12.74885
F-statistic	9.527271	Durbin-Watson stat	1.567670
Prob(F-statistic)	0.000001		

The findings from the error correction regression model offer essential insights into the short-term and long-term dynamics of the link between economic growth and certain macroeconomic variables. The coefficient of determination (R-squared) for the computed regression line is 0.766642, signifying that about 76.7% of the total variance in the dependent variable (economic growth) is collectively elucidated by the explanatory factors included in the model. The corrected R-squared value of 0.686174 modestly tempers this explanatory power, considering the degrees of freedom in the model. This indicates that approximately 68.6% of the variations in economic growth can be ascribed to the chosen variables, while the remaining 31.4% is due to other factors not included in the model (i.e., the error term), which may encompass external shocks, structural breaks, or measurement inaccuracies.

The Durbin-Watson value of 1.567670 is within the allowed range, indicating the absence of significant first-order autocorrelation in the model's residuals. Autocorrelation, if existent, may undermine the validity of the model's estimations;

thus, its absence enhances the reliability of the model's statistical judgements. The statistical importance of the F-statistic is particularly remarkable, as its probability value is quite significant. This strongly indicates that the model is statistically robust and that the combined effect of the independent variables on economic development is significant.

A fundamental discovery of the model is the behaviour of the error correction term (ECT). The ECT is negative and statistically significant at the 5% level, aligning with theoretical assumptions. This outcome indicates that the system tends to rectify any imbalance over the long term at an annual adjustment rate of 24%. This indicates that deviations from the long-run equilibrium level of economic development are rectified at a rate of around 24% annually, validating the model's ability to converge towards a stable equilibrium over time.

The lagged value of the dependent variable (economic growth) is statistically significant at the 10% level, indicating a short-run feedback effect—current economic growth is partially influenced by its historical performance. This discovery is significant, as it illustrates a level of inertia in the growth process, aligning with endogenous growth theories.

Analysing the different explanatory factors, the exchange rate demonstrates a negative and statistically significant coefficient in the near term. An appreciation of the exchange rate, indicating a strengthening of the local currency against foreign currencies, correlates with a loss of 1.956960 units in economic growth, assuming all other factors remain constant (ceteris paribus). This inverse link may be ascribed to the detrimental effect of currency appreciation on export competitiveness, potentially diminishing industrial output and economic activity.

The third lag of the exchange rate exhibits a positive and significant coefficient, signifying a delayed yet beneficial impact on economic growth. This research indicates a complex or variable impact of exchange rate fluctuations on Nigeria's economic performance during the studied period. Although short-term appreciation may impede growth, long-term adjustments could invigorate economic activities, potentially due to enhanced investment or trade balances following the correction of pricing rigidities.

The inflation rate, while a crucial macroeconomic variable, lacks statistical significance at the 5% level. This positions it beyond the 95% confidence interval, indicating that inflation did not significantly impact economic growth throughout the model's estimation period. This may illustrate the intricacy of the inflation-growth relationship, wherein the impacts of inflation are frequently non-linear or contingent upon threshold levels.

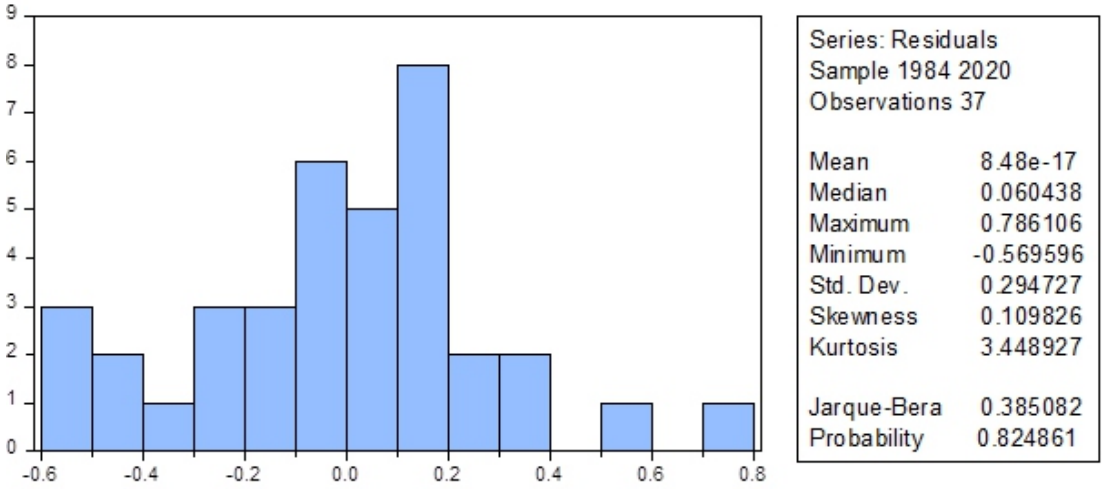
The initial lag of the balance of payments (D(BOP(-1))) demonstrates a positive and considerable impact on economic growth in the short term. An increase of one unit in the lagged balance of payments correlates with a 3.064902 unit rise in economic

growth. This outcome corresponds with past assumptions, as enhanced balance of payments circumstances may indicate augmented foreign earnings, investment inflows, or superior external sector performance—all of which positively impact national income.

The initial lag of trade openness is strongly correlated and statistically significant at the 5% level. This indicates that trade liberalisation and openness positively influence economic performance. A one-unit rise in the lagged value of trade openness leads to a 13.86488-unit increase in economic growth, ceteris paribus. This highlights the significance of international trade in augmenting productivity, facilitating technology transfer, and expanding access to broader markets—essential elements for a developing economy such as Nigeria.

The error correction regression confirms the significance of macroeconomic fundamentals in influencing economic growth in Nigeria. The results indicate substantial short-term dynamics and a considerable long-term adjustment mechanism, thereby providing critical policy implications for exchange rate management, trade liberalisation, and external sector performance.

i. Post estimation Test



Researchers assess the normality of regression residuals to evaluate the validity of regression analysis. This post-estimation test will enable the researcher to ascertain whether the estimated equation aligns with the fundamental assumption of ordinary least squares. With a Jarque-Bera statistic of 0.385081 and a corresponding probability value of 0.824861, we conclude that the residuals have a normal distribution.

ii. Serial Correlation Result. Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.718716	Prob. F(2,18)	0.5008
Obs*R-squared	2.736214	Prob. Chi-Square(2)	0.2546

We utilised the Breusch-Godfrey Serial Correlation LM Test to assess the serial independence of the error term. Considering the F-statistic of 0.718716 and the observed R-square of 2.736214, both of which are statistically insignificant with probability values of 0.5008 and 0.2546, we assert that there is no evidence of serial correlation in the study's residuals, leading us to conclude that the estimated equation is BLUE.

iii. Homoskedasticity Test Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.441272	Prob. F(16,20)	0.2175
Obs*R-squared	19.81482	Prob. Chi-Square(16)	0.2287
Scaled explained SS	7.089123	Prob. Chi-Square(16)	0.9715

To assess the equality of the residual variance, as mandated by the fundamental classical least squares assumption, we utilised the Breusch-Pagan-Godfrey heteroskedasticity test. This test serves as the antithesis of the homoskedasticity test and is crucial for evaluating the validity of classical least squares assumptions. The F statistic is 1.441272, the Obs*R-squared is 19.81482, and the scaled explained SS is 7.089123, with corresponding probability values of 0.2175, 0.2287, and 0.9715, respectively. Therefore, we ascertain that there is evidence of homoskedasticity in the residuals, and we determine that the estimated equation is BLUE.

Model Specification Test – Ramsey Retest Test
Omitted Variables: Squares of fitted values

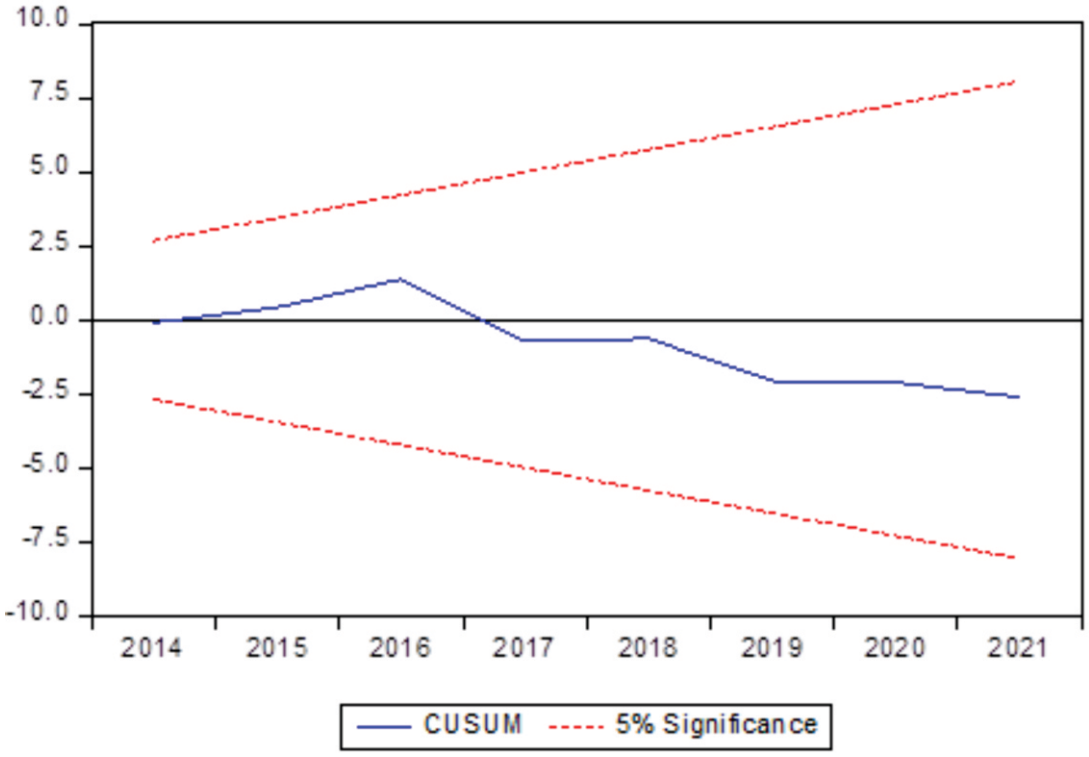
	Value	df	Probability
t-statistic	0.636019	19	0.5324
F-statistic	0.404520	(1, 19)	0.5324
Likelihood ratio	0.779481	1	0.3773

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.065190	1	0.065190
Restricted SSR	3.127098	20	0.156355
Unrestricted SSR	3.061909	19	0.161153

The model formulation for the investigation was performed using the renowned Ramsey Retest Test. This assessment allows researchers to evaluate the model's robustness. Concerning the model employed in this study, we ascertain that it is appropriately stated, as the probabilities of the t-statistic value of 0.636019 (0.5324), the F-statistic value of 0.404520 (0.5324), and the Likelihood ratio of 0.779481 (0.3773) exceeded the threshold of 0.05.

Model stability Test



To ascertain the stability of the model, the researcher employed the famous cusum plot of the series for visualization. A critical look at the graph above shows that the blue line falls within the red line's margin, which implies that the model is relatively

stable. By implication, the estimate is within the 95 percent confidence interval and should be accepted.

Summary, Conclusion, and Recommendations

Summary

This study analysed macroeconomic variables and economic growth in Nigeria. The chosen macroeconomic determinants included the inflation rate, exchange rates, and balance of payments for the study period from 1982 to 2020, with per capita income acting as the proxy for the dependent variable. Secondary data obtained from the Central Bank of Nigeria's statistical bulletin was used for analysis, adopting the stationarity test (Augmented Dickey-Fuller Test), the Johansen cointegration test, the lag selection test, over-parameterisation, and a parsimonious comprehensive error correction model. The regression research investigating the correlation between specific macroeconomic indicators and economic development in Nigeria offers significant insights into both the long-term equilibrium dynamics and short-term adjustments of the economy from 1981 to 2024. The normalised cointegration findings demonstrate the existence of a stable long-term link among the variables. Principal conclusions encompass:

A negative and statistically significant correlation exists between the exchange rate and per capita income. A one-unit appreciation in the exchange rate (i.e., a stronger naira) leads to an 8.7376-unit decline in economic growth, demonstrating the detrimental long-term effects of exchange rate volatility on the Nigerian economy.

Inflation (INFL): Inflation exerts a favourable and strong influence on long-term economic growth. A rise of one unit in inflation results in a 46.3211 unit increase in per capita income. This discovery corresponds with Keynesian theory, which posits that mild inflation can enhance demand and production.

Trade Openness (TOP): Trade openness exhibits a robust positive and statistically significant correlation with economic growth. An increment of one unit in trade openness leads to a significant rise of 430.5946 units in economic growth, highlighting the critical role of international commerce in Nigeria's sustained prosperity.

Balance of Payments (BOP): Despite the negative coefficient, its statistical insignificance suggests that, in the long term, BOP does not significantly impact economic growth.

The current exchange rate exerts a negative and severe short-term impact on economic growth. A one-unit appreciation diminishes growth by 1.9569 units; however, the third lag of the exchange rate has a positive and significant impact, suggesting mixed short-term and lagged reactions to fluctuations in the currency rate.

Short-term inflation lacks statistical significance, indicating that its impact on growth is more substantial in the long term.

The initial lag of the balance of payments (D(BOP(-1))) exerts a positive and considerable influence, contributing 3.0649 units to economic growth, hence corroborating the a priori expectation.

The first lag of trade openness is positively significant at the 5% level, suggesting that a one-unit increase in trade openness results in a 13.8649-unit rise in short-term economic growth.

Conclusion

This study has analysed the dynamic interplay between specific macroeconomic variables, namely, inflation rate, currency rate, trade openness, and balance of payments and economic growth in Nigeria, using per capita income as a proxy for growth from 1982 to 2020. The analysis employs rigorous econometric methods, such as the Augmented Dickey-Fuller test, the Johansen cointegration test, and an error correction model, revealing both long-term equilibrium relationships and short-term adjustment dynamics among the variables.

The principal findings indicate that exchange rate volatility adversely impacts economic growth, highlighting the susceptibility of the Nigerian economy to currency instability. In contrast, inflation demonstrates a beneficial long-term effect on growth, indicating that moderate inflation, in line with Keynesian economics, can enhance productive economic activities. Trade openness has proven to be a significant and beneficial factor for both short- and long-term prosperity, underscoring the necessity of Nigeria's inclusion in the global economy. The balance of payments, however trivial in the long term, exhibits a favourable short-term impact, especially via its delayed effect.

The study emphasises the essential necessity of successfully regulating macroeconomic factors to promote sustainable economic development. Policies designed to ensure exchange rate stability, sustain moderate inflation, promote international commerce, and strengthen external sector resilience would be crucial for Nigeria's long-term economic success.

Recommendations

From the conclusions drawn, the following recommendations are made:

i. Prioritise exchange rate stability through consistent and transparent monetary policy.
ii. Reduce dependence on imports to mitigate exchange rate volatility, particularly for essential goods.
iii. Strengthen foreign exchange reserves and manage capital flows to cushion against external shocks.
iv. The Central Bank of Nigeria should target a moderate inflation rate that supports demand without distorting macroeconomic fundamentals.

v. Adopt an inflation-targeting framework, with tools to distinguish between cost-push and demand-pull inflation to enable tailored policy responses.
vi. Reduce trade barriers and streamline customs procedures to encourage exports.
vii. Implement policies that diversify Nigeria's export base beyond crude oil, especially in agriculture, manufacturing, and services.
viii. Invest in infrastructure and trade logistics to enhance global competitiveness.
ix. Establish a macroeconomic coordination committee to ensure alignment between monetary, fiscal, trade, and exchange rate policies.
x. Strengthen data collection and economic modelling capabilities to support more responsive policymaking.

References

Abubakar, A. B., & Mamman, S. O. (2021). Permanent and transitory effect of public debt on economic growth. *Journal of Economic Studies, 48*(5), 1064–1083. https://doi.org/10.1108/JES-04-2020-0154

Acemoglu, D. (2009). *Introduction to modern economic growth*. Princeton University Press.

Açıkgöz, S., & Mert, M. (2014). Sources of growth revisited: The importance of the nature of technological progress. *Journal of Applied Economics, 17*(1), 31–62. https://doi.org/10.1016/S1514-0326(14)60002-7

Akpakpan, E. B. (1987). *Crossroads in Nigerian development*. New Generation Publishers.

Anderson, L. C., & Jordan, J. L. (1968). Monetary and fiscal action: A test of their relative importance in economic stabilization. *Monthly Review, Federal Reserve Bank of St. Louis*, *50*(November), 11–23.

Antwi, S., Mills, E. F., & Zhao, X. (2013). Impact of macroeconomic factors on economic growth in Ghana: A cointegration analysis. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *3*(1), 35–45.

Anyanwu, J. C. (2014). Factors affecting economic growth in Africa: Are there any lessons from China? *African Development Review*, *26*(3), 468–493.

Barro, R. J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy*, *98*(5), S103–S125.

Barro, R. J. (2004). Determinants of economic growth in a panel of countries. *Annals of Economics and Finance*, *4*, 231–274.

Belshaw, D., & Livingstone, I. (2002). *Renewing development in Sub-Saharan Africa: Policy, performance and prospects* (Vol. 1, p. 496). Routledge.

Bhaskara Rao, B., & Hassan, G. M. (2011). A panel data analysis of the growth effects of remittances. *Economic Modelling, 28*(1–2), 701–709. https://doi.org/10.1016/j.econmod.2010.05.011

Binns, T., Dixon, A., & Nel, E. (2012). *Africa: Diversity and development*. Routledge.

Biswas, S., & Saha, A. K. (2014). Macroeconomic determinants of economic growth in India: A time series analysis. *SOP Transactions on Economic Research*, *1*(2).

CAE. (2001). *Cameroon, country assistance evaluation*. The World Bank.

Chang, C., & Mendy, M. (2012). Economic growth and openness in Africa: What is the empirical relationship? *Applied Economics Letters*, *19*(18), 1903–1907.

Checherita-Westphal, C., & Rother, P. (2012). The impact of high government debt on economic growth and its channels: An empirical investigation for the Euro area. *European Economic Review*, *56*(7), 1392–1405.

Chirwa, T. G., & Odhiambo, N. M. (2020). Public debt and economic growth nexus in the Euro area: A dynamic panel ARDL approach. *Scientific Annals of Economics and Business, 67*(3), 291–310. https://doi.org/10.47743/saeb-2020-0022

Chitonge, H. (2014). *Economic growth and development in Africa: Understanding trends and prospects*. Routledge.

De Long, J. B., & Summers, L. H. (1992). Equipment investment and economic growth: How strong is the nexus? *Brookings Papers on Economic Activity*, *1992*(2), 157–212.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, *74*(366), 427–431.

Ehigiamusoe, K. U., & Lean, H. H. (2017). Macroeconomic variables, investment and economic development in Nigeria: A prognosis. *Journal of Economic Cooperation and Development, 38*, 145–168.

Fetahi-Vehapi, M., Sadiku, L., & Petkovski, M. (2015). Empirical analysis of the effects of trade openness on economic growth: An evidence for South East European countries. *Procedia Economics and Finance, 19*, 17–26. https://doi.org/10.1016/S2212-5671(15)00004-0

Heshmati, A., Maasoumi, E., & Wan, G. (Eds.). (2015). *Poverty reduction policies and practices in developing Asia*. Springer.

Ismaila, M., & Imoughele, L. E. (2015). Macroeconomic determinants of economic growth in Nigeria: A co-integration approach. *International Journal of Academic Research in Economics and Management Sciences*, *4*, 34–46.

Jhingan, M. L. (2007). *The economics of development and planning* (39th ed.). Vrinda Publications.

Johnson, O. E. G. (2016). *Economic diversification and growth in Africa: Critical policy making issues*. Palgrave Macmillan.

Kim, T. Y., & Heshmati, A. (2014). *Economic growth: The new perspectives for theory and policy*. Springer.

Lawal, A. I., Oseni, E., Lawal Adedoyin, B. B., Ise Olorunkanmi, J., Asaleye, A. J., & Inegbedion, H. (2022). Impact of macroeconomic variables on the Nigerian manufacturing sector. *Cogent Economics & Finance, 10*(1), Article 2090664. https://doi.org/10.1080/23322039.2022.2090664

Molua, E. (2010). *Assessment of trade facilitation and competitiveness of Cameroon's coffee sector: Implications for trade liberalization*. Department of Economics and Management, University of Buea, Cameroon.

Moutinho, V. M. F., & Madaleno, M. (2020). Economic growth assessment through an ARDL approach: The case of African OPEC countries. *Energy Reports, 6*(December), 305–311. https://doi.org/10.1016/j.egyr.2020.11.253

Nwanosike, D. U., Uzoechina, B., Ebenyi, G. O., & Ishiwu, V. (2017). Analysis of balance of payment trend in Nigeria: A test of the Marshall–Lerner hypothesis. *Saudi Journal of Business and Management Studies, 2*(4), 468–474. https://doi.org/10.21276/sjbms.2017.2.4.18

Phiri, A. (2013). Inflation and economic growth in Zambia: A threshold autoregressive (TAR) econometric approach. *The Bank of Zambia (BOZ) Reader*, *1*(8), 100–104.

Próchniak, M. (2011). Determinants of economic growth in Central and Eastern Europe: The global crisis perspective. *Post-Communist Economies, 23*(4), 449–468. https://doi.org/10.1080/14631377.2011.622566

Robson, G., & Lury, C. (2011). Making and measuring value: Comparison, singularity and agency in brand valuation practice. *Journal of Cultural Economy*, *4*, 439–445.

Rosenstein-Rodan, P. N. (1944). The international development of economically backward areas. *International Affairs, 20*(2), 157–165. https://doi.org/10.2307/3018547

Tambi, E. (1984). *Agricultural development policy and performance in Cameroon, 1960–1980* (PhD thesis). University of Pittsburgh.

Todaro, M. P., & Smith, S. C. (2011). *Economic development* (11th ed.). Pearson Education Limited.

Uniamikogbo, S. O., & Enoma, A. I. (2001). The impact of monetary policy on manufacturing sector in Nigeria. *The Nigeria Economic and Financial Review*, *3*(2), 37–45.

Van Dan, D., & Vu Duc Binh. (2018). Evaluating the impact of official development assistance (ODA) on economic growth in developing countries. In V. Kreinovich, S. Thach, & N. Trung (Eds.), *Beyond traditional probabilistic methods in economics* (pp. 910–918). Springer. https://doi.org/10.1007/978-3-030-04200-4_66

Wu, S., Wu, L., & Zhao, X. (2022). Impact of the green credit policy on external financing, economic growth and energy consumption of the manufacturing industry. *China Population, Resources and Environment, 31*(1), 96–107. https://doi.org/10.3969/j.issn.1003-2104.2022.01.010

Zafar, I., & Zahid, G. (2013). Macroeconomic determinants of economic growth in Pakistan. *The Pakistan Development Review*, *37*(2), 125–148.