Monetary Policy and International Trade: A Case Study of the Nigerian Economy

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Abstract

The Nigerian economic system attracts international investment, and it is important to understand how the country's policy relates to external capital inflows. In this case, the effectiveness of the monetary policy and international trade on the Nigerian economy is still a debatable issue, particularly related to the efficiency of the dependency mechanism. Accordingly, there is a need to check how monetary policy instruments improve the level of international trade for economic growth. This study examined the role of monetary policy and international trade on the Nigerian economy (1982-2021). The study used secondary time series data from the Central Bank of Nigeria, Statistical Bulletin, and the World Bank Development Indicators (2022). An auto-regressive distributed lag (ARDL) technique was employed in this study. Pre-estimation tests showed Interest rates (INTR), Gross capital formation (GCF), and Trade openness (OPNSS), were integrated of order zero, I(0). While GDP per capita (GDPk), Money supply (MS), and Exchange rates (EXR) were integrated of order one, I (1). The Error Correction Term (ECT) coefficient showed a 29 percent speed of adjustment (moderate), which implies a correctness level towards equilibrium from monetary policy and international trade activities of Nigeria's economy. Findings reveal that MS, INTR, and EXR, negatively but significantly affects the GDP per capita in the short run, while GCF and OPNSS was found to affect GDPk positively. Categorically, international trade has positively contributed to the economy. However, the monetary authority needs an efficient policy to stimulate money flow in the economy. Based on this result, the study recommends that government should put measures to place to stimulate the flow of money circulating in the economy in the short-term period. Nigeria can increase its GDP per capita performance by relying on its trade liberalization policy in all its manifestations and its global trade policy.

Keywords: Monetary Policy, International Trade, and GDP Per Capita.

1.0   INTRODUCTION

The underlying roles of monetary policy cannot be overemphasized in any open economy, specifically in terms of economic administration. Nigeria is included in the quest to accomplish and sustain macroeconomic goals, which highlights the crucial significance that monetary and trade policies play in both developed and developing nations

(Adegboyo et al., 2021). Any sensible government should strive to improve the living standards of its citizens across all significant economic policies, whether through monetary or fiscal policy. Additionally, these measures are mostly employed to maintain economic growth during times of calamity in order to stabilize it. For instance, the government of many economies uses monetary policy measures to address economic disparities and impact economic activity, notably by regulating the supply of money and credit and altering interest rates (Potter, 2019). This is necessary to preserve financial distortions, economic uncertainty, and overall demand.

Governments across the globe establish laws and policies to regulate and control the behavior of economic activities of their nations to create an enabling environment for economic growth and development. To promote economic growth and development in Nigeria, the Federal Government also develops policies and guidelines. One macroeconomic tool that countries (including Nigeria) employ to promote long-term economic growth and development is monetary policy. It comprises the government-initiated steps taken through the central bank of a nation with the intention of altering the price of goods and the accessibility of credit.

The central bank faces impediments in maintaining price stability by considering economic growth sustainability. The determinant of inflation is the supply and demand sides. Monetary policy posture through interest rates faces challenges in maintaining price stability because interest rates affect the economy from the demand side (Astuti, 2021). Various studies that have been done related to the impact of monetary policy on economic growth show different results.

The wider (global) market promotes economic growth that can upset price stability. In a progressively open world economy, a nation that is successful in its economy is a nation that has succeeded in speedily encouraging and sustaining the existence of international trade (UNCTAD. 2019). International trade is expanding due to the ease of transportation and information technology. Many advantages will be acquired because of global or external trade, involving obtaining commodities that cannot be manufactured domestically, profiting from specialization, and technology transfer (Elias *et al.*, 2018).

Nevertheless, external trade can impede high economic growth if a growing number of imports is not complemented by an increase in exports with a flat growth rate (Ijirshar, 2019). Decreased national income due to an increment in imports is more substantial than an increase in national income due to a rise in exports. Consequently, it will result in a slowdown in economic growth. Due to the swift integration of global financial markets, the study of international economics is growing. Businesses, consumers, and governments are gradually realizing how much their lives are impacted by global events in addition to those that occur locally. In a global era, a time of borderless world causes economic openness to influence economic growth and inflation. The larger market encourages economic growth that can disrupt price stability. In increasing globalization, a country that is successful in its economy is a country that has succeeded in rapidly stimulating the existence of international trade (Krugman, 2011). The simplicity of transportation and information technology has increased international trade. International trade will benefit many benefits, including obtaining goods that cannot be produced at home, specialization, and the transfer of technology (Makhmutova & Mustafin, 2017; Elias et al., 2018). But if the volume of imports does not coincide with an increase in exports with a flat growth rate, then international trade may become a barrier to rapid economic expansion (Ijirshar, 2019). Economic growth will slow down when the national income is reduced because of higher imports rather than when it is increased as a result of higher exports.

It is essential to note that international trade is accepted as an important facilitator for economic growth and development. For a developing nation like Nigeria, the role of trade in its overall economic growth is massively enormous owing largely to the noticeable fact that most of the vital elements for expansion such as technical know-how, capital goods, and raw materials are typically imported because of inadequate domestic supply (Emehelu, 2021). However, it is exceptionally vital to note that internal trade complements external trade since domestically produced goods are collected for export whereas imported goods are distributed within the country, sometimes into interior areas of the country.

The effectiveness of the monetary policy and external trade in the real economy is still a debatable issue, particularly related to the efficiency of the transmission mechanism. Traditionally monetary policy is seen as influencing private sector investment via three routes: namely the interest rate channel, the demand for money, and the credit channel. In less developed countries Kahn (2010) claims that underdeveloped financial systems and weak

interest rate responsiveness inhibit the use of the interest rate and demand for money channels due to limited applicability, while he contends that monetary policy is effective on the asset side of a financial intermediary balance sheet where it tends to have a greater impact.

Monetary policy deals with the flexible use of the money supply by monetary authority (CBN) and fiscal authority to attain the required economic goals (Nuhu, 2015). For periods of years now, the geometric increasing speed of long-term sustainable economic growth and development especially, through an increment in international trade as one of the foremost macroeconomic objectives has been the desired aim of every country in the world. Atuma and Eze (2017) understood the required policy guidance which includes the control of policy instruments. Categorically, such macroeconomic approaches that might be employed to actualize the above objective comprise mutual monetary and fiscal policies. Some of these policies are inseparable, apart from implementing authorities and instruments. Still, monetary policy seems more efficient in adjusting short-term macroeconomic maladjustments due to its rate of recurrence in applying and changing policy tools, the relative ease of its decision process, and the absolute nature of the area which proliferates its impact on the real economy. Monetary policy as explained by Nwoko (2016) is a form of Government attempting to oversee the money in its economy to achieve certain economic goals. There are two kinds of monetary policy, which are expansionary and contractionary.

An expansionary monetary policy is used each time the monetary authorities decide to reduce the cost of money or increase the supply of money in the economy to promote an increase in economic activities and to knock out poverty, recession, and deflationary gap (Nuhu, 2015). This can be accomplished with the act of buying securities in an open market, interest and discount rates lessening, relaxing credit controls, and reduction in reserve requirements. When the monetary authorities implement measures to restrict the amount of the money supply in order to cause a contraction in economic activity, this is referred to as contractionary or tight monetary policy. Contractionary policies have the impact of lowering inflation, which will also result in a decline in output, investment, and economic growth (Akpunonu and Orajaka, 2021). Depending on the goals of the economy, the government may go from contractionary to expansionary policies as necessary.

A significant question is raised by the way monetary policy is transmitted. Can the CBN always stabilize the economy using only its tools for monetary policy (the monetary policy rate and open market operations) regardless of the inflation rate at the time? The relationship between economic growth and monetary policy is inconclusive (Twinoburyo and Odhiambo, 2018). What measure should be considered as regards international trade effects on the Nigerian economy? Hence, investigating whether the maintenance impact of monetary policy depends on the price level is important because it improves the understanding of the effectiveness of monetary policy tools and relates external trade activities when it comes to the Nigerian economy in a downturn or expansion.

Several studies such as Bhat *et al.* (2019), and Anwar and Nguyen (2018) have been carried out on the impact of monetary policy on the performance of domestic investment, price level, or aggregate demand and supply, both within and beyond Nigeria. Odungweru (2021) cited the work of Aderibigbe (2004) and argue that because of the drastic fall in the oil market globally, economic conditions in Nigeria worsened and this brought about the introduction of the Structural Adjustment Programme. The monetary policy utilized during this time is the Open Market Operations (OMO). OMO is the principal indirect monetary policy instrument for fostering non-inflationary economic growth and development and other policy objectives. It is mainly the exchange of Treasury Security agency obligations and bankers' acceptances by the Central Bank in the financial marketplace to control the volume of cash flow and level of interest rates which in the long run will influence the money supply in the economy.

Nigeria is eventually an open economy with transnational businesses constituting a significant amount of its aggregate output. Yakubu (2015) stated that external trade provides both foreign exchange revenues and market incentives for accelerated economic growth. World Bank (2020) also contended that small economies have exceptionally small opportunities to attain productivity and efficiency gains to sustain growth. Without hitting a large market through international trade, Nigeria's comparatively large market can bolster growth but alone cannot produce sustainable growth at the level needed to guarantee macroeconomic firmness and societal development. In 2015, the monetary policy of the bank was formed to a great extent by unending market expectations of the normalization of US monetary policy, feeble worldwide growth, and deteriorating crude oil prices in the global market with its undesirable impact on the exchange rates and foreign exchange reserves, as well as the increased dangers from geopolitical pressures in a few portions of the world. Despite the Bank's tight monetary policy

throughout 2015, the decline in foreign reserves, depreciation of the currency, liquidity impact of election-related and post-election spending, impact of the insurgency in some regions of the nation, and other factors all put tremendous pressure on the domestic price level. Due to lower prices on the global market and decreased demand for Nigeria's crude oil abroad, the GDP growth decreased from 6.22 percent in 2014 to 2.79 percent in 2015. (CBN, 2015)

Accordingly, this study looked at the outcome of the direct and indirect periods of monetary policy and international trade in the Nigerian economy. Also, this study assessed the relationship between monetary policy instruments and money supply and exchange rate procedure which appear nonexistent in previous studies. Furthermore, the purpose of this study is to empirically evaluate the link between the key variables of monetary policy and international trade while the outcome of this study would further provide a guide for both government and policymakers to address the current persistent economic decline in Nigeria. Hence suitable monetary policies can be employed to attain sustained macroeconomic stability and appropriate international trade transactions may lead to gains for the economy. However, this study is interested to know, how does monetary policy improve international trade optimism on economic growth in Nigeria? The broad objective is to examine the nexus between monetary policy and international trade in the Nigerian economy.

The rest of this paper includes the literature review section discusses a comprehensive empirical review of the previous interrelated studies and the theoretical framework; follow by the methodology; data presentation and analysis section justify for empirical analysis of the dataset; and lastly, conclusions section clarifies the overall conclusion drawn from the study and policy recommendations.

2.0   LITERATURE REVIEW

2.1   Empirical Review

Several studies have articulated empirically the ways in which monetary policy and international trade can influence the economy of a nation.

The recognition of the objectives of a nation, undoubtedly, cannot be automatic or independent without the help of the government. Nevertheless, it requires policy guidance which involves the handling of policy instruments (Atuma & Eze, 2018; Inimino et al., 2019; Rahmon & Adefunke, 2019; Sakanko & Akim, 2021). Such macroeconomic approaches that could be employed to actualize the above aim encompass mutual fiscal and monetary policies. These policies are complex and separate from instruments and implementing authorities. Monetary policy may seem more effective in correcting short-term macroeconomic instabilities because of its frequency in modifying and applying policy instruments, its decision process easiness, and the sheer nature of the sector which circulates its effect on the real economy. Therefore, monetary policy is perceived as an essential tool by economists that every country can apply for the precise maintenance of exchange rate stability and domestic, as a very important form of attaining sustainable economic growth and development (Balogun, 2007).

Astuti & Udjianto (2022), determined the effect of monetary policy and international trade on economic growth and inflation in four ASEAN countries (Indonesia, Malaysia, the Philippines, and Thailand). The findings reveal that monetary policy has a negative relationship with economic growth in the short run and is positively related in the long run. Panel data analysis indicates the volatility of price as regards the effect of interest rates on inflation. Also, the impact of foreign trade on inflation indicates a positive change. An increase in aggregate demand and prices occurred because of the increase in exports. The implications of the results of the paper show that there is a need for policy coordination of monetary policy in the real sector to increase the effectiveness of the monetary policy.

Uzoma and Odungweru (2021), examined the effect of monetary policies on international trade in Nigeria covering the period from 1980 to 2017. International trade was measured by total trade whereas the explanatory variables including interest rate, money supply, inflation rate exchange rate, minimum discount rate, and cash reserve ratio, described the various macroeconomic policies in Nigeria. The ADF stationary test indicated that the variables in the study have a mixed order of stationarity (i.e., at level and first difference). The analysis depicts a long-run

relationship among the variables of interest. The results revealed exchange rate displays a positive and significant impact on Trade in the long run while the minimum discount rate shows a significant but negative impact on trade in the long run. Monetary authorities should ensure that the minimum discount rate is lessened, and supplementary naira depreciation should be stopped to permit the stability of the exchange rate.

Adegboyo et al. (2020) examine the effect of monetary, trade, and fiscal policy on economic development in Nigeria from 1985 to 2020. The outcome demonstrates that the factors cointegrate. The ARDL long-run outcome showed that economic growth stimulates fiscal measures, on the other hand, trade policies stifle Nigeria's economic growth. The government should therefore support the adoption of fiscal policy, which was found to be promoting the nation's growth rate.

Tanimu & Magaji (2020) examined the relative effectiveness of monetary policy instruments used in Nigeria using the VAR model. The analysis showed that one of the monetary variables (money supply) has a significant impact on the real economy of the sector. The result was that in Nigeria, the monetary policy system controls the real-sector economy. Also, the impact of shocks in the money supply on the real sector variables is similar and seems important. As regards this outcome, monetary policy regulators should use cash supply manipulation more frequently as a tool for improving Nigeria's real-sector economy.

Adediran, George, Alege, & Obasaju (2019) investigates how monetary policy eases the effect of external credit shock on the Nigerian economy between 1980 and 2015. A Cobb-Douglas production framework was adopted while cointegration and autoregressive distributed lag (ARDL) techniques were used to analyze the data. The findings show that a long run relationship exists among the variable. Portfolio and FDI investments from abroad are very common in the Nigerian economy. A quick halt can occur in the event of a bad credit shock coming from their international trading and financial partners. The coefficient of the Error Correction Term (ECT) confirms a speed of adjustment toward the equilibrium position at 23%. The study recommends structural reforms of monetary policy that can offset the adverse effect of external credit shocks.

Zhimin Li (2018) discussed international trade and economic growth. The study investigated how resource allocations within and outside of China are impacted by the country's economic march to the forefront. The model emphasizes how patterns of structural transformation and actual exchange rate dynamics are shaped by the subsistence sector. Using inter-regional trade and migration data, the "China shock" can be broken down into productivity shocks and trade shocks, demonstrating how the two elements mentioned above naturally result from the interplay between the labor market and observable productivity and trade cost shocks. According to research, while productivity growth is the main driver of structural change, joining the WTO accounts for around 35% of the gain in employment share and 20% of the rise in real wages in the manufacturing sector.

Ashamu (2018), examined bank lending and monetary policy in Nigeria's deposit money banks from 1981 to 2015. The study employed the Vector Error Correction Mechanism (VECM) for the analysis. The findings reveal that the crucial roles of banks in economic growth and development cannot be dismissed despite the adverse consequence of their failure or distress in the economy. To address such potential and managed the economy towards optimality, regulatory authority often adjusts monetary policy toward the desired economic position. This implies that changes in monetary policy create fluctuations in bank vigor and focus on factors such as monetary policy rate and bank capital that influence bank position to achieve a significant economic operation.

The impact of fiscal and monetary policies on the growth of Nigeria's economy by Ajayi and Aluko (2017). The estimation technique adopted for the study was Autoregressive Distributed Lag Model (ARDL). Findings that were drawn from the research indicate that money supply and government total expenditure and revenue have a significant impact on economic growth in Nigeria.

Nwoko et al. (2016) investigated the effectiveness of the Central Bank of Nigeria's monetary policies in fostering economic growth over the years 1990 to 201. The study used OLS regression to examine how several economic factors, including money supply, average price, interest rate, and labor force, affected the dependent variable GDP. The study's findings indicate that, while money supply was not important, average price and labor force have a considerable impact on GDP. Although the rate of interest shows a negative link, it is statistically significant.

Therefore, the recommendation implies that the Monetary Authority Policy would be a useful measure to lower lending rates, reduce unemployment, increase investment, and stabilize the economy.

2.2   Theoretical Review

i.   Keynesian Theory of Monetary Analysis and the Principle of Effective Demand

General Theory, the principle of effective demand of John Maynard Keynes, is itself a generalization of classical thoughts that he utilized in the Paper. The core of Keynes's perception is the recognition that a laissez-faire economy can settle into long-run equilibrium before full employment is achieved because businesses reach a limit to the profitable expansion of output. If such equilibrium is realized, an increase in aggregate demand will be discouraged, failing Say's Law. The effective demand principle summarizes why this happens. Keynes's building blocks for the principle of effective demand; liquidity preference, the marginal efficiency of capital, and the propensity to consume are overviews of the concepts of classical and reveal comparatively stable behavioral attributes of businesses and households. Keynes (1936) explains the relationship between interest rates and the marginal efficiency of capital. He stated, "Now those assets of which the normal supply-price is less than the demand-price will be newly produced; these will be those assets of which the marginal efficiency of capital would be greater…than the rate of interest, as the stock of assets is increased, their marginal efficiency tends to fall. Hence, a position is reached at which it no longer pays to produce them, unless the interest rate falls at the same rate".

ii.   Absolute Advantage Trade Theory

The book "Wealth of Nations" by Adam Smith (1776) entails the concept of absolute advantage that was developed earlier to establish how countries can benefit from trade by concentrating on manufacturing and exporting the goods that they have manufactured more proficiently than other nations and by importing goods from other nations produce more efficiently. In the absolute advantage theory, Adam Smith states that with free trade, nations can produce and export commodities that they might produce more proficiently than other countries and import those goods which it could produce less efficiently, eventually all countries benefit from these transactions. Similarly, Adam Smith also stated that absolute advantage means the ability of a state to produce a commodity at a lower absolute cost than another nation that produces the same commodity. In this hypothesis, labor is only a factor of production (Surbhi 2019; Smith, 1776).

iii.   The Harrod-Domar Growth Model

The pioneering Harrod-Domar (1939, 1946) model as cited by Eltis (1987) remains a critical reference in the economics of investment. It explains the role of ascertaining the investment rate required to attain a given rate of economic growth (Sakyi and Egyir, 2017). Similarly, an early pioneer of the AK model was the Harrod-Domar model. Nevertheless, the role of per capita income in economic growth is exceedingly questionable, which assumes that the aggregate production function has fixed technological coefficients:

$$Y = f(K, L) = \min\{\alpha K, \beta L\}$$

where α and β are the fixed coefficients. Technologically concerned, producing a unit of output requires I= α units of capital and I= β units of labor; if any of the variables fall short of this minimum condition there is no way to offset by substituting the other input. The contribution of international trade to sustainable development has attracted very little attention, in general. Sir Fredrick Harrods (1948) and Evsey Domar (1957) ascribed economic growth to total national savings and deterioration in capital stock. Prior to their investigations, the growth model was limited to the closed economy.

Empirically, numerous studies have looked at the connection between monetary policy and international trade as well as other economic variables, both inside and outside of Nigeria. Some of the literature reviewed did not consider the difference in time for economic activities to respond to monetary policy, this is important if vital policies are to be drawn from the conclusions and recommendations. Other studies have shown different results. Effective monetary policy will drive economic growth (Nwoko et al., 2016); monetary policy has a significant relationship with foreign trade, but trade openness encourages imports to impede economic growth and impact

inflation (Uzoma, 2021). This study fills the research gap by combining factors that affect investment inflows and economic growth, in previous studies only analyzed factors that affect economic growth (Tanimu and Magaji, 2020; Nwoko et al., 2016; Adegboyo *et al.* 2020); Adegboyo *et al.* 2020; Odungweru 2020) and international trade (Ashamu 2018; Odungweru 2020) separately. Additionally, besides the separate study of the impact of monetary policy on economic growth and its effect on international trade, this study will incorporate monetary policy and international trade's effect on the Nigerian economy as different from Astuti & Udjianto's (2022) study that involves four different countries. This study seeks to employ more recent data and consider other determining factors not addressed in the previous studies. Also, the study explicitly accounts for Nigeria's fixed assets, using gross capital formation. Expenditures on additions to the economy's fixed assets, as well as net changes in the level of inventories, make up this (World Bank, 2020).

2.3   Theoretical Framework

This study hinged on the AK growth model of the Harrod-Domar and Cobb-Douglas production functions. This theory is intuitively relevant to assessing how and the extent to which Nigerian monetary policy incentives on productivity induced its economic engagements. It is expressed as:

$$Y = \lambda LK \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (1)$$

where Y = Output, λ = technical progression, L = labor, K = capital stock.

Equ. (2) is expressed as (divide equ. 1 by L):

$$y = \lambda k \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (2)$$

where k is the capital per labor, and λ is the fixed technical coefficient. Thus, Equ. (3) becomes

$$\lambda = f(MP, INT) \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (3)$$

Where:

MP: Monetary policy

INT: International trade

3.0   Methodology

The study assumes that policies induce the progression or retraction of an economy, such that monetary policy and trade policy influence economic growth in Nigeria. This study modified the model specified by Adegboyo et al. (2021) to determine monetary policy and international trade on economic growth in Nigeria. As such the model for this study is specified thus, by substituting (3) into (2)

$$y = f(MP, INT)k \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (4)$$

Equ. (3) indicates the monetary policy and international trade.

The choice of the model specification is borne out of the fact that it covers some of the strategic variables that are prevailing in the economic setting of Nigeria. For example, the money supply (M2) accounts for savings deposits, money market funds, deposits, and time deposits. Hence, the monetary policy to enhance the economy during a recession can be tapped into bank deposits and savings. Likewise, interest and exchange rates policy are vital instruments that should induce more investment. Trade openness and the export of commodities capture international trade. They measure the flow of goods and services and how it aids the progression of the economy.

The framework for this study included the capital (k) function in the AK growth model of the Harrod-Domar and Cobb-Douglas production functions. Hence, gross capital formation captures the capital asset measurement.

$$y = f(MS, INTR, EXR, OPNSS, EXP)k \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.. (5)$$

expressing Equ. (5) in econometrics form

$$GDPk_t = a_0 + a_1MS_t + a_2INTR_t + a_3EXR_t + a_4OPNSS_t + a_5K_t + u_t\dots\dots\dots\dots\dots\dots\dots\dots (6)$$

Where:

GDPk: gross domestic product per capita, MS: money supply (M2), INTR: interest rate, EXR: exchange rate, OPNSS: trade openness, K: capital formation, α_0 to α_5 = parameters, u = residual term.

Because some of the coefficients in Equation (6) are in the billions, they must be changed to have the same appropriate coefficient. As a result, the variable that has a value in billions would be logged, resulting in the log-linear model form shown in Eq. (7).

$$LGDP_t = a_0 + a_1LMS_t + a_2INTR_t + a_3LEXR_t + a_4LOPNSS_t + a_5LGCF_t + u_t\dots\dots\dots\dots..(7)$$

3.2   Sources of Data

Secondary data from the World Bank and CBN Statistical Bulletin were used in the study. Annual time series data covering the years 1982 through 2021 are used in the study. In Table 1, the definition and calculation of variables in relation to the source are shown.

Table 1: Source and Meaning of Data

Variable	Explanation	Meaning	Source
GDPk	Gross domestic product per capita	GDP/population	WDI
MS	Broad money supply	M2 is a measure of the money supply that includes cash, checking deposits, and easily-convertible near money.	CBN Bulletin
INTR	Interest rate	Real interest rate	WDI
EXR	Exchange rate	Official exchange rate LCU/US$	WDI
OPNSS	Trade openness	The amount of products and services exported and imported, expressed as a proportion of GDP, is referred to as a trade.	CBN Bulletin
GCF	Gross capital formation	Involves expenditures for raising the economy's fixed assets as well as net changes in inventory levels.	WDI

Source: Author's compilation, 2022

4.0   Data Presentation

4.1 Descriptive Statistic

Table 2: Descriptive Statistics

|	LGDPk	LMS	INTR	EXR	LGCF	LOPNSS
Mean	5.419554	6.814692	2.111346	1.610356	12.92927	13.17932
Median	5.379536	7.219874	4.326392	2.060095	12.92495	13.13677
Maximum	5.585854	8.680187	18.18000	2.763378	13.11032	13.61908
Minimum	5.298939	4.257525	-31.45257	-0.171687	12.75304	12.82840
Std. Dev.	0.106994	1.530161	9.642214	0.840388	0.089576	0.222379
Skewness	0.318027	-0.520532	-1.098317	-0.828811	-0.035233	0.120863
Kurtosis	1.402271	1.782891	5.129686	2.535845	2.204845	1.678143
Jarque-Bera	4.928837	4.275284	15.60127	4.938582	1.062061	3.009563
Probability	0.085058	0.117933	0.000409	0.084645	0.587999	0.222066
Sum	216.7822	272.5877	84.45384	64.41423	517.1708	527.1728
Sum Sq. Dev.	0.446460	91.31435	3625.920	27.54381	0.312932	1.928639
Observations	40	40	40	40	40	40

Source: Eviews output 2022

Table 2 illustrates the descriptive statistics which include the mean, median, maximum value, minimum value, standard deviation, skewness, kurtosis, Jarque-Bera, sum, and the sum square deviation of the variables under consideration which include GDPk, MS, INTR, EXR, GCF, and OPNSS respectively. It is demonstrated that there were 40 observations across all variables considered. OPNSS's mean value is greater than its median value, which is followed by GCF and MS, indicating that the distributions are skewed to the right and indicating that Nigeria's trade openness, gross capital formation, and money supply (M2) are all below their average values. The table also showed that GCF and INTR had the lowest and highest standard deviation values, respectively, indicating that GCF is the variable that is the most stable and INTR is the variable that is the most unstable. Furthermore, every variable—aside from INTR, which is leptokurtic—is platykurtic because its kurtosis value is smaller than three. Since all variables' probability values satisfy the normality threshold according to the Jarque-Bera test, all variables—with the exception of INTR—are normally distributed.

4.2 Trend Analysis

Graphically, the trend analysis (Figure 1) showed that interest rate, gross capital formation, and trade openness showed an unstable trend. These trends could be attributed to the fact that there are fluctuations in the flow of rate of interest and fixed asset expenditures (e.g., roads and railways construction) of both positive and negative in the economy i.e., unfavourable government policies. As well as trade openness, which portrayed instability. It can be observed that the trend analysis showed that the rate of GDP per capita displays a relatively upward trend, the trend of GDPk showed that per capita income fluctuated unsubstantially in past years from 1984 to 2000, and started increasing between 2002 and 2015, then wavering again till recent. However, it recorded its highest value between 2014 and 2015, this was attributable to the government policies in favour of domestic investment in capital assets in Nigeria during that period. The trend analysis depicts an upward trend of money supply and exchange rate, this is because of an increment in public financing through expansion means, while exchange may be attributed to the constant change, based on supply and demand. The perceived value of possessing a currency, whether for investment purposes or to pay for goods and services, determines whether it is more in demand than another.

Figure 1: Trend of Data Set
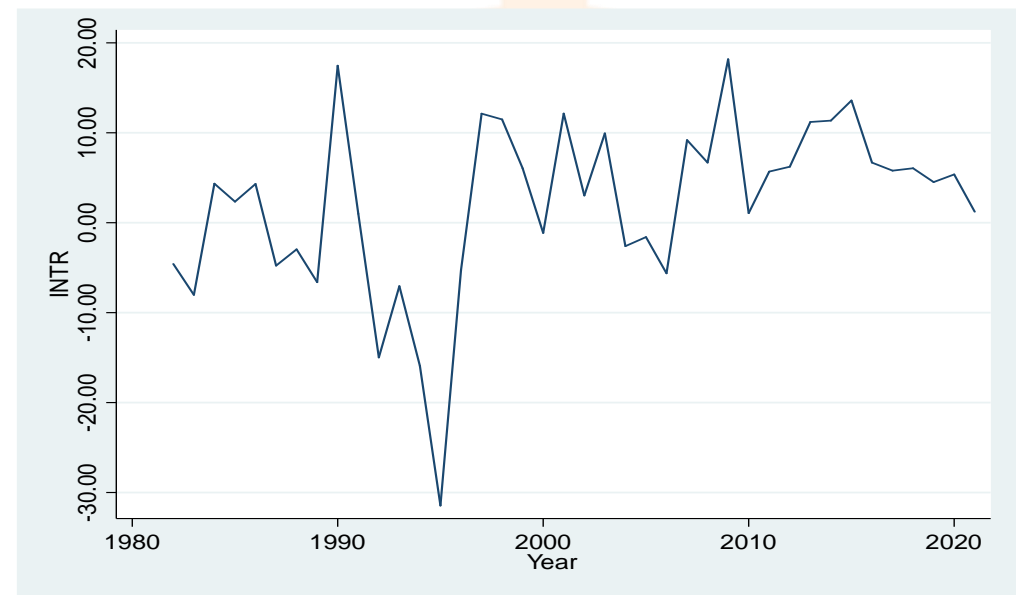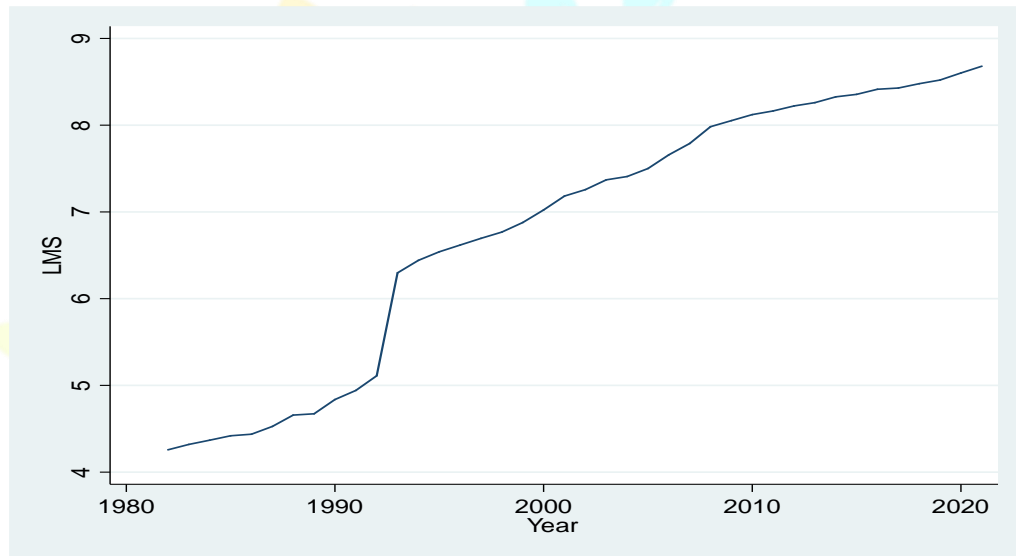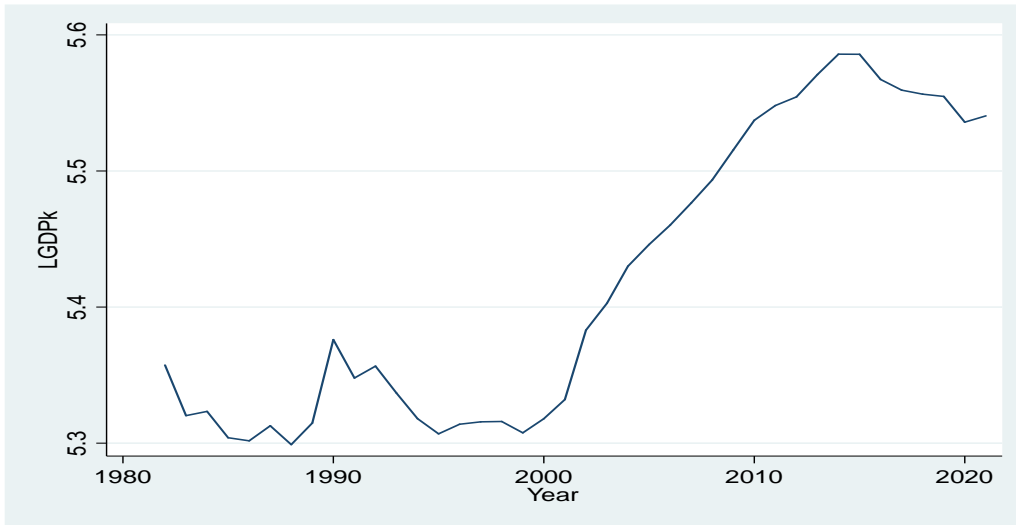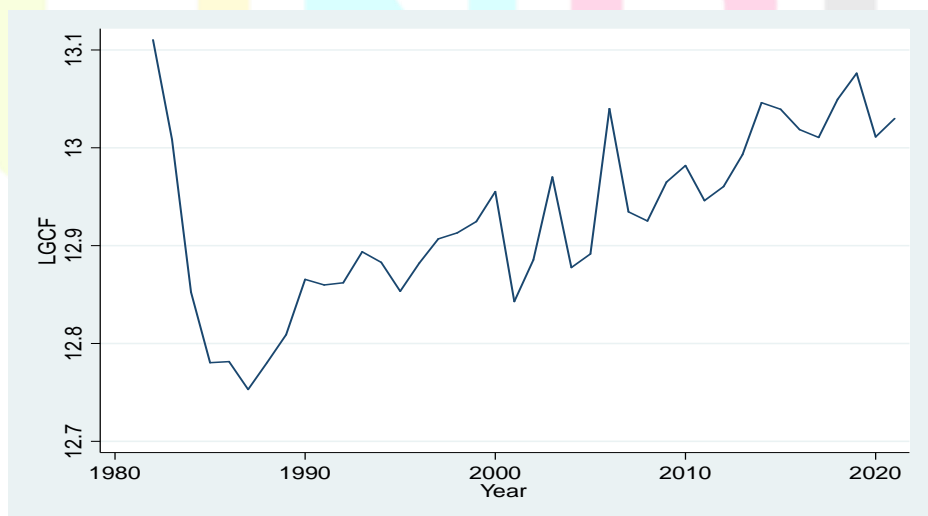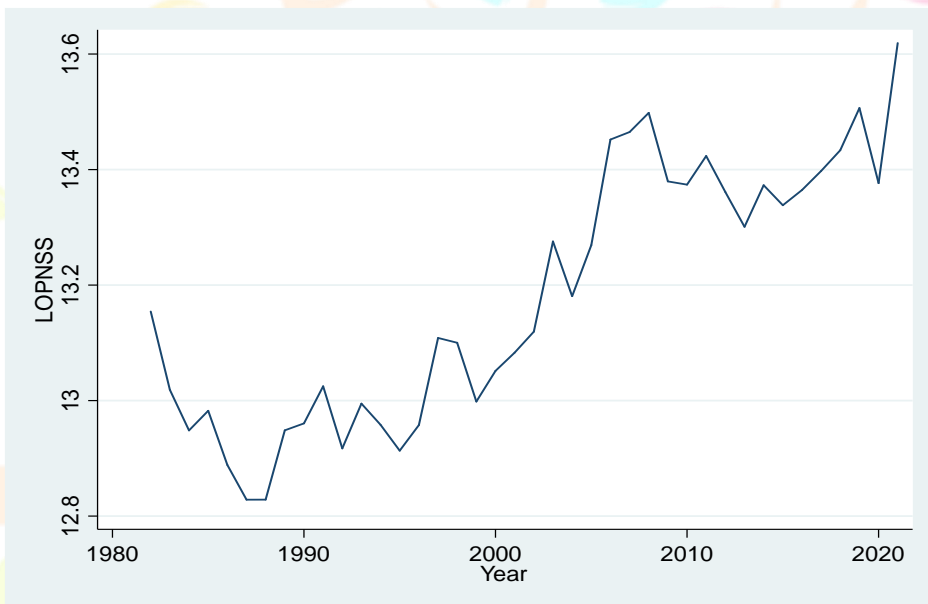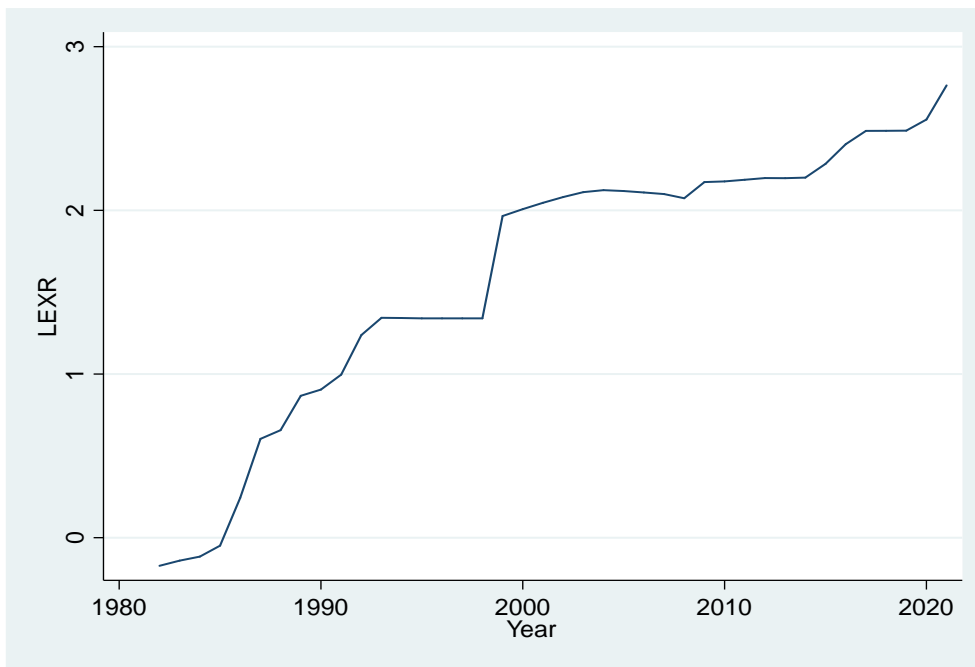
Source: Stata, 2022

4.3 Data Analysis

Table 3 Phillips-perron unit root test

Variable	PP-test	t-critical value @5%	Order of Integration	Interpretation
LGDPk	-5.40	-3.548	I(1)	Stationary @1st diff.
LMS	-5.460	-3.548	I(1)	Stationary @1st diff.
INTR	-4.226	-3.544	I(0)	Stationary @ level
EXR	-5.494	-3.548	I(1)	Stationary @1st diff.
LGCF	-5.884	-3.544	I(0)	Stationary @ level
LOPNSS	-3.752	-3.544	I(0)	Stationary @ level

Source: Author's computation, Stata, 2022.

The Phillips-Perron unit root test result from Table 2 established that at a 5 percent level of significance, the data series of Gross Domestic Product (GDPk) per capita, broad money supply (MS), and Exchange rate (EXR) were all stationary at first difference i.e. integrated of order one, I(1). While real interest rate (INTR), gross capital formation (GCF), and trade openness (OPNSS) were stationary at level i.e. integrated of order zero, I(0).

The next step is to estimate the model's parameters to see how they affect the dependent variable after the stationarity level of the variables has been established. In light of this, the empirical model essentially advanced by these studies offers a dynamic link between GDP per capita and the explanatory variables. Due to the estimating method's ability to account for variables with varying degrees of stationarity, the ARDL technique will be used in this study.

4.4 Autoregressive Distributed Lag Model (ARDL)

$$\Delta LGDPk_t = a_0 + a_1 LGDPk_{t-1} + a_2 LMS_{t-1} + a_3 INTR_{t-1} + a_4 LEXR_{t-1} + a_5 LOPNSS_{t-1} + a_6 LGCF_{t-1} + \sum_{i=1}^{h} \delta_{1i} \Delta LGDPk_{t-1} + \sum_{i=1}^{h} \delta_{2i} \Delta LMS_{t-1} + \sum_{i=1}^{h} \delta_{3i} \Delta INTR_{t-1} + \sum_{i=1}^{h} \delta_{4i} \Delta LEXR_{t-1} + \sum_{i=1}^{h} \delta_{5i} \Delta LOPNSS_{t-1} + \sum_{i=1}^{h} \delta_{6i} \Delta LGCF_{t-1} + u_t \ldots\ldots\ldots\ldots\ldots(8)$$

The variables have been defined previously,

δ_1 to δ_6 = short run vector parameters

a_1 to a_6 = long run vector parameters

Δ = first difference operator

h = length of the optimal lag

a_0 = intercept

u_t = error term

Equation 8 shows the ARDL framework equation to give a better understanding relationship among the variables. The bound test for cointegration is mainly based on the joint F-statistic whose asymptotic distribution is non-standard under the null hypothesis of no cointegration (Pesaran et al., 2001).

Lag Length Order Selection Criteria Result

It is necessary to select the optimal lag that best suits our analysis in order to avoid biased results. This lag length gives the appropriate, excellent, and robust output compared to other lag lengths. The lag length is (2, 1, 1, 1, 2, 4)

Table 4 Bound test for cointegration

	Value	Significance Level	I(0)	I(1)
F-statistic	4.615	10%	2.26	3.35
K	5	5%	2.62	3.79
		2.5%	2.96	4.18
		1%	3.41	4.68

Source: Author's Compilation, Eviews 2022

Table 4 result shows that there is an existence of a long-run relationship among the variables as they cointegrate. The first level is considered on the assumption that all variables included in the ARDL model are integrated of order zero, whereas the second one is intended on the assumption that the variables are integrated of order one. The null hypothesis of no cointegration is rejected when the f-statistic value exceeds the upper crucial limits value, whereas it is accepted when the f-statistic value is lower than the lower boundaries value. The cointegration test is uncertain under various conditions.

ARDL Long Run Regression
Table 5 presents the ARDL long-run analysis, established from the below equation 9

$$\Delta LGDPk_t = a_0 + \sum_{i=1}^{g} a_1 \Delta LGDPk_{t-1} + \sum_{i=0}^{h^1} a_2 \Delta LMS_{t-1} + \sum_{i=0}^{h^2} a_3 \Delta INTR_{t-1} +$$
$$\sum_{i=0}^{h^3} a_4 \Delta LEXR_{t-1} + \sum_{i=0}^{h^4} a_5 \Delta LOPNSS_{t-1} + \sum_{i=0}^{h^5} a_6 \Delta LGCF_{t-1} + u_t \dots\dots\dots\dots\dots(9)$$

Table 5 Long-run parameter estimates
Dependent Variable: LGDPk

Variable	Coefficient	t-Stat
LMS	-0.297	-0.56
INTR(-1)	0.019	0.51
EXR(-1)	1.524	0.54
LGCF(-1)	-10.623	-0.70
LOPNSS(-1)	1.522	0.50

Source: Author's Compilation, Stata 2022.

The results from Table 5 shows a 1% change causes a 0.297% decline in the economy, ceteris paribus, the supply of money (MS) was also discovered to have a negative impact on Nigeria's current GDP per capita. This suggests that inflation happens over the long term when the monetary base is expanded by the government more quickly than the economy. In this case, a country's economy suffers because the amount of money in circulation has increased more than the number of products produced. Gross capital formation (GCF), a measure of capital stock, has also had a negative impact on GDP per capita; for example, a 1% shift in GCF significantly reduced GDP per capita by 10.623%. This suggests that GCF eventually subdues the Nigerian economy. It shows that the money put aside for maintaining the nation's productive assets has not been used effectively and that economic productivity is declining. For instance, the Ajaokuta Steel Plant in Kogi State, which is meant to produce final goods of iron and other related materials for intermediate use or final consumption as well as possible exportation, has become ineffective and unproductive due to its non-functioning activities, even though the government continues to spend on it. Because of this, the importation of finished goods made from such material has cost the country money that could have gone toward projects aimed at its development and progress.

On the other hand, the ARDL long run regression result reveal that in the long run, there exists a positive relationship between interest rate and the level of income in the economy. Moreover, 1% change in the rate of interest will cause the GDP per capita to increase by 0.019%, ceteris paribus. When interest rates are rising, both businesses and consumers will cut back on spending to decrease the rate of price in circulation. This will cause earnings to fall and stock prices to drop. This implies that the increase in the rate of interest can decelerate inflation and ensure sustainable growth. If the interest rates are too high, economic growth could be undesirably influenced. In a similar vein, exchange rate and trade openness positively affect the income level in Nigeria, i.e., a 1% increment in the exchange rate and trade openness will trigger an improvement in the economy by approximately 1.521% and 1.522%, respectively (See Table 5). This implies that the policy of exchange rate in Nigeria promotes economic growth, likewise, the level of importation and exportation in the country has helped in stimulating the level of income.

ARDL Short Run Regression

The Error Correction Model which is also the short run model, and the speed of adjustment is estimated with equation 9

$$\Delta GDPk_t = a_0 + \sum_{i=1}^{g} a_{1i}\Delta LGDk_{t-1} + \sum_{i=1}^{h1} a_{2i}\Delta LMS_{t-1} + \sum_{i=1}^{h2} a_{3i}\Delta INTR_{t-1} + \sum_{i=1}^{h3} a_{4i}\Delta LEXR_{t-1} +$$
$$\sum_{i=1}^{h4} a_{5i}\Delta LOPNSS_{t-1} + \sum_{i=1}^{h5} a_{6i}\Delta LGCF_{t-1} + \gamma EC_{t-1} + u_t \ldots\ldots(10)$$

Where EC$_{t-1}$= Error Correction Term

Table 6 ARDL ECM
ARDL (2, 1, 1, 1, 2, 4)

Variable	Coefficient	t-Stat
Cons	4.721	2.71***
DLMS (-1)	-0.006	-0.46
DINTR(-1)	0.0003	0.80
DEXR(-1)	-0.042	-1.57*
DLGCF(-1)	0.448	3.83***
DLOPNSS(-1)	-0.072	-1.53*
ECT(-1)*	-0.039	-0.56
R-squared	0.722	
Adj. R-squared	0.487	
D.W	1.97	

Source: Author's Compilation, Stata Output, 2022. t-Statistic in parentheses, ***,**, & * signify 1%, 5%, & 10% significance level, respectively.

According to the result in Table 6, the money supply (M2) short-run result did not significantly differ from the long-run result. The short-run outcome demonstrates that, at a 10% level of significance, the money supply is not statistically significant at first lag. Economic growth is 0.0063% slower when the money supply (M2) is increased by 1%. It's possible that the amount of money in circulation causes commodity prices to rise, which in turn inhibits production and consumption and impedes Nigeria's economic progress. According to the ECM, a 1 percent change in the interest rate and currency rate will noticeably reduce the GDP per capita by 0.0024 and 0.0857, respectively, at lag 1. This suggests that the interest rate may short-term disrupt Nigeria's economic growth. This analysis supports the Keynesian liquidity preference theory. This suggests that a higher interest rate discourages investment, which eventually has a negative impact on the economy's productivity and production. The GDP per capita will rise by 0.1061 percent as a result of a shift in trade openness at lag 2, nevertheless. implying that the short-term economic growth of the nation is stimulated by the free trade (trade policy). In the long run, it is consistent with the outcome.

The alternative hypothesis will be accepted at a 1% significance level for gross capital formation (GCF). The capital stock in the short run was found to be positively related to the GDP per capita income, i.e., a percentage change in

GCF will stimulate the income level of the economy by 0.06 percent. This shows that if there is a higher inflow of capital stock into the economy, the gross domestic product per capita income of Nigeria will be higher.

The EC_{t-1}, was significant at 5% with feedback of 29.06 percent, indicating a 29% sizable speed of adjustment of disequilibrium correction for reaching long-run equilibrium steady state position. Thus, it suggests the endogenous variables are converging towards equilibrium.

The fitness of the model is confirmed by the coefficient of determination and its adjusted value which are 98% and 96% respectively.

Diagnostic Test

Table 7

Test	statistic	p-Value**
Normality	0.4386	0.8030
Serial Correlation	0.9728	0.4397
Heteroscedasticity	06573	0.7991

Source: Author's Compilation, Eviews Output, 2022. ** denotes 5% significance level.
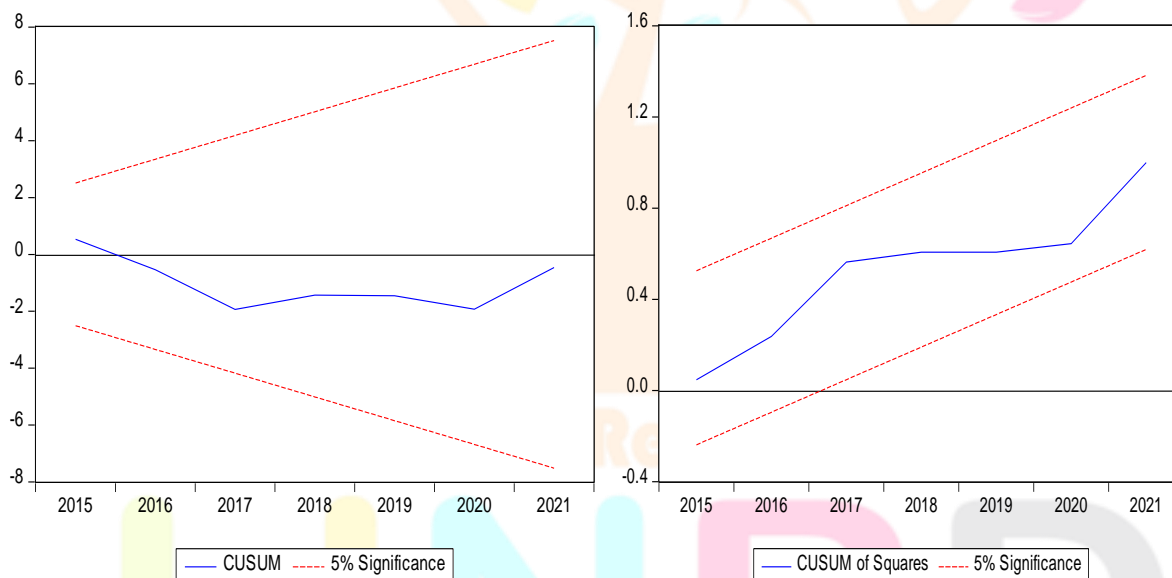

Figure 2. CUSUM and CUSUMSQ

Table 7 displays the diagnostic test results of the ARDL regression to examine the reliability of the estimated parameter coefficients. The estimated model passed the normality, autocorrelation, and heteroskedasticity test at 5% significance level. Moreover, the CUSUM and CUSUM test of the model at 5% affirms the stability of the long run and short run outputs (See Figure 2).

5.0 Conclusion

This study examines the role of monetary policy and international trade on the Nigerian economy. It extends the empirical framework used in the literature to incorporate other economic determinants at the provincial level such

as money supply, interest rate, exchange rate, trade openness, and gross capital formation. Using an annual data sample of 40-year in Nigeria during 1982–2021.

In this study, the result shows that the role of monetary policy (i.e., broad money supply) in influencing per capita income in Nigeria applies in both the short term and long term. The central bank can actively implement monetary policy to stimulate economic growth. However, these policies cannot be long-term as they may be disadvantageous, which can endanger the economy. The interest rate on the other hand drives the per capita income level of the economy, and this is in line with some preceding studies. The increase in income level in the long run from the higher investment demand will eventually raise interest rates. This occurs because an increase in income increases the demand for money. Because the supply of money remains unchanged, an increase in interest rates is necessary to bring the money market back into balance. The exchange rate was also found to be positive and negative in the short and long term. Hence, higher interest rates attract external wealth and trigger the rise in the exchange rate.

Furthermore, the openness to trade affects the per capita income of gross domestic product in Nigeria in the short term and in the long term positively. A going-forward-oriented policy can be a policy strategy that can encourage economic growth. precisely, an increasingly open economy will also increase market opportunities for the exportation and importation of commodities, thereby, giving room for competition, and eventually efficiency in the long term. Increasing the competitiveness and efficiency of domestic production is a prerequisite so that exportation can be increased. International trade via the mean of foreign technologies can as well give room to innovations and drive for a more effective means of production. A progressively international trade, seen from the indicator of an increase in the share of an open economy to GDP, shows a positive impact on the income level of the economy in a relatively long time but may cause an increase in inflation. International trade policies are needed to increase the competitiveness of domestic goods in the global market.

Evidently, this study documented an unprecedented surge in fixed assets of the economy, as the analysis displayed in the short run a positive effect of the gross capital formation on the GDP per capita income. Several reasons have been given to explain the positive significant contribution of gross capital formation to the growth of the Nigerian economy in the short run period. It primarily raises per capita income and increases purchasing power, both of which lead to more effective demand. Second, increased investment results in higher productivity. However, GCF was positive, but insignificant in the long run. This implies that depreciation of capital and the fixed asset has set in, making the GCF not to be significant in the long term.

5.1   Recommendations

Having examined the role of monetary policy and international trade on the Nigerian economy, the following recommendations were made:

i.   Government should implement measures through the monetary authority to increase the flow of money in the economy over the short term.

ii.   There is a need for an effective interest rates policy to respond to the rising inflation in Nigeria to stabilize the economy and restore equilibrium in the money market in the short term.

iii.   Monetary authority should maintain and stabilize a good market-driven exchange rate policy to encourage local production that will lead to an increase in export which in turn will result to increase in the income level of the economy.

iv.   Nigeria can increase its GDP per capita performance by relying on its trade liberalization policy in all its manifestations and, on its global trade policy.

v.   The ongoing reforms in the Security and Exchange Commission (SEC) should be continued and pursued to the latter in the capital market. This is because it is apparent that the existence of a well-developed and efficient fixed asset will contribute to the objective of rapid and sustainable growth.

Suggestion for further findings

The Gross Capital Formation is used to measure stock of capital asset in a country. It was found to have a negative impact on the GDP per capita of Nigeria in the long run in this study. This is a contradictory theory, and further study is suggested.

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