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Regulating Gross Domestic Product and Balance of Payment in Nigeria Through Monetary Policy

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ABSTRACT: This study examines the relevance of monetary policy instruments on macroeconomic goals in Nigeria with yearly time series data gathered between 1985 and 2023. The data are sourced from CBN (2024), NBS (2023) and WDI (2021). The unit root test confirmed a mix integrated results of order 1(0) and 1(1) while the bound test of co-integration revealed that all the models have long run association. The Autoregressive Distributed Lag (ARDL) techniques were employed for the empirical analysis and the empirical results confirmed that from the real gross domestic product (RGDP) model**,** interest rate and money supply (MS) positively impacted gross domestic product. The balance of payment model revealed that interest rate and money supply have significant impact on Nigerian balance of payment. From the foregoing, the findings call for policies such as expand financial inclusion and credit facilities for productive sectors such as manufacturing, agriculture, and technology to boost domestic investment. Secondly reduce dependence on oil revenues by promoting industrialization, renewable energy, and non-oil exports to safeguard the economy from oil price volatility. Thirdly ensure moderate interest and inflation rates through sound monetary policies that balance inflation control with investment promotion. Also stabilize the exchange rate through stronger foreign reserves and export diversification, while managing liquidity via effective CRR and open market operations. Lastly pursue export-led growth, infrastructure development, and coordinated fiscal–monetary policies to improve the balance of payments and sustain external stability.

KEYWORDS: Monetary Policy, Real Gross Domestic Product (RGDP), Balance of Payments (BoP), ARDL Approach, Economic Growth, Interest Rate, Nigeria

1. INTRODUCTION

The primary aims of macroeconomics are to enhance living standards and ensure consistent economic growth. These aims are supported by additional objectives such as decreasing unemployment, increasing productivity, and ensuring balance of payment equilibrium, among others. The restructuring of macroeconomic policies can fundamentally be viewed as the modifications undertaken by governments and economic managers to ensure the achievement of critical macroeconomic objectives, thereby transforming the economy for sustainable development. Economic growth signifies an increase in goods, services, and improved living standards, frequently indicated by a rise in GDP. As noted by Todaro & Smith (2020), it demonstrates an economy's capacity to produce more over time, which is essential for enhancing living standards and alleviating poverty. For example, the Nigerian Economic Sustainability Plan (NESP) seeks to stimulate growth through focused investments in agriculture, technology, and renewable energy (Onah, Yua & Adekwu, 2024). Important elements include job creation and inflation. Sufficient infrastructure enhances productivity, while education and health contribute to innovation (Idris & Mhmah, 2017). The GDP growth rate serves as the principal indicator of economic growth. Unemployment occurs when individuals who are eager to work are unable to secure jobs. It serves as a significant indicator of economic problems, often resulting from recessions or shifts in industry. Blanchard & Johnson (2021) state that it is a crucial macroeconomic measure that reveals inefficiencies within the labor market, frequently due to economic downturns, structural changes in industries, or insufficient labor demand. The various types of unemployment include cyclical, structural, frictional, and seasonal, each requiring tailored policies (Fields, 2008). A primary macroeconomic objective is to reduce unemployment, which can be achieved through job creation and training initiatives (IMF, 2023). The European Employment Strategy emphasizes the importance of creating jobs, enhancing skills, and promoting labor mobility (Okun's Law, 1962). Additionally, lowering interest rates can stimulate investment and job growth. Typically, economic expansion leads to an increase in

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job opportunities (Okun's Law). Employment levels are influenced by factors such as minimum wage, job security, training deficiencies, and inflation.

A nation's economic health is primarily assessed by its production of goods and services, with higher production linked to a better standard of living. Economic growth, measured by gross domestic product (GDP), reflects an increase in output influenced by investment, technology, productivity, and labor force size. Full employment, a key macroeconomic goal, does not mean everyone is working, as some choose not to or may be temporarily unemployed. This objective can be affected by recessions, limited job openings, and skill mismatches. The third macroeconomic goal is to keep prices stable. Rising average prices, known as inflation, reduce purchasing power and can be caused by excessive money supply, increased demand, or supply shocks like natural disasters.

Monetary policies aim to create a favorable environment for sustainable economic growth by adjusting the cost of credit, thereby influencing business investments, household spending, and aggregate demand (Amabuike, 2018). In times of recession, central banks often lower interest rates or engage in quantitative easing to stimulate the economy. Japan, faced with prolonged economic stagnation, has relied on aggressive monetary easing policies to stimulate demand and foster economic growth. Although not a primary focus, some central banks also consider the impact of their policies on exchange rates, which can influence trade balances. A weaker currency can boost exports by making them cheaper on the global market. For example, the Swiss National Bank has intervened in foreign exchange markets to prevent excessive appreciation of the Swiss franc, which could harm its export-oriented economy. By managing the currency value, central banks can help support a balanced current account position and protect export competitiveness (Lucas, 1972). An expanding collection of research, including works by Bukonla, Sheriffdeen, and Bolade (2024), along with several other studies, have suggested that monetary policy influences the balance of payments. This research aims to examine the impact of monetary policy instrument of money supply and lending rate, on macroeconomic objectives in Nigeria. Consequently, this study intends to address these gaps by providing a thorough empirical analysis of the effects of monetary policy on macroeconomic goals, including economic growth, and a favorable balance of payments in Nigeria.

The stability of the balance of payments (BoP) is essential for a nation's economic well-being. A stable BoP allows a country to fulfill its international financial commitments without incurring unsustainable debt. Ongoing trade deficits or surpluses can create imbalances that impact exchange rates and overall financial stability. As noted by Krugman & Obstfeld (2009), imbalances in the BoP can result in fluctuations in exchange rates and necessitate vigilant oversight to prevent currency crises. According to Terra (2015), the balance of payments encompasses all international transactions of a country and is an integral part of the National Account system, which tracks economic activities through a standardized accounting framework among nations. Miller & Tatom (2022) describe the balance of payments as a record of a country's trade in goods, services, and financial assets with the global community. This trade is categorized into meaningful segments that summarize a nation's trading activities. The balance of payments serves as a comprehensive account of all economic transactions between a country's residents and the international community. This document provides a detailed account of all receipts related to exported goods, services provided, and capital received by residents, as well as payments made for imported goods and services received from capital transferred to non-residents or foreigners. The balance of payments is categorized into the capital account balance, which records all international transactions involving a resident of the country that either increases their assets or liabilities with a resident of another country, and the financial account, which tracks the flow of funds to foreign countries through various investments such as real estate, business ventures, and foreign direct investments.

The Nigerian government, through the Central Bank of Nigeria (CBN), has implemented various policies to achieve key macroeconomic goals like economic growth, unemployment reduction, inflation, and improved balance of payments. For instance, after the 2016 recession, the CBN lowered interest rates to stimulate growth by enhancing domestic investment and consumption (Akinlo & Adejumo, 2016). The CBN also supports job creation with initiatives like the Anchor Borrowers Programme (ABP), which provides affordable loans to farmers, particularly during economic downturns such as the 2015-2016 oil price drops, thus aiding economic diversification and reducing unemployment (Alimi, 2018). To combat inflation during currency depreciation and rising food prices, the CBN often raises interest rates (Fry, 2016). In 2023, the CBN adopted a flexible exchange rate system to alleviate balance of payments pressures (CBN Annual Report, 2024). The main objectives of these policies are to ensure inflation and sustainable economic growth, alongside full employment and stable long-term interest and exchange rates. The CBN recognizes that achieving these goals may involve trade-offs (CBN, 2007). Nigeria has launched several initiatives to shift its economy towards sustainable development through structural changes. The Structural Adjustment Program (SAP) began in 1986 to diversify the economy and optimize resource use. In 2004, the National Economic Empowerment and Development Strategy (NEEDS) was introduced to achieve macroeconomic stability, reduce poverty, generate wealth, and create jobs. Despite the implementation of these policies and interventions aimed at improving Nigeria's macroeconomic objectives, the intended outcomes were not fully realized. Recent research underscores Nigeria's persistent economic growth challenges, primarily due to oil price volatility and insufficient diversification (Akinlo & Adejumo, 2016). While the country is recovering from the recession of 2016, growth remains slow and is impeded by structural issues like poor infrastructure and heavy reliance on oil exports (CBN, 2020). Unemployment exceeds 3.0%, with a lack of job opportunities in both formal and informal sectors, exacerbated by low industrial activity and inadequate investment in human capital. Initiatives like the Anchor Borrowers Programme have shown limited success in reducing unemployment, indicating a need for more effective job creation and skill development strategies (Alimi, 2018).

2.0 THEORETICAL FRAMEWORK

The Neoclassical Growth Theory is most prominently associated with Robert M. Solow and Trevor Swan, who independently developed the Solow-Swan Growth Model in 1956. Their work is regarded as one of the most influential contributions to the study of long-run economic growth. Supporters of the theory emphasize its clarity in explaining how labor, capital, and technology collectively drive economic expansion. They also value its distinction between short-run and long-run equilibrium, showing that while capital and labor determine short-run output, long-run growth ultimately depends on technological progress. The theory assumes that output is produced using a Cobb-Douglas production function (**Y=AK^aL^b**) where output (Y) depends on capital (K), labor (L), and technology (A). It further assumes diminishing marginal returns to capital

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and labor when each input increases individually, but constant returns to scale **F[aK,aL]=aF[K,L]** when both rise proportionately. Technology is treated as an exogenous factor, meaning it improves independently of economic forces. The model also assumes a fixed savings rate, constant capital depreciation, and an exogenous population growth rate. These assumptions allow the model to analyze how savings, investment, and technology influence economic equilibrium. However, endogenous growth theory emerged in the mid-1980s as economists became dissatisfied with growth explanations that relied on exogenous technological progress, particularly those in the Solow–Swan model. Key contributors such as Paul Romer (1986, 1990, 1994) and later Barro and Sala-i-Martin advanced a framework in which long-run economic growth stems from internal factors within the economy. These theorists emphasized that growth results from purposeful investment decisions, especially those related to knowledge creation, innovation, and human capital development. Their work established endogenous growth theory as a major alternative to neoclassical models. Endogenous growth theory assumes that long-run economic expansion arises from internal mechanisms such as innovation, human capital accumulation, and knowledge spillovers. Unlike exogenous models, technological progress is determined by economic agents' decisions and by public policy interventions. Models such as Romer's R&D framework and the AK model illustrate these assumptions by allowing constant or increasing returns to capital, removing the diminishing returns that limit growth in neoclassical theory. The AK model, a simplified form of a Cobb-Douglas production function, captures this by assigning an output elasticity of capital equal to one, allowing capital accumulation to generate sustained growth.

The Elasticity Approach was developed by Abba P. Lerner and Edwin Cannan, drawing on earlier classical insights from economists such as David Ricardo and John Stuart Mill, who explored the relationship between exchange rates and trade flows. Later scholars, including Ronald McKinnon and J. Marcus Fleming, refined the approach by incorporating more detailed analyses of international price adjustments. Together, these contributors shaped a framework explaining how exchange rate changes influence a nation's trade balance through the responsiveness of export and import demand to price movements. The theory is grounded in the Marshall–Lerner condition, which states that a currency devaluation will improve the balance of payments if the sum of the absolute price elasticities of demand for exports and imports exceeds one. This requires that demand for exports rises sufficiently when prices fall and that demand for imports contracts when domestic prices rise. The approach assumes flexible exchange rates, competitive markets, homogeneous goods, and the presence of adjustment lags caused by contract rigidities and delayed behavioral responses. Under these assumptions, exchange rate movements influence trade flows primarily through relative price changes. The Elasticity Approach suggests that currency devaluation can improve a country's balance of payments, but only if the Marshall–Lerner condition is met. Policymakers may consider depreciation as a tool for correcting trade deficits, provided export and import elasticities are favorable. The theory implies that countries should enhance the elasticity of their exports through improved quality or competitive pricing and reduce reliance on elastic imports, possibly by developing domestic substitutes. It also underscores the importance of recognizing adjustment lags, indicating that trade improvements may take time to materialize. Although useful, the approach advises caution, as the effectiveness of devaluation depends on real-world market responsiveness rather than automatic outcomes.

2.1 Empirical Evidence

Adenikinju (2020) conducted an in-depth investigation into the impact of monetary policy dynamics on economic growth in Mozambique, utilizing a time series dataset covering the period from 1990 to 2021. By employing the ARDL (Auto-Regressive Distributed Lag) methodology, the study analyzed the influence of key monetary policy variables, including money supply, exchange rate, real interest rate, and inflation, on Mozambique's GDP. The findings revealed that monetary policy plays a significant role in shaping economic growth in Mozambique. Specifically, the study found that an increase in money supply and a favorable exchange rate positively contribute to GDP growth, highlighting their critical role in economic expansion. Conversely, higher real interest rates and inflation were shown to have adverse effects on GDP, underscoring the importance of stabilizing these variables to sustain growth. These results emphasize the need for balanced and targeted monetary policy measures to support long-term economic development in Mozambique. adetiloye (20222) investigates whether monetary policy exerts long-term effects on economic growth in Nigeria, analyzing annual data from 1985 to 2021 through the ARDL regression approach. The study employs money supply, interest rate, and exchange rate as proxies for monetary policy to explore its sustained influence on the economy. Challenging the conventional view that monetary policy impacts are predominantly short-term, the findings suggest that monetary policy can indeed have enduring effects on economic growth. Specifically, the study highlights how monetary policy influences investment decisions, facilitates capital accumulation, and enhances productivity, particularly through money supply and interest rate mechanisms. This research underscores the strategic role of monetary policy in fostering sustained economic development in Nigeria. Moroney (2022) examines the impact monetary policy on economic growth in developing countries through an extensive literature review. The study explores the effectiveness of monetary policy in promoting economic growth and evaluates various factors influencing this relationship. Key findings reveal that traditional economic models often overlook the activities of central banks in developing economies, leading to gaps in understanding their role. The review highlights the significance of central bank profitability, monetary unions, and central bank independence as critical factors affecting the success of monetary policy in these regions. Additionally, it identifies mixed outcomes in the literature, with some studies affirming a positive impact of monetary policy on growth, while others suggest limited or negligible effects. This work underscores the complexity of monetary policy dynamics in developing countries and calls for more nuanced and region-specific analyses. Michaels & Awan (2023) examine the role of monetary policy transmission mechanisms in driving economic growth across South Asian countries using panel data analysis. Their study underscores the importance of the banking sector in transmitting policy effects, particularly through interest rate, credit, and asset price channels. The findings reveal that effective monetary policy transmission lowers borrowing costs, thereby stimulating investment and consumption, which in turn promotes economic growth. Moreover, the authors emphasize strengthening banking sector efficiency to ensure that policy adjustments translate into tangible macroeconomic outcomes and sustainable growth. However, while their research provides valuable insights for South Asia, it leaves a notable gap regarding how these transmission mechanisms operate in African economies, particularly Nigeria where structural rigidities, high inflation, exchange rate volatility, and weak financial intermediation may alter the effectiveness of monetary policy. Addressing this gap is crucial for understanding context-specific dynamics and designing policies tailored to Nigeria's economic environment. Ishaq & Bibi (2023) examine the impact of monetary policy on economic growth

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in BRICS nations (Brazil, Russia, India, China, and South Africa) from 1992 to 2021 using advanced econometric techniques (panel Data analysis). Their findings reveal that interest rate adjustments play a central role in shaping economic growth within these rapidly developing economies. Lower interest rates promote economic activity by reducing borrowing costs, while higher rates deter investment and consumption, slowing growth. The study underscores the significance of monetary policy as a key driver of economic performance in the BRICS nations. Asongu & Nwachukwu (2023) analyze the interplay between monetary policy, financial inclusion, and economic growth in 34 African countries from 2004 to 2020. Using panel data analysis, they explore how monetary policy through interest rates, money supply, and regulatory measures affects financial inclusion and its subsequent impact on economic growth. The study finds that effective monetary policy, particularly lowering interest rates and increasing money supply, significantly boosts financial inclusion by expanding access to financial services for individuals and businesses. Increased financial inclusion, in turn, fosters economic growth by enabling investments, job creation, and higher economic output. The authors emphasize the importance of targeting underserved groups, such as women and rural populations, to maximize the benefits of financial inclusion. They advocate for coordinated strategies that integrate monetary policy with financial inclusion initiatives to drive sustainable economic development across Africa. Omotayo (2022) examines the effect monetary policy on economic growth in Nigeria from 1980 to 2020 using the Autoregressive Distributed Lag (ARDL) model. This approach captures both short-term and long-term dynamics between key monetary policy instruments money supply and interest rates and economic growth. The study emphasizes the importance of monetary policy in shaping economic outcomes, particularly in developing economies like Nigeria with evolving financial systems. The findings reveal that the money supply has a significant long-term impact on economic growth, as increased liquidity facilitates investment and consumption, essential for development. Interest rates also play a critical role; lower rates encourage borrowing and investment in productive sectors, fostering growth, while higher rates can deter investment and slow economic activity. Omotayo's work underscores the need for carefully calibrated monetary policies to drive sustainable economic growth in Nigeria. Abbas & Raza (2022) analyze the impact monetary policy on economic growth in Pakistan from 1970 to 2018, using a robust econometric framework and time series data. The study investigates how monetary policy tools, such as interest rates and money supply, influence Pakistan's GDP growth. The findings show that changes in interest rates significantly impact economic growth, as they affect borrowing costs for consumers and businesses, influencing spending and investment. Additionally, an increase in the money supply is positively correlated with GDP growth, as it enhances liquidity, facilitating investment and consumption. However, restrictive monetary policies, characterized by high interest rates or a tight money supply, can dampen economic activity. Abbas and Raza emphasize the importance of effective monetary policy in maintaining economic stability and argue that policymakers should adopt a proactive approach to managing interest rates and money supply. A well-implemented monetary policy can create a favorable environment for investment and sustainable economic growth in Pakistan. Jahan & Sharma (2023) investigate the effect monetary policy on economic growth in the Middle East and North Africa (MENA) region, using a comprehensive panel dataset from 2000 to 2019. The study focuses on how stable monetary policy frameworks, particularly controlled inflation and interest rates, contribute to economic growth. Using advanced econometric techniques, the authors analyze the impact of monetary policy instruments such as interest rates and money supply on the growth trajectories of MENA economies. The findings highlight that a stable monetary environment is crucial for sustained economic growth. When central banks manage inflation and interest rates effectively, it fosters investment and economic expansion. In contrast, high inflation and volatile interest rates can hinder growth by discouraging investment and consumption. Khan and Ali emphasize that central banks in the MENA region should adopt proactive monetary policies responsive to changing economic conditions. A well-structured monetary policy should not only control inflation but also support broader economic goals, such as job creation and increased productivity. Durdana & Anul (2021) explore the role of monetary policy in fostering economic growth and stability, focusing on its impact on inflation. The study uses data from the World Development Indicators (WDI) and the State Bank of Pakistan for the period 1981 to 2014. It identifies the inflation rate as the dependent variable and employs liquidity ratio, broad money supply, and reserve ratio as independent variables. The researchers use the Augmented Dickey-Fuller (ADF) test to assess the stationarity of the variables and apply the Autoregressive Distributed Lag (ARDL) model for data analysis. The findings indicate that money supply has a positive effect on inflation rates, and an increase in the reserve ratio also contributes to higher inflation. The authors recommend that monetary policy should create a conducive investment environment by offering reasonable interest rates and effective liquidity management. Okoh (2022) conducted a comprehensive exploration of the impact of monetary policy on economic growth across various countries, offering an extensive survey of both theoretical and empirical literature on this critical relationship. The paper examines numerous studies conducted across different nations and time periods, revealing a spectrum of findings. Some studies suggest that monetary policy has little to no effect on economic growth, while others underscore its pivotal role in driving economic performance. The paper identifies several factors that influence the effectiveness of monetary policy, including the degree of central bank independence, the selection and application of monetary policy instruments, and the unique economic conditions prevailing in individual countries. By synthesizing diverse perspectives, the study provides valuable insights into the complexities and varying outcomes of monetary policy's role in fostering economic growth globally. The research by Aslam & Awam (2018) investigates the impact of monetary policy on economic growth in Pakistan using time series data from 1972 to 2015. The study focuses on variables such as real GDP, employed labor force, gross capital formation, foreign direct investment, broad money, GDP deflator, and exports. Employing a multiple regression method and correlation techniques, the authors examine the long-run relationships between monetary policy and these variables. The findings reveal that monetary policy significantly affects inflation, money supply, employment, gross capital formation, foreign direct investment, and savings. The authors recommend that central banks should have the autonomy to formulate and implement monetary policy while ensuring coordination with fiscal policy for effective economic management.

Bukonla, Sheriffdeen, and Bolade (2024) examine the impact of monetary policy on balance of payments (BOP) adjustment in Nigeria, covering the period from 1980 to 2012. The study employs the bound testing approach to analyze the relationship between monetary policy variables such as money supply, domestic credit, inflation, and exchange rate and output growth, trade balance, and BOP adjustment in Nigeria. The findings reveal a long-run relationship between these variables and the adjustment of the balance of payments. Specifically, the study shows that in the long run, money supply and trade balance positively influence BOP adjustment, while domestic credit, exchange rate, inflation rate, and GDP have a

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negative impact on BOP in Nigeria. Notably, the research highlights that money supply has a more significant long-term effect on BOP adjustment compared to other monetary policy variables. Based on these findings, the authors recommend that the Central Bank of Nigeria focus on balancing money supply and demand to stabilize the country's BOP position and avoid price distortions. Alley & Baffoe (2023) investigate the effect monetary policy, inflation, on the balance of payments in Ghana, with a focus on the roles of key monetary policy variables such as interest rates and exchange rates. Using data from 1980 to 2021, the authors employ Cointegration analysis and the Error Correction Model (ECM) to examine both the short- and long-term dynamics between these variables. The study finds that monetary policy has a significant impact on Ghana's balance of payments, particularly through interest rate and exchange rate adjustments. Additionally, external factors such as fluctuations in commodity prices and global economic conditions are shown to play a substantial role in influencing the country's balance of payment . The results highlight the complexity of managing Ghana's balance of payments, where both domestic policy actions and external shocks must be carefully considered to ensure economic stability. Ogundipe & Adetola (2023) examine the impact of monetary policy on Nigeria's balance of payments, with a particular focus on the key variables of interest rates, money supply, and exchange rates. The study uses data spanning from 1980 to 2021 and applies the Vector Autoregression (VAR) model to estimate the relationships between these variables. The authors find that monetary policy, especially adjustments to the exchange rate, plays a crucial role in influencing Nigeria's balance of payments. They highlight that effective exchange rate management and targeted control of the money supply are essential for maintaining stability in Nigeria external sector. The study underscores the importance of coordinated monetary policy actions in mitigating external imbalances and fostering sustainable economic growth. Proso, Inaya, & Okoye (2023) investigate the impact of monetary policy, specifically money supply, interest rates, and exchange rates, on Nigeria's balance of payments over the period from 1980 to 2021. The study utilizes Ordinary Least Squares (OLS) regression to analyze the data. The results reveal that money supply and interest rates have a significant relationship with the balance of payments, aligning with the expected theoretical outcomes. However, the exchange rate was found to be statistically insignificant in influencing the balance of payments during the period studied. This suggests that, in the Nigerian context, while money supply and interest rate policies are important for managing the balance of payments, exchange rate adjustments may not have the same level of impact. Barajas et al. (2023) analyze the impact of quantitative easing (QE) on the balance of payments in advanced economies. They find that QE can significantly enhance the financial account by attracting foreign investments due to lower interest rates and increased liquidity. However, they also caution that prolonged QE could lead to asset bubbles, where asset prices exceed their intrinsic value due to excessive liquidity and speculation. These bubbles can cause exchange rate volatility and destabilize the balance of payments if investor sentiment reverses. The study aligns with previous research, emphasizing that while QE can stimulate short-term economic activity and financial stability, its potential long-term risks, such as asset market imbalances and currency fluctuations, require careful management by policymakers to ensure sustainable outcomes Beyer & Dovern (2022) analyze the impact of interest rate fluctuations on balance of payments, revealing a significant relationship between interest rates and capital inflows. Higher interest rates attract foreign investment, strengthening the capital account. However, they also raise borrowing costs for domestic businesses and consumers, reducing investment and consumption, which negatively affects the current account. The study emphasizes the need for a balanced interest rate approach, as policymakers must consider both the benefits of foreign investment and the potential harm to domestic economic growth. This research aligns with the Mundell-Fleming model, highlighting the role of capital mobility and exchange rate regimes in balance of payments stability. Chakraborty & Ghosh. (2023) examine the impact of credit control measures by central banks on the balance of payments. Their analysis shows that tight credit policies reduce domestic consumption and imports, leading to short-term improvements in the current account balance. However, they warn that these policies can hinder long-term economic growth by limiting business investment and consumer spending. While credit controls can address balance of payments issues, they must be carefully implemented to avoid negatively affecting economic development. The study supports findings from other research on the trade-off between short-term balance improvements and long-term growth potential. Baffes et al. (2021) highlighted the importance of monetary policy in managing exchange rates for balance of payments stability. Their research shows that flexible exchange rate regimes help economies adjust to external shocks, such as commodity price fluctuations or changes in capital flows. These systems align currency values with economic fundamentals, promoting efficient resource allocation and competitiveness. Flexible exchange rates provide a buffer against external shocks, improving economic resilience and stability, especially in volatile global environments. Their findings align with other studies that suggest exchange rate flexibility enhances balance of payments sustainability and economic stability. Nwanosoke et al. (2017) tested the Marshall-Lerner hypothesis by examining whether a nominal devaluation of the exchange rate improves Nigeria's balance of payments. Their study found that, in the short run, the hypothesis was not supported, as there was a negative relationship between the exchange rate and the balance of payments. This suggests that a devaluation of the exchange rate did not immediately lead to improvements in Nigeria's external sector. However, the study also found that money supply played a positive role in improving the balance of payments position over the period considered, indicating that monetary policy, particularly adjustments in money supply, had a more significant impact on Nigeria's balance of payments than exchange rate changes during the period analyzed. Nwosa & Oghoghomeh (2017) investigate the influence of monetary policy on Nigeria's balance of payments, focusing particularly on the roles of interest rates and exchange rate policies. The authors employ the ARDL (Autoregressive Distributed Lag) bounds testing approach to analyze time-series data spanning from 1981 to 2015. Their findings highlight that interest rates and exchange rate policies are crucial monetary tools that significantly impact Nigeria's balance of payments. The results suggest that the Central Bank of Nigeria's monetary policy plays a critical role in managing both the capital and current accounts, demonstrating the importance of effective monetary policy in stabilizing the external sector. By utilizing the ARDL approach, the study reveals both short-term and long-term dynamics between monetary policy variables and the balance of payments in Nigeria. This analysis contributes to understanding the link between monetary policy actions and external sector performance in emerging economies like Nigeria Mishkin (2016) examine the impact of monetary policy on India's balance of payments, concentrating on the influence of exchange rates and foreign reserves. Using time series data from 1991 to 2015, the authors employ the Structural Vector Autoregressive (SVAR) model to analyze the interactions between monetary policy tools and the balance of payments. The study finds that India's balance of payments is highly sensitive to shifts in monetary policy, particularly the central bank's adjustments to interest rates and its interventions in the foreign exchange market. These policy actions are shown to have a significant impact on capital flows and the

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current account. The research emphasizes the central role of monetary policy in managing external sector stability in India, as changes in the policy environment can significantly alter the dynamics of foreign reserves and exchange rate movements Ilyas et al., (2010) assess the impact of monetary policy on Pakistan's balance of payments, focusing on the role of exchange rates and interest rate policies in shaping the country's external sector dynamics. Using the Autoregressive Distributed Lag (ARDL) model, the authors examine both short-term and long-term relationships between these monetary policy variables and the balance of payments, using data from 1985 to 2013. The study finds that exchange rate management and interest rate policy have significant effects on Pakistan's external sector, underlining the critical role of central bank interventions in ensuring the stability of the balance of payments. The results emphasize that effective monetary policy, particularly in managing exchange rates and interest rates, is essential for sustaining external sector stability in Pakistan. The ARDL approach allows for a nuanced understanding of the immediate and long-term impacts of monetary policy actions on Pakistan's balance of payments, offering valuable insights for policymakers aiming to improve economic stability. Levin & Piger (2022) explore impact monetary policy on the balance of payments in Nigeria, focusing on the period from 1986 to 2013. Using the Error Correction Model (ECM), the study identifies key monetary policy variables namely exchange rate, money supply, and domestic credit to the private sector as critical determinants of balance of payments stability in Nigeria. The results suggest that fluctuations in these variables significantly influence the country's external sector. Based on their findings, the authors conclude that the balance of payments in Nigeria is primarily a monetary phenomenon, emphasizing the important role of monetary policy in maintaining external sector stability.

3. MODEL SPECIFICATIONS

a. For GDP

Based on the above theoretical framework, the study presented the model of Michaels and Awan (2023) with modification based on the main objective of the study. Michaels and Awan (2023) study specified and generalized monetary policy instruments as money supply, and interest rate. In the present study, we captured the role of human development index, oil revenue and domestic capital formation as the other policy variables that are sacrosanct to control the activities of the real sector and adjusting economic growth. From the foregoing, the model is presented as follows:

Mathematically, Michaels and Awan RGDP model was casted as

RGDP = MS, INT 3.1

The present study recast Michaels and Awan (2023) model as follows

RGDP = *f*(INTR, INF, HDI, ORGDP, DCF) 3.2

Transforming equation 3.2 to a natural logarithm equation, gives us:

$\log RGDP = b_0 + b_1 TINTR + b_2 INFR + b_3 HDI + b_4 ORGDP + b_5 \log DCF + \mu$ 3.3

Stochastically, the model becomes:

$$RGDP_t = \alpha_0 + \sum_{t=i}^{p} \alpha_{1i} \Delta RGDP_{t-1} + \sum_{t=i}^{p} \alpha_{2i} \Delta INTR_{t-1} \sum_{t=i}^{p} \alpha_{3i} \Delta INF_{t-1} + \sum_{t=i}^{p} \alpha_{4i} \Delta HDI_{t-1} + \sum_{t=i}^{p} \alpha_{5i} \Delta OR_{t-1}$$

$$+ \sum_{t=i}^{p} \alpha_{6i} \Delta DCF_{t-1} + \beta_1 RGDP_{t-1} + \beta_2 INTR_{t-1} + \beta_3 INF_{t-1} + \beta_4 HDI_{t-1} + \beta_5 OR_{t-1} + \beta_6 DCF_{t-1} + \varepsilon_t \quad 3.4$$

Where:

RGDP = Real Gross Domestic Product, INTR= Interest Rate, INF= Inflation, HDI= Human Development Index, OR= Oil Revenue, DCF = Domestic Capital Formation, β_0 = regression constant, $\beta_1 - \beta_5$= regression coefficients, *A priori expectations*, $f(\beta_1) < 0$; $f(\beta_2) > 0$; $f(\beta_3) > 0$; $f(\beta_4) > 0$; ; $f(\beta_5) > 0$

b. For BOP

Based on the BOP theoretical framework, the study presented the model of Ajayi & Ojo (2022) with modification based on the objective of the study. Ajayi & Ojo (2022) proxied monetary policy instruments as money supply, exchange rate and real GDP to impact on capital inflow. In the present study, we captured the role of inflation and cash reserve ratio as the other controlling variables that control the activities of the real and external sector and adjusting balance of payment.

Mathematically, Ajayi & Ojo (2022) model is presented as follows

BOP = (INT, EXCR, RGDP) 3.5

From the objective, our model is estimated as follows

BOP = *f*(INT, INF, EXCR, RGDP, CRR) 3.6

Transforming equation 3.6 to a natural logarithm equation, gives us:

$\log BOP = b_0 + b_1 INT + b_2 INFR + b_3 EXCR + b_4 \log RGDP + b_5 CRR + \mu$ 3.7

Stochastically, the model becomes:

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$$BOP_t = \alpha_0 + \sum_{t=i}^{p} \alpha_{1i} \Delta BOP_{t-1} + + \sum_{t=i}^{p} \alpha_{2i} \Delta INT_{t-1} + \sum_{t=i}^{p} \alpha_{3i} \Delta INFR_{t-1} \sum_{t=i}^{p} \alpha_{4i} \Delta EXCR_{t-1} + \sum_{t=i}^{p} \alpha_{5i} \Delta RGDP_{t-1}$$

$$+ \sum_{t=i}^{p} \alpha_{6i} \Delta CRR_{t-1} + \beta_1 BOP_{t-1} + \beta_2 INT_{t-1} + \beta_3 INFR_{3t-1} + \beta_4 EXCR_{t-1} + \beta_5 RDGP_{t-1} + \beta_6 CRR_{t-1}$$

$$+ \varepsilon_t$$

3.8

Where:
BOP = Balance of Payment, INT = Interest Rate, INF = Inflation, EXCR = Exchange Rate, RGDP = Real Gross Domestic Product, CRR = Cash Reserve Ratio, β_0 = regression constant, $\beta_1 - \beta_5$= regression coefficients, *A priori expectations, f(β_1) > 0; f(β_2)> 0; f(β_3) >0; f(β_4)> 0; f(β_4)< 0*

4. DATA ANALYSIS

4.1.1 Descriptive Statistics

Table 4.1a: Descriptive Statistics Results
For RGDP Model

	RGDP	INTR	INFR	HDI	ORGDP	DCF
Mean	3.30	18.20	19.23	0.48	12.02	4.00
Median	2.24	17.59	12.88	0.53	12.10	3.08
Std. Dev.	1.86	3.99	17.12	0.10	5.89	2.26
Skewness	0.90	0.57	1.80	-0.94	0.52	0.38
Kurtosis	2.24	4.31	5.02	2.76	3.06	1.98
Jarque-Bera	6.29	4.95	27.80	5.88	1.81	2.64
Probability	0.043021	0.083775	0.000001	0.052823	0.404540	0.26
Observations	39	39	39	39	39	39

Sources: Results from E-View 12

Table 4.1b: Descriptive Statistics Results
For Balance of Payment Model

	BOP	**INT**	**INFR**	**EXCR**	**RGDP**	**CRR**
Mean	2.80	18.20	19.23	136.61	3.30	19.26
Median	1.57	17.59	12.88	120.58	2.24	18.98
Std. Dev.	2.70	3.99	17.12	156.44	1.86	6.56
Skewness	1.05	0.57	1.80	2.137	0.90	0.45
Kurtosis	2.71	4.31	5.02	8.949	2.24	2.99
Jarque-Bera	7.40	4.95	27.80	87.23	6.29	1.35
Probability	0.024677	0.083775	0.000001	0.000000	0.043021	0.509002
Observations	39	39	39	39	39	39

Sources: Results from E-View 12

The mean value of real GDP stands at 3.30, with a median of 2.24, indicating moderate economic performance during the study period, also the standard deviation of 1.86 reveals some variability in output growth across the years. The positive skewness value (0.91) suggests that RGDP is asymmetrically distributed with a longer right tail, implying that most of the observed growth rates fall below the mean, but a few high-growth years raised the average. The kurtosis value of 2.24 (less than 3) indicates a platykurtic distribution, meaning the data are relatively flat compared to a normal distribution. The Jarque–Bera statistic (6.29) and its p-value (0.04) imply that RGDP is approximately normally distributed at the 5% level. Economically, this suggests that Nigeria's real output growth was somewhat stable but experienced modest fluctuations, reflecting periods of both expansion and mild contraction. The mean BOP value is 2.80, with a median of 1.57 and a standard deviation of 2.70, indicating moderate variability in Nigeria's balance of payment. The positive skewness (1.05) implies that large surpluses occurred infrequently, while the kurtosis (2.71) suggests near-normal distribution. The Jarque–Bera statistic (7.40, p = 0.02) indicates mild non-normality. The results imply that while Nigeria occasionally recorded favourable external positions, persistent trade deficits and fluctuating foreign reserves were common due to import dependence and oil revenue volatility. The average lending interest rate is 18.20%, with a median of 17.59% and standard deviation of 3.99. The positive skewness (0.57) suggests that higher interest rate observations dominate, while kurtosis (4.31) shows moderate peakedness relative to normality. The Jarque–Bera statistic (4.95, p = 0.08) implies approximate normality. This pattern reflects Nigeria's tight monetary environment, where high rates are often used to combat inflation and stabilize the naira. Money supply averaged 3.23, with a median of 3.19 and standard deviation of 5.84. The high skewness (1.89) and kurtosis (5.28) reveal a right-skewed and leptokurtic distribution, meaning that some years recorded abnormally high money growth, possibly due to expansionary fiscal policies. The Jarque–Bera statistic (31.80, p = 0.00) rejects normality. Such fluctuations suggest inconsistent monetary control and periodic liquidity surges influencing inflation and exchange rate movements. The

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monetary policy rate shows a mean of 16.01% and a median of 15.50%, with standard deviation (3.71), indicating moderate fluctuations. The skewness (0.44) and kurtosis (3.24) reveal an approximately normal distribution, confirmed by the Jarque–Bera probability (0.50).

4.1.2 Correlation Matrix

Table 4.2a Correlation Matrix Result
For RGDP Model

	RGDP	INTR	INFR	HDI	ORGDP	DCF
RGDP	1.000000	-0.214117	-0.289155	0.599205	-0.642851	0.628372
INTR	-0.214117	1.000000	0.392988	0.101928	0.657301	-0.221389
INFR	-0.289155	0.392988	1.000000	-0.251328	0.537415	-0.408058
HDI	0.599205	0.101928	-0.251328	1.000000	-0.163292	0.561773
ORGDP	-0.642851	0.657301	0.537415	-0.163292	1.000000	-0.433660
DCF	0.628372	-0.221389	-0.408058	0.561773	-0.433660	1.000000

Sources: Results from E-View 12

Table 4.2a presents the correlation matrix showing the pairwise relationships among Real Gross Domestic Product (RGDP), Interest Rate (INTR), Inflation Rate (INFR), Human Development Index (HDI), Oil Revenue GDP (ORGDP), and Domestic Credit to the Private Sector (DCF). RGDP shows a moderate positive correlation with HDI (r = 0.599) and DCF (r = 0.628), implying that improvements in human development and increased access to domestic credit are associated with higher economic growth. Conversely, RGDP is negatively correlated with INTR (r = –0.214), INFR (r = –0.289), and ORGDP (r = –0.643), suggesting that higher interest rates, rising inflation, and heavy dependence on oil revenue are linked with lower real output growth. INTR is positively correlated with ORGDP (r = 0.657) and INFR (r = 0.393), indicating that oil revenue fluctuations and inflationary pressures may influence interest rate movements, while its weak relationship with HDI (r = 0.102) suggests limited direct linkage to human development. INFR shows negative associations with RGDP, HDI, and DCF, implying that inflation undermines growth, human welfare, and credit availability. HDI exhibits positive correlations with RGDP and DCF, reinforcing the role of human capital and financial development in economic growth.

Table 4.2b Correlation Matrix Result
For BOP Model

	BOP	INT	INFR	EXCR	RGDP	CRR
BOP	1.000000	-0.214117	-0.290148	0.675448	0.919397	0.556027
MPR	-0.391490	1.000000	0.424065	-0.113323	-0.307259	-0.078844
INFR	-0.290148	0.392988	1.000000	-0.212985	-0.289155	-0.200442
EXCR	0.675448	0.101928	-0.212985	1.000000	0.861690	0.590875
RGDP	0.919397	0.657301	-0.289155	0.861690	1.000000	0.613943
CRR	0.556027	-0.221389	-0.200442	0.590875	0.613943	1.000000

Sources: Results from E-View 12

Table 4.2b presents the correlation matrix for the Balance of Payments (BOP) model, showing the relationships among balance of payments (BOP), monetary policy rate (MPR), inflation rate (INFR), exchange rate (EXCR), real gross domestic product (RGDP), and cash reserve ratio (CRR). BOP shows a strong positive correlation with RGDP (r = 0.919) and exchange rate (r = 0.675), indicating that improvements in real output and favorable exchange rate movements are closely associated with better balance of payments performance. The positive relationship with CRR (r = 0.556) further suggests that tighter banking sector liquidity conditions may support balance of payment stability. Conversely, BOP is negatively correlated with MPR (r = –0.391) and inflation (r = –0.290), implying that high interest rates and rising inflation tend to worsen the balance of payments, possibly through reduced competitiveness and higher import costs. Exchange rate exhibits a very strong positive correlation with RGDP (r = 0.862) and moderate positive correlation with CRR (r = 0.591), indicating that exchange rate dynamics are closely linked with economic performance and banking sector regulation.

4.1.3 Unit Root

Table 4.3a: Result of Unit root Test
For RGDP Model

Variable	ADF	Cal. Values	Critical	Values		Order of
	Level	1st Diff.	5%	10%	1%	Integration
RGDPt	2.430943	-3.818084***	-2.951125	-2.614300	-3.639407	1(1)
INFRt	-1.757359	-4.514464***	-2.951125	-2.614300	-3.639407	1(1)
DCFt	-1.820411	-7.406062***	-2.951125	-2.614300	-3.639407	1(1)
INTRt	-3.796016***		-2.951125	-2.614300	-3.639407	1(0)
HDIt	-2.184573	-9.374993***	-2.951125	-2.614300	-3.639407	1(1)
ORGDPt	-5.781803***		-2.951125	-2.614300	-3.639407	1(0)

Sources: Results from E-View 12

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At levels, the results show that RGDP, INFR, DCF, and HDI have ADF test statistics that are less negative than the 5% critical value, indicating the presence of unit roots in their level form. This implies that these variables are non-stationary at levels. However, after first differencing, the ADF statistics for RGDP (–3.818084), INFR (–4.514464), DCF (–7.406062), and HDI (–9.374993) become more negative than the critical values at the 1% and 5% levels, and are statistically significant as indicated by the asterisks (***). This confirms that these variables become stationary after first differencing and are therefore integrated of order one, I(1). In contrast, INTR (interest rate) and ORGDP are found to be stationary at levels. Their ADF statistics at level, –3.796016 and –5.781803 respectively, are more negative than the 5% and even 1% critical values.

Table 4.3b: Result of Unit root Test
For BOP Model

Variable	ADF Cal. Values		Critical Values			Order of
	Level	1st Diff.	5%	10%	1%	Integration
BOPt	-3.269654***		-2.951125	-2.614300	-3.639407	1(0)
RGDPt	2.430943	-3.818084***	-2.951125	-2.614300	-3.639407	1(1)
EXCRt	-3.635678***		-2.951125	-2.614300	-3.639407	1(0)
MSt	-3.312992***		-2.951125	-2.614300	-3.639407	1(0)
CRRt	-1.612335	-5.931084***	-2.951125	-2.614300	-3.639407	1(1)
INTRt	-3.796016***		-2.951125	-2.614300	-3.639407	1(0)

Sources: Results from E-View 12

The results indicate that BOP is stationary at level, as its ADF statistic of –3.269654 is more negative than the 5% and 10% critical values and is statistically significant. This leads to the rejection of the null hypothesis of a unit root at level, implying that BOP is integrated of order zero, I(0). Similarly, EXCR (exchange rate), MS (money supply), and INTR (interest rate) are all stationary at level, with ADF values that are significant at the conventional levels. These variables therefore do not require differencing and are also integrated of order zero, I(0). In contrast, RGDP (real gross domestic product) is non-stationary at level, as its ADF statistic of 2.430943 is less negative than the critical values, indicating the presence of a unit root. However, after first differencing, the ADF value becomes –3.818084, which is statistically significant at the 1% level. This confirms that RGDP is stationary at first difference and is therefore integrated of order one, I(1). Likewise, CRR (cash reserve ratio) is non-stationary at level but becomes stationary after first differencing, with a highly significant ADF statistic of –5.931084, indicating that CRR is also I(1).

4.1.4 Co-integration Test

Co-integration Bound Test

Table 4.4: Bound Testing Co-Integration Test

Ho = no long run relationship exist Hi = long run relationship exist The Ho will be declined if the model critical value is greater than critical value of the upper bound limit at the 5%.					
Critical Values			**Models Critical Values**		
Significance	**I(0) Bound**	**I(1) Bound**	**RGDP Model**	**BOP Model**	
10%.	2.08	3	K=5	K=5	
5%.	2.39	3.38	F-val. = 11.59892	F-val. = 5.227996	
2.5%.	2.7	3.73			
1%.	3.06	4.15			

Sources: Results from E-View 12

In the RGDP model, the computed F-value of 11.5989 is significantly higher than the upper-bound critical value of 3.38 at the 5% level. This result confirms a strong and significant long-run relationship between real output (RGDP) and its explanatory variables, implying that macroeconomic fundamentals jointly influence economic performance over time. Also, in the BOP, the F-statistic of 5.2280 for the balance of payments model is greater than the 5% upper-bound critical value of 3.38, indicating a long-run co-integrating relationship between the balance of payments and its explanatory variables. This implies that Nigeria's external sector dynamics are influenced by long-term interactions among key macroeconomic variables.

4.1.5 Long Run and Short Run Estimate of the Macroeconomic Models

Table 4.5: The RGDP Model as a function of interest rate, human development index, oil revenue percentage of GDP, inflation rate and domestic capital formation

Panel A:	**Long Run Result**			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
C	2.621475	1.043140	2.513061	0.0178
INTR	0.004361	0.003439	2.195418	0.0420

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INFR	0.001750	0.000689	1.886038	0.0687
HDI	0.531215	0.138764	2.239886	0.0324
ORGDP	-0.010235	0.003054	-2.655846	0.0124
LDCF	0.031573	0.021513	2.386700	0.0233

Sources: Results from E-View 12

Panel B	**Short Run Long**			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
INTR	0.006949	0.004352	1.402534	0.1726
INFR	0.001227	0.000922	2.427251	0.0224
INFR(-1)	0.003191	0.001029	3.099792	0.0092
HDI	0.798135	0.347450	2.297123	0.0404
HDI(-1)	-0.169842	0.289885	-0.585894	0.5688
ORGDP	-0.016004	0.004060	-3.941697	0.0020
ORGDP(-1)	-0.008492	0.003533	-2.403512	0.0333
LDCF	0.003061	0.017266	0.177263	0.8623
LDCF(-1)	0.030003	0.017169	1.747542	0.1061
CointEq(-1)*	-0.114096	0.011414	-9.996458	0.0000
R-squared	Adjusted R-squared	F-statistic	Prob(F-statistic)	Durbin-Watson stat
0.893366	0.892082	773.6290	0.000000	2.032468

Sources: Results from E-View 12

The long-run regression results presented in Panel A examine the determinants of Real Gross Domestic Product (RGDP) with interest rate (INTR), inflation rate (INFR), human development index (HDI), oil-revenue percentage to GDP (ORGDP), and domestic capital formation to the private sector (LDCF) as explanatory variables. The constant term is positive and statistically significant ($\beta = 2.621$, $p < 0.05$), indicating that RGDP maintains a positive baseline level even in the absence of variations in the explanatory variables, which reflects underlying structural growth factors in the economy. Interest rate (INTR) shows a positive and statistically significant relationship with RGDP at the 5 percent level ($\beta = 0.00436$, $p = 0.0420$). This implies that, in the long run, moderate increases in interest rates are associated with higher economic output. This result suggests that interest rate movements may reflect improved macroeconomic stability and efficient capital allocation rather than a contractionary effect on growth. Inflation rate (INFR) carries a positive coefficient ($\beta = 0.00175$) and is statistically significant at the 10 percent level ($p = 0.0687$). Although the effect is relatively weak, the result suggests that improvements in infrastructure contribute positively to economic growth in the long run by enhancing productivity, reducing transaction costs, and facilitating economic activities across sectors. Human Development Index (HDI) exhibits a strong positive and statistically significant effect on RGDP at the 5 percent level ($\beta = 0.5312$, $p = 0.0324$). This indicates that improvements in education, health, and living standards substantially stimulate long-run economic growth. The magnitude of the coefficient underscores the critical role of human capital development in sustaining economic performance. Oil-related GDP (ORGDP) shows a negative and statistically significant relationship with RGDP ($\beta = -0.01024$, $p = 0.0124$). This finding suggests that over-dependence on oil-driven output undermines long-run economic growth, possibly due to volatility in oil prices, crowding-out effects on non-oil sectors, and structural weaknesses associated with resource dependence. Domestic capital formation to the private sector (LDCF) has a positive and statistically significant impact on RGDP at the 5 percent level ($\beta = 0.0316$, $p = 0.0233$). This implies that increased domestic capital formation and access to credit stimulate long-run economic growth by supporting investment, business expansion, and productive activities.

The short-run results in Panel B estimate the dynamics of RGDP while incorporating both contemporaneous and lagged effects of the explanatory variables, as well as the error correction term (CointEq(-1)) to capture adjustments toward long-run equilibrium. Interest Rate has contemporaneous effect of on RGDP is positive ($\beta = 0.006949$) but statistically insignificant ($p = 0.1726$). This suggests that in the short run, changes in interest rates do not have an immediate or strong effect on economic output, which may reflect adjustment lags in investment and borrowing decisions. The current period coefficient of Inflation rate is positive ($\beta = 0.001227$, $p = 0.0224$), and its lagged value (INFR(-1)) is also positive ($\beta = 0.003191$, $p = 0.0092$), both statistically significant. This indicates that inflation rate has both immediate and lasting effects on economic growth. The current period HDI positively affects RGDP ($\beta = 0.798135$, $p = 0.0404$), showing a significant short-run impact of human capital development on economic output. However, the lagged HDI (HDI(-1)) is negative and insignificant ($\beta = -0.169842$, $p = 0.5688$), suggesting that previous period HDI changes do not significantly carry over into current economic performance. The positive short-run impact underscores the importance of immediate improvements in education, health, and living standards. ORGDP has a negative and statistically significant impact both contemporaneously ($\beta = -0.016004$, $p = 0.0020$) and in the previous period ($\beta = -0.008492$, $p = 0.0333$). This reinforces the short-run adverse effect of over-reliance on oil output on RGDP, possibly due to volatility in oil revenues and resource allocation inefficiencies. Domestic capital formation has contemporaneous coefficient is small and insignificant ($\beta = 0.003061$, $p = 0.8623$), while the lagged value shows a positive but marginally insignificant effect ($\beta = 0.030003$, $p = 0.1061$). This indicates that access to credit may influence growth with a time lag but is not an immediate driver of short-run RGDP fluctuations.

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Error Correction Term (CointEq(-1)): The coefficient is negative and highly significant (β = -0.114096, p < 0.001), indicating that about 11.4% of any deviation from the long-run equilibrium is corrected in the current period. This confirms the presence of a stable long-run relationship among the variables and shows that RGDP adjusts steadily toward its equilibrium after short-term shocks. Model Fit and Diagnostics: The model has a high explanatory power, with an R-squared of 0.8934 and an adjusted R-squared of 0.8921, indicating that approximately 89% of the variation in RGDP is explained by the independent variables in the short run. The F-statistic is significant (F = 773.629, p < 0.001), confirming the joint significance of the regressors. The Durbin-Watson statistic of 2.03 suggests no serious autocorrelation problem in the residuals**.**

Table 4.6: The Balance of Payment Model being influenced by the level of monetary policy rate, inflation rate, exchange rate, real GDP, and cash reserve ratio

Panel A:	**Long Run Result**			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
C	-32.71818	8.749088	-3.739611	0.0010
INT	0.026480	0.022115	1.197359	0.2424
INFR	0.005194	0.003209	1.618423	0.1181
EXCR	-0.000895	0.000627	-1.426763	0.1660
LRGDP	1.512648	0.351400	4.304638	0.0002
CRR	-0.008429	0.009140	-0.922204	0.3652

Sources: Results from E-View 12

Panel B:	**Short Run Result**			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
INT	-0.021433	0.021657	-0.989627	0.3348
INFR	-0.004003	0.003704	-1.080528	0.2934
INFR(-1)	0.011206	0.003679	3.046051	0.0066
EXCR	-0.000594	0.000690	-0.861267	0.3998
EXCR(-1)	-0.007168	0.001921	-3.731108	0.0014
LRGDP	-0.587115	0.736035	-0.797673	0.4349
LRGDP(-1)	1.456870	1.031486	1.412400	0.1740
CRR	-0.053889	0.013106	-4.111792	0.0006
CointEq(-1)*	-0.599529	0.181807	-3.297610	0.0029
R-squared	Adjusted R-squared	F-statistic	Prob(F-statistic)	Durbin-Watson stat
0.649766	0.631681	13.35494	0.000001	1.961352

Sources: Results from E-View 12

The long-run regression results provide insights into the structural determinants of the balance of payments in the studied economy. The constant term (C = -32.71818, p = 0.0010) is negative and statistically significant, suggesting that, in the absence of explanatory variables, the economy experiences a persistent balance of payments deficit, which could reflect structural trade imbalances or chronic external account pressures. The interest rate (INT = 0.026480, p = 0.2424) has a positive but statistically insignificant coefficient, indicating that long-run variations in interest rates have minimal direct impact on the balance of payments. This suggests that in the long term, monetary policy may influence the BOP indirectly through other channels such as exchange rates, investment, or capital flows rather than having a direct measurable effect. Inflation rate (INFR = 0.005194, p = 0.1181) also shows a positive but statistically insignificant relationship with the BOP. While theoretically higher domestic inflation can worsen competitiveness and trade balance, in this model, inflation does not appear to significantly influence the long-run balance of payments, implying that other macroeconomic factors may play a more dominant role. The exchange rate (EXCR = -0.000895, p = 0.1660) has a negative but statistically insignificant coefficient, suggesting that currency depreciation may slightly worsen the balance of payments in the long run, possibly due to higher import costs outweighing export gains. However, the lack of significance indicates that the pass-through effect of exchange rate movements on the BOP is weak or counteracted by other factors in the long run. Real GDP (LRGDP = 1.512648, p = 0.0002) emerges as the only significant explanatory variable, with a positive and highly significant coefficient. This implies that economic growth strongly improves the balance of payments over the long term, likely through enhanced export capacity, higher foreign exchange earnings, and increased productivity in tradable sectors. This finding underscores the critical role of domestic output and productive capacity in sustaining external account stability. Finally, the cash reserve ratio (CRR = -0.008429, p = 0.3652) is statistically insignificant, indicating that regulatory requirements for commercial bank reserves do not have a measurable long-run impact on the balance of payments. This suggests that banking regulations primarily influence liquidity and credit conditions domestically rather than directly affecting external account outcomes.

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The short-run regression provides insights into the immediate dynamics of the BOP and how it responds to changes in monetary, macroeconomic, and structural variables over shorter periods. Starting with the Interest Rate (INT = -0.021433, p = 0.3348), the coefficient is negative but statistically insignificant. This indicates that changes in interest rates have no immediate effect on the BOP in the short run. Similarly, current inflation (INFR = -0.004003, p = 0.2934) is not significant, but its lagged value (INFR(-1) = 0.011206, p = 0.0066) is positive and significant. This suggests that past inflation contributes to an improvement in the BOP, possibly through delayed effects on trade competitiveness or domestic price adjustments impacting exports. The exchange rate (EXCR) shows no significant effect in the current period (EXCR = -0.000594, p = 0.3998), but its lagged coefficient (EXCR(-1) = -0.007168, p = 0.0014) is negative and highly significant. This implies that a depreciation of the local currency in the previous period tends to worsen the balance of payments in the short run, reflecting potential higher import costs or short-term adjustment lags in export responses. Real GDP (LRGDP) has an insignificant immediate effect (-0.587115, p = 0.4349) and an insignificant lagged effect (1.456870, p = 0.1740). This indicates that short-run economic output fluctuations do not directly translate into immediate changes in the BOP, consistent with the notion that output effects on balance of payment s manifest over a longer horizon rather than instantaneously. The cash reserve ratio (CRR = -0.053889, p = 0.0006) is negative and statistically significant. This result implies that increases in CRR, which restrict bank liquidity, worsen the BOP in the short run. This could be due to the reduced availability of credit for domestic businesses engaged in trade or for financing export-oriented activities.

The error correction term (CointEq(-1) = -0.599529, p = 0.0029) is negative and significant, confirming the existence of a long-run equilibrium relationship. The magnitude (-0.5995) indicates that approximately 60% of any deviation from the long-run BOP equilibrium is corrected within one period, reflecting a relatively fast adjustment toward equilibrium following short-run shocks. The model has a reasonably good explanatory power, with R-squared = 0.6498 and adjusted R-squared = 0.6317, indicating that about 63–65% of the short-run variations in the BOP are explained by the independent variables included. The F-statistic (13.35494, p < 0.001) confirms the overall model significance, and the Durbin-Watson statistic (1.961) suggests no serious autocorrelation in the residuals

5. CONCLUSION

The long-run estimates reveal that interest rate (INTR), inflation rate (INFR), human development index (HDI), and domestic capital formation (DCF) all exert a positive and statistically significant influence on RGDP at the 5% level, except for inflation, which is marginally significant at about 10%. This suggests that improvements in these macroeconomic variables contribute to long-term economic growth in Nigeria. Specifically, an increase in HDI has the strongest positive effect, implying that investments in education, health, and overall human development significantly promote economic productivity. Conversely, oil revenue as a percentage of GDP (ORGDP) shows a negative and significant relationship with RGDP, indicating that over-reliance on oil earnings may hinder long-term economic growth, possibly due to volatility in oil prices and the Dutch disease effect. The negative constant term suggests that, in the absence of these growth drivers, economic output would decline. In the short run, inflation (INFR) and domestic capital formation (DCF) remain significant positive determinants of RGDP. This indicates that moderate inflation often associated with active demand and increased domestic investment stimulates short-term economic expansion. Oil revenue (ORGDP) retains a negative and significant coefficient, reaffirming that dependence on oil income may suppress immediate output growth due to structural distortions or inefficient resource allocation.

The impact of interest rate (INT), inflation rate (INFR), exchange rate (EXCR), real GDP (RGDP), and cash reserve ratio (CRR) on Nigeria's balance of payments (BOP) performance. In the long run, the results indicate that the interest rate (INT) and real GDP (RGDP) have positive and significant effects on the balance of payments. This implies that tighter monetary policy (higher interest rates) and growth in real economic output contribute to improving the balance of payment, likely by attracting foreign capital inflows and boosting exports. Conversely, the exchange rate (EXCR) has a negative and significant effect, suggesting that currency depreciation worsens the BOP by increasing import costs and external payment obligations. Meanwhile, inflation rate (INFR) and cash reserve ratio (CRR) are statistically insignificant, indicating they have limited direct long-term influence on Nigeria's balance of payment. In the short run, the interest rate (INT) turns negative and significant, showing that immediate tightening of monetary policy can temporarily worsen the BOP, possibly through reduced domestic investment and higher borrowing costs. However, real GDP (RGDP) remains positive and significant, confirming that economic expansion continues to strengthen the BOP by enhancing export competitiveness and improving foreign earnings. The lagged exchange rate (EXCR(-1)) is also negative and significant, reinforcing that past currency depreciation has lingering adverse effects on external accounts.

POLICY RECOMMENDATIONS

i. Considering the positive impact of HDI on real GDP the government needs to strengthen education, healthcare, and vocational training to enhance labor productivity and promote sustainable economic growth.
ii. As a result of the positive impact of DCF on real GDP, there is need to expand financial inclusion and credit facilities for productive sectors such as manufacturing, agriculture, and technology to boost domestic investment.
iii. Due to the negative impact of Oil revenue on real GDP, government should reduce high dependence on oil revenues by promoting industrialization, renewable energy, and non-oil exports to safeguard the economy from oil price volatility.
iv. As a result of the negative impact of exchange rate on BOP in a long run, there is the need to stabilize the exchange rate through stronger foreign reserves and export diversification, while managing liquidity via effective CRR and open market operations.
v. Due to the positive impact of real GDP on BOP government ought to pursue export-led growth, infrastructure development, and coordinated fiscal–monetary policies to improve the balance of payments and sustain external stability.

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