

MONEY SUPPLY AND BALANCE OF PAYMENT EQUILIBRIUM IN NIGERIA: AN EMPIRICAL ANALYSIS.

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ABSTRACT

The study examined empirically the impact of money supply and balance of payments equilibrium in Nigeria: using secondary annual time series data from 1990 to 2024 on the under listed variables from the Central Bank of Nigeria Statistical Bulletin and data from World Development Indicators (WDI). The dependent variable was proxied by balance of payments stability (BOP) while Broad Money Supply (M2), interest rate (INTR), inflation rate (INFL), trade openness (TOP), and foreign direct investment (FDI) were the independent variables. The test mechanism adopted were the unit root test for co-integration and Autoregressive Distributed Lag (ARDL) technique. Findings revealed that there is a positive and significant relationship existing between broad money supply, interest rate, exchange rate, trade openness, and inflation rate, in both long and short run period, suggesting that these variables contribute immensely to balance of payments stabilization in Nigeria. However, foreign direct investment exhibited a shocking negative and insignificant relationship with BOP in both periods, showing that foreign direct investment is not currently structured or targeted in a way that supports external balance that will in turn improve BOP. Therefore, for policy, the study recommended that Government should put in place targeted policy to promote high quality FDI, strengthen domestic institutions, implement local content policies, monitor and manage capital flows and enhance export capacity.

Keywords: Money supply, Trade Openness, FDI, balance of payments, inflation rate etc.

1.0 Background to the Study

The relationship between money supply and the balance of payments (BOP) has long been a critical subject in macroeconomic analysis, especially for developing economies like Nigeria. Understanding this relationship is crucial for effective economic policy formulation, particularly in the pursuit of external sector stability, inflation control, exchange rate management, and sustainable economic growth. In Nigeria, the issue of balance of payments disequilibrium has persisted over the decades, often characterized by current account deficits, overdependence on oil exports, large-scale capital flight, and volatility in foreign exchange earnings. The BOP records a country's transactions with the rest of the world, encompassing trade in goods and services, income flows, and financial transfers. Persistent deficits in the BOP often lead to depletion of foreign reserves, exchange rate pressures, and macroeconomic instability Fashola (2004).

At the heart of these challenges lies the dynamics of money supply, which refers to the total stock of monetary assets available in an economy at a particular point in time. In Nigeria, the Central Bank of Nigeria (CBN) plays a crucial role in regulating money supply through monetary policy instruments such

as open market operations, reserve requirements, and the monetary policy rate. However, the growth in money supply has not always aligned with economic fundamentals, occasionally resulting in inflationary pressures, exchange rate depreciation, and distortions in the external sector. The monetarist theory of the balance of payments posits that an excessive increase in money supply, without a corresponding increase in output, leads to higher domestic prices and increased demand for imports, thereby worsening the BOP. Conversely, a contractionary monetary policy can help reduce excess demand and correct external imbalances. In Nigeria's case, the effectiveness of monetary policy in stabilizing the BOP has been questioned, given the country's structural constraints, fiscal dominance, and the external shocks associated with oil price volatility.

Furthermore, Nigeria's heavy reliance on crude oil exports which account for over 90% of foreign exchange earnings and more than half of government revenue exposes the BOP to global oil market fluctuations. These external vulnerabilities have made it difficult to achieve a stable and sustainable BOP, especially when global oil prices fall and foreign capital inflows decline. In such scenarios, the role of monetary policy becomes even more critical in cushioning the economy and restoring external balance. Despite various policy efforts by the Nigerian government and the CBN to stabilize the external sector including exchange rate adjustments, trade policies, and foreign reserve management the results have been mixed. While there have been periods of relative stability, episodes of sharp currency depreciation, declining reserves, and capital outflows have raised concerns about the adequacy and coordination of monetary policy responses.

Nigeria has consistently grappled with persistent balance of payments (BOP) disequilibrium, which poses significant threats to macroeconomic stability and long-term development. Despite numerous policy efforts by the Central Bank of Nigeria (CBN) and successive governments, the country continues to experience challenges such as foreign exchange shortages, declining foreign reserves, capital flight, and a high degree of import dependency. These issues are often exacerbated by fluctuations in global oil prices, given Nigeria's overwhelming reliance on crude oil exports. At the same time, money supply in Nigeria has grown rapidly over the years, driven by expansive monetary policies, fiscal injections, and structural weaknesses in the financial system. While an increase in money supply is often aimed at stimulating economic growth, it can also trigger inflation, fuel excessive import demand, and exert pressure on the exchange rate — all of which can worsen the balance of payments position.

The trend of Broad money supply (M2) and balance of payments in Nigeria has grown inconsistently over the past two decades, rising from ₦1.6 trillion in 2000 to over ₦50 trillion in 2023 (CBN data), often influenced by oil revenue booms, deficit financing, and monetary interventions. Nigeria has recorded chronic BoP deficits, especially in the current account, largely due to overreliance on oil exports, poor non-oil export diversification, and heavy importation of consumer and capital goods. Also, the naira has depreciated significantly in both official and parallel markets, reflecting BoP imbalances, low foreign reserves, and speculative pressures. Between 2015 and 2024, the naira fell from about ₦199/\$1 to over ₦1,400/\$1. Monetary policy tools like the Monetary Policy Rate (MPR) and Open Market Operations (OMO) have had limited impact on inflation and exchange rate due to low financial inclusion, dominance of the cash economy, and fiscal dominance. About 90% of Nigeria's foreign exchange earnings come from crude oil, making the BoP highly vulnerable to international oil price shocks. Attempts by the CBN to sterilize excess liquidity through Treasury Bills or Cash Reserve Ratio (CRR) increases have sometimes led to credit contraction and discouraged private sector lending. Lack of coordination between fiscal and monetary authorities has sometimes resulted in expansionary fiscal policies (e.g., subsidy payments, borrowing) counteracting monetary tightening efforts. Macroeconomic uncertainty and policy inconsistency have contributed to declining foreign direct investment (FDI) and increasing capital outflows, worsening the financial account of the BoP (NBS 2024).

The theoretical and empirical link between money supply and the balance of payments has been widely debated. Monetarist theory suggests that excessive growth in money supply leads to increased domestic expenditure, much of which spills over into increased demand for foreign goods, thereby

deteriorating the BOP. Conversely, some argue that in a structurally rigid economy like Nigeria's, the transmission mechanism of monetary policy may be weak, and external factors may play a more dominant role in determining the BOP outcome. In spite of the relevance of this relationship, there remains a lack of consensus on the extent to which changes in money supply influence Nigeria's balance of payments performance, and whether monetary policy has been effectively utilized as a tool for external sector stabilization. Furthermore, empirical studies in the Nigerian context have produced mixed results, often failing to account for structural breaks, oil price shocks, and other exogenous factors.

Given these concerns, a thorough investigation into the relationship between money supply and the balance of payments in Nigeria is both timely and relevant. This study therefore provides insights into the extent to which money supply influences external sector outcomes, and how monetary policy can be effectively leveraged to stabilize the BOP in the face of internal and external shocks. It is on the basis of persistence of BOP crises, alongside episodes of currency devaluation, import restrictions, and speculative attacks on the naira, that the study raises critical questions:

1.2 Research Objective

The main objective of this study is examined the impact of money supply and balance of payments equilibrium in Nigeria. The specific objective is to examine the causal relationship between money supply and balance of payment stability in Nigeria.

1.3 Research Question:

This study seeks to answer the following questions:

- i) Is there a significant causal relationship between money supply and BOP performance in Nigeria?
- ii) Has the management of money supply contributed to or mitigated BOP instability?
- iii) What role can monetary policy realistically play in achieving sustainable BOP stability in the Nigerian context?

These questions form the crux of the problem this study seeks to address.

1.4 Research Hypothesis

The research hypothesis stated in null form will be tested in this study:

- i) There is no significant relationship existing between money supply and BOP performance in Nigeria.

LITERATURE REVIEW

2.1 Conceptual Literature:

2.1.1 The Concept of Money Supply:

Money supply refers to the total amount of money available in an economy at a particular time. It includes currency in circulation and deposit money held in banks. It is a key economic indicator used to guide monetary policy, predict inflation, and assess economic stability. Money supply is the stock of currency and liquid instruments in a country's economy at a given time. Money supply is commonly categorized into four broad measures:

Measure	Description	Includes:
M0 (Base Money)	Physical currency in circulation	Coins and notes in the public + vault cash in banks
M1	Narrow money	M0 + demand deposits (checking accounts)
M2	Intermediate money	M1 + savings accounts + small time deposits
M3	Broad money	M2 + large time deposits + institutional money market funds

2.1.2 The Concept of balance of payments:

The Balance of Payments (BoP) is an accounting record that summarizes all economic transactions between a country and the rest of the world over a specific period (usually quarterly or annually). The Balance of Payments is a comprehensive record of a country's economic transactions with the rest of the world over a specific period.

It helps to assess a country's economic position in the global context, tracking how money flows in and out of the country due to trade, investment, aid, tourism, and other international activities. The BoP is divided into three main accounts: Current Account: This records the flow of goods, services, income, and current transfers. Trade Balance (Exports - Imports of goods and services) Net Income (e.g., wages, interest, dividends) Current Transfers (e.g., foreign aid, remittances) Capital Account: This includes capital transfers and the acquisition/disposal of non-produced, non-financial assets like patents or trademarks. It is usually small in many countries. Financial Account: This records investment flows such as: Foreign Direct Investment (FDI), Portfolio Investment (stocks, bonds), Other Investments (loans, banking flows), and Reserve Assets (foreign currency reserves managed by the central bank). BoP Must Always Balance while individual accounts (like the current account) can be in deficit or surplus, the overall BoP always balances due to the double-entry system in accounting. A current account deficit is usually financed by a financial account surplus, and vice versa. BoP Deficit or Surplus: A BoP deficit may indicate that a country is spending more foreign currency than it earns possibly leading to currency depreciation or external debt buildup. A BoP surplus indicates that a country is earning more than it spends often leading to reserve accumulation or upward pressure on the currency. Importance of the Balance of Payments: Reflects a country's international economic health, Guides monetary and fiscal policies, Influences exchange rate stability, Signals to investors and international organizations (e.g., IMF, World Bank). Nigeria's BoP is heavily influenced by: Oil exports (major source of forex), Import dependence, Remittances, Foreign portfolio flows and reserves. Fluctuations in oil prices often lead to BoP instability, prompting policy responses like exchange rate adjustments or foreign reserve interventions.

2.1.3 The Concept of balance of payments equilibrium in Nigeria

Balance of Payments (BoP) equilibrium refers to policy efforts and economic measures aimed at correcting imbalances in a country's balance of payments to ensure sustainable external equilibrium without jeopardizing internal economic stability (such as inflation, growth, or employment). To understand the concept of balance of payments stabilization, we first understand the concept of imbalance in the BoP. A balance of payments imbalance occurs when there is a persistent deficit (more outflows than inflows, leading to loss of reserves and currency pressure) or surplus (more inflows than outflows, possibly causing inflation or exchange rate appreciation). Therefore, balance of payments stabilization refers to adjustments made through monetary, fiscal, exchange rate, or trade policies to: Reduce BoP deficits or surpluses, Maintain exchange rate stability, Restore investor and market confidence, Ensure that the country can meet its international obligations without depleting its foreign reserves or incurring excessive foreign debt. In Nigeria, BoP stabilization might involve CBN interventions to stabilize the naira, reduce excessive import dependency, boost non-oil exports, and attract foreign investments.

2.2 Theoretical Literature:

2.2.1 Monetary Approach to the Balance of Payments (MABP)

The monetary approach is essentially a product of work conducted in the late 1950s, the 1960s and early 1970s, by the International Monetary Fund's research department under Jacques Polak, Harry Johnson and Robert Mundell, and their students at the University of Chicago. The main thesis of the monetary approach to balance of payments is that a country's balance of payments is essentially a monetary phenomenon, and that any observed disequilibrium in the balance of payments can be eliminated through an adroit manipulation of monetary variables especially domestic credit, fixed exchange rate, absence of sterilization by the monetary authorities, and stable demand for money function (Akpansung, 1998).

The monetary approach to the Balance of payments (MABP) emphasizes the relationship between the balance of payments and or exchange rate and the - divergence between the supply of, and demand for money. According to the monetarist, disequilibria in the balance of payments (BOP) is caused by the gap between the demand for, and supply of money. The excess of money supply over money demand leads to a

balance of payment deficits which may, be financed by reserves outflow. An excess demand of money over money supply leads to balance of payments surplus indicated by substantial size of international reserves. The basic conclusion of the monetary approach to the balance of payments is that starting from an initial position of equilibrium, an increase in the supply of money (an increase in the demand for money) will lead to balance of payments deficits (surplus).

There are three main assumptions in the monetary approach to the balance of payments namely (i) the existence of a stable demand for money function, (ii) prices are flexible and markets operate perfectly (markets clear) so that there is full employment and hence a given level of output, (iii) purchasing power parity (PPP) prevails.

The essential foundation of the monetary approach to the balance of payments is the demand for money function assumed, as stated earlier, to be a stable function of a few variables. It is a long run phenomenon. There are three main building blocks.

- (1) The demand for money function (M^d) is a function of real income (Y), interest rate (I) and domestic price level (P) as presented by Equation 2.1 as follows:

$$M^d = g(Y, P, I) \quad \text{Equation 2.1}$$

A rise in real income Y will lead to an increase in the transaction and precautionary demand for money and hence an increase in the demand for money. An increase in domestic price level will reduce real money balances (M/P), and since it is assumed that there is a constant demand for real money balances, will lead to a compensating increase in nominal money balances, all things remaining the same.

- (2) The supply of money (MS) is a function of high-powered money or monetary base (H) separated into domestic credit (D) and international reserves (R) as shown by Equations 2.2 and 2.3 as follows.

$$MS = mH \quad \text{Equation 2.2}$$

$$H = D + R \quad \text{Equation 2.3}$$

where m = money multiplier, H = high powered money, D = domestic credit and R international reserves.

Assuming that the money market clears lead to equilibrium in the money market as by Equation 2.4:

$$MS = M^d \quad \text{Equation 2.4}$$

It is shown that changes in balance of money payments are influenced by national income, the price level to the exchange rate, and the domestic component of high-powered money (monetary base).

2.2.2 Quantity Theory of Money (QTM)

The quantity theory of money is associated with the Monetarist, particularly as advanced by Milton Friedman; it emphasizes the role of money supply in determining economic performance. The central tenet of this theory is that "inflation is always and everywhere a monetary phenomenon," and that changes in money supply have long-term effects on price levels, output, and financial system stability (Friedman, 1968). According to the theory, Inflation affects the real exchange rate and international competitiveness, which in turn influences the BOP. Nigeria's inflationary episodes due to monetary expansion have historically impacted its BOP position.

The theory can also be applied to the banking sector, in this case, the Monetarist perspective suggests that increasing the broad money supply ($M2$) enhances liquidity in the economy, reduces interest rates, and facilitates credit expansion. This, in turn, positively influences bank profitability through greater intermediation and increased loan assets. In contrast, monetary contraction reduces liquidity and weakens banking activity. The theory supports the view that central bank control over money aggregates is fundamental to ensuring financial stability and enhancing banking performance.

Theory of Money is commonly expressed in the equation:

$$MV = PQMV = PQMV = PQ$$

Where:

- M is the money supply,
- V is the velocity of money,
- P is the price level,
- Q is the real output.

2.3 Empirical Literature:

A considerable body of empirical research has explored the impact of money supply and balance of payments equilibrium, particularly in developing countries like Nigeria where the external sector plays a central role in economic growth and development. This section reviews key studies, highlighting their methodologies, findings, and relevance to the current research. To contribute to this debate, Adekunle, et al (2025) investigated the relationship between crude oil prices and Nigeria's balance of payments using the ARDL estimation technique and data from 1991 to 2023. The study found that crude oil prices, inflation, and exchange rate were individually insignificant in explaining balance of payments performance, whereas the balance of trade significantly influenced the country's balance of payments. Although the study focused primarily on oil prices, it highlights that Nigeria's external balance is determined by several macroeconomic variables operating alongside monetary policy, thereby reinforcing the need to examine money supply within a broader macroeconomic framework.

Ajayi et al (2024) examined monetary policy regimes and the balance of payments in West Africa adopting the ex-post facto research design by obtaining secondary data from Central Bank of the WAMZ countries, the World Bank Development Indicators (WDI), and the international Monetary Fund (IMF) data base from 2001 to 2021. The estimation technique employed was the Panel Autoregressive Distribution Lag model, complemented by the Juodis, Karavias, and Sarafidis (2021) granger-causality test. The findings, shows that various monetary policy regimes in West Africa had conflicting effects on the balance of payments. However, over time, policy rate had a positive effect on the balance of payments, as the money supply was insignificant. Based on the findings, the paper concluded and recommends that to achieve a balance of payment equilibrium in West Africa, the monetary policy rate is an effective tool, and this is because it is significant in explaining the changes in the balance of payment in the countries in West Africa. Thus, monetary authorities should ensure a correct balance of the rate when to increase or decrease the policy rate with the hindsight of implications on the current account.

To further buttress Ajayi et al (2024) findings, Iwuagwu et al (2021) determined the impact of monetary policy instruments on balance of payments in Nigeria between 1980 and 2019 to ascertained the impact of cash reserve requirements, exchange rate, inflation rate, interest rate and money supply on balance of payments in Nigeria using secondary data obtained from CBN statistical Bulletin and regression method of analysis anchored on the monetary theory of balance of payment. The regression model was estimated using vector error correction method. Findings unveil that cash reserve requirement, exchange rate, and money supply are statistically significant and as such, impact on balance of payments in Nigeria. The results further show that inflation rate and interest rate are statistically insignificant though in tandem with theoretical expectations. This implies that not all monetary policy instruments impact on the balance of payments in the long run and short run. The study recommends that monetary authorities allow for a credit economy where the monetary policy committee's decision significantly impacts the nation's economic activities. The authorities should ensure stability in the money supply, which may trigger the nation's cash reserve requirement and exchange rate for stability in the balance of payment.

Ukangwa, Iheukwumere and Odionye (2023) investigated the impact of money supply on Nigeria's balance of payments using annual time-series data and econometric analysis. The study found that money supply significantly influences balance of payments performance through its effects on aggregate demand, imports, inflation, and foreign exchange demand. The authors recommended prudent monetary expansion to avoid

persistent balance of payments deficits. Their findings provide direct empirical evidence for the relationship examined in the present study.

Furthermore, Ojike et al (2021) in accessing the negative influence of monetary policy on balance of payments disequilibrium using secondary data from 1970 to 2016 and adopting ARDL model of analysis, observe that that gross national income and cash reserve ratio had significant positive impact on BOP while credit to the private sector and monetary policy rate had negative significant impact on BOP. Interest rate was significant at 10% level while inflation rate had insignificant impact on BOP. Based on these findings, the study concludes that the monetary approach to BOP and monetary policy variables are effective for correcting balance of payments deficits in Nigeria. The study recommends that the Central Bank of Nigeria (CBN) should curtail the rate of increase in credit to the private sector through stringent monetary regimes and properly manage the monetary policy variables (monetary policy rate and cash reserve ratio) to solve BOP problems in Nigeria.

More so, Ocheuje, (2021) explores some of the major developments and trends in Nigeria's BOP as well as their interrelationship with other macroeconomic accounts. It also provided clarity to the structure and components of Nigeria's BOP statistics as compiled in line with the 6th edition of the balance of payments and international investments position manual of the IMF using descriptive analysis. The study therefore deepens the understanding of balance of payments among policy makers, analysts, researchers and compilers of macroeconomic statistics.

Also, Okoroafor and Adolphus (2018) examined the Relative Effectiveness of Monetary Policy on Balance of Payment: Evidence from Nigeria. The effectiveness of monetary policy in correcting BOP deficit and maintaining external balance was the reason behind this study. Therefore, Monetary instrument investigated are; Broad Money Supply (M2), Monetary Policy Rate (MPR) and Prime Lending Rate (PLR). The study employed time-series data which spanned between 1981 and 2016. Auto-Regressive Distributed Lag (ARDL) Model was used to examine the effects of stochastic shocks of the endogenous variables in the midst of Error Correction Model (ECM) technic to establish the long-run effect of Monetary Policy Instrument on Balance of Payment. The findings show that Long run relationship exists among the monetary policy variables and BOP. The core outcome of this study is that monetary policy variables of Broad money supply, Monetary Policy Rate and Prime Lending Rate are major monetary factors that determine BOP in Nigeria. The study concluded that monetary policies and implementation capacity is important in the Nigerian economy, because it is very special for determining Balance of Payment positions and its spillover effect on Internal Balance. Also, from the study, Balance of Payment has been established to be a monetary phenomenon and monetary policy can be used by monetary authority to improve and stabilized the foreign sector performance in Nigeria.

Further, Onwe (2014) examined monetary policy and balance of payments in Nigeria ranging from 1986-2012. A co-integration approach to econometric analysis was employed in investigating the effects of monetary policy variables on Nigeria's balance of payments. The results of the co-integration estimation show a positive relationship between the dependent variable (Balance of Payments) and the Independent variables (Money Supply, Exchange Rate, Interest Rate and GDP). Specifically, Money Supply and Interest Rate had significant relationship with Balance of Payments, whereas Exchange Rate was not statistically significant. Based on the results, it was therefore recommended that the government should promote the exportation of Nigerian products especially the Non-oil products, as this will bring in more foreign exchange into the country, boost productive activities and improve the balance of payments position of the country. Also, the Central Bank of Nigeria should ensure that the monetary policies adopted in the country are complemented with effective fiscal policies to foster economic growth and development in the Nigerian economy.

Inimino, et al (2019) examined monetary approach to Nigerian balance of payments. Therefore, the broad objective of the study was to examine the impact of monetary policy on balance of payments in Nigeria

from 1970 to 2015. The econometrics methods of Co-integration and Error Correction Mechanism were employed as the analytical techniques. The Co-integration result revealed the existence of a long-run relationship among the variables. The result of the parsimonious ECM revealed that exchange rate and credit to private sector have significant impact on balance of payments in Nigeria. While money supply and interest rate do not have significant impact on balance of payments in Nigeria. Moreover, the coefficient of ECM was rightly signed (that is negative) and statistically significant at conventional level. This means that, the short run dynamics adjust to long run equilibrium relationship. Based on these findings, the study recommended that monetary authority should make the financial sector to be viable in order to provide credit at lower interest rates and adopt a managed floating exchange rate policy to redress the problem of exchange rate variation in order to raise the BOPs position of Nigeria.

Ewubare, and Uzoma (2019) examined the effects of stabilization policy measures on the balance of trade in Nigeria for a 38-year time period spanning from 1980 to 2017. Stabilization policy measures were segmented into the money supply, interest rate, exchange rate, government expenditure, and government tax and they served as the explanatory variables in the model. The time-series data used for this work was sourced from the Central Bank of Nigeria (CBN) statistical bulletin and the National Bureau of Statistics (NBS). The study adopted the Auto Distributed Lags (ARDL)/ Bounds testing approach to co-integration to estimate the models. The test for unit root was carried out using the Augmented Dickey-Fuller (ADF) test for stationarity. The ADF test result showed that all the variables used in the study were stationary at first difference except for balance of trade which attained stationarity at levels. The Bounds test result revealed that the variables in the model have a long-run relationship. Evidence from the study showed that most of the stabilization policy indicators had a significant negative impact on the balance of trade in both the long-run and the short-run contrary to theoretical expectation save for interest rate which the inverse relationship was expected a priori. The absolute value of the ECT (-1) term shows a 128 percent speed of convergence to equilibrium. The study, therefore, recommends that the monetary authority should implement interest rate policies that encourage an investment-friendly economy in order to attract foreign investors into the economy thereby boosting the balance of trade position of the nation.

Anulika, (2016). Investigated the balance of payments (BOP) and policies that affects its position in Nigerian economy. The tariff, non- tariff and exchange rate policies were used as policies that affects the BOP. Various Proxies were used to explain the effect of these policies on the BOP. These includes; the indirect tax as a proxy for tariff policies, the money supply, export and interest rate as a proxy for non- tariff policies, and the exchange rate. This study employs the ordinary least square (OLS) methods of estimation and the heteroscedasticity and autocorrelation covariance (HAC) in order to avoid spurious regression results. The E-views 6.0 was employed in the regression analysis. In executing this study, the ADF (Augmented Dickey Fuller) test and the Unit Root Test was carried out to test the stationarity of the variables. The result shows that the indirect tax, export and exchange rate satisfy the economic a priori expectation while the interest rate and money supply negates the a priori expectation. Using the t-test, it is revealed that only three (3) variables are significant in the explanation of the dependent variable (BOP) while the remaining two variables are insignificant. Recommendations are made to ensure that the balance of payments disequilibrium is resolved.

3.0 Research Methodology

The research design for this study is quantitative in nature. Hence, we used ex-post facto research design. The models for this study were estimated using data on money supply and balance of payment indicators, which include: balance of payments (BOP), Exchange Rate (EXR), Trade openness (TOP), inflation rate (INFL), Broad money supply ;(M2), interest rate (INTR), Investment rate(INV), and Foreign Direct Investment (FDI) for the period 1991-2024. A multiple regression analysis was used, predicated on various data diagnostics including Augmented Dickey-Fuller (ADF) and Philip-Peron (PP) unit root tests as well

as the autoregressive distributed lag technique (ARDL) was employed in this study to determine the relationship between money supply and balance of payments stabilization in Nigeria.

3.1 Model Specification:

In order to examine empirically the money supply and balance of payment equilibrium in Nigeria, the model specified for this study is anchored the monetary approach theory conducted in the late 1950s, the 1960s and early 1970s, by the International Monetary Fund's research department under Jacques Polak, Harry Johnson and Robert Mundell, and their students at the University of Chicago. The theory argue that a country's balance of payments is essentially a monetary phenomenon, and that any observed disequilibrium in the balance of payments can be eliminated through an adroit manipulation of monetary variables especially domestic credit, fixed exchange rate, absence of sterilization by the monetary authorities, and stable demand for money function. Hence, the model for this study is as specified as follows:

3.1.1 Balance of payments Equilibrium and Money Supply equation:

The functional form of the model for Balance of payments Equilibrium and Money Supply equation for this study is given as: $BOP_t = f(M2_t, CPS_t, INFL_t, EXR_t, INV_t, FDI_t, TOP_t, INTR_t) \dots \dots \dots (1)$

The econometric form of the model is given as:

$$BOP_t = a_0 + a_1M2_t + a_2CPS_t + a_3INFL_t + a_4EXR_t + a_5INV_t + a_6FDI_t + a_7TOP_t + a_8INTR_t + U_t \dots \dots \dots (2)$$

Linearizing it we will have:

$$\log BOP_t = a_0 + a_1 \log M2_t + a_2 \log INFL_t + a_3 \log EXR_t + a_5 \log INV_t + a_6 \log FDI_t + a_7 \log TOP_t + a_8 \log INTR_t + U_t \dots \dots \dots (3)$$

- BOP_t – Balance of Payments in time t
- M2_t – Broad Money Supply in time t
- EXR_t – Exchange Rate in time t
- INFL_t – Inflation Rate in time t
- FDI_t – Foreign Direct Investment in time t
- TOP_t – Trade Openness in time t
- INV_t – Investment in time t
- INTR_t – interest rate in time t
- U_t – Error term

A priori Expectation shows that $a_1 < 0$, $a_2 > 0$, $a_3 > 0$, $a_4 < 0$, $a_5 > 0$, $a_6 > 0$, $a_7 > 0$, and $a_8 > 0$.

Table 3.1: Data Description and Sources

S/N	Variables	Description of Data	Expected Source
1	BOP	The Balance of Payments is a comprehensive record of a country's economic transactions with the rest of the world over a specific period. BOP serve as a dependent variable in model. The a priori expectation: positive (+)	WDI(2024)
2	M2	Broad money supply denoted as M2 is a comprehensive measure of the total amount of money available in an economy. It is used as a measure for money supply and serves as an explanatory variable for the model. A priori expectation: negative (-)	CBN Statistical Bulletin (2023)
3	EXR	Exchange rate serves as a rate of exchange of Nigeria's currency in the international arena. It is a rate (in %) a naira is exchange for another currency. It serves as explanatory variables in the model. A priori expectation: negative (+)	CBN Statistical Bulletin (2023)

4	INFL	Inflation rate is the persistent rise in the general price level. It serves as a control variable in the models. A priori expectation: negative (-)	CBN Statistical Bulletin (2024)
5	TOP	Openness is the index of import plus export divided by GDP. It serves as explanatory variables in the model. A priori expectation: positive (+)	World Bank Indicator (2024)
6	FDI	FDI is a direct investment into production or business in a country by an individual or company of another country, either by buying a company in the target country or by expanding operations of an existing business in that country. It is used as an explanatory variable in the model. A priori expectation: positive (+)	World Bank Indicator (2024)
7	INTR	Interest rate is the rate or MPR rate of the CBN charged on income or investment. It serves as an independent variable for model one.	World Bank Indicator (2023)
9	INV	Investment rate refers to the ratio of total investment (gross fixed capital formation) to gross domestic product (GDP), usually expressed as a percentage. It serves as an explanatory variable in the model: A priori expectation: positive (+)	World Bank Indicator (2024)
10	INTR	Interest rate is the percentage at which borrowed money is paid back to the lender. It is essentially the cost of borrowing money. It is often fixed by the Apex. It served as an explanatory variable in the model. A priori expectation: negative (-)	World Bank Indicator (2024)

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Descriptive statistics and matrix of correlations

Table 4.1: Descriptive statistics

	BOP	M2	INTR	INFL	FDI	EXR	TOP
Mean	1.706571	314.8186	18.69486	19.94629	1.509143	192.6671	0.722571
Median	0.140000	266.9400	17.95000	13.00000	1.370000	132.1500	0.370000
Maximum	21.79000	951.3800	29.80000	72.84000	5.790000	1750.000	6.790000
Minimum	-2.020000	57.55000	11.55000	5.390000	-0.040000	8.040000	0.180000
Std. Dev.	5.024129	212.9115	4.097001	17.73125	1.213838	292.5340	1.246924
Skewness	3.207038	1.345537	0.801280	1.801650	1.793031	4.468001	3.909728
Kurtosis	12.54778	4.449639	3.669397	4.998340	6.781899	24.37021	18.17181
Jarque-Bera	192.9382	13.62569	4.398761	24.75831	39.61213	782.4512	424.8530
Probability	0.000000	0.001100	0.110872	0.000004	0.000000	0.000000	0.000000
Sum	59.73000	11018.65	654.3200	698.1200	52.82000	6743.350	25.29000
Sum Sq. Dev.	858.2236	1541264.	570.7043	10689.50	50.09567	2909588.	52.86387
Observations	35	35	35	35	35	35	35

The descriptive statistics of the variables are presented in Tables 2 above. This table highlights key trends in Nigeria's Balance of payments Equilibrium and Money Supply indicators during the review period. The data reveal a high level of broad money supply (M2), interest rate (INTR), inflation rate (INFL), and Exchange rate (EXR). For broad money supply (M2), the mean, median, and maximum values are 314.8186, 266.9400, and 951.3800, respectively. Interest rate (INTR) values are 18.69486 (mean), 17.95000 (median) and 29.80000(maximum). Inflation rate (INFL) values are 19.94629 (mean), 13.00000 (median) and 72.84000 (maximum). Exchange rate (EXR) values are 192.6671 (mean), 132.1500 (median), and 1750.000 (maximum).

In contrast, balance of payments (BOP), foreign direct investment (FDI) and trade openness (TOP) made relatively low contributions to economic growth, with a statistics of 1.706571 (mean), 0.140000 (median) and 21.79000 (maximum). For foreign direct investment (FDI), the statistics are 1.509143(mean), 1.370000(median) and 5.790000(maximum). For trade openness (TOP) the statistics are; 0.722571 (mean), 0.370000 (median) and 6.790000 (maximum) respectively.

The response of broad money supply (M2), interest rate (INTR), inflation rate (INFL) and exchange rate (EXR) to economic growth has been volatile, showing fluctuations during the period. Broad money supply (M2), statistics include mean 314.8186, median 266.9400, maximum of 951.3800 with a standard deviation of 212.9112; Interest rate (INTR) statistics include a mean of 17.91680, a median of 17.26000, and a maximum of 27.50000, with a standard deviation of 3.882276. Inflation rate (INFL) statistics reveals a mean of 19.94629, a median of 13.0000, a maximum of 72.84000, and a standard deviation of 17.73125. Exchange rate (EXR) statistics include a mean of 192.6671, a median of 132.1500, a maximum of 1750.000 and a standard deviation of 292.5340 respectively.

Skewness and Kurtosis Analysis:

The skewness results indicate that three variables are positively skewed, suggesting right-tailed distributions. The kurtosis results show that all the seven variables are leptokurtic (kurtosis > 3), indicating peaked distributions.

Normality and Variability:

The Jarque-Bera test confirms that all variables are normally distributed over the analysis period. The standard deviation values highlight the extent of variation in the data, with most variables showing significant deviations from their true values, except foreign direct investment (FDI) which has relatively small deviations of 1.213838.

Table 4.2: correlation Matrix:

	BOP	M2	INTR	INFL	FDI	EXR	TOP
BOP	1						
M2	-0.72	1					
INTR	0.33	0.42	1				
INFL	-0.96	0.88	-0.07	1			
FDI	-0.79	0.10	0.32	0.92	1		
EXR	-0.96	0.88	-0.06	0.10	0.92	1	
TOP	-0.99	0.81	-0.19	0.99	0.87	0.99	1

The correlation matrix of the variables is as shown in Table 3 above. The correlation matrix is a statistical tool that measures the relationship between multiple variables. It provides a table of correlation coefficients which describe the strength and direction of the linear relationships between each pair of variables. From the table above therefore, BOP has a positive correlation coefficient with INTR. This therefore indicates that the variables tend to move in the same direction. Meanwhile, M2, INFL, FDI, EXR and TOP have a weak negative correlation (-0.72, -0.96, -0.79, -0.96 and -0.99) with BOP, indicating that as BOP increases, M2, INFL, FDI, EXR and TOP tends to decrease. Also, from the table, there exist positive correlation coefficient between M2 and EXR, INFL, FDI, INTR, and TOP and FDI and INTR, INFL, TOP, EXR respectively, while there is a weak negative correlation between INFL and INTR, EXR and INTR, as well as TOP and INTR.

4.2 Unit Root Test

The Augmented Dickey Fuller and the Philip-Perron unit root tests were conducted to examine the stationarity condition of the variables. As indicated in Table 4 below, BOP, EXR, FDI, M2 and TOP were stationary at level in ADF, and PP, while INFL and INTR were stationary after first differencing in both ADF and PP. In other words, the variables are integrated of order zero and one (i.e., I (0) and I (1)). Where some of the variables are I (0) while others are I (1) one suggests the problem of unit root= in the equations. It becomes imperative to perform co-integration tests to determine the presence of equilibrium

relationship amongst the variables in each equation. The study adopts the ARDL bound testing technique for co-integration, as the variables are integrated of diverse orders (i.e., order zero and order one).

Table 4.3: ADF and Philip-Perron Unit Root Test Results

Variables	ADF Level	1 st Difference	Order of integration	Level	PP 1 st Difference	Order of integration
BOP	-6.865134	-	I(0)	-	-	I(0)
EXR	3.491078	-	I(0)	-	-	I(0)
INFL	-2.206072	-3.349184	I(1)	-	-	I(1)
INTR	-2.509852	-3.412064	I(1)	-	-	I(1)
FDI	-2.962348	-	I(0)	-	-	I(0)
TOP	19.92614	-	I(0)	-	-	I(0)
M2	5.732034	-	I(0)	-	-	I(0)

Source: Researcher's computation (2025), using E-Views 9.

Note: Mackinnon critical values for ADF at 1, 5 and 10% levels are -3.60, -2.93 and -2.60 respectively, and for PP are 3.605, 2.936 and 2.606, respectively. ** means significant at 5% level.

4.3 Lag Length Selection

Table 4.4: Lag Length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-817.4752	NA	5.65e+13	51.52970	51.85033	51.63598
1	-676.1042	212.0566	1.89e+11	45.75651	48.32155	46.60675
2	-614.1775	65.79710	1.36e+11	44.94859	49.75804	46.54279
3	-504.3163	68.66328*	1.54e+10*	41.14477*	48.19862*	43.48292*

* indicates lag order selected by the criterion

The efficiency and validity of an error correction model depends on the lag structure. The study used VAR lag order selection criteria to determine the lag lengths. The study employed the Akaike Information Criterion (AIC) and Schwarz Criterion (SC) and the result shows four optimal lag lengths in the Balance of payments Equilibrium and Money Supply models as shown in Table 5 above. In order to reduce the possibilities of underestimation whilst maximizing the likelihood of recovering the true lag (Venus, 2004), the study used three and four as the maximum lag lengths, respectively.

4.1.4 Co-integration Test Results

From the bound testing result reported in Table 6 below, long run relationship exists amongst the variables in all the estimated equations, given that the values of the F-statistic are greater than the critical values at five per cent level in both the upper and the lower bounds. Therefore, the null hypothesis of absence of co-integration is rejected, while the study proceeds to estimate the long run coefficient of each of the equations.

Table 4.5: Co-Integration Test Results

5% critical value						
Equations	K	F-Stat	I (0)	I (1)	Outcome	
BOP (M2,FDI,EXR,INTR,TOP,INFL)	6	8.92	2.45	3.61	Co-integration	

Note: K =number of parameters

Source: Researcher's computation (2025), using E-Views 9.

4.2 Findings, Presentation and Analysis of Econometric Results of the Long run coefficients of Balance of payments Equilibrium and Money Supply Equation Results

Table 4.6: Dependent variable: BOP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	0.025003	0.011163	2.239884	0.0490
INTR	2.982553	0.828150	3.601466	0.0048
INFL	0.305074	0.157068	1.942301	0.0808
FDI	-5.373366	1.687048	-3.185069	0.0097
EXR	0.101320	0.039297	2.578296	0.0275
TOP	68.580777	22.902372	2.994484	0.0135
C	-93.252372	28.521259	-3.269574	0.0084

Long Run coefficients of Balance of payments Equilibrium and Money Supply Equation

The long-run relationship between Balance of payments Equilibrium and Money Supply variables is presented in Table 4.6 above. Based on the ARDL long-run estimates, the findings reveal the following perceptions:

The coefficient for money supply (M2) is positive and statistically significant, indicating that a unit increase in M2 will results in 25% increases in BOP. This finding is in line with a priori expectation in the long run. The positive effect between money supply and BOP stabilization suggests that, under the right conditions, monetary expansion can strengthen external stability by stimulating productive sectors, boosting exports, reducing imports, and attracting foreign capital. However, to achieve this requires effective monetary governance and productive absorption of liquidity.

Similarly, the coefficient for interest rate (INTR) is positive and statistically significant, indicating that a unit rise in INTR will results in a 298.2% increases in BOP. This finding is in line with a priori expectation. This result therefore suggests that higher interest rates strengthen the external sector by attracting capital, reducing imports, and controlling inflation. This tool is especially useful in open, developing economies like Nigeria, but must be balance with domestic growth priorities.

The coefficient for INFL is positive and statistically insignificant, indicating that a one-unit increase in INFL contributes to 30.5% rise in BOP. This finding deviates from a priori expectation. The positive but insignificant relationship between inflation and BOP stabilization suggests that inflation does not play a meaningful or consistent role in driving improvements in the balance of payments.

More so, the relationship between FDI and BOP is negative and statistically significant. A one-unit increase in FDI leads to a -537.3% reduction in BOP. This result contravened theoretical expectation, as a negative relationship between FDI and BOP stabilization during the study period fall short of a positive expectation. However, a negative but significant relationship indicates that in practice, FDI in the economy may be contributing to external sector vulnerabilities – due to import – heavy investments, profit repatriation, or weak domestic integration.

Furthermore, the relationship between EXR and BOP is positive and statistically significant. A one-unit increase in EXR will leads to a 10.1% increases in BOP. This result is in line a priori expectations. This finding suggests that exchange rate depreciation (a rise in the exchange rate, meaning more naira per dollar) helps to stabilize Nigeria's balance of payments. Exchange rate depreciation helps restore external balance by boosting exports, reducing imports, and encouraging local production.

Trade openness (TOP) exhibits a positive and statistically significant relationship with BOP. A one-unit increase in TOP is associated with a 685.8% increases in BOP. This finding is in line with a priori expectations. This result suggest that in the long run, greater integration into global trade improves Nigeria's external sector stability through leveraging on openness to build competitive export industries, diversify its economy, and ensure imports support productive capacity.

In summary, the long-run analysis highlights the complex interplay between money supply variables and balance of payments stabilization. While certain factors such as broad money supply (M2), trade openness

(TOP), exchange rate (EXR), interest rate (INTR) and inflation rate (INFL) positively influenced balance of payment stabilization, only foreign direct investment (FDI), posed significant negative challenges. These findings underscore the need for targeted policy interventions to strategically manage and redirect FDI to enhance its net contribution to external stability.

4.2 Findings, Presentation and Analysis of Econometric Results of the Short run coefficients of Balance of payments Equilibrium and Money Supply Equation Results

Table 4.7: Dependent variable: BOP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(M2)	-0.000397	0.004432	-0.089476	0.9305
D(M2(-1))	0.001759	0.004693	0.374890	0.7156
D(M2(-2))	-0.016018	0.004638	-3.453685	0.0062
D(INTR)	0.659178	0.276282	2.385889	0.0382
D(INTR(-1))	-0.739518	0.342591	-2.158606	0.0562
D(INTR(-2))	-1.295482	0.332460	-3.896657	0.0030
D(INFL)	0.175120	0.162935	1.074782	0.3077
D(FDI)	-3.944178	1.278088	-3.085999	0.0115
D(FDI(-1))	1.062812	0.951518	1.116964	0.2901
D(EXR)	-0.012318	0.006931	-1.777039	0.1059
D(EXR(-1))	-0.081897	0.031860	-2.570486	0.0279
D(TOP)	-37.870458	12.298305	-3.079323	0.0117
D(TOP(-1))	-33.681450	17.236057	-1.954127	0.0792
D(TOP(-2))	-44.798594	15.548013	-2.881307	0.0163
CointEq(-1)	-1.087101	0.201527	-5.394308	0.0003
R-squared	0.874334	Mean dependent var	1.681875	
Adjusted R-squared	0.610435	S.D. dependent var	5.192029	
S.E. of regression	3.240612	Akaike info criterion	5.401250	
Sum squared resid	105.0156	Schwarz criterion	6.408944	
Log likelihood	-64.42001	Hannan-Quinn criter.	5.735272	
F-statistic	3.313141	Durbin-Watson stat	2.332929	
Prob(F-statistic)	0.027432			

The short-run dynamics of the relationship between Balance of payments Equilibrium and Money Supply Equation Results is as presented in Table 4.7, which reveal several significant findings.

In the current and second period lag, broad money supply (M2) exhibits a negative and significant relationship with BOP while it became positive and insignificant at first period lag. Specifically, a 1% increase in M2 will leads to a -0.003%, -01.6% decreases in BOP in current and second period and 0.001% increases in first period lag . The result of the first period lag aligns with a priori expectations, underscoring the adverse effects of monetary expansion in strengthening external sector stability in Nigeria.

Also, in the current period of the short run, INTR exhibit a positive and significant relationship with BOP and it became negative in first and second period lag. Therefore, a unit rise in INTR will lead to 65.91% increases in BOP in current period and -73.95%, -129.54% decreases after first and second period lags. The result of the first and second period lag deviate from a priori expectation, suggesting that the dynamics of interest rate in the short run did not strengthen external sector balance.

INFL shows a positive and insignificant relationship with BOP in the current period of the short run. Specifically, a unit rise in INFL will lead to 17.51% increases in BOP. This result deviate from a priori expectation suggesting that in the short run, inflation does not play a meaningful or consistent role in driving improvements in the balance of payments. This result is in corroborating the findings of the long run period.

The coefficient of FDI is negative and statistically significant in current period but became positive and significant after a period lag. Therefore, a unit rise in FDI will lead to -394.41% decreases in BOP in the current period and 106.28% increases in BOP after a period lag. The result of the first period lag is in line with a priori expectation, showing that FDI contribute immensely to external sector growth in Nigeria. The coefficient of EXR exhibits a negative and significant relationship with BOP in both current and first period lag. Therefore, a unit rise in EXR will lead to -01.23% and -08.18% decreases in BOP in both periods. These results deviates from theoretical expectation, suggesting that in the short run period the result negate the dynamic effect of exchange rate depreciation in restoring external balance by boosting exports, reducing imports, and encouraging local production.

Trade openness (TOP) exhibited a negative and significant relationship with BOP in both current, first and second period lag as against positive relationship in the long run, therefore, a unit rise in TOP will result in a -378.70%, -336.81% and -447.98% decreases in BOP in the short run. The result of both period lags is not in line with a priori expectation, suggesting that leveraging on openness to build competitive export industries, diversify its economy, and ensure imports support productive capacity was not enhance in the short run.

The ECM coefficient (-1.087101) is correctly signed and statistically significant, indicating that approximately 108% of short-run disequilibria adjust to the long-run equilibrium within a year. The t-statistic (-5.394308) confirms the significance of the ECM at the 5% level.

The R-squared value (0.874334) and adjusted R-squared (0.610435) demonstrate that approximately 87% of the variation in BOP is explained by the included variables (both current and lagged), with 13% attributable to factors outside the model. The F-statistic (3.31) confirms the joint significance of the model's variables, ensuring a good overall fit. Additionally, the Durbin-Watson statistic (2.33) indicates no autocorrelation, affirming the reliability of the results for forecasting and policy formulation.

5.1 Discussion of Findings:

The short run and the long run ARDL dynamics shows an intriguing insight as the regression result offers a positive and significant relationship between the five key variables of money supply; broad money supply (M2), interest rate (INTR), Inflation rate (INFL), exchange rate (EXR) and trade openness (TOP) interacted with dependent variable BOP. The result suggest that increases in the under listed variables in essence will lead to corresponding increases in balance of payments which will enhance balance of payment stability, greater integration into global trade which will improves Nigeria's external sector stability through leveraging on openness to build competitive export industries, diversify its economy, boosting exports, reducing imports, encouraging local production and ensure imports support productive capacity.

This finding is in line with the views of Ajayi et al (2024), Ojike et al (2021), Onwe (2014) Okoroafor and Adolphus (2018) who posit that broad money supply, interest rate exhibited strong positive relationship with balance of payments.

However, foreign direct investment (FDI), showed negative relationship with balance of payment stabilization in both long and short run period under review, reflecting that in practice, FDI in the Nigerian economy in the period under review may be contributing to external sector vulnerabilities – due to import – heavy investments, profit repatriation, or weak domestic integration.

Conclusion and Recommendation

The study investigates empirically the impact of Balance of payments Equilibrium and Money Supply in Nigeria from 1990-2024 adopting the autoregressive distributive lag model. The study observed that changes in the ratios of broad money supply (M2), interest rate (INTR), exchange rate (EXR), inflation rate (INFL) and trade openness (TOP) variables affect balance of payment stabilization in Nigeria. In addition, the study revealed a negative relationship between foreign direct investment (FDI), implying that these ratios are mostly above the threshold levels. It means that the FDI inflows are not reliably

contributing to BOP stability, leakages may offset benefits, low quality or extractive FDI and policy and institutional weaknesses which lead to imbalances in the Nigeria's balance of payments.

Recommendation

Therefore, we recommend that:

- i) Government should put in place targeted policy to promote high quality FDI, strengthen domestic institutions, implement local content policies, monitor and manage capital flows and enhance export capacity.
- ii) Government and policy makers should as a matter of facts improve infrastructure investment and attract value – adding and foreign exchange –generating investments.
- iii) Government should ensure a mix of sound macroeconomic management, investment in productive capacity and trade policy reforms which will in turn enhance and improve BOP resilience.

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