RELATIONSHIP BETWEEN MONEY SUPPLY AND INTEREST RATE IN NIGERIA 1990 – 2023

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Abstract

This study investigates the relationship between money supply and interest rate in Nigeria from 1990 to 2023. The specific objectives were to examine the pattern of money supply and interest rate, assess the effect of Narrow Money (M1) on interest rate, determine the impact of Broad Money (M2) on interest rate, and evaluate the direction of causality between money supply and interest rate. Using the Autoregressive Distributed Lag (ARDL) model and Granger causality tests, the results reveal a long-run relationship among broad money supply (BM), exchange rate (EXR), gross domestic product (GDP), inflation (INF), and interest rate (INR) at the 5% significance level. The ARDL estimates indicate a long-run positive relationship between broad money supply and interest rate (0.521919), consistent with the Irving Fisher effect, and a long-run negative relationship between narrow money supply and interest rate (-6.81E-08). Granger causality analysis shows that interest rate Granger-causes broad money supply, inflation Granger-causes exchange rate, and a bidirectional causality exists between interest rate and inflation. The study recommends a balanced expansion of broad money aligned with real sector productivity, targeted liquidity interventions via narrow money to reduce interest rates, coordinated interest rate inflation policies, and inflation control measures to enhance exchange rate stability.

Keywords: *Relationship; Money Supply; Interest Rate*

INTRODUCTION

1.0 Background of the research

One important macroeconomic factor that affects capital flows, investment choices, and total economic growth is interest rates. Interest rates are a monetary policy instrument used by central banks in both developed and developing nations to manage inflation, stabilize currencies, and direct economic growth. Interest rates are usually kept low in sophisticated economies like the US and the Eurozone to promote borrowing and spending, which boosts economic activity further. These areas' central banks, like the European Central Bank (ECB) and the U.S. Federal Reserve, frequently modify interest rates to balance fostering growth with reining in inflation. Low interest rates were utilized to aid in recovery after the 2008 financial crisis, whereas tighter interest rates were

employed during inflationary pressures to control excessive demand and price increases (Blanchard,2020). Interest rate dynamics are more complicated in developing nations and are frequently impacted by outside variables such international financial flows, exchange rate volatility, and unstable economies. Due to increased risk premiums, inflationary pressure and relatively poor financial systems, the African countries, including Nigeria, are typically offered higher interest rates than those of developed countries. Although the changing interest rates are feared by both consumers and businesses, the high cost of borrowing in such economies may limit investment and slow down the growth rate (Saxegaard, 2022). Due to this, the scope of monetary policy in these countries has been based on currency stabilization, taming inflation and creating an environment that favours economic growth

The largest economy in Africa, Nigeria is characterized by many of the characteristics of a developing economy, namely a high reliance on commodity exportation, particularly oil, that exposes it to external shocks. Interest rates have been one of the most important policy instruments at the Central Bank of Nigeria (CBN) to cope with economic instability, inflation, and currency devaluation. The rate used as the benchmark interest rate is the Monetary Policy Rate (MPR) which has been periodically adjusted by the CBN in efforts to deal with inflationary effects, and to trigger economic activity. An example to consider is when the inflation is high like in the case of the oil price crash in 2016 where the CBN increased the MPR to tame inflation whereas at other times; it reduced the rate to stimulate borrowing and investment (Adewale, 2023).

As a reaction, the Central Bank of Nigeria introduced the policies that would stabilize the economy and the main ones were the changes to the MPR and the interventions into the money supply. To provide an example, in the case of the 2016 oil price crash, the CBN constricted the monetary supply by increasing interest rates and using foreign exchange controls to stabilize the Naira (Adewale, 2023). However, in 2020, the CBN lowered the MPR to stimulate borrowing and put money into the economy to rescue businesses and individuals at a loss due to lockdowns (IMF, 2021).

As an instrument of the monetary policy, money supply has the potential to solve most of the problems relating to unstable interest rates in Nigeria. The CBN can control the level of liquidity by controlling the supply of money in the market, which in turn impacts the interest levels. The money supply dimensions, M0, M1, M2, and M3 all have a special role in the process. As an illustration, raising M0 (monetary base) will add more liquidity to the economy, which may ultimately decrease interest rates because more money will be lent out (Mishkin, 2019). Equally, by raising M1 (narrow money) by increasing access to demand deposits, short-term liquidity is enhanced, and businesses take loans and invest. M2 (broad money) consisting of savings and time deposits may further promote economic activity as it gives a more stable source of money to invest in the long term (Blanchard, 2020). Lastly, M3 (extended broad money) management which marks the inclusion of larger institutional deposits and money market instruments would provide the central bank with a means of determining the broader financial markets and able to control the inflationary pressure. Through these elements of money supply, the CBN would be able to counter the demeriting influence of high interest rates and spur economic growth.

This study is necessary because of the need to comprehend better how the high and fluctuating interest rates in Nigeria can be resolved through the manipulation of money supply by the CBN. Considering the economic instability observed over this time, such as the oil price fall in 2016 and the 2020 pandemic, it is important to analyze the relationship between various aspects of money supply and how changes in the monetary policy contributed to the fluctuations in interest rates and how successfully the changes have facilitated economic stability. This study will address a significant gap in the literature as it will shed light on the more productive monetary policies in the future, specific to the problems of the Nigerian economy.

The following research questions will serve as a guide for the study:
1. What is the trend of interest rates and the money supply in Nigeria?

2. What is the relationship between Nigeria's interest rate and Narrow Money (M1)?

3. What impact does Broad Money (M2) have on interest rates in Nigeria?

4. What is the causal relationship between Nigeria's money supply and interest rate?

This study's primary goal is to investigate the relationship between Nigeria's money supply and interest rates from the 1990s to 2023. The particular goals are as follows:

i. To investigate Nigeria's money supply and interest rates.

ii. To look into how Nigerian interest rates are affected by narrow money (M1).
iii. To ascertain how Broad Money (M2) affects interest rate determination in Nigeria.
iii. To calculate the causal relationship between Nigeria's money supply and interest rate.

The relationship between Nigeria's money supply and interest rate from 1990 to 2023 can be attributed to the crucial roles that both variables play in maintaining the nation's long-term development, investment inflow, and macroeconomic stability. The 2014 oil price collapse, the 2016 recession, and the COVID-19 pandemic's economic repercussions are just a few of the internal and external variables that have caused Nigeria's economy to undergo severe oscillations over the past ten years. These developments have placed a great deal of pressure on Nigeria's monetary authorities, especially the Central Bank of Nigeria (CBN), to implement prudent monetary policy in order to balance promoting economic expansion with containing inflation (Adewuyi & Omisore, 2021). Understanding the dynamics of the money supply and how they affect interest rates is necessary to address these economic issues.
Since interest rates have a direct impact on borrowing costs, investment choices, and consumer spending, they are also a key tool of monetary policy. However, despite exogenous shocks, varying inflation, and divergent economic strategies, the CBN has unable to stabilize interest rates (Sanusi, 2022). This has resulted in times when interest rates were high and unstable, which has had a detrimental effect on private sector investments, job creation, and the economy as a whole. Examining how any change in the money supply during this time can lessen liquidity problems is crucial because interest rates are directly impacted

by the money supply, which also has a significant impact on liquidity. The CBN can affect market interest rates and enhance economic stability by managing market liquidity through different money supply dimensions, including M0 (monetary base), M1 (narrow money), M2 (wide money), and M3 (extended broad money) (Mishkin,2021).

The research looked into the monetary policies of Central Bank of Nigeria (CBN) at this time, with specific emphasis on how this organization has managed to regulate interest rates through control of liquidity due to both domestic and international financial crises.

Geographically the study is limited to Nigeria and it will utilize secondary sources of data such as the national bureau of statistics, central bank of Nigeria and other international financial institutions. To include periods of economic turmoil and periods of relative economic stability, the temporal range falls between 1990 and 2023. Among these prominent events are the 2016 recession and the COVID-19 pandemic ones that had an economic impact. The study will also employ econometric models in the analysis of the relationship between the interest rates and money supply in the selected period.

Despite its extensive scope, the research may suffer several limitations. One major disadvantage is the use of secondary data which sometimes tends to suffer reporting faults or lag and may undermine the quality of the research. Due to the evolving nature of financial reporting, it can also be hard to get consistent and reliable data on certain measures of the money supply particularly the M3.

Lastly, the work could have failed to consider all the microeconomic factors which influence the interest rates including the expectations of the company and the consumer confidence. This would have led to introduction of variables not identified but had influence on the relation between interest rates and the money supply. Although it is possible that the econometric models will be applied in the study to resolve the concerns, the inherent weaknesses of the model in representing all the real-life complexities might still affect the interpretation of the findings.

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Monetary theory is the foundation of the money supply concept in Nigeria, as it is in the majority of economies. While Keynes (1936) highlighted money's significance in the near term, especially through the interest rate channel, which influences investment and aggregate demand, the Classical school saw money as neutral and only had an impact on prices over the long term (Pigou, 1941). The need of managing the money supply was further emphasized by monetarists, most notably Friedman (1968)

In some cases, the CBN also measures liquidity aggregate (L), which goes further to capture less-liquid assets such as securities. The differences among these aggregates lie in their liquidity levels and policy implications. While M1 captures money for immediate transactions, M2 accounts for longer-term savings and credit creation, and M3 reflects broader financial depth, including foreign currency holdings. In practice, the CBN relies more on M2 as an intermediate target for monetary policy, balancing liquidity and financial

mobilization, although this sometimes underestimates the informal and dollarized components of Nigeria's economy (Ogunleye, 2015).

Conversely, the interest rate, which is a percentage of the principal amount, is the cost of borrowing money or the return on savings. It affects consumer spending, inflation expectations, investment choices, and total economic growth, making it one of the most potent instruments in monetary management. Divergent opinions exist among economists about the calculation of interest rates. Keynes (1936) maintained that interest rates are fundamentally a monetary phenomenon, influenced by the supply and demand of money, in contrast to the Classical school's view that they are governed by the interaction of savings and investment (Wicksell, 1898). Interest rates are used in Nigeria as a tool for policy and as a result of market forces. The CBN sets the benchmark Monetary Policy Rate (MPR), which informs the financial sector of the monetary policy's position (CBN, 2023). In Nigeria's banking industry, structural inefficiencies, high credit risks, and weak intermediation are reflected in the maximum lending rate, which is applied to less creditworthy borrowers. The prime lending rate is the rate at which commercial banks lend to their most creditworthy clients (Sanusi, 2010). The interest paid on deposits that banks mobilize is represented by savings deposit rates, which are frequently much lower than lending rates. As a result, there is a continuous disparity between deposit and lending rates. Furthermore, interbank call rates are the short-term rates at which banks lend to one another, frequently impacted by immediate liquidity conditions, whereas treasury bill rates are the yields on short-run government securities and serve as risk-free interest rate sources in the bigger financial market. The difference between market and policy rate, the difference between nominal and real rate depicts the fluctuations of interest rate structure in Nigeria. Real interest rates, interest rates that have been adjusted to take into consideration inflation, and which are mostly set at negative values in Nigeria due to continuous inflationary pressures, contrast with nominal interest rates, which are often

quoted by the CBN and which do not reflect inflation (World Bank, 2021). Lending rates are also characteristic of the high cost of funds and the structural defect of the financial system, they are usually much higher than deposit rates. Although fiscal processes and inflation expectations affect long-term rates more, short-term rates including interbank rates and treasury bill rates are highly volatile and prone to liquidity shocks (Iyoha & Ekanem, 2019).

Interest rates and money supply form the basis of the monetary policy of the Nigerian government. Interest rates dictate the cost and distribution of the money supply which is a measure of the amount of liquidity in the economy. The impossibility of achieving complete coverage of the scale of financial activity in an economy that is partly formal and partly informal is emphasized by the differences in money supply measurement schemes, existing between narrow to broad aggregates. The complexity of Nigerian financial system is further shown in the differences in interest rate structures which span between the benchmark rates as stipulated by policy to the market-based lending and deposit interest rates. Finally, the extent to which the Central Bank of Nigeria manages to price stability, financial. development, investment stimulation, and sustainable economic growth is determined by the interplay between money supply and interest rates.

THEORETICAL REVIEW

Theories of Money Supply

The Credit Creation Theory of Money is another view that is put forward by Joseph Schumpeter and subsequently endorsed by post-Keynesian economists. According to this theory, the central bank does not exogenously determine a supply of money but endogenously create money by the lending process of commercial banks. The banks lend money to borrowers and this in itself generates new deposits and increases the supply of money. When applied to Nigeria, this theory points out the significance of the conditions of credit, and the interest rate spreads as well as the role of commercial banks in determining the supply of money. It also brings out the problems of financial repression, poor banking penetration and access to credit, which limits the ability of the Nigerian financial system to finance extensive monetary growth.

The implication is that interest rate is practically a real phenomenon, which is unaffected by monetary factors, and indicates intertemporal preferences to consumption and production. Although useful in the explanation of the long-run tendencies, this theory fails to explain short-run fluctuations in Nigeria, where the liquidity conditions, the inflation expectations, and policy interventions have a greater impact on interest rates.

Credit growth causes an accumulation of inflationary pressure; when it is above the natural rate, there is a tendency to deflation. This model provides some insight into the frequent inflationary problems in Nigeria whereby the rates set by the policy frequently fall behind the inflation expectations resulting in the long-term occurrence of negative real interest rates.

There has been a heated theoretical debate on the interaction between money supply and the interest rate. Classical economists underlined on the money being neutral, whereas Keynesians stressed on the short run correlation between money supply, interest rate, as well as output. Monetarists strengthened the leading role of money supply in causing inflation and post-Keynesians emphasized the endogenous property of money supply and its reliance upon credit demand. The theoretical nexus is of specific relevance in Nigeria since expansionary monetary policy frequently leads to an excess of liquidity, and the inflexibility of the financial framework has no way to allow interest rates to respond efficiently. In addition, high inflation undermines real returns, which leads to the financial disintermediation conditions. In this way, the theoretical reviews are the combined source of knowledge about how the Central Bank of Nigeria uses monetary aggregates and interest rates as means of attaining price stability and sustainable economic growth.

EMPIRICAL LITERATURE

Paschal, Kevin, and Uzoma (2022) explored the relationship between money supply rate, interest rate, and exchange rate on inflation in Nigeria using the ARDL bounds testing approach. Analyzing data from 1991 to 2021, the results indicated that both money supply and interest rates did not significantly affect inflation

in the short or long run. Conversely, exchange rate movements showed a strong and negative impact on inflation. The study concluded that inflationary trends in Nigeria are driven more by exchange rate volatility than monetary aggregates or interest rate movements.

Oyadeyi (2025) adopted a Quantile Autoregressive Distributed Lag (QARDL) model to investigate the implications of money velocity on monetary policy effectiveness in Nigeria. Though not directly focused on interest rates, the study highlighted how the impact of money supply on inflation varied significantly across different quantiles of the inflation distribution. The findings emphasized that traditional monetary policy tools, such as controlling money supply and setting interest rates, might yield non-uniform outcomes across different inflationary conditions.

Ademola, Alalade, Ogbebor, and Lawal (2024) investigated the interplay among interest rates, money supply, institutional quality, and exchange rate stability in Nigeria. Using the ARDL model with quarterly data from 2006Q1 to 2022Q4, they discovered that while interest rates had a statistically significant impact on exchange rate stability, money supply did not exhibit any long-run cointegrating relationship with the exchange rate. The study emphasized the importance of strong institutional frameworks in complementing monetary policy efforts aimed at maintaining macroeconomic stability.

Oyadeyi (2025) investigated the velocity of money and its implications for monetary policy in Nigeria by applying a Quantile Autoregressive Distributed Lag (QARDL) model. Using data up to 2021, the study demonstrated that the impact of money supply on inflation varied significantly across inflation quantiles. These results suggest that conventional tools such as money supply targeting and interest rate adjustments may not produce uniform effects under different inflationary regimes.

The integrated business cycle dynamics of inflation, money growth, real money demand, and nominal and real interest rates are all studied by Marcus Hagedorn (2009). He adds idiosyncratic choice shocks to cash consumption and a banking sector to a typical cash and credit monetary model, which he then extends and measures. In contrast to typical monetary models, the estimated model produces a very good explanation for the business cycle data. He discovers that significant liquidity effects account for the model's quantitative performance.

METHODOLOGY

SOURCES AND METHOD OF DATA COLLECTION

The primary source of secondary data used in this study is reliable national and international statistical agencies. The primary sources are the World Bank's World Development Indicators (WDI), the National Bureau of Statistics (NBS), and the Central Bank of Nigeria's (CBN) Statistical Bulletin. The data will provide adequate time-series coverage from 1990 to 2023.

Observations for empirical analysis. Specifically, data on money supply (M2) and interest rate (lending interest rate,) was extracted for the Nigerian economy. The choice of these sources is based on their credibility, accessibility, and consistency in reporting macroeconomic indicators. The study adopts

secondary data because it is cost-effective, time-saving, and suitable for macroeconomic research that requires long time-series data.

MODEL SPECIFICATION

The theoretical foundation of the model is anchored on Keynes' Liquidity Preference Theory and the Quantity Theory of Money, which both establish a link between money supply and interest rate. To capture this relationship empirically, the study specifies the model of Eze Ibekwe was adopted and modified:

$$INTR_t = f(MS_t, X_t) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

TECHNIQUES OF ANALYSIS

The study employs both descriptive and econometric techniques of analysis. Descriptive analysis will be used to summarize the characteristics of the data, highlighting the trend, mean, standard deviation, and other relevant statistical measures. Graphs and tables will also be used to visualize the behavior of money supply and interest rate over time. Correlation analysis will be carried out to examine the degree and direction of association between money supply and interest rate before proceeding to more advanced econometric tests.

EXPECTED CONTRIBUTION TO KNOWLEDGE

By offering empirical data on the dynamic relationship between Nigeria's money supply and interest rate—a topic that has continued to spark discussion among academics and policymakers—this study is anticipated to make a substantial contribution to the body of information already in existence. In contrast to many earlier studies that only looked at M2, this study takes a more comprehensive approach by taking into account a variety of money supply (M2) metrics in addition to several interest rate proxies. Additionally, by simultaneously capturing short-run adjustments and long-run equilibrium, the ARDL framework will enhance the literature and provide a more thorough understanding of the relationship between interest rates and monetary aggregates. The results will give policymakers—especially the Central Bank of Nigeria—important information about how well monetary policy tools work to control liquidity, maintain interest rate stability, and accomplish macroeconomic stability.

DATA PRESENTATION AND ANALYSIS

THE DESCRIPTIVE ANALYSIS

Table 4.1 Descriptive Analysis of Variables (1990-2023)

Sample					
1990-2023					
	BM	EXR	GDP	INF	INR
Mean	18.18383	109.3193	4.287737	18.08467	18.74353
Median	15.90097	100.5039	4.230061	12.87658	17.79500
Maximum	27.37879	273.0126	15.32916	72.83550	31.65000
Minimum	9.063329	49.77684	-2.035119	5.388008	11.48313

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Std. Dev.	6.142791	48.82227	3.958301	16.10793	3.997027
Skewness	0.027623	1.818812	0.465009	2.198991	1.026019
Kurtosis	1.352526	6.329744	3.389531	6.826438	4.849022
Jarque-Bera	3.736179	33.43932	1.397917	46.72782	10.49090
Probability	0.154418	0.000000	0.497103	0.000000	0.005271
Sum	600.0664	3607.537	141.4953	596.7940	618.5365
Sum Sq. Dev.	1207.484	76275.66	501.3807	8302.893	511.2393
Observations	33	33	33	33	33

Source: Authors computation using EViews 10.0.

Pattern of Broad Money Supply (BM) in Nigeria (1990-2023)

On the average basis, broad money supply (BM) in Nigeria during the period was 18.18383, while the median of broad money supply was 15.90097. Also, the maximum in broad money supply was 27.37879 in 2012. This means that the rate at which broad money supply was high during the period. The minimum broad money supply was 9.063329 in 2000. The standard deviation was 6.142791. This showed the degree of deviation from the mean (Table 4.1)

Pattern of Exchange rate (EXR) in Nigeria (1990-2023)

Descriptive analysis in table 4.1. indicates that, exchange rate (EXR) exhibited an average value of ₦109.32 per US dollar, with a median of ₦100.50, indicating mild upward skewness (1.82) due to extreme depreciation episodes, such as the peak of ₦273.01. The minimum rate of ₦49.77 represents the strongest naira value within the sample period. The high standard deviation (48.82) reflects substantial exchange rate volatility.

Pattern of Economic Growth (RGDP) in Nigeria (1990-2023)

Economic growth (GDP) averaged 4.29% over the sample period, with a median of 4.23%. The highest growth rate of 15.33% reflects periods of economic boom, while the lowest rate of -2.04% corresponds to recessionary periods. The standard deviation of 3.96 which suggests a moderate fluctuation in growth performance. The skewness (0.47) and kurtosis (3.39) values imply a slightly peaked and positively skewed distribution.

Pattern of Inflation Rate (INF) in Nigeria (1990-2023)

Inflation (INF) averaged 18.08% annually, with a median value of 12.88%. The maximum inflation rate of 72.83% represents a period of hyperinflation, while the minimum of 5.39% reflects relative price stability. The high standard deviation (16.11) and skewness (2.20) indicate that the series is heavily influenced by extreme inflationary episodes. The kurtosis value of 6.83 further supports the presence of fat tails.

Pattern of Interest rate (INR) in Nigeria (1990-2023)

Interest rates averaged 18.74%, with a median of 17.80%, reflecting generally high borrowing costs in Nigeria. The maximum rate of 31.65% suggests periods of aggressive monetary tightening, while the

minimum of 11.48% indicates the most accommodative stance within the sample period. The standard deviation of 4.00 implies moderate variability, and the skewness (1.03) indicates a right-skewed distribution. The kurtosis value of 4.85.

CORRELATION ANALYSIS

Correlation analysis was performed to ascertain the link between the variables, and table 4.2 displays the outcome.

Table 4.2 Correlation Result.

	BM	EXR	GDP	INF	INR
BM	1.000000				
EXR	-0.119613	1.000000			
GDP	-0.171524	-0.205583	1.000000		
INF	-0.273532	-0.022312	-0.420149	1.000000	
INR	-0.567090	-0.357278	0.131553	0.439394	1.000000

Source: Authors computation using EViews 10.0

UNIT ROOT TEST / TEST OF STATIONARITY

Table 4.3 shows the results of a unit root test or a test of the variables' stationarity. A common stochastic tendency in macroeconomic data can be eliminated by differentiating the variables. The Augmented Dickey Fuller (ADF) t-test is used to evaluate the order of integration. The outcomes of the unit root test are displayed in table 4.3.
Table 4.3 presents the findings of the stationarity test.

Variables	**Augmented Dickey Fuller (ADF) Test**		**5% Critical Values**		**Order of Integration**
	At Level	**At First Deference**	**At Level**	**At First Deference**	
BM	-1.037282	-4.567915	-2.957110	-2.960411	**I(1)**
EXR	-2.655221	-5.440819	-2.954021	-2.957110	**I(1)**
GDP	-3.735593	____	-2.954021	_____	**I(0)**
INF	-2.480090	-9.797882	-3.552973	-3.580623	**I(1)**
INR	-6.086408	_____	-3.568379	_____	**I(0)**

Source: Authors computation using EViews 10.0

By offering empirical data on the dynamic relationship between Nigeria's money supply and interest rate—a topic that has continued to spark discussion among academics and policymakers—this study is anticipated to make a substantial contribution to the body of information already in existence. In contrast to many earlier studies that only looked at M2, this study takes a more comprehensive approach by taking into account a variety of money supply (M2) metrics in addition to several interest rate proxies. Additionally, by

simultaneously capturing short-run adjustments and long-run equilibrium, the ARDL framework will enhance the literature and provide a more thorough understanding of the relationship between interest rates and monetary aggregates. The results will give policymakers—especially the Central Bank of Nigeria—important information about how well monetary policy tools work to control liquidity, maintain interest rate stability, and accomplish macroeconomic stability.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BM	0.521919	0.208300	-2.505607	0.0197
EXR	0.012403	0.034562	0.358847	0.7230
GDP	0.011694	0.280447	0.041699	0.9671
INF	-0.085513	0.125183	-0.683100	0.5014
C	27.98659	5.762380	4.856776	0.0001

Source: Authors computation using EViews 10.0

Note: * imply significance at 5 %level.

The broad money supply (BM) long run coefficient of 0.521919 in table 4.6 is positive and statistically significant at the 5% level. This suggests that a rise in the supply of BM might lead to an increase in interest rates, so validating the long-term effect of Irving Fisher. At the 5% level, the exchange rate's long-term coefficient (0.012403) is positive but not statistically significant. In the same way, the GDP's long-term coefficient of growth (0.011694) is positive but not statistically significant at the 5% level. However, at the 5% level, the long-term coefficient of inflation (INF), which is -0.085513, is negative and still not statistically significant.

Table 4.7 Estimated long run coefficients of **Narrow Money Supply** based on ARDL model.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NM	-6.81E-08	1.54E-08	-4.415017	0.0002
EXR	0.006174	0.020591	0.299830	0.7673
GDP	-0.342151	0.248585	-1.376392	0.1832
INF	-0.073249	0.077349	-0.946998	0.3544
C	23.87514	2.938288	8.125527	0.0000

Source: Authors computation using EViews 10.0

Note: * imply significance at 5 %level.

In table 4.7, long run coefficient of broad money supply (NM) -6.81E-08 is negative and statistically significant at 5% level. This implies that an increase in supply of (NM) has the potential to reduce interest rate (INR). The long run coefficient of Exchange rate (EXR) 0.006174is positive but not statistically significant at 5% level. The long run coefficient of economic growth (GDP) -0.342151is negative and not statistically significant at 5% level. Similarly, the long run coefficient of inflation (INF) -0.073249 is negative and still not statistically significant at 5% level.

Table 4.8 Granger Causality/ block Exogeneity Wald Result

Dependent variable: BM				
Excluded	Chi-sq	df	Prob.	Decision
EXR	2.745333	2	0.2534	Accept
GDP	1.736132	2	0.4198	Accept
INF	1.658492	2	0.4364	Accept
INR	8.305672	2	0.0157	Reject
All	15.33241	8	0.0530	
Dependent variable: EXR				
Excluded	Chi-sq	df	Prob.	Decision
BM	0.227984	2	0.8923	Accept
GDP	0.024473	2	0.9878	Accept
INF	20.63773	2	0.0000	Reject
INR	2.085170	2	0.3525	Accept
All	28.86961	8	0.0003	
Dependent variable: GDP				
Excluded	Chi-sq	df	Prob.	Decision
BM	1.465217	2	0.4807	Accept
EXR	0.859605	2	0.6506	Accept
INF	0.064735	2	0.9682	Accept
INR	0.718314	2	0.6983	Accept
All	2.412165	8	0.9657	
Dependent variable: INF				
Excluded	Chi-sq	df	Prob.	Decision
BM	2.154230	2	0.3406	Accept
EXR	0.889304	2	0.6410	Accept
GDP	3.119390	2	0.2102	Accept
INR	15.09469	2	0.0005	Reject
All	32.19139	8	0.0001	
Dependent variable: INR				
Excluded	Chi-sq	df	Prob.	Decision
BM	4.561321	2	0.1022	Accept
EXR	0.221329	2	0.8952	Accept
GDP	2.767759	2	0.2506	Accept
INF	10.77419	2	0.0046	Reject
All	16.39485	8	0.0371	

Source: Authors computation using EViews 10.0

Table 4.8's Granger causality results demonstrate that, at the 5% level of significance, the exchange rate (EXR), GDP, and inflation (INF) do not Granger cause the broad money supply (BM). At the 5% level of significance, however, the interest rate (INR) Granger causes the broad money supply (BM). The outcome further demonstrates that, at the 5% level of significance, the broad money supply (BM), GDP, and interest

rate (INR) do not granger causes to the exchange rate (EXR). Granger causes of the exchange rate (EXR) at the 5% level of significance are inflation (INF). At the 5% level of significance, the variables broad money supply (BM), exchange rate (EXR), inflation (INF), and interest rate (INT) do not granger drives economic growth (GDP). Additionally, at the 5% level of significance, interest rate (INR) granger produces inflation (INF) while broad money supply (BM), exchange rate (EXR), and economic growth (GDP) do not. Last but not least, inflation (INF) granger causes interest rate (INR) at the 5% threshold of significance, while the broad money supply (BM), exchange rate (EXR), and economic growth (GDP) do not.

SUMMARY OF MAJOR FINDINGS

The Pattern of the variables shows that on the average basis, broad money supply (BM) in Nigeria during the period was 18.18383, while the median of broad money supply was 15.90097. Also, the maximum in broad money supply was 27.37879 in 2012. This means that the rate at which broad money supply was high during the period. The minimum broad money supply was 9.063329 in 2000. The standard deviation was 6.142791. This showed the degree of deviation from the mean. The Descriptive analysis also indicates that, exchange rate (EXR) exhibited an average value of ₦109.32 per US dollar, with a median of ₦100.50, indicating mild upward skewness (1.82) due to extreme depreciation episodes, such as the peak of ₦273.01. The minimum rate of ₦49.77 represents the strongest naira value within the sample period. The high standard deviation (48.82) reflects substantial exchange rate volatility.

The pattern of Economic growth (GDP) shows that the averaged 4.29% over the sample period, with a median of 4.23%. The highest growth rate of 15.33% reflects periods of economic boom, while the lowest rate of -2.04% corresponds to recessionary periods. The standard deviation of 3.96 which suggests a moderate fluctuation in growth performance. The skewness (0.47) and kurtosis (3.39) values imply a slightly peaked and positively skewed distribution. Inflation (INF) averaged 18.08% annually, with a median value of 12.88%. The maximum inflation rate of 72.83% represents a period of hyperinflation, while the minimum of 5.39% reflects relative price stability. The high standard deviation (16.11) and skewness (2.20) indicate that the series is heavily influenced by extreme inflationary episodes. The kurtosis value of 6.83 further supports the presence of fat tails. Interest rates averaged 18.74%, with a median of 17.80%, reflecting generally high borrowing costs in Nigeria. The maximum rate of 31.65% suggests periods of aggressive monetary tightening, while the minimum of 11.48% indicates the most accommodative stance within the sample period. The standard deviation of 4.00 implies moderate variability, and the skewness (1.03) indicates a right-skewed distribution. The kurtosis value of 4.85.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

SUMMARY

According to the pattern of the variables, the median broad money supply (BM) in Nigeria over the time was 15.90097, while the average BM was 18.18383. Additionally, the wide money supply peaked in 2012 at 27.37879. This indicates that the broad money supply was growing at a rapid pace during that time. In the year 2000, the minimum wide money supply was 9.063329. 6.142791 was the standard deviation. This displayed the extent of the departure from the average. Additionally, according to the descriptive analysis, the exchange rate (EXR) showed a median of ₦100.50 and an average of ₦109.32 per US dollar, indicating

a minor upward skewness (1.82) brought on by significant depreciation occurrences, including the peak of ₦273.01. The strongest naira value during the study period is represented by the minimum rate of ₦49.77. Significant exchange rate volatility is seen in the large standard deviation (48.82). According to the GDP pattern, the average growth rate over the study period was 4.29%, with a median of 4.23%. Economic booms are reflected in the highest growth rate of 15.33%, while recessions are reflected in the lowest rate of -2.04%. The 3.96 standard deviation indicates a moderate degree of variation in growth performance. The distribution appears to be slightly peaked and positively skewed, as shown by the skewness (0.47) and kurtosis (3.39). The median annual inflation rate (INF) was 12.88%, with an average of 18.08%. A time of hyperinflation is represented by an inflation rate of 72.83%, while relative price stability is reflected by an inflation rate of 5.39%. The series is strongly impacted by intense inflationary episodes, as evidenced by the high skewness (2.20) and standard deviation (16.11). The existence of fat tails is further supported by the kurtosis value of 6.83. Nigerian borrowing expenses are often high, as seen by interest rates, which averaged 18.74% with a median of 17.80%. The most accommodating approach is indicated by a minimum rate of 11.48%, while periods of strong monetary tightening are suggested by a maximum rate of 31.65% within the sample period. The standard deviation of 4.00 implies moderate variability, and the skewness (1.03) indicates a right-skewed distribution. The kurtosis value of 4.85.

CONCLUSION

In conclusion, at the 5% level of significance, there is a long-term association between the variables BM, EXR, GDP, INF, and INR in Nigeria. The ARDL model of the broad money supply confirms the Irving Fisher long-run impact by demonstrating a long-term positive correlation between the interest rate and the broad money supply (BM), 0.521919. In contrast, the broad money supply (NM) -6.81E-08 and interest rate have a long-term negative connection in the narrow money supply model

RECOMMENDATIONS

i. The positive long-run relationship between broad money supply and interest rate, as confirmed by the ARDL model and consistent with the Irving Fisher effect, suggests the need for a balanced expansion of broad money. Monetary authorities should ensure that increases in broad money supply are aligned with real sector productivity to prevent excessive upward pressure on interest rates.

ii. The negative long-run relationship between narrow money supply and interest rate indicates that targeted increases in narrow money components, such as currency in circulation and demand deposits, could be an effective strategy to lower interest rates. The Central Bank should employ short-term liquidity injections and adjustments in reserve requirements to facilitate favorable lending conditions.

iii. The bidirectional causality between interest rate and inflation underscores the importance of policy coordination. An integrated monetary policy framework that simultaneously addresses both variables through inflation targeting and interest rate management will help break the feedback loop and promote macroeconomic stability.

iv. The unidirectional causality from inflation to exchange rate implies that effective inflation control is essential for exchange rate stability. Policymakers should adopt measures such as prudent fiscal discipline,

supply-side interventions to mitigate cost-push inflation, and consistent monitoring of money supply growth to maintain a stable macroeconomic environment.

REFERENCES

Adeoye, A., & Omisore, B. (2019). *Monetary policy and inflation in Nigeria: An empirical investigation*. Journal of Economics and Public Policy, 11(2), 23-38.

Adewuyi, O., & Omisore, B. (2021). *Monetary policy and economic stabilization in Nigeria: An empirical investigation*. Journal of Economics and Public Policy, 13(2), 27-42.

Blanchard, O. (2020). *Macroeconomics: A European perspective* (4th ed.). Pearson Education.

Cagan, P. (2022). *The demand for money*. University of Chicago Press.

CBN Statistical Bulletin for several years.

CBN. (2022). *Statistical Bulletin: Money and Credit Statistics*. Abuja: Central Bank of Nigeria.

Central Bank of Nigeria (CBN). (2022). *Statistical Bulletin: Money and Credit Statistics*. Abuja: CBN.

Central Bank of Nigeria (CBN). (2023). *Monetary Policy Communiqué*. Abuja: CBN.

Central Bank of Nigeria. (2023). 2021 Annual Economic Report. https://www.cbn.gov.ng/Out/2023/RSD/2021%20CBN%20ANNUAL%20ECONOMIC%20REPORT.a.pdf

Central Bank of Nigeria. (2023). 2022 Statistical Bulletin: Financial Statistics. https://www.cbn.gov.ng/documents/statbulletin.asp

Central Bank of Nigeria. (2023). 2023 FMD Annual Activity Report. https://www.cbn.gov.ng/out/2024/fmd/2023%20fmd%20annual%20activity%20report%20.pdf

Fisher, I. (1911). *The Purchasing Power of Money*. New York: Macmillan.

Friedman, M. (1956). The quantity theory of money: A restatement. In M. Friedman (Ed.), *Studies in the Quantity Theory of Money* (pp. 3–21). Chicago: University of Chicago Press.

Friedman, M. (1968). The role of monetary policy. *American Economic Review*, 58(1), 1–17.

Friedman, M. (2021). *The quantity theory of money: A restatement*. University of Chicago Press.

Hall, M. (2022). How do fiscal and monetary policies affect aggregate demand?Retrieved from Investopedia:https://www.investopedia.com/ask/answers/040315/how-do-fiscal-and-monetary-policies-affect-demand.asp

Hicks, J. R. (1937). Mr. Keynes and the classics: A suggested interpretation. *Econometrica*, 5(2), 147–159.

IMF. (2021). *Nigeria: Staff report for the 2020 Article IV consultation*. International Monetary Fund.

Iyoha, M., & Ekanem, O. (2019). *Macroeconomic policy in Nigeria: Issues and challenges*. Ibadan: Spectrum Books.

Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money*. London: Macmillan.

Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money*. London: Macmillan.

Mishkin, F. S. (2019). *The economics of money, banking, and financial markets* (12th ed.). Pearson.

Mishkin, F. S. (2021). *The economics of money, banking, and financial markets* (13th ed.). Pearson.

Mishkin, F. S. (2021). *The economics of money, banking, and financial markets* (13th ed.). Pearson.

O’mte Diahavbe, Rabiu and Oshilim (1989) The output and price effect of money supply in Nigeria.

Ogunleye, T. S. (2015). Money supply and inflation dynamics in Nigeria: An empirical investigation. *Journal of Monetary and Economic Policy*, 8(2), 45–63.

Pigou, A. C. (1941). *Employment and Equilibrium*. London: Macmillan.

Sanusi, L. S. (2010). The Nigerian banking industry: What went wrong and the way forward. *Convocation Lecture, Igbinedion University, Okada*.

Sanusi, L. S. (2022). *Monetary policy challenges in developing economies: A Nigerian perspective*. Central Bank of Nigeria Economic Review, 32(4), 15-31.

Saxegaard, M. (2020). *Monetary policy and interest rates in African economies: A comparative analysis*. African Development Review, 34(2), 127-145.

Schumpeter, J. A. (1934). *The Theory of Economic Development*. Cambridge, MA: Harvard University Press.

Wicksell, K. (1898). *Interest and Prices*. London: Macmillan.

World Bank. (2021). *World Development Indicators*. Washington, D.C.: World Bank.