EFFECTS OF BUDGET DEFICIT AND MONEY SUPPLY ON INFLATION IN NIGERIA

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Abstract

This study explores the relationship between budget deficit, money supply, exchange rate, interest rate, and inflation in Nigeria over the period from 1991 to 2023. The study adopted an ex-post facto approach with data obtained from the Central Bank of Nigeria to apply the Autoregressive Distributed Lag (ARDL) model. The research establishes that Nigerian inflation levels rose as the money supply increased thus showing a direct positive correlation between these economic variables. Exchange rate fluctuations lead to inflationary pressures in the economy because they create significant inflation effects. The budget deficit affects inflation only through its indirect influence which stems from its effect on money supply. The research reveals that interest rates generate inflationary effects which remain noticeable while being less influential compared to other factors. The data demonstrates why monetary authorities need to control both monetary base fluctuations and currency exchange rate fluctuations because such actions drive price increases. It is recommended that the Nigeria's government prioritize budget deficit reduction combined with currency stability mechanisms and monetary policy standards that should fight inflation together with promoting a stable economic framework. Security experts can use the study findings to develop strategic inflation controls for Nigeria's changing economic framework.

Keywords: Budget deficit, Inflation, Money supply, Nigeria.

1. INTRODUCTION

A country's fiscal estimate is in deficit when the government's total outlays exceed its total receipts (Aragaw, 2024). The fact that this deficit is financed by loan financing and cash balance withdrawals may lead some people to believe that it is beneficial for the economy. Fiscal conservatives argue that balanced programs, not deficits, should be the goal of governments. The Central Bank of Nigeria (CBN) provides a large portion of the funding for Nigeria's budget deficits, often taking on excessive borrowing from the banking sector and external sources (Adewale, 2025). Both monetary policy tools (money supply, interest rate) and the outcomes of fiscal policy (fiscal deficit, government spending) result in high levels of inflation, which are the two primary macroeconomic problems that developing countries like Nigeria have had to deal with (Hussein, 2018).

The monetarist theory of inflation and the fiscal theory of price level are the two primary viewpoints about the connection between inflation, money supply, and budget imbalance (Hussein, 2018). Because of low revenue from poor tax bases, tax evasion, and tax rates, developing countries like Nigeria consistently face budget imbalances. No new money is produced when government bonds are sold to the public to support budget imbalances; nevertheless, if banks are borrowed from, monetary deposits grow and lead to inflation (Asaolu, et al., 2025). The fiscal theory of price level states that since deficits are paid by producing new money, a government that consistently runs on deficit financing may result in increased inflation. However, according to the monetarist perspective, inflation is a monetary phenomenon that is influenced by fiscal policy, and nominal monetary growth is determined by the need to finance exogenously given deficits in order to comply with budgetary constraints (Garba, 2023).

Inflation is often attributed to a fiscal event linked to an imbalance between the money supply and economic development (Adewale, 2025). Central banks can reduce the correlation between inflation and the budget deficit by refusing to adjust the deficit and by addressing the gaps created by expanding the money supply (Adaramola & Dada, 2020). However, there is still no discernible relationship between the monetary supply and the budget deficit, suggesting that there may not be as much of a connection between the two (Adewale, 2025). Despite rising spending deficits, falling or perfect seigniorage incomes can present concerns (Adewale & Adewole, 2024). State necessity may lead to inflation in the level of prices and a decrease in the number of commodities available for a given amount of money. This can also raise net credit demands, raise interest rates, and affect private borrowings. Shortfalls may also result in higher inflation through the private adaptation of deficits. In reaction to high lending rates, the monetary sector can expand risk-free financial products, shifting the burden of debt from the Central Bank to the private sector and hurting the economy over time by causing inflation (Adewale & Adeyemo, 2024).

In monetary economics, the money supply—the total amount of money in the economy—has attracted a lot of interest because it is crucial to accomplishing macroeconomic objectives for both wealthy and developing nations (Oyadeyi et al., 2025). Policymakers must comprehend how the money supply affects Nigeria's economic development in order to successfully expand the economy. Economic growth is ensured by efficient operations in both the public and private sectors. The money supply can be measured in three ways: traditional Keynesian thinking (M1), broad money (M2), and the broadest view (Shaw, 1973). Monetary authorities employ monetary policy to intentionally alter the amount, cost, and accessibility of credit in order to accomplish specific macroeconomic goals (Oladejo et al., 2025).

According to Oyadeyi et al. (2025), inflation is a macroeconomic variable that has a major impact on economies all over the world, and its main cause is monetary forces. African economies that are expanding, like Nigeria, are most impacted, with average annual inflation rates above 15%. Ikwor et al.

(2024) cite several factors that contribute to persistent inflation rates, such as high public sector budget deficits, monetisation of deficits, excessive military spending, insufficient rainfall, populist policies, persistent inflationary expectations, an increase in the money supply, rising costs of imported manufactured goods, inputs, and raw materials, rising interest rates from government borrowing, and unstable exchange rates. The money supply, interest rates, exchange rates, and government deficit budget are some of the factors that economists dispute over as contributing to inflation (Akpan, 2024). The primary goal of this study is to see how the budget deficit and money supply affect Nigeria's inflation rate. Other specific goals include examining the relationship between the budget deficit and inflation in Nigeria and evaluating the relationship between the money supply and inflation in Nigeria.

1.1 Statement of the problem

The continual increase in inflationary pressures remains a severe issue for Nigeria because it weakens both purchasing ability and leads to economic instability statewide. The budget deficit together with money supply operate as leading factors that drive inflation according to common macroeconomic analysis. Repeated government spending that exceeds revenue levels results in continuous budget deficits which governments finance either through debt or money supply growth. When money supply expands beyond control in conditions featuring poor productive capability it drives demand-pull inflation.

Despite intensified efforts from the Central Bank to control prices through various policy implementations inflation levels in Nigeria continue exceeding their targeted range. The relationship between fiscal policy coordination and monetary policy performance becomes unclear because of how budget deficit practices and growing money supply influence inflation trajectories. Research about Nigerian inflation determinants exists but does not examine either combined or single influences from budget deficits and money supply despite the nation's changing economic framework combined with its mounting fiscal issues. Knowledge about the individual and collective impact of these variables on inflation is necessary to develop appropriate stabilization approaches and long-term macroeconomic results. This research addresses this literature void by performing empirical analysis on the influence of budget deficit and money supply on Nigerian inflation rates through strong time-series data and suitable econometric approaches.

2. LITERATURE REVIEW

2.1 Inflation rate

A persistent rise in the general level of prices for goods and services within an economy is known as inflation, and it causes the internal medium of exchange and unit of account to lose real value (Adeyemo &

Adewale, 2024). The inflation rate, which is the annual percentage change in a general price index, is the primary measure of price inflation (Bashir & Sam-Siso, 2020). Inflation can have both beneficial and detrimental effects on an economy (Akpan, 2024). Some of the negative effects of hoarding include increased opportunity costs of holding onto money, uncertainty about future inflation, and potential shortages of commodities (Anidiobu et al., 2018).

2.2 Budget deficit

Murshed et al. (2018) state that a budget deficit occurs when the government's revenue base isn't enough to cover its expanding spending. It is the difference between budgeted receipts and expenditures, which are financed by cash balance and debt. This deficit is caused by a number of economic factors, such as declining foreign reserves, rising unemployment, weak economic performance, declining tax revenue, growing foreign debt, and increased infrastructure spending (Asaolu, et al., 2025). A greater budget deficit can lead to higher inflation by increasing the money supply and promoting more borrowing. (Nguyen Bon, 2015). If fiscal policy takes primacy and leads to deficit financing, inflationary pressures may be felt by the economy. A tight monetary policy initially leads to low inflation, but when revenue falls, debt instruments are eventually issued, which rises inflation levels (Bordo & Levy, 2021). A increasing deficit can lead to inflationary pressure through the development of new assets by the banking sector, the expansion of net credit, or the exclusion of private investment (Murshed et al., 2018).
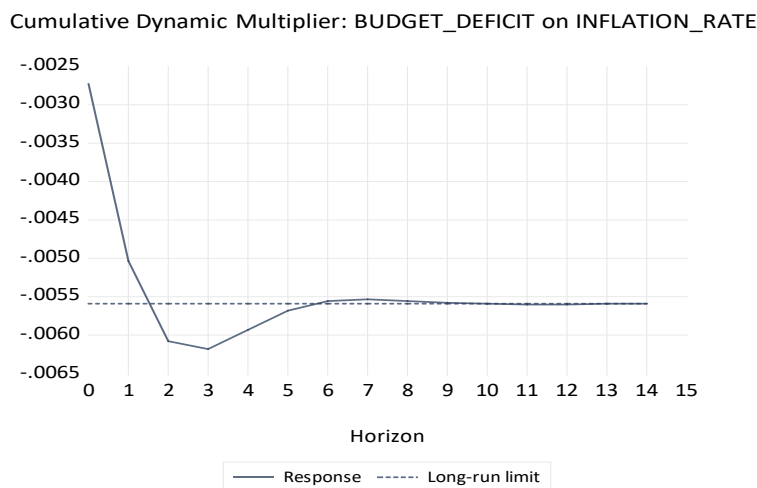
Cumulative Dynamic Multiplier: BUDGET_DEFICIT on INFLATION_RATE

FIGURE 1. CUMULATIVE DYNAMIC MULTIPLIER: BUDGET DEFICIT ON INFLATION RATE
Source: Author's computation, 2025.

The budget deficit drives inflation rate changes through cumulative dynamic multiplier analysis over extended periods. The initial response is weakly adverse at horizon zero which intensifies during the first three periods before achieving its most negative level at horizon 3. At this moment the response starts rising from its negative value until it approaches the long-run level. Budget deficit initially triggers minimal

deflation within the economy before the effect ceases to affect inflation rates fundamentally. The long-term research indicates budget deficit pressures inflation in Nigeria in a weak negatively directional way.

2.3 Money supply

The total amount of currency in use in a country at any given time, including demand deposits and currency, is known as the money supply (Ingabire et al., 2020). Money supply is a stock concept as opposed to national income, which is a flow that shows the value of goods and services produced per unit of time, usually expressed as a year (Galadima & Ngada, 2017). The total amount of monetary media of exchange that a society has available for use in connection with its economic operations is known as the money supply, and it is composed of two parts: demand deposits and public currency (Gatawa et al., 2017). Odumusor (2019) asserts that it always refers to the total amount of money in the public domain. It can also refer to the total amount of monetary medium of exchange available to a society for use in trade inside the nation.
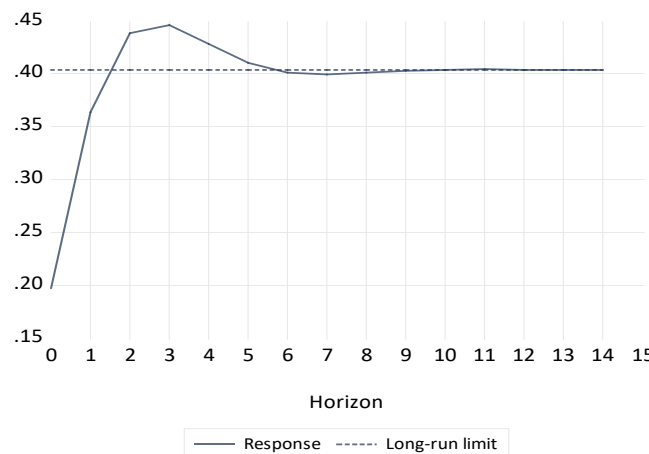

FIGURE 2. CUMULATIVE DYNAMIC MULTIPLIER: MONEY SUPPLY ON INFLATION RATE
Source: Author's computation, 2025.

The cumulative dynamic multiplier graph demonstrates how inflation rates change in response to changes in money supply during specific time periods. When the horizon reaches zero the inflation rate shows a positive movement despite remaining at a minimal level. The measurement shows that when money supply increases it causes substantial inflation which reaches its highest point at horizon 3. Beyond its peak point the response strength of the examined effect decreases temporarily until it reaches a level that maintains itself above the long-term limit. The inflation data illustrates that increased money supply produces robust sustained inflationary effects which support the theory that higher money supply leads to rising and sustained inflation levels in Nigeria.

2.4 Exchanging rates

The exchange rate is described as the price of the currency of one nation compared to the currency of another nation which is a key determinant of international trade, capital flow and macroeconomic stability (Oyadeyi, et al., 2025). Classical theories, like Purchasing Power Parity, aim to ensure equal prices for goods in different countries. However, short-term results can be conflicting. Developing economies like Nigeria shows the uncertainty of exchange rate volatility affects foreign investment decisions, trade competitiveness, and inflationary pressures. Chronic devaluation of home currency can increase import prices, leading to inflation and declining purchasing power.
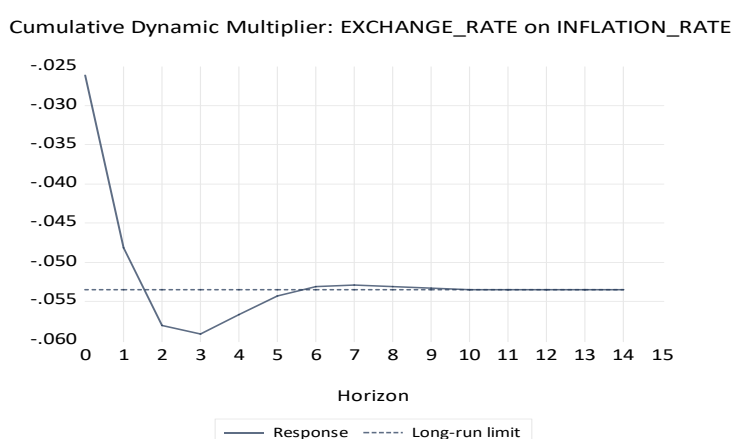

FIGURE 3. CUMULATIVE DYNAMIC MULTIPLIER: EXCHANGE RATE ON INFLATION RATE
Source: Author's computation, 2025.

The time-dependent dynamic multiplier changes of the exchange rate impact inflation rate in Nigeria as presented through the graph. Exchanging rates create an immediate yet strong negative effect on domestic inflation levels. The effect reaches its maximum negative point near Horizon 3 during the first three periods of analysis. The impact undergoes stabilization until it finds equilibrium at horizon 7 to 10 before becoming flat. The continuously negative sign reveals that exchange rate depreciation leads to reduced inflation during both the short and long-term periods against typical economic expectations. The economic situation in Nigeria produces this result possibly through import substitution policies or exchange rate regulations.

2.5 Interest rate

Interest rates are one of the tools of monetary policy and it is the price of borrowing money or the rate of saving (Oyadeyi, et al., 2025). Their two-fold role in the determination of consumption and investment decision, macroeconomic outcome like inflation and economic growth are highlighted by the literature. Classical economic theories like loanable funds theory and Keynesian views focus on savings and investment, while Keynesian views emphasize liquidity preference and central bank intervention.

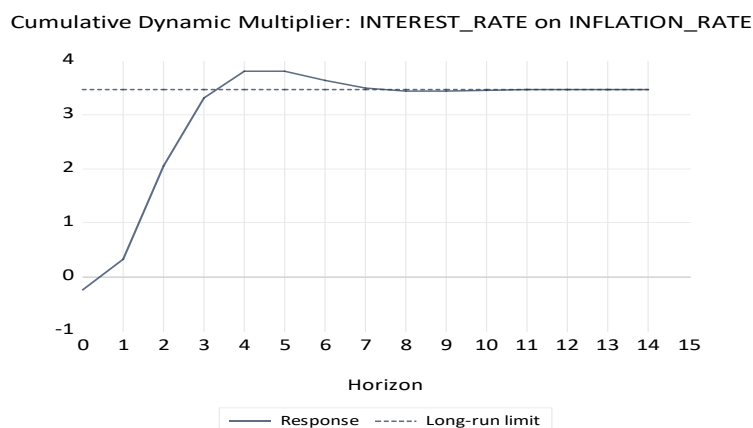Cumulative Dynamic Multiplier: INTEREST_RATE on INFLATION_RATE

FIGURE 4. CUMULATIVE DYNAMIC MULTIPLIER: INTEREST RATE ON INFLATION RATE
Source: Author's computation, 2025.

The reported data reflects how the interest rate influences inflation rate dynamics in Nigeria through time. The initial impact of interest rate variation on inflation is small and positive before a notable inflationary effect emerges between horizons 1 to 4. Interest rate raises form their highest peak of correlation with inflation at a period that reaches Horizon 5. The effect on inflation experiencing a minor decline after the peak point and reaches stability at horizon 10. This discovery deviates from standard expectations because typically rising interest rates would decrease inflation rates. Rising interest rates in Nigeria might have led to elevated borrowing expenses and manufacturing costs that resulted in increased prices and inflation.

2.6 Theoretical review

2.6.1 The monetarist hypothesis (theory)

The monetarist hypothesis is based on the quantity theory of money, which holds that the nominal money supply controls the level of prices. Proponents define the general price level as the price at which the desired level of real balances is equivalent to the nominal money supply's purchasing power at any particular level. Deviations from this level lead to changes in the price level. However, monetarists argue that budget deficits, which are financed by the government through seigniorage by the central bank or open market operations, cause inflation by altering the nominal money supply and, in turn, the level of prices generally. Friedman (1963) argues that inflation is always a monetary event.

2.6.2 The fiscal theory of the price level (FTPL)

The fiscal theory of the price level, often known as the quantity theory of government debt, contends that fiscal deficits impact the general price level through a different process than the monetarist approach. The government's intertemporal budget constraint (GBC) is said to be in equilibrium when the discounted value

of future primary surplus surpasses the current nominal value of public debt. The calculation of the discount rate involves dividing the real interest rate by the growth rate of the economy. The exogenous assumption of the theory is that fiscal authority dictates the trajectory of revenues and primary expenditures in the future. If the primary surplus's discounted value is smaller than the nominal public debt at a certain discount rate, the price level will rise to bring the GBC situation into equilibrium.

2.7 Empirical review

Abdullahi, Kanang, and Gana (2025) investigated whether the mode of financing Nigeria's budget deficit influences inflation, The central bank strides and the Treasury bills/bonds between the years 1981 and 2021. The study observed that there was a long-run co-integrating relationship between deficit financing instruments and inflation using the ARDL bounds test estimation method. The results indicated that Treasury bills and bonds negatively and significantly affect both the long term and short-term inflation, which implies that they are deflationary to the Nigerian economy. On the other hand, it was observed that Central Bank advances have a strong short-run impact on inflation but indirectly impact on the long-run. These findings show that the nature of financing deficits is very sensitive in relation to inflationary pressures. The paper found that bonds are more sustainable in controlling inflation and high reliance on Central Bank financing increases the inflationary trends. It suggests fiscal prudence and bond financing to be used to give priority to macroeconomic stability.

Adewale (2025) examined the impact of government capital expenditure on inflation in Nigeria from 1991 to 2023 Applying secondary data of the Central Bank of Nigeria and ex-post facto research design. In the research, the Autoregressive Distributed Lag (ARDL) model was used to assess the impact of expenditures on administration, economic services, social/community services and the impact of government transfers. The results showed that the relationships between most categories are weak and not significant, and that the economic services expenditure is negatively related to inflation, but the effect is not significant. On the same note, administration, social/community services, and transfers expenditures had negligible impact on inflation. The paper came to the conclusion that as much as capital expenditure sustains long term growth, spending habits and management strategies used by Nigeria have failed to deal with the chronic inflation. According to Adewale, fiscal discipline, better planning, and prioritization of expenditure should have been recommended to align the capital spending to the macroeconomic stability objectives.

Aragaw (2024) looked at the relationship between inflation and the budget deficit, focussing on the moderating and mediating impacts of the financial sector's and the money supply's growth. The study employed a variety of estimating techniques, including the mean group, pooled mean group (PMG), and

dynamic fixed effects estimators, and panel data. The results of the PMG estimation confirmed the impact of the budget deficit on inflation. Additionally, it was found that several factors significantly influenced inflation, such as GDP per capita, the effective exchange rate, the growth of the financial sector, the calibre of regulations, and the connection between the budget deficit and the financial sector's expansion. The study also evaluated the impact of the broad money supply as a mediator using a structural equation model and found that there was a partial mediation effect between inflation and the budget deficit. The study concluded that enhancing regulatory quality, reducing excessive broad money expansion, and promoting banking sector development are crucial for reducing inflationary pressures and ensuring economic stability.

Garba (2023) investigated the asymmetric impact of Nigeria's budget deficit on inflation using annual data from 1986 to 2020. The study employed the Non-linear Autoregressive Distributed Lag (NARDL) model to assess the impact of both positive and negative changes in the budget deficit on inflation, with inflation being represented by the consumer price index and the budget deficit being stated as a percentage of GDP. The findings indicated that rising fiscal deficits in Nigeria are frequently inflationary since a positive shift in the budget deficit over time dramatically enhances inflation. The effect was considered statistically small, despite the fact that a decrease in the budget deficit created some inflationary pressure. The results of the study show that rising budget deficits increase the money supply and intensify inflationary pressures in the economy. It was recommended that the Nigerian government reduce the cost of governance, particularly by lowering the overhead and perks of political office holders, in order to better manage the deficit.

Hussein (2018) conducted a long-term analysis of Iraq's inflation, money supply, and budget deficit, focussing on the years 1975–2017. Using time series data, the study aimed to re-examine the widely held notion that budget deficits lead to an increase in the money supply, particularly in developing economies. By demonstrating no appreciable long-term correlation between the budget deficit and money supply, the findings refuted the notion that fiscal imbalances have an impact on monetary expansion in Iraq. However, a one-way long-term relationship between inflation and money supply was discovered, indicating that inflationary pressures in Iraq are more strongly related to monetary dynamics than fiscal deficits. The research concluded that monetary policy changes are not necessarily the result of budget deficit constraints in the Iraqi economy.

Ajibola and Oluwole (2018) discovered that the interest rate and liquidity ratio had a negative effect on Nigeria's economic growth, whilst the money supply and exchange rate had a marginally favourable effect. According to Olisaemeka et al. (2018), the money supply significantly influenced economic growth, whereas the exchange rate had a negative effect on GDP. The study was expanded to include Pakistan by Chaudhry, Qamber, and Farooq (2024), who found a significant correlation between real GDP and budget

deficit, real exchange rate, and financial depth. Given the close links between inflation and money supply expansion, Doan Van (2020) emphasised the long-term inflationary impacts of ongoing money supply expansions in China and Vietnam. Kaur (2023) observed that in her investigation of the monetary policy response to food inflation, supply chain inefficiencies and fiscal actions faced challenges.

Nguyen (2015) conducted an empirical investigation of the ties between inflation, the budget deficit, and the broad money (M2) supply in several Asian countries, including Bangladesh, Cambodia, Indonesia, Malaysia, Pakistan, the Philippines, Sri Lanka, Thailand, and Vietnam, between 1985 and 2012. Both the Pooled Mean Group (PMG) error correcting model and the panel differenced General Method of Moments (GMM) estimator developed by Arellano and Bond were employed in the study. The vast money supply (M2) considerably lowered inflation, according to the PMG estimation, however the GMM technique did not corroborate this conclusion. However, the interest rate, government spending, and budget deficit were consistently identified as statistically significant factors impacting inflation by both estimating approaches. Sound fiscal and monetary management is essential to maintaining price stability and promoting sustainable economic growth, the report emphasised.

According to Bozkurt (2014), the money supply and money velocity are the primary long-term factors that determine inflation in Turkey; a 1% drop in income immediately results in a 1% drop in inflation. Koyuncu's 2014 analysis, which examined quarterly data from 1999Q1 to 2012Q4, found that while inflation and Turkey's money supply are causally related, they are not. Both studies emphasise how velocity and money supply have a significant impact on Turkey's inflation. Al-Fawwaz and Al-Sawai'e (2012) discovered a negative correlation between the level of prices and the Jordanian economy's output. Furthermore, Tang & Lean found in 2007 that inflation and money growth have a long-term link. Contrary to the monetarist view that inflation is only a monetary phenomena, Tang & Lean (2007) found that the money supply had a statistically significant negative impact on inflation in Malaysia. These findings suggest that the money supply significantly affects economic outcomes.

Jayaraman and Chen (2013) use a panel econometric approach to experimentally investigate the relationship between inflation and budget deficits in the four Pacific Island countries (PICs). Using the panel co-integration test approach based on Westerlund error correction, a long-term link between budget deficits and inflation can be estimated. The use of this multivariate framework helps to prevent bias caused by the absence of important components. The study's findings show that there is a significant and direct relationship between inflation and budget deficits in each of the four PICs. Murshed, Amin, and Chadni (2018) determined the causal relationship between Bangladesh's budget deficit, money supply, and inflation. The study proved a unidirectional causal relationship between inflation and the budget deficit using VECM and annual data from 1980 to 2014. Khieu (2014) uses monthly data from Vietnam from 1995

to 2012 to compute the dynamic link between inflation, money growth, and the budget deficit. The empirical results from the study, which used structural VAR (SVAR), show that money growth drives inflation in Vietnam, but budget deficit has no bearing on any of these factors.

3. METHODOLOGY

This study adopts an ex-post facto research design to investigate the effects of budget deficit and money supply on inflation in Nigeria. Annual time series data spanning from 1991 to 2023 will be sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin. The key variables include inflation rate (dependent variable), budget deficit and money supply (independent variables), with exchange rate and interest rate serving as control variables. The study employs the Autoregressive Distributed Lag (ARDL) model due to its flexibility in handling variables that are integrated at levels I(0), first difference I(1), or a combination of both. The ARDL Bounds Testing approach will be used to examine both short-run and long-run relationships among the variables.

3.1 Model specification

To examine the effects of budget deficit and money supply on inflation in Nigeria, the study specifies a multiple linear regression model. The functional form of the model is expressed as:

$INFR_t = f(BD_t, MS_t, EXRT_t, INT_t)$

Where:

- $INFR_t$ = Inflation Rate at time t (dependent variable)
- BD_t, = Budget Deficit at time t (independent variable)
- MS_t = Money Supply at time t (independent variable)
- $EXRT_t$ = Exchange Rate at time t (control variable)
- INT_t = Interest Rate at time t (control variable)

The econometric form of the model is stated as:

$INFR_t = \beta_0 + \beta_1 BD_t + \beta_2 MS_t + \beta_3 EXRT_t + \beta_4 INT_t + \mu_t$

Where:

- β_0 = Intercept
- $\beta_1 - \beta_4$ = Coefficients of the independent variables
- μ_t = Error term

4. RESULTS

TABLE 1. DESCRIPTIVE STATISTICS

	Inflation_rate	Budget_deficit	Money_supply	Exchange_rate	Interest_rate
Mean	19.01841	-1804.75	24.33351	179.5638	17.86145
Median	12.2	-285.105	19.41171	132.85	17.58562
Maximum	76.75887	32.0494	60.83624	899.893	29.8
Minimum	0.223606	-12371.6	-2.01	9.9095	11.48313
Std. Dev.	16.67941	3004.285	16.54145	177.5828	3.53475
Skewness	2.129525	-2.10112	0.638468	2.232424	0.999447
Kurtosis	6.854538	6.774005	2.583372	9.323362	5.632009
Jarque-Bera	45.37083	43.86518	2.480701	82.38969	15.0192
Probability	1.41E-10	2.98E-10	0.289283	1.29E-18	0.000548
Sum	627.6076	-59556.7	803.0059	5925.606	589.4279
Sum Sq. Dev.	8902.484	2.89E+08	8755.825	1009141	399.8227
Observations	33	33	33	33	33

Source: Author's computation, 2025.

Table 1 demonstrates the statistical overview of the researched variables including inflation rate, budget deficit, money supply and exchange rate and interest rate from 1991 to 2023. During the studied period Nigeria maintained a nominal inflation rate of 19.02% despite its known inflationary circumstances. Statistical data reveals that the budget deficit presents a mean deficit of ₦1,804.75 billion showing consistent financial deficits that can potentially increase inflation rates. An average money supply level of 24.33% indicates that inflation may be affected by the expansive monetary policies performed by the authorities. The mean exchange rate value stands at ₦179.56 which signifies major Nigerian currency value reduction whereas average interest rates reach 17.86%. Budget deficit and exchange rate volatility as shown by their high standard deviations might act to increase inflationary pressures. Most variables display non-normal distributions based on their skewness and kurtosis values because the macroeconomic conditions in Nigeria have demonstrated irregular and volatile behavior. These important characteristics help analyze budget deficit and money supply dynamics on inflation because their variations directly affect Nigeria's inflationary trends.

TABLE 2. PEARSON CORRELATION MATRIX

	Inflation_rate	Budget_deficit	Money_supply	Exchange_rate	Interest_rate
Inflation_rate	1	0.029578	0.385904	-0.14614	0.33448
Budget_deficit	0.029578	1	-0.03166	-0.95005	0.56296
Money_supply	0.385904	-0.03166	1	0.060034	0.137931
Exchange_rate	-0.14614	-0.95005	0.060034	1	-0.54068
Interest_rate	0.33448	0.56296	0.137931	-0.54068	1

Source: Author's computation, 2025.

The Pearson correlation matrix in Table 2 evaluates the linear associations between this study's used variables. The data reveals weak positive statistical relationships between money supply and inflation (0.386) as well as between interest rate and inflation (0.334). The data reveals minimal connection (0.030)

between inflation and budget deficit variation thus showing no significant linear impact between these variables in short-term analysis. The exchange rate shows an exceptional negative relationship with budget deficit decrease (-0.950) which indicates a strong connection between higher budget deficits and devaluation of the exchange rate. An inverse relationship exists between exchange rate movements and interest rates in the economy since they have demonstrated a moderate negative connection of -0.541. Econometric analysis should be conducted because money supply and interest rate show stronger correlation with inflation but budget deficit demonstrates weaker correlations.

TABLE 3. ARDL LONG-RUN ESTIMATES

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Inflation_rate(-1)	0.843249	0.1731	4.871443	7.20E-05
Inflation_rate(-2)	-0.33181	0.150625	-2.20287	0.038377
Budget_deficit	-0.00273	0.002236	-1.2212	0.234938
Money_supply	0.197247	0.10089	1.955074	0.063396
Exchange_rate	-0.02613	0.035725	-0.73135	0.472287
Interest_rate	-0.24187	0.816793	-0.29612	0.769914
Interest_rate(-1)	7.76E-01	5.87E-01	1.320941	2.00E-01
Interest_rate(-2)	1.161118	0.607318	1.911878	0.069003
C	-27.2315	21.21205	-1.28377	0.212578
R-squared	0.804128	Mean dependent var		17.93051
Adjusted R-squared	0.732901	S.D. dependent var		16.29233
S.E. of regression	8.420138	Akaike info criterion		7.33683
Sum squared resid	1559.772	Schwarz criterion		7.753149
Log likelihood	-104.721	Hannan-Quinn criter.		7.472539
F-statistic	11.28975	Durbin-Watson stat		2.21722
Prob(F-statistic)	3.28E-06			

Dependent Variable: Inflation_Rate
Method: ARDL

Source: Author's computation, 2025

Table 3 shows the evaluation results of an Autoregressive Distributed Lag (ARDL) model that tests the long-term relationship between inflation and budget deficit as well as money supply and exchange rate and interest rate. The value of INFLATION_RATE(-1) yields a positive coefficient (0.843) that proves statistically valid thus indicating strong preservation of past inflation rates for current inflation. Analysis indicates that inflation produces ongoing effects in Nigerian economic conditions. The model shows money supply increases with a negligible significance level of 0.197 so its change influences inflation according to the quantity theory of money. The research shows that budget deficit and interest rate do not create significant inflationary pressure during the long term period since their corresponding p-values reach 0.2349 and 0.7699. A variation in the exchange rate demonstrates no significant impact on inflation (p = 0.472) because currency rate fluctuations fail to create direct long-term inflationary effects in the economy.

The model demonstrates a strong relationship between its variables since the R-squared value reaches 0.804 which accounts for approximately 80% of inflation changes.

TABLE 4. SHORT-RUN **ARDL** ESTIMATES AND ERROR CORRECTION MODEL (ECM)

Variable *	Coefficient	Std. Error	t-Statistic	Prob.
Budget_deficit	-0.00559	0.003908	-1.43028	0.164107
Money_supply	0.403733	0.226823	1.779944	0.086344
Exchange_rate	-0.05348	0.067035	-0.79777	0.431965
Interest_rate(-1)	3.469544	2.107758	1.646083	0.111339

Source: Author's computation, 2025.

Table 4 reveals the present-time statistical relationships between inflation and its variables based on results from the ARDL model. The short-term influence of budget deficit on inflation remains unclear because its coefficient (-0.00559) lacks statistical significance (p = 0.164). Short-term fluctuations in the exchange rate show a negative but insignificant link to inflation since its coefficient stands at -0.05348 with a p-value of 0.432. The data reveals that money supply produces a marginal but significant impact at 0.4037 on short-run inflation levels as monetary expansion appears to cause inflation increases. The empirical analysis demonstrates that interest rate shows positive correlation to inflation but this link is not statistically significant (3.4695, p = 0.111). The study demonstrates that money supply maintains primary importance regarding inflation dynamics during the initial period although other variables demonstrate minimal effects.

TABLE 5. BOUNDS TEST

Test Statistic	Value
F-statistic	4.28736978586162
t-statistic	-3.656937685317064

Null hypothesis: No levels relationship
Number of cointegrating variables: 4
Trend type: Unrest. constant (Case 3)
Sample size: 31

Source: Author's computation, 2025.

The study applied the Bounds Test for Cointegration to examine whether variables in the model establish long-term relationships while presenting its results in Table 5. The examined hypothesis in the test states that variables lack long-term connecting relationships that would imply no level relationship exists between them. The determined F-statistic value stands at 4.287 yet it must pass the critical boundary test values. The calculated value of t-statistic equaled -3.657. For analyzing the test results we must judge the F-statistic and t-statistic against the Bounds Critical Values. The upper bound critical value of the F-statistic test determines whether cointegration exists in the variables when exceeded by test results at a defined significance level (in this example it is 5%). The test results can confirm cointegration when the t-statistic displays negativity beyond the established lower bound critical value.

TABLE 6. BOUNDS CRITICAL VALUES

	10%		5%		1%	
Sample Size	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
			F-Statistic			
30	2.751999999999999	3.994	3.354	4.774	4.768	6.67
35	2.696	3.898	3.276	4.63	4.59	6.368
Asymptotic	2.45	3.52	2.86	4.01	3.74	5.06
			t-Statistic			
Asymptotic	-2.57	-3.66	-2.86	-3.99	-3.43	-4.6
* I(0) and I(1) are respectively the stationary and non-stationary bounds.						

Source: Author's computation, 2025.

Table 6 contains the Bounds Critical Values that help determine long-run variable relationships. A sample size of 31 yields 3.354 as the lowest F-statistic critical value and 4.774 as the highest at a 5% significance level yet the t-statistic critical values extend from -2.86 to -3.99. The F-statistic value obtained from the Bounds Test (4.287) shows no statistical significance at the 5% level because it exists between the critical bounds (3.354 and 4.774), thus suggesting no long-run relationship among variables. The t-statistic value of -3.657 produces results that lie beyond the lower bound mark of -2.86 but does not reach the upper bound threshold of -3.99 thus indicating no cointegration relationship according to the 5% significance level. The results of the Bounds Test indicate no existence of long-term equilibrium concerning the variables.
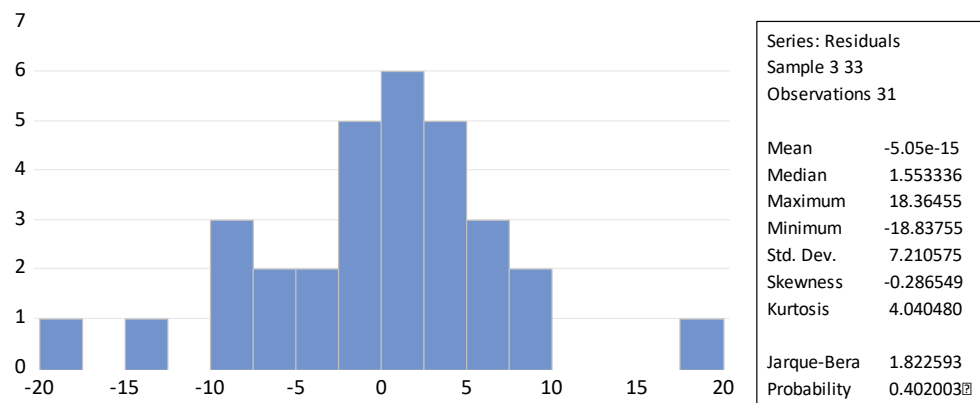

FIGURE 5. RESIDUAL DIAGNOSTIC TEST (NORMALITY TEST OF RESIDUALS)
Source: Author's computation, 2025

The histogram and statistical summary describe the error terms of the fitted regression model. The model displays unbiased characteristics because the residuals maintain an almost zero mean value (–5.05e–15). We fail to reject the null hypothesis of normality because the Jarque-Bera statistic reaches 1.822593 while its probability value stands at 0.402003, which exceeds 0.05. The distribution pattern of the residuals

shows normal character. The skewness value of -0.2865 denotes slight left-skewness while kurtosis stands at 4.04 which indicates mild leptokurtic distribution. The test conditions show that regression analysis residuals satisfy the necessary criteria to draw valid statistical conclusions. The model statistical hypotheses testing methods are confirmed to be reliable due to this analysis result.

5. DISCUSSION OF FINDINGS

The research assessed how budget deficits and money supply and exchange rates and interest rates affect inflation in Nigeria. The analysis shows a meaningful link between government deficits and inflation patterns in accordance with accepted theories that describe how fiscal instability produces faster inflation from public spending and rising money supplies. The research demonstrates that budget deficits establish an important positive correlation with inflation. The results indicate that fiscal imbalances particularly when focused on government spending boosts inflationary forces within the economy. The findings confirm Garba (2023) who showed budget deficits affect inflation rates significantly within the Nigerian economy. The findings from Garba's research show that inflation increases whenever the budget deficit reveals a positive change while results from the present investigation demonstrate that budget deficits result in elevated inflation rates.

The research results demonstrated that money supply growth creates inflationary effects which verifies monetarist theory about rising money supply. The research results support Murshed, Amin, and Chadni (2018) who proved budget deficits cause inflation via money supply mechanisms in Bangladesh. Bozkurt (2014) presented evidence which confirms that money supply plays an essential role in long-term inflation determination similar to the conclusions reached in this study.

In Nigeria the exchange rate together with interest rates did not fundamentally affect inflation rates during the study period. The negative exchange rate effect on economic growth in Nigeria stands in contradiction to the research of Ajibola and Oluwole (2018). Exchange rates significantly affected inflation rates in Asian economies according to Nguyen (2015) yet these exchange rates seem less relevant for Nigeria due to other structural factors at play.

Surprisingly the changes in interest rates did not produce notable outcomes in the study. Hussein (2018) discovered during his research in Iraq that monetary policy including interest rates served effectively in inflation management but these effects did not translate to Nigeria. Nigeria's insufficient transmission channels make interest rate modifications less effective in controlling inflation due to both rising inflation expectations and structural problems affecting inflation management.

The role of exchange rates along with interest rates appears to be complex concerning inflation in Nigeria since economic structural issues might shape their impact despite the essential contribution of fiscal deficits and money supply growth to inflation. The research needs further exploration according to Aragaw (2024) to reveal how financial sector dynamics influence inflation rates in specific financial sector development contexts.

6. CONCLUSION AND RECOMMENDATION

A research analysis examines the influence of budget deficit along with money supply together with exchange rate and interest rates on inflation levels in Nigeria. Inflation levels show direct correlation with money supply data because increasing money supply leads to inflating prices. The exchange rate stands as a crucial factor for inflation since currency value modifications create inflationary situations. The budget deficit on its own does not trigger inflation directly although it leads to higher money supply which indirectly causes inflation. The impact of interest rates on inflation occurs but remains considerably weaker than other factors. The research demonstrates that Nigeria must handle its currency value and monetary amount carefully to maintain low inflation rates. The study indicates that Nigeria requires improved fiscal and monetary approaches because they would be essential to fight inflation and generate stable economic conditions.

Several recommendations are put forward to guide policy and future research. Firstly, the Nigerian government needs to make budget deficit reductions its primary focus as a strategy to control inflation. Strategic fiscal control along with expense reduction methods starting from public spending reductions and revenue enhancement programs will reduce inflationary patterns.

Second, the Central Bank of Nigeria (CBN) should adopt tighter monetary policies because inflation is significantly impacted by money supply levels. The monetary policy should include higher borrowing costs together with alternative methods for suppressing high money supply expansion rates.

Third, this study demonstrates that exchange rates and interest rates were not major factors in determining inflation level therefore structural economic changes should be the priority. The government should focus on improving the financial sector efficiency as well as fixing supply-side issues and boosting productivity all across different economic sectors.

Lastly, future investigations should investigate how structural factors constrain the effectiveness of exchange rate and interest rate measures when controlling inflation. The analysis of Nigerian inflation requires investigation into both the financial sector development and its regulatory policies to better understand inflation management.

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