

Determinants of Budget Implementation in Nigeria

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Abstract

The below-par performance of budget implementation (BI) in Nigeria has contributed to the country’s economic instability and public distrust in fiscal policies. This study primarily investigates the determinants of BI in Nigeria by focusing on foreign exchange rates (FEXR), inflation rates (INFR), interest rates (INTR), and corruption control (CINR). Using annual data from 2008 to 2024, this study employs time series analysis to examine the causal relationships between key macroeconomic variables and BI. Findings reveal that FEXR significantly influences BI, underscoring Nigeria’s fiscal vulnerability to FEXR fluctuations. INTR also exhibits a significant impact on BI, highlighting the importance of INTR policies in BI. Conversely, INFR has no direct effect on BI, suggesting that inflation’s influence on fiscal performance is secondary. The study concludes that Nigeria’s BI is usually undermined and disrupted by FEXR and INTR instability. The study recommends that the Nigerian government prioritize FEXR stability through sound monetary policies to mitigate currency-related fiscal risks. Furthermore, the Central Bank of Nigeria should implement measures to maintain favorable INTR, ensuring that borrowing costs do not hinder BI. Strengthening institutional accountability is essential to minimizing corruption’s negative effects on fiscal performance. These findings provide valuable insights for policymakers seeking to enhance budget efficiency and promote sustainable economic development in Nigeria.

Keywords: Budget implementation, Corruption index, Foreign exchange rates, Inflation rates, Interest rates.

1. Introduction

The consistent failure of African governments to implement budgets effectively continues to erode public confidence in governmental institutions. Citizens become disillusioned with the government's ability to manage public resources, which has led to apathy and reduced civic engagement. There may be a time in the future when citizens will rise in agitation against the governments in Africa due to public distrust in fiscal policies (Bredino et al., 2022). Nwala and Ogboji (2020) opined that discrepancies between planned and actual expenditures can result in stalled projects and underutilized investments, thereby limiting economic progress. This highlights that ineffective budget implementation often leads to suboptimal allocation and utilization of resources, hindering economic growth.

Sedgo and Omgba (2023) argue that ineffective budget implementation in Africa fosters corruption and financial mismanagement. The misallocation of capital budgets due to weak oversight and governance structures creates loopholes for embezzlement and inefficiencies. This leads to poor service delivery, as public funds meant for infrastructure and essential services are either mismanaged or diverted. Supporting studies by Ibeh (2025) and Matovu (2025) reinforce this view, highlighting that without strong financial controls and transparency, budgetary weaknesses will continue to hinder sustainable growth in Africa.

Nigeria continues to face challenges in aligning budgetary projections with actual implementation. The Ministry of Finance (2023) reported that capital budget implementation rates averaged less than 65% between 2018 and 2022, reflecting administrative bottlenecks and revenue mobilization challenges. Nigeria has persistently grappled with poor budget implementation and economic instability due to underlying macroeconomic and institutional constraints (Olawale et al., 2023). These challenges have been worsened by corruption, which undermines fiscal discipline and reduces the effectiveness of policy measures designed to manage debt and implement budgets. This underscores why Nigeria struggles with economic instability and ineffective public financial management, limiting the country’s ability to achieve sustainable development.

Effective execution of budgetary plans is essential for achieving long-term development goals and ensuring that government spending aligns with developmental priorities (Fatukasi et al., 2020). However, despite successive

reforms, Nigeria continues to face obstacles such as delayed project execution, cost overruns, and inadequate resource allocation, compounded by external economic shocks and structural inefficiencies (Ministry of Finance, 2023; Debt Management Office, 2023). While budget implementation is an important aspect of fiscal management, understanding the determinants of budget implementation is crucial for designing effective fiscal policies. Identifying key factors such as foreign exchange stability, inflation control, improved revenue generation, and institutional accountability will empower policymakers to address these challenges more strategically (Michael et al., 2020).

Existing research primarily focuses on the effects of individual macroeconomic variables on fiscal performance (Okafor et al., 2021; Ugwuanyi et al., 2021; Onoh et al., 2021; Onwuka, 2020; Onyebuchukwu, 2019), often neglecting their combined impact in the context of budget implementation. Additionally, few analyses examine how foreign exchange rates, inflation rates, and interest rates collectively shape budget implementation, leaving a significant gap in understanding the interplay of these variables in the Nigerian context (Agboola & Ojo, 2021; Obi, 2020; Charles & Chilaka, 2019). Lastly, studies on Nigeria's fiscal performance seldom integrate corruption indices as critical variable influencing outcomes.

To address these gaps, this study primarily investigates the determinants of budget implementation in Nigeria, using foreign exchange rates, inflation rates, and interest rates as proxies while incorporating the corruption index as a control variable. Specifically, the study seeks to examine the extent to which foreign exchange rate fluctuations influence budget implementation in Nigeria, assess the impact of the inflation rate on Nigeria's fiscal performance, evaluate how interest rates affect budget execution, and analyze the moderating role of corruption in the relationship between macroeconomic variables and fiscal outcomes.

The study focuses on Nigeria's fiscal performance from 2008 to 2023, leveraging annual data on foreign exchange rates, inflation rates, interest rates, and corruption indices. It examines the dynamic interactions between these variables and their combined influence on budget implementation. Given Nigeria's growing fiscal challenges, this study is timely and significant. Understanding the determinants of budget implementation provides valuable insights for policymakers to design targeted interventions. By incorporating corruption as a control variable, the study highlights the importance of institutional quality in fiscal management. Moreover, the findings will contribute to existing literature by offering a comprehensive analysis of macroeconomic and institutional factors influencing Nigeria's fiscal performance, thereby guiding future policy decisions to enhance budget efficiency.

2. A Review of Extant Literature

This section extensively examines the theories and empirical studies that explain the concept related to the determinants of budget implementation and debt servicing.

2.1. Conceptual Review

2.1.1. Budget Implementation

Budget implementation in the view of Alabi et al. (2024), involve the detailed approach or procedural steps undertaken to ensure that a planned budget is well executed. This involves key activities such as revenue mobilization, efficient expenditure management, and monitoring to ensure compliance with budgetary goals while making necessary adjustments to address economic changes. Effective budget implementation depends on institutional capacity, fiscal discipline, macroeconomic stability, and governance quality, which help align spending with developmental priorities (Schick, 2022; IMF, 2023). However, efficient budget execution fosters economic growth by directing public funds into productive sectors, reducing unemployment, and preventing fiscal deficits (Okonjo et al., 2023). It also enhances fiscal discipline by minimizing overrun, thereby strengthening accountability and resource management. Transparent execution builds public trust in government institutions, while poor implementation fosters corruption and weakens governance (World Bank, 2023; Transparency International, 2023).

Recent studies on budget implementation in developing nations highlight challenges and opportunities in improving fiscal performance. In Nigeria, Okeke and Adewuyi (2023) found that only 60% of approved capital expenditures between 2015 and 2022 were executed due to revenue shortfalls and bureaucratic inefficiencies, underscoring the need for stronger institutional capacity. Transparency International (2023) further demonstrated that nations with lower corruption indices achieve significantly higher implementation rates, reinforcing the detrimental impact of corruption on fiscal performance. Conversely, Kenya's adoption of digital tools and enhanced monitoring mechanisms increased budget implementation rates by 25% over five years, showcasing the transformative role of technology (Mwangi et al., 2023). An IMF (2023) analysis linked higher budget implementation rates to stronger GDP growth, as efficient spending supports timely investments in critical sectors. Meanwhile, the World Bank (2023) identified wage bill pressures and resource misallocation as major obstacles in South Africa, recommending fiscal discipline and strategic reallocations. These studies collectively emphasize the importance of governance, technology, and institutional reforms in achieving effective budget implementation and fostering economic growth.

2.1.2. Foreign Exchange Rate

Kwan and Kanda (2024) describe foreign exchange rate (FX rate) as the value at which one currency can be exchanged for another and plays a crucial role in international trade, investment, and economic policy. It is influenced by multiple factors, including inflation, interest rates, political stability, and market speculation (Obi, 2020). The FX rate has significant economic implications, as a depreciating currency can make exports cheaper and imports more expensive, potentially improving the trade balance, while an appreciating currency may lead to trade deficits (Ahmed et al., 2024). Exchange rate fluctuations also impact inflation, with weaker currencies raising import prices and contributing to inflation, particularly in import-dependent nations. Additionally, currency movements affect capital flows, as investors prefer stable environments for higher returns, making volatile currencies less attractive (Ubadike et al., 2023).

Exchange rate fluctuations can significantly influence budget implementation by affecting revenue generation, and expenditure planning. When exchange rate volatility negatively impacts economic growth, as noted by Bamidele (2024), government revenues may decline due to reduced business activity, lower tax collection, and unstable foreign investment flows. In commodity-dependent economies, external shocks from exchange rate instability can lead to unpredictable revenue streams, making budget planning more challenging. As opined by Alabi et al. (2025), an increase in the exchange rate of US dollar to the Nigerian Naira implies that the Naira has been devalued consequent to the increase in the exchange rate, thereby reducing the purchasing power of the Nigerian Naira. In view of this, Afolabi (2023) highlight that currency devaluation can trigger inflationary pressures, which increase the cost of public sector expenditures, including wages, infrastructure projects, and social programs. Inflation-driven budget overruns can force governments to either cut essential services or seek additional financing, potentially leading to fiscal deficits.

2.1.3. Inflation Rate

Inflation represents a sustained increase in the overall price level of goods and services in an economy, resulting in diminished purchasing power as consumers can buy less with the same amount of money (Ana et al., 2024). This implies that governments may struggle to finance planned projects as the actual cost of goods and services rises beyond initial estimates. Typically measured by indices like the Consumer Price Index (CPI), inflation impacts multiple facets of the economy (Ha et al., 2024). It erodes purchasing power, particularly affecting low-income households and reduces the real returns on savings and fixed-income investments. Businesses face challenges in long-term planning due to cost and pricing uncertainties, while fixed-income earners, such as retirees, bear the brunt of income redistribution. Moreover, inflation can spark a wage-price spiral, where rising wages lead to higher production costs, perpetuating further price increases. For governments, this creates fiscal instability, as revenue projections may fall short in real terms while expenditure requirements increase. Fixed-income earners, such as public sector workers and pensioners, face declining purchasing power, leading to pressures for wage adjustments that further strain budget sustainability.

Bill et al. (2024) and Jongrim et al. (2023) explained that between 2021 and 2023, the global economy experienced an unprecedented surge in inflation, driven by intertwined factors such as COVID-19-induced supply chain disruptions, expansive fiscal and monetary policies, and geopolitical tensions like the Russia-Ukraine conflict. These factors contributed to rising costs of essential commodities, making it difficult for governments to implement budgets effectively without frequent revisions. Additionally, aggressive interest rate hikes aimed at curbing inflation increased borrowing costs, limiting governments' ability to finance deficits or invest in capital projects without incurring higher debt burdens. While Ha et al. (2025) pointed out that inflation moderation efforts helped some economies approach stability, consumer prices remain elevated, complicating budgetary planning. Governments must balance inflation control measures with the need to maintain economic growth and public welfare spending. In some cases, achieving price stability may require deflationary measures, which could slow economic activity and further challenge budget execution.

2.1.4. Interest Rate

Interest rates, representing the cost of borrowing or return on savings, play a crucial role in monetary policy by influencing economic activities such as consumption, investment, and inflation. These dynamics directly impact budget implementation, as government expenditures and revenues are sensitive to interest rate fluctuations. Lower rates encourage borrowing and spending, fostering growth, while higher rates curb excessive demand and control inflation (Mishkin, 2021). Central banks adjust interest rates to maintain economic stability, tailoring policies to inflationary or deflationary conditions (Bernanke, 2023). However, frequent rate adjustments can create budgetary uncertainties, making it difficult for governments to plan long-term fiscal policies effectively. The effects of interest rates extend beyond domestic economies; higher rates attract foreign capital, strengthening local currencies but potentially reducing export competitiveness (IMF, 2023). Additionally, rising rates increase public debt servicing costs, impacting fiscal sustainability (OECD, 2023). As such, interest rates shape financial and macroeconomic landscapes, influencing savings behavior, investment trends, and global trade flows (Blanchard et al., 2022).

Between 2021 and 2023, global interest rates underwent significant fluctuations as economies navigated post-pandemic recovery and inflationary pressures. Initially, central banks kept rates low to support growth, allowing governments to finance stimulus packages. However, surging inflation led to aggressive hikes by 2022, complicating budget implementation. For instance, the U.S. Federal Reserve raised its benchmark rate from near zero to over 5%, reducing inflation but increasing borrowing costs for government spending programs (Federal Reserve, 2023). Similarly, the European Central Bank's rate hikes lowered inflation but constrained fiscal flexibility (European Central Bank (ECB), 2023). Developing economies, such as Nigeria, faced inflation exceeding 20% in 2023 despite rate increases, limiting the effectiveness of monetary policy in supporting budget execution (CBN, 2023). Higher inflation eroded the real value of government revenues, making it harder to fund budgeted expenditures. Japan, in contrast, maintained ultra-low rates to counter deflation, but this approach limited the government's ability to stimulate the economy through monetary policy alone (Bank of Japan (BOJ), 2023). The rate hikes also affected financial markets, raising borrowing costs, reducing corporate profits, and slowing housing markets (IMF, 2023). These effects, in turn, influenced tax revenues, debt sustainability, and public expenditure planning.

2.1.5. Corruption Index Rate

The Corruption Perceptions Index (CPI), developed by Transparency International in 1995, ranks countries annually based on perceived public sector corruption using data from credible sources like the World Bank and World Economic Forum (Transparency International, 2023). The CPI scores range from 0 (highly corrupt) to 100 (very clean), reflecting expert and business opinions on corruption prevalence. High corruption levels indicate systemic governance issues, undermining judicial integrity, diverting resources, and eroding public trust—factors that directly impact budget implementation. Effective budget execution depends on transparent allocation and

prudent resource utilization. However, corruption weakens institutional oversight, leading to misallocation, embezzlement, and inflated contracts that derail government spending efficiency. The 2023 CPI highlights persistent global challenges, with only 28 out of 180 countries improving over 12 years, while 34 have significantly declined (EQS Group, 2023). In Africa, corruption remains widespread, diverting essential resources meant for public services and infrastructure projects, thereby undermining fiscal discipline and development efforts (Transparency International, 2023; World Bank, 2023).

2.2. Theoretical Framework

2.2.1. Institutional Theory

Institutional theory formed the bedrock of this study. Institutional theory, rooted in Max Weber's sociological principles and expanded by Douglass North (1990), emphasizes the role of both formal and informal institutions—such as laws, norms, and conventions—in shaping economic and organizational behaviour (Douglass, 1990). The theory posits that institutions provide a framework for social, economic, and political interactions, significantly influencing decisions and outcomes (Agarwal et al., 2024). Key assumptions include the dual impact of formal and informal structures, the persistence of historical contexts (path dependency), and the necessity for organizations and governments to align with institutional frameworks to gain legitimacy (Davis & Boianovsky, 2023). These principles underscore the role of institutions in guiding governance and policy actions (North, 1990).

The theory is particularly relevant to economic processes including budget implementation. Strong institutions enhance fiscal performance by promoting transparency, accountability, and efficient resource allocation, while weak institutions—marked by corruption and governance failures—undermine economic stability. Recent empirical studies validate these claims. For example, Adesina and Adeyemo (2022) show that governance quality significantly impacts budget execution in Sub-Saharan Africa, while Ahmed et al. (2022) highlight the importance of institutional strength for effective inflation management. These findings demonstrate the critical influence of institutional quality on fostering fiscal stability and economic development.

Recent studies continue to emphasize the importance of institutional quality in shaping fiscal and macroeconomic outcomes, especially in developing economies. Adesina and Okafor (2023) found that weak institutions, characterized by corruption and poor regulatory frameworks, negatively affect budget execution and debt servicing in Sub-Saharan Africa. Similarly, Ahmed et al. (2022) showed that strong institutional structures facilitate effective monetary policy implementation, which stabilizes inflation and enhances fiscal sustainability. The IMF (2023) highlighted that institutional reforms, such as improving central bank autonomy, help reduce exchange rate volatility, thereby supporting fiscal planning and debt management. Together, these studies confirm that strengthening institutions is essential for addressing fiscal and economic challenges in developing countries like Nigeria.

Institutional theory offers a valuable framework for understanding the relationship between macroeconomic variables—such as foreign exchange rates, inflation, and interest rates—and fiscal outcomes, including budget implementation (North, 1990; IMF, 2023). Effective institutions ensure currency stability through central bank autonomy and transparent policies, reducing exchange rate volatility and its fiscal implications (Adesina & Okafor, 2023). Robust monetary policies driven by strong institutions help control inflation, preventing disruptions in budget planning and minimizing debt servicing costs (Ahmed et al., 2022; World Bank, 2023). Additionally, strong governance lowers borrowing risks, reducing interest rates and alleviating fiscal strain (IMF, 2023). However, institutional theory has been critiqued for its static framework, overemphasis on formal structures, and limited focus on micro-level dynamics (Adesina & Okafor, 2023). Despite these criticisms, its relevance to macroeconomic determinants underscores the importance of institutional reforms in promoting fiscal sustainability and economic growth (North, 1990; World Bank, 2023).

2.3. Empirical Review

2.3.1. Foreign Exchange Rate and Budget Implementation

The World Bank (2023) employed a mixed-method approach, combining macroeconomic data from 50 developing economies with qualitative case studies, and applied Fixed Effects Regression models to examine budget implementation in sub-Sahara Africa. The study found that overvalued exchange rates inflated fiscal deficits by raising the costs of imports and external borrowings, thereby complicating budget execution. Conversely, undervalued exchange rates disrupted infrastructure projects due to reduced purchasing power for capital imports. Exchange rate reforms, particularly market-determined rates, were identified as essential for achieving fiscal stability and improving budget outcomes.

The OECD (2023) applied cross-sectional analysis and Structural Equation Modeling (SEM) to assess exchange rate impacts among its member countries. Exchange rate volatility was found to disrupt budget implementation by inflating costs for foreign-denominated debt and procurement. Stable exchange rates, supported by coordinated fiscal and monetary policies, enhanced debt sustainability and fiscal planning. The study emphasized aligning fiscal frameworks with exchange rate policies to strengthen budget execution and long-term economic stability.

Ahmed et al. (2022) analyzed data from 2010 to 2021 using regression analysis and Granger causality tests to assess the impact of exchange rate fluctuations on Nigeria's fiscal performance. The study found that naira depreciation led to a 25% increase in debt servicing costs between 2020 and 2022, resulting in significant budgetary shortfalls. The study emphasized the need to diversify government revenue sources and strengthen foreign exchange reserves to mitigate fiscal vulnerabilities and ensure sustainable economic management.

Collectively, the reviewed studies highlight the critical role of exchange rate stability in fiscal sustainability and budget implementation. Globally, foreign exchange volatility disrupts budget execution, and hampers infrastructure projects. This study, therefore, hypothesizes that:

H₀: Foreign exchange rate has no significant influence on budget implementation in Nigeria.

2.3.2. Inflation Rate and Budget Implementation

The IMF (2023) conducted a time-series analysis using panel data econometrics, focusing on 50 emerging markets from 1990 to 2022 to evaluate macroeconomic stability in the face of inflationary shocks with insights from emerging markets. Data on inflation rates and budgetary performance reports were sourced from the IMF World Economic Outlook and country-specific financial records. The study found that inflation volatility disrupted fiscal planning, leading to frequent budget revisions and implementation delays. The findings emphasized the importance of effective monetary policy and inflation targeting to stabilize fiscal outcomes.

The World Bank (2023) employed a comparative analysis methodology to assess inflation's impact on fiscal stability in 25 low-income and 30 middle-income countries between 2000 and 2022. Data included budget implementation reports, inflation trends, and debt profiles from the World Bank database and national statistics agencies. Persistent inflation was found to undermine budget execution by increasing government procurement and capital project costs. Countries with inflation exceeding 10% experienced, on average.

Studying inflation and fiscal management, the OECD (2022) used panel regression analysis to study 37 member countries from 1995 to 2021. Data on inflation rates and budget deficit statistics were obtained from the OECD database. The study revealed that inflation exacerbates fiscal strain by raising borrowing costs and reducing the real value of government revenue. Stable inflation rates below 2% supported efficient budget execution. Coordinated fiscal and monetary policies were identified as effective measures for enhancing resilience against inflationary shocks and improving fiscal performance.

Adler and Schwartz (2023) conducted an econometric analysis on *interest rate volatility in Latin* using the generalized method of moments (GMM) on 45 developing economies from 1990 to 2022. Data on annual inflation rates and government expenditure reports were sourced from the World Development Indicators. Findings indicated that inflation above 12% significantly impaired budget implementation, particularly for infrastructure projects. Adesina and Bello (2023) used descriptive and inferential analysis with ordinary least squares (OLS) regression to examine Nigeria's annual fiscal performance from 2000 to 2022. Data on inflation rates, government budget execution reports, and debt servicing costs were obtained from the Central Bank of Nigeria (CBN) and the Debt Management Office (DMO). The study found that inflation exceeding 15% increased the cost of capital projects by over 25%, disrupting budget execution.

Studying inflation and fiscal sustainability in Nigeria, Ahmed et al. (2022) performed panel data analysis incorporating structural breaks, focusing on fiscal data from Nigeria's federal and state governments between 2000 and 2021. Data on inflation trends and public expenditure reports were collected from the Nigerian Bureau of Statistics (NBS) and the CBN. Persistent double-digit inflation caused significant budgetary shortfalls and delayed project implementation. However, global and Nigerian empirical studies consistently show high inflation rates adversely impact budget implementation. Globally, inflation raises procurement costs, and disrupts fiscal planning, and budget execution. This study, therefore, hypothesizes as follows:

H₀₂: Inflation rate has no significant influence on budget implementation in Nigeria.

2.3.3. Interest Rate and Budget Implementation

The IMF (2023) conducted a quantitative analysis using panel data regression to examine the impact of rising global interest rates on fiscal stability in 50 emerging markets. The study analyzed annual data from 2000 to 2022, focusing on interest rates and budgetary allocations. It was found that higher global interest rates significantly increase debt servicing costs, particularly for countries reliant on variable-rate external debt. This rise in costs reduces fiscal space for budget implementation. However, countries with stronger fiscal frameworks and diversified borrowing portfolios experienced lower fiscal disruptions, emphasizing the importance of sound fiscal management practices.

Using structural equation modeling (SEM), the World Bank (2023) analyzed the causal relationship between interest rates, fiscal performance, and institutional factors in 40 low- and middle-income countries. The study used data from 2005 to 2022, including interest rate trends, debt profiles, and fiscal expenditures. The findings revealed that a 1% increase in interest rates leads to a 5% rise in debt servicing costs. High interest rates discourage public borrowing for development projects, resulting in under-executed budgets. However, countries with strong institutional quality were better equipped to mitigate interest rate risks and maintain fiscal stability.

Adler and Jin (2022) employed econometric modeling with time series data from 10 Latin American countries between 1995 and 2021 to examine *interest rate volatility in Latin America*. The study analyzed central bank reports on interest rates and government budgets. The results concluded that interest rate volatility increases fiscal unpredictability, complicating budget planning. Countries with a higher proportion of fixed-rate debt were less affected by interest rate fluctuations. Furthermore, transparent monetary policies were shown to reduce borrowing costs and improve budget execution, demonstrating the critical role of monetary policy in mitigating interest rate risks.

The OECD (2022) used a mixed-methods approach, combining quantitative analysis and case studies, to examine the impact of interest rate fluctuations on fiscal performance in 20 member countries from 2000 to 2020. The study found that low-interest rate environments improved budget implementation by reducing debt servicing costs, allowing more resources to be allocated to public investments. Conversely, prolonged periods of high interest rates strained fiscal budgets and curtailed developmental expenditures. Efficient debt management systems were highlighted as essential for enhancing fiscal performance in fluctuating interest rate environments.

Adesina and Okafor (2023) applied autoregressive distributed lag (ARDL) models to analyze Nigeria's federal budgetary data from 1990 to 2022 in a study on *the impact of interest rates on Nigeria's fiscal budget*. The study focused on interest rates and budget implementation rates. It was found that high interest rates significantly increased Nigeria's domestic debt servicing costs, reducing funds available for capital projects. Interest rate hikes in the domestic bond market discouraged private-sector lending, further straining fiscal budgets.

Ahmed et al. (2022) used vector error correction models (VECM) to analyze Nigeria's fiscal and monetary data from 2000 to 2021. The study revealed that rising interest rates, both domestic and international, resulted in a 30% increase in debt servicing costs over five years. Budget implementation was constrained by high borrowing costs,

delaying critical infrastructure projects. The researchers emphasized the importance of strengthening institutional mechanisms for debt management and improving coordination between monetary and fiscal policies to mitigate the adverse effects of rising interest rates on Nigeria’s fiscal performance. Therefore, this study hypothesizes that:

H₀₃: Interest rate has no significant influence on budget implementation in Nigeria.

2.4. Conceptual Framework

The conceptual framework depicted in Figure 1 demonstrates the relationships among factors influencing budget implementation in Nigeria.

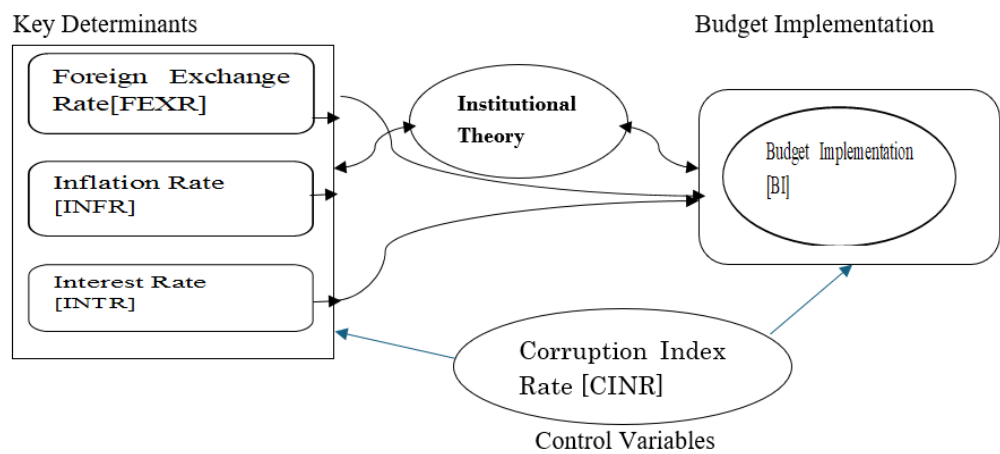


Figure 1. The Conceptual Framework.

3. Methodology

This study involves time series analysis; therefore, both *ex-post facto* and longitudinal research methods were used. The study covered the period from 2008 to 2024 fiscal year. The Federal Government of Nigeria (FGN) served as the study focus and population. Secondary data was obtained from the FGN's Annual Budget and reports from the CBN, Debt Management Office (DMO), and the Federal Ministry of Finance. Data was subjected to multiple regression analysis, and the hypotheses were tested using the Stata statistical package. The study’s econometric model regressed budget implementation against the foreign exchange, inflation, and interest rates, with the corruption index as a control variable. The regression equations are stated as follows:

$$BI_t = \beta_0 + \beta_1 FEXR_t + \beta_2 INFR_t + \beta_3 INTR_t + \beta_4 CINR_t + \varepsilon_t \tag{1}$$

Where:

- BI= Budget Implementation
- FEXR= Foreign Exchange Rate
- INFR= Inflation Rate
- INTR= Interest Rate
- CINR= Corruption Index Rate
- β₀= Constant
- β₁-β₄= Gradients
- t= time
- ε= Error Term

3.1. Measurement and Description of Variables

The variables being studied, together with their description, measurement, data source and supporting literature, are shown in Table 1.

Table 1. Measurement and Description of Research Variables.					
SN	Variable	Description	Measurement	Data Source	Literature Evidence
1	Budget Implementation	Budget implementation entails executing the government's financial strategy, ensuring that spending and revenues line with the approved budget	the ratio of the public sector expenditure to its planned or approved budget	Government Annual Reports.	(DMO, 2022)
2	Foreign Exchange Rate	The foreign exchange rate is the value of one country's currency in relation to another's currency.	Official exchange rate at the end of the year	CBN REPORT	Ubadike et al., 2023
3	Inflation Rate	The inflation rate refers to the rate at which prices rise over time.	Official inflation rate at the end of the year	CBN REPORT	Ana et al., 2024
4	Interest Rate	The interest rate is the percentage charged on the entire amount of a loan or paid on deposits over a given period.	Official interest rate at the end of the year	CBN REPORT	Bernanke, 2023
5	Corruption Index Rate	The Corruption Perceptions Index (CPI) ranks countries on a scale of 0 (very corrupt) to 100 (extremely clean).	perceived levels of public sector corruption, scoring on a scale of 0 (highly corrupt) to	CPI 2023 Reports	Transparency International, 2023

			100 (very clean).		
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4. Data Analysis and Discussion of Findings

This section depicts the characteristics of the variables used, data analysis, and study findings.

4.1. Descriptive Statistics

Statistical features for each variable, along with information on their distribution and properties across datasets, are included in Table 2. BI (Budget implementation) has a mean of 1.237 indicating that real spending exceeds the anticipated revenue. BI value ranges from 0.456 to 2.446, revealing significant variation in budget execution efficiency. The standard deviation is 0.50, indicating a moderate variability in budget execution. Also, the skewness is slightly right-skewed at 0.67, while the kurtosis is 3.23 indicating a close-to-normal distribution. Likewise, the foreign exchange rate (FEXR) statistics show substantial variability, with a mean of 340.30 and a huge standard deviation of 340.49. This implies a highly volatile or depreciating currency era. The lowest value is approximately 118.57, while the highest value is 1550.70. The skewness of 2.85 implies a highly right-skewed. This indicates currency depreciation. The kurtosis of 10.69 is high. This means the presence of extreme exchange rate fluctuations.

In the same vein, the sample's inflation rate (INFR) ranges from roughly 8.05% to 34.8%, with an average of 14.74%. The substantial dispersion and high average indicate that inflation is a major concern and a possible risk factor influencing budget implementation. The standard deviation of 6.62 implies substantial inflation volatility. The skewness of 1.82 indicates a right-skewed, with higher extreme values. The kurtosis of 6.12 implies a fat-tailed with periods of very high inflation. Additionally, the interest rate (INTR) statistics show a minimum of 6% and a maximum of 27.5%, a mean value of 13.12%. This variation suggests that borrowing terms and risk premiums varied during the observations. The skewness of 1.35 indicates a right skew. This implies periods of high interest rates. The kurtosis of 5.84 connotes a fat-tailed distribution. This suggests extreme interest rate variations. On the other hand, with a mean of 25.65 on a scale that ranges from 0 to 100 basis points, this index evaluates perceived corruption in the public sector. The narrow range (24 to 28) and somewhat low standard deviation of 1.32 imply that corruption levels are reasonably stable within the sample. The skewness of 0.18 indicates close to symmetric distribution while the kurtosis of 1.70 implies a slightly platykurtic, with few extreme values.

Finally, it can be inferred that the FEXR is extremely volatile, with sharp movements and a substantial right skewness, indicating periods of rapid currency depreciation. However, BI has a generally stable distribution, which means that government expenditure is continuously implemented with minor deviations. The corruption Index (CINR) is generally steady, but its low mean value indicates considerable concerns about corruption.

Table 2. Descriptive Statistics.							
Variable	Obs.	Mean	Std. Dev.	Min.	Max.	Skewness	Kurtosis
BI	17	1.24	0.50	0.46	2.45	0.67	3.23
FEXR	17	340.30	340.49	118.57	1550.70	2.85	10.69
INFR	17	14.74	6.62	8.05	34.80	1.82	6.12
INTR	17	13.12	4.86	6.00	27.50	1.35	5.84
CINR	17	25.65	1.32	24.00	28.00	0.18	1.70

Note: Results of mean, median, minimum and maximum of each variable from analysis of study data are shown above table.

4.2. Test of Variables

This section includes essential pre- and post-estimation tests to ensure the study's conclusions are relevant and reliable.

4.2.1. Pre-estimation Test

To ensure that the assumptions of the selected model were fulfilled and that there was enough data for analysis, the following tests were carried out.

4.2.1.1. Variables' Stationary Test

Table 3 displays the results of the stationary test. The Dickey-Fuller (ADF) tests the presence of a unit root in the variables under study. According to the null hypothesis, the distribution of data varies over time, but in the alternative hypothesis, the distribution of data remains constant across time. If the significant result is greater than 0.05, the null hypothesis is accepted; if it is less than 0.05, it is rejected. All variables have p-values greater than 0.05, indicating that variables are non-stationary. Accordingly, log transformation was carried out among the variables, the p-values of BI, FEXR, INFR, INTR, and CINR were 0.0017, 0.0000, 0.0392, 0.0072, and 0.0000, respectively. This implies that all variables were stationary.

Despite this, variables were checked for cointegration using the Engle-Granger Cointegration Test. As shown in Table 3, the test statistics for the model was -4.209 with a p-value of 0.0006. In this regard, the null hypothesis is rejected. This indicates that the cointegration regression's residuals are stationary. The study shows cointegration with stationary residuals, indicating a long-term equilibrium relationship between variables, despite individual variables being stationary. Also, selection order criteria were determined using the Akaike Information Criterion and Schwarz-Bayesian Criterion. The result for SBIC (Schwarz-Bayesian Criterion) was -417.838 at lag 4 while the result for Akaike Criterion (AIC) was -421.227 at lag 4. The study chooses Lag 4 as the optimal lag selection since it has the lowest value.

Table 3. Stationary Test.

Variable	Dickey-Fuller Lag (0)		Dickey-Fuller Lag (0) After Transformation	
	Z-value	P-value	Z-value	P-value
BI	-0.87	0.7969	-3.955	0.0017
FEXR	4.63	1.0000	-5.972	0.0000
INFR	1.68	0.9981	-2.956	0.0392
INTR	0.63	0.9884	-3.531	0.0072
CINR	-2.55	0.1036	-5.513	0.0000
Engle-Granger Cointegration Test	-4.209	0.0006		
Akaike Information Criterion	-417.838			
Schwarz-Bayesian Criterion	-421.227			

Table 3 shows the estimated coefficients of different stationary tests of the study’s variables

4.2.1.2. Multicollinearity

Variance inflation factor (VIF) analysis is shown in Table 4. FEXR, INFR, INTR and CINR have 1.27, 1.24, 1.29 and 1.29, respectively as VIF. These imply that there exists no multicollinearity. The mean VIF factor is 1.35, indicating the absence of multicollinearity among the variables.

Table 4. Variance Inflation Factor.

Variable	VIF	1/VIF
CINR	1.61	0.621874
INFR	1.29	0.773040
FEXR	1.27	0.786158
INTR	1.24	0.808915
Mean VIF	1.35	

Note: Results of a test of multicollinearity relationships amongst variables of the study are shown in the above table.

4.2.1.3. Correlation Analysis

Table 5 presents pairwise correlation coefficients and test results for independent variables. The test results revealed the correlation between the FEXR and INFR is 0.2067 ($p = 0.4260$), indicating an insignificant but weak relationship. This shows that there is little correlation between these variables. Also, the relationship between FEXR and INTR is 0.0329 ($p = 0.9003$). This implies an insignificant but weak positive connection. The correlation coefficient between INFR and INTR is 0.0234 ($p = 0.9290$), indicating an insignificant relationship. There are no significant correlations between CINR and other variables. The study concludes that there is no multicollinearity among variables.

Table 5. Pairwise Correlation.

	FEXR	INFR	INTR	CINR
FEXR	1.0000			
INFR	0.2067	1.0000		
	0.4260			
INTR	0.0329	0.0234	1.0000	
	0.9003	0.9290		
CINR	-0.2815	0.3246	0.3790	1.0000
	0.2738	0.2037	0.1335	

Note: Results of a pairwise correlation coefficient test of relationships amongst variables of the study are shown in the above table.

4.2.2. Post-Estimation Tests

In Table 6, a heteroskedasticity test was used to determine the constant variance of residuals or changes in fitted values. The test results for the model revealed a chi-square of 0.77 and a significant value of 0.3813, showing high evidence of homoskedasticity in the residuals of the study's model.

Similarly from Table 6, Durbin’s Alternative Test for Autocorrelation was used to determine autocorrelation in the data distribution. The Chi-square value of 1.069 and p-value of 0.3012>0.05 for the model implies that the study accepts the null hypothesis at the 5% significance level. The study, therefore, concludes that the residuals did not exhibit considerable autocorrelation, indicating that errors are not correlated over time.

In the same vein, the Skewness/Kurtosis tests for normality were used to determine whether the variables were normal. The result as contained in Table 6 showed that FEXR, INFR, INTR, and CINR were normally distributed while BI was not normally distributed.

Table 6. Summary of Post-Estimation Test Results.

Test	F-Statistic	P-value
Heteroskedasticity test	0.77	0.3813
Durbin’s Alternative Test for Autocorrelation	1.069	0.3012
Skewness/Kurtosis tests for normality:		
FEXR	0.71	0.7009
INFR	0.41	0.8144
INTR	4.03	0.1335
CINR	3.06	0.2169

BI	9.85	0.0073
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Table 6 shows the estimated coefficients of f-statistics and p-value for the model.

4.3. Vector Error Correction Model (VECM)

Vector Error Correction Model (VECM) was used to analyse short- and long-term relationships identified by the Engle-Granger Cointegration Test. R-square and p-value are used to illustrate the short-run dynamics in the model. As presented in Table 7, FEXR has an R-square of 0.9799 and a p-value of 0.0000, suggesting that the model explains short-term changes and provides significant evidence for short-run effects. This implies that FEXR is highly responsive to economic shocks. The R-square for INFR is 0.9344, with p-values of 0.0047. This implies that 93.4% of short-term inflation changes are accounted for. The R-square for INTR is 0.9929, with a p-value of 0.0000, indicates that the model explains 99% of the variability. This suggests that interest rates respond quickly to economic changes. The CINR has a p-value of 0.0000 and an R-square of 0.9710, which indicates a very high explanatory power.

Table 7. Vector Error-Correction Model.

Sample: 2011 - 2024		Number of	Obs.	=	14
		AIC		=	-121.71
Log-likelihood = 915.9416		HQIC		=	-121.98
Det (Sigma_ml) =-1.02e-63		SBIC		=	-118.79
Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_FEXR	12	0.0621	0.9799	97.3367	0.0000
D_INFR	12	0.0913	0.9344	28.5056	0.0047
D_INTR	12	0.0321	0.9929	280.781	0.0000
D_CINR	12	0.0183	0.971	67.0094	0.0000

Table 7 shows the estimated coefficients, R square-values, and p-values of the study’s main variables and control variables for model.

4.3.1. Cointegrating Equations in VECM

The cointegrating equation illustrates the long-term equilibrium relationship between the variables. As shown in Table 8, the chi-square statistic is 125.4675 and the p-value is 0.0000<0.05. The result shows that the cointegrating equation is statistically significant, indicating a strong long-term relationship among the variables in the model.

Table 8. Cointegrating Equations in VECM.

Equation	Parameters (Parms)	Chi² (Wald Statistic)	P-value (P>Chi²)
Cointegrating Equation	3	125.4675	0.0000

Table 8 shows the estimated coefficients of Cointegrating Equations in VECM.

4.3.2. Stability Test

The roots of the companion matrix plot are used to assess the stability of a vector error correction model (VECM). It assists in detecting structural breaks or changes in the relationship between variables. Figure 2 illustrates the companion matrix plot. The VECM model is stable, with all roots within or on the unit circle, and no eigenvalues outside the circle. This indicates no divergence over time. This stability allows for confident impulse response functions, variance decomposition, and forecasting, ensuring well-behaved relationships among variables for accurate forecasting.

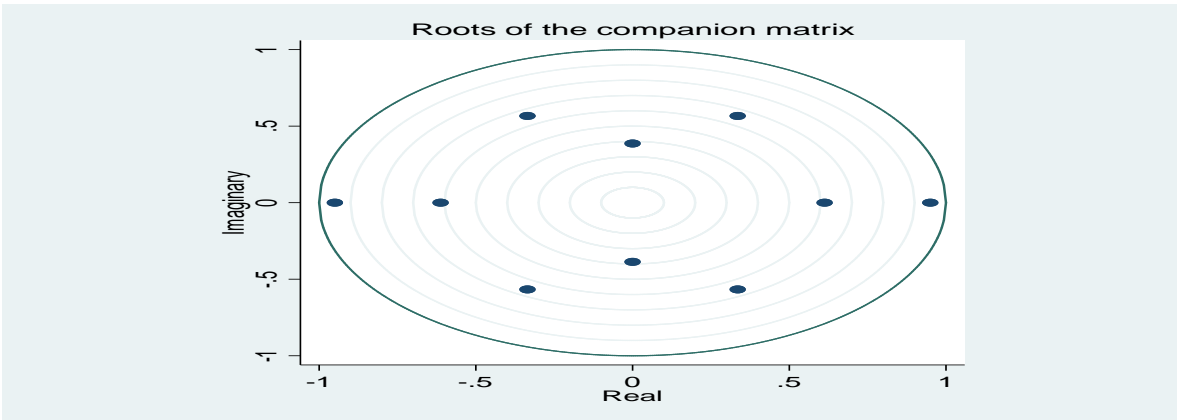


Figure 2. Companion Matrix.

Source: Researchers’ Computation (2025).

4.3.3. Impulse Response Function (IRF) Plot

The Impulse Response Function (IRF) plot illustrates how a shock to one variable affects another over time. Figure 3 shows the impulse response function (IRF) plot. The x-axis (step) depicts the periods following the shock. The y-axis shows the size of the response. The blue line illustrates the cumulative impulse response function, which shows how the response accumulates over time. The grey shaded area represents the 95% confidence interval (CI), which indicates the range of uncertainty surrounding the response. Each panel depicts the response of budget implementation (BI) to shocks in different variables.

Also, BI's response to CINR is close to zero, indicating a shock to corruption that has little to no impact on budget implementation (BI). The confidence intervals are narrow, suggesting a stable estimate. BI's response to FEXR is positive, implying that a shock to FEXR increases BI over time. The response becomes stronger around steps 5-10, indicating a delayed but growing effect. Again, BI's response to INFR is positive, meaning that an increase in inflation positively affects budget implementation. The response strengthens over time, stabilizing around steps 7-10. BI's response to INTR shows a small positive response initially, but it starts declining after step 5. The response fluctuates slightly but remains within a stable confidence range.

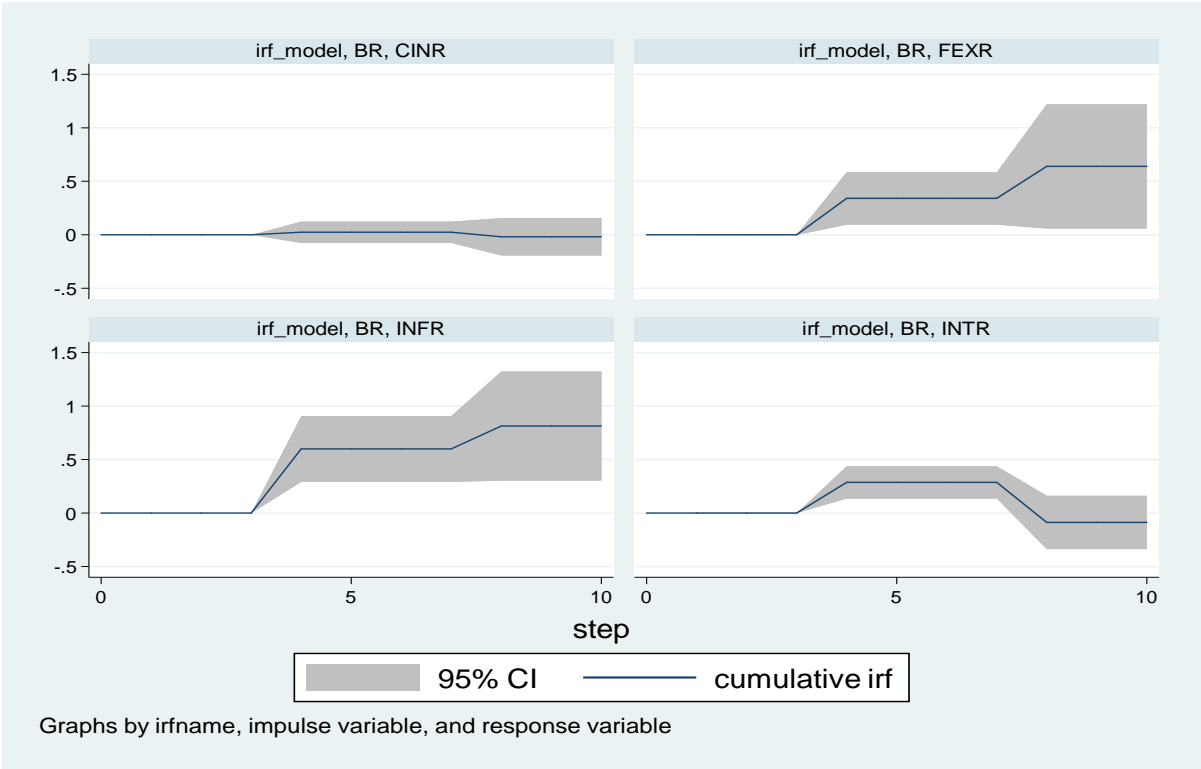


Figure 3. Impulse Response Function.

Source: Researchers' Computation (2025)

4.4. Granger Causality Tests

Granger causality tests assess if historical data series on one variable aids in the prediction of another. Granger causality is shown by a low p-value (usually less than 0.05), which results in the rejection of the null hypothesis. The Granger causality test results are presented in Table 9.

4.4.1. Foreign Exchange Rate and Its Influence on Budget Implementation.

From Table 9, the relationship between BI and FEXR is denoted by a Chi-statistic of 14.8690 and a p-value of $0.0010 < 0.05$. This suggests statistically significant but strong evidence of causality. Therefore, the Foreign Exchange Rate significantly influences budget implementation. This result agrees with the findings of Adler and Garcia-Macia (2022), the World Bank (2023), OCED (2023), and IMF (2023).

4.4.2. Inflation Rate and Its Influence on Budget Implementation

As shown in Table 9, BI and INFR have a Chi-square of 2.6314 and a p-value of $0.2680 > 0.05$. This suggests that INFR does not Granger-cause BI. Inflation Rate has no significant influence on Budget Implementation. While this agrees with the null hypothesis, this result however disagrees with the findings of Adesina and Bello (2023), the World Bank (2023), OCED (2023), and IMF (2023).

4.4.3. Interest Rate and Its Influence on Budget Implementation

Lastly from Table 9, BI and INTR have a Chi-square of 7.7533 and a p-value of $0.0210 < 0.05$. This suggests that INTR influences BI. The inflation rate has a major impact on budget implementation. This is not consistent with the null hypothesis, it also does not contradict the conclusions of Ahmed et al. (2023) and Adesina and Bello (2023).

Table 9. Granger Causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
BI	FEXR	14.8690	2	0.0010
BI	INFR	2.6314	2	0.2680
BI	INTR	7.7533	2	0.0210
BI	CINR	26.9530	2	0.0000
BI	ALL	47.5930	8	0.0000
FEXR	BI	6.5276	2	0.0380
FEXR	INFR	1.6510	2	0.4380
FEXR	INTR	3.1452	2	0.2080
FEXR	CINR	2.5313	2	0.2820
FEXR	ALL	16.8980	8	0.0310
INFR	BI	19.2490	2	0.0000
INFR	FEXR	14.5780	2	0.0010
INFR	INTR	20.7920	2	0.0000
INFR	CINR	17.4470	2	0.0000
INFR	ALL	78.7390	8	0.0000
INTR	BI	2.8280	2	0.2430
INTR	FEXR	4.6585	2	0.0970
INTR	INFR	7.4070	2	0.0250
INTR	CINR	3.5245	2	0.1720
INTR	ALL	10.5940	8	0.2260
CINR	BI	11.725	2	0.0030
CINR	FEXR	0.1051	2	0.9490
CINR	INFR	0.4738	2	0.7890
CINR	INTR	35.293	2	0.0000
CINR	ALL	96.489	8	0.0000

Table 9 shows the estimated coefficients of Granger Causality Wald test results of all variables of the study.

4.5. Discussion of Findings

The findings of the Granger causality test provide useful insights into the relationships between key economic and fiscal variables in Nigeria. Foreign exchange rates and budget implementation have a substantial bidirectional causal relationship. This indicates that foreign exchange rates and budget implementation are inextricably related, with foreign exchange rates influencing how the government executes its budget and vice versa. While inflation has no significant effect on budget implementation, budget implementation has a substantial influence on inflation. This implies that government budgeting can influence inflation. Also, interest rates have a significant impact on budget implementation, but budget implementation does not affect interest rates. Therefore, interest rates are a major factor in deciding how the government distributes and uses its budget. In general, the findings emphasize that foreign exchange rates and interest rates have the most significant influence on Nigeria's budget implementation while inflation has a less direct influence.

5. Conclusion and Recommendations

This study investigated the determining factor of budget implementation in Nigeria. The literature on these factors was evaluated. Annual data on the foreign exchange rate, inflation rate, interest rate, corruption perception index, and budget implementation ratio were gathered from CBN annual reports between 2008 and 2024. These data were examined using times series analysis. The study demonstrates that budget implementations are significantly affected by foreign exchange rates. This emphasises how susceptible Nigeria's fiscal stability is to changes in the foreign exchange rate. Also, interest rates have a complementary causal relationship with budget implementation. This highlights the importance of interest rate policies in determining government spending. Inflation rates have little or no effect on budget implementation. This suggests that inflation has a more indirect and secondary effect on budget implementation.

Based on this, the following recommendations were made: Firstly, the government should prioritize exchange rate stability through good monetary policy. This will reduce the risk of currency changes affecting budget implementation, hence preserving fiscal stability. Secondly, since interest rates have significant effects on budget implementation, the Central Bank of Nigeria (CBN) should try to keep interest rates low to boost the economy. The effects of interest rate fluctuations on government spending and fiscal capacity should be closely monitored by policymakers.

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