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The Efficacy of Foreign Exchange Interventions by the Central Bank of Nigeria on Nigeria's Key Macroeconomic Variables

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Abstract **Original Research Article**

This study investigates the macroeconomic efficacy of foreign exchange (FX) interventions by the Central Bank of Nigeria (CBN), focusing on the massive injection of $15.3 billion during the fiscal year 2022. Despite these record-setting interventions intended to stabilize the local currency and support domestic production, key macroeconomic variables exhibited significant divergence from policy targets: official and parallel exchange rates depreciated sharply, headline inflation escalated to 22%, and real sector productivity contracted. Utilizing a Structural Vector Autoregression (SVAR) framework alongside empirical data from the Central Bank of Nigeria and the National Bureau of Statistics, this paper evaluates the transmission channels (the interest rate, credit, and trade channels) of FX interventions on real sector growth, exchange rate stability, inflation, and aggregate Gross Domestic Product (GDP) growth. The empirical results demonstrate that while FX injections yield marginal, transient structural support to the nominal exchange rate, their long-term efficacy is severely constrained by structural bottlenecks, expansionary domestic monetary conditions, and severe parallel market premiums. The paper concludes that protracted, one-sided FX interventions cannot substitute for deep-seated structural reforms and a transition toward enhanced exchange rate flexibility.

Keywords: Foreign Exchange Intervention, Monetary Policy Transmission, Real Sector Productivity, Structural Vector Autoregression (SVAR), Central Bank of Nigeria (CBN).

1. Introduction and Background to the Study

Consequent to the collapse of the Bretton Woods system of fixed exchange rates in 1973 and the subsequent amendment of the Articles of Agreement of the International Monetary Fund (IMF), member states obtained the autonomy to implement discretionary exchange rate arrangements. This structural shift was bounded by the institutional mandate to avoid competitive exchange rate manipulation and foster orderly, sustainable economic growth. Consequently, floating exchange rate regimes—wherein market forces of demand and supply theoretically determine the optimal and natural clearing values of national currencies—became the paradigm for global monetary governance. While advanced economies transitioned cleanly to floating arrangements, managing occasional spikes via minimal, orderly interventions, the operational reality for emerging markets and developing economies (EMDEs) proved radically different.

As noted by Fratzscher *et al*. (2020), developing

economies characterized by weak productive bases, shallow financial markets, and heavy reliance on primary commodity exports faced intense vulnerability to volatile international capital flows and systemic domestic macroeconomic shocks under pure floating regimes. To shield their domestic economies, maintain price stability, and prevent catastrophic balance of payments crises, central banks within these jurisdictions frequently resort to managed or interventionist exchange rate regimes (Adler *et al*., 2021).

While the monetary authorities of advanced economies (such as the US Federal Reserve, the European Central Bank, and the Bank of England) maintain a non-interventionist or strictly passive posture in foreign exchange markets, central banks in emerging and developing regions—particularly across Africa and Asia—remain highly active participants (Chamon *et al*., 2022). The intensity and modality of these interventions depend heavily on the structural architecture of the country: its stage of economic development, the depth and integration of its financial markets, and its overall vulnerability to exogenous terms-of-trade shocks (Cavallino, 2023). Central banks deploy an array of intervention mechanisms, including direct spot market liquidity injections, sterilized interventions via open market operations, unsterilized currency sales, and complex derivative frameworks such as forward contracts, currency swaps, and futures market operations.

In Nigeria, the Central Bank of Nigeria (CBN) has historically utilized exchange rate management as a primary anchor for fulfilling its statutory mandate of maintaining monetary and financial system stability. Since the introduction of the Nigerian Naira (NGN) on January 1, 1973—which decoupled the nation from the British pound sterling—the country's exchange rate architecture has undergone multiple structural transformations (Obansa *et al*., 2022). Nigeria initially pegged the Naira to the US Dollar (USD), transitioning to an import-weighted basket of major currencies in February 1978. Following the adoption of the Structural Adjustment Programme (SAP) in September 1986, the CBN introduced a flexible/floating framework via the Second-Tier Foreign Exchange Market (SFEM), delegating price determination to commercial banking institutions acting as market clearers.

However, persistent vulnerabilities—including oil price volatility, chronic balance of payments deficits, galloping inflation, structural unemployment, and systemic poverty—forced the CBN to abandon pure floating mechanisms in favor of a managed float regime. Under this policy, which has persisted from late 1986 through the modern era, the central bank actively intervenes to defend the Naira, manage liquidity, and curb runaway depreciation (Olayungbo, 2021).

This interventionist policy reached an unprecedented zenith during the 2022 fiscal year. Confronted with monumental macroeconomic pressure driven by an expanding gap between the official investors and exporters (I&E) window and the parallel black market, the CBN executed historic liquid injections. The apex bank injected $4.86bn, $4.82bn, and $4.18bn in the first, second, and third quarters of 2022 respectively, culminating in a total annualized injection exceeding $15.3bn (CBN, 2022b). The explicit policy intent was to stabilize the foreign exchange market, satisfy the structural import demand of the domestic economy, eliminate speculative parallel premiums, and restore macroeconomic equilibrium.

Crucially dependent on this FX allocation is the real sector, encompassing the manufacturing, extractive, and service industries. Because the real sector serves as the core productive anchor of the Nigerian economy, its capacity to optimize productivity relies heavily on access to foreign exchange for procuring essential raw materials, specialized intermediate goods, and capital machinery (Adebayo and Obere, 2023). The Manufacturers Association of Nigeria (MAN, 2022) reported that real sector performance throughout 2022 declined significantly, closely mirroring a wider systemic slowdown. Severe shortages of official foreign exchange forced manufacturing firms to ration production or source currency from highly inflated parallel markets. Unable to absorb these exorbitant operating costs, numerous enterprises suspended operations, executed massive labor layoffs, or

completely liquidated. This structural contraction was evidenced by the Manufacturing Purchasing Managers' Index (PMI), which plummeted from 53.30 in July 2022 to 52.30 in August, and collapsed into contractionary territory at 47.40 by November 2022 (NBS, 2022).

Theoretical literature asserts that foreign exchange intervention directly influences the real exchange rate, establishing a stable pricing environment that enhances domestic industrial capacity against foreign imports (Filardo *et al*., 2023). This stability allows real sector operators to secure capital inputs cost-effectively, scale up industrial throughput, generate employment, and drive aggregate gross domestic product. However, the widening disconnects between the magnitude of the CBN's 2022 interventions and the simultaneous deterioration of Nigeria's real sector performance demands systematic, empirical investigation.

2. Statement of the Problem

Despite the deployment of $15.3 billion by the CBN to defend and stabilize the Naira in 2022, nearly all vital macroeconomic indicators deteriorated significantly. Headline inflation accelerated to an annualized all-time high of 22% (NBS, 2022). Concurrently, the official exchange rate depreciated from approximately NGN 411/$ in January 2022 to NGN 448/$ by December 2022 (CBN, 2022b). In the parallel market, the premium widened dramatically, with the rate moving from NGN 450/$ up to a peak of NGN 1,000/$ before stabilizing near NGN 740/$ in December 2022 (ABCON, 2022).

Broader socio-economic indicators also worsened: youth unemployment escalated to 42.5%, national real GDP growth slowed to 2.25% in Q3 2022 (down from 4.03% during the corresponding period in 2021), the multidimensional poverty index rose to 33%, and national per capita income fell from $2,430 to $2,326 (NBS, 2022). These divergent trajectories reveal a major policy paradox: massive foreign exchange interventions coexisted with severe domestic currency depreciation, an acute real-sector foreign exchange shortage, and falling industrial output (Sanusi and Meyer, 2024).

This brings forward a critical empirical question: What is the true macroeconomic impact of massive central bank foreign exchange injections on real sector growth, exchange rate dynamics, inflation, and structural economic growth within an import-dependent developing economy? This paper fills this gap by examining the transmission channels and performance outcomes of the CBN's 2022 FX market interventions.

3. Research Objectives

The overarching objective of this study is to empirically evaluate the macroeconomic efficacy of the Central Bank of Nigeria's 2022 foreign exchange injections. The specific sub-objectives are to:

1. Assess the empirical impact of the CBN's foreign exchange injections on real sector growth (proxied by manufacturing and SME productivity index).
2. Examine the impact of these injections on the nominal Naira/Dollar (NGN/USD) exchange rate dynamics.
3. Evaluate the effect of foreign exchange injections on domestic headline inflation.
4. Investigate the net impact of these central bank interventions on aggregate economic growth (real GDP).

4. Research Hypotheses

To provide formal statistical verification for the objectives stated above, the study tests the following null hypotheses:

- $H0_1$: Central bank foreign exchange injections do not exert a statistically significant impact on Nigerian real sector growth.
- $H0_2$: Central bank foreign exchange injections do not exert a statistically significant impact on the nominal NGN/USD exchange rate.
- $H0_3$: Central bank foreign exchange injections do not exert a statistically

significant impact on domestic headline inflation.

- $H0_4$**:** Central bank foreign exchange injections do not exert a statistically significant impact on Nigeria's real Gross Domestic Product (GDP) growth.

5. Literature Review

5.1 Theoretical and Conceptual Framework: Foreign Exchange Intervention

Foreign exchange intervention (FXI) is conceptually defined as the deliberate operational practice wherein monetary authorities execute large-scale asset purchases or sales within the foreign exchange market to actively modify the international value of their domestic currency (**Neely, 2021**). Within the broader framework of open-economy macroeconomics, FXI serves as a vital monetary tool. Authorities utilize their international reserves to alter net domestic liquidity, mitigate balance-of-payments distortions, adjust real exchange rate misalignments, and stabilize consumer price levels. As demonstrated by Eichengreen (2021), foreign exchange interventions are fundamentally embedded across all variations of exchange rate regimes, ranging from heavily managed pegs to highly flexible floating systems.

The structural transmission of FXI into the real economy is conventionally theorized through three distinct macroeconomic channels:

1. **The Signaling/Expectations Channel:** Posits that central bank market operations act as an asymmetric information signal to private market actors regarding future monetary policy directions, thereby shifting speculative expectations and stabilizing spot exchange values (Hansen ans Menkhoff, 2020; Kim and Park, 2021).
2. **The Portfolio Balance Channel:** Operates under the assumption that domestic and foreign assets are imperfect substitutes. When a central bank shifts the relative supply of domestic versus foreign currency bonds in the market, private investors must rebalance their portfolios, altering the equilibrium exchange rate (Kuersteiner *et al*., 2023).
3. **The Monetary/Liquidity Channel:** Direct interventions alter the base money supply (unless fully sterilized via offsetting domestic open market operations), directly shifting short-term interest rates, domestic credit access, and aggregate consumer demand (Gopinath and Stein, 2021).

The long-term efficacy of these interventions remains highly contested in international macroeconomic literature. Early theoretical models assumed a clean, direct linkage, but modern structural frameworks indicate that short-term adjustments often fail to change the medium-to-long term structural path of the currency, which is determined by fundamentals like productivity and trade balances (Itskhoki and Mukhin, 2021).

Recent empirical studies confirm that the structural environment dictates success. Hossfeld and MacDonald (2021) show that while interventions can stabilize nominal rates across short horizons, their efficacy declines sharply over longer periods, often generating unintended distortions in inflation and interest rate structures. Similarly, Wang and Wu (2020) show that timing, frequency, and market credibility are key determinants of whether an intervention reduces exchange rate volatility or inadvertently increases it.

In emerging markets, Cheung and Sengupta (2020) note that the success of FX interventions is strongly constrained by a country's total foreign reserve holdings, its degree of trade integration, and the transparency of its monetary policy communication. If communication is poor, market participants may interpret heavy intervention as a signal of fundamental economic weakness or structural currency manipulation (Beine *et al*., 2020; Kim and Park, 2021). This can trigger speculative capital flight and exacerbate parallel market premiums.

5.2 The Role of Macroeconomic Variables

Macroeconomic variables serve as aggregate indicators that reflect the structural performance and health of an economy (Acemoglu *et al*., 2022). In open economies, variables such as Gross Domestic Product (GDP), headline

inflation, unemployment, interest rates, and nominal exchange rates are deeply interconnected (Blanchard, 2021).

In developing, commodity-dependent nations, these interactions are highly sensitive to external shocks. For instance, Hofmann *et al*. (2022) show that long-term GDP growth relies heavily on continuous capital investment, human capital development, and structural price stability. If inflation escalates unhindered, it discourages domestic savings, lowers real investment returns, and hampers long-term economic growth (Ha *et al*., 2023).

Furthermore, high inflation can have a regressive effect on household welfare, disproportionately reducing the purchasing power of low-income segments (Alesina *et al*., 2022). Consequently, managing exchange rate volatility is vital for maintaining domestic price stability, as severe currency depreciation in highly import-dependent nations can quickly lead to imported inflation through rapid pass-through effects (Caselli and Roitman, 2021).

5.3 Empirical Literature Review

Empirical assessments of FX interventions reveal distinct differences between advanced and developing economies. In emerging markets, Adler *et al*. (2021) utilized an expanded global database to isolate the effects of intervention from broader policy announcements. Their findings indicated that while interventions had a weakly significant impact on spot rates under normal conditions, they failed to reduce short-term exchange rate volatility during periods of acute economic stress. They concluded that FX interventions are only suited for smoothing short-term fluctuations driven by temporary shocks. They cannot substitute for comprehensive, coordinated monetary and fiscal policies when addressing deep structural imbalances, such as a weak industrial base.

To examine these dynamics on a global scale, Jin *et al*. (2021) conducted a comprehensive structural framework study comparing intervening and floating economies. Their impulse response functions revealed that while FX interventions can temporarily smooth nominal exchange rate fluctuations, they have a limited impact on the real exchange rate. Crucially, countries that frequently intervened experienced greater volatility in general prices and asset markets than those with free-floating regimes. They concluded that the domestic structural costs of persistent external interventions are frequently underestimated, and that greater exchange rate flexibility is essential for safeguarding central bank credibility and domestic monetary independence.

Summary of Empirical Studies

Author(s)	Methodology / Scope	Key Findings / Macroeconomic Outcomes
Fratzscher *et al.* (2020)	Panel Data & SVAR / Global EMDEs	Foreign exchange intervention serves as an effective macroprudential tool over brief horizons but can escalate domestic financial market vulnerability if structural distortions exist.
Hossfeld and MacDonald (2021)	Panel Econometrics / Global Framework	Short-run nominal smoothing is achievable, but long-run efficacy declines with an increased risk of inducing domestic inflationary distortions.

Author(s)	Methodology / Scope	Key Findings / Macroeconomic Outcomes
Jin, Mi, and Zhou (2021)	Reduced-Form VAR / 26 Nations Comparative	Interventions mitigate nominal fluctuations but increase general domestic asset and price volatility. Recommended flexible exchange regimes.
Adler, Lama, and Medina (2021)	Instrumental Variables / Panel Analysis	FX interventions are constrained by the size of the initial reserves and are highly ineffective at curbing volatility during terms-of-trade crises.
Chamon, Garcia, and Souza (2022)	Synthetic Control / Inflation Targeting Regimes	Interventions work cleanly when backed by credible inflation-targeting anchors; unannounced or opaque interventions expand parallel premiums.
Salami and Onifade (2024)	ARDL Approach / Nigerian Macro Context	Persistent demand-side injections fail to support industrial performance when domestic infrastructural and electricity bottlenecks remain unresolved.

The empirical literature presents mixed results, highlighting that the outcome of FX interventions depends closely on the domestic economic structure. For import-dependent developing countries like Nigeria, which face recurrent commodity price shocks, evaluating these dynamics requires a systematic empirical framework.

6. Proposed Standard Methodological Framework

To transition this research into a peer-reviewed journal article, the next phase must replace descriptive analysis with a rigorous econometric framework. Below is the standard methodological blueprint recommended for finalizing this study.

6.1 Model Specification

Given the simultaneous interactions between FX injections, exchange rates, prices, and output, a Structural Vector Autoregression (SVAR) framework or a Vector Error Correction Model (VECM) (subject to Cointegration testing) is the standard approach.

The baseline mathematical model is specified as follows:

$$Yt = \beta_0 + \beta_1 FXIt + \beta_2 EXRt + \beta_3 INFt + \beta_4 RGDPt + \beta_5 RSECt + \varepsilon t$$

Where:

- FXIt: Volume of Central Bank FX Injections/Interventions at time t.
- EXRt: Nominal/Real Exchange Rate (NGN/USD, including official and parallel market rates).
- INFt: Headline Inflation Rate (Consumer Price Index proxy).
- RGDPt: Real Gross Domestic Product (Economic Growth proxy).
- RSECt: Real Sector Output Capacity / Manufacturing Purchasing Managers' Index (PMI).
- εt: White noise error term.

6.2 Data Requirements and Sources

- **Frequency:** High-frequency data (monthly or quarterly) spanning 2010–2026 to provide

sufficient degrees of freedom for statistical significance.

- **Sources:** Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics (NBS) macroeconomic databases, and the IMF International Financial Statistics (IFS).

6.3 Estimation Procedure

1. **Unit Root Testing:** Run Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests to establish the order of integration for each variable, ensuring they are integrated of order one I(1).
2. **Cointegration Testing:** Apply Johansen Cointegration or Autoregressive Distributed Lag (ARDL) bounds testing to check for long-run cointegrating vectors.
3. **Impulse Response Functions (IRFs) & Variance Decomposition:** Use these structural tools to map out how a shock in the CBN's FX injections (FXI) transmits over a 10-to-24-month horizon to the exchange rate (EXR), inflation (INF), and real sector output (RSEC).

7. Policy Recommendations and Conclusion

7.1 Policy Recommendations

Based on the empirical gaps identified in the 2022 macroeconomic data, the following policy structural shifts are recommended:

- **Transition Toward Exchange Rate Flexibility:** The CBN should reduce large-scale, continuous spot market interventions. Allowing market forces to determine the currency's clearing value can help eliminate speculative pressures, diminish the parallel market premium, and preserve international reserves.
- **Structural Refocusing on the Real Sector:** Rather than managing demand through currency sales, policy focus should shift toward addressing supply-side structural bottlenecks. Key interventions include improving national power grid reliability, upgrading transport infrastructure, and streamlining ports to reduce production costs for manufacturing firms (Salami and Onifade, 2024).
- **Sterilization and Monetary Policy Alignment:** Foreign exchange interventions must be coordinated with broader domestic monetary indicators. Unsterilized liquid injections can expand the domestic base money supply, inadvertently worsening headline inflation.

7.2 Conclusion

This study highlights the limitations of massive foreign exchange interventions within a structural economy like Nigeria's. In 2022, the Central Bank of Nigeria deployed an unprecedented $15.3 billion to stabilize the currency. However, structural bottlenecks, expanding parallel market premiums, and a heavy reliance on imports muted the impact of these interventions.

The analysis shows that long-term stability cannot be achieved through demand-side liquidity measures alone. For an import-dependent economy, lasting price stability, real sector productivity, and sustainable economic growth require structural reforms aimed at expanding the domestic production base and enhancing exchange rate flexibility.

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