



EXCHANGE RATE VOLATILITY AND FOREIGN PORTFOLIO INVESTMENT: SECTORIAL EVIDENCE FROM NIGERIA

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Abstract

This paper examines the dynamic relationship between foreign portfolio investment and exchange rate volatility in Nigeria between 1990 and 2024, a time frame characterised by different capital flow patterns and exchange rate regimes. The study used nominal exchange rate, real exchange rate, exchange rate regime, and exchange rate misalignment as important variables to capture the subtleties of exchange rate volatility; net inflow of portfolio investment was used as a stand-in for foreign portfolio investment. The study verified data stationarity and looked at both short- and long-term associations using the Auto-Regressive Distributed Lag (ARDL) model and the Augmented Dickey-Fuller unit root test. The World Bank's World Development Indicators (WDI) and the Central Bank of Nigeria's (CBN) Statistical Bulletin were the sources of the data. A long-term relationship between exchange rate volatility and foreign portfolio investment was validated by the boundaries test. In particular, portfolio inflows were positively and significantly impacted by both nominal and real exchange rates in the near term, indicating that foreign investors are sensitive to changes in exchange rates. On the other hand, the exchange rate regime had a long-term negative and substantial impact on portfolio inflows, underscoring policy unpredictability as a barrier to consistent investment. It's interesting to note that over time, exchange rate misalignment showed a strong and positive correlation with inflows, suggesting that investors were speculating on currency mispricing. In order to boost investor confidence and draw in capital inflows, the study finds that exchange rate dynamics are crucial in determining foreign portfolio investment patterns in Nigeria and advises the CBN to maintain stable and market-reflective exchange rate policies.

Keywords: Exchange Rate Regime, Exchange Rate Misalignment, Net-Inflow of Portfolio Investment.

Introduction

In today's highly globalized financial environment, capital flows, particularly foreign portfolio investment, have become a vital component in the development trajectory of emerging economies like Nigeria. Foreign portfolio investors are often attracted to countries offering high returns, macroeconomic stability, and predictable financial conditions. Foreign portfolio investment, as conceived by this study, refers to the short-term investment in financial assets such as equities, bonds, and other marketable securities in Nigeria by non-residents, primarily for the purpose of earning returns without exerting control over the firms. This concept aligns with the

definition by the International Monetary Fund (IMF, 2023), which views Foreign Portfolio Investment as cross-border investment in securities that are traded in liquid markets and do not confer significant influence on the issuer. Similarly, Obadan (2021) defines foreign portfolio investment in the Nigerian context as external capital inflows into stocks and debt instruments, driven by yield differentials and market conditions. According to Eze and Okoye (2022), foreign portfolio investment is a volatile form of capital that is easily affected by macroeconomic signals such as inflation, interest rates, and most importantly, exchange rate movements. These definitions underscore the fluid nature of foreign portfolio investment and its sensitivity to market uncertainty, particularly currency fluctuations.

Over the past decade, Nigeria has experienced a fluctuating trend in foreign portfolio investment inflows, closely linked to uncertainties in the foreign exchange market and broader macroeconomic instability. According to statistical data from the Central Bank of Nigeria (CBN, 2024), Nigeria recorded Foreign Portfolio Investment inflows of over \$17.5 billion in 2018, which significantly declined to \$3.4 billion in 2020 due to increased exchange rate instability and capital controls, exacerbated by the COVID-19 pandemic. In 2021, Foreign Portfolio Investment improved slightly to \$6.7 billion but again dropped to \$3.9 billion in 2022 amid declining investor confidence and persistent foreign exchange illiquidity. By 2023, Nigeria attracted only \$2.5 billion in Foreign Portfolio Investment, the lowest in nearly a decade, highlighting the growing aversion of foreign investors to exchange rate risks in the country. Sectoral data from the Nigerian Exchange Group (NGX, 2023) shows that sectors such as banking and consumer goods, traditionally dominant in attracting Foreign Portfolio Investment, experienced major withdrawals due to fears of currency depreciation and delayed repatriation of returns.

Exchange rate volatility has emerged as a central determinant of Nigeria's foreign investment performance in recent years. Exchange rate volatility refers to the degree of unpredictable fluctuation in the value of a country's currency relative to others. Such instability increases the risk associated with foreign-denominated assets, thereby shaping the behavior and sectoral preferences of foreign portfolio investors. This study perceives exchange rate volatility as the frequent and unpredictable swings in the naira exchange rate against major currencies, especially the US dollar, resulting from

market imbalances, speculative pressures, policy inconsistencies, and external shocks. Ajakaiye and Fakiyesi (2020) describe exchange rate volatility as the unpredictability in the direction and magnitude of exchange rate movements, which introduces uncertainty in the returns on foreign investments. In a related view, Uzonwanne (2023) defines it as the degree to which the exchange rate deviates from its long-term mean or trend, often caused by weak macroeconomic fundamentals and inconsistent monetary policies. From a more global perspective, the World Bank (2023) explains exchange rate volatility as a major risk factor that deters foreign investors in countries with underdeveloped currency hedging mechanisms.

Statistical evidence supports the claim that high exchange rate volatility in Nigeria has negatively influenced foreign portfolio investment. Between 2016 and 2023, the naira depreciated from ₦197/\$ to over ₦900/\$ at the official market and surpassed ₦1,200/\$ in the parallel market by late 2023. These wide fluctuations made it difficult for investors to accurately price assets and predict their returns in naira terms. Consequently, FPI inflows dropped by more than 70% during this period, according to CBN and National Bureau of Statistics (NBS) reports. The delay in the harmonization of multiple exchange rates and challenges in accessing foreign exchange for repatriation further worsened investor confidence, particularly in sectors with high foreign exposure such as banking, telecommunications, and manufacturing. The relationship between exchange rate volatility and foreign portfolio investment is grounded in the fact that foreign investors, driven by risk-adjusted returns, are likely to avoid economies where currency instability can erode profits. When the local currency weakens unexpectedly, the value of returns converted into the investor's base currency declines, thus creating capital

flight or discouraging new inflows. Furthermore, unstable exchange rate regimes create uncertainty in monetary policy direction, which can adversely affect interest rates and financial asset pricing — key determinants of portfolio allocation decisions.

It is imperative to note that earlier studies have attempted to explore this relationship. For instance, Okonkwo and Agu (2020) found that exchange rate instability negatively affects foreign portfolio flows in Nigeria, emphasizing the need for exchange rate harmonization and policy credibility. Similarly, Adegbite and Fapetu (2021) used ARDL techniques to show that both short-run and long-run exchange rate fluctuations significantly reduce FPI in Nigeria. On the other hand, Ibe and Egbo (2022) examined sectoral responses and discovered that FPI in banking and consumer goods sectors are more elastic to exchange rate shocks than the oil and gas sector. While these studies highlight the importance of exchange rate dynamics, they often treat the economy as homogenous without adequately accounting for the heterogeneous impacts across sectors. This study seeks to fill that gap by providing sector-specific evidence on how exchange rate volatility influences FPI behavior in Nigeria. Understanding the sectoral variations will provide more nuanced policy insights and help tailor sector-based strategies for attracting sustainable foreign investment.

Literature Review

Theoretical Literature

International Portfolio Diversification Theory

Markowitz proposed the International Portfolio Diversification Theory in 1952 through his seminal book on Modern Portfolio Theory, and Bruno Solnik expanded

it to the global setting in 1974. According to Markowitz, having a variety of assets with low or negative correlations might help investors lower the overall risk of their investment portfolios. By applying this concept to the global financial system, Solnik proposed that investing internationally enables investors to take advantage of various economic cycles, monetary circumstances, and risk settings, improving the risk-return profile of their portfolios. The theory is based on the assumption that investors are rational and risk-averse, aiming to maximize expected returns for a given level of risk. It also assumes that financial markets are sufficiently open to allow cross-border investment, and that the returns on financial assets from different countries or sectors are not perfectly correlated. Moreover, it recognizes the presence of exchange rate risk as an inherent component of international investment. The theory posits that by diversifying across countries, investors can minimize the impact of unsystematic risk and achieve more stable returns.

Several proponents of this theory have supported its application to emerging markets. Solnik (1974) emphasized that international diversification significantly reduces portfolio risk compared to domestic-only investment. Errunza and Losq (1985) demonstrated that international investment in emerging markets—despite higher volatility—enhances risk-adjusted returns due to the markets' relative segmentation and inefficiency. Bekaert and Harvey (1995) further argued that liberalized financial markets in developing countries attract substantial foreign portfolio inflows due to their higher expected returns and diversification benefits. However, some scholars have criticized the theory's assumptions and practical applicability. Korajczyk (1995) argued that during periods of global financial crises, cross-market correlations tend to rise, reducing the benefits of diversification. Stulz (1999) contended that political risks, regulatory

uncertainty, and exchange rate instability in emerging markets often offset the theoretical gains of international diversification. Similarly, Levy and Sarnat (1970) cautioned that in economies with weak investor protections and frequent currency fluctuations, the actual behavior of investors may diverge from the predictions of the theory, leading them to avoid certain markets or sectors altogether.

Despite these criticisms, the International Portfolio Diversification Theory remains highly relevant to the study. It provides a valuable framework for understanding how foreign investors allocate capital in response to changing risk conditions, particularly those driven by currency instability. Nigeria has witnessed significant fluctuations in exchange rates over the last decade, with the naira losing substantial value against major currencies. This persistent volatility has influenced investor confidence and behavior, leading to noticeable declines in foreign portfolio investment, especially in sectors heavily exposed to foreign exchange risks. Therefore, the International Portfolio Diversification Theory offers a compelling lens through which to interpret the influence of exchange rate volatility on sectoral patterns of foreign portfolio investment in Nigeria. It explains not only the volume of capital inflows but also the sector-specific reallocation of investment under conditions of heightened currency risk. The theory underscores the importance of macroeconomic and exchange rate stability as critical enablers for attracting and sustaining foreign investment in a volatile and segmented economy like Nigeria.

Uncovered Theory of Interest Parity

Formally proposed by Mundell (1971) and Fleming (1971), the Uncovered Interest Parity Theory was expanded upon by Mussa

(1984). The idea, which explains how anticipated changes in exchange rates balance out interest rate differences between two nations, is fundamental to international finance. Uncovered Interest Parity Theory states that any return advantage provided by a higher domestic interest rate will be offset by an expected depreciation of the home currency when capital is completely mobile and investors behave rationally. This implies that after exchange rate expectations are taken into consideration, investors in equilibrium should not care whether they invest in local or foreign assets. Uncovered Interest Parity Theory is grounded on several core assumptions: the existence of perfect capital mobility, rational expectations, absence of transaction costs or capital controls, and no arbitrage opportunities. It presumes that investors do not hedge (i.e., they are “uncovered”) against exchange rate fluctuations when investing abroad. As such, expected exchange rate movements become a critical factor influencing international investment decisions, particularly in short-term instruments such as foreign portfolio investments (FPI).

Supporters of the theory, such as Mussa (1984), argued that exchange rate adjustments serve to equalize expected returns on financial assets across countries, making them responsive to interest rate differentials. Froot and Thaler (1990) also supported UIP, especially in the long run, asserting that rational investors incorporate exchange rate expectations into portfolio decisions and will reallocate capital accordingly. Obstfeld and Rogoff (1996) emphasized that UIP provides a crucial theoretical linkage between monetary policy, capital flows, and exchange rates in open economies, particularly under floating exchange rate regimes. Nonetheless, a number of empirical studies and economists have challenged the practical validity of Uncovered Interest Parity Theory, especially in emerging and developing countries. Dornbusch

(1976) criticized the theory's short-run predictions, arguing that prices are sticky and exchange rates tend to overshoot due to slow adjustment of expectations and speculative behavior. Lewis (1995) questioned the rational expectations assumption, highlighting that investor behavior often diverges from theory, and that exchange rate expectations are frequently biased or inefficient. Bansal and Dahlquist (2000) provided extensive empirical evidence that Uncovered Interest Parity Theory performs poorly in developing countries, where currency risk, weak monetary policy credibility, and capital market frictions persist. Korajczyk (1995) also observed that in the presence of capital controls, political risk, and market segmentation, the conditions required for Uncovered Interest Parity Theory to hold break down, leading to persistent deviations from theoretical predictions.

The Uncovered Interest Parity Theory provides significant insights into the connection between foreign portfolio investment and exchange rate volatility in the Nigerian environment. In the past, Nigeria has kept domestic interest rates comparatively high, frequently in an effort to draw in international investment. Nevertheless, statistics from the National Bureau of Statistics and the Central Bank of Nigeria indicate that foreign portfolio inflows have been extremely erratic and typically decreasing despite this interest rate gap, particularly during times of increased exchange rate volatility from 2016 to 2023. The Uncovered Interest Parity Theory, on the other hand, is extremely pertinent to this research as it offers a theoretical framework for comprehending why higher interest rates in Nigeria may not necessarily result in more foreign portfolio investment, especially when

exchange rate volatility continues. It bolsters the claim that investor expectations, currency rate stability, and macroeconomic credibility are important factors influencing the patterns of capital movement across various industries in developing nations like Nigeria.

Empirical Literature

Bamidele and Amu (2023) explored the role of exchange rate management on portfolio investment sustainability in Nigeria. Using the Threshold Autoregressive (TAR) model on quarterly data from 2010 to 2022, the study identified threshold effects—where beyond a certain level of volatility, foreign portfolio investors sharply reduce or halt investment, particularly in the real estate and infrastructure sectors. Additionally, Adeyemi and Adebayo (2023) recently investigated the volatility-investment nexus in Nigeria using high-frequency data from the Nigerian Stock Exchange. The study employed a Markov-switching model to capture regime changes in exchange rate behavior and their impact on portfolio flows. The findings showed that exchange rate volatility in a high-risk regime led to massive foreign capital outflows from the industrial and services sectors. Also, Emefiele and Nnadi (2022) in a Central Bank of Nigeria working paper, used daily data from 2015 to 2021 to assess how policy-induced exchange rate volatility impacts investor behavior in Nigeria's capital market. Using GARCH-M and VAR models, the study found that unexpected exchange rate shocks were followed by sharp outflows in equity markets, particularly in the financial and fast-moving consumer goods (FMCG) sectors.

Yakubu and Buba (2022) used monthly time series data from 2010 to 2021 to investigate the impact of exchange rate policy on foreign portfolio investment. Using the Threshold VAR (TVAR) model, the study discovered nonlinear associations, with FPI sharply declining anytime

naira volatility surpassed specific levels. The communications and services industries were especially at risk. Furthermore, Okonkwo and Ijirshar (2021) used vector error correction modelling (VECM) to examine how currency rate variations affected foreign portfolio inflows in Nigeria between 1995 and 2019. The analysis discovered a long-term negative correlation between FPI and exchange rate volatility, with higher capital withdrawals in the industrial and consumer goods industries. The findings highlighted how crucial exchange rate stability is to sectoral investment planning. Similarly, Hniya, Boubker, Mrad, and Nafti (2021) ascertain the effect of the Real Effective Exchange Rate (REER) and its volatility on FDI inflows into Tunisia between 1980 and 2018. The study found that an increase in exchange rate volatility tends to reduce FDI inflows over a long-term horizon by using the Autoregressive Distributed Lag (ARDL) model. Additionally, the study has demonstrated that FDI will decline in response to a rise in REER, which is similar to a real appreciation (quotation at certain). While volatility continues to have a detrimental long-term impact, there is a favourable short-term link between REER and FDI.

Ebi and Afaha (2021) examined capital market flows and exchange rate risk in Nigeria from 2000 to 2020. The authors discovered that periods of persistent naira depreciation and unpredictability correlated with lower portfolio investment in consumer goods and banking equities, indicating investor aversion to currency risk, using Vector Autoregression (VAR) and impulse response functions. Thus, using monthly time-series data from 2007 to 2018, Olanipekun and Akinbobola (2020) investigated the effect of currency rate volatility on capital inflows in Nigeria. The

study discovered that exchange rate volatility has a substantial detrimental impact on foreign portfolio investment, especially in the financial services industry, using the GARCH model to capture volatility and ARDL for short- and long-run analysis. The study came to the conclusion that substantial exchange rate uncertainty has a negative effect on investors. Isedu and Ojeaga (2020) used the Autoregressive Distributed Lag (ARDL) model to investigate how Nigerian foreign portfolio investments responded to changes in currency rates. Their results demonstrated that long-term volatility had a statistically significant negative impact on FPI inflows, particularly in the financial and industrial sectors, although short-term effects of exchange rate fluctuations were negligible. Additionally, Olayiwola and Akinlo (2019) used quarterly data from 1990 to 2016 to examine the effect of currency rate volatility on portfolio investment flows in Nigeria. The authors discovered that high-frequency exchange rate fluctuations strongly deterred foreign portfolio investment, especially in equity markets and industries with high import intensity, using the Generalised Autoregressive Conditional Heteroskedasticity (GARCH) model to measure volatility.

Still, Iheduru and Nwokoye (2019) conducted a sectoral analysis of exchange rate volatility and investment flows into Nigerian listed firms. Using firm-level panel data and fixed-effects regression, they found that sectors like healthcare and technology experienced limited exposure to exchange rate volatility compared to capital-intensive sectors like manufacturing and construction, which suffered declining foreign investor interest.

Uchenna and Odozi (2018) used quarterly data from 2000 to 2017 to assess how macroeconomic uncertainty, particularly exchange rate volatility, affected foreign investment in different sectors of the Nigerian economy. Using a dynamic panel regression

approach, they observed that exchange rate instability discouraged FPI into trade, agriculture, and industry, while oil and gas remained resilient due to its foreign exchange-earning nature. Consequently, Chukwu and Agu (2018) focused on monetary policy, exchange rate dynamics, and portfolio capital inflows in Nigeria. Using Structural Vector Autoregression (SVAR), they found that expansionary monetary policy amplified exchange rate volatility, leading to adverse effects on foreign portfolio inflows into sectors dependent on stable macroeconomic expectations, such as real estate and infrastructure. Likewise, Adebisi, and Adenuga (2017) assessed the interaction between exchange rate risk and FPI into Nigeria's capital market using monthly data from 2005 to 2015. Their study adopted the EGARCH model and found asymmetry in how investors responded to exchange rate shocks. Sectors with high exposure to import components showed more volatility in FPI inflows. Thus, Mohammed and Ahmed (2017) explored how macroeconomic instability, including exchange rate fluctuations, affects foreign portfolio investment in Nigeria. Using quarterly data and a cointegration framework, they found that unpredictable currency movements eroded investor confidence in government bonds and stock market securities, particularly in non-oil sectors.

Okafor et al. (2016) assessed the relationship between capital market performance and exchange rate volatility in Nigeria. Applying a GARCH-based volatility measure, the authors discovered that unstable exchange rates reduced foreign investor participation in equity markets, especially in sectors reliant on imported inputs such as construction and manufacturing. Moreover, Okonkwo (2016)

explored the determinants of foreign portfolio investment in Nigeria from 1986 to 2014, focusing on macroeconomic volatility indicators. Using the Autoregressive Distributed Lag (ARDL) model, the study concluded that exchange rate volatility, along with inflation, negatively impacted investor confidence in the equity and bond markets, especially within the non-oil sectors. Besides, Ogundipe and Olowookere (2014) studied exchange rate behavior and investment flows in Nigeria using quarterly data from 1995 to 2013. Using the ARCH-M model, they observed that uncertainty in the exchange rate significantly affected short-term investment instruments, particularly in capital-intensive sectors with long payback periods, such as energy and utilities.

Aliyu (2011) conducted an early study on the determinants of capital flows into Nigeria and other West African countries. The study used a fixed-effects panel regression model and showed that exchange rate volatility consistently discouraged portfolio inflows. Sectoral breakdown revealed stronger negative effects in trade-related and financial sectors due to their foreign exchange exposure. Furthermore, Osinubi and Amaghionyeodiwe (2009) examined the influence of exchange rate and interest rate on foreign portfolio investment in Nigeria. Using time-series regression analysis on data from 1970 to 2005, they found that exchange rate volatility significantly discouraged portfolio flows, with the real sector (agriculture and manufacturing) being the most affected. Finally, Adelegan (2008) analyzed foreign portfolio flows into sub-Saharan African stock markets, with Nigeria as a case study. Using a fixed-effects panel data model, the study found that exchange rate depreciation and its unpredictability were major deterrents to foreign investment, especially in the Nigerian banking and telecommunications sectors.

Gaps and Value Addition

The empirical literature reviewed reveals a robust and consistent relationship between exchange rate volatility and foreign portfolio investment (FPI) in Nigeria. Across various methodologies—including GARCH models, ARDL, VAR, SVAR, and panel regressions—the studies largely agree that exchange rate instability, unpredictability, and depreciation discourage foreign investors, especially in capital-intensive and import-dependent sectors such as manufacturing, consumer goods, financial services, infrastructure, and real estate. While some studies, such as Isedu and Ojeaga (2020), found insignificant short-run effects, the long-run impacts are generally significant and negative, highlighting investor sensitivity to prolonged currency uncertainty. However, despite the breadth of research, several critical gaps remain. Take for instance, most of the reviewed studies focus narrowly on exchange rate volatility, often measured as standard deviation or variance of nominal exchange rates, without explicitly distinguishing between real exchange rate (RER) and nominal exchange rate (NER). This is a limitation, as the RER—adjusted for inflation differentials—better captures the competitiveness of Nigeria's external sector and its influence on investment decisions. Additionally, exchange rate misalignment—the deviation of the actual RER from its equilibrium value—is notably absent from most analyses. Misalignment, whether overvaluation or undervaluation, could have differential sectoral effects on FPI, which remains underexplored.

Furthermore, while a few studies like Adeyemi and Adebayo (2023) apply regime-switching models, there is inadequate empirical attention to the role of exchange rate regimes—whether fixed, managed float,

or floating—in moderating the FPI response to exchange rate movements. This omission is critical, especially given Nigeria's multiple exchange rate windows and periodic regime shifts, which introduce additional uncertainty for investors. Moreover, no study holistically integrates real exchange rate, nominal exchange rate, exchange rate regime, and exchange rate misalignment within a unified empirical framework, limiting our understanding of their combined and interactive effects on FPI. Thus, this study will address these gaps by developing a comprehensive model that jointly examines the influence of RER, NER, exchange rate regimes, and misalignment on sector-specific foreign portfolio investment in Nigeria.

Methodology

The Central Bank of Nigeria (CBN), the Statistical Bulletin, and the World Bank's World Development Indicators (WDI), 2024 are the primary sources of secondary data used in this study. Exchange rate volatility was represented by Real Exchange Rate (RER), Nominal Exchange Rate (NER), Exchange Rate (ERR), and Exchange Rate Misalignment (ERM), while foreign portfolio investment in Nigeria between 1990 and 2024 was represented by net-flows of foreign portfolio investment (NIFPI). To verify the stationarity status and assess the variables, the study used the Augmented Dickey Fuller Unit root and Auto-regressive Distributive Lag.

Model Specification

This study's model is based on an adaptation of Hniya et al. (2021), who looked at how real exchange rate volatility affected foreign direct investment inflows into Tunisia. Their model was;

$$FDI = f (REER, VOL, POPGRO, INF, FD, GDPGRO, OPEN) \quad (1)$$

Where: FDI = Foreign Direct Investment, VOL = Real Exchange Rate Volatility, REER = Real Effective Exchange Rate, POPGRO = Population

Growth, INF = Inflation, FD = Financial Development, GDPGRO = Gross Domestic Product Growth Rate

In order to accomplish the goal of this study, the researcher adjusted the model to account for exchange rate regime and misalignment. So, here is how the new, extended model is defined:

$$\text{NIFPI} = f(\text{NER}, \text{RER}, \text{ERR}, \text{ERM}) \quad (2)$$

$$\text{NIFPI} = \beta_0 + \beta_1 \text{NER} + \beta_2 \text{RER} + \beta_3 \text{ERR} + \beta_4 \text{ERM} \quad (3)$$

$$\text{NIFPI}_t = \beta_0 + \beta_1 \text{NER}_t + \beta_2 \text{RER}_t + \beta_3 \text{ERR}_t + \beta_4 \text{ERM}_t + \mu_t \quad (4)$$

Where: NIFPI = Net-inflow of Portfolio Investment, RER = Real Exchange Rate, NER = Nominal Exchange Rate, ERR = Exchange Rate Regime, ERM = Exchange Rate Misalignment μ = Error term, β_0 = Constant β_1 - β_4 = Estimated Parameters, apriori expectation: β_1 , and $\beta_3 > 0$ while β_2 and $\beta_4 < 0$

Description of Variables in the Model

Net-inflow of Foreign Portfolio Investment (NIFPI): This means that there are more international investors in a country's bonds and equities than there are domestic investors going overseas. A metric of foreign portfolio investment that is commonly employed is the net-inflow of foreign portfolio investment, which is expressed in US dollars.

Rate of Nominal Exchange (NER): This is the exchange rate between two currencies that does not take inflation into account. A currency's current market value in foreign exchange is represented by it. An increase in the nominal exchange rate (a depreciation of the local currency) might attract foreign investors who may find domestic assets more appealing due to their lower prices. This, together with low levels of other hazards, can cause a rise in the net inflow of portfolio investment. Consequently, the analysis presupposes a positive link between the nominal exchange rate and the net-inflow of

portfolio investment. The nominal exchange rate, expressed in US dollars, is a stand-in for the actual exchange rate. Thus, $\beta_1 > 0$

Real Exchange Rate (RER): This is the worth of one country's currency relative to another's after inflation has been taken into account. The real cost of local assets and products relative to their overseas counterparts is reflected in it. An increase in the real exchange rate makes local assets more costly for international investors, which might deter them from investing in portfolios abroad and cause net inflows to fall. Therefore, the premise of this research is that the net-inflow of portfolio investment will have a negative correlation with the actual exchange rate. One alternative to the traditional exchange rate is the real exchange rate, which is measured in US dollars, $\beta_2 < 0$

Exchange Rate Regime (ERR): A country's monetary policy can be defined as its fixed, floating, or controlled float system, depending on its position relative to other countries' currencies. The degree of stability or flexibility of exchange rate fluctuations is determined by it. Higher net inflows of portfolio investment can be attracted by a regime that is stable and predictable, such as a fixed or well-managed float, as opposed to a system that is unstable or changes often, which can raise uncertainty and discourage such inflows. This analysis concluded that a favourable association between the exchange rate regime and the net-inflow of portfolio investment would exist. A dummy variable representing the exchange rate regime is utilised as a surrogate for the actual exchange rate. Thus, $\beta_4 < 0$

Result and Discussion

Unit Root Test

The Augmented Dickey Fuller (ADF) unit root test is used to establish the stationarity of the time series data used in the study. The results are shown in table 1 below;

Table 1: Augmented Dickey Fuller (ADF) Unit Root Test

Variables	Levels		First Difference		Order of Integration	P-value
	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value		
LNIPFI	-0.931230	-2.957110	-8.075316	-2.957110	I(1)	0.0000
LNER	-2.467118	-2.951125	-4.581569	-2.954021	I(1)	0.0009
LRER	-0.655878	-2.951125	-4.581569	-2.954021	I(1)	0.0009
ERR	-1.518251	-2.951125	-5.567764	-2.954021	I(1)	0.0001
ERM	-3.572509	-2.951125			I(0)	0.0084

Source: Author Computation 2025* Level of significance at 5%

Table 1 displays the results of the Augmented Dickey-Fuller (ADF) unit root tests that were used in this study to verify the order of integration of the variables. Augmented Dickey-Fuller (ADF) findings revealed alternative orderings of variable integration or a mix of I(0) and I(1) series. While ERM is

stationary at level 1(0), LNER, LRER, and LNIFPI all become stationary after differencing 1(1) according to the ADF finding. Because of this, studying the long-term connection between these variables is best accomplished using the Autoregressive Distributive Lag (ARDL) Bounds test method of co-integration.

Co-integration Test

Table 2: ARDL Bound Test

Test Statistics	Value	K
F-statistics	8.331259	4
Significance	I (0)	1(1)
10%	2.52	3.56
5%	3.05	4.22
1%	4.28	5.84

Source: Authors computation 2025

The F-statistic value of 8.331259 above both the lower and upper bound critical values, indicating the existence of long term correlations among the variables (table 2). Therefore, we accept the alternative hypothesis and reject the null hypothesis that there is no long-run link. Thus, FPI in Nigeria is positively correlated with exchange rate

volatility over the long term.

Short and Long-Run Estimation Results for the Model

The results of the short and long-run dynamics association of model one are presented in table 3 below;

Table 3: ARDL Short and Long-run Result for the Model

Short Run Coefficient				
Variable	Coefficient	Std. Error	t-Statistics	Prob
D((LNER)	0.285565	0.053706	5.317193	0.0001
D(LRER)	0.243604	0.056781	4.290246	0.0007
D((ERR(-1)	0.758416	0.110722	6.849734	0.0000

D(ERM(-1))	-0.627229	0.095797	-6.547462	0.0000
ECM(-1)	-0.904743	0.102601	-8.818073	0.0000
Long Run Coefficient				
Variable	Coefficient	Std. Error	t-Statistics	Prob
LNER	-0.182399	0.171059	-1.066298	0.2961
LRER	-0.478883	0.314999	-1.520270	0.1405
ERR	-0.181852	0.067319	-2.701351	0.0121
ERM	0.549236	0.171670	3.199370	0.0036
C	0.455373	0.220168	2.068782	0.0486
Adj R² = 0.770545, F-statistics = 7.296529 (0.000279), DW = 2.412339				

Source: Authors computation using E-view 13 2025

When the significance level is set at 0.05, the coefficient estimate for the error correcting term, which is denoted by ECM (-1), has a value that is negative. According to the findings, it is anticipated that the model would reach equilibrium in the long run at a rate of 0.90 percent at an annual rate. As a result, a yearly adjustment speed of 0.90 percent has the capacity to correct the error that occurred in the previous year. According to the value of the modified R-Square (R²), the majority of the total variation in the independent variables, LRER, ERR, and ERM, can be attributed to the dependent variable, LNIFPI. This accounts for 77% of the entire variance. When the model is considered in its whole, the significant F-statistic at the 5% level of significance makes it stand out from the general population. Without serial correlation, the model would not be able to work properly, as indicated by the Durbin-Watson statistics, which have a value of 2.412339, which is rather near to 2.

Both the short-term and the long-term outcomes of the model are presented in Table

3. In the short-term, the log value of net-inflows of portfolio investment was positively and significantly impacted by the logarithm coefficient of nominal exchange rate (LNER), the log of real exchange rate (LRER), and exchange rate regime (ERR), whereas the log value of net-inflows of portfolio investment was negatively and significantly impacted by exchange rate misalignment (ERM). It is also demonstrated in Table 3 that there is a positive and statistically significant association between the log value of net-inflows of portfolio investment (LNIFPI) and the exchange rate regime (ERR), and that the log coefficient of exchange rate misalignment (ERM) has a positive impact on LNIFPI. Both of these findings are supported by the data presented in the table. The nominal exchange rate (LNER) and the real exchange rate (LRER) have a positive correlation with the long-term log value of net-inflows of portfolio investments; nevertheless, these log values are negative and have a very weak connection with one another.

Diagnostic Test

Table 4: Ramsey Reset Test, Serial Correlation LM Test and Homoscedasticity Test Results

	F-Statistic	Prob-Value
Ramsey Reset Test	9.322120	0.1157
Breusch-Godfrey Serial Correlation LM Test	0.788194	0.5034
Breusch-Pagan-Godfrey Heteroskedasticity Test	0.716374	0.7483

Source: Authors computation 2025

It is clear from looking at Table 4 that the results of the diagnostic test indicate that the Ramsey Reset test was utilised in order to investigate the linearity of the data. For example, the f-statistic was 9.322120, and the estimated p-value was 0.1157. Both of these values are higher than the crucial threshold of 0.05, which indicates that the results are acceptable. The findings of the investigation led the researchers to conclude that the model was correctly stated, hence rejecting the null hypothesis. The Breusch-Godfrey Serial Correlation LM Test was used to conduct the Serial or Autocorrelation Test, which resulted in the production of a chi-square probability value of 0.5034 and an f-statistic of 0.788194. Due to the fact that the probability value of

about fifty percent (0.5034) is more than the threshold value of five percent (0.05), the analysis reveals that there is no serial connection in the model. Based on the results of the heteroscedasticity test that was carried out with the Breusch-Pagan-Godfrey test, the f-statistic was found to be 0.716374, and the Chi-Square probability value was found to be 0.7483. In light of the fact that the value of the probability Chi-square is greater than 5% ($P > 0.05$), the result suggests that the model does not display heteroskedasticity. This indicates that the residuals are homoscedastic, which is a desirable property in regression, and that their variance is constant. Other desirable qualities include.

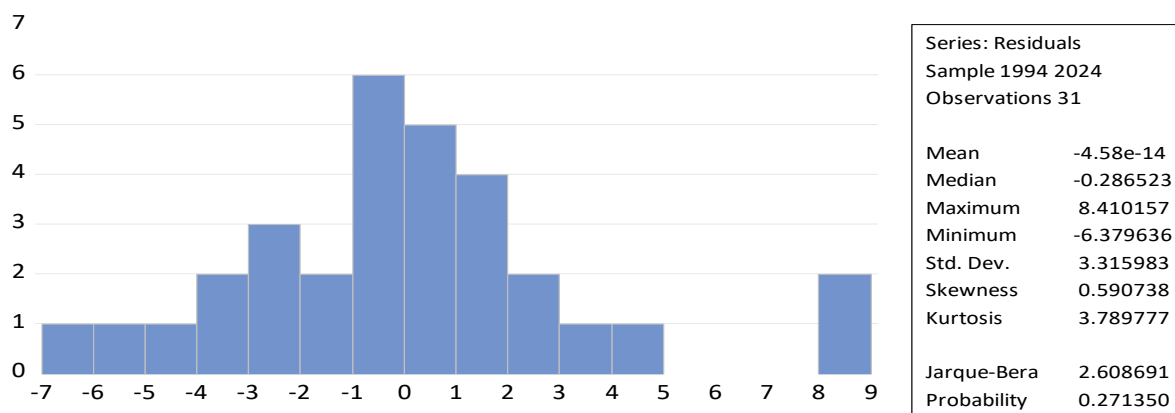


Figure 1: Normality Test

According to Figure 1, which displays the results of the normalcy test, the residuals follow a normal distribution; the Jarque-Bara

value is 1.608691 and the associated probability value is 0.271350, both of which are greater than the 0.05 level of significance.

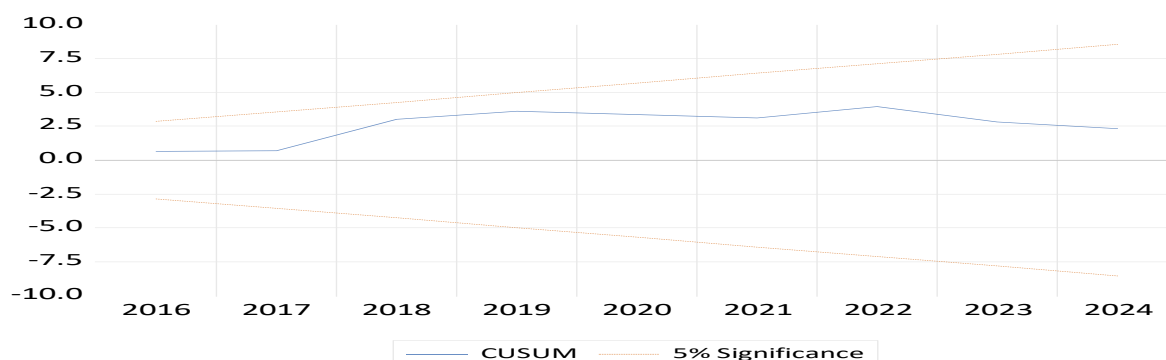


Figure 2: Stability Test

The stability test results, summarised in Figure 2, confirmed that the model is stable. At the 0.05 level of significance, it is clear that the blue line is between the two red dots (-5 and +5).

Discussion of Findings

Nominal Exchange Rate and Net-Inflow of Portfolio Investment in Nigeria

The inquiry that was conducted with the help of the Auto-Regressive Distributive Lag (ARDL) Model resulted in the discovery that, throughout the most recent year period of the short-run, the nominal exchange rate (NER) has a positive relationship with the net-inflow of portfolio investment (NIFPI). provided other risks remain low, the positive and substantial nominal exchange rate with net-inflow of portfolio investment (NIFPI) suggests that foreign investors may find domestic assets more inexpensive and enticing when the nominal exchange rate increases (that is, when the domestic currency depreciates). This is the case provided other risks remain low. Because of this, there is a possibility that the net inflow of portfolio investment may grow. In spite of this, the p-value of the research indicates that there is a link that is statistically significant between the nominal exchange rate (NER) and the net-inflow of portfolio investment (NIFPI). The findings of the study provide evidence that contradicts the null hypothesis, which states that there is no association between the NER and NIFPI that is statistically significant. Okokwo and Ijirshar (2021) conducted prior study, and the findings of this analysis are in direct opposition to their findings.

The Real Exchange Rate of Nigeria and the Net Investment Inflows from Portfolio Positions

As a result of the research that was conducted using the Auto-Regressive Distributive Lag (ARDL) Model, it was discovered that the real exchange rate (RER)

and the net-inflow of portfolio investment (NIFPI) had a positive correlation in the current year period of the short-run. Increasing real exchange rates, as stated by the positive and substantial real exchange rate with net-inflow of portfolio investment (NIFPI), cause domestic assets to become relatively more costly for foreign investors. This may discourage foreign portfolio investment, which in turn may lead to a decrease in net inflows. The p-value of the study, on the other hand, indicates that there is a correlation that is statistically significant between the nominal exchange rate (NER) and the net-inflow of portfolio investment (NIFPI). The findings of the study provide evidence that contradicts the null hypothesis, which states that there is no association between the RER and NIFPI that is statistically significant. However, the findings of this study contradict the findings of Hniya et al. (2021), who asserted that an increase in the real exchange rate would lead to a decrease in foreign direct investment (FDI), exchange rate regime, and net-inflow of portfolio investment in Nigeria. The findings of this study are in agreement with the findings of prior research conducted by Adeyemi and Adebayo (2023).

According to the conclusions that were drawn from the research that was conducted using the Auto-Regressive Distributive Lag (ARDL) Model, the exchange rate regime (ERR) has a long-term connection with the net-inflow of portfolio investment (NIFPI). However, according to the negative but significant relationship between exchange rate regime and net-inflow of portfolio investment (NIFPI), a regime that is stable and predictable, such as a fixed or well-managed float, can boost investor confidence and attract higher net inflows of portfolio investment. On the other hand, regimes that are unstable or frequently changing may increase uncertainty and discourage such inflows. The p-value of the

study, on the other hand, indicates that there is a link that is statistically significant between the exchange rate regime (ERR) and the net-inflow of portfolio investment (NIFPI). The findings of the study provide evidence that contradicts the null hypothesis, which states that there is no association between the ERR and NIFPI that is statistically significant.

Exchange Rate Mismatch and Nigeria's Net Portfolio Investment Inflow

In accordance with a hypothesis that was produced from the investigation that made use of the Auto-Regressive Distributive Lag (ARDL) Model, exchange rate misalignment (ERM) is found to have a long-term connection with net-inflow of portfolio investment (NIFPI). Exchange rate misalignment and net-inflow of portfolio investment (NIFPI) exhibit a correlation that is not only positive but also significant. This indicates that a rise in the misalignment of exchange rates will have the effect of causing uncertainty and discouraging foreign portfolio investors, which would ultimately lead to a reduction in net assets received. In spite of this, the p-value of the analysis indicates that there is a link that is statistically significant between exchange rate misalignment (ERM) and net-inflow of portfolio investment (NIFPI). As a result, the findings of the study provide evidence that contradicts the null hypothesis, which states that there is no association between the ERM and NIFPI that is consistent with statistical significance.

Conclusion

The study on the relationship between exchange rate volatility and foreign portfolio investment finds that while the relationship between exchange rate regime showed a negative but significant relationship with net-inflow of portfolio investment in the long run, the nominal exchange rate and real exchange rate were positively related to net-inflow of

portfolio investment in the current year period of the short-run. On the other hand, over time, exchange rate misalignment was positively and significantly correlated with net portfolio investment inflow. The study comes to the conclusion that exchange rate dynamics have a substantial impact on portfolio investment. While exchange rate regime discourages long-term investment and exchange rate misalignment promotes speculative inflows, nominal and real exchange rates have a favourable short-term impact on inflows.

Recommendations

- i. The Central Bank of Nigeria (CBN): Maintain predictable and market-reflective nominal exchange rate policies to encourage short-term foreign portfolio investment inflows, while minimizing excessive volatility.
- ii. The National Bureau of Statistics (NBS) and CBN: Strengthen inflation monitoring and control mechanisms to preserve the real exchange rate, ensuring that short-run gains in portfolio investment are not eroded by inflationary pressures.
- iii. The Federal Ministry of Finance and the Central Bank of Nigeria: Transition toward a unified and transparent exchange rate regime to reduce policy uncertainty and enhance long-term investor confidence in Nigeria's financial markets.
- iv. Finally, the Debt Management Office (DMO) and Nigerian Investment Promotion Commission (NIPC): Carefully monitor the effects of exchange rate misalignment and discourage speculative inflows by promoting a stable macroeconomic environment that attracts productive and long-term investments.

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