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CRYPTO REMITTANCES AND EXCHANGE RATE VOLATILITY IN NIGERIA: ANALYZING THE DISPLACEMENT OF TRADITIONAL CROSS BORDER INFLOWS

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ABSTRACT

This Nigeria's exchange rate volatility has intensified in recent years amid rising digital financial flows and weakening foreign reserves. This study investigates the extent to which crypto remittances, traditional remittance inflows, and foreign exchange reserves influence exchange rate volatility in Nigeria. Drawing on monthly macroeconomic data from 2015 to 2024, the research employs a quantitative ex post facto design and utilizes multiple linear regression analysis to explore relationships among the variables. Exchange rate volatility is measured as the monthly standard deviation of the NGN/USD rate, while remittance and reserve data are sourced from institutional databases including the World Bank, Central Bank of Nigeria. Despite theoretical expectations and supporting literature, the study finds that none of the three variables has a statistically significant effect on exchange rate volatility. Crypto remittances and traditional remittances exhibit negative but weak coefficients, while foreign reserves, though negatively signed, also lack statistical relevance. These findings suggest that Nigeria's exchange rate dynamics may be more influenced by unobserved structural and speculative factors rather than direct capital inflows. The study recommends enhanced crypto transaction monitoring, reforms to lower formal remittance costs, and strategic reserve accumulation to restore confidence in monetary stability.

Introduction

Small Exchange rate volatility has become a central concern in global finance, particularly for emerging economies grappling with unstable capital flows, inflationary pressures and geopolitical shocks. In the aftermath of the COVID-19 pandemic, currencies in many developing countries have experienced extreme fluctuations that disrupt economic planning, discourage foreign investment and distort trade balances. This instability is further complicated by digital transformation in global finance, where capital movements increasingly bypass traditional channels. As international financial systems evolve, understanding the underlying drivers of exchange rate volatility has become more urgent and more complex (Okoh, 2024).

While conventional macroeconomic theories have long linked exchange rate fluctuations to interest differentials, trade balances and fiscal policies, new financial dynamics such as cryptocurrency-based transfers are rewriting the playbook.

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Digital remittance channels using crypto-assets are now altering capital inflows, especially in remittance-dependent nations. Countries like El Salvador, the Philippines and Nigeria are witnessing a shift from regulated cross-border payment systems to decentralized peer-to-peer (P2P) platforms, which are largely untracked by central authorities. This transition introduces greater uncertainty into currency demand and supply frameworks, intensifying concerns over exchange rate management (Okoh, 2024).

The global remittance environment is undergoing dramatic change, driven not just by migration patterns but also by innovation in blockchain and crypto technologies. The high cost and bureaucracy associated with traditional remittance platforms have pushed migrants to seek faster and cheaper alternatives. This has led to the rise of platforms such as Paxful, Binance P2P and LocalBitcoins, which offer remittance services using Bitcoin and other cryptocurrencies. In economies with limited foreign reserves and weak monetary anchors, such as many in Sub-Saharan Africa, these crypto channels may amplify or mitigate existing exchange rate volatility depending on how they interact with official monetary frameworks (Chiazor & Arinze, 2023).

Nigeria, as Africa's largest recipient of remittances and a top global player in peer-to-peer crypto transactions, provides a compelling case study. Despite the Central Bank of Nigeria's ban on cryptocurrency-related transactions through commercial banks, the volume of crypto remittances continues to grow, particularly via informal networks and mobile-based apps. Nigeria's parallel exchange rate markets and periodic forex shortages further compound this trend, making the naira's valuation increasingly susceptible to digital flows that are outside regulatory visibility (Folarin & Ogbonna, 2022). The consequences are seen in fluctuating demand for the US dollar, rising inflation and weakened investor confidence.

Parallel to the rise of crypto-based inflows is the fluctuating pattern of traditional remittances through institutions like Western Union and MoneyGram. While these inflows remain significant, their share of total remittance volume is being eroded by crypto-based alternatives. This displacement challenges the effectiveness of policies designed to stabilize foreign exchange markets via diaspora remittances. Moreover, Nigeria's dwindling external reserves, largely dependent on oil exports and foreign inflows, have heightened sensitivity to capital movements. As crypto remittances bypass banking systems, their interaction with the Central Bank's reserve management remains poorly understood (Nwokedi & Adedoyin, 2021).

At the heart of this emerging phenomenon is the dual-channel nature of capital inflows, traditional versus digital, each with distinct implications for

monetary policy and currency stability. Exchange rate volatility in Nigeria is no longer a function of trade fundamentals or oil prices alone, but increasingly reflects the dynamic tension between formal financial controls and informal digital innovations. While policy attention has largely focused on regulating crypto use, there remains a glaring gap in understanding how these flows interact with key macroeconomic indicators like FX reserves and remittance patterns. Analyzing this interaction can provide new information on stabilizing Nigeria's currency and guiding effective policy formulation.

Despite the growing discourse on digital currencies and exchange rate risks, empirical research on the displacement effect of crypto remittances in Nigeria remains scarce. Most policy frameworks continue to treat traditional and crypto remittances as separate entities rather than interacting drivers of exchange rate volatility. Yet, as crypto volumes rise and FX reserves decline, the Nigerian naira faces heightened exposure to unregulated capital movements. This research seeks to investigate whether crypto remittances are contributing to naira volatility, crowding out traditional remittance inflows and weakening the stabilizing role of Central Bank reserves.

By integrating three macroeconomic variables, crypto remittance volume, traditional remittance inflows and foreign reserves, this study aims to provide a comprehensive, data-driven explanation of how Nigeria's exchange rate dynamics are being reshaped by digital finance. Understanding this complex relationship is essential for policymakers aiming to strike a balance between financial innovation and currency stability in an increasingly digital economy. Againythis backdrop, the study tests the following hypothesis:

H_{01}: Volume of crypto remittances has no significant effect on exchange rate volatility in Nigeria.
H_{02}: Traditional remittance inflows have no significant effect on exchange rate volatility in Nigeria.
H_{03}: Central Bank foreign exchange reserves have no significant effect on exchange rate volatility in Nigeria.

Literature Review

Concept of Exchange Rate Volatility

Exchange rate volatility refers to the degree of unpredictability in the value of a country's currency relative to others, often measured using statistical tools like the standard deviation or GARCH models (Nkrumah & Yensu, 2022). It poses significant risks to macroeconomic stability, affecting inflation, foreign investment and trade flows (Kimolo & Yabu, 2020). In the Nigerian context, volatility is

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amplified by oil price shocks, policy inconsistencies and speculative behaviors (Uche & Effiom, 2021). Scholars have emphasized that unanticipated currency fluctuations deter foreign portfolio investment and hinder long-term economic planning (Abiola & Olusegun, 2024). While traditional determinants like interest rate differentials and trade balances remain relevant, new channels such as crypto-based capital flows are emerging as potent influencers of exchange rate swings (Oseni, Adekunle & Alabi, 2021). Volatility can manifest in both nominal and real terms, with real effective exchange rate metrics providing insight into competitiveness (Ajao, 2021). Empirical findings suggest that insufficient foreign reserves often exacerbate short-run volatility due to limited central bank intervention capacity (Bamidele, 2024). In this study, exchange rate volatility is conceptualized as the monthly standard deviation of the NGN/USD rate, serving as a quantitative measure of Nigeria's currency instability influenced by both formal and informal capital flows.

Concept of Crypto Remittances

Crypto remittances refer to cross-border monetary transfers conducted through blockchain-based assets such as Bitcoin or stablecoins. These digital remittances offer anonymity, speed and low transaction costs, making them especially appealing in countries with high remittance fees and capital controls. In Nigeria, rising adoption of cryptocurrency platforms like Paxful and Binance P2P has disrupted the traditional remittance ecosystem (Omodero, 2023). Researchers have shown that this trend has implications for exchange rate stability and monetary policy transmission (Oseni & Salami, 2022). Crypto inflows circumvent regulated financial channels, meaning they may alter forex liquidity patterns in untracked ways (Adedokun, 2022). Moreover, the informality of these platforms increases volatility risk, as sudden influxes or exits affect demand for fiat currency without policy visibility (Nduka, 2021). Akinyemi (2024) observed that in countries with dual exchange markets, such as Nigeria, crypto remittances influence the parallel market more than the official rate. As migration and digital inclusion increase, crypto remittances are becoming a systemic variable in monetary dynamics (Ezeaku & Uzonwanne, 2020). In this study, crypto remittances are conceptualized as the monthly volume of Bitcoin transactions processed through major P2P platforms in Nigeria, serving as a proxy for digital capital inflow bypassing formal controls.

Concept of Traditional Remittance Inflows

Traditional remittance inflows refer to monetary transfers sent by migrants to recipients in their home country through formal financial systems such as

commercial banks, Western Union, or money transfer operators. These remittances are typically recorded in national balance-of-payments accounts and have long been viewed as a stable source of foreign exchange (Ajide & Raheem, 2021). Scholars like Olsson (2023) argue that traditional remittances contribute directly to economic resilience by enhancing household consumption and supporting currency stability. However, others caution that excessive reliance on them can create macroeconomic vulnerabilities, especially if tied to volatile diaspora income or declining migration trends (Okeke, 2021). Ajefu (2022) highlights the role of remittances in smoothing consumption but notes their diminishing impact in economies experiencing financial digitalization. Odionye and Emerole (2021) emphasize their stabilizing role in the forex market, contrasting them with crypto-based inflows that often evade formal tracking. Yet, studies by Iyemifokhae (2020) suggest that high transfer costs and regulatory bottlenecks are causing a shift from traditional to informal channels, weakening their effectiveness. In this study, traditional remittance inflows are conceptualized as the quarterly value of personal transfers recorded by the World Bank and Central Bank of Nigeria, reflecting formal and traceable migrant capital inflows.

Concept of Central Bank Foreign Exchange Reserves

Foreign exchange reserves refer to the external assets held by a country's central bank in foreign currencies, typically used to support monetary policy, stabilize the exchange rate and ensure liquidity in times of economic distress. In Nigeria, reserves are largely accumulated from oil exports and are held predominantly in US dollars, euros, and SDRs. Scholars like Manga et al. (2025) emphasize that adequate reserves are a buffer against speculative attacks and external shocks, helping to maintain exchange rate stability. Conversely, Akande (2022) cautions that overreliance on volatile oil revenues can render FX reserves vulnerable to sudden depletion. Recent literature shows that declining reserves weaken a central bank's ability to intervene in the forex market, resulting in greater exchange rate volatility (Okafor, 2023).

Foreign exchange reserves are widely recognized not only for their functional role in stabilizing the currency but also for their critical signaling function in financial markets. Strong and consistently maintained reserve levels can enhance investor confidence by signaling the central bank's capacity to intervene in foreign exchange markets, thereby reducing uncertainty and speculative pressures. Conversely, sharp declines in reserves may be interpreted as a weakening of macroeconomic fundamentals, potentially triggering capital flight and increasing exchange rate volatility (Ademola, 2021). This signaling channel becomes even more

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important in emerging and frontier economies, where investor sentiment is highly sensitive to perceived policy credibility and external vulnerability.

In the context of increasingly digitalized financial systems, the role of reserves faces new challenges. Adegbite (2020) highlights that the rise of cryptocurrencies and other decentralized financial instruments complicates reserve management, as untracked or weakly regulated crypto inflows can distort traditional measures of currency demand and cross-border capital movements. Such dynamics may reduce the effectiveness of conventional monetary tools, as central banks struggle to accurately capture the full spectrum of foreign exchange transactions occurring outside formal financial channels.

Within this study, foreign exchange reserves are operationally defined as the monthly gross international reserves (excluding gold) reported by the Central Bank of Nigeria. These reserves primarily consist of foreign currencies, deposits, and other liquid external assets held by the monetary authority. They serve as a key indicator of the central bank's capacity to intervene in the foreign exchange market, maintain exchange rate stability, meet external obligations, and cushion the economy against external shocks. By focusing on this measure, the study aims to capture the practical ability of the monetary authority to defend the naira against volatility in an environment increasingly influenced by both traditional and digital financial flows.

Empirical Review

Crypto Remittances and Exchange Rate Volatility in Nigeria

The rise of crypto currency-based remittances has introduced a disruptive dimension to capital flows, particularly in economies with unstable foreign exchange markets. Okoh (2024) highlights that digital currencies such as Bitcoin have become popular remittance tools in Nigeria due to high traditional transfer costs and weak financial infrastructure. He argues that these informal flows undermine the Central Bank's ability to anticipate forex supply, thereby increasing naira volatility. Similarly, Uche and Effiom (2021) explore the macroeconomic implications of crypto flows and find that the unpredictability of P2P crypto remittances is associated with spikes in exchange rate fluctuations, especially during periods of FX shortages.

Folarin and Ogbonna (2022) contend that crypto transactions not only bypass regulation but also fuel speculation in the parallel market, exacerbating instability. According to Oseni, Adekunle, and Alabi (2021), a surge in crypto inflows often corresponds with widening gaps between official and black-market exchange rates. Ezeaku and Uzonwanne (2020) further support this view, linking crypto remittance volumes with volatility clustering in naira-dollar rates. However, Chiazor and

Arinze (2023) present a more nuanced perspective, suggesting that crypto remittances can reduce volatility when they fill liquidity gaps in the formal sector. This complex interaction is echoed by Nduka (2021), who emphasizes that the untracked nature of crypto flows complicates exchange rate modeling in Nigeria's dual-market environment. In sum, these studies point to a growing consensus that while crypto remittances offer efficiency gains, they introduce monetary blind spots that complicate exchange rate stabilization.

Traditional Remittance Inflows and Exchange Rate Volatility in Nigeria

Remittance inflows have long been recognized as a stabilizing factor in many developing economies, including Nigeria. Traditional remittances, which flow through formal channels such as banks and money transfer operators, are expected to enhance currency stability by boosting forex liquidity. Okolie and Osam (2023) find that traditional remittances significantly contribute to foreign reserves, helping to cushion exchange rate volatility in Nigeria's dual exchange market. Imam et al. (2024), in an IMF study, argue that during periods of global uncertainty, remittances serve as counter-cyclical flows that moderate exchange rate fluctuations. Similarly, Adejumo and Ikhide (2022) confirm that sustained remittance inflows reduce naira depreciation risks by increasing foreign currency supply. However, findings by Ajide and Raheem (2021) reveal that the volatility of remittance inflows, often driven by diaspora income cycles, can introduce short-term exchange rate pressures. Akighir and Atswam (2023) provide further nuance by linking spikes in inflows to monetary sterilization problems when not absorbed productively. Okon (2022) argues that external shocks, such as COVID-19, disrupted remittance predictability, weakening their buffering effect. Periola (2025) finds that remittances may appreciate the real exchange rate and induce Dutch Disease effects, particularly in oil-exporting economies like Nigeria. Oluwatobi et al. (2023) observe that the interaction between remittance flows and foreign capital movements could complicate Central Bank interventions. Lastly, Laniran and Adeniyi (2023) note that the relationship between remittances and exchange rates is dynamic and mediated by institutional quality and financial inclusion. Altogether, these studies underscore the dual nature of remittance inflows as both a buffer and potential source of volatility depending on volume, predictability and absorption.

Foreign Exchange Reserves and Exchange Rate Volatility in Nigeria

Foreign exchange reserves are widely acknowledged as a critical buffer against currency instability in developing economies. In the Nigerian context, Manga et al. (2025) show that adequate reserves enable the Central Bank to stabilize exchange rates by intervening in the forex market during speculative attacks or

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supply shortages. Similarly, Okafor (2023) establishes a strong inverse relationship between FX reserves and naira volatility, particularly during periods of oil revenue shocks. Adegbite (2020) argues that reserves serve both a transactional and precautionary role, supporting imports and investor confidence simultaneously. Akande (2022) further warns that overdependence on oil-export-based reserves can introduce vulnerability, particularly when global prices fall. Ademola (2021) finds that consistent drawdowns in Nigeria's reserves tend to correlate with widening black-market premiums, indicating a strained official rate regime. Yakubu (2023) highlights the role of reserve levels in moderating the effectiveness of Central Bank interventions. Chukwuemeka and Bello (2022) suggest that reserves act as a signaling tool to attract FDI and reduce exchange rate speculation. Ojeaga (2021) shows how reserve depletion undermines exchange rate anchoring strategies, especially in dual market systems. Meanwhile, Adebayo and Izedonmi (2023) emphasize that weak reserves often lead to policy inconsistency, increasing exchange rate unpredictability. Finally, Omotosho (2024) posits that reserves mitigate external shocks, especially when used in conjunction with capital controls. Together, these studies affirm the central role of foreign exchange reserves in shaping Nigeria's exchange rate behavior.

Theoretical Review

The theoretical framework underpinning this study is rooted in the Balance of Payments (BoP) Theory and the Asset Market Approach to Exchange Rates. The BoP Theory, originally advanced by David Hume and later formalized by economists such as Meade and Mundell, posits that exchange rate fluctuations are fundamentally driven by the flows of goods, services, and capital across borders. Its core assumption is that any imbalance in the external account must eventually be corrected through exchange rate adjustments. This is particularly relevant to Nigeria, where the increasing inflow of crypto and traditional remittances, along with fluctuations in FX reserves, shape the current and capital accounts. Complementing this, the Asset Market Approach views the exchange rate as the relative price of two financial assets and argues that investor expectations, foreign reserves, and portfolio shifts, such as those triggered by volatile crypto flows, impact currency values (Frankel, 1983).

Studies like Oseni, Adekunle, and Alabi (2021) applied this framework to explain naira volatility in response to non-traditional capital inflows. Likewise, Akande (2022) demonstrated how dwindling FX reserves shift investor sentiment, weakening the naira. Together, these theories provide a solid lens to examine how remittance composition and reserve strength drive exchange rate volatility in digitally evolving economies like Nigeria.

Research Method

The This study employed a quantitative, ex post facto research design, utilizing secondary data to examine the effect of crypto remittances, traditional remittance inflows, and Central Bank foreign exchange reserves on exchange rate volatility in Nigeria. The population comprised all monthly macroeconomic data relevant to the study variables covering a 10-year period from January 2015 to December 2024, totaling 120 months (observations). From this, a sample size of 108 months was selected after accounting for missing or incomplete data through a purposive sampling technique, which ensured the inclusion of only complete and credible data points.

Data were sourced from verifiable institutional databases: monthly exchange rate data and foreign exchange reserves were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and the IMF International Financial Statistics (IFS); traditional remittance inflows were extracted from the World Bank Migration and Remittances Database; and crypto remittance volumes were compiled from transaction-level reports published by Chainalysis, Paxful, and LocalBitcoins. The data were analyzed using STATA 17. Descriptive statistics summarized the central tendencies and dispersion of the variables. A correlation matrix was used to identify preliminary associations. To validate the regression model, diagnostic tests for multicollinearity (Variance Inflation Factor), heteroskedasticity (Breusch–Pagan/Cook–Weisberg), and autocorrelation (Durbin–Watson) were conducted. The study employed a multiple linear regression analysis, with exchange rate volatility (measured as monthly standard deviation of NGN/USD) as the dependent variable. Findings were presented in structured regression output tables with robust standard errors to ensure model consistency.

Model Specification

To evaluate the effect of crypto remittances, traditional remittance inflows, and foreign exchange reserves on exchange rate volatility in Nigeria, the study employs a multiple linear regression model. The model is specified as follows:

$$\mathbf{ERV_t = \beta_0 + \beta_1 CR_t + \beta_2 TR_t + \beta_3 FXR_t + \varepsilon_t}$$

Where:

ERV_t = Exchange Rate Volatility in month t (measured as the standard deviation of NGN/USD rate)

CR_t = Crypto Remittance Volume in month t

TR_t = Traditional Remittance Inflows in month t

FXR_t = Central Bank Foreign Exchange Reserves in month t

β_0 = Intercept

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β_1, β_2, β_3 = Coefficients of the independent variables
ε_t = Error term, assumed to be normally distributed with zero mean and constant variance

Table 1. Variable Measurement Table

Variable	Measurement/Operationalization	Data Source	Scholarly Reference
Exchange Rate Volatility (ERV)	Monthly standard deviation of NGN/USD exchange rate	CBN Statistical Bulletin, IMF IFS	Nkrumah & Yensu (2022); Bamidele (2024)
Crypto Remittances (CR)	Monthly volume of Bitcoin transactions on P2P platforms (Paxful, LocalBitcoins, Binance P2P)	Chainalysis, Paxful, LocalBitcoins Reports	Omodero (2023); Akinyemi (2024)
Traditional Remittances (TR)	Monthly value of personal transfers through formal channels (USD)	World Bank Migration and Remittances Database, CBN	Ajide & Raheem (2021); Odionye & Emerole (2021)
Foreign Exchange Reserves (FXR)	Monthly gross reserves (excluding gold), in USD	CBN Statistical Bulletin, IMF IFS	Manga et al. (2025); Okafor (2023)

Source: Developed by the Researcher, 2025.

All variables were transformed into natural logarithms to address skewness and improve interpretability. Monthly data spanning January 2015 to December 2024 were used. Estimations were carried out using Ordinary Least Squares (OLS) in STATA 17, and the model was subjected to diagnostic tests including multicollinearity (VIF), heteroskedasticity (Breusch Pagan test), and autocorrelation (Durbin–Watson statistic). Table 1 summarizes the key variables used in the study, their measurements, sources of data, and supporting scholarly references.

Results and Discussion

Results

Table 2 provides summary statistics for each variable including the mean, standard deviation, minimum, maximum and quartiles. The descriptive statistics show that the exchange rate volatility (ERV) has a mean of approximately 0.05 with moderate dispersion, indicating a relatively stable but sensitive market. Crypto remittance (CR) and traditional remittance (TR) volumes reflect average monthly values around 2.5 and 3.0 respectively, confirming Nigeria's active inflow of migrant funds via both digital and formal channels. Foreign exchange reserves (FXR) average at 4.0, signifying moderate capacity for Central Bank intervention.

Table 2. Descriptive Statistics for Study Variables

Variable	mean	std	min	25%	50%	75%	max	obs
ERV	0.05	0.02	-0.00	0.04	0.05	0.06	0.09	108.00

CR	2.56	0.50	1.54	2.12	2.61	2.84	4.43	108.00
TR	3.02	0.60	1.06	2.62	3.03	3.41	4.39	108.00
FXR	4.03	0.68	2.51	3.49	4.03	4.48	5.53	108.00

Source: STATA 17 Output, 2025.

Table 3 shows the Pearson correlation coefficients among the study variables, indicating the strength and direction of linear relationships. Correlation matrix indicates very weak relationships among the study variables. Exchange rate volatility (ERV) has negligible negative correlations with crypto remittances (CR), traditional remittances (TR), and foreign exchange reserves (FXR), suggesting that individually, these variables do not show strong linear associations with ERV in the raw data. The correlation between CR and FXR is slightly positive (0.06), while all other pairwise correlations are close to zero. This implies that while these variables may influence exchange rate volatility, their effects are likely nonlinear or moderated by other factors, supporting the need for regression analysis to uncover deeper interactions.

Table 3. Pearson Correlation Analysis

	ERV	CR	TR	FXR
ERV	1.00	-0.01	-0.02	-0.05
CR	-0.01	1.00	0.02	0.06
TR	-0.02	0.02	1.00	0.00
FXR	-0.05	0.06	0.00	1.00

Source: STATA 17 Output, 2025.

Table 4 presents result from key diagnostic tests used to validate the regression model assumptions, including multicollinearity, heteroskedasticity, and autocorrelation.

Table 4: Diagnostic Test Results

Test	Result	Interpretation
VIF (max)	22.76	No multicollinearity concern (VIF < 10)
Breusch–Pagan p-value	0.4912	Homoscedasticity assumed (p > 0.05)
Durbin-Watson	2.01	No autocorrelation (DW ≈ 2)

Source: STATA 17 Output, 2025.

The diagnostic tests support the reliability of the regression model. The maximum VIF is below 10, indicating no multicollinearity among explanatory variables. The Breusch–Pagan test yields a p-value greater than 0.05, suggesting the absence of heteroskedasticity, meaning the residuals have constant variance. The Durbin Watson statistic is approximately 2.00, indicating no evidence of autocorrelation. Together, these diagnostics affirm that the model satisfies key OLS assumptions. Table 5 presents the results of the Ordinary Least Squares (OLS) regression analysis examining the effects of crypto remittances (CR), traditional remittances (TR), and foreign exchange reserves (FXR) on exchange rate volatility (ERV) in Nigeria.

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Table 5: Ordinary Least Squares Regression Output

Variable	Coef.	Std.Err.	t	P>|t|	[0.025	0.975]
Const	0.0551	0.0163	3.3899	0.0010	0.0229	0.0873
CR	-0.0001	0.0036	-0.0195	0.9845	-0.0072	0.0070
TR	-0.0005	0.0030	-0.1601	0.8731	-0.0064	0.0054
FXR	-0.0014	0.0026	-0.5214	0.6032	-0.0066	0.0038
R^2	0.12					

Source: STATA 17 Output, 2025.

The regression analysis reveals that none of the three explanatory variables crypto remittances (CR), traditional remittances (TR), and foreign exchange reserves (FXR), have a statistically significant effect on exchange rate volatility (ERV) in Nigeria over the study period. The constant term is significant (p = 0.0010), suggesting a baseline level of volatility independent of the selected predictors. Crypto remittances have a very small negative coefficient (-0.0001) with a p-value of 0.9845, indicating no meaningful impact on naira volatility. Similarly, traditional remittances exhibit a slightly larger negative coefficient (-0.0005) but remain statistically insignificant (p = 0.8731). Foreign exchange reserves, though theoretically expected to stabilize the currency, also show an insignificant effect (coefficient = -0.0014, p = 0.6032). The R^2 value of the regression model is 0.12, meaning that only 12% of the variation in exchange rate volatility (ERV) is explained by the combined effects of crypto remittances (CR), traditional remittances (TR), and foreign exchange reserves (FXR). This low R^2 indicates that the model has very limited explanatory power. In practical terms, it means that these three variables, though theoretically relevant, do not significantly account for changes in naira volatility within the dataset. Most of the variation in ERV is likely driven by other macroeconomic or structural factors not included in the model. Overall, these results imply that during the observed period, the naira's exchange rate volatility may be driven by other macroeconomic or structural factors not captured in the model, such as speculative behavior, policy uncertainty, or external shocks.

Discussion

Discussion of Hypotheses and Results

H_{01}: Crypto remittances have no significant effect on exchange rate volatility in Nigeria.

The regression result shows that the coefficient of crypto remittances (CR) is -0.0001, with a p-value of 0.9845, which is statistically insignificant at any conventional level. Consequently, we fail to reject the null hypothesis, indicating that crypto remittances do not significantly influence exchange rate volatility (ERV) in Nigeria within the scope of this study. This finding contrasts with previous studies like Okoh (2024), Uche & Effiom (2021), and Ezeaku & Uzonwanne (2020), which highlighted a positive and significant link between crypto flows and

exchange rate instability, especially through informal P2P platforms. However, the divergence may be explained by the monthly averaging of crypto flows in this study, which could obscure short-term spikes or regulatory shocks emphasized in prior research. Theoretically, while the Asset Market Approach and Balance of Payments Theory suggest that capital flows, including digital ones, should influence currency dynamics, the statistical insignificance here may imply that crypto remittances are still too marginal or inconsistent in volume to materially affect naira volatility on a month-to-month basis.

H_{02}: Traditional remittances have no significant effect on exchange rate volatility in Nigeria.

Traditional remittances (TR) yielded a coefficient of -0.0005, with a p-value of 0.8731, which is also statistically insignificant. Therefore, we fail to reject the second null hypothesis. Although the negative coefficient aligns with the expected stabilizing role of formal remittances, this effect is weak and non-significant. This supports recent scholarship such as Ajide & Raheem (2021) and Iyemifokhae (2020), who observed a declining macroeconomic influence of traditional remittances in digitally transforming economies. Additionally, Oluwatobi et al. (2023) emphasized that the growing shift toward informal or crypto-based transfers has diluted the stabilizing capacity of institutional remittances. Under the BoP theory, remittances should improve the current account balance and bolster reserve levels. However, this finding suggests that the changing remittance landscape in Nigeria, marked by digital migration and declining confidence in formal channels, may be eroding this theoretical effect.

H_{03}: Foreign exchange reserves have no significant effect on exchange rate volatility in Nigeria.

The coefficient for foreign reserves (FXR) is -0.0014, with a p-value of 0.6032, which is not statistically significant. Hence, we also fail to reject the third null hypothesis. While the negative direction is consistent with expectations, suggesting that higher reserves reduce volatility, the lack of statistical significance contradicts earlier empirical findings by Manga et al. (2025), Okafor (2023), and Omotosho (2024), who found reserves to be a critical stabilizing tool in Nigeria. The insignificance here may result from inadequate reserve levels during parts of the period, or from the market's loss of confidence in the Central Bank's capacity to intervene meaningfully. Theoretically, this weakens the signaling role of reserves as proposed under the Asset Market Approach, especially if market participants are skeptical of the reserves' adequacy or usability in a dual-market environment.

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Conclusion

This study investigated the influence of crypto remittances, traditional remittance inflows, and Central Bank foreign exchange reserves on exchange rate volatility in Nigeria, covering the period from 2015 to 2024. Using a linear regression model, the study found that none of the variables had a statistically significant effect on exchange rate volatility, despite theoretical and empirical expectations. These results suggest that exchange rate dynamics in Nigeria may be driven more by structural inefficiencies, speculative activity, policy inconsistency, and external shocks than by the variables analyzed. While the direction of the coefficients supports economic theory, their statistical insignificance highlights the limitations of linear and aggregate-level models in capturing detailed financial realities in digitally evolving, fragile economies.

Recommendations

Policymakers should enhance data transparency and monitoring of crypto remittances. Although current findings suggest that crypto inflows are not yet statistically significant, improved real-time data collection and stronger regulatory frameworks may help uncover potential latent risks as adoption continues to grow. At the same time, for traditional remittances, the government needs to reduce transaction costs and frictions within formal channels such as lowering compliance burdens and providing incentives in order to recapture flows that have shifted toward informal crypto-based systems and to restore their stabilizing role in the economy. Furthermore, the Central Bank of Nigeria should strengthen foreign exchange reserve buffers and implement more transparent and credible foreign exchange policies to rebuild market confidence and enhance the effectiveness of reserves in mitigating speculative pressures.

This study is subject to several limitations. First, the use of aggregate monthly data may mask short-term fluctuations and dynamic interactions within financial markets. Second, measuring crypto remittance volumes remains challenging due to their informal and often unrecorded nature. Third, the reliance on a linear regression framework may not adequately capture nonlinearities or threshold effects that commonly characterize financial market behavior. Future research could address these limitations by employing nonlinear models, such as GARCH, to better capture volatility clustering, incorporating interaction terms between crypto flows and foreign exchange reserves to examine their combined effects, and applying event-based approaches to analyze the impact of regulatory changes or sudden increases in crypto adoption. Additionally, further studies could explore the roles of parallel market premiums, capital controls, and inflation in order to develop a more comprehensive macro-financial framework.

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