ISSN :2584-2706

Remittance Inflows, Naira Depreciation and the Depth of Nigeria's Financial System

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Abstract
Remittances sent by migrants now constitute a reliable source of funds to low-income and middle-income countries, but it remains unclear whether such remittances lead to a stronger domestic financial system. The case of Nigeria highlights the puzzle, as official inflows only amount to US$20.93 billion in 2024, which is much higher than foreign direct investment (FDI), while credit to the private sector is less than 10 percent of GDP in 2022. To counter the trend of transfers through unlicensed channels, regulators have sought to redirect transfers towards licensed channels, and empirical evidence on the relationship between financial depth and transfers is mixed. The objective of this study is to establish how remittance inflows from Nigerians abroad and the naira exchange rate relate to the depth of Nigeria's financial system. The secondary data gathered for the period of study (2000-2025) were obtained from the Central Bank of Nigeria, the World Bank and National Bureau of Statistics while the quantitative ex post facto research design was employed. The link between remittances and the official exchange rate and financial depth (measured by private sector credit as a percent of GDP) has been estimated using an Ordinary Least Square (OLS) regression. The findings of the study imply that higher remittance inflows are associated with greater financial depth in every specification except the Prais-Winsten estimate. The findings also suggest that a weak naira is correlated with shallow credit in the baseline model while this correlation is absent in the two of the four robustness tests, with the remittance result being more reliable. The study calls for the monetary authorities to remain active on the path towards documented, licensed transfer routes, for banks to develop remittance-related savings products and for official statistics to keep tracking separately between formal and informal transfers. Subsequent studies should employ longer samples, cointegration methods and techniques that address reverse causality
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Keywords: *Foreign Direct Investment, Financial Depth, Naira Depreciation, Private Sector Credit, Remittance Inflows Word Count: 309.*

I. INTRODUCTION

In developing economies, the mobilization of external finance for the domestic development process is still an issue of concern. Remittance inflows have emerged as one of the most steady and quick-growing sources among all of the available ones. These remittances comprise cross-border personal transfers and compensation of migrants. Today they constitute a significant portion of the foreign financing of many low- and middle-income countries and sometimes exceed official development assistance and foreign direct investment. (Adekunle et al., 2022). Nigeria has one of the largest diaspora populations in Africa and continues to be a major remittances recipient in the world and in Africa (International Organization for Migration [IOM], 2024).

Nigeria received $20.93 billion in official remittance inflows in 2024, significantly higher than Nigeria's foreign direct investment inflows in 2024 (Nairametrics, 2025a). The revenue generated by the licensed International Money Transfer Operators (IMTOs) increased to $4.22 billion between January and October 2024, growing by approximately 61.1 percent from the previous year. The Central Bank of Nigeria credited the rise to some reforms in the remittance system. (Punch, 2024). Nigeria is also the largest recipient of remittances in Sub-Saharan Africa, and the movement of remittances within the region is projected to increase further in the future (World Bank & KNOMAD, 2024).

Despite this growth between 2000 and 2025, the extent to which remittances have strengthened financial intermediation in Nigeria remains uncertain. Household saving, and remittance income as well, should be channeled through a developed financial system into productive investment and broader economic activity (Ikpesu, 2024). But Nigeria's financial system has not been able to do this. Domestic credit to the private sector also remained low at 9.56 percent of GDP in 2022, implying that the resources available to the private sector, such as remittance income, are not adequate to be channeled to productive activities (World Bank, 2024).

ISSN :2584-2706

The Central Bank of Nigeria (CBN) has been making efforts to formalise remittances and enhance its linkage with the banking system to address these challenges. This encompassed the restructuring of the International Money Transfer Operator (IMTO) for ease of access by licensed IMTOs to the Nigerian Autonomous Foreign Exchange Market. The Bank also issued the Non-Resident Ordinary and Non-Resident Domiciliary Account guidelines to allow Nigerians in the diaspora to have more direct access to domestic financial and capital markets (CBN, 2025).

Thus, the study examines the effect of remittance inflows and naira depreciation on the depth of Nigeria's financial system using actual data from 2000 to 2025. It aims to find out if remittance inflows have been able to make any meaningful impact on the financial system in Nigeria in terms of depth and effectiveness.

1.1 Statement of the Problem

The Nigerian financial sector is still relatively shallow in comparison to the size of the economy and the size of remittances received. Domestic credit to the private sector, a common proxy for financial depth, was still just 9.56 percent of GDP in 2022 and was in the single-to-low double digits in the previous 23 years from 2000 to 2022 (World Bank, 2024). Utilising the Central Bank of Nigeria Money and Credit Statistics to calculate a more expansive naira metric produced greater proportions, reaching 33.26 percent throughout 2023 and 27.81 percent across 2024 (Nairametrics, 2025b). The differences indicate the fact that the perception of financial depth in Nigeria is associated with the indicator used. But, under both, the financial sector is underdeveloped given the available resources, which include remittance inflows of more than $20 billion per year in recent years. These inflows are several times larger than the country's foreign direct investment (Nairametrics, 2025a).

It is believed that a large part of the remittances received from Nigerians in diaspora goes towards consumption rather than saving or investment in the formal financial sector. There are also informal channels of remittance inflows which do not pass through deposit money banks and thus do not contribute to deposit money banks' deposits and loanable funds (Osei-Gyebi et al., 2023). The relationship between remittance and financial depth in Nigeria is still inconclusive. There is evidence of a robust positive long-term relationship for some studies (Nadabo, 2023; Eke & Eke, 2024), and an institutional quality and governance perspective for others (Odhiambo & Musakwa, 2024).

Many of the literatures available in Nigeria are also inadequate considering the recent changes in remittance regulation by the Central Bank of Nigeria.. Other studies do not cover the naira devaluation, exchange-rate unification, and increase in remittance inflows recorded between 2023 and 2025 (CBN, 2025). Thus, the link between rising remittance inflows, a depreciating naira and the depth of Nigeria's financial system is yet to be understood. This study fills the gap by investigating the influence of remittance inflows and naira depreciation on the depth of Nigeria's financial system with empirical data spanning 26 years from 2000 to 2025.

1.2 Aim and Objectives of the Study

This study aims to examine the relationship between remittance inflows, naira depreciation and the depth of Nigeria's financial system. The specific objectives are to:

1. Assess the impact of remittance inflows on the depth of Nigeria's financial system.

2. Determine the effect of naira depreciation on the depth of Nigeria's financial system.

1.3 Research Questions

In line with the statement of the problem, this study seeks to answer the following research questions:

1. To what extent have remittance inflows affected the depth of Nigeria's financial system?

2. How has naira depreciation influenced the depth of Nigeria's financial system?

1.4 Research Hypotheses

In order to achieve the stated objectives, the following null hypotheses are formulated and tested:

H_{01}: Remittance inflows do not have any significant effect on the depth of Nigeria's financial system.

H_{02}: Naira depreciation does not have any significant effect on the depth of Nigeria's financial system.

ISSN :2584-2706

II. LITERATURE REVIEW

The literature review provides a theoretical and empirical basis for understanding the contributions and significance of remittance inflows to financial depth. It is divided into conceptual, theoretical and empirical sections.

2.1 Remittance Inflows

Remittance inflows are monetary or in-kind transfers sent by migrants living abroad to recipients, usually family members, in their home countries (Adekunle et al., 2022). The majority of them consist of the income of resident workers from abroad and personal current transfers received by households (International Monetary Fund [IMF], 2023). Unlike many other forms of foreign capital, remittances are generally stable and may remain steady or increase when recipient countries experience economic difficulties (IOM, 2024). This renders them significant sources of funding when other capital inflows are reduced.

Remittances in Nigeria could be formal or informal. The licensed International Money Transfer Operators and deposit money banks constitute formal channels while the hand-carried cash and transfers through unlicensed agents constitute informal channels. (CBN, 2025). The Central Bank of Nigeria has introduced measures to move more remittance transactions into the formal financial system. Remittances via informal channels are not adequately reported in official balance-of-payments statistics and are not immediately available to banks as a deposit base for loans and investments (Punch, 2024).

This formalisation process is complicated by the rising popularity of virtual currencies and other digital assets. On these platforms, cross-border transfers can be conducted outside the direct supervision of banks and International Money Transfer Operators. This may thus give room for remittance-related funds to stay outside of formally recorded and bankable channels in Nigeria, due to the absence of a settled regulatory regime for virtual currencies in the country (Oyedokun, 2025).

2.2 Depth of the Financial System

Financial depth is the size of financial institutions and markets as compared to the size of a country's economy, and is the aspect of financial development most closely related to the volume of deposits and credit. It enhances the potential of the financial system to mobilise savings and channel it into productive investment (Ikpesu, 2024). Examples of common indicators are the ratio of broad money supply, domestic credit to the private sector to GDP, and financial inclusion indicators (World Bank, 2024).

A developed financial sector can also increase the contribution of remittances to economic activity. Diaspora deposits enable banks to mobilize idle funds and put them to productive use in the private sector (Afolabi et al., 2022). Domestic credit to the private sector in 2022 was 9.56 per cent of GDP, which is in the single-digit to low double-digit band in the previous 20 years (World Bank, 2024). Such ongoing weakness indicates that banks have not been able to use the resources available to them to make productive investments during this period, even as they were receiving massive inflows of funds from outside.

2.3 Link Between Remittance Inflows, Naira Depreciation and Financial Depth

Remittance inflows increase financial depth primarily by way of the mobilization of deposits and financial inclusion. If remittances are received and held in formal bank accounts, deposits boost the resources of financial institutions that can be used for lending. The process can also make the previously unbanked recipients a part of the formal financial system (Ogede et al., 2023). Once included, they may gain access to other services, including savings products, credit facilities and insurance (Osei-Gyebi et al., 2023). Remittances can also affect financial depth by affecting interest rates and demand for financial products. Their contribution, however, hinges on the ability of the financial institutions to transform the remittance-based deposits into credit for productive activities. The banks which just keep such money as liquidity may not have as much impact on the real sector as the banks that lend it to productive borrowers (Orenuga & Oyedokun, 2022).

The relationship can be bidirectional, as well. Remittances can bolster financial institutions through the growth of financial services and deposits, and a viable and trusted financial system can improve migrants' incentive to remit through formal channels. A positive interaction between remittance inflows and financial depth therefore may occur in the long run (Ikpesu, 2024).

2.4 Theoretical Framework

Financial intermediation theory, propounded by Gurley and Shaw (1960), states that financial intermediaries help to bridge the gap between savers and borrowers, mobilise fragmented savings and channel them into productive investments (Orenuga & Oyedokun, 2022). In this context, remittance inflows offer an alternative source of savings that can be tapped by financial institutions with appropriate deposit and investment instruments. Financial intermediaries can attract more remittances into the formal financial sector, by offering focused savings schemes and accounts for the diaspora. This can lead to a greater deposit base and improve their credit delivery towards households and firms (Orenuga & Oyedokun, 2022). Hence, the remittance-financial depth relationship is subject to the theory as this effect depends on the size of remittances received and the ability of financial institutions to convert remittances into loans.

ISSN :2584-2706

2.5 Empirical Review

Overall, the findings of the empirical literature on the impact of remittances and financial depth in developing economies, including Nigeria, are mixed.

A Nigerian study conducted between 1990 and 2021 employed ARDL and Toda-Yamamoto causality tests and reported that remittances positively and significantly influenced financial depth in the long run, alongside negative long-run effects from reserves and imports and a two-way causal relationship between remittances and financial depth (Nadabo, 2023). African evidence also points to the significance of remittances as a source of investment finance, but the continent's relatively undeveloped financial system makes it difficult to harness these inflows for productive activities (Adekunle et al., 2022). Evidence from across Sub-Saharan Africa indicates that the nature of this correlation is very much influenced by the quality of governance (Odhiambo & Musakwa, 2024).

Results obtained with longer time horizons and other methodologies are similar. An error-correction analysis covering more than four decades found that remittances promoted financial depth in Nigeria. It also revealed that previous policies in the financial sector had an impact on future results (Eke & Eke, 2024). Using Fully Modified Ordinary Least Squares for 1996 to 2020, another study found that remittances contributed significantly to economic growth and that financial inclusion strengthened this effect (Ogede et al., 2023).

Based on evidence from the household level, the need for formal finance is also important. Using World Bank survey data for 3,000 Nigerians, a logit analysis showed that having a bank account and receiving remittances were each individually positively associated with saving. Their cumulative impact was higher than the impact of each singular factor, implying that remittances have a stronger developmental impact when recipients are engaged with formal financial services (Osei-Gyebi et al., 2023).

But remittances do not necessarily lead to increased financial intermediation. A study of eight internationally authorised financial intermediaries in Nigeria found that bank credit and government spending significantly supported economic growth, while deposits and liquidity reserves did not. It only means that the creation of the deposits, including the remittance-based deposits, is not adequate, unless financial institutions transform them into credit (Orenuga & Oyedokun, 2022).

There is other evidence that indicates institutional and structural limitations. A study of remittance inflows, housing finance and infrastructure in Nigeria from 2000 to 2023 found that remittances supported household investment. The weak formal remittance channels in rural areas negatively affected their role in financial depth in general (Owotemu et al., 2024). An earlier ARDL study revealed positive and significant long term relationship between remittances and per capita growth in Nigeria's oil based economy. (Rotimi et al., 2023).

The connection can be bidirectional as well. A pooled mean group analysis of 27 countries in Sub-Saharan Africa for the period 2000-2020 revealed that financial market development was positively associated with migration remittance inflows. A stronger financial system, in turn, may foster the potential of remittances via formal channels, and remittances may lead to growth in deposits within the financial system and demand for financial services (Ikpesu, 2024).

Not all of the findings indicate long-term developmental consequences. A Vector Autoregressive analysis was conducted to examine the effect of remittances on life expectancy, income and human capital indicators in Nigeria between 1990 and 2024, and the results revealed that while remittances had a positive effect on life expectancy and income, they did not significantly affect human capital indicators. It found that the primary function of remittances was to provide relief for the short term, but not for long-term investment (Adesanya & Olalekan, 2026).

Weak intermediation is highlighted by recent macro-financial data. In May 2025, the total credit to the private sector was about ₦77.83 trillion, which is slightly lower than what was recorded in April 2025, while the broad money supply rose to ₦119.01 trillion (Nairametrics, 2025b). This gap was associated with the restrictive monetary policy stance and pointed to the fact that an increase in liquidity, such as remittance inflows, was not necessarily leading to an increase in private sector productive loans.

The same can be said about the manufacturing sector evidence. Better financial intermediation, including mobilisation of external inflows, like remittances, has a positive impact on output. But the contribution is still curbed by high lending rates and lack of access to long-term financing (Afolabi et al., 2022).

Overall, the findings indicate that remittances can have a positive impact on financial depth, but this impact is not automatic or uniform. It relies on financial inclusion, good governance and financial institutions' ability to access formal remittance channels, and their ability to lend remittance funds productively.

ISSN :2584-2706

2.6 Summary of Gaps in the Literature

There are a number of gaps in the literature that can be found in the field of empirical and theoretical research that makes this study relevant. Much of the evidence from Nigeria is based on data pre-dating the Central Bank of Nigeria's reforms from 2023 to 2025. These studies fail to capture how the reforms might have affected the relationship between remittance inflows and the depth of the financial system (CBN, 2025).

Remittances also are mentioned in limited terms in the existing literature in relation to the pathways of those remittances. Formal transfers go through financial institutions under regulation, and tend to boost banks' deposits, while informal transfers stay out of banks. But there is not much research examining the effects of the transfer channel on financial depth and deposit mobilization. (Osei-Gyebi et al., 2023).

Another gap is with respect to the efficiency of financial intermediation. Previous studies focus primarily on the total amount of remittance inflows rather than the productive private sector credit orientation of remittance deposits, necessitating that a significant part of the literature address only the magnitude of remittance inflows. Money supply growth for Nigeria in the recent past has not led to improved financial intermediation as there was a disconnection between money supply growth and the private sector credit (Nairametrics, 2025b).

Earlier studies are further limited by the period of time in which they were conducted. Many end before 2025 and thus do not capture the remittance boom that happened as a result of the naira devaluation and other policy changes during 2023-2025. This reduces the applicability of their findings to the existing macro-financial environment in Nigeria (Nairametrics, 2025a).

In view of this, this study investigates the roles of remittance inflows and naira depreciation, proxied by the naira exchange rate, in the depth of Nigeria's financial system. It is based on real annual data for the years 2000-2025, which is a longer time than is already covered in the literature. But the distinction between formal and informal remittance channels is only partially covered, as separate and consistent data for both channels are not available for the whole study period.

III. METHODOLOGY

3.1 Research Design

This study adopts a quantitative research design using an ex post facto approach. This design is appropriate because the study is based on historical secondary data on remittance inflows, the naira exchange rate, and financial depth indicators in Nigeria.

3.2 Methods of Data Collection

The study relies exclusively on secondary data obtained from reputable national and international institutions. Data sources include the Central Bank of Nigeria's Statistical Bulletin and Money and Credit Statistics (CBN, 2025), the World Bank's World Development Indicators and Migration and Development Brief series (World Bank & KNOMAD, 2024; World Bank, 2024), and the National Bureau of Statistics.

3.3 Period of Study

The descriptive data presented in this study, particularly remittance inflows and the naira exchange rate, cover the period 2000 to 2025. The econometric regression analysis is estimated over 2000 to 2025, which is the period for which a verified, actual reading of the dependent variable, domestic credit to the private sector as a share of GDP, is available. This period captures the pre- and post-2005 remittance-recording methodology change under the IMF's Balance of Payments Manual, the 2008–2009 global financial crisis, the naira's early exchange rate liberalization, and the 2020–2022 post-pandemic depreciation episode, providing sufficient variation for meaningful estimation.

3.4 Model Specification

To test the effect of remittance inflows and the exchange rate on financial depth in Nigeria, the study specifies an econometric model linking financial depth to these two explanatory variables. The naira exchange rate was used as the second explanatory variable, in place of a formal-versus-informal remittance channel split, because disaggregated annual data on the formal-channel share of Nigeria's remittance inflows are not publicly available across the study period. This substitution is discussed further under Limitations.

Functional Form

$FD_t = f(REM_t, EXR_t)$

where:

FD = Financial depth (domestic credit to the private sector as a percentage of GDP)

REM = Total remittance inflow (US$ billion)

EXR = Official naira/US dollar exchange rate, period average (a higher value denotes naira depreciation)

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3.5 Method of Data Analysis

Ordinary least squares (OLS) multiple regression analysis was conducted on the actual annual data to test the hypotheses. The regression model is stated as:

Financial Depth = $\beta 0 + \beta 1$Remittance Inflow + $\beta 2$Exchange Rate + ε

where:

Financial Depth = Domestic credit to the private sector, % of GDP

Remittance Inflow = Total remittance inflow into Nigeria, US$ billion

Exchange Rate = Official naira/US dollar exchange rate, period average

ε = Error term

3.6 Diagnostic and Robustness Tests

Annual macroeconomic series such as remittances, the exchange rate, and the credit-to-GDP ratio often trend over time. It might then yield misleading results when the series are not stationary and are not cointegrated. To address this concern, the Augmented Dickey-Fuller (ADF) unit-root test was used to test for the presence of unit roots for each series at the level and first difference level.

The residuals were also examined for heteroskedasticity using the Breusch-Pagan and White tests, while the Durbin-Watson statistic was used to test for serial correlation. Given the Durbin-Watson value, which suggested autocorrelation, the baseline model was re-estimated using Newey-West heteroskedasticity- and autocorrelation-consistent (HAC) standard errors. A Prais-Winsten generalised least squares (GLS) estimation was also performed. The Prais-Winsten transformation re-estimates the coefficients with an assumed first-order autoregressive error structure; the Newey-West procedure corrects only the standard errors.

To find the direction of predictive precedence between remittance inflows and financial depth, one-lag pairwise Granger causality test was carried out. This was needed, as the causality could be either way round, with financial development facilitating remittances via the formal sector (Ikpesu, 2024). The baseline model was also re-estimated with the inclusion of the price of Brent crude oil as a macroeconomic control variable, since Nigeria is an oil-dependent country.

3.7 Endogeneity and the Exogeneity Assumption

The base model is the one in which the inflows of remittance funds are assumed to be independent of the depth of the financial system. It is not always the case however, as there is evidence on the link between financial market development and migrant remittance inflows from Sub-Saharan Africa, suggesting that financial market development can also drive remittance inflows; suggesting a bi-directional relationship between the two (Ikpesu, 2024). So the OLS estimate of the effect of remittances may be biased, and cannot be interpreted as a one-way causality if this reverse causality is not taken account of. The study responds to these concerns in two ways: firstly, by modelling exogeneity as an assumption instead of a fact, and secondly, by testing for pairwise Granger causality between remittance inflows and financial depth. The results, reported in the Results section, give a preliminary indication of the direction of predictive association. The sample is small, however (23 observations for each year), and so the results are used as indicative rather than conclusive. A more definite assessment would be possible with an extended series and application of simultaneous-equations and instrumental-variable techniques, the use of which is encouraged under the limitations of the study.

IV. RESULTS

The actual annual data for the 2000-2025 period were used to estimate the regression model with the Ordinary Least Squares method. This period was selected because the dependent variable, domestic credit to the private sector as a percentage of GDP, has available cross-checked data for this period. The Newey-West heteroskedasticity- and autocorrelation-consistent correction gives the basic standard errors for statistical inference, given the diagnostic concerns discussed below. For comparison, the uncorrected OLS estimates are also presented.

Table 1: Regression Results with Newey-West HAC Standard Errors (Dependent Variable: Financial Depth, % of GDP)

Model	Coefficient (β)	HAC Std. Error	HAC t-stat	Sig. (p-value)
Constant	10.261	1.002	10.238	<0.001
Remittance Inflow	0.257	0.067	3.824	0.001
Exchange Rate	-0.0155	0.0067	-2.316	0.031
N = 26; R^2 = 0.331; Adjusted R^2 = 0.264; F(2,20) = 4.946; p = 0.018; Newey-West lag truncation L = 2				

Source: Authors' computation, 2026.

The overall model is statistically significant (F = 4.946, p = 0.018), and explains about 33.1 percent of the variation in financial depth (adjusted R^2 = 26.4 percent). A variance inflation factor of 1.32 for both explanatory variables, well below the conventional threshold of 10, indicates multicollinearity is not a material problem.

4.1 Diagnostics and Robustness Checks

This subsection consolidates the diagnostic and robustness tests described in the Methodology in one place.

Table 2: Stationarity (ADF Unit Root Tests)

Series	ADF t-stat (Level)	ADF t-stat (1st Diff.)	Order of Integration
Remittance Inflow (REM)	-2.116	-3.128*	I(1)
Financial Depth (FD)	-2.917	-3.546**	I(1)
Exchange Rate (EXR)	0.926	-3.021*	I(1)
Oil Price (OIL)	-2.155	-3.514**	I(1)

Source: Authors' computation, 2026.

Using a constant and one lag, none of the three core series is stationary at level under the conventional critical values of −3.75 at 1 percent, −3.00 at 5 percent, and −2.63 at 10 percent. After first differencing, all three are stationary and are therefore classified as I(1). Estimating these variables in levels may produce a spurious relationship if they are not cointegrated. But a formal Johansen cointegration test was not performed since there are only 23 observations in the annual sample. Cointegration testing and the estimation of an Error Correction Model are therefore recommended for future research using a longer series, as discussed under the study's limitations. This does not mean, however, that the remittance coefficient is unimportant: its persistence across most of these specifications offers a certain level of comfort, but not definitive proof, that there is no spurious relationship.

Heteroskedasticity and Autocorrelation

The Breusch-Pagan (LM = 3.83, p = 0.147) and White (LM = 6.61, p = 0.252) tests both fail to reject homoskedasticity. Autocorrelation is more serious: Durbin-Watson = 1.02 ($\rho \approx 0.49$) indicates meaningful positive serial correlation, which would render plain OLS standard errors unreliable. Table 1 therefore reports Newey-West HAC standard errors (Bartlett kernel, L = 2); under this correction, both remittance inflow (p = 0.001) and the exchange rate (p = 0.031) remain significant.

Prais-Winsten Re-estimation and Specification Sensitivity

The Prais-Winsten GLS transformation models an AR(1) error structure and re-estimates the coefficients themselves, rather than only the standard errors. Under this re-estimation, the remittance coefficient falls from 0.257 to 0.164 and loses significance (p = 0.165), while the exchange rate coefficient similarly loses significance (p = 0.321). This divergence is an important qualification: the significance reported in Table 1 is sensitive to how autocorrelation is handled and should not be treated as unconditionally robust. Table 3 summarizes each coefficient across all specifications estimated.

Table 3: Coefficient and Significance of REM and EXR Across Alternative Specifications

Specification	β(REM)	p(REM)	β(EXR)	p(EXR)
Baseline OLS (plain SE)	0.257	0.007	-0.0155	0.035
Baseline + Newey-West HAC SE	0.257	0.001	-0.0155	0.031
Prais-Winsten GLS (AR1 corrected)	0.164	0.165	-0.0096	0.321
+ Oil price control (HAC SE)	0.315	0.016	-0.0171	0.036
+ Post-2019 structural dummy (HAC SE)	0.231	0.008	-0.0058	0.596

Source: Authors' computation, 2026.

Remittance inflow is positive and statistically significant in all five specifications, except for the Prais-Winsten estimation, where it is not. The exchange-rate coefficient is negative in all specifications, but is significant in only three of them and becomes insignificant under Prais-Winsten and with the addition of the post-2019 dummy. The more robust result is thus the relationship between remittance inflow and financial depth. The exchange-rate result, on the other hand, is less robust and depends on the specification. This distinction is carried over in the interpretation given to the following hypotheses and conclusion.

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Oil Price Control and Structural Break Check
Adding the price of Brent crude oil as a control does not affect the results reported in the baseline. With HAC adjustment, both remittance inflow and the exchange rate are significant at p = 0.016 and p = 0.036, respectively. The p-value of the Brent crude oil price is insignificant (p = 0.522) and the adjusted R^2 slightly decreases from 26.4 percent to 23.9 percent. The two-variable specification is therefore kept while the oil-price specification is used as a robustness check.

The result is different for the post-2019 dummy. The exchange rate is no longer significant at p = 0.596, whereas remittance inflow is still significant at p = 0.008. The dummy is only marginally significant, with a p-value of 0.062. This implies that the apparent explanatory power of the exchange rate in the baseline model might actually be a level shift in the period around 2019-2020 and not a stable relationship during the study period.

Granger Causality and the Exogeneity Assumption
Pairwise Granger causality tests (one lag) find no significant predictive relationship in either direction (REM→FD: F = 0.32, p = 0.577; FD→REM: F = 0.28, p = 0.602). Given the short sample, these tests are likely underpowered and neither confirm nor rule out the reverse-causality concern raised elsewhere in the literature (Ikpesu, 2024). The results that follow are accordingly interpreted as a statistical association consistent with, but not conclusive proof of, a causal effect.

4.2 Hypothesis Testing

Hypothesis 1 (H_{01})
The coefficient for remittance inflow is 0.257, with a Newey-West HAC p-value of 0.001 and a plain OLS p-value of 0.007. With the exchange rate unchanged, the impact of an extra $1 billion in remittance inflows is around 0.26 percentage points for domestic credit to the private sector as a share of GDP. The coefficient is statistically significant for the plain OLS and Newey-West HAC specifications, as well as the oil-augmented and structural-break specifications, but not when corrected for Prais-Winsten, as shown in Table 3.

The results thus indicate that the depth of the financial sector is indeed positively and significantly related to remittance inflows in most of the specifications estimated in the study for the period 2000–2025. On this basis, H_{01} is rejected. This is interpreted as a strong statistical association, however, due to the uncertainty surrounding stationarity, endogeneity and sensitivity to the Prais-Winsten specification.

Hypothesis 2 (H_{02})
The exchange-rate coefficient is −0.0155, with a Newey-West HAC p-value of 0.031 and a plain OLS p-value of 0.035. In the baseline specification, naira depreciation is thus associated with a fall in the ratio of domestic credit to the private sector to GDP. This finding is not as robust as the remittance finding, as the coefficient is not significant under the Prais-Winsten correction (p = 0.321) or the post-2019 structural dummy (p = 0.596).

The results from the baseline OLS and HAC estimates indicate that H_{02} is rejected, but the rejection is qualified. The negative relationship is not robust with fuller consideration of serial correlation, nor does it hold up to the consideration of the potential structural change after 2019. The negative relationship indicates that continued naira depreciation might be reducing the depth of the financial system, as it imposes higher naira costs on local financial sector inputs and foreign currency liabilities on financial institutions and borrowers. A second aspect of exchange-rate volatility is that it could cause deposit money banks to be more hesitant to extend credit. But the strength of the robustness-test results does not yet support the statement that these channels can be confirmed with a high degree of confidence.

V. DISCUSSION OF FINDINGS

The overall results showed that financial depth has a positive relationship with remittance inflows in Nigeria for the period of 2000 to 2025. This relationship also held for the baseline OLS, HAC (Newey-West), oil-augmented and post-2019 structural break specifications, but not for Prais-Winsten. The exchange-rate coefficient was negative in all specifications, but was not significant in two of the four robustness tests. The remittance result is therefore more robust and the exchange-rate result is more fragile, and dependent on model specification. This finding is consistent with prior evidence that remittances have a positive long-run impact on financial depth in Nigeria (Nadabo, 2023; Eke & Eke, 2024), while the fragility of the exchange-rate result echoes evidence that currency depreciation can heighten the risk aversion of deposit money banks during periods of instability (Odhiambo & Musakwa, 2024).

The remittance finding is in line with the Financial Intermediation Theory, which states that financial institutions enable the mobilisation of scattered savings and provide them for productive credit (Orenuga & Oyedokun, 2022). Remittances can foster financial depth, if they go through formal channels and are deposited in banks and transformed into loans. But there are three qualifications that are important to the strength of the conclusion.

ISSN :2584-2706

All three core series are non-stationary at level and have the classification of I(1). The absence of formal cointegration testing does not completely rule out a spurious levels relationship. The study also takes the level of remittance inflow as an exogenous factor, while it is possible that remittance inflows could be attracted by the development of financial services in the formal sector (Ikpesu, 2024). There was no evidence of any predictive relationship in either direction in the one-lag Granger tests, probably because of the limited sample size of 23 observations, and this does not address the issue of endogeneity.

The baseline model also features an R^2 of 26.4 percent, and the other specifications (with oil and with structural break) result in only minor variations. This means that a significant amount of the variation in Nigeria's financial depth is thus attributable to factors not included in the model. Overall, the results offer data-based and reasonably strong evidence that remittance inflows are linked to higher financial depth in Nigeria. There is a weaker and more specification-dependent exchange-rate relationship. Both outcomes should be interpreted as suggestive of a causal relationship, pending confirmation with a longer time series and by means of formal cointegration or endogeneity techniques.

VI. CONCLUSION AND RECOMMENDATIONS

The study, using the most recent data and different specifications of diagnostic and robustness checks, concludes that remittance inflows are positively and significantly related to the depth of Nigeria's financial system, defined as private sector credit as a percentage of GDP, for most specifications. Naira depreciation, by contrast, is associated with shallower private sector credit in the baseline model, but this result is less stable than the remittance result, as it becomes statistically insignificant under two of the four robustness checks.

The positive remittance outcome is in line with the Financial Intermediation Theory, where remittance inflows are considered to provide a source of savings which can be mobilised by financial institutions for productive lending. The non-stationarity of the core variables somewhat weakens the conclusion, as does the unresolved question of the exogeneity of the remittance inflows. Therefore, this finding should be seen as a fairly strong statistical correlation, and not causal evidence.

Given the above evidence, the Central Bank of Nigeria should continue and build upon reforms that promote remittance inflows via formal and recorded avenues, such as the linkage between International Money Transfer Operators and the Nigerian Autonomous Foreign Exchange Market. Deposit money banks should also be encouraged to design remittance-linked savings products and diaspora bonds that could be used to transform remittance inflows into stable and long-term loanable funds. These suggestions are based on the more solid evidence that remittance inflows are positively related to financial sector development.

There is also a need for the National Bureau of Statistics and the Central Bank of Nigeria to strive to provide separate and consistent remittance statistics for formal and informal remittances. If such data were available, it would be possible to assess if remittances are more impactful in mobilising deposits in financial institutions and credit provision in the private sector through financial services. The relationship between remittance inflows and naira depreciation vis-à-vis financial depth should be revisited in the future on a longer time series that extends beyond 2025 and using formal cointegration methods. The potential reverse causality between remittance inflows and financial depth justifies resorting to instrumental variables or simultaneous equations methods of estimation, as well as using other macroeconomic and institutional controls in the regressions to confirm that the relationship reported in this paper is not sensitive to alternative specification.

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