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Remittances and Financial Sector Development in Nigeria: An Empirical Dynamic Analysis

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Abstract:

Remittance inflow is expected to improve financial sector development in destination countries, although its effects may vary across different dimensions such as depth, access, and efficiency. Therefore, this study investigates the dynamic impact of remittances on financial sector development in Nigeria, covering the period 1981 to 2021. Employing the Autoregressive Distributed Lag (ARDL) methodology, the findings revealed that, in the short run, remittances negatively influence financial development, with a statistically significant effect only on financial depth. However, in the long run, remittances significantly enhance financial access and marginally improve financial depth, while their negative effect on financial efficiency remains statistically insignificant. Furthermore, GDP growth consistently promotes financial development in both the short and long run. Exchange rate depreciation supports financial development in the short run but exerts a negative influence over time. Inflation is found to have no significant effect on financial development across both time horizons. Based on these results, the study recommends policies aimed at formalising remittance channels, promoting financial literacy, leveraging economic growth for inclusive financial access, ensuring exchange rate stability, and implementing structural reforms to support long-term financial sector development.

Keywords:

Remittances, Financial Depth, Financial Access, Financial Efficiency, ARDL

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Introduction

Remittances have become a vital and stable source of external finance for developing nations, often surpassing foreign direct investment (FDI) and official development assistance (ODA) in both volume and resilience (World Bank, 2023). They play a key role in poverty reduction, economic stability, and household welfare, particularly during global crises, by supporting basic needs and smoothing consumption (Ratha, 2020). The increasing adoption of digital financial services has further enhanced their speed, accessibility, and affordability, particularly for underserved regions (IFAD, 2022). The financial sector, comprising banks, non-bank financial intermediaries, insurance firms, capital markets, and microfinance institutions, remains a cornerstone of economic development by mobilising savings, allocating credit, managing risk, and promoting financial inclusion (Udo, 2022). Financial sector development is measured through indicators such as private sector credit-to-GDP ratio, bank branch and ATM density, deposit mobilisation rates, and financial inclusion metrics (Antwi et al., 2024). However, many developing economies still face persistent structural weaknesses, including high transaction costs, poor credit access, limited outreach, and a large informal sector (Khan et al., 2024). Remittances can significantly strengthen financial sector development when channelled through formal institutions, as they expand banking system liquidity, lower funding costs, and enable greater credit provision, particularly to SMEs (Ikpesu et al., 2022; Kaya, 2024). Remittance-receiving households are more likely to open bank accounts, engage with microfinance, and integrate into formal financial systems, fostering broader inclusion (Osei-Gyebi et al., 2023). Additionally, remittance-driven demand has spurred financial innovation, notably through mobile money platforms and digital wallets, extending services to rural and previously unbanked populations (Demirgüç-Kunt et al., 2018). However, the extent of these benefits depends on enabling conditions such as regulatory quality, financial infrastructure, digital readiness, and institutional capacity

In the Nigerian context, remittances constitute a major economic lifeline, accounting for over 5% of the country's GDP in 2023 and serving as the largest source of foreign exchange after oil exports (Aja et al., 2024). Despite the substantial and growing volume of remittance inflows into Nigeria, their transformative potential for driving financial sector development remains largely untapped. Globally, remittances reached an estimated $647 billion in 2022, with low- and middle-income countries (LMICs) receiving over $550 billion, significantly outpacing foreign direct investment and official development assistance (World Bank, 2023). Nigeria alone received over $20 billion in remittance inflows in 2022, accounting for more than 6% of its GDP (CBN, 2022). Yet, financial sector indicators reveal persistent underdevelopment: only 45% of Nigerian adults have access to formal financial services, and financial inclusion remains significantly lower in rural areas and among women (EFInA, 2020). This disconnect between large-scale remittance inflows and low levels of financial sector development highlights a

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critical structural problem. In response, Nigerian authorities have introduced various initiatives aimed at leveraging remittances to enhance financial sector performance. These include the introduction of the Naira 4 Dollar Scheme, aimed at incentivising diaspora remittances through formal channels, and efforts to improve digital remittance infrastructure via fintech partnerships and mobile money platforms (CBN, 2020; Damilola, 2022). However, these policies have yielded limited results. Challenges such as low trust in formal banking institutions, inconsistent regulatory environments, poor rural connectivity, and financial illiteracy continue to hinder progress (Bello, 2024). Moreover, the informal nature of many remittance transfers persists, undermining the potential for these inflows to contribute meaningfully to financial intermediation or credit expansion (Okolie et al., 2023).

Moreover, theoretically, scholars remain divided on the developmental role of remittances in the financial sector. One school of thought argues that remittances enhance financial development by encouraging savings, increasing bank deposits, and promoting financial inclusion, especially when sent through formal channels (Virak & Bilan, 2022; Adekunle et al., 2022). Conversely, critics argue that remittances may foster dependency, reduce labour market participation, and contribute more to consumption than investment, thereby failing to generate sustainable growth or deepening of financial markets (Ofori et al., 2023). Furthermore, it is argued that in the absence of strong financial institutions and adequate policy frameworks, the positive impact of remittances may be blunted, leading to short-term welfare improvements but limited structural transformation (Khan, 2024). Empirically, while several studies such as Basnet et al. (2021), Adekunle et al. (2022), and Das and McFarlane (2022) have examined the relationship between remittances and financial development at the global or regional level, country-specific evidence, particularly within the Nigerian context, remains inconclusive. Moreover, there is a lack of research that explicitly considers how factors such as digital financial channels, regulatory quality, and financial literacy shape this relationship.

In light of the foregoing analyses, this study seeks to answer the question: What is the impact of remittances on Nigeria's financial sector development, considering financial depth, accessibility, and efficiency?.

Literature Review

Several studies have been carried out on the relationship between remittance and financial development. For instance, Keho (2020) examined the impact of remittances on financial development in selected West African countries over the period from 1980 to 2017. The study employed data on credit to the private sector, broad money supply as a percentage of GDP, real gross domestic product, exchange rate, and inflation rate. Employing the panel ARDL technique, the study found that remittance has a negative short and long-run effect on credit to the private sector but a negative short-run and positive long-run effect on money supply per GDP. The study also revealed that GDP has a positive

short and long-run effect on money supply per GDP while having a negative short but positive long-run effect on credit to the private sector. Lastly, the study showed that inflation and FDI had negative short and long-run effects on the two financial development indices. In Jamaica, using annual data from 1976 to 2016, Deonanan et al. (2020) investigate the relationship between remittances and financial development. They employ Principal Component Analysis to create a composite index capturing multiple dimensions of financial development. Using an ARDL-based error-correction model alongside the Toda-Yamamoto causality test, the study differentiates between the long-run and short-run dynamics linking remittances to financial development. The findings reveal that remittances positively influence financial development in the long run but act as a substitute for financial development in the short run. Using a panel of 124 developing countries, Azizi (2020) analysed the impact of remittance on financial development from 1990 to 2015. The study estimated an instrumental variable-fixed effect model and found that remittances exert a positive impact on various dimensions of financial development; a 10% increase in the remittance-to-GDP ratio is associated with a 1.7% rise in domestic credit to the private sector, a 1.9% increase in bank credit, a 1.2% growth in bank deposits, and a 0.8% expansion in liquid liabilities.

With a panel of 40 developing countries, Miao and Qamruzzaman (2021) investigated the impact of remittances on openness and financial stability covering 1975 to 2018. The study used data on remittance, financial openness, financial stability (M2/GDP), government external debt, physical capital, financial development (credit to private sector), and GDP growth. The study employs the Generalised Method of Moments (GMM) and System-GMM techniques and finds that remittance inflows have a positive and statistically significant impact on economic and financial openness as well as financial stability. Additionally, the study reveals a bidirectional causal relationship between remittances, openness, and financial stability. In the case of the Indian economy, Deheri (2022) examined the substitutes or complements of the relationship between remittance and financial development from 1980 to 2018. Using the ARDL and Vector Error Correction (VEC) models, the study finds that remittances have a negative short-run impact on financial development but exert a positive long-run effect. The impulse response function analysis indicates that financial development responds favourably to a positive shock in remittance inflows. Additionally, the forecast error variance decomposition analysis shows that remittance shocks account for approximately 30% to 32% of the total variation in financial development. In the context of Keyan, Atem (2022) analysed the relationship between remittances and financial development covering 1970 to 2018. The study employed private sector credit as a percent of GDP, remittance, trade openness, remittance, and GDP growth. Employing the ECM technique, the study found that remittance, openness, and GDP growth had significant negative effects on financial development in the long run. Similarly, Kudaisi et al. (2022) investigated the role of remittances and financial liberalisation in economic growth in Nigeria from 1990 to 2018. Using the generalised method

of moments (GMM) technique to address endogeneity, the study finds that both remittances and financial liberalisation individually have significant negative impacts on economic growth. However, the interaction between financial liberalisation and remittances exerts a positive and significant effect, suggesting that these factors act as complements in promoting economic growth. Employing the panel of BRICS countries, Bindu et al. (2022) examined the causal relationship between remittances and financial development from 1990 to 2020. The study examines the impact of remittances on financial development using three key indicators: domestic credit to the private sector, bank deposits, and liquid liabilities, all measured as percentages of GDP. Employing fixed and random effects models and the panel Vector Error Correction Model, and Wald, the study finds a positive impact of remittances on bank deposits in the long run but insignificant in the short run. In Ghana, Prempeh et al. (2023) investigated the relationship between remittance inflows and financial development covering 1980 to 2019. The study employed data on the financial development index, remittance, GDP, foreign direct investment, and trade openness. Employing ARDL, VECM, DOLS, CCR and FMOLS techniques, the study conclusively showed that remittance, trade openness, and GDP had significant positive effects on financial development both in the short and long run, while FDI had negative effects both in the short and long run. In Nigeria, Obayagbona and Osasogie (2024) analysed the relationship between foreign remittances inflows, official development assistance and financial markets development. The study employed data on credit to the private sector, broad money supply as a percentage of GDP, development assistance, financial openness, and exchange rate. Estimating the FMOLS, they found that the exchange rate and remittance had significant positive effects on credit to the private sector and broad money supply as a percentage of GDP in the long run, while official development assistance and financial openness had significant negative effects.

Despite considerable research efforts in this area, several gaps remain evident in the existing literature. First, while several studies (e.g., Keho, 2020; Azizi, 2020; Bindu et al., 2022) have explored the impact of remittances on broad financial development indicators such as credit to the private sector and broad money supply, there is limited country-specific analysis focusing explicitly on financial depth within Nigeria's unique financial system. Some of these studies either consider composite financial development indices or proxy financial depth by limited indicators without isolating the distinct effects of remittances on financial depth measures. Additionally, some findings show mixed effects (negative short run, positive long run) on financial depth indicators in other countries, but it remains unclear how these dynamics play out specifically in Nigeria's context, given its unique economic structure and remittance inflows pattern. Also, the existing literature largely focuses on aggregate measures of financial development or uses composite indices (Deonanan et al., 2020; Prempeh et al., 2023), without separately examining the access dimension of the financial sector, such as how remittances influence the ability of individuals and businesses to access financial services in Nigeria. Moreover, studies such

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as Kudaisi et al. (2022) explore remittances in relation to economic growth but do not directly link remittances to financial access. There is a paucity of empirical evidence that isolates the direct effects of remittances on financial access metrics (e.g., number of bank accounts and credit availability to underserved populations) within the Nigerian financial landscape. Furthermore, the dimension of financial efficiency, which refers to how well financial institutions allocate resources and perform operations, has been less emphasised in remittance-financial development studies. Most prior studies (e.g., Keho, 2020; Azizi, 2020) focus on financial depth and access but do not extend to assessing how remittances affect the efficiency of the financial sector in Nigeria. Given Nigeria's rapidly evolving financial system and the significant role remittances play, there is a need to investigate whether remittances contribute to improving or impairing efficiency metrics (e.g., cost efficiency, intermediation efficiency) of Nigerian financial institutions. This gap limits the understanding of the full impact of remittances on the multifaceted dimensions of financial sector development in Nigeria. Based on the identified gaps above, this study endeavours to employ the three dimensions of financial development, financial depth, financial access, and financial efficiency, to comprehensively examine how remittances impact the financial sector development in Nigeria.

Methods and Data

To examine the dynamic impact of remittances on financial sector development, this study adopts with modification the model of Keho (2020), who analysed the impact of remittances on financial development: Revisiting the evidence for ECOWAS countries. In his study, he employed:

$$\mathrm{FD_t} = \mathrm{f}(\mathrm{REM_t}, \mathrm{GDP_t}, \mathrm{InfR_t}, \mathrm{FDI_t}) \quad (1)$$

Where FD is the financial development index, which comprises credit to the private sector and broad money supply as a percent of GDP, Rem is remittance, GDP is the real GDP, Inf is the inflation, and FDI is the foreign direct investment. However, the modified version employed in this study is:

$$\mathrm{FD_t} = \mathrm{f}(\mathrm{Rem_t}, \mathrm{GDP_t}, \mathrm{Inf_t}, \mathrm{ExR_t}) \quad (2)$$

Where FD is the financial sector development index across the three dimensions of depth, accessibility, and efficiency, and ExR is the exchange rate. The three dimensions of the financial sector development indices replace those indicators employed in the study of Keho (2020) as they represent a broader index of financial sector development disaggregated into three core dimensions. Moreover, FDI is replaced with the exchange rate to capture the macroeconomic environment's stability and its influence on financial sector performance. To parameterise the functional models in Equation 3.3-3.5, it is represented in the ARDL regression model as follows:

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$$\Delta\ln(\mathrm{FID}_t) = \phi_0 + \sum_{i=1}^{p} \phi_{1i}\,\Delta\ln(\mathrm{FID}_{t-i}) + \sum_{i=0}^{q} \phi_{2i}\,\Delta\ln(\mathrm{Rem}_{t-i}) + \sum_{i=0}^{q} \phi_{3i}\,\Delta\ln(\mathrm{GDP}_{t-i}) + \sum_{i=0}^{q} \phi_{4i}\,\Delta\ln(\mathrm{Inf}_{t-i}) + \sum_{i=0}^{q} \phi_{5i}\,\Delta\ln(\mathrm{Exr}_{t-i}) + \eta_1\ln(\mathrm{Rem}_{t-1}) + \eta_2\ln(\mathrm{GDP}_{t-1}) + \eta_3\ln(\mathrm{Inf}_{t-1}) + \eta_4\ln(\mathrm{Exr}_{t-1}) + v_t \quad (3)$$

$$\Delta\ln(\mathrm{FIA}_t) = \phi_0 + \sum_{i=1}^{p} \phi_{1i}\,\Delta\ln(\mathrm{FIA}_{t-i}) + \sum_{i=0}^{q} \phi_{2i}\,\Delta\ln(\mathrm{Rem}_{t-i}) + \sum_{i=0}^{q} \phi_{3i}\,\Delta\ln(\mathrm{GDP}_{t-i}) + \sum_{i=0}^{q} \phi_{4i}\,\Delta\ln(\mathrm{Inf}_{t-i}) + \sum_{i=0}^{q} \phi_{5i}\,\Delta\ln(\mathrm{Exr}_{t-i}) + \eta_1\ln(\mathrm{Rem}_{t-1}) + \eta_2\ln(\mathrm{GDP}_{t-1}) + \eta_3\ln(\mathrm{Inf}_{t-1}) + \eta_4\ln(\mathrm{Exr}_{t-1}) + v_t \quad (4)$$

$$\Delta\ln(\mathrm{FIE}_t) = \phi_0 + \sum_{i=1}^{p} \phi_{1i}\,\Delta\ln(\mathrm{FIE}_{t-i}) + \sum_{i=0}^{q} \phi_{2i}\,\Delta\ln(\mathrm{Rem}_{t-i}) + \sum_{i=0}^{q} \phi_{3i}\,\Delta\ln(\mathrm{GDP}_{t-i}) + \sum_{i=0}^{q} \phi_{4i}\,\Delta\ln(\mathrm{Inf}_{t-i}) + \sum_{i=0}^{q} \phi_{5i}\,\Delta\ln(\mathrm{Exr}_{t-i}) + \eta_1\ln(\mathrm{Rem}_{t-1}) + \eta_2\ln(\mathrm{GDP}_{t-1}) + \eta_3\ln(\mathrm{Inf}_{t-1}) + \eta_4\ln(\mathrm{Exr}_{t-1}) + v_t \quad (5)$$

Where FID is the financial sector depth, FIA is the financial sector access, and FIE is the efficiency, respectively. In Equation 3-5, the terms with the summation signs represent the short-run (ECM) dynamics with their respective short-run coefficients ($\phi_1 - \phi_5$) while the coefficients ($\eta_1 - \eta_4$) are the long-run coefficients. The parameter ϕ_0 is the intercept while v_t is the stochastic error term, Δ is the first difference operator that describes the short-run dynamics and *p* and *q* are the maximum lag length for the dependent and the independent variables. To test the existence of a long-run relationship in the model, both the F-stat and the t-stat type of the bound test can be performed using Equation 3.3-3.5 by testing for the joint significance of the coefficient of the long-run variables.

One of the major challenges in developing countries, of which Nigeria is not exempt, is the availability of data, and this has become one of the limitations of this study. Due to this, the historical data for this study will cover the period of 41 years (1981 – 2021). Data on financial sector developed indices are sourced from the IMF Financial Development Index Database, while data on GDP, exchange rate, and inflation (proxy with CPI) are sourced from the World Bank's Development Index (WDI) Database.

Results

Table 1 presents the statistical properties of financial development indicators, remittances, and key macroeconomic variables in the Nigerian economy over the observed period. Firstly, it is observed that financial institution access (FIA), which measures how easily individuals and businesses can access financial services, has a mean value of 0.08115, with a standard deviation of 0.03326, indicating relatively low but moderately variable access to financial institutions in Nigeria. The maximum FIA value

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of 0.13708 suggests that at some point, access improved considerably, while the minimum of 0.04747 underscores persistent financial exclusion in earlier or weaker periods. Also, financial institution depth (FID), reflecting the extent and usage of financial services, shows a mean of 0.04827 and a standard deviation of 0.01222.

Variable	Mean	Std. Dev.	Maxi	Min
FIA	0.08115	0.03326	0.13708	0.04747
FID	0.04827	0.01222	0.07470	0.03083
FIE	0.51308	0.07797	0.66860	0.38372
Rem	1776.90	2461.08	7820.00	0.00700
GDP	38068.3	20499.9	73400.0	16200.0
ExR	108.087	109.970	401.152	0.61771
CPI	74.4706	92.1449	354.296	0.48935

Table 1: Descriptive statistics

This indicates shallow financial intermediation in Nigeria, with limited changes over time. The relatively low maximum of 0.07470 and minimum of 0.03083 confirm the underdeveloped nature of Nigeria's financial sector in terms of depth. Financial institution efficiency (FIE) is significantly higher, with a mean of 0.51308 and a standard deviation of 0.07797, suggesting that while access and depth are weak, the institutions themselves perform moderately well in allocating resources, managing costs, and serving customers. The maximum efficiency of 0.66860 and the minimum of 0.38372 point to variability in performance over the years, possibly due to reforms or economic shocks. Furthermore, remittances (Rem) have a mean of $1,776.90 billion, but with a very high standard deviation of $2,461.08 billion, indicating substantial fluctuations. The maximum of $7,820 billion likely reflects years of strong diaspora inflows, possibly due to currency arbitrage or economic downturns prompting support for families back home. The minimum value of just $0.007 billion shows that in earlier periods or during economic or political instability, inflows were negligible. GDP also reflects significant variation, with a mean of $38,068.3 billion and a standard deviation of $20,499.9 billion, underscoring growth alongside volatility in economic performance. The maximum GDP of $73,400 billion contrasts with a minimum of $16,200 billion, pointing to both growth phases and downturns in Nigeria's economic cycle. It is also observed that the exchange rate (ExR) has a mean of ₦108.087 per USD, but a very high standard deviation of ₦109.970, with a minimum of ₦0.61771 and a maximum of ₦401.152, reflecting substantial naira depreciation over time. This volatility suggests macroeconomic instability and vulnerability to external shocks such as oil price fluctuations. Lastly, the consumer price index (CPI), a proxy for inflation, has a mean of 74.47, but a high standard deviation of 92.14, with a minimum of 0.48935 and a maximum of 354.296, indicating severe inflationary episodes during some periods. This points to significant challenges in price stability, which affects both household welfare and investment decisions.

Table 2 shows the unit root test results for the variables. As shown in Table 2, the unit root tests (ADF and Phillips-Perron) reveal that all variables are integrated of order one, I(1), except for ln(CPI), which

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shows mixed results (I(1) in ADF but inconclusive in Phillips-Perron at first difference. Unlike traditional cointegration techniques (e.g., Johansen or Engle-Granger), which require all variables to be *I*(1), the ARDL bounds testing approach accommodates variables with mixed orders of integration—*I*(0) or *I*(1)—without necessitating pre-testing for unit roots in every case.

Variable	ADF		Phillips-Perron		Remark
	@level	@diff	@level	@diff	
ln(FIA)	-2.220	-5.172***	-1.947	-5.077***	*I*(1)
ln(FID)	-3.091	-6.527***	-2.731	-15.785***	*I*(1)
ln(FIE)	-2.663	-5.912***	-1.801	-9.722***	*I*(1)
Ln(Rem)	-1.121	-6.665***	-1.121	-6.657***	*I*(1)
ln(GDP)	-1.891	-3.904**	-3.027	-3.904**	*I*(1)
ln(ExR)	-1.388	-5.747***	-1.390	-5.878***	*I*(1)
ln(CPI)	-0.985	-4.002***	-0.885	-2.974	*I*(1)

Table 2: Unit-root test results

Note: *** p < 0.01; ** p < 0.05; * p < 0.1

This makes ARDL particularly suitable for this analysis, as it avoids potential biases from differencing variables unnecessarily. Additionally, the model provides robust short-run and long-run estimates simultaneously, even in small sample sizes, enhancing the reliability of the findings. Given the *I*(1) nature of most variables and possible mixed integration, the ARDL framework ensures accurate estimation of cointegration relationships while mitigating spurious regression risks. Thus, its adaptability and efficiency justify its application in this study.

	Model	ARDL Specification
1	DV: ln(FIA) IV: ln(Rem), ln(GDP), ln(ExR), ln(CPI)	ARDL (1,1,1,1,0)
2	DV: ln(FID) IV: ln(Rem), ln(GDP), ln(ExR), ln(CPI)	ARDL (1,1,0,1,1)
3	DV: ln(FIE) IV: ln(Rem), ln(GDP), ln(ExR), ln(CPI)	ARDL (1,0,0,1,0)

Table 3: Schwarz model selection criteria table

Table 3 presents the optimal lag structure for each Autoregressive Distributed Lag (ARDL) model, as selected by the Schwarz Information Criterion (SIC), to determine the most parsimonious lag specification that balances model fit and complexity. The result shows that lag specifications selected for each model are ARDL (1,1,1,1,0), ARDL (1,1,1,1,0), and ARDL (1,1,1,1,0), respectively.

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	Model	F-stat	Critical value		
1	DV: ln(FIA) IV: ln(Rem), ln(GDP), ln(ExR), ln(CPI)	5.510		*I*(0)	*I*(1)
			10%	2.26	3.35
2	DV: ln(FID) IV: ln(Rem), ln(GDP), ln(ExR), ln(CPI)	5.375	5%	2.62	3.79
			1%	3.41	4.68
3	DV: ln(FIE) IV: ln(Rem), ln(GDP), ln(ExR), ln(CPI)	4.926			

Table 4: ARDL bound test results summary

Table 4 presents the bound test results for each Autoregressive Distributed Lag (ARDL) model, as selected by the Schwarz Information Criterion (SIC) above. The ARDL bounds test confirms a long-run cointegration relationship between three financial development indices and the independent variables in both models. For Model 1 (F-stat = 5.510), the F-statistic exceeds the upper critical value at all significance levels (even 1%, where *I*(1) = 4.68), proving financial access has a stable long-run link with remittance, GDP, exchange rate, and inflation. Model 2 (F-stat = 5.375) also shows a stronger cointegration, as its F-statistic surpasses the 1% *I*(1) threshold (4.68) by a wider margin, indicating remittance, GDP, exchange rate, and inflation are key long-run financial depth drivers. Similarly, Model 3 (F-stat = 4.926) shows a stronger cointegration, as its F-statistic surpasses the 1% *I*(1) threshold (4.68), although with a narrow margin, indicating remittance, GDP, exchange rate, and inflation are key long-run financial efficiency drivers. These results imply that while short-term shocks may cause deviations, financial development indices and these variables eventually return to equilibrium.

Table 5 presents the short and long-run ARDL model estimates for the financial development models: access, depth, and efficiency. First, the result shows that remittance has a negative short-run impact on the financial development indicators but is significant in the depth model only; a percent rise in remittance results in a 0.071% reduction in financial depth. However, remittance has a significant positive impact on financial access and is marginally significant for financial depth. Specifically, a percent increase in remittance results in a 0.129% and 0.071% increase in financial access and depth in the long run. However, remittance has a negative long-run impact on financial efficiency but is insignificant. Moreover, the result shows that an increase in GDP has a positive impact on financial development in the short and long run. In the short run, the result shows that a percent increase in real GDP led to an increase of about 1.021% and 0.221% in financial access and depth, while the impact on financial efficiency (0.142) is insignificant. However, in the long run, the result shows that a percent increase in real GDP led to an increase of about 0.926%, 0.369%, and 0.331% in financial access, depth and efficiency. Furthermore, the result shows that exchange rate depreciation has short-run positive but long-run negative impacts on financial development. Specifically, the result shows that in the short run, exchange rate depreciation leads to a 0.138% and 0.245% increase in financial access and depth, while the impact on financial efficiency (0.044%) is insignificant. In the long run, exchange rate depreciation

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leads to a 0.35% and 0.159% decrease in financial access and depth, while the impact on financial efficiency (0.161%) is insignificant. Lastly, there is no statistical evidence, as shown in the results, that inflation has an impact on financial development, access, depth, and efficiency, both in the short and long run. Regarding the post-diagnostics test results, the LM and White's test statistics both have high probability values, which implies that they are statistically insignificant. It can thus be inferred that the estimated model is free of serial correlation and heteroscedasticity problems.

Independent Variable	Dependent variable:		
Long-run estimates	$\Delta \ln(\text{FIA})$	$\Delta \ln(\text{FID})$	$\Delta \ln(\text{FIE})$
$\ln(\text{Rem})$	0.129**	0.071*	-0.006
	(0.061)	(0.038)	(0.039)
$\ln(\text{GDP})$	0.926***	0.369**	0.331*
	(0.182)	(0.136)	(0.174)
$\ln(\text{ExR})$	-0.350***	-0.159**	-0.161
	(0.127)	(0.073)	(0.101)
$\ln(\text{CPI})$	-0.066	-0.002	0.081
	(0.128)	(0.098)	(0.119)
Short-run estimates			
$\Delta \ln(\text{Rem})$	-0.025	-0.051*	-0.003
	(0.025)	(0.026)	(0.017)
$\Delta \ln(\text{GDP})$	1.021**	0.221**	0.142
	(0.404)	(0.093)	(0.090)
$\Delta \ln(\text{ExR})$	0.138**	0.245***	0.044
	(0.065)	(0.070)	(0.056)
$\Delta \ln(\text{CPI})$	-0.028	0.269	0.035
	(0.052)	(0.164)	(0.048)
Constant	-33.119***	-15.784***	-10.536*
	(5.282)	(4.079)	(5.211)
Adjustment term			
Ect_{t-1}	-0.420***	-0.600***	-0.430***
	(0.102)	(0.125)	(0.132)
R2	0.446	0.456	0.180
LM Test	0.231	3.641	2.697
White	12.67	6.645	7.083

Table 5: Estimates for the impact of remittance on financial development indices

Note: *** p < 0.01; ** p < 0.05; * p < 0.1

Discussion

The ARDL results reveal that remittances have a negative short-run effect on financial development, with a significant 0.071% decline in financial depth for every 1% increase in inflows. This aligns with the remittance paradox theory, which attributes such outcomes to the prevalence of informal transfer

channels and the substitution of remittances for formal credit in contexts with weak financial infrastructure (Ofori et al., 2022; Keho, 2020; Deonanan et al., 2020). In the long run, however, remittances exert a positive influence, raising financial access by 0.129% and depth by 0.071%. This supports the financial development–enhancing hypothesis, as consistent inflows draw recipients into formal banking and digital platforms over time (Deheri, 2022; Azizi, 2020; Bindu et al., 2022). The effect on financial efficiency remains negative and insignificant, likely reflecting persistent institutional inefficiencies in Nigeria (Kudaisi et al., 2022). The findings also indicate that GDP growth significantly improves access and depth in the short run and all three dimensions in the long run, consistent with the demand-following hypothesis (Patrick, 1966) and Schumpeterian growth theory (Henrekson et al., 2024). Exchange rate depreciation boosts access and depth in the short term through increased foreign inflows but has adverse long-run effects, consistent with the monetary instability hypothesis (Aytaç & Steinberg, 2023) and currency substitution theory (Chen & Siklos, 2023). Inflation's effect is insignificant in both periods, suggesting resilience possibly due to policy and financial innovation, though this challenges the McKinnon-Shaw hypothesis (Balogun & Talabi, 2024; Keho, 2020).

Conclusion

This study empirically examined the impact of remittances on financial sector development in Nigeria by objectively analysing the impact of remittances on financial depth, access, and efficiency, respectively. The findings revealed that remittance negatively affects financial development indicators in the short run, with a statistically significant effect observed only in the financial depth model. In contrast, remittance has a significant positive effect on financial access and a marginally significant effect on financial depth in the long run, while its negative impact on financial efficiency is statistically insignificant. Additionally, GDP growth positively influences financial development in both the short and long run. The results also indicate that exchange rate depreciation enhances financial development in the short run but has a negative effect in the long term. Finally, the analysis finds no statistically significant evidence that inflation impacts financial development in either the short or long run. Based on the findings, this study recommends that the Nigerian government promote formal remittance channels by reducing transaction costs, streamlining regulations, and encouraging the use of licensed financial institutions. Financial literacy programs should be intensified to guide remittance-receiving households toward saving and investing through formal channels, transforming inflows into long-term financial assets. Policymakers should harness GDP growth by investing in infrastructure, supporting SMEs, and encouraging sectoral diversification, thereby fostering inclusive financial access as incomes rise. To enhance exchange rate stability, authorities should adopt prudent fiscal and monetary policies, build foreign reserves, and ensure transparency in exchange rate management, as a stable exchange rate underpins financial sector confidence. Although inflation has a limited direct effect on financial

development, the Central Bank should maintain low and stable inflation while prioritising structural reforms, such as improving institutional quality, strengthening regulatory frameworks, and expanding digital financial infrastructure, to ensure more enduring progress in financial sector development.

Based on this study, the main takeaways for practitioners are:

- Promote formal remittance channels by lowering transaction costs and improving regulatory efficiency.
- Enhance financial literacy to encourage the productive use of remittances through formal financial systems.
- Leverage GDP growth by investing in infrastructure, supporting SMEs, and diversifying the economy to expand financial access.
- Manage exchange rate volatility with prudent fiscal and monetary policies to maintain financial sector confidence.
- Maintain low and stable inflation while pursuing structural reforms to support long-term financial development.
- Invest in digital financial infrastructure and regulatory frameworks to deepen financial inclusion and efficiency.

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