Impact of Remittance Inflows on Financial Inclusion in Nigeria

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Abstract

This study investigates the dynamic relationship between diaspora remittance inflows and financial inclusion in Nigeria over the period 1981 to 2023. Employing a simultaneous equations framework and the Generalised Method of Moments (GMM) estimation technique, the research explores how remittance inflows affect financial inclusion, which is measured by the number of bank branches per 100,000 square kilometers and the volume of bank deposits per adult population. These variables are used to respectively measure access and use of financial services. The study adapted the financial access possibility frontier theoretical framework to develop a model that explains how remittances extend financial access to the initially excluded groups. The empirical analysis reveals that remittance inflows have a significant and positive impact on financial inclusion by enhancing both access to formal banking infrastructure and the use of banking services in Nigeria. Thus, there is evidence that remittances can be leveraged to promote financial inclusion and drive inclusive economic growth in Nigeria. The study therefore advocates for the improved efficiency of remittance channels and better integration of remittance recipients with the formal financial sector to maximise the inclusive benefits of remittances. This outcome would be particularly favourable to the vulnerable and underserved populations since they are expected to benefit more from increased financial inclusion.

***Keywords*:** bank branches, bank deposits, finance access, finance use, remittances

***JEL Classification*:** G21, O16, O19

Introduction

Migration push factors have become more associated with opportunities and the desire to improve personal and household welfare than with other factors in developing countries (Tuki, 2025; Démurger, 2015). In this regard, diaspora remittances have become a strategic capital inflow option for these countries, including Nigeria. Since 2016, the inflow of remittances into the country has

exceeded foreign investment (FDI) on an annual basis. According to the World Bank (2024), personal remittances to Nigeria in 2024 were US$20.93 billion compared to Foreign Direct Investment (FDI) inflow of US$3.4 billion. At the household level, remittances are a useful means of meeting both transaction and precautionary demand for money in terms of funds to cover daily expenses and funds for meeting unforeseen contingencies (Kpodar & Imam, 2024). These factors make remittances a crucial component of the financial system in developing countries.

Another unique aspect of remittance flows is their resilience to fluctuations in international financial flows. For instance, remittance flows to Nigeria remained resilient during the global financial crisis that affected private capital flows in 2008–2010 (World Bank, 2011). Likewise, the decline in foreign capital inflows observed since 2016 did not reverse the upward trend in remittances. This shows that remittance inflows are more persistent than other forms of capital inflows into the country.

While the importance of remittances has often been analysed from the perspective of poverty alleviation and household consumption smoothing, recent scholarship has turned attention to its role in promoting financial inclusion. Financial inclusion refers to access to and effective use of formal financial services such as savings, payment systems, insurance and credit (Demirguc-Kunt & Klapper, 2012). Although Nigeria has made progress, financial inclusion remains low relative to other emerging economies. Data from the Global Findex Database show that only 54% of Nigerian adults had a formal account as of 2023 compared to 61% in Sub-Saharan Africa and 76% in developing economies (Demirguc-Kunt et al., 2022). Barriers such as distance, cost, low trust, financial illiteracy and informality persist. This situation has motivated the introduction of national policies like the National Financial Inclusion Strategy and the expansion of mobile money and agency banking in Nigeria.

Theoretically, several channels exist that linking remittances to financial inclusion. First, banks and financial institutions that process remittances can use transaction information to cross-sell savings, payments and credit products, thereby expanding access (Demirguc-Kunt & Klapper, 2012). Second, households that regularly receive remittances tend to use financial services more often, especially savings, insurance and payments (Ambrosius & Cuecuecha, 2016). Third, the New Economics of Labour Migration theory suggests that remittances act as a household risk-sharing mechanism that increases the demand for secure

and formal financial services (Sindi, 2006). Indeed, there is evidence that, for developing countries, remittance-receiving households are significantly more likely to hold bank accounts and use mobile payments (Giuliano & Ruiz-Arranz, 2009; IMF, 2023). The implications of more financially included households in an economy have also been demonstrated to be clearly positive both from economic and social perspectives (Briano-Turrent, 2025; Boachie & Adu-Darko, 2024; Adegboye, 2017).

Although both remittances and financial inclusion have been widely promoted as instruments for stimulating development (IFAD, 2010), empirical evidence on their interaction in Nigeria are essentially limited and inconclusive. Existing studies internationally suggest that remittances can support access to formal savings, payment systems and financial products (Giuliano & Ruiz-Arranz, 2009; Ambrosius & Cuecuecha, 2016). However, studies focusing on Nigeria have either examined the macroeconomic effects of remittances (such as growth, poverty or consumption smoothing) without directly assessing their contribution to financial inclusion.

In addition, the relationship between remittances and financial inclusion is not theoretically or empirically straightforward. Some studies find positive effects in developing countries (Naceur et al, 2020; Mbaye, 2020), while others show that informal remittance channels can bypass the financial sector altogether (Chuc et al 2022; Abba, 2021)). Nigeria's situation is even more complex because of persistent financial exclusion and low banking penetration, especially in rural areas. Thus, whether remittances translate into measurable improvements in access, usage and availability of financial services in Nigeria is an on-going debate. Specifically, little is known about which dimension of financial inclusion (access, usage or adoption) is most responsive to remittance inflows in the country.

These gaps highlight two unanswered questions in the Nigerian context. First, it is unclear whether remittances lead to deeper financial inclusion among the financially underserved, and second through which channels these possible effects occur. Addressing these gaps is crucial, given that Nigeria is one of the largest remittance-receiving economies in Sub-Saharan Africa and yet continues to record relatively low levels of financial inclusion by global standards (Demirguc-Kunt et al., 2022). This study therefore contributes to the literature by providing country-

specific evidence on the extent to which remittance inflows affect both access and usage indicators of financial inclusion in Nigeria.

This study, therefore seeks to determine how receipts of remittances affect the variables associated with financial inclusion in Nigeria, especially at the grassroots financial systems. It is argued that although remittances directly contribute to financial growth in Nigeria, these inflows may have a different effect on the inclusivity of the financial sector in Nigeria depending on whether financial access, usage or quality is being considered. The paper is organised into five sections, including the first section which introduces the study and provides contextual background. Section 2 reviews extant literature on the pertinent issues, while section 3 outlines the methodology and data for the study. Section 4 presents and discusses the empirical results and the study is concluded in section 5 while also providing relevant policy implications.

Literature Review

The initial theoretical postulations on access and use of financial market instruments (and the willingness of the financial system to participate) are based on the formulations by Stiglitz and Weiss (1981). Their model stated that due to imperfect information available to finance providers during the screening of potential loan beneficiaries, the loan markets will always be characterised by a state of credit rationing, irrespective of market-clearing conditions. Essentially, banks which provide loans are initially concerned about the interest rate, then about the riskiness of the loan. However, the risk composition of loan takers is easily influenced by interest rates charged by the banks through the phenomena of adverse selection effect and moral hazard effect. This outcome often ensures that certain portions of the system are effectively denied access to quality finance services.

The theory by Stiglitz and Weiss, therefore, focused on the interest rates and loan risk factors as effective means of assessing the financial markets. Thus, any information available to the banks from which they can infer lower loan risks may provide more incentives for such banks to offer loans. In this direction, households' remittance receipts can be a particularly interesting consideration by the banks for granting loans that they believe are less risky, even after effecting the interest rates (Özyakışır et al, 2023; Mbaye, 2021). Other nonprice barriers to financial access exist in these countries in the form of geographical, socio-economic, and opportunity limitations that further increase financial sector exclusion (Naceur et al, 2020; Demirguc-Kunt et al, 2008). Examples of such

constraints include the absence of bank branches, group discrimination, or a lack of fixed collateral.

A more extensive treatment of financial inclusion that can be related to remittances on a multilevel basis was initially proposed by Porteous and Zollmann (2016). The access frontier developed in the theory represents the maximum usage possible under existing income levels, structural conditions of technology, infrastructure and regulation. According to the model, the frontier is attained at the point where potential demand for financial services is equal to the potential supply of financial services. To reach this point, the model emphasises that economic factors must be driving both demand and supply of financial services. In particular, when the supply of financial services exceeds demand, the theory suggests that a greater inflow of remittances can aid in lifting demand conditions for these services. With this inflow, the efficient point is attained where the maximum number of individuals are being financially served and the financial system is making optimum use of their resources.

Empirical research on the effects of remittance inflows on financial inclusion has been relatively more recent, stemming from the realisation that the role of remittances on welfare comes from different channels. Earlier studies had found that remittances generally improved financial inclusion, especially in developing countries. For instance, Toxopeus and Lensink (2007) examined the relationship between remittance inflows and financial inclusion using both single equation and system estimates in which economic growth was explained by a selection of proxies for financial inclusion. The study found evidence of remittances having a positive impact on financial inclusion in general. Anzoategui et al (2014) also investigated the impact of remittances on financial inclusion using household-level survey data for El Salvador, in terms of how recipients assess both formal savings and formal credit financial services. They found that while remittances directly improve households' use of deposit accounts, remittances do not influence access to credit.

More recently, Naceur et al (2020) investigated the relationship between remittances and financial inclusion for a group of developing and advanced economies over the period 2004-2015. Based on a dynamic panel regression approach, it was found that remittances inflow significantly increased financial access to the lower cadre of the financial system, especially when remittances form a large proportion of household's income. They also found a "U-shaped"

relationship between aggregate remittance inflows and financial inclusion for the sample. Similarly, Mbaye (2021) found that in Senegal, remittances complement credit market participation by households. In particular, remittances act as a positive sorting mechanism by the banking sector in loan disbursement decisions in Senegal. A similar micro-level analysis for Nigeria was conducted by Ajefu and Ogebe (2019). Using an instrumental variable estimation technique, the study found that remittances significantly increased the probability of using formal financial services by households in Nigeria.

The general positive impact of remittances on financial inclusion could also occur irrespective of the measurement of the empirical strategy used in the analysis. For instance, Tah (2019) also examined how remittances impact access to financial services in a group of sub-Saharan Africa countries and found that remittances have a predominantly positive impact on financial access in the region, irrespective of accounting for endogeneity, controlling for country-specific specific, or using alternative measures of financial access. Anarfo et al (2020) also found similar results of an indirect relationship between migrant remittances and financial inclusion in sub-Saharan Africa. In the same vein, Eggoh and Bangaké (2021) employed the GMM and panel threshold regressions to examine the effects of remittances on financial inclusion for 64 countries. There was evidence of non-linearity in terms of how remittances promote financial inclusion for these countries.

The effects of remittances on the disaggregated measures of financial inclusion also present interesting outcomes. For instance, Chuc et al (2022) employed Probit models and found that households receiving remittances are more likely to have bank accounts and to use bank branches but are less likely to have insurance and to use ATMs. The effects of remittances on having a payroll account or other investments, providing investment funds, getting a loan or credit or using credit cards were all insignificant in the study. Using the PMG estimation framework for data from 2004 to 2018 for a group of African economies, Abba et al (2021) examined the role of remittances in significantly increased financial access in the economies. On the other hand, they found that remittances actually reduced the use of financial services in the long term. Similarly, Mbilla et al (2018) found that while internal remittances had helped to improve both access to loans and other banking services, foreign remittances only influenced the probability of recipients' opening a bank account. In this direction, Eshun and Kočenda (2025) found that for Pakistan, the deleterious role of banking costs on financial inclusion is significant in limiting the effects of remittances on financial inclusion.

The literature reviewed has shown that although remittances may directly influence financial inclusion, such influences may be mitigated or eliminated for certain forms of inclusion components of other characteristics of the banking sector. Thus, remittances alone may not stimulate financial access and use by the vulnerable, especially in developing countries until credit constraints are removed or reduced or other initial conditions are met. This is an important gap that this study seeks to fill by employing a system of simultaneous equations which outlines the direct and indirect effects of remittances on financial inclusion in Nigeria.

Research Methodology

This study adopts the Access Possibility Frontier Model developed by Beck and de la Torre (2006), which combines demand–supply interactions to determine the share of population a financial system can serve at any point in time. The model extends the access frontier approach of Porteous (2004), where the access frontier represents "the maximum usage possible under existing structural financial conditions." Financial inclusion is represented in a traditional price-quantity space, where financial service fees form the price axis while the proportion of population engaged in savings and payment services forms the quantity axis. Demand is downward sloping because higher fees reduce uptake, and supply is upward sloping because higher fees increase outreach. Aggregate demand is expressed as:

$$D = f(\text{income}, \text{price}) \qquad (1)$$

Where $\delta D / \delta income > 0$, $\delta D / \delta price < 0$. Remittance inflows raise household income and lower participation barriers, shifting demand and supply outward. Thus, higher remittances move the financial inclusion frontier by expanding equilibrium access. The model specified in this study is based on the theoretical framework and empirical studies by Naceur et al (2020) and Chuc et al (2022). From Eqn (1), it is seen that demand for financial services depends on income and price of the services. Given that

$$Income = f(Remittances) \qquad (2)$$

Then Eqn (1) is written as

$$D = f(REM, price) \qquad (3)$$

Where REM represents remittances. Equation (3) links between remittances to financial inclusion (the demand for financial services). It shows that demand for financial inclusion is be determined by increased remittances inflow and the cost of financial services. Based on this, the model for the study can be specified as:

$$FI_t = \alpha + \beta_1 REM_t + \beta_2 X_t + \varepsilon_h \quad (4)$$

where *FI* is the measure of financial inclusion, *REM* is remittances inflows which is measured as the ratio of remittances to GDP, *X* is a matrix of other control-level variables that further explain financial inclusion and also aid in explaining the specified relationship, and ε is the error term. For the measures of financial inclusion (*FI*), two variables were used. First, financial inclusion is measured in terms of access by using the number of commercial bank branches per 100,000 sq km (BRANCH_SQKM). This variable has also been used in previous studies Abba et al (2021) and Mbaye (2021), as a major financial access variable highlighted by the IMF Financial Access Survey (FAS). The variable also demonstrates the level of penetration of the financial sector in the economy or the rate of financial outreach (Beck, et al, 2007). Second, the per capita amount of deposits in banks (DEP_POP) is used proxy for the level of financial services use and the participation of individuals in the banking system. The full specification of Equation (1) is presented as:

$$FI = f(FI_{t-1}, REM, GDPPC, PDEN, EDU, URBANR, INFRA, INST) \quad (5)$$

Where FI is financial inclusion proxied by bank branch density (BRANCH_ SQKM) and deposit per capita (DEP_POP); REM is remittances; GDPPC is GDP per capita; PDEN is population density; EDU is educational development; URBANR is Urban population rate; INFRA is infrastructural development; INST is institutional quality proxied by political stability (POLSTAB).

In the model, remittances inflows are expected to boost financial inclusion, since they specifically promote potential demand for financial services by increasing income levels. Thus, as more remittances flow into the country, income levels are increased, and financial demand is increased even from the lower levels. The control variables in the model a critical for limiting omitted variable bias in the model. As Eshun and Kočenda (2025) noted, the level of economic performance and infrastructure is crucial for driving the extent of financial inclusion. Moreover, social factors like education, urbanisation and institutions also support financial inclusion mandates in an economy (Ozili, 2025; Tinta et al, 2022).

Several papers on the financial inclusion and external resource inflows nexus, with a lagged dependent variable to account for dynamic effects (Chuc et al 2022; Tah, 2019). Moreover, studies such as Anarfo et al (2020) and Dabla-Norris et al. (2015) have shown that a simultaneous or reverse relationship exists between financial inclusion and remittances inflows to developing countries. In essence, while remittances inflow has the capacity of promoting financial inclusion, a sound financial system with inclusive participation is also a formidable background for drawing more remittances into the country. These bi-directional effects show that remittance equation is incorporated into the estimation process. Specifically, the financial inclusion model is re-specified as follows:

$$FI = f(REM, FI_{t-1}, GDPPC, PDEN, EDU, INFRA, INST) \quad (6)$$

while the remittances equation is specified as:

$$REM = (Fi_{t-1}, FO, GDPPC, INFL, ADEPR, URBANR, INST) \quad (7)$$

where FO is degree of financial openness; INFL is inflation rate; ADEPR is age dependency ratio; URBANR is urban rate (share of population in urban centres). All the other variables are as defined earlier. In the model for remittances, financial inclusion is expected to have a positive coefficient since improved financial system is a major demand factor that stimulates remittances from foreign countries. The two equations above are behavioural equations with two endogenous variables (*FI* and *REM*) and ten predetermined variables. The predetermined variables include nine current exogenous (*GDPPC, EDU, INST, FO, PDEN, INFL, ADEPR, URBANR, INFRA*) and one lagged endogenous (FI_{t-1}). In the model, it is hypothesized that some of the factors that explain financial inclusion also tend to explain remittance inflows in Nigeria. Both equations contain a lagged endogenous variable (FI_{t-1}) and thus implies that the model is dynamic in its structure.

The goal of the empirical strategy in the study is to provide elasticities with respect to how remittances influence financial inclusion. Hence, the natural logarithms of the variables are used in the estimations. The econometric forms of the models are therefore specified as:

$$FI_t = \beta_0 + \beta_1 REM_t + \beta_2 FI_{t-1} + \beta_3 GDPPC_t + \beta_4 EDU_t + \beta_5 INST_t + \beta_3 PDEN_t + \beta_4 INFRA_t + u_{1t} \quad (8\text{-}1)$$

$$REM_t = \lambda_0 + \lambda_1 FI_{t-1} + \lambda_2 FO_t + \lambda_3 GDPPC_t + \lambda_4 INST_t + \lambda_5 INFL_t + \lambda_3 ADEPR_t + \lambda_4 URBANR_t + u_{2t} \quad (8\text{-}2)$$

where u is the stochastic error term and t represents time. Given the simultaneity among the residuals of the estimates from the system of equations specified above, the OLS technique is expected to provide biased estimates of the coefficients. In order to address the simultaneity bias and account for endogeneity in the relationships, a simultaneous estimation strategy is adopted. However, a two-Stage Least Squares estimation technique will not properly estimate the relationship since it is dynamic in nature. Thus, we adopt the Generalised Method of Moments (GMM) estimation technique (Panizza, 2002) which is a system estimator.

GMM estimator addresses the simultaneous and endogenous relationships between remittance inflows and financial inclusion and therefore minimises the bi-directional causality and feedback effects. GMM is more efficient in the estimation since it provides efficient and consistent estimates in the presence of endogeneity, heteroskedasticity and autocorrelation, and does not rely on strict distributional assumptions. It is therefore suitable for macro-financial models where variables jointly determine each other (Hansen, 1982; Greene, 2012).

The period of this study spans from 1981 to 2023. The data on remittances, GDP per capita, educational level, financial openness and demographic factors will be sourced from the World Bank Development Indicator (WDI) 2024. Data on institutional quality were sourced from the International Risk Guide. Finally, data on financial inclusion were sourced from the Central Bank Statistical Bulletin.

Presentation and Analysis of Results

The summary of the variables used in the empirical analysis is reported in Table 1. Average remittance to GDP rate is 2.51 for the period, which is an impressive value, especially considering that remittances to GDP rate over the period is less than 2.5%. The average number of bank branches per 100,000 square kilometres is 3.42, which is quite a low value on average. However, when the ratio for urban centres is compared with that of rural centres, a very wide gap can be noted in the rate. This implies that a very high concentration of bank branches is found in urban centres, with very low values in rural areas in Nigeria. Interestingly, the average deposit per adult population over the period is N17,963.1, which is also low. This outcome shows a generally low level of financial inclusion in Nigeria. Other variables in the Table indicate that the average secondary school enrolment

rate is 38.75, while the urban rate for the period was 35.78 over the period. This indicates low levels of education but high levels of urbanisation in the country.

Table 1: Descriptive Statistics

Variable	Mean	Max.	Min.	Std. Dev.
REMYR	2.51	8.31	0.00	2.57
BRANCH_SQKM	3.42	6.29	0.94	1.81
DEP_POP	17963.1	59420.8	116.2	23066.6
EDU	38.75	54.17	23.92	10.24
FO	42.98	59.78	18.99	11.77
GDPPC	4008.93	6371.20	2715.40	1119.69
INFRA	28830.8	85749.7	4817.8	24924.0
ADEPR	89.05	92.74	86.60	2.02
PDEN	138.10	209.59	82.88	38.65
URBANR	35.78	49.91	22.67	8.09
INFL	19.99	72.81	4.67	17.73
POLSTAB	6.74	10.50	3.75	1.64

Source: Authors

The stationarity status of the variables used in the study is tested using the ADF and the PP tests. The stationarity tests are conducted in this study in order to remove any possibility of estimating coefficients that cannot be generalised across periods over time (or long run characteristics). Table 2 shows the result of the unit root test in levels and first differences. Both test outcomes indicate that all the variables are integrated of the first order.

Table 2: The Unit Root Test Results

Variable	ADF value		Phillip-Peron		Remark
	Level	First difference	Level	First difference	
REMYR	-2.57	-5.78**	-2.236	-7.378**	I[1]
BRANCH_SQKM	-2.12	-6.87**	-1.844	-6.087**	I[1]
DEP_POP	-2.12	-7.67**	-1.844	-6.087**	I[1]
EDU	-1.52	-6.89**	-1.322	-4.364**	I[1]
FO	-1.52	-5.89**	-1.322	-4.364**	I[1]
GDPPC	-1.12	-7.06**	-0.974	-3.216**	I[1]
INFRA	-2.15	-4.97**	-1.871	-6.173**	I[1]
ADEPR	-1.11	-5.01**	-0.966	-3.187**	I[1]
PDEN	-0.22	-5.38**	-0.191	-3.827**	I[1]
URBANR	-1.36	-5.69**	-1.183	-3.905**	I[1]
INFL	-2.69	-3.65**	-2.340	-7.723**	I[1]

Source: Author's computation. Note: ** indicates significant at 5%

Having established the order of integration of the data, the Johansen cointegration test is conducted to determine the presence of long run equilibrium relationship among the variables. The tests are performed for the two equation sets. The results of the Johansen cointegration tests are reported in Table 3 and indicate that for each of the equations, there is more than one cointegrating vector. This implies a high level of cointegration and long-run relationships among the variables.

Table 3: Johansen Cointegration Tests, Showing hypothesized Number of Cointegrating Equations

Series: BRANCH		**Series: DEPOSITS**	
Trace Test			
Hypothesized Max. No. of Cointegrating Equations(s)	Prob.**	Hypothesized Max. No. of Cointegrating Equations(s)	Prob.**
None *	0.000	None *	0.000
At most 8 *	0.023	At most 8	0.067
Maximum Eigenvalue Test			
Hypothesized No. of CE(s)	Prob.**	Hypothesized No. of CE(s)	Prob.**
None *	0.000	None *	0.000
At most 1*	0.037	At most 1*	0.043

Source: Author's computations. Note: ** indicates significance at 5%

In Table 4, the results of the estimated model using bank branches per 100,000 square kilometres are presented. As a result, the diagnostic statistics are essentially impressive considering the estimation methods adopted. The adjusted R-squared value of 0.86 (for the remittances equation) and 0.77 for the financial inclusion equation indicates that the models have high goodness of fit coefficients. This indicates that 88% of the systematic variations in remittances and 77% of the systematic variations in bank branches per 1000,000 square kilometres were captured in the model. The D.W. statistics are also appropriate, suggesting no form of autocorrelation in the estimates presented.

In the remittances equation, the coefficient of bank branches per 1000,000 square kilometres failed the significance test at the 5% level, indicating that the number of bank branches or the access to bank branches by individuals does not have a significant impact on remittances inflows in the country. This implies that even when bank branches are brought closer to individuals, there might not be a corresponding expansion of remittances by migrants in Nigeria. on the other hand, the coefficients of financial openness, adult dependency ratio and rate of urbanisation are significant in the model. While the coefficients of financial openness and urban rate are both positive, that of the adult dependency ratio is

negative. The result, therefore, indicates that an increased level of financial openness in the country leads to an increase in remittance inflow into the country, while increases in urban population also tend to stimulate remittance inflow to Nigeria. However, increases in the dependency ratio actually reduce remittance inflows to the country.

Table 4: Result for Remittances and Bank Branches per 100,000 km^2

	Remittances equation				**Bank Branch/1000 km^2 equation**			
	GMM		**OLS**		**GMM**		**OLS**	
Variables	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**
CONSTANT	199.8**	9.54	217.5*	2.16	-7.16	-1.85	-0.70	-0.35
BRANCH_SQKM	1.19	1.37	1.03	0.61				
BRANCH_SQKM(-1)					0.74**	3.22	0.67**	5.25
FO	2.03**	3.67	1.93	1.61				
GDPPC	-3.44	-1.78	-2.88	-0.65	2.18**	3.62	-0.30	-0.79
INFL	0.06	0.43	0.08	0.43				
ADEPR	-4.89**	-4.54	-4.37*	-4.21				
URBANR	4.47**	3.18	5.73	0.76				
INST	0.08	1.37	-0.23	-1.39	0.07**	4.72	-0.01	-0.71
REMYR					0.16**	7.01	0.00	-0.08
PDEN					0.04	1.29	-0.05	-1.47
EDU					-3.44**	-7.23	0.98*	2.36
INFRA					0.12*	2.37	0.03	0.93
Adj. R-sq	0.86		0.92		0.77		0.98	
D.W. Stat	2.20		1.85		1.63		1.97	
J-stat	0.326				0.204			

*Note: * and ** indicate significance at 5% and 1% respectively*
Source: Author's computation

More important implications can be drawn from the equation that shows bank branches per 1000,000 square kilometres. From the result in the second panel of Table 4.6. It can be seen that the coefficient of remittances passed the significance test at the 1% level and is positive. This shows that remittance inflows have a significant positive impact on bank branches per 1000,000 square kilometres in Nigeria. The more the inflows of remittances, the more the tendency of the banking system to increase its creation of bank branches, thereby increasing the ease of access to the formal banking system in Nigeria. Apparently, the result shows that remittances are a veritable tool for promoting ease of bank access in Nigeria.

The significance of the lagged dependent variable shows that past branch expansion tends to positively affect current branch expansion. It also shows that a centre that already has a bank has a higher chance of attracting more bank

branches. This is an indication of banking sector concentration in the economy, as demonstrated in the analysis further performed in this study. Indeed, all the coefficients in the equation for bank branches per 1000,000 square kilometres are significant apart from population density and rule of law. Thus, the result shows that GDP per capita, rate of infrastructural development, and political stability all have significant positive impacts on bank branches per 1000,000 square kilometres in Nigeria. This indicates that both economic, physical and institutional factors are needed, along with remittance inflows, to promote financial inclusion in Nigeria. Rising income levels (or general economic growth are shown to be a critical tool for promoting financial inclusion in Nigeria. on the other hand, the infrastructural status of the economy and the ability of the country to maintain stability are all important for promoting financial inclusion in Nigeria. The Hansen test for over-identifying restrictions indicates that the null hypothesis of irrelevant instruments in the GMM estimates can be rejected. Hence, the instruments are well identified.

We further use the deposit per capita of the adult population in deposit money banks as a measure of financial inclusion, and the results for the estimated model are presented in Table 5. The goodness of fit statistics are also quite relevant and indicative of the well-specified equations for the relationships. In the remittance result for this model, the coefficient of deposit per capita passes the significance test at the 1% level and is also positive. This indicates that the deposit per capita significantly increases remittance inflows to Nigeria. The easier the capacity of individuals to access deposit accounts in Nigeria, the higher will be the inflows of remittances into the country.

Table 5: Result for Remittances and Deposit per capita (adult population)

	Remittances equation				**Deposit per capita equation**			
	GMM		**OLS**		**GMM**		**OLS**	
Variables	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**
constant	-647.4**	-4.86	161.6	1.56	-2.01	-0.73	-0.80	-0.29
DEP_POP	5.04**	5.47	0.62	0.97				
DEP_POP (-1)					0.71**	6.82	0.48**	3.47
FO	-5.20*	-2.60	1.83	1.55				
GDPPC	-0.75**	-6.19	-3.09	-0.68	-0.18	-0.30	-2.22**	-3.26
INFL	-0.34	-0.78	0.11	0.62				
ADEPR	1.65**	5.14	-35.43	-1.39				
URBANR	0.67**	4.29	3.29	0.42				
INST	0.20	0.67	-0.23	-1.39	0.02	1.09	0.01	0.56
REMYR					0.12**	3.84	0.03	0.82
PDEN					-0.09	-1.43	-0.06	-1.03
EDU					1.87	1.59	5.79**	3.59
INFRA					-0.01	-0.17	0.24**	3.26
Adj. R-sq	0.56		0.94		1.00		1.00	
D.W. Stat	1.26		1.89		2.15		1.84	
J-stat	0.201				0.131			

*Note: * and ** indicate significance at 5% and 1% respectively*
Source: Author's computation

The result, therefore, suggests that it is not just the access to banks that stimulates remittance inflows, but it is the actual use of the banking system for transactions that can encourage more remittance inflows. Thus, financial inclusion in Nigeria transcends the ease of accessing banks to the ease of use of bank services in relation to the ability of financial inclusion to promote foreign capital inflows in the form of remittances. The coefficients of financial openness, GDP per capita, adult dependency rate and urban rate are also significant in the model. However, the coefficient of financial openness and GDP per capita indicate that economic performance actually reduces remittance inflows when individuals have more access to bank deposits or bank accounts. On the other hand, the result shows that the adult dependency rate tends to increase the inflow of remittances to Nigeria. Since adult dependency rates represent the responsibility of migrants to their own households left behind, the result shows that when individuals have more use of the financial system, remittances are more responsive to responsibilities left behind by migrants.

In the equation for deposit per capita in Table 5, the coefficient of remittances also passes the test at the 1% level, still confirming the outcome of the previous result that remittances boost financial inclusion, even when it is measured in terms of

use of banking activities. This result demonstrates that when remittances increase, there is a tendency for more individuals in the country to use banking system instruments, especially for deposits. The coefficient of lagged dependent variable is also significant and positive, once again confirming the agglomeration effects of financial services and financial inclusion in Nigeria. the result shows that owning a bank deposit is a very strong factor that stimulates further use of bank deposits in future. As mentioned before, this sort of agglomeration effect is inimical to the rapid development of the financial sector in Nigeria, especially in terms of financial inclusion.

Among the other coefficients of the variables in the remittances result in Table 5, only the coefficients of political stability and rule of law passed the significance test, suggesting that when more individuals use banking system activities, income, and other infrastructural development may not matter in promoting remittances in the country. However, it is the impact of institutional factors that significantly promotes remittances inflows to the country. When the political system is more stable, remittances inflow tends to be more than in periods with less stability.

The empirical outcomes of this study therefore show that remittances effectively improve financial inclusion in Nigeria, irrespective of the proxy for financial inclusion. There is evidence that a one per cent rise in remittance receipts in Nigeria leads to a 0.16% increase in ease of accessing a bank branch and a 0.12% increase in use of bank deposits These are very impressive multipliers that can effectively be harnessed to ensure that the vast inflows of remittances speed up the dimensions of financial inclusion in Nigeria. The results found in this study are in line with those of Barkat (2024), Abba et al (2021), Mbaye (2021) and Eggoh and Bangaké (2021), and Tah (2019). For instance, Abba et al (2021) have shown that deeper remittance inflows generate the system for removing the binding constraints on unbanked individuals in developing countries. The impressive results from the simultaneous equations framework adopted in this study also tend to align with studies line Khan et al (2025) and Barkat et al (2024) on the indirect effect that remittances can also exert on financial inclusion.

Conclusion and Policy Recommendations

This study examines the extent of the relationship between remittances receipts and financial inclusion in Nigeria. It is argued in this study that a reverse or bi-directional relationship exists between the inflows of remittance and the patterns of financial inclusion in Nigeria. It investigates the pattern of interactions between the variables by devising a simultaneous equations strategy and using appropriate

estimation methodology for estimating the relationship. Financial inclusion in Nigeria is captured using two variables in the study, which are bank branches per 100,000 square kilometres and bank deposits per adult population. These variables were used based on the demonstration in the study that financial inclusion involves access to formal financial services and the use of financial services by individuals who are essentially excluded. Based on the simultaneous equations analysis, the empirical findings show that remittance receipts have a significant positive impact on bank branches per 1000,000 square kilometres in Nigeria. This suggests that the more the inflows of remittances into Nigeria, the more the tendency of the banking system to increase its creation of bank branches. This increases, then leads to increased ease of access to the formal banking system in Nigeria. There is also evidence that remittance receipts have a significant positive impact on the use of bank deposits in Nigeria. This result demonstrates that when remittances increase, there is a tendency for more individuals in the country to use banking system instruments, especially for deposits.

The empirical evidence from this study establishes that remittance inflows positively influence both the access and usage dimensions of financial inclusion in Nigeria. This finding confirms the argument that remittances can function as an important source of external finance that is capable of stimulating the formal banking system. From a policy standpoint, this suggests that Nigeria's financial sector regulators and commercial banks should increasingly integrate remittance flows into the architecture of inclusive finance. In particular, reforms that reduce remittance transfer fees, expand foreign exchange access and simplify Know-Your-Customer (KYC) compliance are essential for enabling more migrants and recipients to use regulated financial services. These measures will directly influence the capacity of the financial system to broaden access to formal financial infrastructure, especially for the rural and low-income households that are dominant remittance beneficiaries in Nigeria.

The result that remittances stimulate branch expansion has direct implications for the geographical inclusiveness of the Nigerian financial system. Given that physical and proximity constraints are among the leading causes of financial exclusion, the wide access gaps in regions with low bank density is particularly worrisome. Policy responses need to therefore support financial institutions in extending branch and agent banking infrastructure to underserved localities. A dual strategy that combines traditional branch expansion with mobile money, agency banking and digital finance models is necessary given the peculiar nature

of finance in the country. Such models have been shown to advance financial inclusion by lowering the cost and distance barriers associated with formal banking. Banks are also encouraged to develop remittance-linked financial products, including savings accounts, micro-insurance, and deposit-mobilisation schemes, since the findings show that higher remittances increase the use of bank deposit services.

Finally, regulators need to integrate remittances into national financial inclusion policy frameworks. The National Financial Inclusion Strategy and the Payment System Vision must explicitly incorporate remittance flows as drivers of inclusive finance. Lessons from other similar economies indicate that inclusive financial development is most effective when regulatory, institutional, and market reforms are aligned. Strengthening financial literacy and consumer protection initiatives that are tailor-made for remittance-receiving households can further improve the effectiveness of financial inclusion policies in Nigeria.

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