

Research Article

Financial Development and Remittances Inflow: Evidence from a Panel of Six Countries in the Economic Community of West African States (ECOWAS)

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Abstract

The complexity of the nexus between financial development and remittance inflows in Africa has remained largely underexplored. Therefore, we contributed to the literature by providing more specific and valuable insights into the channels through which financial development affects inward remittances in a panel of six (6) ECOWAS countries (Ghana, Mali, Niger, Nigeria, Senegal, and Sierra Leone). We utilised panel datasets from the World Bank and IMF Financial Statistics and employed the Mean Group (MG) estimator, the Hausman test, and summary statistics for the analysis. The findings showed that the long-term implications of financial institutions' development on remittance inflows are positive. In particular, the effects of financial institution access and efficiency on personal remittances are positive in the long run. This finding indicates that greater access to financial services and efficient, cost-effective allocation of financial resources are beneficial for mobilising personal remittances to the ECOWAS region. Additionally, overall financial development positively affected personal remittances in the long run, being significant at the 5% level, which suggests that gradual and consistent improvements in financial institutions' activities—such as increased access to services, size, efficiency, and stability play an important role in mobilising diaspora remittances to the ECOWAS sub-region. However, the depth of financial institutions has a positive effect on personal remittances. This finding is not significant at the 5% level, indicating that the size of financial institutions relative to GDP has not significantly enhanced the inflows of migrants' remittances. Based on these findings, we recommend that governments and monetary authorities within ECOWAS collaborate efforts to promote financial development and expand digital financial services, thereby providing a sustainable roadmap for increased remittance inflows.

Keywords

Remittances, Financial Development, Financial Access, Depth, Efficiency and ECOWAS

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1. Introduction

Remittances have been identified in the extant literature as an important source of financial inflows in developing economies, including Africa. [27] argue that remittances enable migrants' households to smoothen consumption and fund education, healthcare and small-scale enterprises. This highlights the critical roles of remittances in economic and social development in the recipient economies. According to [32], remittances have emerged as an important source of financing for Africa's development. In 2022, remittance inflows to West Africa accounted for 7.6% of GDP with a total of nearly \$34 billion, which exceeded the total amount of Official Development Assistance (ODA) and Foreign Direct Investment (FDI) received by the sub-region [31]. This could be partly attributed to the more resilient nature of remittances compared to other sources of finance, especially during economic downturns and crises. As outlined in some previous studies [4, 5, 11, 17], financial development is pivotal for mobilising foreign capital, including remittances.

Furthermore, financial development is critical for determining both the volume and developmental impact of remittances. [35] describes financial institutions' development to include financial depth, access, efficiency, and stability. The report further explained that financial depth focuses on the ratio of broad money (M2) to gross domestic product (GDP), private sector credits to GDP, financial institutions' assets to GDP and the ratio of deposits to GDP while financial access captures the percentage of the population with a bank account and percentage of firms with line of credit and spread of bank branches. Additionally, financial efficiency embodies lending-deposits spread and net interest margin, among others, whereas financial stability integrates capital adequacy ratio and asset quality ratios. [14] posits that the development of the financial sector plays an important role in determining how remittances are transferred, saved, and invested in recipient countries. It is also argued that the availability of formal financial services provides a good signal for migrants to use official channels for remitting money to their households.

[2] argue that stronger and more accessible financial systems, characterised by reduced transaction costs, improved security of transfers, and a variety of financial products, offer more opportunities for countries to attract more remittances through formal channels. This aligns with [13] assertion that a robust financial sector not only reduces transaction costs but also boosts trust in formal institutions, incentivising migrants to use regulated channels. Considering the benefits linked to the development of financial institutions, many developing economies, including African countries, have initiated extensive financial reforms that encompass financial deregulation and a shift from direct to indirect monetary controls to enhance their economies as attractive destinations for foreign capital. In particular, the ECOWAS economic bloc, comprising fifteen (15) countries, has continued to implement measures to deepen financial development, creating an envi-

ronment conducive to large inflows of capital whilst increasing the availability of funds to investors at an affordable cost. This economic integration also aims to strengthen the quality of institutions and broaden the scope of economic cooperation across various sectors among member countries.

However, it is important to note that most ECOWAS member countries face the challenge of an underdeveloped financial system, which hampers public confidence in financial institutions and the attraction of foreign capital, including remittances and ODA, for sustainable growth and development. Therefore, it becomes essential to deepen the understanding of the implications of financial development in the ECOWAS region. In this context, this study examines how financial access, depth, efficiency, and overall development influence remittance inflows to the ECOWAS region. Following the introduction, the rest of this paper is organised as follows: Section II provides the literature, including theoretical background, empirical review and stylised facts, while data and methodology are explained in Section III; results and discussions are provided in Section IV, and conclusion and policy implications are provided in Section V.

2. Related Literature

McKinnon and Shaw proposed the financial liberalisation theory [19, 28], highlighting the critical role of a well-developed financial sector in mobilising capital inflows, including remittances, to their recipient economies. The theory assumes that the liberalisation of the financial sector enhances the efficiency of foreign capital inflows, including remittance transfers, by reducing the transaction costs. This theory highlights how crucial it is to keep transaction costs low in economic exchanges [34]. When it comes to remittance transfers, high fees, delays, and a lack of trust in financial institutions can really drive up those costs, making it tough for migrants to rely on formal financial channels. However, financial development can help bring those costs down by boosting institutional efficiency, expanding digital platforms, and encouraging competition among money transfer operators. [22, 30] posit that by reducing transaction costs, financial sector development promotes a competitive banking and digital payment system, thus incentivising migrants to send money to their home countries. [30] further explains that a sound financial system has the potential to mobilise remittances efficiently, shifting them toward productive investments rather than consumption-driven inflation. An underdeveloped financial system undermines the effectiveness of remittances in driving macroeconomic stability [24]. Overall, financial development is believed to bolster remittance inflows by improving the investment opportunities and reinforcing the confidence of migrants in the financial system of their home countries.

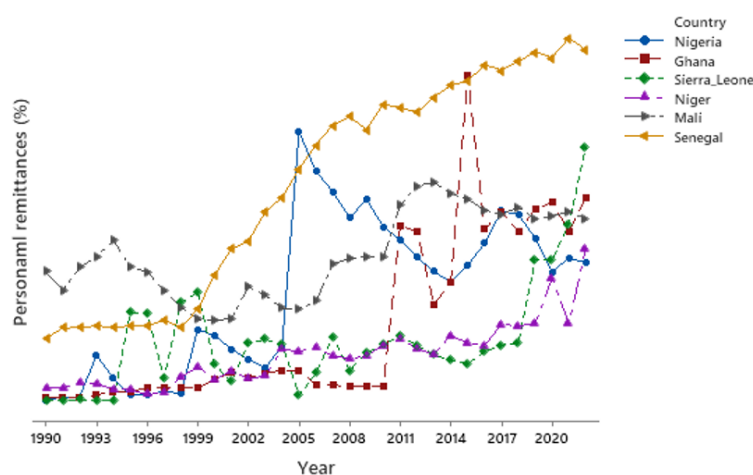
Furthermore, the empirical evidence on the link between

financial development and remittances has varied across countries, regions and methods. This has raised concerns about the intended and desired implications of financial development on remittance inflows. For instance, empirical studies by [1, 3, 7, 12, 14, 21, 23, 29, 33] showed that financial development is a significant catalyst for mobilising remittances to developing economies in Africa. On the contrary, [8, 20] found that financial development is not a significant determinant of capital inflows in Africa. These conflicting findings have provoked further inquiry into the sources through which financial development affects remittance inflows. For this reason, we disaggregated the financial devel-

opment into the indices of financial access, depth, efficiency and overall financial development. This is distinct from previous studies that limited their attention to aggregate financial development, thus providing valuable insights into the specific contributions of financial development indicators to remittance inflows for more informed and targeted policies.

Stylised Facts on Remittances Inflows

The trend of remittance inflows across West African countries has varied in the past two decades. The dynamics of personal remittances in the six selected countries for this study are presented in Figure 1.



Source: Authors' compilation (2025)

Figure 1. Time series trend of remittances inflow, 1990 - 2022.

The trends of personal remittances showed that Sierra Leone witnessed a rapid growth in the inflow of remittances, thus surpassing other countries in the cross-sections during the study period. This finding shows that Senegal is an important destination for migrants' remittances in the ECOWAS sub-region. It was also found that Nigeria and Sierra Leone witnessed a substantial increase in remittance inflows. This could be attributed to the high level of migration and brain drain that have characterised these countries. The level of remittances inflow in Ghana and Niger exceeded that of Mali, which experienced the lowest level of remittances inflow when compared to other countries in the sample.

3. Data and Methodology

3.1. Data Description

The panel datasets for this study were obtained from the World Bank World Development Indicators and the International Monetary Fund (IMF) Financial Statistics. Six countries were covered in this study due to data availability, and the scope spanned from 1990 to 2022. The summary of the variable description is presented in Table 1.

Table 1. Variable description and abbreviations.

Variable	Notation	Description
Personal remittances	PER	These involve the money remitted by migrants employed in foreign destinations to their home country. This was measured by the remittances received, including personal transfers and compensation as defined in the sixth edition of the IMF's Balance of Payments Manual.
Financial access	FAC	This is the level to which financial agents, such as individuals or companies, have access to financial institutions in the absence of price and non-price barriers.

Variable	Notation	Description
		ers. Consistent with the World Bank definition, financial access ranges from bank account holding to credit access and distribution of bank branches, etc. The financial access index from the World Bank database was utilised as the reference for this variable.
Financial depth	FDE	This measures the size of the financial sector relative to the economy's GDP. It is often captured by the domestic private credit to the real sector by deposit money banks as a percentage of GDP. The financial depth index provided by the World Bank was relied upon to measure this variable.
Financial efficiency	FEE	As an important aspect of the financial sector development, financial efficiency refers to the efficient allocation of financial resources at the lowest possible cost. According to the World Bank, this concept includes the lending-deposit spread, overhead costs, and profitability, among other things. To assess this variable, the World Bank's financial efficiency index is used.
Overall financial development	OFD	This refers to improving in the financial institutions. The World Bank identified financial depth, access, efficiency and stability as the integral aspects of financial institutions' development. This study relied on the financial institutions development index provided by the World Bank to measure this variable.

Source: Authors' compilation (2025)

3.2. Model Specification

The functional specification of the model is provided as follows:

$$PER = f(FAC, FDE, FEE, OFD) \quad (1)$$

$$FBO_{it} = \alpha + \beta_1 FAC_{it} + \beta_2 FDE_{it} + \beta_3 FEE_{it} + \beta_4 OFD_{it} + \varepsilon_{it}, i = 1, \dots, N, t = 1, \dots, T \quad (2)$$

Where: α = common intercept, $\beta_1 - \beta_4$ = common slope parameters, ε_{it} = error term, i = cross-sectional units comprising the countries in the ECOWAS sub-region and t = time

Where: PER = personal remittances, FAC = financial access index, FDE = Financial dept index, FEE = Financial efficiency index and OFD = overall financial development index.

The pooled regression models are specified accordingly as follows:

frame (1990 to 2022)

The panel autoregressive distributed lag (PARDL) model is specified as follows:

$$\Delta PER_{it} = \theta_i [PER_{i,t-1} - \vartheta_{0i} - \vartheta_{1i} x_{i,t-1}] + \sum_{j=1}^p \varphi_{ij} \Delta PER_{i,t-j} + \sum_{j=0}^q \delta_{ij} \Delta x_{i,t-j} + \mu_i + v_{it} \quad (3)$$

Where: x = vector of the regressors comprising FAC, FDE, FEE and OFD as defined previously, ϑ_{0i} and ϑ_{1i} = long run parameters, φ_{ij} and δ_{ij} = short run parameters, p and q = optimal lag orders, θ_i = error correction coefficient, u_i = individual effects and v_{it} = remainder disturbance term.

3.3. Method of Data Analysis

We employed the mean group (MG) estimator introduced by [25], along with the pooled mean group (PMG) estimator credited to [26], to explore how financial development impacts remittance inflows in six selected ECOWAS countries. The appeal for these two estimators is based on their robustness in modelling dynamic relationships in heterogeneous panels, including PARDL. Essentially, the MG estimator allows the parameters, including the intercept, slope coeffi-

cients, and the variance of error, to vary across the cross-sectional units. On the contrary, the PMG estimator allows the intercept and short-run coefficients to be different across groups but restricts the long-run coefficients to be homogeneous. We also employed the [10] test to decide the appropriate estimator between the MG and PMG estimator for the PARDL. Apart from the MG and PMG, descriptive statistics were used in this study to analyse the distribution of each of the variables across the individual units over the time dimensions. In addition, we employed [16] unit root test and [24] cointegration test to ascertain the order of integration of the variables and evidence of long-run relationship among the variables. These tests were conducted at the 5% significance level using their associated test statistics.

4. Results and Discussion

4.1. Descriptive Statistics

The summary statistics, including the mean, standard deviation and minimum and maximum values of each of the variables, are presented in Table 2.

The descriptive statistics presented in Table 2 revealed that personal remittances as a percentage of GNI had a mean of 3.3404%, with a range of .0036% to 11.232%. The standard deviation of 2.8753 was less than the mean, indicating that personal remittance observations were concentrated around the mean. The results also showed that the financial access index and the financial depth index had means

of .1122% and .04459% respectively. This suggests that the overall degree of financial access exceeded the overall degree of financial depth within the six nations of the ECOWAS sub-region. The standard deviation indicated that depth observations clustered around the mean. The mean of the financial efficiency index was .52485%, with the lowest at .2372% and the highest at .8937% during the study period. Similarly, the mean financial development index for the period was .17368% with a standard deviation of .03903, which was less than the mean score, suggesting that financial development observations clustered around the mean. This explains why the countries in the ECOWAS sub-region displayed similarities in levels of financial development during the study period.

Table 2. Descriptive summary of the related variables.

Variable	Observation	Mean	Std. dev.	Minimum value	Maximum value
PER	198	3.3404	2.8753	.0036	11.232
FAC	198	.1122	.16324	.0060	.5075
FDE	198	.04459	.0221	.0083	.1116
FEE	198	.52485	.11419	.2372	.8937
OFD	198	.17368	.03903	.0843	.25688

Source: Authors' compilations (2025)

4.2. Panel Unit Root Test Results

As previously noted, the LLC method formed the basis for the unit root test. The test was conducted at the 5% level, and the results are presented in Table 3.

Table 3. Summary of LLC unit root test results for the variables.

Variable	Levels test results	1 st diff. test results	Number of panels	Order of integration
PER	0.2937 (0.6155)	-5.5929*** (0.0000)	6	I (1)
FAC	0.6341 (0.7370)	-1.8182** (0.0345)	6	I (1)
FDE	0.5926 (0.2767)	-4.4117*** (0.0000)	6	I (1)
FEE	-1.4808* (0.0693)	-7.247*** (0.0000)	6	I (1)
OFD	-1.2274 (0.1098)	-6.7871*** (0.0000)	6	I (1)

Source: Authors' compilations (2025)

Note: Figures in brackets are the corresponding probability values of the test statistics, while ***, ** and * imply statistically significant at 1%, 5% and 10%, respectively.

The findings revealed that none of the variables is stationary at the 5% level. This is evident because the probability values of the test statistics for each variable exceed 0.05 at the levels test results. However, the results revealed that the variables became stationary at the first difference. Therefore, we concluded they are of order one, I (1). The evidence of a first-difference stationary process in each of the series necessitated the conduct of the panel cointegration test.

4.3. Panel Cointegration Test Results

With evidence difference stationary process in the series, we proceeded to conduct the panel cointegration test using the Pedroni (1999) method. The results are presented in Table 4.

Table 4. Summary of the Pedroni cointegration test results.

Series: PER FAC FDE FEE OFD		
H0: No cointegration Number of panels = 6		
Ha: All panels are cointegrated Number of periods = 32		
Cointegrating vector: Panel-specific		
	Statistic	p-value
Modified Phillips-Perron t	0.8593	0.1951
Phillips-Perron t	-1.6108**	0.0536
Augmented Dickey-Fuller t	-1.7692**	0.0384

Source: Authors' compilations (2025)

Note: *** p<0.01, ** p<0.05, * p<0.1 denote significant at 1%, 5% and 10% level respectively

The Pedroni panel cointegration test results shown in Table 4 indicate that the probability values of the Phillips-Perron test statistic (-1.6108) and the Augmented Dickey-Fuller test statistic (-1.7692) are less than 0.05, leading to the rejection of the null hypothesis. Conversely, the Modified Phillips-Perron test statistic (0.8593) has a probability value of 0.1951, which exceeds 0.05, suggesting that the null hypothesis cannot be rejected. Since two out of the three test statistics support rejecting the null hypothesis at the 5% significance level, cointegration is confirmed. This implies that all panels are cointegrated, indicating a

long-run relationship between personal remittances and the development indicators of financial institutions. This finding aligns with previous studies [1, 9, 13], who reported that remittance inflows are cointegrated with the level of financial development in recipient economies.

4.4. Model Estimation

The PARDL model was estimated using MG and PMG estimators, and the results are summarised in Table 5.

Table 5. Summary of MG and PMG results.

Dependent variable: PER		
	(1)	(2)
Variables	MG	PMG
Ec	-0.437*** (0.151)	-0.363*** (0.138)
D. FAC	-214.5* (117.0)	-73.16 (57.40)
D. FDE	-142.0	-29.70

Dependent variable: PER		
	(1)	(2)
Variables	MG	PMG
	(101.4)	(35.63)
D. FEE	-96.36*	-26.26
	(55.78)	(16.27)
D. OFD	373.1*	104.4*
	(220.5)	(63.42)
FAC	630.7***	135.5
	(194.19)	(120.6)
FDE	519.9	16.20
	(458.5)	(109.9)
FEE	330.5***	36.25
	(82.08)	(69.99)
OFD	1,296**	-139.3
	(504.916)	(273.3)
Constant	-0.998	-0.147
	(1.228)	(0.452)
Observations	192	192
Hausman test results		
Chi-square statistic	27.41	
Probability value	0.000	

Source: Authors' compilations (2025)

Note: *** p<0.01, ** p<0.05, * p<0.1 denote significant at 1%, 5% and 10% level respectively

As explained earlier, the decision regarding the appropriate estimation method between the MG and PMG is based on the outcome of the unit Hausman test. Essentially, Hausman's test results indicated that MG is preferable because the p-value (0.000) of the chi-square statistic (27.41) is less than the 5% (0.05) significance level. This suggests that MG is a better estimator than the PMG method. Therefore, the results for model 3 are interpreted with a focus on the MG estimation method. The results showed that the coefficient (-0.437) for error correction is associated with the expected negative sign, which is significant at the 5% level. This finding indicates that the model can adjust from short-run to long-run equilibrium at a speed of 43.7%. This supports the presence of cointegration among the series over the study period. The findings from the MG estimator for model 2 also revealed evidence of negative effects of financial institution access and financial institution efficiency on personal remittances in the short run. This deviates from the initial expectation that financial development is essential for inflows of migrant remittances. Instead, this

highlights the ineffectiveness of financial institution access and efficiency in mobilising remittance inflows in the short term. Conversely, in the long run, the effects of financial institution access and financial efficiency on personal remittances are positive and significant. These long-term positive effects are encouraging as they support the theoretical expectation that the growth of migrant remittances is closely linked to the level of financial development in the recipient economies. This finding corroborates the results of [1, 6, 15], who reported that financial efficiency plays a key role in mobilising remittances to migrants' home countries.

Furthermore, the long-term positive contribution of financial access to remittance inflows aligns with the findings of [18], who identified improved access to financial services as a facilitator of diaspora remittance inflows. The results also showed that the depth of financial institutions has a negative and significant effect on personal remittances. This suggests that the size of the financial sector as a share of GDP has not significantly incentivised the growth of remittances within the

ECOWAS sub-region. However, evidence from the long-run results indicates a positive effect of financial institution depth. This aligns with the theoretical expectation that greater financial depth attracts remittance inflows and is supported by findings from [9], who reported a positive relationship between remittances and financial depth. This implies that increasing the share of monetary aggregates, such as broad money supply and private sector lending, can help boost capital inflows through personal remittances. The results also demonstrate that overall financial development has a positive and significant contribution to personal remittances in the long term, at the 5% level. These findings are consistent with those of [12], who highlighted the interrelationship between financial development and remittances in developing and transition economies. This suggests that gradual improvements in financial institution activities, such as providing better access to financial services, expanding size, enhancing efficiency, and ensuring stability, are crucial for mobilising diaspora remittances within the ECOWAS sub-region.

5. Concluding Remarks

The study explores the effects of financial development on remittance inflows to the ECOWAS region. This was motivated by the crucial role of a well-developed financial sector in attracting foreign capital from various sources, including remittances and aid. The findings indicate that the financial access index positively affects personal remittances in the long term. This suggests that greater access to financial services can encourage migrants to use formal channels for sending money to their home countries. Additionally, there is evidence of a long-term positive impact of the financial depth index on personal remittances. This means that the size of financial institutions relative to GDP acts as a positive signal for increasing remittances to the selected ECOWAS countries. Most importantly, the results show that overall financial development significantly boosts remittance flows. This suggests that comprehensive development of financial institutions—improving access, depth, efficiency, and stability—helps to motivate migrants to send money home. Based on these findings, we recommend that governments and monetary authorities within ECOWAS collaborate to promote financial development and expand digital financial services, providing a sustainable route for increasing remittance inflows.

Abbreviations

ECOWAS	Economic Community of West African States
ODA	Official Development Assistance
GDP	Gross Domestic Product
PMG	Pooled Mean Group

Author Contributions

Christopher Ifeanyi Ezekwe: Formal Analysis, Methodology

Evwienure Ibunor Agama: Conceptualization

James Enebeli: Data curation, Writing - review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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