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Nonlinear Impact of Remittances on Financial Inclusion in Developing Countries. Does Governance Quality Matter?

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Abstract

This paper explores the relationship between remittance inflows and financial inclusion in developing countries, emphasizing the crucial role of governance quality. Using dynamic panel data methods on data from 2011-2021 across 89 countries, the study reveals a nonlinear relationship between remittances and financial inclusion. We employed GMM approach to address endogeneity issues and mediation model analysis while using Stata software. Notably, remittance inflows have a negative impact on financial inclusion in countries with lower levels of remittances but a positive impact in countries with higher levels of remittances. Furthermore, the study demonstrates that the effect of remittances on financial inclusion is significantly mediated by governance quality. Good governance enhances the positive impact of remittances, transforming them into a powerful tool for promoting financial inclusion. Conversely, in countries with weak governance, remittances enhance financial exclusion by increasing mistrust in financial institutions. These findings highlight the need to improve governance structures to maximize the developmental potential of remittances.

Keywords: Remittances, financial inclusion index, governance quality, governance index.

1. Introduction

Remittance can be defined as the money sent by immigrant workers to their families in their home countries. Imagine a world; where sending money home to families in developing countries could be a game-changer, opening doors to financial inclusion (FI) and economic growth. Remittances have experienced a substantial increase over the past two decades. In many lower and lower-middle-income countries, remittances now surpass Foreign Direct Investments (FDI) as a share of GDP. For example, from 2011 to 2021, remittance flows to developing countries reached an impressive US$240 billion out of a global total of US$418 billion. By 2021, this figure rose to US$737 billion, with a

significant portion directed toward low-income countries. These figures highlight the critical role remittances play in the economic frameworks of these countries, making it essential to examine their impact on financial inclusion.

However, despite the rise in remittances to Low-Income Countries (LICs) and Lower-Middle-Income Countries (LMCs), many individuals in these regions continue to face significant barriers when it comes to accessing financial services (Chowdhury & Chowdhury, 2024). The process of moving beyond financing accessibility in many LICs and LMCs is beset by a number of challenges. Limited physical infrastructure like no bank branches in rural areas, little to no payment and settlement arrangement leads to non-access to financial networks. The gap is also compounded by systemic barriers which include the hurdles posed by complex regulatory environments, governance quality, and a lack of financial literacy.

Therefore, remittance's impact on financial inclusion depends on a more fundamental issue like governance quality in these countries (Barkat et al., 2023, 2024). So, whilst the rest of the world seems to have moved on to placing a higher focus on FI as one of the pillars that needs to be addressed to achieve true economic equality through society, understanding the barriers to its growth will be crucial. Thus, although remittances are influential at the macro level in countries they flow to, governance can be a powerful determining factor that restrains the potential of these flows in countries where remittances are significant.

This makes our paper important and relevant because it attempts to explain this relationship that have real-world significance. This research is crucial due to the widespread, persistent financial exclusion in many developing countries. While remittances pour in, millions of people do not have access to the formal financial system and thus lack the bank accounts they need to access services (Krumer-Nevo et al., 2017). This exclusion increases inequality, slows down economic growth, and weakens development policies. Our study aims to address this obstacle by investigating the role of governance in identifying policy options relevant to increasing inclusive economic development (Boachie et al., 2023).

Despite the significant flow of remittances into developing economies, where they often surpass foreign direct investments, the anticipated boost in financial inclusion doesn't always follow (Chami et al., 2012). It is interesting to analyze that countries with high remittance inflows are associated with low levels of FI, especially in lower and lower-middle-income countries. This challenge has troubled economists and policymakers alike, marking it as one of the most pressing concerns in development. The literature provides some evidence about how remittances can positively contribute to financial inclusion (Anzoategui et al., 2014; Ajefu & Ogebe, 2019) by providing cash for personal savings, lines of credit, and additional economic services. However, this positive effect doesn't always persist, especially in countries where governance is weak (Naceur et al., 2020). Ineffective governance leads to mistrust in financial institutions, as it fails to provide the necessary support and stability (Periola & Salami, 2024). This finding challenges the conventional wisdom that remittances inherently enhance FI, highlighting the critical role

of governance in this equation (Khan et al., 2024). Existing studies have explored how remittances affect FI, but there is a gap regarding the role of governance in this relationship; this study aims to fill that gap.

The aim of this study is to explore the role of governance quality in the relationship between remittances and FI. Perhaps the quality of governance holds the answer. Good governance characterized by transparency, accountability, and effectiveness can create an environment where remittances lead to meaningful FI (Saydaliyev et al., 2020; Khan et al., 2024). We use data from 2011-2021 from 89 developing countries (lower-income, lower-middle-income, and upper-middle-income countries) to explore these patterns and shed new light on this question. By employing a composite index of FI, we cover the different dimensions involved in accessing finance across various countries to capture how it evolves over time.

Therefore, guided by these insights, our research objectives are clearly defined to explore this complex relationship between remittance and financial inclusion and does governance quality matters in this relationship. This research seeks to investigate how remittance inflows lead to FI, particularly in lower, lower-middle, and upper-middle-income countries, and to examine the mediating role of governance. Through this exploration, we aim to provide a comprehensive understanding of these dynamics, offering conclusions that can inform both policy and practice, ultimately driving meaningful change.

Our research contributes to the literature on building a stable environment for remittances so they can mobilize resources and spur inclusive economic development by shedding light on this interaction. It provides new perspectives that are helpful from a policy point of view, especially for developing countries with significant governance issues.

Our findings have profound implications. Enhancing financial inclusion through remittances requires more than just facilitating money transfers; the governance quality must improve. Trust is essential for financial institutions to flourish, especially to create credibility so that remittances are not just received but successfully utilized. Highlighting this in our study represents a considerable step in the ongoing debate on how remittances, financial inclusion, and governance intersect.

2. Literature Review

Remittances play a significant role in enhancing financial inclusion (FI), particularly in developing countries. The influx of remittances provides households with additional income, which can lead to increased savings and greater engagement with formal financial institutions. For example, based on study with Bangladeshi migrant households, remittances play a significant role in the digital FI of the receiving families. Mannan (2023) found that there exist links between money and finance dimensions. Similarly, Ajefu & Ogebe (2019) identified that remittance inflows in Nigeria predict the probability of households having a bank account as funds create excess cash conditions favorable to savings deposits. The World Bank also found that individuals who report receiving

remittances are much more likely to use formal financial services such as deposit accounts and m-banking, creating a positive relationship (Virak & Bilan, 2022).

In addition, remittances ease liquidity constraints, thereby increasing the demand for savings instruments and making borrowing easier as they can be used as collateral (Yamada et al., 2021). This becomes especially important in contexts characterized by large remittance flows. A study conducted during the pandemic highlighted that mobile money apps could effectively distribute remittances, increasing access to financial services while reducing income disparities (Gatsi, 2020). Other research indicates that remittances channel resources into financial intermediaries, enhancing the financial status of both traditional and banked households (Naceur et al., 2020).

The quality of institutions is another way in which the dynamics between remittances and financial inclusion (FI) are influenced. Barket et al. (2024) examined the interaction of remittances and their transformative role in promoting SDGs and FI as possible mediators in developing nations. Drawing on data from 109 countries (2000–2022) and exploiting the strengths of robust econometric methods, such as the system GMM, the results show that remittances make a significant contribution to reducing poverty (SDG 1), food security (SDG 2), healthcare (SDG 3), and education (SDG 4). We also show that FI magnifies these effects by helping an optimal deployment of remittances in health, education, and entrepreneurship using a new index based on a principal components analysis (PCA). Nonetheless, labor disincentives, Dutch disease effects, and environmental issues (specifically Co_2 emissions) may undercut their effectiveness. However, the effects of remittances are appreciably stronger in more needy regions like Africa, and for poorer population groups, the study highlights the importance of government spending and policy alignment. It recommends strengthening financial infrastructure and exploring digital banking solutions to maximize remittance benefits. Despite limitations, the research provides valuable insights into leveraging remittances for sustainable development.

Similarly, Saydaliyev et al. (2020) pointed out that the availability of financial services benefits economic development through remittances, conditional on good governance. Besides, the results expose that stiff governance is very likely to intensify economic freedom and financial literacy influences in remittances corner on FI fewer lending a hand back toward increasing family unit dissemination (Muhammad et al., 2021). Additionally, government policies underscore the function of governance. For example, Arthur et al. (2020) explored the policies of the Kenyan government have a mediating role in remittances and financial inclusion relationship, implying effective governance can foster a better flow of remittances for upscaling its impact in promoting economic activity through increased integration with formal banking systems. This is in line with the argument of those who also assert that remittances can not only give a push to financial inclusion in low- and middle-income countries, but this effect happens especially when good governance structures facilitate growth Naceur et al. (2020). Similarly, remittances encourage bank account ownership by households as they create surplus cash that can be

deposited and allow for FI (Chinoda & Kwenda, 2019; Ajefu & Ogebe, 2019). This relationship is reinforced by the results of this study and by those who posit that remittances such as mobile applications significantly increase access to financial services, which is a fundamental element in achieving FI (Gatsi, 2020).

However, not all remittances exhibit a straightforward positive association with FI. A number of studies, including one by Issabayev et al. (2020), present an interesting and slightly more complex relationship where the outcome of remittances on FI is adverse in countries with smaller amounts of inflow, suggesting that effectiveness could differ depending upon local economic conditions. Additionally, Chami et al. (2020) claim remittances, as they decrease reliance on formal credit by the household levels, but meanwhile, erasing financial intermediaries' ability to capitalize on the market might put the quest for financial inclusion at stake.

3. Data and Methodology

3.1. Data

The data for this study is collected from the World Bank (WDI) and the International Monetary Fund (IMF). Analyzing remittance inflows to 89 countries, top global recipients from 2011 until 2021. The selection of countries was based on the availability of data and included low-income, lower-middle-income, and upper-middle-income levels. In this research, we focus on financial inclusion (FI) as the dependent variable. Control variables used in this research are Trade openness (TO), foreign direct investment (FDI), and government expenditure (Gexp). In this study, governance is taken as the average of six indicators: government effectiveness, political stability, rule of law, corruption, voice and accountability, and regularity quality. The governance index is taken as the mediating variable, and remittance is taken as an independent variable.

3.2 Financial Inclusion Index

To better understand financial inclusion (FI) in a country, there is no agreed index or value that comprehensively explains the true level of FI in a country. For our study, we used 12 indicators from 89 countries for the period 2011-2021 to make a FI index.

To find the best weighted collection of indicators that characterize our underlying structure, we will use a two-stage principal components methodology to quantify FI as an indexing strategy (Honohan 2008).

We initially estimate the FI dimensions, penetration, accessibility, and usability in the first stage of principal component analysis (PCA). We evaluate the component weights and the overall FI index in the second step, principal component analysis, using the dimensions as explanatory variables. PCA can process a large number of index variables with little impact from duplicate data.

First Stage PCA

As said before, the initial step of principal component analysis is to estimate the sub-indices of the three dimensions: penetration, accessibility, and usage. $(\gamma_i^p, \gamma_i^a, \gamma_i^u)$ in equations (1), (2), and (3).

$$\gamma_i^p = \beta_1 accounts_i + \beta_2 creditcards_i + \beta_3 debitcards_i + \mu_i \quad \textbf{(1)}$$

$$\gamma_i^a = \alpha_1 atm + \alpha_2 bankbranch_i + \mu_i \quad \textbf{(2)}$$

$$\gamma_i^u = \theta_1 deposit_i + \theta_2 savings_i + \theta_3 credit_i + \theta_4 borrower_i + \theta_5 digital_i + \mu_i \ \textbf{(3)}$$

Here, $(\beta, \alpha, \text{and } \theta)$ are the parameters to be estimated from the data and μ_i is the error term following classical OLS assumptions.

Second Stage PCA

$$FII_i = w_i\gamma_i^p + w_i\gamma_i^a + w_i\gamma_i^u + \mu_i \quad \textbf{(4)}$$

Where.

$FII_i =$ the composite FI index of the country i;

w_i = relative weight of each dimension.

γ_i^p = Penetration dimension.

γ_i^a = accessibility dimension.

γ_i^u = Usability dimension

3.3 Remittance and Financial Inclusion

This study used the Generalized Method of Moments (GMM) technique and, more specifically, a system GMM estimator for its panel data nature. The data sets consist of 89 countries, and the data ranges from 2011 to 2021, which potentially poses several classical endogeneity problems as well as requirements to control for unobserved country-specific effects (Raj & Baltagi, 2014). These issues are not encountered by the traditional panel data estimation techniques. As a result, the dynamic panel can be used here, which is recognized that the system GMM approach fits well for endogeneity problems and with country-fixed effects removed as it eliminates version-specific variation of coefficients.

This wide-ranging data set, paired with a large number of countries, enables a strong examination of the relationship between remittances and financial access, even holding constant variation across countries and over an extensive period. In this paper, we estimate the relationship between remittances and financial inclusion using a benchmark equation of Case 1, which is further amended for different equations.

Case 1

$$(FII_{it}) = \beta_0 + \gamma\, log(FII_{it-1}) + \beta_1 logR_{it} + X'_{it}\beta + \mu_{it} \quad \textbf{(5)}$$

This model aims to capture the relationship between the current FII and its lagged value, along with a remittance. R_{it} And other control variables. We are using the log in the model to explore how percentage changes in past FII and remittance affect FII.

Case 2

$$(FII_{it}) = \beta_0 + \gamma\, log(FII_{it-1}) + \beta_1 logR_{it} + \beta_2 logGOV_{it} + X'_{it}\beta + \mu_{it} \quad \textbf{(6)}$$

This model extends Case 1 by adding a governance variable (GOV_{it}) in logarithmic form. The goal is to assess how governance quality mediates the relationship between FII and remittance.

Case 3

$$(FII_{it}) = \beta_0 + \gamma \log(FII_{it-1}) + \beta_1 logR_{it} + \beta_1 logR_{it}^2 + \beta_2 logGOV_{it} + X'_{it}\beta + \mu_{it} \quad \textbf{(7)}$$

This model adds a quadratic term $logR_{it}^2$ to capture potential nonlinear effects of the remittance on FII_{it}.

Case 4

$$(FII_{it}) = \beta_0 + \gamma \log(FII_{it-1}) + \beta_1 logR_{it} + \beta_2 logGOV_{it} + \beta_2 log(R_{it} * GOV_{it}) + X'_{it}\beta + \mu_{it} \quad \textbf{(8)}$$

Considering the U-shaped relationship between This model builds on Case 3 by focusing on the interaction between economic indicators and governance. It is to analyze how the combined effect of R_{it} and GOV_{it} influences FII_{it}, it will help us explore whether good governance amplifies or dampens the effects of economic conditions on foreign investment.

Case 5

$$(FII_{it}) = \beta_0 + \gamma \log(FII_{it-1}) + \beta_1 logR_{it} + \beta_2 logR_{it}^2 + \beta_3 logGOV_{it} + \beta_4 log(R_{it} * GOV_{it}) + X'_{it}\beta + \mu_{it} \quad \textbf{(9)}$$

The concept of governance is derived from the work of Demetriades and Hook Law (2006), who assert that financial development is more efficient in middle-income economies when combined with high governance quality. This perspective allows for an assessment of the combined effects of remittances and governance. To examine the relationship between $(R_{it} * GOV_{it})$and FI, and to assess whether an increase in remittances, coupled with improved governance quality, results in enhanced FI (Ruiz et al., 2009). Case 5 combines all the previous elements, including the logarithmic transformation of variables, a quadratic term for $logR_{it}$, and the interaction term $(R_{it} * GOV_{it})$. It aims to fully capture the nonlinear dynamics and interactions between remittance, governance, and their combined impact on FII. This model provides the most detailed and nuanced understanding of the factors driving (FII_{it}).

For extending the study, we use mediation model analysis by following Malhotra et al. (2014), and we hypothesize that governance quality affects the relationship between remittances and FI. This suggests that the effect of remittances on FI is indirect and operates through the intermediary role of governance quality.

Prior research indicates that the impact of remittances on fostering long-term financial development intensifies with the enhancement of institutional quality in recipient countries. (Hamma, 2019; Ikpesu et al., 2022; Law & Azman- Saini, 2012; Ramirez, 2013). To check the marginal effect of how much governance quality enhances or decreases the remittance impact on FI, we take the partial derivative of the case 5 equation, and we get

$$\frac{\gamma \log(FII_{it-1})}{\beta_1 logR_{it}} = \beta_1 + \beta_3 logGOV_{it} \quad \textbf{(10)}$$

The sign of Equation 10

$$\beta_1 < 0, \qquad \beta_3 > 0$$

The signs in this study were expected to be highly statistically significant, thus suggesting a U-shaped relationship between remittances and FI. Intuitively, this further implies that for a small amount of remittance flows, there is not a huge demand for bank accounts.

4. Data Analysis and Results

4.1 U Test

The nonlinear link between real remittances and financial inclusion (FI) was evaluated using the U-shaped test given by Lind and Mehlum (2010) before the dynamic system GMM approach was applied in this study. The results from the test provide robust evidence supporting this nonlinear relationship. Specifically, the test identified an extreme point at 9.117527, and the hypotheses tested were whether the relationship was U-shaped (H_1) or monotone/inverse U-shaped (H_0). Since the p-value is below the 0.05 significance level, we reject the null hypothesis of a monotone or inverse U-shaped relationship and accept the alternative hypothesis, confirming the existence of a U-shaped relationship between FI and remittances.

The test results from the U-test indicate that the relationship between financial inclusion and remittances is indeed U-shaped. Initially, when remittances are low, they have a negative impact on FI. This is reflected in the negative slope and t-value for the lower bound. However, as remittances increase beyond a certain threshold (the extreme point), the impact becomes positive, as shown by the positive slope and t-value for the upper bound.

The U-shaped relationship means that within some levels of remittances, households would rather consume than save in financial institutions or deposit the money due to current needs. However, remittances grow and become more permanent in a household, proportionately increasing the savings of these funds in institutions, thereby improving FI.

The presence of this U-shape relationship also suggests that researchers and policymakers need to incorporate the money-metrics element in looking at whether compressing or expanding remittances has a positive/negative impact on FI. The promise of increasing

remittances for FI is, therefore, a longer-term one, and policymakers should know that the impacts will not be immediate until levels reach higher.

Table 1 shows the GMM results. A generalized Method of Moments (GMM) is employed to investigate these interactions, addressing potential endogeneity issues and ensuring robust findings.

Table 1: GMM Estimations of the Impact of Remittances on Financial Inclusion

	(1)	(2)	(3)	(4)	(5)
Variables	FII	FII	FII	FII	FII
L.FII	1.178***	1.310***	1.315***	1.311***	1.314***
	(0.00642)	(0.00119)	(0.00147)	(0.000906)	(0.00181)
REM	-0.0204***	-0.0938***	0.0193**	-0.0944***	0.0162*
	(0.00610)	(0.00241)	(0.00880)	(0.00292)	(0.00862)
REM^2			0.110***		0.117***
			(0.00549)		(0.00661)
GOV		0.0159***	0.0172***	0.0139***	0.00669*
		(0.00160)	(0.00163)	(0.00343)	(0.00371)
TO	-0.260***	0.0616***	0.00835	0.0610***	-0.0123
	(0.0391)	(0.0236)	(0.0219)	(0.0209)	(0.0243)
FDI	0.0388***	0.0281***	0.0309***	0.0273***	0.0325***
	(0.00918)	(0.00268)	(0.00436)	(0.00245)	(0.00688)
GOVEXP	0.136***	1.160***	1.089***	1.168***	1.118***
	(0.0214)	(0.0270)	(0.0309)	(0.0272)	(0.0303)
REM * GOV				0.00140*	0.00694***
				(0.000824)	(0.000949)
Constant	0.359***	-1.455***	-1.365***	-1.477***	-1.419***
	(0.0724)	(0.0642)	(0.0724)	(0.0598)	(0.0811)
AR(1)	0.0326	0.0642	0.0564	0.0638	0.0556
AR (2)	0.9408	0.8345	0.9198	0.8212	0.8786
Hansen test	0.181	0.3901	0.3638	0.3409	0.4437

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 1 shows the dynamic GMM regression results. The lagged dependent variable (L.FII) is statistically significant across all five models, suggesting that the dynamic system GMM is a suitable estimator, and the empirical findings are dependable for statistical inference. The coefficients for L.FII range from 1.178 to 1.315, showing strong persistence in financial inclusion over time. This suggests that countries with higher financial inclusion levels in the past are likely to maintain or even improve those levels in the future.

Results in Table 2, provide strong evidence of a complex relationship where the role of governance significantly mediates the impact of remittances on FI. The estimated regression coefficients of remittances (REM) in column (1) indicate a significant negative impact on FI, where a 1% increase in remittances leads to a 0.0204% decrease in FI. This negative relationship remains significant in model (2) with a larger magnitude (-0.0938%). This result is particularly evident in lower and lower-middle-income countries where governance tends to be weaker. The negative coefficient for remittances suggests that in these countries, remittance inflows may not be effectively channeled into the formal financial sector, potentially due to a lack of trust in financial institutions or the immediate consumption needs of recipients (Giuliano & Ruiz-Arranz, 2009; Brown et al., 2013). However, the positive effects of FDI and government expenditure indicate that external capital and public spending can provide the necessary support to improve FI, even in the face of weak governance.

In the second case, we introduced Governance (GOV) to examine its mediating role in transforming remittances into a positive force for FI. Though this negative effect is higher in the absence of good governance, its positive effect is enhanced in the presence of good governance. Findings show that governance greatly mediates the effect of remittances on financial inclusiveness. In weak governance countries, remittances may hinder financial inclusion possibly by curbing the effective use of the funds due to inefficiencies and/or corruption. Yet good governance continues to grow its fruits in this area, and it reveals its own retort that upon good institutions, remittances favorable effect on financial inclusion provided support.

Similarly, the shift from a negative to a positive influence of trade openness suggests that effective governance enables better integration into the global economy. The result implies that strengthening governance structures is crucial for transforming remittances into a positive force for FI and maximizing the economic benefits of global integration.

This result matches with Ruiz et al.(2009), they mentioned that financial development, when combined with strong institutions, can provide a substantial boost to these remittance benefits. Thereby, the transition from a negative to a positive impact of trade openness (TO) in favour of countries with stronger governance underlines the capacity to integrate into the world economy with higher remittance efficiency, through more financial inclusiveness.

At low levels, however, remittances seem to harm financial inclusion (FI) since the relative size may not be enough to access formal financial services (Calderón et al., 2008; Chami & Fullenkamp, 2012). However, larger remittances are usually beneficial, especially in the case of well governed countries. This result supports the belief that remittances can foster FI with increases in effective governance (Giuliano & Ruiz-Arranz, 2009; Mundaca, 2009). The implication of this result is that the effect of remittances on FI depends on both their magnitude and the quality of governance back home. Because remittances at low levels are not large enough to encourage the use of formal financial services, they then do not

contribute to a significant increase in FI. On the contrary, when above-average remittances flow are received and the country has sufficient governance, remittances achieve doing well to financial inclusion as they entice people to use formal settlers as well.

The lack of a significant role for trade openness in this context implies that strengthening domestic institutions should be prioritized over simply pursuing global economic integration. This limited effect on the other hand underlines that trade openness then has a small role in enhancing FI, which implies that merely opening up to the world economy is not sufficient to enhance FI. It ought instead to highlight the need for more robust domestic institutions and governance. Hence, effective governance is crucial to tap the best out of remittances to achieve financial inclusion rather than mere reliance on trade liberalization by the policymakers.

The fourth case, meanwhile, points to a more potent interaction between remittances and governance (REM * GOV), demonstrating the need for clear institutional structures as well in order to limit any negative effects of remittance flows. The result indicates that good governance is a key in taking advantage of the positive impact of remittances on the economy of a country. Good institutional setups allow remittances to enter formal financial channels instead of using informal channels. It will promote FI by adding a number of people who use the formal financial services, bank or credit institutions. With increased remittance deposits in more formal accounts, more of that money is available to the financial sector for investment and for lending — generating economic growth. Thus, an improved quality of governance allows countries to capture the full developmental gains of the remittance flow, making their economies stronger and more inclusive. This finding is supported by the results from Law and Azman-Saini (2012), who argue that governance quality is important in enhancing the positive developmental impacts of remittances, mostly due to its roots in the economic activities of the informal sector. Higher quality of governance ensures that remittances are stored in formal financial accounts (lifting the inclusion levels). Furthermore, the importance of FDI and government expenditure continues to suggest that they play a complementary role in promoting FI, provided governance remains sound.

Finally, in model five, we find this U-shaped relationship between remittances and financial inclusion one more time, but it is much stronger when governance quality interacts with the flow of remittance ($Rit * GOVit$). These results draw attention to the central role of governance in establishing a remittance that can drive financial inclusion, especially as their scale increases (Ambrosius & Cuecuecha, 2013). The results show that if countries are well-governed, remittances can potentially change from a weakness to an economic strength and financial inclusion powerhouse. Furthermore, the insignificance of trade openness emphasizes that remittances alone are not the silver bullet to boosting domestic revenue, and so institutional reforms at home will be necessary before a country can fully cash in on external income.

4.2 Mediation Model Analysis

Table 2 shows the result of the mediation model analysis. To verify the governance mediation role between financial inclusion (FI) and remittance, we use mediation model analysis as described by Malhotra et al. (2014). Mediation analysis helps us disentangle the total effect of remittances on FI into a direct effect where remittances directly improve FI and an indirect effect where remittances improve governance, which in turn enhances FI. This breakdown allows us to understand how remittances affect financial inclusion both on their own and through their influence on governance.

Table2: Mediation Model

FII	Coefficient	Robust		P>|t|	95% Conf. interval	
		Std. Err.	z			
POmeans						
Y0M0	-0.135	0.061	-2.190	0.028	-0.255	-0.014
Y1M0	-0.382	0.191	-2.000	0.045	-0.757	-0.008
Y2M0	0.113	0.135	0.830	0.404	-0.152	0.377
Y0M1	-0.454	0.185	-2.460	0.014	-0.816	-0.093
Y1M1	-0.702	0.248	-2.830	0.005	-1.187	-0.216
Y0M2	0.184	0.112	1.650	0.098	-0.034	0.403
Y0M2	0.432	0.147	2.950	0.003	0.145	0.719
NIE						
(1 vs 0)	-0.319	0.140	-2.290	0.022	-0.593	-0.046
(2 vs 0)	0.319	0.139	2.290	0.022	0.046	0.592
NDE						
(1 vs 0)	-0.247	0.153	-1.610	0.107	-0.548	0.053
(2 vs 0)	0.247	0.153	1.610	0.107	-0.053	0.548
PNIE						
(1 vs 0)	-0.319	0.140	-2.290	0.022	-0.593	-0.046
(2 vs 0)	0.319	0.139	2.290	0.022	0.046	0.592
TNDE						
(1 vs 0)	-0.247	0.153	-1.610	0.107	-0.548	0.053
(2 vs 0)	0.247	0.153	1.610	0.107	-0.053	0.548
TE						
(1 vs 0)	-0.567	0.194	-2.920	0.003	-0.947	-0.186
(2 vs 0)	0.567	0.194	2.920	0.003	0.187	0.947

The mediation analysis to explore the relationships among these variables uses three levels of the independent variable (representing remittances): 4, 8 (control), and 12. The model's goal is to understand how changes in remittances impact FI directly and indirectly through governance. The robust standard errors provided ensure the reliability of the results.

The potential outcome represents the expected financial inclusion (FI) outcomes when governance (the mediator) remains at its reference level while remittances vary. The results indicate that a lower level of remittances (remittance = 4) is associated with a significant negative impact on FI (Y1M0 = -0.382, p=0.045p=0.045p=0.045). This result is consistent with the findings of (Issabayev et al., 2020) observed negative effects of remittance inflow on financial inclusion under low levels of remittance, further highlighting the role of remittances in enhancing access to financial services.

However, when remittances are high (Remittance = 12), the impact on financial inclusion (FI) becomes positive (Y2M0 = 0.113), though not statistically significant. This suggests that remittances alone, without considering governance, might have a mixed impact on FI. When governance is considered, the impact of remittances on FI changes significantly. For instance, Y1M1 shows a significant negative impact (-0.702, p=0.005p=0.005p=0.005) when remittances are low, indicating that poor governance intensifies the negative effect of low remittances on FI. This result is aligned with the study of (Ogede et al, 2023) who used governance as a mediating variable between remittance and FI, and stated that weak governance structures prevent remittance from enhancing financial access, Conversely, high remittances combined with better governance (Y2M2) show a significantly positive impact on FI (0.432, p=0.003p=0.003p=0.003).

The natural indirect effect (NIE) represents the portion of the effect of remittances on FI that is mediated by governance. The results indicate that when remittances increase from a low (Remittance = 4) to a control level (Remittance = 8), the mediated effect through governance is significantly negative (-0.319, p=0.022p=0.022p=0.022). This suggests that poor governance diminishes the potential positive impact of remittances on FI. The result corroborates (Williams, 2016) finding that remittances have the ability to improve FI through access (due to the provision of more resources for the households which expand the demand for formal financial services such as bank accounts and demand savings products).

However, when remittances increase from the control to a high level (Remittance= 12), the NIE becomes significantly positive (0.319, p=0.022p=0.022p=0.022), indicating that governance plays a crucial role in translating higher remittances into better FI outcomes.

The natural direct effect (NDE) reflects the effect of remittances on FI that is not mediated by governance. The results indicate that the direct impact of remittances on FI, without considering governance, is not statistically significant at both low and high levels of remittances. This finding suggests that governance is a critical factor in the remittance-FI relationship and ignoring it may lead to underestimating the true impact of remittances. The outcome is consistent with the outcome of (Saydaliyev et al., 2020), suggesting that remittances have a strong positive relationship in FI, whereas the strength of the relationship is dependent on the governance quality and structures.

The total effect (TE) integrates direct and indirect effects. The total effect of remittances on financial inclusion is found to be significantly negative at total remittances of (4) for total remittances of (8) (-0.567, p=0.003p=0.003p=0.003).

However, increasing remittances from the control to a higher level (remittance = 12) has a significantly positive total effect (0.567, p=0.003p=0.003p=0.003). This underscores the need to go beyond just policy thinking and focus also on governance, to ensure higher remittances result in improved FI. This finding is consistent with the finding of the study (Virak & Bilan, 2022), which concluded that remittance inflow increases the probability of formal financial service usage by households, such as bank account and mobile banking. The proportion mediated tallying around 0.563 with a z-statistic demonstrates the large effect of remittances on FI is mediated by governance ($p < 0.001$) – over half of the total effect is mediated by governance. It highlights the importance of governance in turning remittances into real progress in terms of financial inclusion.

The positive NIE for remittance at higher levels of governance indicates its importance. Under good governance, remittances lead to FI by ensuring that the population has access to and is able to affordably use financial services in as wide a manner as possible (Qamruzzaman, 2023). This is consistent with theoretical predictions in economics about the importance of institutions for economic growth, suggesting that well-developed ones can help foreign financial inflows such as remittances stimulate inclusive development.

Table 4 presents the robust analysis of our mediation model, focusing on how governance mediates the relationship between remittances and financial inclusion.

Table 3: Robustness of Mediation

Proportion	Std error	z	P>|z|	95%	Conf interval
0.563	0.197	2.850	0.004	0.176	0.950
0.563	0.197	2.860	0.004	0.177	0.950

The estimated proportion mediated is 0.563, indicating that approximately 56.3% of the total effect of remittances on financial inclusion (FI) operates through governance. The standard error is 0.197, and the z-statistic is 2.850, with a p-value of 0.004. The 95% confidence interval ranges from 0.176 to 0.950, confirming that the mediated effect is statistically significant and does not include zero, thereby reinforcing the reliability of our findings. The findings suggest that governance plays a crucial mediating role in translating remittance inflows into increased FI. While remittances provide additional financial resources to recipients, effective governance ensures that these funds are channeled through formal financial systems, thereby expanding access to financial services. That is highly relevant for the purposes of policy related implications as well. Governance structures that are better, for example, higher regulatory quality, more political stability, and reduced corruption, can strengthen the ways in which remittances are beneficial for FI. Policymakers can utilize remittance flows to achieve broader economic development goals and reduce poverty levels, by creating an environment conducive to the efficient functioning of the financial institutions that mediate these inflows. These

findings have been confirmed in previous literature stressing the role of governance in increasing the effect of remittances on FI (Aggarwalet al., 2011). Specifically, remittances exert a positive impact on the development of financial sectors, which tends to be larger in magnitude in countries with more robust institutional settings and more effective governance. In the same vein, Gupta et al. (2009) showed that remittances foster financial development much more when governance is good.

Figure 1 shows the marginal impact of remittance on financial inclusion (FI) at different values of governance using a margin plot in Stata. In the figure, the predictions of FI across levels of remittances (logREM) and governance (loggav) are adjusted. LogREM is the logarithm of remittances, and it ranges from -3 to 1.9 (horizontal axis). The y-axis represents the linear prediction of FI under a model. Each line, color-coded, represents the predicted proportion of FI at a given governance level, ranging from governance=-1 (blue line) to governance=5 (purple line).

From the figure, some important takeaways are that all lines have an inverse relationship (negative slope), which means that as remittances increase, financial inclusion (FI) tends to decrease. It is in line with our regression output, which shows a negative coefficient of remittance. The figure also shows that lines with higher values of governance (governance=1, purple line =5) stack above those with lower values (e.g., governance =-1, represented by the blue line). This implies that higher levels of FI are linked with better governance amidst growing remittances.

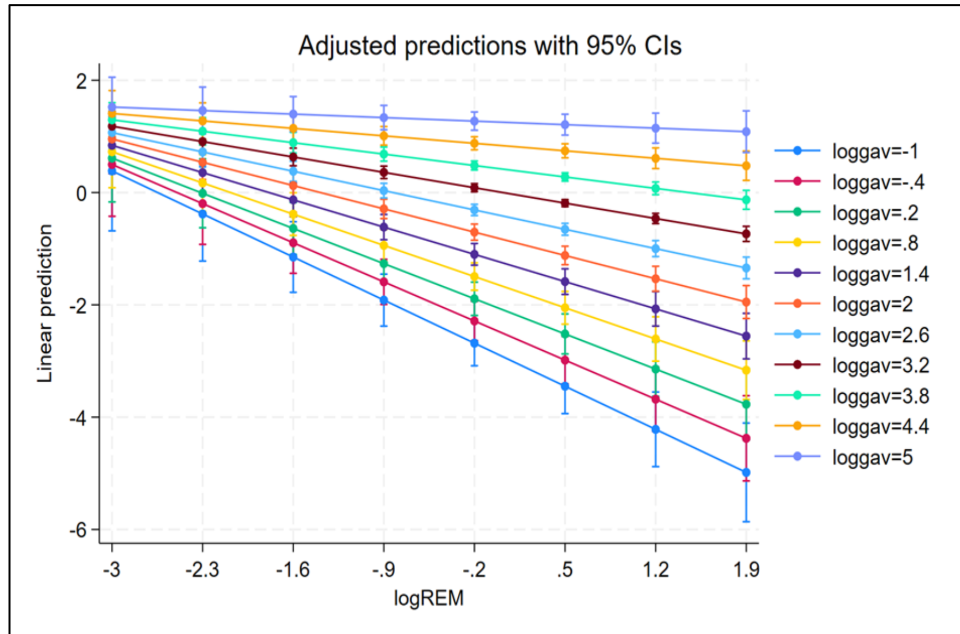

Figure 1: Marginal Impact of Remittance and Governance on Financial Inclusion

The interaction effect shown in the graph is that a higher quality of governance mitigates the negative influence of remittances on FI. Improved governance means a slower decline in FI associated with higher remittances, i.e., the lines are flatter as the governance level increases. Collectively, findings suggest that remittances tend to have a negative effect on FI, but this impact is significantly reduced in a better governance environment. Better governance is positively associated with higher levels of FI as well and affects mostly the adverse impact that remittances may have. This interaction is represented by the flatter lines in high governance scenarios (as a result of lower costs and higher benefits) than these shown improvement with increased remittances with regard to low governance quality scenarios.

5. Discussion and Implications

The results of this study explored the role governance plays in linking remittances to financial inclusion and provided fresh evidence that neutralizes conventional wisdom in literature. This explains that the nexus between remittances and financial inclusion is not linear but is affected by governance quality. As a result, this detailed understanding affects academic discussions and is also useful for policymakers and development workers.

In the first place, there is evidence of a 'U-shaped' relationship between remittances and FI, especially in low- and lower-middle-income countries, so one could conclude that remittances negatively affect financial inclusion at an early stage. Potential reasons for this are a lack of trust in local institutions or because the primary focus is receiving financial support, often resulting in low useability of formal financial services. This evidence is consistent with the works of Calderón et al. (2008) and Chami et al. (2012), who explained the role of governance in promoting financial inclusion through remittance. In simple terms, the government should work on reducing corruption and the rule of law. This will build trust in financial institutions and encourage people who receive money transfers to use them as intended.

The results also show that effective governance can turn remittances from merely a financial return to a much stronger force for inclusion, especially as the volume increases. This finding confirms some of the results arrived at by earlier studies of Giuliano and Ruiz-Arranz (2009), as well as Mundaca (2009), who suggested that poor institutions can lower transnational signals for development to affect remittance. This translates to the fact that increasing transparency, decreasing corruption, and building institutional capacity in financial institutions is key for countries looking at remittances as a tool in broader financial inclusion efforts.

Further, the strong interaction between remittances and governance underlines that not all countries are conducive to acquiring the benefits of remittances. Instead, they rely on well-functioning institutions to use remittance inflows in the formal sector of the economy. Therefore, this finding is in line with Law & Azman-Saini (2012) and Ramirez (2013), who state that the quality of institutions crucially matters for economic development. For

policymakers, the obvious lesson is that attracting remittances to a country requires much more than simply controlling corruption.

The mediation analysis highlights the relationship between remittances and governance, as well as financial inclusion in general. This emphasizes that remittances do not directly impact financial inclusion as they require good governance to deliver outcomes. The consideration of these factors is, therefore, inescapable for remittance-friendly policy to help shape broader-based economic development goals (Malhotra et al., 2014).

This study has broader implications than the academic and can provide policy recommendations for countries that are recipients of remittances. To maximize the potential of remittances, we need to create an environment where people have trust in financial institutions and use the financial services that drive financial inclusion. This includes both the governance side and making sure that financial institutions are available, affordable, and trusted by the population. Policymakers can use this framework to focus attention and resources on the weakest links in their remittance corridors, turning an informal flow of money into a zone for vibrant economic development processes that include everyone.

5.1 Conclusion

This study adds significant evidence on the complex effect of remittances and government quality in FI. The key results suggest that remittances can raise FI, but there are important differences in how far this is the case depending on governance quality. More directly, the study uncovers a U-shape linkage between remittances and FI, starting with negative effects in low-governance environments but gradually switching to positive roles with better governance.

The results of this paper aim to enrich the present literature by providing new insights into how governance plays an important role in mediating the relationship between remittances and FI. In short, the findings indicate that governance quality is needed to further facilitate a more positive impact of remittances on FI. This strengthens the case for governance reforms as a crucial component of policy actions to enhance the development impact of remittances.

The positive outcomes of the study will be twofold, it not only provides empirical evidence on how governance mediates remittances and financial inclusion but also helps gain a deeper understanding of this relationship. Second, it provides policy suggestions based on empirical evidence that underlines the need to reinforce governance structure in order for remittance impact to be optimal.

This study demonstrates the role of governance in influencing remittances on financial inclusion. To influence governance structures that facilitate remittance flows to be formalized into the financial systems. In doing so, they will have converted remittances into an effective weapon for financial inclusion and inclusive economic growth.

5.2 Limitation and Future Research Direction

This study examines the relationship between remittance inflows, governance quality, and financial inclusion across 89 developing countries from 2011 to 2021. While it provides significant insights, there are areas where future research could further enhance our understanding of these dynamics. While this research offers a broad analysis across multiple countries, it does not conduct in-depth case studies of individual countries. Future studies could focus on country-specific or regional analyses to uncover contextual factors influencing the relationship between remittances, governance quality, and financial inclusion. Qualitative approaches could complement the quantitative findings, providing a more comprehensive understanding of local conditions and challenges. Moreover, another area not considered in this study is the role of digital currencies and cryptocurrencies in financial inclusion. With the rise of these technologies, future research could investigate their potential effects on remittances and financial inclusion.

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