Leveraging Remittances for Financial Inclusion: Empirical Evidence

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Abstract: Access and use of sustainable finance is pitched as an important factor for an inclusive economy. Remittances on the other hand have been a strong force for development, allowing easy access and use of financial products and services in low and medium income countries. Panel data from 2010-2020 was used to determine the nexus between financial inclusion and remittances. System Generalised method of moments was employed to examine the deterministic relationship between remittances and financial inclusion. For the financial inclusion index used in the study was constructed using the principal component analysis. Four financial inclusion indicators related to dimensions of financial inclusion that measure access and usage of financial services were used to develop the index. The results show that remittances can enhance the inclusivity of the financial sector. However as more remittances are received they do not aid the access and use of the formal financial services. Rather for the sample of countries in our study as more remittances are received there is less inclusion of the formal financial sector. Furthermore the inclusiveness of the financial sector is also contingent to the indicator used in measuring either access or use of the financial services.

1. INTRODUCTION

Financial inclusion is positioned to be an enabler for the realisation of the broader Sustainable Development Goals (SDGs) United Nations Capital Development (UNCD) (no date). The Bank of International Settlement (2022) opined that remittances are a primary financial service used by migrants and their families, consequently providing a point of contact with the financial sector that can be leveraged to encourage access and use of other financial services. Since the integration of financial inclusion in the development agenda by the G20 in 2013 it has increased in its importance in low and middle income countries. For the 17 Sustainable development goals financial inclusion is pinpointed as a target in eight of the SDGS (United Nations, 2022) acknowledging that it is an enabler of economic development. These goals include the eradication of poverty; ending hunger, achieving food security and promoting sustainable agriculture; health and well-being; achieving gender equality and economic empowerment of women; promoting economic growth and jobs, supporting industry, innovation, and infrastructure and reducing inequality among others (United Nations, n.d). The target of "*Strengthening the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all*" is a key element to enable the achievement of most of the SDGs using remittances.

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Greater financial inclusion can be achieved through better savings mobilization for investment and consumption which in turn are incentives for economic growth (Kabakova & Plaksenkov, 2018). Progress in the sustainable development goals is achieved when people have better access and use of affordable, effective and safe financial services (World Bank, 2018). In low and medium income countries the advancement of sustainable development goals is hindered by the exclusion from accessing and using formal financial products and services (World Bank, 2022). Naceur, Chami and Trabelsi (2020) argued that at lower level of financial inclusion remittances act as a substitution to formal financial inclusion. It is also argued that high remittance inflows create opportunities for formal financial institutions to design financial products and services to harness remittances recipients to access and use formal financial products and services as remittances become regular (African Development Bank, 2012, BIS, 2022).

Literature on the remittance-financial development nexus, empirically argued that remittances can be a substitute for finance to spur economic growth and or it can complement finance (Inoue, 2018, Naceur, 2020). However, the macroeconomic perspective on financial inclusion-remittances nexus is an ongoing debate as there are improvements in data availability on the financial inclusion measurement for cross country studies. Migration-related Sustainable Development Goal (SDG) indicators are centred on increasing the volume of remittances as a percentage of gross domestic product (SDG indicator 17.3.2) and reducing remittance costs (SDG indicator 10.c.1). Remittance receipts in most low and medium income countries are an essential source of capital for

many low-income households (Knomad, 2022). Therefore this study examines the links between financial inclusion and remittances. Can remittances enhance financial inclusion? The broader empirical literature that is available is on remittances and financial development, remittances-growth nexus, remittances-poverty or inequality nexus. There is limited literature on remittances-financial inclusion nexus.

Due to the nature of remittance, that they reduce poverty and inequality (Adams, 2004, Ratha, 2013; Magwedere, Chisasa and Marozva, 2021), promote innovation (Yang, 2008; Cuadros-Meñaca, 2020) and spurring growth (Chami et al., 2015; Meyer & Shera, 2017) among others, there is a strong policy interest in enabling the affordability, reliability and accessibility of remittances receipts through the formal financial sector. It is the aim of this study therefore to examine the nexus between remittances and financial inclusion. Therefore, this study contributes to the empirical literature on remittances-financial inclusion nexus. In most low and medium income countries most remittances are not formally captured as the funds enters the country through the informal markets due to the bottlenecks in the formal financial markets (Knomad, 2022). There are financial barriers that prohibit the access and use of affordable financial services in most low and medium income countries (Kokorović Jukan, Okičić & Hopić, 2020). Previous studies that have connected remittances to finance have centred more on financial development than the aspect of financial inclusion focusing on access and usage of the financial sector (Aggarwal, Demirgüç-Kunt, and Martínez Pería, 2011; Cooray, 2012; Barajas, Chami, Ebeke & Oeking, 2018). There is no empirical consensus on the nexus between financial inclusion and remittances

The International Monetary Fund (no date) opined that financial inclusion is an essential aspect of financial development and the purpose of this study is to examine financial inclusion aspect on whether remittances enhance financial inclusion. As highlighted earlier the financial inclusion aspect was only adopted by the G20 as a developmental aspect in 2013. Studies that have argued on the determinants of financial inclusion in low- and medium income countries focused mainly on education, gender and age and income among others (Allen, Demirgüc-Kunt, Klapper & Martínez Pería., 2016; Demirgüc-Kunt & Klapper, 2012; Zins & Weill, 2016) and few focused on remittances as a determinant of financial inclusion at macrolevel (Aggarwal et al., 2011; Naceur, Chami & Trabelsi, 2020). At micro level Anzoategui et al (2014) and Aga and Martínez Pería (2014) found that household receiving remittances are most likely to open a bank account for Salvador and five Sub-Saharan Africa countries respectively.

This paper provides a contribution to the emergent literature on financial inclusion- remittances nexus with a focus on African countries. In Africa, remittances are an important financial lifeline with a significant contribution as a share of gross domestic product in some countries. The study contributes to the debate on linking migrant remittances to financial inclusion. Contrary to other studies, this study takes a broader view of financial inclusion by comprehensively investigating the two major dimensions of financial inclusions: *access* and *usage* of financial services and products.

Wang and Guan (2017) argued that analysis of financial inclusion proxies in silos does not provide sufficient information therefore in this article, over and above the analysis of individual proxies a financial inclusion index was developed to accounts for both dimensions. Moreover, this study account for minimum threshold that is required to influence financial inclusion. The finding of this study was that remittances increase the demographic outreach of bank branches and the opening of deposit accounts. The number of borrowers only increased when remittances were squared suggesting that the borrowing from formal institutions occurs when a certain threshold of remittances is reached. It is therefore essential for policy makers to understand the specific dimension of financial inclusion that they want to achieve for their respective economic ecosystem such that remittances can ai the inclusivity of formal financial sector.

The rest of the paper is organised as follows: Section 2 is review of literature on remittances and financial inclusion while the section 3 of the paper is the methodology where the data and empirical models are described. The fourth section discusses the empirical findings of the study whilst the conclusions and policy implications are in section 5.

2. LITERATURE REVIEW

Low and medium income countries have financial access barriers mainly due to information asymmetry and other financial blockades (Beck, Demirgüç-Kunt & Levine, 2007; Tchamyou, 2020). In market imperfections, underprivileged individuals who receive remittances uses remittances to overcome liquidity limitations that restrict their access to formal loans to finance investment in physical and human capital (Calero, Bedi & Sparrow, 2009; Nacuer et al., 2020). The asymmetric nature of the financial markets in low and medium income countries argue for "the substitutability hypothesis" between remittances and financial inclusion (Bettin & Zazzaro, 2012; Inoue, 2018). Thus, remittances enable receivers to attain additional income, which in turn support recipients to overcome liquidity constraints and compensate for inefficiencies or non-existence of formal financial products and services that cater for the low income households (Ramirez, 2013). Alternatively, "the complementarity hypothesis" adopts that an advanced financial system attract more remittances to the formal financial sector by lowering remittance sending transaction costs (Lartey, 2013; Abida & Sghaier, 2014; Inoue, 2018).

Aggarwal et al. (2011); Cooray, 2012 and Barajas et al., 2018) among others argued that remittances contribute to the financial sector development. Remittances contribute to the financial sector development through increased savings and the provision of loanable funds to the private sector using the financial intermediation process (Naceur et al. 2020). However financial sector development does not necessarily mean an inclusive financial sector (Anzoategui, Demirgüç-Kunt and Martínez Pería, 2014,Magwedere et al., 2021). Naceur et al. (2020) argued that the amount remittances as a percentage of the gross domestic product determine the inclusiveness of the financial sector. In countries with lower level of remittance-to-gross domestic product remittances can lead to financial exclusion as remittances act as a substitute to formal financial channels (Inoue, 2018; Nacuer et al., 2020). How-

ever, in countries with higher remittance to the gross domestic product, remittances complement access and usage of formal financial services (Naceur et al., 2020). Thus, the role of remittances in enhancing financial inclusion is not conclusive as some argue remittances can be used to finance consumption expenditure by receiving households with no effect to the formal finance (Barajas et al., 2018).

At higher levels of remittance-to-GDP, households' formal savings increases formal financial intermediation (Naceur et al., 2020). Kokorović Jukan et al. (2020) found that remittances are a stable source of finance and they increase savings and improve the financial inclusion of remittance recipients in South East Europe. Inoue and Hamori (2016) argue that remittances improve access to the financial sector only if the previously unbanked households formally bank the remittances receipts in the formal sector. Remittances can also enhance financial inclusion in that formally banked remittance income improves the borrowing capacity of individuals as they can provide financial information on the additional sources of income of remittance receiver (Ambrosius & Cuecuecha, 2016; Kokorović Jukan et al., 2020).

However, Anzoategui et al. (2014) found that despite remittances enhancing use of deposit accounts in El Salvador they did not increase the demand and use of credit from formal financial institutions. Furthermore, Kokorović Jukan et al. (2020) argued that remittances provides other sources of income and reduces the borrowing (credit) needs of remittances receivers. Consequently, the increase in the income of remittance recipients improves their eligibility of financial products and services as the remittances income act as a buffer to economics shock of the remittance recipients (Asongu & Odhiambo, 2021). Remittances also increases formal banking deposits as the liquidity status of remittances recipients' improves they are likely to use the formal banking services to bank excess liquidity thereby increasing the bank deposits (Barajas et al., 2018). Furthermore remittances are said to improve the network of bank branches in low and medium income countries and they increase the bank deposits t (Anzoategui et al., 2014, Aga & Martínez Pería, 2014). For a Mexican study on the role of remittance, it was found that remittances were significant and positively correlated to bank breadth and depth in Mexico (Demirgüç-Kunt, Lopez-Córdova, Martínez Pería & Woodruff, 2011).

Thus from the literature the financial inclusion-remittances nexus is inconclusive and remains an empirical argument. Section 3 discusses the methodology to which was used in this study to quantitatively determine financial inclusion-remittances nexus.

3. DATA AND METHODOLOGY

Data

Annual panel data for 18 countries in Africa from 2010-2020[1] was used to determine the nexus between remittances and financial inclusion The choice of the countries included

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[1] Countries included in the sample based on data availability for all the variables include: Algeria, Burundi, Cameroon, Comoros, D.R Congo, Egypt, Eswatini, Ghana, Guinea, Kenya, Lesotho, Madagascar, Mozambique, Namibia, Rwanda, Seychelles, Tanzania and Uganda

in the study and the equivalent period of study were reliant on data availability constraints at the time of the study. The study could not be extended to a period prior to 2010 as the data used for the financial inclusion variables which measures the usage of financial services was not available for most of the countries for a broader cross country study. Subsequent to Beck, Demirguc-Kunt and Martinez Peria (2007) and Wang and Guan (2017), two dimensions for financial inclusion (FI) were adopted namely access and usage.

Access to financial services was the first dimension considered where an indicator of demographic penetration of financial services was considered. Measures of demographic penetration of bank branches and automatic teller machines (ATMs) were adopted according to the International Monetary Fund (IMF) financial access survey (FAS). The first indicator of the financial sector outreach is the number of branches of commercial banks per 100,000 adults (Branches) and the second is the number of ATMs per 100,000 adults (ATMs). Usage of financial services was the second dimension considered for this study and two indicators were considered namely the deposit accounts with commercial banks per 1,000 adults (*Deposits*) the number of borrowers at commercial banks per 1,000 adults (*Borrowers*). The definition, description and the data sources of the variables used in this study are summarised in Table 1. A summary of Table of the financial inclusion dimensions and measures is in the appendix. Wang and Guan (2017) argued that just considering a single measure of financial inclusion is not sufficient as the indicators provide complete information if they are used together. Hence the principal component analysis was used to develop an index for financial inclusion and regressions were run for each singe index and for the financial inclusion index for robustness of the results. Definition of the variables and data sources are summarised in Table **1**.

Table 1. Variable Definition and Data Sources.

Variable	Definition /Measurement	Source	Expected Sign
Financial Inclusion	the proportion of individuals and firms that use financial services	International Monetary Fund (FAS)	
Remittances (REMIT)	Personal remittances, received (% of GDP)	WDI	Positive (+/-)
Economic growth (GDPG)	Annual GDP growth	WDI	Positive (+)
Trade	imports plus exports, in percent of GDP) as a proxy for trade openness	WID	Positive (+)
Inflation (INF)	Percent change in consumption price proxied by inflation (annual %)	WDI	Negative (-)
Savings rate SAVR	Gross savings (% of GDP)	WID	Positive (+)

The number of variable included in the study was also considered contingent to the methodology used as more variables could result in instrument proliferation. Thus, a choice between controlling for variable omission bias and estimating a model that is robust to instrument proliferation was considered (Bruno, De Bonis & Silvestrini, 2012; Asongu and Odhiambo, 2020). The use of a limited number of control variables in this study was to limit the instrument proliferation.

Estimation Technique

Using the system generalised method of moments, the relationship between financial inclusion and remittances was examined. The Arellano and Bond (1991) method was applied since it addresses the endogeneity issues and bias emanating from the correlation between the lagged dependent variable and fixed effects in the error term. Since the number of cross sections is more than the number of years for this panel the system GMM is the appropriate approach (Tchamyou, Asongu and Nwachukwu, 2018). This method further permits relaxing the assumption of strong exogeneity of the explanatory variables by allowing them to be correlated with current and past realisations of the time-varying error term. A mixture of internal instruments were used in line with Arellano and Bond (1991), which is suitable for lags of the explanatory variables, along with external instruments for the variables of interest. The diagnostic estimations for time series and cross-sectional studies were performed before estimating the model using the system GMM. Sargan (1958) and Hansen (1982) were performed for the validity of the instruments and the over-identifying restrictions. The Arellano-Bond test was applied to check for correlation of the error terms that assure the effectiveness of the results (Arellano & Bond, 1991; Windmeijer, 2005; Roodman, 2009). The system GMM estimator does not require the use of external instruments other than the variables already incorporated in the dataset hence it was adopted for this study. There are likelihoods of endogeneity in the explanatory variables hence the study also tested for cross-section dependence. The nexus between financial inclusion and remittances was investigated through 5 equations where the proxies for financial inclusion were analysed separately and as an index. Therefore, the system GMM applied to the econometric models is summarised in equation 1 through 5.

$$\Delta CBBA_{it} = \beta_0 + \Delta\beta_1 CBBA_{it-1} + \sum_{i-1}^{n} \beta_{ij} \Delta REMIT_{it} + \sum_{i-1}^{n} \beta_{ij} \Delta REMIT_{it}^2 + \sum_{i-1}^{n} \beta_{iq} \Delta X_{q,it} + \Delta\mu_i + \lambda_{it} + \Delta\varepsilon_{it} \quad (1)$$

$$\Delta ATMA_{it} = \beta_0 + \Delta\beta_1 ATMA_{it-1} + \sum_{i-1}^{n} \beta_{ij} \Delta REMIT_{it} + \sum_{i-1}^{n} \delta_{ij} \Delta REMIT_{it}^2 + \sum_{i-1}^{n} \psi_{iq} \Delta X_{q,it} + \Delta\mu_i + \lambda_{it} + \Delta\varepsilon_{it} \quad (2)$$

$$\Delta DEP_{it} = \beta_0 + \Delta\beta_1 DEP_{it-1} + \sum_{i-1}^{n} \beta_{ij} \Delta REMIT_{it} + \sum_{i-1}^{n} \delta_{ij} \Delta REMIT_{it}^2 + \sum_{i-1}^{n} \psi_{iq} \Delta X_{q,it} + \Delta\mu_i + \lambda_{it} + \Delta\varepsilon_{it} \quad (3)$$

$$\Delta BOR_{it} = \beta_0 + \Delta\beta_1 BOR_{it-1} + \sum_{i-1}^{n} \beta_{ij} \Delta REMIT_{it} + \sum_{i-1}^{n} \delta_{ij} \Delta REMIT_{it}^2 + \sum_{i-1}^{n} \psi_{iq} \Delta X_{q,it} + \Delta\mu_i + \lambda_{it} + \Delta\varepsilon_{it} \quad (4)$$

$$\Delta FIINDEX_{it} = \beta_0 + \Delta\beta_1 FIINDEX_{it-1} + \sum_{i-1}^{n} \beta_{ij} \Delta REMIT_{it} + \sum_{i-1}^{n} \delta_{ij} \Delta REMIT_{it}^2 + \sum_{i-1}^{n} \psi_{iq} \Delta X_{q,it} + \Delta\mu_i + \lambda_{it} + \Delta\varepsilon_{it} \quad (5)$$

Where $CBBA_{it}$ is the branches of commercial banks per 100,000 for country i in period t, ATM is the ATMs per 100,000 adults for country i in period t, DEP is the deposit accounts with commercial banks per 1,000 adults for country i in period t, BOR is the borrowers at commercial banks per 1,000 adults for country i in period t and $FIINDEX_{it}$ is the financial inclusion index for country i in period t, $REMIT_{it}$ represents remittance inflows as percentage of gross domestic product in country i for year t X_{it} is a vector of control variables, μ_i captures the cross-country heterogeneity, λ_{it} time specific effect and $\Delta\varepsilon_{it}$ represents the error term. X is a vector of control variables which included gross domestic product growth, inflation, savings rate and trade openness.

4. EMPIRICAL FINDINGS

The descriptive statistics are presented in Table **2**.[2]

Table 2.

Variable	Mean	Std.Dev	Minimum	Maximum	Observations
CBBA	6.869	11.054	0.6	55.07	198
ATMA	14.188	20.129	0.41	89.99	198
DEP	493.521	596.17	17.25	4077.04	198
BOR	71.257	89.383	1.1	592.41	198
REMIT	3.917	5.415	0	27.30192	198
$REMIT^2$	44.513	123.382	0	745.395	198
GDPG	3.881	3.318	-10.771	14.047	198
INF	6.158	4.679	-4.295	29.507	198
SAVR	16.117	9.283	-7.78	49.83	198
TRADE	71.856	40.418	27.353	216.483	198

Source: Authors' estimations
The descriptive statistics were not discussed for brevity.

Regression Results

Table **3** are the regression results of the deterministic relationship between each measure of financial inclusion and remittances. Empirical studies have argued that remittances only enhance financial inclusion after a certain threshold (see Naceur et al., 2020) hence a square of remittances was also included in the regression results to examine the argument of increased value of remittances to financial inclusion in the countries in our sample.

In Table 3 the dependent variables are the indicators of financial inclusion represented by the demographic outreach of commercial bank branches (CBBA), geographic outreach of automatic teller machines (ATMA) deposit accounts with commercial banks per 1,000 adults (DEP) the number of bor-

[2] The correlation matrix and the unit root results are not presented for space consideration but is available upon request

Table 3. Deterministic Relationship of Financial Inclusion and Remittances.

	Dependent Variables				
	(Model 1)	**(Model 2)**	**(Model 3)**	**(Model 4)**	**(Model 5)**
	CBBA	ATMA	DEP	BOR	FIINDEX
L.CBBA	0.694***				
	(0.0998)				
REMIT	0.263**	-0.0932*	28.39**	-1.481	0.0137***
	(0.0828)	(0.0366)	(7.929)	(1.532)	(0.000979)
REMIT^2	-0.00808***	0.00340**	-0.618*	0.193**	-0.000245***
	(0.00203)	(0.00106)	(0.219)	(0.0543)	(0.0000315)
GDPG	0.0544*	0.0445***	-6.303***	0.126	0.0113***
	(0.0228)	(0.00503)	(0.474)	(0.223)	(0.00118)
INF	-0.174*	0.0373*	2.524	1.062	-0.00155
	(0.0778)	(0.0157)	(1.382)	(0.617)	(0.000867)
SAVR	0.00929	0.00749	0.903**	1.307***	0.00179***
	(0.00655)	(0.00457)	(0.239)	(0.211)	(0.000204)
TRADE	0.0361**	-0.0332***	-3.457***	-1.576***	0.000954**
	(0.0125)	(0.00240)	(0.310)	(0.147)	(0.000252)
L.ATMA		0.890***			
		(0.0172)			
L.DEP			0.917***		
			(0.0227)		
L.BOR				0.962***	
				(0.157)	
L.FIINDEX					1.335***
					(0.0889)
Observations	162	162	161	162	161
Instruments	11	13	13	12	
Arellano Bond AR (2)	0.974	0.711	0.964	0.153	0.258
Sargan Test p-level	0.988	0.954	0.995	0.970	0.978
Hansen Test p-level	0.620	0.867	0.587	0.669	0.674

Note: Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: Authors estimations using Stata 13.

rowers at commercial banks per 1,000 adults (BOR) and the financial inclusion index shown in Models 1-5 respectively.

As measured with demographic penetration of commercial bank branches (CBBA) financial inclusion is positively associated with remittances. A percentage increase in remittances increases financial inclusion by 26,3 percent. The results confirm the finding of Naceur et al. (2020) and Tweneboah, Gatsi and Asamoah (2019). In other studies it is argued that for remittances to enhance financial inclusion a certain threshold has to be reached hence a measure that includes this threshold

was also included as squared remittances. As measured with demographic penetration of commercial bank branches (Model 1), deposit accounts (Model 3) and the financial inclusion index (Model 5) the squared remittances are negatively related to financial inclusion. In regions with weak financial system remittances can substitute formal financial institution as they can act as an alternative of financing mechanism (Giuliano & Ruiz-Arranz, 2009; Gatsi, 2020).

From the study deposits and the demographic outreach of commercial bank branches benefitted from the inflow of

remittances as they exhibit a positive association. This finding supports the statement by Gautam (2019) who opined that having an account at a formal financial institution is a first step to broader financial inclusion. The intuition is that holding a deposit account allow for access to other financial services. Contrary, the indicator of automated teller machines and borrowers decrease with an increase in remittances. This concurs with the argument in Gatsi (2020) who found out that there was no increase in credit demand as remittance inflows increase. However it contradicts with Mbaye (2015) findings for Senegal where remittances were found to complement access to credit.

Borrowing is insignificant and negative to remittances (Model 4) as migrant sends more remittances they may reduce the demands for credits for the remaining households. This concurs with Gatsi (2020) findings for Ghana that international remittances had no effect on borrowing by households. However, with squared remittances as remittances increase borrowing through the formal finance increases by 19,3 percent and the relationship is significant. This is supported by the assertion that more remittances can provide information of more sources of income enhancing the borrowing capacity of households (Ambrosius & Cuecuecha, 2016; Kokorović Jukan et al., 2020). For the usage dimension deposits increased with an increase in remittances and the relationship is significant at 0.01 percent. However with borrowers as an indicator of financial inclusion there is no significant relationship with remittances. The results contradicts Inoue and Hamori (2016) and Ambrosius and Cuecuecha (2016) who found that both indicators increase with an increase in remittances enhancing financial inclusion.

Additionally this study used the composite index of financial inclusion. When financial inclusion index is used the net effect of remittances on financial inclusion in positive and statistically significant this is in contrast with Naceur et al. (2020) who found a negative relationship between remittances and financial inclusion index. However, with squared remittances the relationship between financial inclusion and remittances is negative. As more remittances are received they do not complement the financial inclusion rather they act as a substitute. Enhancing remittances beyond a certain threshold do not increase financial inclusion in this study. This finding contrasted Naceur et al. (2020) who found an increase in financial inclusion with an increase in the squared remittances.

The coefficient of saving rate has a positive and significant relationship with financial inclusion when financial inclusion is measure with the usage dimensions (deposits and borrowers) and the financial inclusion index.

However there is no when ATMs are used as the access dimension remittances are negatively related to financial inclusion and the relationship is significant. Only when the remittances are squared is when the relationship is positive and significant. The findings support that a certain threshold has to be reached for remittances to enhance financial inclusion. Formal financial institutions will increase the demographic outreach of financial services as more remittances are received.

Trade is positively related with FIINDEX and the demographic outreach of financial inclusion. The relationship is

statistically significant. As businesses are involved in the exchange of commodities the demand of financial services increases. However, when financial inclusion is measured using ATMs, deposits and borrowers the relationship of trade with remittances is negative and statistically significant. The findings are in contrast with Naceur et al (2020) for low and medium countries where remittances and financial inclusion index had a positive and insignificant relationship.

5. CONCLUSIONS AND POLICY IMPLICATIONS

Remittances are central to the development agenda in low and medium countries hence it is essential to harness migrant funds for financial inclusion. The study found mixed results on the statistically significance of remittances on financial inclusion whilst controlling for observable and unobservable differences across countries; and when using instruments in order to control for the endogeneity of remittances. The findings of the study supports that remittances can enhance financial inclusion, however this is contingent to the financial inclusion indicator used to measure access or usage of financial services. The study found that remittances enable the demographic outreach of commercial banks and deposit accounts with commercial banks. However, borrowing from financial institution only increases as more remittances are received supporting the threshold argument. This finding suggests that a threshold of remittances has to be reached for ease access of borrowing from a formal financial institution. That is, as more remittances are received, borrowing from a financial institution and the demographic outreach of ATMs also increases. More remittances received did not increase the desire by commercial bank to increase the bank branches neither do they increase the number of deposit accounts.

The relationship between remittances and financial inclusion in this study was contingent to the financial inclusion used. It is therefore recommended that policy makers should and understand the dimension of financial inclusion that is needed in their respective economies for remittances to be an effective tool to be used to broaden access and usage of finance. It is important for policymakers to understand the target level of financial inclusion as different indicators of financial inclusion are affected by remittances differently. Additionally, one size fits all do not appear to be sufficient for the remittances recipients, hence formal institutions should be knowledgeable on the financial needs of remittances receivers so that appropriate products are offered for remittances to enhance broader financial inclusion. The limitation of the study is mainly on data availability for a larger cross-section study and the data available on financial inclusion is a supply-side dataset. Further empirical research is recommended as more cross country data becomes available on how remittances costs in Africa constrain financial inclusion. This further includes a study to identify and frictions that hinder broader financial inclusion, Furthermore, it is recommended to further research on whether remittances can be sufficiently used by formal financial services to extend credit to remittance recipients.

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