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Harnessing remittances for the poor: the role of institutions

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ABSTRACT

This paper investigates the direct effect of institutions on poverty and explores whether the remittances and poverty link can be strengthened by institutions in Sub-Saharan Africa. The results suggest that a country characterized by sound financial development and good and stable government with systems to control corruption and attract investment will provide the enabling environment to reduce the rate, depth and severity of poverty. Such quality institutional attributes reinforce the effectiveness of international remittances in reducing poverty.

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1. Introduction

More people than ever are living away from their home country. The stock of international migrants was estimated at 220 million in 2010, 247 million in 2013 and reached 258 million in 2017 (WorldBank 2015; UnitedNations 2017).

One of the outcomes of migration is the inflow of remittances. Remittances to developing countries were estimated at US$404 billion in 2013, up 3.5% compared with 2012 and reached US$436 billion in 2014, a 4.4% increase over the 2013 level (WorldBank 2015). The flows to developing countries are estimated to have declined by 2.4% to US$429 billion in 2016, after a decline of 1% in 2015 (WorldBank 2017).

A growing number of papers are addressing institutions and remittances in a growth context. Fajnzylber and López (2008), Giuliano and Ruiz-Arranz (2009) and Singh et al. (2011) look at the effectiveness of remittances by interacting them with institutional variables to see how such variables enhance the remittances-growth relationship. Tebaldi and Mohan (2010) find that the quality of the regulatory system, rule of law, voice and accountability, and expropriation risk are negatively related to poverty headcount. Chong and Calderón (2000) provide empirical evidence that the more efficient a country's governance institutions are, the lower the poverty levels. Their papers do not consider how institutions enhance remittances and poverty relationships.

This current paper considers the interactive effects of remittances with institutions on poverty and demonstrate the direct effects of institutional variables on the three poverty measures – poverty headcount, poverty gap and squared poverty gap. Adams and Page (2005) and Gupta, Pattillo, and Wagh (2009) establish with cross-country analysis that remittances reduce poverty but did not consider the role of institutions. Akobeng (2016b)

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finds that credit to the private sector enhances remittances and poverty link. The paper does not consider the role of governance structures or political institutions in the remittances-poverty relationship.

Quality institutions can help recipients of remittances make the best use of the transfers they receive (Barajas et al. 2009). According to Fajnzylber and López (2008), remittances are more effective in both raising investment and facilitating growth in countries with higher levels of human capital, strong institutions, and good policy environments.

Many of the Sub-Saharan African countries do not have strong public and private institutional structures (Akobeng 2017, 2016a). Collier (1991) argues that putting checks on governmental power is particularly difficult in post-colonial settings in Africa. Easterly and Levine (1997) demonstrate that the conventional factors of growth do not totally explain Africa's experience and call for an institutional explanation.

The objective of this article is to test the hypothesis that there is a negative relationship between institutions and poverty and verify whether institutions reinforce the poverty-reducing effect of remittances. This paper contributes to the existing literature by providing macro-level evidence of the direct impact of institutional indicators on poverty and how the remittances-poverty link can be reinforced by political institutions and the financial indicator of money and quasi money in Sub-Saharan Africa.

To estimate the impact of institutions and remittances on poverty, this paper relies on the standard Two Stage Least Squares Instrumental Variable (2SLS – IV) approach and complements it with the Fixed Effect (FE) and the dynamic panel-data modelling by 2-step System Generalised Method of Moment (SGMM) estimators. Although it is an empirical challenge to ensure that all biases associated with measurement error, reverse causality, and omitted variable problem are efficiently addressed, attempts are made using the different estimators and the finding of the article is that institutions reduce poverty and also enhance the poverty-reducing effects of remittances.

The focus on Sub-Saharan Africa is important for the reason that the fast growth rate recorded in Africa is not inclusive or sustainable and has not created jobs because it is not driven by private investments in the productive sectors. The Human Development report 2014 (UNDP 2015) provides that the lowest regional Human Development Index values are for Sub-Saharan Africa (0.502) and South Asia (0.588), and the highest are for Latin America and the Caribbean (0.740), followed closely by Europe and Central Asia (0.738).

The paper is structured as follows. The next section, 2 reviews the findings of studies on the relationship between institutions, international remittances and poverty. Section 3 presents the data set. Section 4 utilises econometric methodology to estimate the effect of institutions and remittances on poverty. Section 5 discusses the results.

2. Brief literature review

North (1990) defines institutions as the formal and informal constraints on political, economic, and social interactions. From this perspective, "good institutions" are viewed as establishing an incentive structure that reduces uncertainty and stimulates efficiency, hence leading to stronger economic performance.

Acemoglu and Robinson (2010, p. 1) argue that Africa is poor because its people have very "bad interlocking economic and political incentives". A country with a strong system of an effective government and a stable political system provides an enabling environment for economic growth by minimising income distribution conflicts (Tebaldi and Mohan 2010). Shepherd (2000) contends that the poor suffer most under bad governments, so policies towards good governance will benefit them.

The literature provides that corruption has direct consequences on economic and governance factors, intermediaries that in turn lead to poverty (Chetwynd, Chetwynd, and Spector 2003). Corruption distorts the economy and the legal and policy frameworks, leading to gainers and losers. Lower-income households (and businesses) pay a higher proportion of their income in bribes than do middle – or upper-income households (Mujumdar 2001).

Borja (2020) examines the direct effects of remittances and corruption on five development indicators and demonstrates that remittances affect human capital indicators, and more so among countries fighting corruption in Latin America.

Akhter and Daly (2009) show that financial development is favourable ground for poverty reduction but financial instability that may be associated with financial development may be hurtful to the poor. Jeanneney and Kpodar (2011) demonstrate that the benefits of financial development outweigh the cost of financial instability to the poor.

Acemoglu and Robinson (2010) argue that if the quality of institutions in the recipient country is low, remittances can have adverse consequences on growth and Singh et al. (2011) posit that a well-developed financial sector or a more stable political environment could contain the adverse effects of remittances on growth and enhance their positive contributions.

According to Ratha (2011), remittances are often the only connection that many poor people have with the formal financial system. The scholar demonstrates that households that receive international remittances normally have better access to financial services in Africa.

2.1. The mechanisms through which institutions facilitate remittances and poverty relationship

As institutions shape the settings in which individuals function, they play a significant role in remittance-recipient household's decision on how to use remittances received. The quality of institutions may affect the use and the efficiency of investment (Rodrik, Subramanian, and Trebbi 2004) and may facilitate the effect of remittances on poverty.

The incentives for the remittance-recipient household to invest the remittances depend on the control the recipient household or the remitter has on the returns to the investment. An improved institutional quality will increase the investment yield and will raise the opportunity cost of consumption. On the other hand, a bad institutional environment will reduce the return of investment and decrease the opportunity cost of consumption (Fajnzylber and Humberto 2006).

The institutional settings may affect who receives remittances. Countries with good institutional settings may make it easier for those with few resources to migrate and therefore send home remittances, and vice versa (Thieme and Wyss 2005). In a bad institutional setting, it may only be those in the middle-income bracket who have the resources to migrate and remit.

More so, it may be the case that in good governance environment, higher remittances flow will be used to increase public spending on health and education. In authoritarian regimes, remittances may have the opposite effect (Easton and Montinola 2017; Hubert Ebeke 2012).

Ratha (2011, p.14) asserts that migration in Africa has been affected by the "continent's history of conflict, coups, insurgencies, dictatorships, war, and natural disasters". The author indicates that the lack of an effective legal and institutional framework to govern migration significantly increases the risks and costs facing migrants.

De Haas (2005) stresses that the development problems such as corruption, red tape, the absence of good public policies, poor legal security and a lack of trust in government institutions are likely to play a limiting role in remittance transfers and may prevent migrant households from taking the risk of investing in their countries of origin and lower their incentive to contribute to the development of their home country.

Black and Castaldo (2009) outline institutions, laws, and regulations as some of the hindrances facing migrants and return migrants in establishing a business in their home country. According to the authors, the frequently mentioned challenges of returnees in Ghana and Cote d'Ivoire are government bureaucracy, poor functioning of the legal system and corruption. This affects the setting up of business to boost employment and enhance welfare.

An effective financial system lowers the costs of conducting business transactions, and help directs remittances to projects that yield the highest return and therefore enhance growth rates and reduce poverty. On the other hand, remittances may be substitutes for inefficient or non-existing credit markets by assisting local businesses to sidestep lack of collateral or high lending costs and start productive ventures (Ketkar and Ratha 2001; Giuliano and Ruiz-Arranz 2009).

Gupta, Pattillo, and Wagh (2009) finds that the volumes of remittance inflows increase with lower transaction costs and fewer constraints on payments. Regression analysis shows that remittances have the maximum effect on growth when the share of the broad money supply (M2 in GDP) is below 28%, as is the case in most Sub-Saharan African countries (Mohapatra and Ratha 2011).

Some scholars show that if remittances are received through banks or other financial intermediaries, there is a high probability that some part of the remittance income will be saved (Singh et al. 2011; Aggarwal, Demirgüç-Kunt, and Pera 2011).

3 Data

This paper investigates the relationship between institutions, remittances and poverty in SSA with a data set of 41 Sub-Saharan African countries.[1] A 5-year non-overlapping average panel data is used essentially because the primary source, the World Bank, does not provide information on poverty indicators annually. The empirical panel models have a dimension of $N * T$ such that $N = 41$ and $t = 1, 2, 3, \ldots T$ so that $T = 6$ (5-year average from 1981–2010). Poverty headcount ratio, poverty gap index and squared poverty gap are the measures of poverty used in this study. The controlled variables are: workers' remittances as percentage of GDP, real GDP per capita, inequality proxied

with Gini index, gross fixed capital formation as percentage of GDP, private capital flows as percentage of GDP, inflation, real exchange rate, general government expenditure as percentage of GDP, trade openness, foreign aid and schooling.

The remittances variable is scaled by the country's GDP to obtain remittances to GDP ratio. The remittances to GDP ratio indicates the part of GDP due to remittances. This is to avoid the situation where the remittances variable is controlled by the sheer size of the country's economy.[2] It must be noted that the ratio of remittances to GDP can change if remittances change or GDP changes.

The institutional variables are money and quasi-money as percentage of GDP as the financial side and the World Bank's democratic score, polity, corruption perception index and the International Country Risk Guide (ICRG) measures of government stability and investment profile for the governance side. The construction and source of the variables are in Table A1.

GDP per capita and inequality (Gini) are included in the poverty equations to cater for the direct effect of GDP per capita and inequality on poverty. The specification for this article has institutions integrated into the growth-poverty framework used by Datt and Ravallion (1992) and Ravallion and Chen (1997) to study the contribution of growth and income distribution to changes in poverty measures. Datt and Ravallion (1992) prove that changes in poverty measures can be decomposed into growth and redistribution components.

Clemens and McKenzie (2014) show that the aggregate numbers from the national balance of payment statistics (which are used for the World Bank numbers) have many problems. The authors assert that "large surges" in the macro remittance data do not appear to be accompanied by "corresponding surges" in the micro remittance data in many countries. To them, the macro data for many African countries are widely believed to underestimate remittances due to poor statistical systems and a higher incidence of informal transfer of remittances.[3] This data issue portrays a caveat to this paper and one has to bear in mind the data limitation associated with this article. The poverty data are not annually as they are based on surveys conducted by the World Bank and obtained from the PovcalNet interactive database.

The instrument for the 2SLS-IV estimation is the GDP per capita growth weighted by the average distance between the remittance-receiving country and the five main OECD countries with the largest migrant population from the remittance-receiving SSA country. The selection of the five main OECD countries with the largest migrant population from the remittance-receiving SSA country is based on the United Nation's trends in international migrants stock database (UN 2013) and the World Bank bilateral migration and remittances database (WorldBank 2013). The use of OECD countries is due to the fact that these countries have detailed data on migration.

The poverty indicators for this study follow the class of poverty measures developed by Foster, Greer, and Thorbecke (1984). These are poverty headcount, poverty gap and squared poverty gap indices. Poverty headcount is the proportion of the people in a household with income per person less than the poverty line (1.25). Poverty gap is the mean shortfall from the poverty line, expressed as a percentage of the poverty line. The squared poverty gap or poverty severity is defined similar to the poverty gap index except that the poverty gaps are changes in the severity of squaring the poverty gaps, thus giving the highest weight to the largest poverty gap. The definition of each measure of poverty is as used in the World Bank's PovcalNet database.

Table 1. Summary statistics.

Variable	Mean	Std. Dev.	Min.	Max.	N
Poverty headcount (povh)	50.0	22.9	0.2	92.1	246
Poverty gap (povg)	23.2	14.3	0.1	62.6	246
Squared poverty gap (povgs)	13.6	10.4	0.0	47.8	246
Remittances as % of GDP (rem)	3.6	9.9	0.0	84.83	246
Gini index (gini)	46.5	10.4	28.9	79.3	246
Real GDP per capital (gdpcap)	2534.1	3563.5	258.9	20,598.7	246
Fixed capital formation as % of GDP (inv)	19.4	8.7	3.2	70.5	246
Private capital as % of GDP (priv_cap)	2.3	3.6	−7.4	25.3	196
Inflation (lainf)	56.4	430.6	−3.0	6517	246
Real exchange rate (rlr)	22.7	23.4	6.3	206.3	240
Trade Openness	70.7	36.9	13.4	220.4	246
Foreign Aid	12.1	10.3	0.1	56.8	246
Schooling	64.7	20.8	16.8	99.0	246
Government expenditure as % of GDP (gxp)	16.0	7.0	6.2	42.2	246
Money and quasi-money as % of GDP (m2)	24.6	15.3	0.23	103.1	236
Democracy (dem)	−2.5	16.8	−85.8	10	246
Polity index (polity)	−6.0	16.7	−85.8	10	239
Corruption perception index (cpi)	2.9	1.1	1.4	7	246
Government stability index (icrg_gvs)	7.2	2.2	2	11	170
Investment profile (icrg_invprof)	6.3	2.0	1.1	11	170
Distance from sending countries to receiving countries	4885.0	1540.0	2419.4	7493.0	246
Average GDP per capita growth of main remittances-sending countries	1.62	0.71	−0.01	3.8	246

This table provides the summary statistics for the data of 41 Sub-Saharan African countries based on 5-year non-overlapping average. The distance variable is in miles.

The descriptive statistics for the variables are presented in Table 1. Remittance as a share of GDP is 3.6%. Sub-Saharan Africa as a whole receives a small amount of remittances with a substantial amount of variation, as indicated by the standard deviation. The means of institutional variables are all low, implying that the quality of these institutional indicators is very low.

4. Empirical concerns and model specification

The major challenge in this empirical analysis is that both institutions and remittances are endogenous variables. Using two instruments to treat the endogeneity might make it hard to interpret results. First, fixed effect estimation without the lagged dependent variable is conducted by including country and time fixed effects to account for unobserved country characteristics and for common shocks and developments across countries. These fixed effect estimations may help lessen concerns about endogeneity due to relevant omitted factors.

We estimate a simple fixed effects model without the lagged dependent variable, and interact remittances with a measure of institutions in the initial period. Using initial institutional quality will not completely address the endogeneity of institutions, but it might mitigate it. The country fixed effect would now swallow the effect of initial institutional quality on poverty; however, the interaction effect will still be identified.

To minimise biases due to reverse causality, internal instruments are used with the dynamic two-step system Generalised Method of Moments estimation technique developed by Blundell and Bond (1998) by using lagged explanatory variables as instruments.

The system GMM estimator allows for the incorporation of the lagged dependent variable to account for the persistence of poverty and purges the country-fixed effect by differencing the internal instruments to make them exogenous to the fixed effects. The SGMM estimator provides the flexibility to control for endogeneity of all the explanatory variables. However, Hayashi (2000) and Baltagi (2008) point out that the optimal weighting matrix behind the efficient GMM is a function of fourth moments, and obtaining reasonable estimates of fourth moments may require very large sample sizes. Thus, the GMM estimator brings with it the cost of conceivably poor finite sample performance.

The normal instrumental variable (2SLS-IV) estimation approach is used to treat, in a more direct way, the potential endogeneity of remittances due to measurement error, omitted factors, and/or reverse causality. The instrument used is based on the economic condition (GDP per capita growth) of the main OECD countries where migrants sending remittances reside. Following Fajnzylber and López (2008), Acosta et al. (2008) and Akobeng (2016b), the GDP per capita growth of the main OECD countries with the largest migrant population from the remittance-receiving country is scaled by the inverse of the geographic distance between the remittance-receiving country and the main OECD countries with the largest migrant population from the remittance-receiving country.

GDP per capita growth in the remittance-sending countries is likely to influence the flow of remittances that migrants are able to send, but may not affect poverty in the remittance-receiving countries directly, after controlling for variables like gross fixed capital formation, trade and GDP per capita of the remittance-receiving countries that are affected by GDP per capita growth abroad in the regressions. Some scholars find that distance is negatively related to international migration and therefore affects remittances.[4]

The GDP per capita growth instrument is interacted with initial institutional level as an instrument for the interaction terms.

The objective of this paper is to estimate the relationship between remittances, institutions and poverty. The structural equation for this relationship in the 2SLS-IV estimation is:

$$Poverty_{it} = \beta_0 + \beta_1 gdpcap_{it} + \beta_2 gini_{it} + \beta_3 rem_{it} + \beta_4 inst_{it} + \zeta X'_{it} + \mu_{it} \quad (1)$$

The persistent nature of poverty is catered for by including lagged poverty ($Poverty_{i,t-1}$) as an explanatory variable in a SGMM framework as follows:

$$Poverty_{it} = \beta_0 + \alpha Poverty_{i,t-1} + \beta_1 gdpcap_{it} + \beta_2 gini_{it} + \beta_3 rem_{it} + \beta_4 inst_{it} + \zeta X'_{it} + \mu_{it} \quad (2)$$

The subscripts i and t are the country and year index. $Poverty_{it}$ is the measure of poverty. $gdpcap_{it}$ and $gini_{it}$ are the real per capita income and the Gini coefficient for country i at time t, respectively. rem_{it} and $inst_{it}$ are remittances and institutional variables respectively. (X'_{it}) is a vector of other variables that affect poverty. Time-invariant country characteristics or the fixed effects are contained in the error term (μ_{it}) which consists of the unobserved country-specific effects v_i, the observation specific or the idiosyncratic errors ε_{it} and λ_t, which is the time-varying parameter. β_1 and β_2 are the effect of real GDP

per capita and inequality on poverty respectively. ε_{it} is assumed to be independent and identically distributed with mean of 0 and variance ofσ_{ε}^2. The parameter β_4 measures the direct impact of institutions on poverty. The estimate of ζ represents the direct impact of the other X variables on poverty.

In order to capture the effect of remittances, institutions and poverty, equations (1) and (2) are rewritten to include the interaction of remittances and institution below:

$$Poverty_{it} = \beta_0 + \beta_1 gdpcap_{it} + \beta_2 gini_{it} + \beta_3 rem_{it} + \beta_4 inst_{it} + \beta_5 (rem_{it} \times inst_{it}) + \zeta X'_{it} + \mu_{it} \tag{3}$$

$$Poverty_{it} = \beta_0 + \alpha Poverty_{i,t-1} + \beta_1 gdpcap_{it} + \beta_2 gini_{it} + \beta_3 rem_{it} + \beta_4 inst_{it} + \beta_5 (rem_{it} \times inst_{it}) + \zeta X'_{it} + \mu_{it} \tag{4}$$

where $rem_{it} \times inst_{it}$ is an interaction term for remittances (remittances as % of GDP) of country i at time t and institution of country i at time t.

Differentiating equation (3) or (4) with respect to remittances gives the following:

$$\frac{\partial (Poverty_{it})}{\partial (rem_{it})} = \beta_3 + \beta_5 inst_{it} \tag{5}$$

Here β_5 defines the extent to which the institutional variables enhance or moderate the remittances-poverty relationship. The effect of remittances on poverty is given by the right hand side of (5).

The two-stage least squares instrumental variable (2SLS-IV) estimator may provide a way to obtain consistent parameter estimates and accounts for the potential endogeneity of remittances. This is implemented by estimating the following system of equations:

$$Rem_{it} = \Omega_0 + \Omega_1 dist\_gdpgr\_source_{it} + \Omega_2 inst_{it} + \Omega_3 (rem_{it} \times inst_{it}) + \gamma X'_{it} + \delta_j + \phi_t + \eta_{it} \tag{6}$$

$$Poverty_{it} = \beta_0 + \beta_1 gdpcap_{it} + \beta_2 gini_{it} + \beta_3 \hat{rem}_{it} + \beta_4 inst_{it} + \beta_5 (rem_{it} \times inst_{it}) + \zeta X'_{it} + \mu_{it} \tag{7}$$

The first-stage Equation (6)) is used to isolate the part of remittances that is uncorrelated with the error term. For this strategy to provide a consistent estimates of β_5 we require that the excluded instrument, distance-weighted GDP per capita growth in remittances-sending countries ($dist\_gdpgr\_source_{it}$), satisfies two conditions: (1) it must have a non-trivial correlation with remittances; (2) it must not be correlated with poverty other than through its effect on remittances.

5. Estimation results

Tables 2 and 3 show the estimation results of equations (1) to (7). In Table 2, SGMM and FE estimators are used to estimate the direct effect of the institutional variables on poverty where each institutional variable enters the regression individually with the

Table 2. Estimates of the direct effect of the institutional variables on poverty.

Dep. Var.: Poverty						
	Poverty headcount		Poverty gap		Squared poverty gap	
	SGMM	FE	SGMM	FE	SGMM	FE
	(1)	(2)	(1)	(2)	(1)	(2)
Democracy	− 1.290	− 1.187 **	−1.179	− 1.219 **	− 1.156	− 1.259 **
	(0.991)	(0.529)	(0.880)	(0.592)	(0.968)	(0.628)
Money and quasi-money	− 1.863 *	− 1.897 *	− 1.603 *	− 1.847 *	− 1.848 *	− 1.797 *
	(1.037)	(1.120)	(0.954)	(1.012)	(1.067)	(1.062)
Polity index	− 1.013	− 1.057	− 0.984	− 1.153	− 0.925	− 1.237 *
	(0.913)	(0.977)	(0.737)	(0.893)	(0.747)	(0.721)
Corruption perception index	− 1.629 **	− 1.710 **	− 1.837 **	− 1.809 **	− 1.927 **	− 2.126 **
	(0.737)	(0.799)	(0.823)	(0.806)	(0.803)	(0.854)
Government stability index	− 1.549 **	− 1.488 **	− 1.391 **	− 1.403 **	− 0.749 **	− 1.107 **
	(0.671)	(0.685)	(0.572)	(0.622)	(0.334)	(0.551)
Investment Profile	− 2.840 *	− 3.241 *	− 3.306 *	− 3.778 *	− 3.241 **	− 3.389 *
	(1.578)	(1.873)	(1.945)	(2.099)	(1.473)	(1.882)
$povh_{i,t-1}$	√					
$povg_{i,t-1}$			√			
$povgs_{i,t-1}$					√	
Range of Hansen J-test (p-value)	0.271–0.575		0.209–0.537		0.203–0.531	
Range of AR(2) test (p-value)	0.344–0.642		0.241–0.760		0.310–0.598	

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ SGMM (n = 111–147), FE (n = 127–173)

This table shows the results of the direct effect of each institutional variable on poverty without controlling for other institutional variables in the respective models. Remittances, Gini index, real GDP per capita, fixed capital formation, private capital, inflation, real exchange rate, government expenditure, trade openness, foreign aid, schooling, country dummies, time dummies and intercepts are controlled in all the 36 regressions. The symbol √ shows an included variable. n is the range of observations from the lowest to the highest of the estimated models. The range of the Hansen J-test (p-value) and the AR(2) test (p-value) of the SGMM models are shown.

other controlled variables. The control variables are remittances, Gini index, real GDP per capital, fixed capital formation as % of GDP, private capital as % of GDP, inflation, real exchange rate, trade openness, foreign aid, schooling and government expenditure as % of GDP. Democracy appears 5% significant in the fixed effect models but insignificant in the SGMM models. Money and quasi-money (m2) appears to be 10% significant in both the SGMM and fixed effects models. Polity index emerges insignificant in all the models except the Fixed Effect (FE) estimation in the squared poverty gap model. Corruption perception index and government stability index appear 5% significant in all the poverty models. Investment profile appears 10% significant in all the models except the SGMM estimation under the squared poverty gap model. Thus, some of institutional variables are significant in reducing poverty than others.

Table 3 shows the estimates of the interaction effect of the institutional variables with remittances on poverty where each institutional variable and its interaction term enter into the specifications with the included controlled variables but without the other institutional variables. The interaction terms of remittances with money and quasi-money ($rem * m2$) and remittances with polity ($rem * pol$) appear significant in the SGMM and FE models. The interaction term of remittances with government stability ($rem * icrg\_gvs$) appears to be 5% significant in the SGMM, FE and the 2SLS estimations. The interaction term of remittances with corruption perception index ($rem * cpi$) appears significant in all the models. The interaction term of remittances with corruption

Table 3. Estimates of the interaction effect of the institutional variables and remittances on poverty.

Dep. Var.: Poverty									
	Poverty headcount			Poverty gap			Squared poverty gap		
	SGMM	FE	2SLS-IV	SGMM	FE	2SLS-IV	SGMM	FE	2SLS-IV
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
M2	− 1.621	− 2.610 *	− 3.203 *	− 1.801	− 2.536 *	− 2.912 *	− 1.592	− 2.582 *	−2.813 *
	(1.212)	(1.431)	(1.881)	(1.462)	(1.487)	(1.733)	(1.225)	(1.535)	(1.654)
rem ∗ *m2*	− 1.558 **	− 1.586 **	− 2.324 **	− 0.902 *	− 1.266 **	− 2.380 **	− 0.866 *	− 1.188 **	− 2.290 **
	(0.664)	(0.721)	(1.112)	(0.536)	(0.629)	(1.004)	(0.515)	(0.584)	(1.001)
dem	− 0.837	− 2.243 **	− 2.295 *	−0.501	− 1.233 *	− 1.923 *	− 0.685	− 1.010	− 1.855 *
	(0.633)	(0.910)	(1.374)	(0.435)	(0.674)	(1.080)	(0.501)	(0.834)	(1.072)
rem ∗ *dem*	− 0.420	− 0.735 **	− 2.230 **	−0.475	− 0.783 **	− 2.317 **	− 0.510	− 0.963 **	− 2.541 **
	(0.321)	(0.359)	(1.060)	(0.352)	(0.386)	(1.078)	(0.376)	(0.467)	(1.105)
polity	− 0.992	− 1.330	− 2.130 *	− 0.859	− 1.291	− 1.604 *	− 0.998	− 1.330	− 1.584 *
	(0.784)	(1.105)	(1.132)	(0.811)	(0.908)	(0.949)	(0.683)	(0.918)	(1.017)
rem ∗ *polity*	− 1.039 **	− 1.257 **	− 2.357 **	− 0.541 *	− 1.298 **	− 2.365 **	− 0.820 **	− 1.272 **	− 2.511 **
	(0.403)	(0.614)	(1.165)	(0.324)	(0.604)	(1.071)	(0.389)	(0.552)	(1.092)
cpi	− 2.242 **	− 2.433 **	− 3.939 **	− 1.546 **	− 2.001 *	− 2.700 **	− 1.305 *	− 1.513 *	− 2.698 **
	(0.886)	(1.217)	(1.648)	(0.650)	(1.127)	(1.132)	(0.774)	(0.891)	(1.184)
rem ∗ *cpi*	− 0.654 *	− 0.610 *	− 1.731 ***	− 0.595 *	− 0.577 *	− 1.755 ***	− 0.578 *	− 0.563 *	− 1.834 ***
	(0.365)	(0.349)	(0.577)	(0.308)	(0.325)	(0.601)	(0.312)	(0.287)	(0.632)
icrg_gvs	− 1.127 **	− 1.028 *	− 1.378 **	− 0.793 **	− 1.107 *	− 1.294 **	− 0.525 **	− 0.941 *	− 1.203 *
	(0.460)	(0.578)	(0.674)	(0.361)	(0.617)	(0.654)	(0.228)	(0.517)	(0.701)
rem ∗ *icrg_gvs*	− 0.146 **	− 0.320 **	− 0.569 **	− 0.174 **	− 0.371 **	− 0.588 **	− 0.203 **	− 0.414 **	− 0.603 **
	(0.065)	(0.148)	(0.248)	(0.077)	(0.176)	(0.295)	(0.083)	(0.195)	(0.291)
Investment profile (icrg_invprof)	− 1.461 *	− 1.597	− 1.912 **	− 0.979	− 1.248	− 1.950 **	− 1.392 **	− 1.018	− 1.781 *
	(0.851)	(1.228)	(0.831)	(0.715)	(0.893)	(0.900)	(0.571)	(0.713)	(0.989)
rem ∗ *icrg_invprof*	− 0.557	− 0.829 *	− 1.050 *	− 0.775	− 0.998 *	− 1.349 *	− 0.829	− 1.066 *	− 1.379 *
	(0.399)	(0.451)	(0.590)	(0.368)	(0.581)	(0.792)	(0.632)	(0.628)	(0.810)
$povh_{i,t-1}$	√								
$povg_{i,t-1}$				√					
$povgs_{i,t-1}$							√		
Hansen J-test (p-value)	0.465–0.885			0.470–0.891			0.443–0.901		
AR(2) test (p-value)	0.201–0.789			0.179–0.867			0.229–0.709		

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ SGMM (n = 93–142), FE (n = 107–167), 2SLS-IV (107–167)

In the table each institutional variable and its interaction with remittances enter in the specifications together with other controlled variables. **Remittances, Gini index, real GDP per capita, fixed capital formation, private capital, inflation, real exchange rate, government expenditure, trade openness, foreign aid, schooling, country dummies, time dummies and intercepts are controlled in all regressions**. Remittance is instrumented with the distance-weighted GDP per capita growth in remittances-sending countries in the 2SLS-IV framework. The distance-weighted GDP per capita growth instrument is interacted with initial institutional quality level to instrument for each of the interaction terms. n is the range of observations from the lowest to the highest of the estimated models under each poverty measure. The range of the Hansen J-test (p-value) and the AR(2) test (p-value) of the SGMM models are shown.

Table 4. OLS estimates, effect of distance-weighted GDP per capita growth and the interaction of distance-weighted GDP per capita growth with initial level of institutions on remittances and remittances and institution interaction (first-stage).

Dep. Var.: rem/*rem* ∗ *inst*		
		F-statistics
Instruments		
Distance-weighted GDP per capita growth (dist_gdpgr_source)	0.705 ***	21.50
	(0.196)	
dist_gdpgr_source ∗ *dem*	0.583 ***	19.73
	(0.166)	
dist_gdpgr_source ∗ *m2*	0.521 ***	18.89
	(0.161)	
dist_gdpgr_source ∗ *polity*	0.313 ***	15.30
	(0.127)	
dist_gdpgr_source ∗ *cpi*	0.243 *	12.31
	(0.135)	
dist_gdpgr_source ∗ *icrg_gvs*	0.213 *	11.43
	(0.113)	
dist_gdpgr_source ∗ *icrg_invprof*	0.148 *	10.51
	(0.079)	

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, Standard errors in parentheses.

The first-stage results of the effect of of the instrument – GDP per capita growth weighted by average distance (*dist_gdpgr_source*) on remittances, and the effect of the *dist_gdpgr_source* interaction with the initial level of institution (*dist_gdpgr_source* ∗ *inst*) on the interaction of remittances with institutions (*rem* ∗ *inst*). Gini index, real GDP per capita, fixed capital formation, private capital, inflation, real exchange rate, government expenditure, trade openness, foreign aid, schooling, country dummies, time dummies and intercepts are controlled in all the regressions.

perception index (*rem* ∗ *cpi*) appears to be 1% significant in the 2SLS estimation under all the poverty measures. Thus, control of corruption interacts more effectively with remittances in reducing poverty.

In the presence of the interraction term the direct effects of corruption perception index and the government stability index still remain significant across all the poverty measures with all the three estimators.

We can infer from the 2SLS estimates that the coefficients of the interaction terms of remittances and democracy (*rem* ∗ *dem*), remittances and polity (*rem* ∗ *pol*), remittances and corruption perception index (*rem* ∗ *cpi*), remittances and government stability (*rem* ∗ *icrg_gvs*) and remittances and investment profile (*rem* ∗ *icrg_invprof*) increase as we move from poverty headcount to squared poverty gap. This holds for the interaction of remittances and all the political institutional variables. The trend does not apply to the money and quasi money (financial variable) interaction with remittances.

The interaction results imply that the marginal effect of remittances in reducing poverty is increasing with the level of institutional development. In other words, quality institutions can reinforce the remittances-poverty relationship. This extends the existing work on the important role of institutions in enhancing remittance-growth leverage by Chami, Fullenkamp, and Jahjah (2003), Catrinescu et al. (2009) and Singh (2010). The study also extends the remittances, finance and poverty studies by Adams and Page (2005), Gupta, Pattillo, and Wagh (2009) and Aggarwal, Demirgüç-Kunt, and Pera (2011) to the direct effect of institutions on poverty depth and poverty severity and the role played by institutions in enhancing the effectiveness of remittances.

As these poverty measures differ in terms of their responsiveness to the extreme poor and income distribution, there may be the possibility that some institutional variables may interact effectively with remittances in a way that may have different effect on the poverty groupings. It can be inferred from the findings that the political institutional variables may interact effectively with remittances to benefit the squared poverty gap (poverty severity) group.

After discussing the statistical significance, we further look at the economic significance of the estimated coefficients. For Economic significance, we resort to the ceteris paribus approach developed by Sterck et al. (2018) and proposed by Sterck (2019). The economic importance captures the ceteris paribus variation generated by each explanatory variable and express it in percentage terms. With this approach the covariance terms are therefore ignored.

In all the 36 estimated direct effect models (without interaction terms) in Table 2, Gini index, real GDP per capita, remittances, foreign aid and the institutional variable appear to be the most important variables, ceteris paribus. The variation generated by each institutional variable in their respective direct effect models as in Table 2, when other explanatory variables are kept constant, in the System GMM estimations of the poverty headcount models are corruption perception index (9.1%), money and quasi-money (8.9%), government stability index (8.7%), investment profile (7.5%), democracy (4.9%), and polity index (4.3%). Thus, corruption seems to be the most economically important variable among the institutional variables in affecting poverty followed by money and quasi money (financial sector) and government stability.

The variation generated by each interaction term (remittances and institution) in their respective indirect effect models as in Table 3, when other explanatory variables are kept constant in the 2SLS-IV estimations of the poverty headcount models are $rem * polity$ (11.3%), $rem * m2$ (10.5%), $rem * dem$ (10.3%) $rem * cpi$ (9.9%), $rem * icrg\_gvs$ (8.2%) and $rem * icrg\_invprof$ (6.1%). Thus, the interaction of remittances and polity emerges the most economically significant interaction variable in the respective interaction models. Polity index emerges statistically insignificant in the direct effect model with the SGMM approach in Table 2 (SGMM model), but it interacts effectively (statistically and economically) with remittances in the 2SLS-IV estimation in the poverty headcount model in Table 3.

5.1. The 2SLS-IV and the dynamic panel 2-step SGMM estimation diagnoses

A weak identification test is conducted for the 2SLS-IV estimation using the Kleibergen-Paap rk Wald F-statistic as the yardstick. The null hypothesis for the test is that the instruments are weakly identified. The rule of thumb is that a Kleibergen-Paap Wald rk F statistic (F-statistics of excluded instruments) higher than 10 is needed to reject the null hypothesis (Baum 2006). The Kleibergen-Paap Wald rk F statistics from the first stage results in Table 4 are all greater than 10, indicating that the instruments are not weakly identified in both the direct and indirect (interaction) models.

The validity of the internal instruments of the SGMM estimation is assessed with Hansen (1982) J-test for over-identifying restrictions. The null hypothesis is that the over-identifying instruments are uncorrelated with the error term. The p-values of the Hansen J-statistics of the estimated models do not reject the null hypothesis that the instruments are valid.[5] To take into account bias-efficiency trade-off, the number of

instruments are restricted to be less than or equal to the number of groups as suggested by Baltagi (2008). The maximum lag of the dependent variable is restricted to one in all estimations and the endogenous variables are instrumented with their levels lagged by two periods. The instruments are applied with the collapse option in order to reduce their "proliferation" (Roodman 2006, 1). In order to test for first – and second-order serial correlation Arellano and Bond (1991) AR(2) test is used. The absence of second-order serial correlation is not rejected in all the estimations. More so, standard errors are corrected for small sample bias using the Windmeijer (2005) finite sample correction.

6. Conclusion and policy implications

This paper reveals that quality institutions' measures of money and quasi-money as percentage of GDP, government stability, democracy, investment profile and corruption perception index have a direct poverty-reducing effects using the 2SLS estimator. Remittances may interact effectively with institutional measures to reduce poverty. The interaction effect of remittances with government stability, democracy and investment profile increases as we move towards the more distributive poverty measure. The results have important policy implications for developing countries and the Sub-Saharan African region in particular. The presence of quality institutions makes it possible for remittances to be saved and invested in an efficient manner and lead to greater output, growth and poverty reduction. The finding throws up a challenge for policy makers and development partners to rise to the task of taking on board institutional realities to create a solid and effective environment for the escape of the poor out of poverty in SSA. Developing banking services by especially targeting migrants can be effective in attracting remittances to the banking sector.

The empirical finding from this article calls for a theoretical study into the complementary relationship between remittances and institutions in reducing poverty. As institutions and their interaction with remittances reduce poverty in Sub-Saharan Africa, Sub-Saharan African countries need to consider and implement institutional development and remittance-attracting policies towards the achievement of the 2030 Sustainable Development Goal, as well as the Africa Union Agenda 2063. It is possible that quality of institutions may affect the incentive to invest using money from remittances because people will invest first in consumption. Perhaps one interesting question would be to test how quality of institutions affects people decision to allocate remittances between consumption and investment.

An extension to this article may take into account a composite institutional index that substantially captures the principal components of the subjective institutional indicators.

Notes

1. Note that Liberia, Djibouti, Equatorial Guinea, Sao Tome and Principe, Somalia, Eritrea and Zimbabwe were excluded due to data limitation.
2. Some of the macroeconomic studies on remittances and development that use remittances to GDP ratio are Acemoglu and Robinson (2010), Aggarwal, Demirgüç-Kunt, and Pera (2011), Anyanwu and Erhijakpor (2010), Giuliano and Ruiz-Arranz (2009) and Gupta, Pattillo, and Wagh (2009).

3. According to Page and Plaza (2006); IFAD (2009), informal remittances flow through post offices, saving cooperatives and microfinance institutions, and mobile money services which are not included in the International Monetary Fund estimates could be greater than or equal to the official estimates for Sub-Saharan Africa.
4. See for example Karemera, Oguledo, and Davis (2000), Vogler and Rotte (2000) and Hatton and Williamson (2002).
5. The p-values of the Hansen J-statistics of the estimated models are above 0.1.

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Appendix 1: Variables construction and source

Table A1. Variables construction and source.

Variable	Abbreviation	Construction	Source
Poverty Headcount	povh		PovcalNet, World Bank
Poverty Gap	povg		PovcalNet, World Bank
Squared Poverty Gap	povgs		PovcalNet, World Bank
Gini Index	gini		PovcalNet, World Bank
Remittances	rem	remittances as % GDP	IMF-IFS/World Bank
Real GDP Per Capital	lgdpcap	log of real GDP per capita	WDI-World Bank
Investment	linv	log of gross capital formation as % GDP	WDI-World Bank
Private Capital	lpriv_cap	log of private capital as % GDP	WDI-World Bank
Inflation	lainf	log of 1 plus inflation rate	WDI-World Bank
Government Expenditure	lgxp	log of government expenditure as % GDP	WDI-World Bank
Real exchange rate	rlr		WDI-World Bank
Trade Openness	ltrade	Log of Trade Openness	WDI-World Bank
Foreign aid	aid	Aid as % of GDP	WDI-World Bank
Schooling (Human Capital)	hca		WDI-World Bank
Money and Quasi-money	m2	m2 as % GDP	WDI-World Bank
Democracy Score	dem		ADI-World Bank
Polity	polity		ADI-World Bank
Corruption Perception Index	cpi		ADI-World Bank
Government Stability Index	icrg_gvs		ICRG
Investment Profile	icrg_invprof		ICRG
Distance			Map tools
GDP per capita growth of senders			WDI-World Bank
Distance-weighted growth	dist_gdpgr_source	weighted by inverse of distance	Own construction

The distance is calculated from http://www.freemaptools.com