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Abstract

An attempt has been made in this paper to examine the impact of international remittances on poverty and income inequality in sub-Saharan Africa (SSA). In carrying out the study, 34 SSA countries for which relevant data are available, between 1980 and 2009, were sampled for the poverty analysis whilst a sample size of 36 was used in the remittances-income inequality exploration. A set of dynamic panel-data models was estimated using system Generalized Method of Moments. It was found that remittances have significant poverty-alleviating effect, with the poorest of the poor being the least beneficiaries. Additionally, International remittances have income equalisation effects in countries with relatively narrower income gap, but with an intensifying income-inequality aggravating effects in countries with relatively wider income gap. It is, thus, concluded that although remittances have huge potentials to alleviate poverty and equilibrate incomes in SSA, these remittances have size-effects to the detriment of relatively poorer countries and countries with relatively higher income gap. Therefore, the paper recommends that, although the poverty-alleviating effects and income equalisation effects of remittances cannot be downplayed, it is imprudent for SSA policymakers to overly exclusively on remittances as a poverty-reduction strategy towards sustainable socioeconomic development of the sub-region.

Introduction

International migration and its consequential effects on socioeconomic transformation of labour-exporting countries have received the most attention from academics, policymakers and researchers in the area of development economics and finance in this current era of globalization. The upsurge of research interest on international migrant remittances, in particular, is not surprising given the magnitude and stability in the positive growth trend over the past three decades. There is one other important reason why a lot of policy-research on the implications of remittances for economic development might have dominated related studies on other forms of development finance since the recognition of remittances as an alternative source of development finance three decades ago. Unlike all other forms of development finance, remittances have a direct impact on the economy of a recipient-country at disintegrated levels – household, community, and nationwide. Consequently, the direct linkages of remittances and socioeconomic development can be explored at three possible levels – micro, meso, and macro (Adenutsi 2010).

At the micro level, remittances are a major source of additional income for sustenance of remittance-receiving households and capital for small and medium-scale enterprises (SMEs). Unlike aid, remittances flow directly to individual households and institutions; and unlike loans they attract no direct interest and repayment obligations. Besides contributing to increased consumption in the short run by empowering recipients to pay for food, clothes, shelter, healthcare, utility bills, funerals, festivals, and so on, remittances can propel longer-term development process through investment in education, vocational training, land, housing, and SMEs. At the meso level, local communities can benefit from essential social amenities such as the roads, educational facilities, and healthcare facilities, initiated and funded by overseas-based associations of native migrants. Associations of migrants can also mobilise funding through non-governmental organisations and other development-oriented

civil society organisations in support of important social projects such as vaccination against communicable diseases and the provision of potable water in their local communities back home. In this case, besides the indirect trickling down effects, families without international migrants can also benefit directly from an outcome of international migration at the meso level.

At the macro level, international remittances are an essential source of foreign exchange, as they augment international reserves thereby helping low-income countries through macroeconomic stabilization by ameliorating their perennial balance of payments (BoP) problems. Remittance inflows are also countercyclical as they increase during economic downturns; hence they contribute significantly absorbing various forms of negative natural and macroeconomic shocks in labour-exporting countries. For instance, international evidences have shown that remittance inflows have always increased in disaster- and conflict-inflicted countries (Clarke and Wallsten 2004; Yang and Choi 2007). Besides, remittance inflows have consistently remained the most resilient form of private external capital during global financial crises and violent conflicts in labour-exporting developing countries. Again, remittance inflows are more equally spread among developing countries than any other form of private capital. On the reverse side, remittances may contribute to destabilizing the macroeconomy of labour-exporting countries by sparking inflation and worsening BoP problems in import-dependent small-open economies where domestic output often falls short of aggregate demand.

Even though developing countries have been the largest recipients of international remittances ever since they were recognized as an important alternative source of development finance in low-income countries, high incidence of poverty in the developing world still persists, with SSA remaining the poorest among the poor. The evidence for the apparent perpetuation of poverty and inequality in the developing world is certainly a

fundamental reason why the world decided to set poverty reduction as the first and foremost priority target under the Millennium Development Goals in the year 2000. So, is it the case that remittances fail to impact on poverty and inequality in developing countries that are too poor? This paper, therefore, seeks to contribute to filling this research gap by: (i) determining the impact of remittances on poverty headcount, poverty gap, poverty severity, and income inequality in SSA; and (ii) verifying if the effects of remittances on poverty and income inequality vary according to the severity of poverty and inequality among SSA countries.

Following this introduction are some stylized facts in Section 2. Then, the review of the literature is undertaken in Section 3. Specification of the empirical model, and discussion of issues related to methodology and data are presented in Section 4. The empirical results are presented and discussed in Section 5, whilst Section 6 concludes with some policy recommendations.

Some stylized facts

Figure 1 Panel A reveals that between 1980 and 2009, real GDP at purchasing power parity (PPP) per capita (symbolized Y) has been relatively stagnant until the latter part of the 2000s. During this same period, remittances have been increasing steadily and robustly, especially from the 1990s, whilst all the three indicators of poverty (headcount (PovH), gap (PovG) and severity (PovS))[1] increased and only started to decline after mid-1990s. Even though the incidence and severity of poverty are beginning to reduce in more recent years, the levels are still relatively high in the 2000s when compared with the indicators of the 1980s. In other words, current poverty levels have only fallen slightly below the levels that prevailed in the 1980s. Thus, by matching the trends in poverty against the trends in income levels and remittances received, it can be observed that there is a somewhat inverse relationship between

poverty and remittances just like the relationship between poverty and real GDP PPP per capita.

Figure 1: The Remittance-Poverty Nexus in SSA, 1980-2009
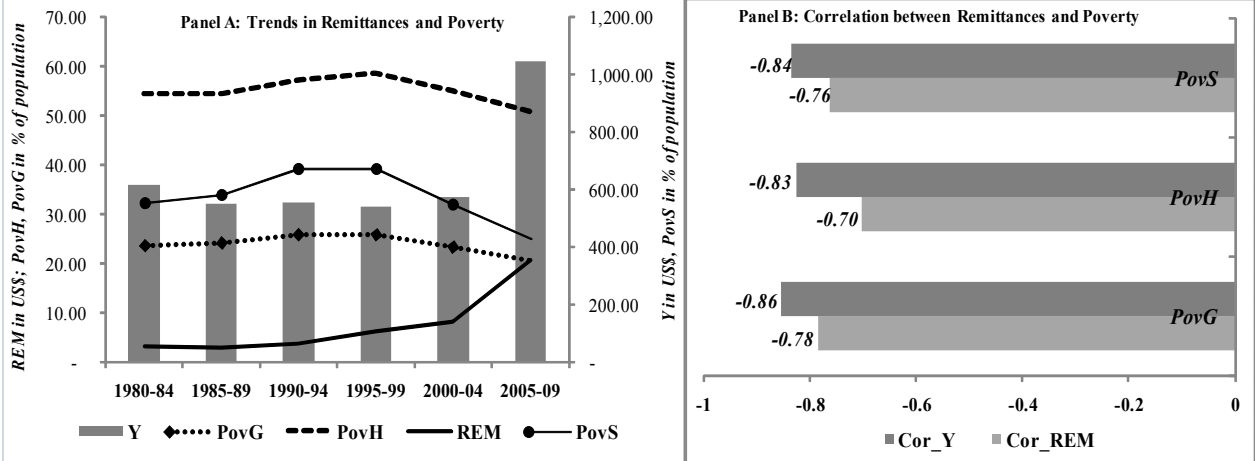
Source: *Author based on 5-year non-overlapping average data from World Bank (2011)*

Figure 1 Panel B confirms earlier observation that there is a strong negative correlation between remittances per capita received and poverty (-0.78, -0.70 and -0.76 for PovH, PovG and PovS respectively) with a stronger negative relationship between remittances per capita and real GDP PPP per capita. By implication, assuming the correlation is actually a one-directional the causal effect from remittances then remittances had a strong poverty-alleviating effect in SSA over the past three decades.

In Table 1, the 36 sampled SSA countries are ranked according to remittances per capita received in recent years, 2000-2009. An important observation is that, with the exception of Togo, Uganda, Mali, and Guinea-Bissau, generally, countries ranked as highest remittance-recipients are also countries with the highest per capita income within the sub-region. This holds for the countries ranked as the least remittance-recipients. More specifically, whereas the countries ranked at the upper semi (1st-18th highest recipients) have average real GDP PPP per capita of US$3,884.02 with a corresponding US$61.90 remittances

6

per capita, those ranked at the bottom semi (19th-36th) recorded average of US$2,089.97 and US$4.03 respectively.

Table 1: Remittances Received and Income Status of SSA Countries, 2000-2009

Rank	Country (remittances per capita in US$)	GDP per capita PPP (constant 2005 US$)	Rank	Country (remittances per capita in US$)	GDP per capita PPP (constant 2005 US$)
1	Cape Verde (249.88)	2,714.64	19	Sao Tome & Principe (9.62)	1,420.32
2	Mauritius (170.62)	10,235.56	20	Cote d'Ivoire (8.08)	1,591.94
3	Lesotho (168.66)	1,221.92	21	Guinea (7.07)	935.12
4	Seychelles (89.09)	17,953.95	22	Namibia (6.59)	5,296.28
5	Swaziland (71.37)	4,294.24	23	Gabon (5.97)	13,125.41
6	Senegal (64.91)	1,568.52	24	Cameroon (5.21)	1,942.17
7	Botswana (42.74)	11,481.19	25	Sierra Leone (4.28)	620.77
8	Sudan (38.31)	1,634.52	26	Niger (3.86)	613.90
9	Togo (31.15)	777.52	27	Burkina Faso (3.85)	1,013.92
10	Nigeria (30.56)	1,697.17	28	Ghana (3.76)	1,197.68
11	Gambia (30.31)	1,152.99	29	Congo, Rep. (3.53)	3,457.62
12	Kenya (26.20)	1,342.15	30	Mozambique (3.44)	656.35
13	Comoros (20.20)	1,105.51	31	Rwanda (3.11)	845.71
14	Benin (19.59)	1,322.06	32	Ethiopia (2.16)	644.78
15	Mali (18.14)	968.39	33	Madagascar (0.78)	895.14
16	Guinea-Bissau (15.59)	995.04	34	Mauritania (0.68)	1,688.52
17	Uganda (14.60)	914.28	35	Tanzania (0.37)	1,044.25
18	South Africa (12.31)	8,532.65	36	Malawi (0.07)	629.52

Source: Author based on World Bank (2011)

Indeed, the very poorest SSA countries in terms of GDP PPP per capita (Niger, Sierra Leone, Malawi, Ethiopia, Mozambique, Rwanda and Madagascar) are also countries with the least receipt of remittances per capita. This trend is inconsistent with the argument that remittances flow more to poorer countries. The trend appears to justify the position of the remittance-pessimists that because the very poor cannot afford to finance international migration, they receive lower remittances; implying remittances can exacerbate income inequality depending upon some underlying features of the labour-exporting countries.

Literature review

From theoretical and empirical literature, there is less controversy concerning the positive effects of remittances on poverty in labour-exporting countries unlike the possible conflicting effects on income inequality. The main theoretical debate has been that it is only households

with relatively higher incomes that can afford to finance the cost of international migration and to enable them earn remittances (Lipton 1980; Stahl 1982). Therefore, remittances can widen income inequality among households in low-income labour-exporting countries. This poses a challenge to policymakers, given that, income inequality, through a number of mechanisms, can undermine the effectiveness of poverty reduction strategies with negative repercussions for long-run growth as members of the less-privileged households cannot realistically compete with the more-privileged in a market economy. However, Chami et al. (2005) argue that remittances often result in moral hazards effects as recipients reduce labour supply and job search efforts. If this proposition holds, remittances can contribute to eliminating income inequality among households, assuming it is the rich and not the poor that succeed in sponsoring a family member abroad. In either case, in the long run, the income-equalization effects of remittances cannot be taken for granted because of their intrinsic positive externalities and trickling down effects on society. Furthermore, international remittances do not flow directly to only labour-exporting households, but also to local communities[2] where they are used mainly to finance social projects, from which the economically-disadvantaged naturally derive the most utility.

Adams (1991), in based on a survey of 1000 households in rural Egypt, using income data from households with and without migrants to determine the effects of remittances on poverty, income distribution and rural development, finds that remittances were important in alleviating poverty. However, Adams (1991) concludes that despite the direct poverty-mitigating effects of international remittances, they also contributed to inequality in the distribution of income. Chimhowu et al. (2004) provide evidences in support of the view that remittances do increase inequality at a national level, but internationally they transfer resources from developed to developing countries, thereby, contributing to reducing income inequality. Other similar inequality-mitigating effects of remittances were found by Barham

and Boucher (1998) for Nicaragua; Adams (2006) in the case of Ghana; World Bank (2007) for households in East European and former Soviet Union countries; and Nguyem (2008) for Vietnam.

On the contrary, Gustafsson and Makonnen (1993) reveal that in Lesotho, migrant remittances do not only reduce poverty but they actually decrease income inequality. For Mexico, using National Household Survey Data on income and expenditure for year 2002, Esquivel and Huerta-Pineda (2007) find that remittances-recipient households are less likely to be poor. Evidences from various cross-country studies including Adams and Page (2005), and Acosta et al. (2008) lend support to the fact that remittances directly reduce poverty; whilst many more studies including Stark et al. (1986), Taylor (1992), McKenzie and Rapoport (2007), and Unger (2005) show that remittances directly reduce inequality.

Empirical model, methodological approach and data issues

An important methodological challenge related to modelling the effects of remittances on economic development outcomes is endogeneity bias that could arise from reverse causality, omitted variable bias and migrants' self-selection bias of target recipients. In addition, remittance inflows do not only affect the socioeconomic welfare of direct recipients but also non-migrant households, the business sector, the community and the nation as a whole. To circumvent this plausible endogeneity problem, it is important to adopt an econometric approach where it is possible to test for endogeneity in the empirical model. Analysts who take serious cognizance of this problem often use either instrumental variable techniques or dynamic panel-data modelling especially where the data dimension is of larger cross-section[3] over time series. Of these two approaches, dynamic panel-data modelling by Generalized Method of Moment (GMM) dominated empirical studies of recent years[4]; and even where the two approaches are used for the sake of robustness, conclusions have been based mainly on

results from GMM estimators[5]. Therefore, to estimate the impact of remittances on poverty and income inequality in SSA, this paper relied on a dynamic panel-data modelling by system GMM. The system GMM estimation technique developed by Blundell and Bond (1998) is superior to the conventional difference GMM proposed by Arellano and Bond (1991) and the deviation GMM suggested by Arellano and Bover (1995) in a number of ways. For example, in system GMM, it is possible include time-invariant regressors which tend to disappear in difference GMM (Roodman 2006). By allowing for more instruments, the estimated parameters of Blundell and Bond (1998) system GMM are not only more efficient, but also more consistent than the other alternative GMM estimation techniques.

Each estimated model has remittances incorporated into an otherwise standard endogenous growth-type economic development model with inspiration from highly-cited related studies undertaken by Adams and Page (2005), Acosta et al. (2006; 2007), Gupta et al. (2009), and Adenutsi (2010). The general empirical model is specified as Equation (1), which states that any measure of poverty or inequality $(\Theta_{i,t})$ in an SSA country i at year t is explained by the current remittances per capita received $(REM_{i,t})$, plus a set of other possible macroeconomic determinants of Θ. Mathematically, it is specified that:

$$(poverty \ or \ inequality)_{i,t} \equiv \ln \Theta_{i,t} = \psi \ln REM_{i,t} + \beta' \ln X_{i,t} + \theta' Z_{i,t} + \mu_t + \phi_i + \varepsilon_{i,t} \quad \textbf{(1)}$$

where the regressand, Θ, denotes a measure of poverty or income inequality; and REM represents remittances per capita. Consistent with the theory underlying endogenous economic growth and development framework proposed by Romer (1986), Lucas (1988), and Barro (1990), X is a matrix of uncontrolled exogenous variables $viz.$ an index of poverty or inequality as at last year (Θ_{i,t_1}), real GDP per capita according to purchasing power parity, investment in physical capital and openness to international economy. Z is a matrix containing the set of principal control variables in related empirical studies such as Acosta et al. (2006; 2008), Gupta et al. (2009), and Adenutsi (2010). The original elements of Z are human capital

accumulation, foreign direct investment, official development assistance, inflation, government expenditure, exchange rate, real lending rate, business cycle, adult literacy rate and institutional quality. The subscripts i and t are the country and time identities respectively whilst μ_t and ϕ_i are the time-specific and country-fixed effects respectively. The residuals, which are assumed to be normally distributed with a constant variance and zero mean, take into account the unobserved time-variant factors that can influence $\Theta_{i,t}$. *A priori,* the signs of ψ, β' and θ' are indeterminate. The notation *ln* preceding Θ, R and X signifies the natural logarithm, whilst each element of Z is in natural logarithm unless otherwise stated in Table A1.

A systematic three-stage estimation procedure was carried out; starting with modelling Equation (1) as specified to determine the impact of remittances on poverty and inequality in SSA. For the second-level estimation, a median-dummy variable of the regressand was introduced into final estimated Equation (1) obtained through parsimony (with controlled variables in contest) at the first level. This median-dummy variable (MDV) is a dichotomous variable that takes the value of one if in a particular time period, t, a poverty or income inequality index (the specific regressand in context) of a country i exceeds the respective median of the sampled countries; otherwise it takes the value of zero. Scientifically, $MDV = 1$, *if* $\ln \Theta_{i,t} > 1$, and $MDV = 0$, *if* otherwise. A statistical significance of the estimated parameter corresponding to MDV indicates incidence of discriminatory impact of remittances within the sample requiring further investigation of the nature into this bias. Therefore, where MDV is statistically significant, the study proceeds to the third stage of estimation. This is where MDV is replaced with an interacted MDV-remittances, and the modified Equation (1) is re-estimated to evaluate the impact of remittances when at any particular time a sampled country records a poverty index (or income inequality index as the case may be) exceeding the matching median-level index of the sampled countries. The

respective computed median used to construct MDV based on the natural logarithm of poverty headcount; poverty gap; poverty severity, and income inequality are 3.94051; 3.08024; 6.16048 and 3.86231.

The two-step system GMM estimation was used because this yields standard errors that are asymptotically robust to heteroskedasticity (Blundell and Bond 1998). For the joint statistical significance of the right-hand side variables in explaining a regressand, the Wald statistics was used. The conventional diagnostic tests for the performance of the model carried out are the Sargan-Hansen test for over-identifying restrictions to establish the validity of the selected instruments; and the Arellano-Bond test for second-order autocorrelation in the first-differenced idiosyncratic residuals.

Based strictly on consistent availability of relevant data, 36 SSA countries[6] were initially sampled for the analysis, but for the models involving poverty, the sample size reduced to 34 (excluding Mauritius and Sudan) because of lack of data on poverty indicators. In the absence of annual panel data, a 5-year non-overlapping average panel data was used essentially because the primary source, the World Bank, does not report on poverty indicators annually. The empirical dynamic panel model has a dimension of $N > T$, as $i = 1, 2, 3, ..., N$ such that $N = 34$ in the case of poverty models but $N = 36$ in the case of income-inequality model; and $t = 1, 2, 3, ..., T$ so that, for each empirical poverty and inequality model, $T = 6$.

Poverty headcount ratio, poverty gap index which measures the depth and incidence of poverty, and squared poverty gap as a proxy for poverty severity are the indicators of poverty used in this study whilst the Gini index was used to measure income inequality. The definition, specific measurement and main source of the variables are outlined in Table A1 in the Appendix.

Empirical results and discussions

The empirical results of this study are reported in Table 2. The number of observations in each estimated poverty model was 169, whilst that of income inequality is 175. The number instruments used in each of the estimated models (poverty headcount, poverty gap, poverty severity and income inequality) was 25. At one percent level of statistical significance, the Wald statistics suggest that the explanatory variables jointly explain total variations in the dependent variable in each of the estimated models. The Arellano-Bond test statistics and the Sargan-Hansen statistics indicate that, at the conventional levels of statistical significance, none of the estimated model is inefficient. This is because the instruments used in the system GMM estimations are valid and there are no autocorrelations in the first-difference residuals in any of the estimated models.

At five percent level of statistical significance[7], international migrant remittance inflows impacted negatively on all dimensions of poverty, (-0.02174, -0.02919, and -0.05839 for poverty headcount, poverty gap and poverty severity respectively), in SSA between 1980 and 2009. This implies that, a percentage increase in international remittance inflows per capita reduced the number persons living on less than US$1.25 per day by approximately 0.022 percent in SSA between 1980 and 2009. During this same period, a similar increase in remittances per capita reduced poverty gap by at least 0.029 percent, while the severity of poverty reduced by about 0.058 percent in a typical labour-exporting SSA country. The findings of this study, thus, point to the fact that, as far as macroeconomic factors are concerned, international migrant remittances received through official channels have significant poverty alleviating effects in SSA. Indeed, besides higher human capital accumulation, investment in physical assets, and real income per capita, international migrant remittances have the most consistent and significant economic impact on poverty alleviation

Table 2: Impact of Remittances on Poverty and Inequality in SSA (1980-2009)

Group variable: Ccode   Time variable: 5-Year Average

Two-Step Estimation by Blundell-Bond System Dynamic Panel-Data Procedure

	Poverty Headcount	Poverty Gap	Poverty Severity	Income Inequality
Lagged dependent variable	1.05056	0.83226	0.83226	0.91124
	$(31.51)^{***}$	$(7.21)^{***}$	$(7.21)^{***}$	$(11.22)^{***}$
Remittances (lnREMPC)	**-0.02174**	**-0.02919**	**-0.05839**	**-0.00137**
	$(-3.04)^{***}$	**$(-2.07)^{**}$**	**$(-2.07)^{**}$**	**(-0.27)**
Human capital accumulation (lnHCA)	………..	-0.32159	-0.64317	-0.03344
	………..	$(-5.14)^{***}$	$(-5.14)^{***}$	$(-2.06)^{**}$
Real GDP per capita (lnY_PPP)	-0.03048	-0.07481	-0.14963	0.07417
	(-0.55)	$(-2.18)^{***}$	$(-2.18)^{***}$	(2.85)
Investment in physical assets (lnINV)	0.08624	-0.17023	-0.34047	0.06799
	$(1.73)^{*}$	$(-2.20)^{**}$	$(-2.20)^{**}$	$(2.77)^{***}$
Foreign direct investment (FDI)	-0.01778	………..	………..	………..
	$(-3.30)^{**}$	………..	………..	………..
Official development assistance (lnODA)	0.01949	0.06708	0.13415	-0.02001
	(0.82)	$(1.93)^{*}$	$(1.93)^{*}$	$(-2.97)^{***}$
Trade openness (lnOPN)	-0.13505	0.04169	0.08338	-0.13591
	$(-1.80)^{*}$	(0.42)	(0.42)	$(-2.88)^{***}$
Rate of inflation (INF)	-0.00123	0.00046	0.00917	………..
	$(-2.22)^{**}$	(0.71)	(0.71)	………..
Government expenditure (lnGXP)	0.29931	0.61328	1.22655	………..
	$(4.10)^{***}$	$(5.49)^{***}$	$(5.49)^{***}$	………..
Real exchange rate (lnRXR)	0.01586	0.03537	0.07073	-0.02900
	(0.53)	(0.61)	(0.61)	$(-1.76)^{*}$
Business cycle (BZC)	………..	………..	………..	-0.00902
	………..	………..	………..	$(-5.75)^{***}$
Institutional quality (INS)	………..	………..	………..	0.00353
	………..	………..	………..	(1.23)
Constant term	-0.58598	0.24427	0.48854	0.49255
	(-1.03)	(0.30)	(0.30)	(1.39)
Number of observations	169	169	169	175
Number of groups	34	34	34	36
Number of instruments	25	25	25	25
Wald $\chi^2_{[\bullet],}$	$_{[11],}17667.07^{***}$	$_{[11],}2518.00^{***}$	$_{[11],}2518.00^{***}$	$_{[10],}596.03^{***}$
Arellano-Bond test for zero autocorrelation in first-difference errors (order 2):				
	-5.186{0.604}	0.7467{0.455}	0.7467{0.455}	-0.0169{0.987}
Sargan-Hansen test of over-identifying restrictions:				
$\chi^2_{[13],}$	16.0871	20.0526	20.0526	11.4423

Source: *Author's estimation* */**/*** *denote statistical significance at 10%, 5% and 1% respectively*
z-statistics are in ( ), z-probabilities are { }

in SSA. In this regard, it is important to emphasize the fact that human capital accumulation and investment in physical assets, although had the most significant poverty-alleviating effects in SSA between 1980 and 2009, unlike real income per capita and international remittances, these two factors failed to have any significant impact on poverty headcount.

At conventional levels of statistical significance, this study has shown that, generally, remittances do not impact income inequality in SSA (Table 2); yet, when the level of income inequality is above the group median, migrant remittances do aggravate income inequality more significantly (Table 3). Therefore, even if remittances contribute to bridging the income gap between the South and the North, among labour-exporting developing countries such as those in SSA, this study has shown that, alas, they do entrench income inequality.

In Table 3, the finding further shows that the poverty-alleviating effects of remittances differ across SSA countries, using the group median-level indicators of poverty as a reference point. With statistically significant coefficients of 0.0452, 0.0750 and 0.1500 for poverty headcount, poverty gap and poverty severity respectively, the study reveals that, when the incidence of poverty by any measure is above the median level, official remittances received aggravate poverty, at least, internationally[8]. This may be due to the fact that, as shown in Table A2, the poorest SSA countries in terms of GDP per capita, such as Burundi, Congo Republic, Ethiopia, Malawi and Rwanda, receive the least official remittances per capita. Besides, even in the 2000-2009 decade when SSA received the highest amount of remittances, no country could receive even up to US$1 per day, as Cape Verde (the highest recipient) received only US$249.88 per annum[9]. This seems to justify the apprehension of remittance-pessimists that severely poor families would normally not have the means to sponsor migrants to high-income countries to enable them directly benefit from international migration by way of remittances. To the extent that remittances generally have direct and instantaneous poverty-

mitigating effect in SSA, the findings of this study are consistent with the results obtained in related previous studies including Adams and Page (2005), López-Córdova (2005), Acosta *et al.* (2006), Gupta *et al.* (2009), Kalim and Shahbaz (2009), and Gubert *et al.* (2010).

Table 3: **Comparative Analysis of Remittance Effects on Poverty and Inequality in SSA**

Type of Dummy Effect	Poverty Headcount	Poverty Gap	Poverty Severity	Income Inequality
Independent Median	0.1415 (2.83)***	0.2620 (4.73)***	0.5240 (4.73)***	0.1388 (6.27)***
MDV-Remittance Interactive	**0.0452 (2.67)****	**0.0750 (4.40)******	**0.1500 (4.40)******	**0.0357 (4.09)******
Number of observations	169	169	169	175
Number of groups	34	34	34	36
Instruments	26	26	26	25
Wald ($\chi^2_{(0)}$)	[12], 9448.46***	[12], 1240.28***	[12], 1240.28***	[11], 486.67***
Arellano-Bond Test	-0.8852{0.3760}	0.7114{0.4769}	0.7114{0.4769}	0.1813{0.8561}
Sargan-Hansen Test (χ^2_{13})	12.5386	18.8135	18.8135	11.5240

Source: *Author's estimation*   **Note**: ***(***) denote statistical significance at 5(1) percent respectively z-statistics in ( ); z-probabilities in { }*

To a large extent, this result is consistent with Nguyen (2008), and Ekebe and Le Goff (2009) that although remittances reduce poverty, they are less inequality-mitigating. The findings of this study also seem to support earlier conclusions drawn by Acosta *et al.* (2007) for 10 LAC countries and Gubert *et al.* (2010) for Mali; that, remittances either reduce or have no effects on income equality.

Conclusions and policy recommendations

Based on the above empirical findings, this study concludes that, in SSA, remittances have huge potentials for promoting economic development by way helping to reduce poverty but not necessarily income inequality. The main implications of this conclusion[10] are that remittances contributed to poverty alleviation in SSA over the past three decades, but the optimal contribution of remittances to socioeconomic development of SSA has not been fully realised mainly because the sub-region failed to mobilise adequate remittances from its migrants. Consequently, there is the need to attract higher remittances in order to realise the optimal developmental-impact of remittances in SSA. In addition, governments and policymakers in SSA must pursue complementary development strategies towards

empowering the economically-disadvantaged and the vulnerable group to reduce poverty and income inequality. For example, because higher human capital accumulation by way of improved secondary school enrolment has consistent poverty and income inequality mitigating effects, non-discriminatory access to higher education policies such as free education up to the secondary level could be essential in eliminating poverty and income inequality more permanently. Policymakers can also encourage formation of vibrant and progressive migrant hometown associations in all major migrant host countries as a means to mobilising more remittances to finance development projects at the community levels, so that the direct benefits of the poor from remittances can be enhanced.

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Table A1: **Data Description, Measurement and Sources**

VARIABLE	NOTATION	DESCRIPTION, MEASUREMENT AND MAIN SOURCES
Dependent Variables: Poverty & Income Inequality		
Poverty headcount	*lnPovH*	Share of the population living on less than US$1.25 per day at 2005 international prices. *Source*: WDI.
Poverty gap	*lnPovG*	The mean shortfall from the poverty line[1] (counting the non-poor as having zero shortfall) expressed as a percentage of the poverty line. *Source*: WDI.
Poverty severity	*lnPovS*	Squared value of the PovG. *Source*: Author's computation based on WDI.
Income Inequality	*lnGini*	Gini index measuring the extent to which the distribution of income (or consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. *Source*: WDI.
Explanatory and Control Variables		
Remittances per capita	*lnREMPC*	The sum of *workers' remittances* and *compensation of employees* as ratio of population. **Sources**: *WDI, BoPS, MRF-2011* CD-ROMs and e-databases and estimates based on country-specific information obtained from country-desk officials of the IMF and the World Bank.
Real GDP per capita PPP	*lnY_PPP*$^{+/-}$	GDP per capita based on purchasing power parity (PPP) at constant 2005 international prices in US dollars. **Sources**: *WDI* and *WEO*.
Human capital accumulation	*lnHCA*	Net enrolment ratio of children of official school age based on International Standard Classification of Education 1997 who enrolled in post-primary school relative to the population of the corresponding official school age. **Source**: *WDI*.
Investment in physical assets	*lnINV*$^{+/-}$	Gross fixed capital formation as a ratio to nominal GDP. **Sources**: *WDI* and *WEO*.
Inflation rate	*INF*$^{+/-}$	Rate of growth in annual average of consumer price index. **Source**: *WDI* and author based on *IFS* and *WEO*.
Real exchange rate	*lnRXR*$^{+/-}$	The annual average value of the national currency of a sampled SSA country in real terms of the national currency of USA. Computed as a multiplication of nominal exchange rate by the ratio of host-country CPI to the USA CPI. **Source**: *WDI* and author based on *IFS* and *WEO*.
Government expenditure	*lnGXP*$^{+/-}$	Central government final consumption expenditure as a percentage of nominal GDP. **Sources**: Author based on *WDI*, *IFS* and *WEO*.
Business Cycle	*BZC*$^{+/-}$	Annual growth in real GDP. **Sources**: Author based on *WDI, IFS* and *WEO*.
Real lending rate	*RLR*$^{+/-}$	Average annual rate charged by banks on loans to prime customers minus the annual rate of inflation. **Sources**: Author based on *WDI*, *IFS* and *WEO*.
Openness to international trade	*lnOPN*$^{+/-}$	Sum of exports and imports as a percentage of nominal GDP. **Sources**: Author's computation based on *WDI* and *WEO*.
Foreign direct investment	*FDI*$^{+/-}$	Net inflows of investment, being the sum of equity capital, reinvestment of profits, other long-term capital, and short-term capital, to acquire long-term management interest in an enterprise operating in an economy other than that of the investor, expressed as a percentage of nominal GDP. **Sources**: Author based on *WDI* and *WEO*.
Official development assistance	*lnODA*$^{+/-}$	Disbursement flows (net of repayments) from official donors to a country as a percentage of nominal GDP. **Source**: *WDI*.
Institutional quality	*INS*$^{+/-}$	A polity2 index used to capture the qualities/standards of democratic governance and institutions in a typical home SSA country. It ranges between -10 for low democratic governance (including dictatorship and autocratic governance regimes) and weak institutions, and +10 for high democratic governance and institutions. Source: Marshall and Jaggers (2011).

Source: *Author based on February 2011 editions of WDI, WEO and IFS were primarily used. The a priori sign is indicated by* $^{+/-}$ *by the notation column of each variable.*

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[1] The World Bank defines poverty line as the annual cost of obtaining the standardised minimum daily caloric 2172 requirement of 2172 calories per person plus basic non-food essential items such as food and education.

Table A2: Current Migrant Remittance-Dependent Countries in SSA, 2000-2009

A: Top-10 Remittance *per capita* Recipients		B: Top-10 Dependent Countries (as % of GDP)		C: Top-10 Dependent Countries (in US$'m)	
Rank	**Country (remittances *per capita* in US$)**	**Rank**	**Country (% share of GDP)**	**Rank**	**Country (remittances in US$ millions)**
1	Cape Verde (249.28)	1	Lesotho (28.73)	1	Nigeria (4,465.23)
2	Mauritius (170.62)	2	Cape Verde (12.68)	2	Sudan (1,504.21)
3	Lesotho (164.94)	3	Gambia (9.24)	3	Kenya (957.81)
4	Seychelles (89.09)	4	*Liberia (8.87)*	4	Senegal (777.32)
5	Swaziland (68.93)	5	Togo (8.52)	5	South Africa (583.74)
6	Senegal (67.17)	6	Senegal (8.43)	6	Uganda (427.62)
7	Botswana (41.12)	7	Guinea-Bissau (5.28)	7	Lesotho (329.06)
8	Sudan (38.15)	8	Sudan (5.22)	8	Mali (217.69)
9	Gambia (31.00)	9	Uganda (4.62)	9	Mauritius (210.82)
10	Togo (30.81)	10	Kenya (4.58)	10	Togo (188.66)

A: Bottom-10 Remittance p*er capita* Recipients		B: Bottom-10 Dependent Countries (as % of GDP)		C: Bottom-10 Dependent Countries (in US$'m)	
Rank	**Country (remittances *per capita* in US$)**	**Rank**	**Country (% share of GDP)**	**Rank**	**Country (remittances in US$ millions)**
1	Ghana (3.76)	1	Cameroon (0.54)	1	Madagascar (13.35)
2	Congo, Rep. (3.51)	2	South Africa (0.27)	2	Namibia (13.24)
3	Mozambique (3.44)	3	Madagascar (0.26)	3	Comoros (11.93)
4	Rwanda (3.11)	4	Congo, Rep. (0.23)	4	Congo, Rep. (11.89)
5	Ethiopia (2.11)	5	Namibia (0.22)	5	Gabon (8.16)
6	Madagascar (0.78)	6	Mauritania (0.12)	6	Seychelles (7.54)
7	Mauritania (0.68)	7	*Burundi (0.11)*	7	Mauritania (2.00)
8	Tanzania (0.38)	8	Tanzania (0.11)	8	Sao Tome & Principe (1.48)
9	*Burundi (0.16)*	9	Gabon (0.10)	9	*Burundi (1.29)*
10	Malawi (0.07)	10	Malawi (0.03)	10	Malawi (0.92)

Source: *Author*

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[1] For definition of these poverty measures, refer to Table A1 in the Appendix.

[2] See for example, Diatta and Mbow (1999) in the case of Senegal.

[3] Number of sampled countries is 34 for poverty models and 36 for inequality model based on availability of data.

[4] Some of these studies are Acosta et al. (2007; 2008; 2009), Jongwanich (2007), and Adenutsi and Ahortor (2010).

[5] See, for example, Aggarwal et al. (2006), and Jongwanich (2007).

[6] List of sampled countries are presented in Table 1.

[7] The estimated coefficient of international migrant remittance inflows per capita on poverty headcount was, in fact, significant at one percent statistical level.

[8] The poverty line used in this study is based on international caloric requirement based on PPP, therefore, remittances can actually reduce poverty at national levels in both category of countries (which is outside the scope of this study), but not in terms of comparative international terms (as revealed by this study).

[9] No SSA country received up to US$1 per day in migrant remittances per capita since the highest recipient, Cape Verde, received a mere US$249.28 which is far less than US$365.25, representing US$1 per day.

[10] It is important to note that, with regard to the conclusions based on distributive effects of the comparative analyses in particular, given that higher unofficial remittances are more likely to be received in poorer countries with weaker institutions and financial infrastructure, the developmental impact of remittances in these countries could be underestimated if only official remittances are used, as in this the case of study, because data on unofficial remittances are not available over the study period and across the sampled countries.