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Inequality Effects of Remittance Inflows on Per Capita Income Decomposition in Sub-Saharan Africa

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ABSTRACT

The debate on whether migration-induced remittances are effective for driving income growth, reducing inequality, and promoting long-term economic convergence in SSA still persists despite the benefits highlighted in the literature. This study examines the inequality effects of remittance inflows on the decomposition of per capita income in SSA. The panel data for 46 sub-Saharan African countries spanning the period 2000–2023 were used. The study employs the Gini income decomposition framework to disaggregate total income inequality into its constituent sources. The analysis focuses on the contributions of personal remittances received and paid relative to other income components, while considering the fragility of SSA economies to external shocks. The results provide robust evidence that remittance inflows posed a statistically significant inequality-reducing effect in SSA. That is, a one-percent increase in personal remittances received and paid reduces the Gini coefficient by approximately 0.93 percent and 0.91 percent, respectively. The low Gini correlation coefficients with remittances show that transfers are evenly distributed across income groups, and unequally of benefit to the lower-income households. The heterogeneity effect is shown by the result across countries. The implication is that the impact of remittances depends on domestic income, labor market conditions, and financial systems. In summary, remittances contribute to short-term inequality reduction in SSA, but the effect in ensuring a long-term per capita income convergence is conditional on the performance of the domestic policies.

Keywords: Remittance, income inequality, income convergence, sub-Saharan Africa, international migration.

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1. Introduction

The prevalence of international migration is as old as human existence. For sub-Saharan Africa (SSA), migration has become an underlying factor that shapes both political boundaries and the region's demographic and economic projections. Migration is defined as the movement of individuals within or across national borders either for a short, temporary, or permanent residence (UN DESA, 2020; IOM, 2023). Following the Push-Pull migration theory, international migration from SSA has increased, and the driver is persistent with income and wage differentials between origin and destination countries (Zlotnik, 2019; UN DESA, 2022). That is, the positioning of the region as a major supplier of migrants to Europe, North America, and parts of Asia

Migration-induced remittance is a major channel through which migration shapes the economy. That is, aside from the foreign direct investment and official development assistance in several SSA economies, remittances have become one of the most stable and significant sources of external finance for low- and middle-income countries (World Bank, 2023; KNOMAD, 2024). Evidence has shown that at the household level, remittances support consumption smoothing and human capital investments in education and health, while at the aggregated economic perspective, the contribution is driven by the level of foreign exchange earnings (Gupta et al., 2009; IOM, 2023). These attributes combined to suggest that remittances promote income growth, reduce inequality, and facilitate per capita income convergence between poorer SSA economies and richer migrant-receiving countries.

In contrast, the era of steady rise in remittance inflows exceeding US\$53 billion in 2022, sub-Saharan Africa still has documented the highest levels of income inequality globally (World Bank, 2023; World Inequality Database, 2023). Many countries in the region consistently report Gini coefficients above 45%, for example, South Africa, Namibia, Botswana, and Eswatini, ranking among the most unequal economies worldwide. The paradox is that despite SSA becoming a major source of international migrants and receiving growing remittance inflows, the region remains structurally less developed than major migrant-receiving economies (Zlotnik, 2019). Standard growth and convergence theories suggest that capital inflows such as remittances should accelerate growth in poorer economies and support income convergence over time (Domar, 1994). However, empirical evidence from SSA is inconclusive on the causal effect of migration. A few high-remittance countries like Nigeria, Ethiopia, Botswana, and Zambia have continued to experience widening income inequality, while countries like Ghana, Malawi, Liberia, and Uganda exhibit relatively more odds for income equity. These varying experiences suggest that remittances do not pose uniform effects and that their impact relies on income channels, labor market dynamics, and institutional engagement.

Understanding the relationship between the remittance and income is further made complex by recent changes in migration dynamics from SSA. The demographic characteristics have shown that migrant

profiles have younger and more gender-balanced profiles. Likewise, the forced migration in the region is driven by the prevailing conflict and climate stress and digital financial technologies (UN DESA, 2022; IOM, 2023). The SSA economy's vulnerability to external shocks is demonstrated by the experience of global financial crises, the era of COVID-19 pandemics, commodity price volatility, and policy outcome uncertainty during this era (Ravallion, 2018; World Bank, 2023). This implies that all weaknesses of the system may be attributable to remittance inflows. These concerns raise important questions about the sustainability of remittance development and its effect in the long run.

Against this backdrop, earlier studies provided no clear or uniform empirical position on whether remittance inflows in sub-Saharan Africa influence income convergence or inequality. While a plethora of empirical evidence focuses on short-run poverty or average income effects, the attention to long-run convergence dynamics and income distribution across countries is limited. Moreover, cross-country heterogeneity of inequality outcomes is yet to be explored, particularly in the context of increasing variance in remittances, technological change, and global shocks. Then, it is unclear whether remittances function as an effective mechanism for targeting the income gap or whether their benefits are indiscriminately determined by higher-income and varying groups.

The coexistence of rising remittances and persistent inequality raises concerns about whether remittance inflows translate into income gains or instead reinforce existing disparities. And this position is further uncertain with the empirical outcomes across the SSA that have remained uneven, whether remittances are often assumed to disproportionately benefit poorer households. The underlying research questions, despite the remittance inflow, are:

Research Question

- a) To what extent can remittance inflow foster income convergence?
- b) What are the effects of remittance inflow on income inequality?

Objectives of the Study

This study is motivated by the need to address this gap by systematically-

- a) Examining the effect of remittance inflows on shaping per capita income convergence
- b) Determine the impact of remittance on income inequality in sub-Saharan Africa.

By analyzing how remittances affect income levels and distribution across countries with varying inequality profiles, the study seeks to provide clarity on the barriers and facilitators under which remittances support may be growth-inclusive and of a long-term convergence. In doing so, it contributes to ongoing debates on migration and development and provides policy-relevant insights for designing

migration and remittance frameworks capable of enhancing equitable income growth and economic convergence in SSA.

2.0. Literature Review

2.1. The Concept of Migration, Income Convergence, and Income Inequality

Migration is a human phenomenon shaping economic and social interactions across societies through the remittance channel and globalization enhancement. Following the International Organization for Migration (IOM) conceptualization, a migrant is any individual who moves across the borders of countries or within a state from their place of origin to a place of residence (IOM, 2017). Migration is either way, immigration (into a country) and emigration (out of a country), and is closely associated with economic development through the odds of remittance flows, labor mobility, and income redistribution (World Bank, 2023; KNOMAD, 2024; Joshi & Piya, 2025; Smith, 2025). For Remittances, it refers to the money or non-monetary metric transfers sent by migrants to households in their countries of origin. Unlike FDI or official development assistance, remittances are private or individualistic and provide a source for external finance into developing economies (Gachino, 2025; Inije, 2025). The determinant of the causal effect relationship is underpinned by the push–pull frameworks, which explain remittance behavior through wage differentials, employment opportunities, and economic disparities (Stalker, 1997; Taylor et al., 1996). Modern event provides a transformative perspective on the factors of migration, including altruism, household risk-sharing, migrant networks, and responses to shocks like climate change and insecurity (Lucas & Stark, 1985; Yang & Choi, 2007).

Remittance inflows have continued to grow steadily over the past three decades, further supported by declining transaction costs and digital innovations in finance. The effect is demonstrated by the high. Worldwide migrant stocks now exceed 200 million, shared by the United States, Europe, and other high-income economies in Asia (IOM, 2017; Allen, 2021). In sub-Saharan Africa, aggregate flows are smaller than in South Asia or Latin America, thereby making remittances a substantial share of GDP, as seen in countries like Cabo Verde, Lesotho, The Gambia, Nigeria, and South Sudan, often surpassing FDI and ODA as household livelihood support (Gachino, 2025; Inije, 2025).

Income Inequality

Income inequality, on the other hand, is defined as the unequal distribution of income across individuals or households within an economy (Anyanwu, 2011; Koop, 2023). The concept is overflooded in the literature, and the majority of the studies adopted the monetary measurement approach, the Lorenz curve, and the Gini coefficient for evaluation. The Lorenz curve displays the deviations from perfect equality in income distribution, and the Gini coefficient provides a summary measure ranging from zero to one, indicating perfect equality to inequality (Todaro & Smith, 2011). Aside from the measure of inequality

can be non-income dimensions such as wealth, access to education, health, and opportunities, highlighting its multidimensional nature (Ravallion, 2018).

Globally, inequality trends reveal a complex pattern in recent times. Either way, Sub-Saharan Africa is a region hit the hardest by income inequality, where some countries have high Gini coefficients in excess of 40%, as presented in Figure 1. Likewise, the levels of convergence in inequality observed show that high-inequality countries experience declining inequality and low-inequality countries see rising inequality. Overall, convergence speed is slow, and estimates suggest that full convergence could take several decades.

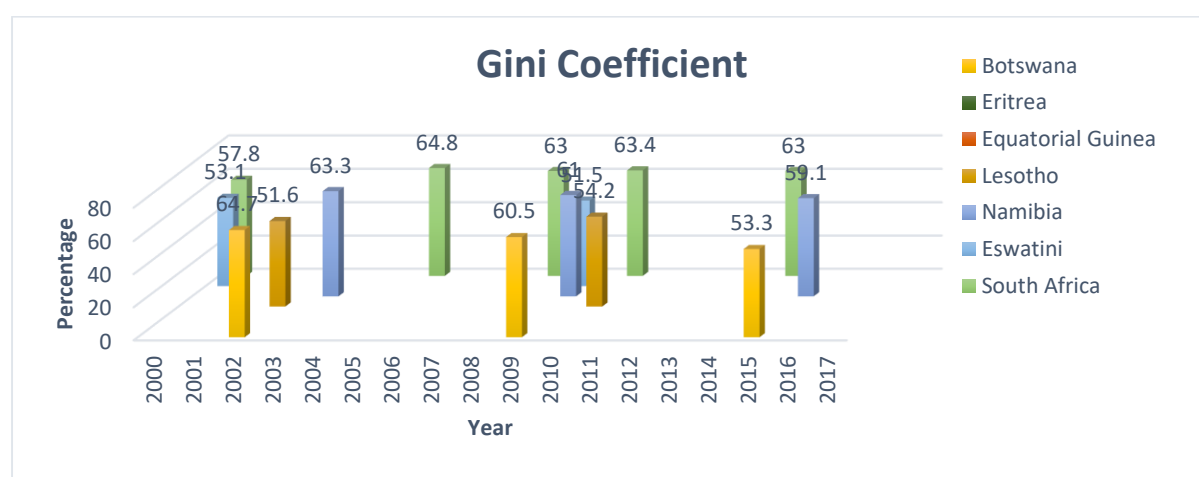


Figure 1: Income Decomposition

In light of the income convergence hypothesis, the poorer economies grow faster than richer ones, leading to a reduction in income disparities over time (Domar 1996). Underlined by the Solow growth framework, convergence responds to diminishing returns to capital. That is, higher marginal productivity in capital-scarce economies and knowledge use across countries. Similarly, the migration and remittance inflows are theoretically positioned to converge by enhancing capital transfer, human capital investment, and consumption in poorer economies. However, the hypothesis remains empirically contested, particularly for Africa. The reason for the contention is partly constraints arising from structure, institutional weaknesses, and uneven access to productive opportunities, limiting the enhancing effects of remittances on convergence odds. In summary, the conceptual views opined that remittances have the potential to reduce income inequality and support convergence, but the actual impact is tied to how they are evenly distributed and embedded within broader economic utilization. The inconclusive position in the literature provides a strong theoretical foundation to drive future investigation and shed light on the remittance-inequality relationship, particularly in the context of sub-Saharan Africa.

2.2. Empirical Literature Review

Previous studies on migration and remittances empirically showed the effect of the cross-border labor mobility on income redistribution and development outcomes in Africa to be dominant. The migration theories of the push–pull framework and the new economics of labor migration, with focus on wage differentials, employment opportunities, and economic disparities between origin and destination countries is adopted to demonstrate why migration increased and remittance inflows (Stalker, 1997; Taylor et al., 1996). Emerging works include the household insurance motives, migrant networks, altruism, and exposure to shocks such as climate change and insecurity to extend the understanding of remittance behavior (Lucas & Stark, 1985; Yang & Choi, 2007; Ullah, Joshi, and Piya, 2025; Smith, 2025).

Moreover, empirical literature examining remittances within the context of international financial flows adopts the foreign direct investment (FDI) and official development assistance (ODA) for inflow. That is, FDI enhances growth, but several empirical studies highlight the mixed effects of using FDI in developing countries by revealing the risk of crowding out domestic investment, capital flight, tax concessions, and weak linkages with local economies (Todaro & Smith, 2011). This supports the rationale of accepting that remittances form a more individualistic concept than aggregate, household-level transfers and are seen to play a direct role in supporting consumption and welfare, particularly in low- and middle-income countries. The empirical evidence suggests that remittances often exceed FDI and ODA in support of their role in household livelihoods in many developing regions, especially sub-Saharan Africa (Gupta et al., 2009; KNOMAD 2024).

Empirical evidence from SSA showed a sustained increase in remittance inflows over the past two decades, both in absolute terms and as a share of GDP (Odhambo and Musakwa 2024; Yakubu, Issaku, and Oumarou 2025). The region receives a smaller share of global remittances compared to Asia or Latin America, but remittances account for large share of GDP in countries such as Cabo Verde, The Gambia, Lesotho, Nigeria, and South Sudan. The emphasis from the evidence now shifts to these inflows serving as a strong incentive for continued migration, following persistent wage gaps between SSA and major destination economies in North America and Europe (World Bank 2022).

For the nexus between remittance and income inequality, finding seems mixed and even contradictory. Using panel data for African countries between 1969 and 2006, Anyanwu (2011) employed instrumental variable techniques to address endogeneity and found that remittances are positively associated with income inequality. The study reports that a 10 percent increase in remittances as a share of GDP raises the Gini coefficient by approximately 0.013 percent. This outcome suggests that remittances may disproportionately benefit higher-income households with greater access to migration networks. Ofori et al. (2022), on the other hand, applied a generalized method of moments (GMM) estimator to panel data with 42 African countries to find that remittance inflows increase income inequality, attributing this

outcome to unequal access to migration opportunities and the dominance of remittance among relatively better-off households. Conversely, Owamah et al. (2025), using a seemingly unrelated regression (SUR) framework for ten selected sub-Saharan African countries over the period 2000–2023, reveal that remittances reduce income inequality. The opinion is based on the Gini index for measurement. Contrasting findings underscore the sensitivity of empirical results to methodological choices, country coverage, time periods, and inequality measures.

The literature on income inequality in Africa further highlights heterogeneous effects across countries. For example, macro-level Gini coefficients from household surveys show that South Africa, Namibia, and Botswana consistently exhibit very high inequality, while others show relatively moderate or low levels (UNDP, 2017). Ravallion (2018), with most studies relying on income-based measures, omits wealth and non-income dimensions, potentially understating why disparities exist. Aggregate data may also withhold within-country heterogeneity across income groups, which the debate on income convergence is tied to.

Key gaps in the literature are, first, there is no consensus on whether remittances reduce or increase inequality in sub-Saharan Africa. Second, aggregate inequality measures without decomposing income sources limit insights. Third, the link between remittances, inequality, and long-run income convergence is underexplored. This study aims to decompose per capita income and examine how remittance inflows influence inequality and convergence dynamics across sub-Saharan Africa.

3. Methodology

Variable Description

This study focuses on the sub-Saharan African region based on the World Bank's classification of the region as a host for low and middle-income countries (WDI 2019).

Secondly, the geographical mapping for sub-Saharan Africa comprises the area of the African continent within the zone south of the Sahara. According to World Bank 2019 classification, sub-Sahara Africa countries include Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central Africa Republic, Chad, Comoros, Congo, Dem. Republic, Congo, Republic, Cote D'Ivoire, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Tanzania, Togo, Uganda, Zambia, and Zimbabwe. Likewise, this study covers the period from 1980 to 2023 due to the availability of data.

Variables and Proxies

LY_{it} = income stream proxy by per capita income: This is the national income of each of the countries selected from the SSA, divided by the population. The national income is measured in USD, and it accounts for the aggregated economic activities over the years.

ProbE = probability of employment: This measures the probability of the employment proxy with the employment ratio to the population in the region. The employment rate measures the percentage of the labour force that is gainfully engaged, and it is measured in terms of the headcount of the population proportion.

LS = expected wealth accumulation at the end of the working period: This measured the asset base of each of the selected countries from the SSA. It is measured in the worth of millions of USD.

L = working lifetime proxy by the labor force of the country: This measures the working time plan across the countries in Africa.

W_{ai} = wage abroad: This is the wage for labor across the selected countries from SSA. It is measured in millions of USD.

RM_{it} = Remittance: This is the gains from the international migration of capital, and it is measured in millions of USD.

Pop_{it} = Population: This is the total number of human beings in the selected SSA countries.

FDI = Foreign direct investment

NX = net export as a measure of international trade.

Analytical Framework

The system GMM estimator is the combination of the GMM differenced estimator and a GMM levels estimator that considers the zero correlation of the error term and lagged regressor. This method is commonly applied where the T, time, is relatively small compared to the N-cross section ($T < N$), following the problem of endogenous independent variables and serial correlation. The System-GMM in the dynamic panel has the lagged dependent variable among the regressors and an individual effect characterizing the heterogeneity among individuals. The underlying assumptions of System GMM improved on the weakness of the assumptions of the traditional estimators (Pooled OLS, Generalized Least Squares, fixed effect, and Random Effect panel data model), as the zero correlations between the error term and explanatory variables were consistent. From the system-GMM in panel data, the functional model is specified as:

$$y_{it} = \delta y_{it-1} + x'_{it}\beta + \mu_i + u_{it}, \quad (1)$$

Model Specification

$$Y / N = \phi_1 + S^1 \varpi + V^1 \rho + \nu_{it}, \dots, \quad (2)$$

Where Y/N represents per capita income, ϕ_1 represents the intercept, S_1 represents the vector of Capital(K), Labour(L), and technological progress(A), while V^1 represents the vector of the international migration and REMT as specified in the equation above.

Following the Solow growth balance growth Path convergence conditions, $Y(t)$ converges to Y^* at a rate $(1-\alpha-\beta)(n+g) \equiv \lambda$

$$\frac{\partial \ln y(t)}{\partial t} \approx -\lambda [\ln y(t) - \ln y^*], \dots, \quad (3)$$

The equation implies that $\ln y$ approached $\ln y^*$ exponentially.

$$\ln Y(t) - \ln Y^* = e^{-\lambda t} [\ln(Y(0) - \ln Y^*)], \dots, \quad (4)$$

Where $Y(0)$ is the value of Y at some initial date. To obtain conditional convergence, we add $\ln Y^* - \ln Y(0)$ to both sides of the equation above.

$$\ln Y(t) - \ln Y(0) \approx -(1 - e^{-\lambda t}) [\ln Y(0) - \ln Y^*], \dots \quad (5)$$

This implies that countries with initial incomes that are low relative to their balanced growth path have higher growth.

Following the convergence theory above, we expand to include capturing the impact of remittance on the convergence of per capita income in SSA.

Hence,

$$\ln[\text{Per capita income}(t)]_{it} - \ln[\text{cper capita income}(0)]_{it} = \phi_0 + \delta [\ln \text{per capita income}(0) - \ln(\text{per capita income})_{it}] + \Psi \text{REMT}_{it} + \mu_{it}, \dots, \quad (6)$$

Where δ represents the exponential convergence growth rate $-(1 - e^{-\lambda t})$, and REMT_{it} represents the remittance inflow across the SSA.

$$LY_{ai} = F(LY_{i,t-i}, RM_{ai}^e, ProbE_{ai}, LS_{ai}^e, RW_{ait}, WD_{it}, Age_i, HCD_{it}, WA_i, EX_{it}, SEX_i, T_i, NX_{it}, FDI_{it}, E_{ia}), \dots, (7)$$

Where LY = income stream proxy by per capita income,

$ProbE$ = probability of employment proxy by the ratio of the percentage of employment to GDP

LS = expected wealth accumulation at the end of the working period proxy by national income

L = Working lifetime proxy by labor force population

W_{ai} = wage abroad proxy, the ratio of wage to exchange rate(W/EX)

RM_i = Remittance (personal remittance received, paid and % of GDP-prr, prp and prrg)

W_i = Wage

HCD = Human Capital Development Index

EX = Exchange rate

NX = net export

FDI = proxy by the ratio of Foreign Direct Investment to GDP

Also, r_i denotes the coefficient of impact on all the variables explained, and δ represents the convergence coefficient as defined by the convergence theory.

Income Decomposition

The levels of income inequality would be decomposed across the remittance inflow in sub-Saharan Africa. This would allow us to examine the correlation between remittance inflow at each level of income inequality using the income decomposition model and proxy by the Gini coefficient. The Gini decomposition technique analyses the extent of equal and unequal distribution of international remittances of the remittance inflow in SSA. The Gini coefficient measures the inequality of a distribution and defines it in ratio values between 0 and 1 (Stark et al 1986; Fonta et al., 2011; Asogwa et al., 2019). The income inequality G function is specified as:

$$G_t = \sum_{i=1}^k R_k G_k S_k = (8)$$

Where S_k denotes the income stream proxy by per capita income, G_k denotes the source G, and R_k denotes the Gini correlation of income from source k with the distribution of total income. Following equation 8 above, we are allowed to decompose the correlation of the remittance and levels of income inequality by (i) decomposing the remittance across the levels of income inequality as S_k , (ii).decompose the extent of the equal and unequal remittances distribution denoted as G_k and (iii) determine how the remittance inflow, sources, and income distribution are correlated R_k . We, therefore, specify the implicit function as:

Gini coefficients percentage levels = $F(\text{remittance inflow}), \dots, (9)$.

3. Methodology

Descriptive Statistics

The data for this study consist of annual data covering the years 2000 to 2023 and across forty-six (46) sub-Saharan African countries. The included countries are based on the data availability and consistency of data patterns on each of the indicators or variables considered. In line with the objectives of the study, the indicators selected and the units for measurement as shown in Table 1 include: acsrsp "average transaction cost of sending remittances to a specific country (%)", wage "Wage and salaried workers, total (% of total employment) (modeled ILO estimate)", eap "Educational attainment, at least completed primary, population 25+ years, total (%) (cumulative)", lfbe "Labor force with basic education (% of total working-age population with basic education)", nm "Net migration-immigration minus emigration", fdi "Foreign direct investment, net (BoP, current US\$)", gdpd "GDP deflator (base year varies by country)", gdppc "GDP per capita (constant LCU)", epr "Employment to population ratio, 15+, total (%) (modeled ILO estimate)", nxe "Net export value, US Dollar", exch "Official exchange rate (LCU per US\$, period average)", prp "Personal remittances, paid (current US\$)", prr "Personal remittances, received (current US\$)", prrg "Personal remittances, received (% of GDP)", gdp "GDP (current US\$)".

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
*acsrsp	1104	6.456e+08	8.871e+08	-49693334	9.054e+09
*wage	1104	3.524e+09	2.515e+09	1003114	9.986e+09
eap	1104	4.334e+09	8.330e+08	43405159	8.844e+09
lfbe	1104	51853.195	9553.894	621	95195
nm	1104	-10810.936	61240.936	-866101	644996
fdi	1104	-2.872e+09	3.196e+09	-4.056e+10	1.273e+10
gdpd	1104	3.767e+09	3.080e+09	100	1.000e+10
gdppc	1104	3.765e+09	2.468e+09	1229069	9.987e+09
*epr	1104	58.79	13.934	19.65	85.866
Dnxe	1104	13.536	38.128	-116.934	398.954
exch	1104	3.747e+09	2.647e+09	1289	9.969e+09
prp	1104	3.609e+09	2.658e+09	0	9.998e+09
*prr	1104	3.325e+09	3.385e+09	0	2.431e+10
prrg	1104	1.853e+09	2.134e+09	0	9.901e+09
gdp	1104	1.613e+12	7.346e+12	1.880e+08	5.740e+13

Pre-Estimation testing

The first step before the estimation of the effect of international migration and remittance inflow on the per capita income growth in sub-Saharan African countries is the estimation of the Instrumental variable model and the test of heteroscedasticity. The Null Hypothesis is: "The disturbance is homoscedastic," and the alternative is the opposite of the null hypothesis. The result of the test of the Heteroscedasticity is

presented in Table 2, and the statistic showed a strong indicator not to reject the Null hypothesis and suggests no presence of heteroscedasticity. That is, the probability value is 0.671%, and it is no less than 1%, 5%, and 10% level of significance. Likewise, the test statistic of the test of heteroscedasticity is 28.937. Following the result, the Two-Stage Least Squares is considered for adoption in the estimation of the effect of International migration, remittance, and economic globalization.

Table 2: Heteroscedasticity test

Test Statistic	Value	P.value	Dependent Variable
White/Koenker nR2 test statistic	28.937	0.671	Per capita income growth convergence

Computed by the author

*** p<0.01, ** p<0.05, * p<0.1

Results on the effect of international migration and remittance inflow on per capita income growth in sub-Saharan African Countries.

The result of the effect of international migration and remittance on per capita income is presented in column 2, label IV2 in Table 3, that is, the estimate from the 2-stage instrumental variable regression.

Table 3: Effect of remittance inflow on per capita income growth in SSA countries

VARIABLES	IV2	MCREG	subregion	MCREG*wg	sub*wg	MCREG*exch	subregion*exch
L.loggdppc	0.349*** (0.0438)	0.309*** (0.0440)	0.320*** (0.0455)	0.299*** (0.0436)	0.310*** (0.0454)	0.308*** (0.0439)	0.317*** (0.0455)
lognm	0.00687* (0.00410)	0.00474 (0.00423)	0.00545 (0.00418)	0.00580 (0.00425)	0.00633 (0.00425)	0.00469 (0.00426)	0.00488 (0.00420)
logwage	0.0817** (0.0375)	0.0630* (0.0368)	0.0482 (0.0359)	-0.196*** (0.0549)	0.154** (0.0685)	0.0592 (0.0368)	0.0494 (0.0359)
logexch	- 0.0178** (0.00901)	- 0.0249*** (0.00944)	-0.0226** (0.00943)	-0.0234** (0.00921)	-0.0225** (0.00918)	-0.0687 (0.0859)	-0.0393*** (0.0145)
L.logconverge	0.0195 (0.337)	-0.0275 (0.331)	0.0944 (0.330)	-0.0811 (0.333)	0.0601 (0.328)	-0.0318 (0.330)	0.108 (0.328)
COMESA		-0.283* (0.171)					
EAC-5		-0.517*** (0.174)					
SADC		-0.512*** (0.161)					
SACU		-0.0763 (0.178)					
ECOWAS		-0.289** (0.141)					
COMESA*logwage				0.214** (0.0964)			
EAC-5*logwage				0.261*** (0.0831)			
SADC*logwage				0.468*** (0.114)			
SACU*logwage				0.370***			

			(0.124)			
ECOWAS*logwage			0.156**			
West Africa		0.193**		4.584**		-0.383
		(0.0827)		(1.891)		(0.393)
Middle Africa		0.213*		7.699***		-3.455***
		(0.109)		(2.247)		(1.275)
Southern Africa		0.370***		2.451		-0.00229
		(0.117)		(1.978)		(0.624)
West Africa*logwage				-0.205**		
				(0.0874)		
Middle Africa*logwage				-		
				0.347***		
				(0.103)		
						(0.0195)

Computed by the author Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Results on the decomposition of income inequality in SSA countries by remittance inflow into sub-Saharan Africa

The decomposition of the per capita income over the remittance inflow in sub-Saharan Africa allows us to examine the correlation that exists between the indicators. The result of the Gini decomposition is presented in Table 4.

Table 4: Total Income Variable: Gini Decomposition by Income Source

Source	Sk	Gk	Rk	Share	% Change
logpr	0.99	0.03	0.04	0.05	-0.93
logprp	0.99	0.03	0.06	0.08	-0.91
Total income		0.02			

Computed by the author using Stata

The Bootstrap statistics in Table 4 present the standard error of the personal remittance received and the personal remittance paid. The Bias statistics are low, likewise is the standard error from the personal remittance received and paid. The confidence interval showed that the observed statistics are significant at a 5% level of significance.

Table 5: Bootstrap statistics **Number of obs = 990. Replication = 50**

Variable	Reps	Observed	Bias	Std. err.	[95% conf.	interval]	
b_logpr	50	-.9342042	-.0053776	.0538212	-1.042362	-.8260464	(N)
					-1.027101	-.8427067	(P)
					-1.025296	-.7753453	(BC)
b_logprp	50	-.9096125	.010138	.0494318	-1.008949	-.8102756	(N)
					-.9917048	-.7897386	(P)
					-.9955237	-.805325	(BC)

Key: N: Normal, P: Percentile, BC: Bias-corrected.

4. Result and Discussion

4.1 Result

Descriptive Statistics

The discussion on the descriptive statistics will be restricted to directly related international migration variables or determinants such as acsrsp, wage, nm, epr, prp, and prrg. From Table 2 below, the total observation of the variable analysed is 1104, and the average transaction cost of sending remittances annually to a specific country across SSA (acsrsp) is USD 645,600,000 across the countries selected in sub-Saharan Africa. And, the average transaction cost of sending remittance is relatively far from the cross-sectional average shown by the standard deviation of USD 887,100,000 to the average mean with individual countries. This suggests that individual countries in SSA spend relatively higher on the transaction cost of remittance compared to the regional average cost of sending remittance to specific countries.

The average wage and salaries of the workers across sub-Saharan Africa are USD 3,524,000,000, while the deviation from the mean of the individual countries is lower than the mean at USD 2,515,000,000, suggesting a negative disparity at the country-specific wage annually. The minimum annual wage in SSA is USD10,031,114, and the maximum annual wage in SSA is USD9,986,000,000.

The examination of the mean wage in SSA against the employment-to-population ratio revealed a mean of 58.79%. The disparity between the SSA's mean employment to population ratio and standard deviation ratio is high and far away from the mean at 13.93%. The implication is that some countries may have a higher employment-to-population ratio than others in the region. In sub-Saharan Africa, the minimum employment-to-population ratio is 19.65% while the maximum is 86.86%. That is, countries from the SSA with an employment-to-population ratio close to the minimum ratio have more population than the available employment and contribute to the regional unemployment ratio, while the country-specific employment ratio to a population close to 85.86% suggests that there is more employment than the population in the countries. The sub-group mean analysis with an average employment-to-population ratio of less than 40%, a double of 19.65%, the regional minimum showed that Cabo Verde (30.44%), Eswatini(38.64%), Gabon (39.33%), Mauritania(38.855), and Somalia(27.91%) are among the countries that contribute to the unemployment ratio in the SSA.

The mean of Personal remittances received (Prr-current US\$) at the regional level annually is USD 3,325,000,000. The disparity from the country-specific is low compared to the regional mean. The maximum Personal remittances received by the region in a year is USD 24,310,000,000, while no country in the region received zero prr "Personal remittances. Nigeria, from the SSA countries, received a mean remittance (USD16,000,000,000) and the highest remittance ever received in the region, but with a high disparity in the receipt each year over the twenty-four years.

Now, the evaluation of the mean of the primary determinants of migration (acsrsp, wage, epr, prr) and comparing with the mean outcome of the net migration (nm), the SSA average net migration annually is a negative -10,810 balance. This implies that in the twenty-four years and across the forty-six countries, Africa has an average of 10,810 people emigrating out of the region than immigrating into the region annually. The positive statistics of the standard deviation at 61,240 further suggest a high variance among the individual countries in the net migration. The minimum net migration showed that a country has 866,101 people emigrating from the country than immigration into the country in the sub-Saharan African region. Similarly, 644,996 people were the maximum number of migrants experienced annually in the region. Country investigation revealed further that South Africa is the only country where the number of people immigrating into the country is higher than the number of people emigrating out of South Africa. The mean value of the determinant of the migration, like the average cost of sending remittance, wage, and employment to population ratio, respectively, explains why South Africa is a major destination for migrants in the region.

Table 1 further showed the descriptive statistics and non-migration determining variables not reported in the discussion. For example, the means of the globalization indicators: Foreign Direct Investment (FDI), the Exchange rate (exch), and net export (nxe) are USD-2,872,000,000, USD3,747,000,000, and USD 13.53, respectively. The implication is that for foreign direct investment, a net balance of payment is a deficit balance. That is, the financial transaction flowing into the region is outweighed by the payment outside sub-Saharan Africa. The disparity from the individual countries is low, further implying that the majority of the countries in the region may be experiencing an international financial transaction flowing into the countries that is lower than the outflow from the countries. The net export average at USD 13 on the regional scale differed greatly, with a standard deviation of USD 38.12. The individual countries may have reasons or resources to have a positive net export more than the other. This may not be far from the inequality in resource endowment across the region. The average exchange rate across the forty-six countries considered is USD 3,747,000,000, but a concern is flagged for wide disparity from the obtainable exchange rate from the individual countries. It shows that some countries have strengthened exchange rates against the US dollar more than others.

Another concern in this study is the mean of the gross domestic product per capita to reflect the level of inequality in the region. Sub-Saharan Africa has an average USD3,765,000,000 GDP per capita annually. The deviation of the regional mean from the individual country mean is wide, with USD 2,468,000,000 as the standard deviation. This suggests that some countries have higher GDP per capita than others. The minimum value also showed that the lowest minimum GDP per capita received in a country in a particular year is USD 1,229,069, and Tanzania is the country in the region that has ever had the least GDP per capita with the year considered. The maximum is USD 9,987,000,000 in a particular year.

Effect of international migration and remittance inflow on per capita income growth in sub-Saharan African Countries

From the result in Table 3, the initial level of the per capita income (ie. The lag of the dependent variable) has a positive and significant effect on the current level of the per capita income. The implication is that a 1% increase in the previous value of the per capita income is associated with a 0.34% increase in the current level of the per capita income at a 1% level of significance. The finding is consistent with the Solow growth convergence theories with the framework of conditional convergence of per capita income, where the initial value of the per capita income is underscored in the convergence equation (Angel 2000). However, the convergence term showed no evidence for conditional convergence, and the term was not significant. Based on the evidence, the hypothesis of convergence in the per capita income for sub-Saharan Africa is rejected. The finding is consistent with previous empirical evidence from ECOWAS, which in turn rejected the hypothesis of convergence of the per capita income, the closest evidence to SSA (Anoruo 2019). The implication of the non-significance of the convergence term in the convergence equation suggests that international migration and remittance may not influence the possibility of per capita income convergence within the period considered.

However, international migration showed a positive and weakly significant effect on the per capita income. That is, a 1% increase in the net migration in favor of immigration increases the per capita income by a very small effect of 0.006%. Wage, a major determinant of international migration, has a 0.08% increase in the per capita income for every 1% increase. The finding is rationalized by Woytinsky (1942), who provided evidence to show the direct and proportionate effect of wages on the per capita income, aligning with the wage theory.

Heterogeneity Effects

The group comparison by the regional membership for the economic community showed that COMESA has a 0.28% lower per capita income than the Economic and Monetary Community of Central African States (CEMAC). The EAC-5, SADC, and ECOWAS have -0.51%, -0.51%, and -0.28% lower per capita income than the Economic and Monetary Community of Central Africa State at 1% level of significance, respectively. For the sub-regions in the SSA, the West Africa region has a per capita income that is 0.19% more than that of Eastern Africa and significant at 1% level. Middle Africa and Southern Africa have per capita incomes that is 0.21% and 0.37% greater than Eastern Africa, and Significant at 10% and 1 % level respectively.

Examining the direct and proportionate relationship of wage and per capita income, the interactive effects for every 1% increase in wage within COMESA, EAC-5, SADC, SACU, and ECOWAS are 0.21%, 0.26%, 0.46%, 0.37%, and 0.15% greater than the Economic and Monetary Community of Central African States (CEMAC) and significant at 1% level of significance respectively. However, the interactive effect of wages across the sub-regions in the SSA showed that a 1% increase in wages, given that it is West

African and the Middle Africa region, yields a -0.20% and -0.34% low and significant per capita income, respectively, than the Eastern Africa region. The implication of the findings suggests that while wage, a determinant of international migration, improves the per capita income, the effects vary by region and economic classifications.

Discussion on the decomposition of income inequality in SSA countries by remittance inflow into sub-Saharan Africa

Following Lopez-Feldman (2006), when an income source contributes a large share of total income, it may potentially have a large influence on inequality. But when the income is equally distributed ($G_k = 0$), it cannot influence inequality, even if its magnitude is large. Likewise, when the income source is large and unequally distributed (S_k and G_k are large), it may either increase or decrease inequality. This may depend on which households (individuals), at which points in the income distribution, earn it. Also, when the income source is unequally distributed and flows disproportionately toward those at the top of the income distribution (R_k is positive and large), its contribution to inequality will be positive.

From the result presented in Table 4, a 1% increase in the personal remittance received contributes to the decrease in the Gini coefficient by -0.93%, *ceteris paribus*. The S_k at 0.99% suggests that the personal remittance received is a major source of income. The G_k at 0.03 opined that personal remittance received has an equalizing effect on the distribution of total income. That is, despite the personal remittance received contributing to the major source of income, the Gini correlation between the personal remittance received and the total income is low (0.04). The correlation indicates that the personal remittance received favors the poor. Similarly, the personal remittance paid shared a similar implication with the personal remittance received. But, a 1% increase in the personal remittance paid reduces the Gini coefficient by -0.91%. That is, the income dispersion is reduced by -0.91%. Relating this outcome to Anyanwu (2011), using panel data regression, the study opined that international remittance increases income inequality using data from 1969 to 2006. The evidence from this study presents a more recent reality on the impact of international remittance on income inequality. Using the data from 2000 to 2023 and with the income decomposition estimator, international remittance was shown to reduce income dispersion and favor the poor group. Lankoande (2023) supported the findings from the study despite using a panel regression estimate. The estimators adopted in this study not only complement the Lankoande(2023) outcome but also present the findings as robust to explain the impact of international remittance on income inequality.

5. Conclusion and Recommendation

5.1 Conclusion

This study examined the effects of remittance inflows on per capita income inequality and income decomposition in sub-Saharan Africa. Motivated by persistent income disparities and uncertain convergence prospects and debates in the literature for the region, the Gini income decomposition

framework and data covering 46 SSA countries from 2000 to 2023 were applied to provide robust evidence on the distributive role of remittances.

The empirical findings show that both personal remittances received and paid pose a negative and statistically significant effect on income inequality, leading to a reduction in income inequality as expressed by the Gini coefficient. Approximately, the Gini coefficient reducing effect is 0.93% and 0.91%, respectively, for a 1% increase in remittances. Importantly, the low Gini correlation coefficients indicate that remittances are more evenly distributed and disproportionately benefit lower-income households. This contradicts earlier findings that associated remittances with rising inequality in Africa and instead aligns with more recent evidence suggesting an equalizing role of remittance inflows (Anyanwu 2011).

However, substantial heterogeneity effects across countries, reflecting differences in income structures, labor market conditions, financial systems, and migration patterns, are revealed. While remittances contribute to short-term inequality reduction, their ability to drive long-term per capita income convergence remains contingent on complementary domestic policies, particularly those targeting employment, financial inclusion, and productive investment.

In conclusion, remittances are not a substitute for domestic development strategies but rather a viable complementary mechanism for reducing income inequality in sub-Saharan Africa. When supported by appropriate financial, labor market, and migration policies, remittance inflows can enhance inclusive growth and strengthen the region's prospects for income convergence. Future research may build on this study by incorporating household-level microdata and exploring nonlinear or threshold effects of remittances across different income groups.

5.2 Recommendation

The findings of this study showed that remittance inflows are statistically significant in reducing income inequality in sub-Saharan Africa. That is, the Gini decomposition results reveal that increases in both personal remittances received and paid reduce income dispersion and disproportionately favor lower-income households. These outcomes provided some important policy advice for governments, regional institutions, and development partners in SSA.

First, the descriptive evidence reveals that transaction costs associated with remittance transfers remain high and uneven across SSA countries, constraining the redistributive potential of remittances. Therefore, reducing the cost of sending remittances through the financial sector reforms is advised. For example, policymakers should encourage competition among the money transfer operators and fintech platforms. The strategy should apply to the regulatory frameworks to support digital and mobile-based remittances services. Likewise, a harmonization of the cross-border payment system at the regional level may jointly

and respectively drive towards reducing the cost of sending remittances. It is expected that the lower remittance cost would increase the net income received by migrant households and cause an inequality-reducing effect.

Second, redirecting the framework to leverage remittance for inclusive growth over consumption is recommended. The study revealed that remittances are pro-poor households, and the long-term impact on income convergence depends on the balance between plugging remittances for productive gain rather than consumption. It is against this background that this study suggests that the government introduce a matching saving scheme and diaspora bonds to re-channel remittances into productive investment. For example, encouraging remittance-backed credit access for small and medium enterprises (SMEs). And also, the integration of remittance recipients into the formal financial system through financial programs should be encouraged.

Third, to target the root cause of migration as revealed by the study, which are unemployment and wage disparities, the government should invest remittance-based revenues in education, skills development, and labour market reforms. Policies should target to translate remittance inflow into domestic job creation for mostly youths and women within the age the odds of migration are higher.

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