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Do remittances mitigate poverty? Evidence from selected countries in Africa, Asia and Latin America

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Abstract

The overall objective of the Sustainable Development Goals is to end poverty in all its manifestations by 2030. To achieve this, international remittance inflows have been identified as crucial external financing, especially for developing countries, to secure the resources needed to improve the living conditions of the poor in these countries. It is on this premise that this study investigates the nexus between remittances and poverty in selected countries in Asia, Africa and Latin America, given that these regions receive the highest amount of remittances globally. The study uses annual data on 38 top recipients of remittances between 1990 and 2021. To ensure the robustness of the results, the study employs two indicators of poverty: household consumption expenditure and poverty headcount. On the methodological front, the study addresses the issue of cross-sectional dependence in a panel study and also corrects for endogeneity, using both static and dynamic methods of analysis, respectively. Empirical findings from the cross-sectional dependence test confirm the interdependence of countries in the study. Interestingly, the study confirms the optimistic view that remittance reduces poverty in the selected countries. This finding is consistent for the two poverty indicators regardless of the methodology adopted. The study concludes that remittance inflows play a pivotal role in alleviating poverty in the selected countries. Based on the findings, governments in the three regions are advised to devise appropriate policies and structures that can support and channel the proceeds from remittances to productive ventures to reduce the incidence of poverty in their respective countries.

Keywords Remittance · Household consumption expenditure · Poverty headcount · Cross-sectional dependence · Endogeneity

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1 Introduction

The increasing flow of international remittances into the Global South has received unwavering attention over the years. It is widely recognised as a stable source of external capital, particularly during economic downturns, and it is a critical financial resource for households in the receiving countries. According to the World Bank (2021), the flow of remittances into middle-income countries has experienced a substantial increase from about USD 27 billion in 1990 to more than USD 570 billion in 2022 (see Fig. 1). As a percentage of gross domestic product (GDP), remittances also account for more than 10% of income in over 30 counties largely domiciled in Asia, Africa and Latin America. Remittances currently treble the official development assistance (ODA) and exceed foreign direct investment (FDI) by more than half, thereby increasingly smoothing consumption, especially in the region of the top recipients.

Given the magnitude of this financial flow, its micro and macroeconomic impacts are enormous. At the household and individual levels, remittances increase non-labour income, ease budget constraints, boost consumption or investment, and improve welfare. However, this may also reduce employment likelihood by discouraging household members from working (Taylor et al. 2005; Adams 2011) At the aggregate level, remittances constitute a steady source of foreign exchange and encourage the inflow of new investments, but they can also lead to a rise in the price of domestically produced goods and reduce a country's competitiveness (Jongwanich 2007).

With respect to poverty, the possible effects of remittances are mixed and debatably classified into the "optimistic and pessimistic scenarios" (Taylor et al. 2005, p. 3). Based on the optimistic approach, remittances can contribute to

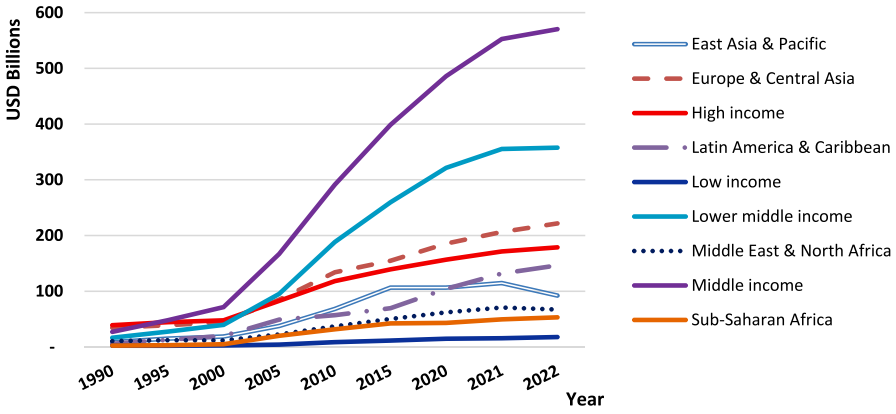

Fig. 1 Global flow of remittances (1990–2022) Source: World Bank's World Development Indicators (2023)

poverty reduction if migrants are shifting from low-income rural sectors to high-income urban sectors. That is, if the money sent to the migrants' poor households directly improves their standard of living and capital accumulation. On the contrary, the pessimistic view opines that poor households are limited in their access to the migrant labour markets due to the risk and cost of migration. Hence, if migrants mostly originate from the middle or upper quintile of the income distribution, then the truly poor households will be limited in their benefits from remittances. Underpinning the former view, empirical studies such as Pradhan and Mahesh (2016), Azizi (2019, 2021), Abduvaliev and Bustillo (2020) and Chea (2023) support the argument that remittances help to reduce poverty in developing countries. Meanwhile, Wouterse (2010) shows that international remittances which marginally impact poverty also exclude the rural poor, thereby worsening the poverty gap. In addition, Coon and College (2012) suggest that households receiving remittances still remain in some level of poverty despite their increase in income. Hence, the remittances-poverty nexus is mixed. Based on these inconclusive findings, our study aims to contribute to the existing literature by reassessing the impact of remittances on poverty.

This study adds to the discussion on the remittances-poverty nexus in the following ways. Firstly, unlike other studies that centre on developing countries in general, our study focuses on the aggregate effect of remittances on poverty in top recipients of remittances in low- and middle-income countries, and particularly in Africa, Asia and Latin America. These countries are known to have the largest share of remittances received globally and they also have the poorest population. Secondly, rather than focussing on the conventional measures of poverty, this study employs two proxies—poverty headcount and consumption expenditure of households—in order to provide a deeper insight into the remittances-poverty nexus. Thirdly, this study accounts for cross-sectional dependence in the model, which has been overtly neglected in the remittances-poverty literature. One major weakness of previous panel studies on the remittances-poverty nexus is the assumption that the residual terms in the panel are independent of one another, suggesting that countries in the panel are cross-sectionally independent. However, there is increasing evidence that this assumption may not hold, especially in recent times, given the level of globalisation among countries. Besides, countries in this study are major recipients of remittances and are thus exposed to common shocks. This suggests that the assumption of independence among cross-sectional units in the prior studies is unrealistic. Therefore, any attempt to ignore this interdependent relationship among the countries in the study would produce biased and inconsistent estimates. Hence, this study makes a novel contribution in this area. Fourthly, this study controls for the presence of endogeneity in the estimated model by employing an instrumental variable approach, given the possibility of the remittances being endogenous to poverty. Lastly, as a robustness check, the remittances-poverty nexus is further examined, following the findings of Mashayekhi et al. (2011) and Banga and Sahu (2013) that the effect of remittances on poverty is more reliable when the inflow is over 5% of GDP. To do this, the selected countries are classified into two broad categories (countries with remittance inflows below 5% of their GDP and countries with remittances of over 5% of GDP).

The rest of the paper is organised as follows: Sect. 2 reviews the theoretical literature, country-level studies and panel studies that have assessed the relationship between remittances and poverty. Section 3 outlines the data and the methodology, while Sect. 4 discusses the findings of the study. The conclusion of the study is discussed in the last Sect. 5.

2 Literature review

Discussion on the remittances-poverty nexus has been topical for decades now, particularly in developing countries where a considerable proportion of the poor are domiciled and the active labour force is emigrating. Although recipient households often consider remittances as transitory income (Yoshino et al. 2019), a large body of literature (Mim et al. 2012; Jouini 2015; Lim and Simmons 2015; Dash 2020) has documented evidence supporting its effect on savings, consumption and even investment, all of which affect national and household poverty levels differently. Since the focus of this study is on remittances and poverty, subsequent paragraphs present a review of theoretical and empirical studies on the subject matter.

2.1 Theoretical literature

The neoclassical economics theory of migration pioneered by Hicks (1932) and extended by Harris and Todaro (1970) has been very relevant to the discussions around remittances. This is primarily because the theory explains migration as a rational decision made by individuals in the pursuit of improved economic conditions. That is, the disparities in the earnings of remittance-sending countries motivate individual migration to the regions with higher wages where skills and qualifications are more valuable (Kureková 2010). Although this theory has been criticised for focussing on wage differentials across countries/markets without accounting for other social and political factors, it is relevant to this study based on two major assumptions. First, poverty motivates migration from low-wage countries to high-income areas. Second, remittances received from migration affect poverty by increasing wages and stimulating development.

2.2 Empirical literature

Several studies have documented both the positive and negative effects of remittances on poverty globally. For example, Adams and Page (2005) investigated the effect of international migration and remittances on poverty, using 71 developing countries. The study employed three measures of poverty (poverty headcount at 1.08 USD, poverty gap and squared poverty gap), while accounting for the possibility of international remittances being endogenous. The findings from the study showed that an increase in international remittances by 10% will lead to approximately 4% reduction in the share of poor people. Similarly, Banga et al. (2010) and Mashayekhi et al. (2011) employed an instrumental variable approach (three-stage

least square estimation) in showing that remittances reduce poverty in 77 developing countries, although they noted that the effect of remittances on poverty is higher when what is remitted is larger than 5% of GDP. Using a related methodology on 25 and 103 developing countries, respectively, Pradhan and Mahesh (2016) and Azizi (2019) buttressed the findings of Adams and Page (2005) and Banga et al. (2010) that remittances significantly reduce poverty in developing countries. Following this strand of studies, Azizi (2021), in a study on 103 developing countries, documented that increase in per capita remittances propels poverty reduction.

At the household level, Taylor et al. (2005) explored the effect of remittances on rural inequality and poverty in a Latin American country. The authors utilised a nationally and regionally representative household survey in categorising the percentage of impoverished households into three poverty headcount measures. Their findings suggested that foreign remittances have a greater impact on rural poverty reduction than domestic remittances as the rate of migration increases. Besides, evidence from the Philippines (Yang and Martínez 2006) suggested that foreign remittances reduce household poverty because of their supplementary effect on the income of households with migrant members. The authors noted further that the spillover effect was observed in households without migrant members, and poverty declined more where the average exchange rate shocks were favourable. Also using micro data, Shroff (2009) found that the effect of remittances on poverty per year is subject to the size of remittances received and the population of poor households receiving it. However, this study, unlike Taylor et al. (2005), found that the effect of internal remittances on poverty outweighs that of foreign remittances due to the low prevalence of foreign remittances in Mexico.

Notable among the studies that focused on Latin American countries is Acosta et al. (2007), where nationally representative data from 11 countries was used to provide evidence of the positive impact of remittances on lowering poverty levels. Meanwhile, a similar cross-country panel dataset of 10 Latin American and Caribbean (LAC) countries (Acosta et al. 2008) found a negative, relatively small effect of remittances on poverty after accounting for the potential endogeneity of remittances. The study also noted that the reductions in poverty levels are a result of the increase in the income of remittances-receiving households. More recently, Ekanayake and Moslares (2020) examined the relationship between remittances and growth, and between remittances and poverty among 21 Latin American countries. Employing the panel fully modified ordinary least square (FMOLS) approach, the authors found that remittances increase economic growth in the long run and reduce the poverty rates of these countries. Similarly, Nuñez and Osorio-Caballero (2021) unravelled the influence of foreign remittances on poverty headcount in Mexico and Central America. Using the instrumental variable technique, the study found that increase in remittances diminished the proportion of people living below the poverty line of $1.90 per day.

Focussing on 17 Asia–Pacific countries between 1993 and 2003, Jongwanich (2007) showed that remittances have no significant effect on poverty alleviation through consumption smoothing, income or the ease of capital, but that remittances marginally affect growth through the development of human capital and domestic investment. Likewise, Imai et al. (2014), focussing on 24 countries in the same

region, using both static and dynamic models, documented a positive effect of remittances on poverty reduction. Furthermore, Yoshino et al. (2019) employed the random effect model and found that a 1% increase in remittances as a percentage of GDP results in a 16% decrease in the severity of poverty and about 23% reduction in the poverty gap ratio of 10 Asian countries. In the same way, Cui et al. (2023) explored the influence of remittances on poverty alleviation in 15 Asian countries and found that remittances exact a reducing effect on the poverty level across the 15 countries. On the other hand, the study by Kayani (2021) employed the ordinary least square method to explore the role of international remittance inflows in poverty reduction in Kyrgyzstan and failed to document a significant impact of remittances on poverty for the Central Asian country.

Regarding emerging markets, Gaaliche and Zayati (2015) discovered a two-way causal relationship between remittances and poverty; however, the impact of the causal relationship was stronger for poverty leading to remittances than remittances causing poverty. Tsaurai (2018) employed the fixed-effect approach in exploring the relationship between remittances and poverty. This study utilised two poverty proxies (the poverty headcount ratio of 1.90 USD and 3.10 USD daily) and found that remittances reduced poverty among emerging economies. However, when pooled OLS was used for the analysis instead of fixed effect, the effect of remittances on poverty became positive. That is, remittances increased poverty. Hence, the study suggested a need to avoid relying too much on remittances, as it may have a retrogressive effect on per capita income and economic growth. Additionally, Mehedintu et al. (2019) assessed the effect of remittances on poverty level among emerging European countries between 2005 and 2017, and discovered that remittance transfers improve the living conditions of the beneficiaries.

A number of studies also focused on Africa and its sub-regions. For instance, Gupta et al. (2009) investigated the effect of an increasing flow of remittances to Sub-Saharan Africa on poverty, using 24 countries. The study found that stable remittances and private transfers have a direct poverty-mitigating effect and it promotes financial development in the countries. Using a panel of 33 African countries, Anyanwu and Erhijakpor (2010) analysed the effect of international remittances on the severity, level and depth of poverty between 1990 and 2005. This study employed both fixed (OLS) and dynamic estimation methods (GMM approach) in examining the relationship between poverty and remittances. To instrument for the possibility of remittances being endogenous, the first and second lags of remittance inflows were considered as instruments. The study also confirmed that a 10% increase in remittances leads to approximately 3% decline in poverty headcount, poverty depth and poverty severity. Other studies, such as Wouterse (2010), showed that in Burkina Faso, households with international migrants are less poor in comparison with households with intra-continental migrants. Funlayo and Benedict (2018) suggested that remittances significantly alleviate poverty in the Economic Community of West African States (ECOWAS) region. However, Ewubare and Okpoi (2018) affirmed that remittances into Nigeria have a mixed effect on the reduction of poverty in the short run. In a country-specific study on South Africa, Musakwa and Odhiambo (2019) employed the autoregressive distributed lag (ARDL) approach and found substantial evidence that remittances stimulate household consumption expenditure

but with no significant impact on infant mortality rate. Focussing on the Middle East and North America (MENA) countries, Khan et al. (2022) discovered that remittances play a prominent role in mitigating the severity of poverty in the region. Following this, the recent study by Amaka et al. (2023) employed the error correction model and validated the poverty-reducing effect of remittances in Nigeria.

In summary, studies reviewed in this section have presented the macro- and micro-effects of remittances on poverty using diverse proxies. Among these are poverty headcount (Acharya and Leon-Gonzalez 2012; Imai et al. 2014; Azam 2016; Inoue 2018; Masron and Subramaniam 2018), household consumption expenditure (Musakwa and Odhiambo 2019; Musakwa and Odhiambo 2019; Chea 2023), and a combination of poverty headcount, depth and severity (Gupta et al. 2009; Anyanwu and Erhijakpor 2010; Yoshino et al. 2019; Azizi 2019; Arapi-gjini et al. 2020). Although the majority of the studies show that remittances alleviate poverty in developing countries, some other studies (Coon and College 2012; Azam 2016; Ewubare and Okpoi 2018; Tsaurai 2018) that found a mixed outcome suggested that there is no consensus in policy debates on the effect of remittances on poverty. Against this background, this study contributes to the debate by presenting an analysis of the effect of remittances on poverty in Latin American, Asian and African countries, using diverse indicators of poverty. The study also accounts for endogeneity and cross-sectional dependence, while disaggregating the effect on countries with remittance inflows into those that are below and above 5% threshold.

3 Data, model and methodology

3.1 Data

The study seeks to investigate the impact of remittance inflows on poverty in Africa, Asia and Latin America, using annual data between 1990 and 2021. Based on data availability, the study focuses on 38 countries in Africa, Asia and Latin America with the highest remittance inflows (in US dollars) as none of the selected countries received less than $1 billion in 2020 (World Development Indicators, 2021). The three regions are selected because they serve as major destinations of remittance inflows in the world. Besides, all the selected countries are classified as low- and middle-income countries in line with the World Bank classification in 2020. Similarly, the countries in the sample are classified as developing countries characterised by high incidences of poverty. In percentage terms, the countries included in the study collectively received approximately 63% of the total remittance inflows to the low- and middle-income countries in 2020. The full list of countries selected for the study is presented in Table 10 in the appendix based on their geographical region. However, due to some missing data, especially on poverty headcount ratio, we use unbalanced panel data.

Principally, there are two core variables of interest in the study, which are poverty and remittance. To ensure the robustness of the result estimates, two variables are employed as proxies for poverty. The first proxy is household consumption expenditure, expressed as a percentage of GDP to capture income poverty (HCE).

Theoretically, an increase in household consumption expenditure suggests a reduction in poverty; hence, a positive relationship between household consumption expenditure and remittance implies that poverty reduces with an increase in remittance inflow. This measure of poverty has been widely employed in the literature by studies such as Sehrawat and Giri (2015), Kaidi et al. (2019), Musakawa and Odhiambo (2019), Musakawa and Odhiambo (2021) and Olaniyi et al. (2023). The choice of HCE is based on the notion that remittances have a direct impact on consumption, as argued by Musakawa and Odhiambo (2021). The receipt of external financing enhances the consumption ability of the beneficiaries, increases their purchasing power, and thus contributes to their wellbeing, and by extension, their standard of living. Thus, HCE constitutes an important indicator of poverty, especially among the low- and middle-income countries characterised by low consumption power. The study also employs poverty headcount (PH) as the second proxy for poverty incidence. The study defines poverty headcount as the percentage of the population living below the national poverty line of $2.15 per day using 2017 purchasing power parity. This measure has been extensively used in the literature to measure the extent of extreme poverty in the economy (Peković, 2017; Apergis and Cooray 2018; Inuoue 2018; Masron and Subramaniam 2018; Azizi 2019, 2021; Khan et al. 2022). The main independent variable in this study is remittance (REM), which is captured by the international remittance inflow as a percentage of GDP to ensure inter-country comparison. This measure has been used to proxy remittance inflow in the previous studies (Anyawu 2011; Musakawa & Odhiambo 2019, 2022; Yoshino et al. 2019).

Besides the key variables, some control variables have been identified in the literature as major drivers of poverty. Following Musakawa and Odhiambo (2019) and Acheampong et al. (2021), this study identifies trade openness (DOP) measured as the ratio of total trade to GDP, inflation (INFL) using the consumer price index, real GDP per capita (RGDP) calculated as GDP at US 2015 constant price divided by mid-year population, and secondary school enrolment as proxy for human capital as control variables. In the literature, real GDP and education have been identified as two critical variables when explaining the dynamics between remittance inflows and poverty (Musakawa & Odhiambo 2021). At the macro level, increase in remittance inflow is expected to provide additional resources to the economy, increase the economy's productive investment, and thus stimulate the productive capacity of the economy. Similarly, at the micro level, the beneficiaries of remittances have more resources to sponsor their children in school, which in turn increases the school enrolment rate. Consequently, increase in school enrolment rate will boost human capital development via knowledge acquisition, which will in turn stimulate individual capacity to contribute to economic development, and by extension, poverty reduction in the economy. On the other hand, the inclusion of trade openness as a control variable in the remittances-poverty nexus is premised on the fact that a country's economic interactions and integration with the rest of the world can serve as a crucial factor in the achievement of poverty reduction by providing access to a wide range of commodities (Musakawa & Odhiambo 2019; Olaniyi et al. 2023). Meanwhile, the inflation rate in an economy reflects the degree of macroeconomic uncertainty in the economy. A surge in inflation rate would lead to an increase in the

cost of living, lower individual purchasing power, hurt people's standard of living, and consequently worsen the level of poverty in the economy.

3.2 Theoretical framework

This study is hinged on the optimistic theory of remittance proposed by Taylor et al. (2005). According to the theory, remittance constitutes an important factor for poverty reduction in that people migrate from Third World countries in search of greener pastures to relatively high-income foreign economies. Income remittances from such migrants significantly contribute to household income in the migrants' home countries, and by extension, reduce poverty. In addition, other exponents of the optimistic view, such as De Haas (2007, 2010), conceive remittance as an integral component of economic development and a veritable tool for poverty reduction in developing countries. The argument of the dominant views on the development theory in the 1950s and 1960s is that "return migrants are seen as important agents of change and innovation" (De Haas 2010, p. 231). The expectation is that the migrants would not only bring back money, but also ideas, knowledge and entrepreneurial skills, and attitudes that will engender the development process in their home countries (De Haas 2010; Olayungbo and Quadri 2019). Thus, the present study is premised on the expectation that remittance inflow is poverty-reducing in the economy.

3.3 Model specification

Based on the theoretical framework discussed above, the study follows the works of Adam and Page (2005), Anyanwu and Erhijakpor (2010), Musakwa and Odhiambo (2019) and Azizi (2021), and models the nexus between remittance and poverty as follows:

$$\mathrm{POV}_{it} = \beta_0 + \beta_1 \mathrm{REM}_{it} + \beta_2 \mathrm{RGDP}_{it} + \beta_3 \mathrm{DOP}_{it} + \beta_4 \mathrm{INF}_{it} + \beta_5 \mathrm{EDU}_{it} + \varepsilon_{it} \quad (1)$$

where POV is a measure of poverty, which can be household consumption expenditure as a percentage of GDP or poverty headcount, REM_{it} is the remittance as a ratio of GDP, RGDP_{it} is the real GDP per capita. DOP_{it} and INF_{it} are trade openness measured as total trade as a percentage of GDP and inflation, respectively. EDU_{it} is education to capture the impact of human capital on poverty, while ε_{it} is the residual term that captures the influence of other variables that affect the dependent variable.

To reflect the dynamic nature of the model, Eq. (1) is augmented with the lag value of the poverty variable (POV_{it-1}) to align with the GMM modelling style as presented in Eq. (2) below:

$$\mathrm{POV}_{it} = \beta_0 + \beta_1 \mathrm{POV}_{it-1} + \beta_2 \mathrm{REM}_{it} + \beta_3 \mathrm{RGDP}_{it} + \beta_4 \mathrm{DOP}_{it} + \beta_5 \mathrm{INF}_{it} + \beta_6 \mathrm{EDU}_{it} + \varepsilon_{it} \quad (2)$$

where POV_{it-1} represents the level of poverty in the previous year. All the variables are used in their level forms. The description and measurement of variables in the study are presented in Table 8 under the appendix, while the a priori expectation from each of the explanatory variables from Eq. (2) is shown in Table 9 of the

appendix. All the variables are expressed in percentage, except the measure of economic growth (RGDP) which is transformed to its natural logarithm form.

3.4 Estimation technique

The study employs two techniques of estimation to address the study objective and to ensure the robustness of the estimates. First, the study makes a novel contribution to the literature on the remittances-poverty relationship by accounting for the possibility of cross-sectional dependence among the cross-sectional units in the panel. To address the cross-sectional dependence issue, the paper employs the robust standard errors technique for panel models proposed by Driscoll and Kraay (1998). Extant studies (Le and Tran-Nam 2018; Le et al. 2020; Ojeyinka and Akinlo 2021; Olaniyi 2021; Olaoye et al. 2021) argue that Driscoll and Kraay's (1998) approach is consistent to heteroscedasticity and robust to handle panel models with cross-sectional and temporal dependence. To estimate the model, we use the xtcc command in Stata proposed by Hoechle (2007), which produces the Driscoll and Kraay (1998) standard error for panel models. More important is the fact that the xtcc command performs well with unbalanced panels, which is the case in the present study (Le and Tran-Nam 2018; Le et al. 2020). Thus, we estimate Eq. 1 based on the robust standard error approach developed by Driscoll and Kraay (1998) as the static model.

Second, we apply the dynamic generalised method of moment to address the issue of endogeneity perceived in Eq. (2). This is based on the intuition that it is possible for some of the exogenous variables in Eq. (2) to be influenced by poverty, signalling the problem of reverse causality in the model. For instance, a reduction in poverty in an economy could stimulate the real GDP per capita. Following the same line of argument, people migrate due to the prevalence of poverty in their home countries in search of greener pastures and better living conditions in the host countries. Hence, reductions in poverty might reduce the movement of people and the amount of remittance inflows across the globe. Meanwhile, the study by Azizi (2021) argues that remittances may be endogenous to poverty in remittance-receiving countries, and this implies evidence of reverse causality in Eq. (2) which must be addressed to provide robust, unbiased and consistent estimates. Based on this argument, there is a possibility of reverse causality and endogeneity bias from the presentation of Eq. (2). To control for such possibility, the study adopts the generalised method of moments (GMM) to ensure the reliability and the consistency of the estimates. The study follows the works of Arellano and Bond (1991) and Arellano and Bover (1995) by using the lagged value of independent variables as instruments. Theoretically, for a variable to qualify as an instrument, it must be uncorrelated with the residual term. Therefore, the study follows the standard practice in the literature by choosing the lagged values of the explanatory variables as instruments in the study (see Anyanwu and Erhijakpor 2010; Vacaflores 2018). Thereafter, we conduct Hansen-*J*-statistic to test the validity of the chosen instruments. The outcome of the Hansen-*J*-test suggests that the instruments used in the study are valid. In the same way, we test for autocorrelation among the residual terms using the Arellano and Bond (1991) AR

(2) statistic. Again, the dynamic model is adopted to account for the self-reinforcing attribute of poverty among the low- and middle-income countries.

4 Empirical results and discussion

4.1 Descriptive statistics

Before proceeding with the analysis, it is imperative to examine the descriptive statistics of the series in the study. This will help to ascertain the distribution and variability of the series in the study. Table 1 presents a summary of the descriptive statistics of variables in the full sample and the three subsamples (Africa, Asia and Latin America). Considering the outcomes from Table 1, average household consumption expenditure (as a percentage of GDP) for the full sample is 68.6%, while the minimum and maximum values of this measure of poverty are approximately 12.7% and 119.4%, respectively. On the other hand, 16.4% of the population in the selected countries live below the international poverty line of $2.15 per day. This is closely related to the outcome of Azizi (2021), who documents a mean value of 17.2% for 103 middle- and low-income countries between 1990 and 2014. Further analysis reveals that the poorest country, using the poverty headcount, is Mali with 84.5% of the population living below $2.15 per day, while Malaysia has 0% of her population living below the international poverty line of $2.15 within the sample period. Similarly, on the average, remittances received by the sampled countries account for 5.5% of the GDP over the study period. This again reiterates the fact that remittance is now being considered a major driver of GDP in these countries. The maximum value of remittance, as a ratio of GDP, is 44.13% observed in Tajikistan, while Zimbabwe's remittance (0.00%) is the least in terms of its contribution to GDP. For the full sample, the average real GDP per capita stands at $3,505.2, with minimum and maximum values of $189.3 and $36,138.5 in Myanmar and Japan, respectively. For other variables, additional insight from Table 1 shows that total trade as a ratio of GDP is approximately 61% on average, with a maximum percentage of 220.4% in Malaysia. Similarly, average inflation rate among the sampled countries is extremely high, with a mean value of 25% and a maximum value of approximately 7482% in Peru in 1990. Lastly, average secondary school enrolment rate among the sampled countries stands at 65% with the lowest and highest proportions estimated to be 6% and 112%, respectively. The coefficients of skewness show that all the series in the study are positively skewed, except the education variable which is negatively skewed. Similarly, the values of kurtosis indicate all the variables are leptokurtic, except secondary school enrolment (EDU) which is platykurtic. Thus, the probability values of Jarque Bera statistic for all the series are significant, suggesting that the hypothesis of normality is rejected for all the variables in the study.

Table 1 also contains the outcome of the descriptive statistics on a regional basis. We classify the 38 countries in the sample into three consisting of Africa, Asia and Latin America to make the regional comparison of the key variables in the study. Evidence from Table 1 suggests that average household consumption expenditure in Africa (approximately 70%) is the highest against 69% and 66% recorded in Asia

Table 1 Summary of descriptive statistics

Variable/sample	HCE	PHC	REM	RGDP	DOP	INF	EDU
Full sample							
Mean	68.626	16.386	5.515	3505.236	61.458	25.492	65.428
Std dev	14.727	18.288	7.077	5244.908	35.016	259.409	24.883
Min	12.712	0.000	0.000	189.282	4.128	− 6.243	6.438
Max	119.413	84.500	44.126	36,138.530	220.407	7481.660	111.902
Skewness	0.034	1.570	2.289	4.575	1.574	23.741	− 0.308
Kurtosis	3.640	4.931	8.861	25.777	5.831	641.478	2.104
Jarque Bera	19.681	208.304	2565.155	30,351.300	858.266	1,882,166.000	40.660
Prob (J-B)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Africa							
Mean	69.608	28.873	3.719	2147.188	54.499	14.303	52.236
Std dev	13.201	22.380	2.953	1368.655	20.037	39.696	24.968
Min	30.183	0.000	0.000	369.487	4.128	− 6.243	6.438
Max	119.413	84.500	14.583	6263.104	116.048	557.202	111.802
Skewness	− 0.506	0.362	0.805	1.109	0.427	9.231	0.297
Kurtosis	3.717	2.099	3.401	3.775	3.186	109.043	2.344
Jarque Bera	26.702	4.065	45.499	95.669	13.231	189,237.800	8.360
Prob (J-B)	0.000	0.000	0.000	0.000	0.001	0.000	0.015
Asia							
Mean	68.573	15.639	7.839	4058.091	71.801	8.462	69.306
Std dev	17.355	19.392	9.043	6959.734	43.176	11.295	22.047
Min	12.712	0.000	0.010	189.282	11.855	− 3.749	17.793
Max	119.058	81.500	44.127	36,138.500	220.407	154.756	105.893
Skewness	0.151	1.561	1.470	3.504	1.061	5.678	− 0.472
Kurtosis	2.930	4.836	4.704	14.736	3.539	59.280	2.117
Jarque Bera	2.261	95.088	267.523	4928.061	114.520	75,543.220	30.325
Prob (J-B)	0.323	0.000	0.000	0.000	0.000	0.000	0.000
Latin America							
Mean	66.490	9.873	1.897	4848.922	42.510	111.450	84.216
Std dev	5.087	6.292	1.717	1928.306	15.003	672.985	16.868
Min	58.994	1.900	0.064	1687.443	15.156	− 0.339	52.073
Max	79.445	28.400	8.044	9216.131	85.264	7481.664	106.652
Skewness	0.637	0.805	1.263	0.301	0.607	9.050	− 0.410
Kurtosis	2.600	2.594	2.244	2.368	3.343	93.847	1.737
Jarque Bera	11.899	13.776	52.843	5.081	10.627	57,204.670	10.205
Prob (J-B)	0.002	0.001	0.000	0.079	0.005	0.000	0.006

HCE is household consumption expenditure as a percentage of GDP, PHC is poverty headcount, REM represents international remittance as a percentage of GDP, RGDP is real GDP per capita, DOP is degree of openness and INF is inflation measured by consumer price index, EDU is secondary school enrolment

and Latin America, respectively. For poverty headcount, Africa also has the highest poverty incidence compared with other regions. Specifically, on average, approximately 29% of the population in the sampled African countries live on less than $2.15 per day against 16% and 10% in Asia and Latin America, respectively. This confirms the findings of previous studies that Africa houses the largest proportion of poor people in the world. Similarly, in terms of real GDP per capita, the African region has the lowest value, with an average real GDP per capita of approximately $2,147 against $4,058 and $4,849 for Asia and Latin America, respectively. This clearly shows why most African countries are wallowing in abject poverty compared with their counterparts in other parts of the world. As noted above, Mali has the highest poverty headcount, with more than 84% of the population living on less than $2.15 per day. However, on remittance inflow, Latin America has the least contribution in terms of the proportion of remittance flow to the GDP, with a value of less than 2% against approximately 4% and 8% for Africa and Asia, respectively. In the same way, Latin America experiences the highest inflation rate with an average of 111% within the study period. Meanwhile, countries in Latin America also record the highest secondary school enrolment rate (84%) compared with countries in Africa and Asia with average secondary school enrolment rates of 52% and 69%, respectively. Thus, the low secondary school enrolment rate in Africa is an indication of low human capital in the region, which might be responsible for low output and higher poverty incidence in the region. Similarly, the hypothesis of normality is rejected for all the variables across the three regions, except for household consumption expenditure (HCE) in Asia.

One major observation from the discussion above is that in Latin America, remittance inflows account for approximately 2% of the GDP while the region is ranked low in the incidence of poverty measured by poverty headcount. On the other hand, remittance contributes more than 4% of GDP among the African countries but with a high incidence of poverty. The question is does remittance inflow contribute to poverty reduction in these top remittance recipient economies?

4.2 Correlation analysis

It is important to ascertain the strength of the association among the explanatory variables in the model to preclude the problem of multicollinearity in the estimated models. To do this, we conduct correlation analysis among the variables in the study, using the threshold of 0.70 as a benchmark (Kennedy 2008; Ojeyinka and Akinlo 2021). The outcome of the correlation analysis is presented in Table 2. The upper part of the table contains the correlation analysis between household consumption expenditure (HCE) and other explanatory variables, while the association between poverty headcount (PHC) and the independent variables is displayed in the lower part. The results from the Table indicate a moderate level of association with −0.65 as the highest correlation coefficient between education (EDU) and poverty headcount (PHC). Again, to corroborate the finding from the pairwise correlation coefficient, we apply the variance inflation factor (VIF) as another test for multicollinearity among the explanatory variables. Evidence from the VIF suggests no threat

Table 2 Correlation analysis

Variables	HCE	REM	RGDP	INF	DOP	EDU	VIF
HCE	1.000						
REM	0.574	1.000					1.45
RGDP	−0.314	−0.224	1.000				1.62
INF	0.023	−0.031	−0.011	1.000			1.08
DOP	−0.003	0.237	−0.040	−0.040	1.000		1.25
EDU	−0.198	0.107	0.467	−0.005	0.174	1.000	1.54
Variable	PHC	REM	RGDP	INF	DOP	EDU	VIF
PHC	1.000						
REM	−0.232	1.000					1.45
RGDP	−0.394	−0.325	1.000				1.62
INF	−0.260	0.024	−0.147	1.000			1.08
DOP	−0.243	0.434	−0.048	−0.025	1.000		1.25
EDU	−0.653	0.038	0.512	−0.275	0.114	1.000	1.54

of multicollineary with the highest VIF estimated to be 1.62. Therefore, it can be concluded that all the models estimated are free from multicollinearity problems.

4.3 Cross-sectional dependence tests

As argued in the introductory section, the study conducts cross-sectional dependence (CD) tests to determine whether the residuals in the model are independent or otherwise. The outcomes of the CD test will guide the selection of appropriate methodology to estimate the parameters of Eq. 1. Following the studies by Olayungbo and Quadri (2019), Le et al. (2020), Sarkodie and Owusu (2020) and Olaniyi (2021), we employ the CD tests on individual variables. The null hypothesis

Table 3 Cross-sectional dependence tests

Variables	B-P LM		P-S LM		B-CS LM		P CD	
	Test	Prob	Test	Prob	Test	prob	test	prob
HCE	4636.005***	0.000	108.778***	0.000	108.181***	0.000	0.315	0.753
PHC	11,607.66***	0.000	309.261***	0.000	308.68***	0.000	60.977***	0.000
REM	4831.345***	0.000	110.099***	0.000	109.486***	0.000	17.454***	0.000
LRGDP	15,650.43***	0.000	398.634***	0.000	398.021***	0.000	107.418***	0.000
INF	2588.858***	0.000	50.294***	0.000	49.681***	0.000	32.205***	0.000
DOP	4735.107***	0.000	107.53***	0.000	106.917***	0.000	27.213***	0.000
EDU	10,630.13***	0.000	264.747***	0.000	264.134***	0.000	69.921	0.000

***, ** and * represent 1%, 5% and 10% significant levels, respectively, B-P is Breusch Pagan LM test, P-S is Pesaran Scale LM test, B-CS is Bias-corrected Scale LM test, P-CD captures Pesaran cross-sectional dependence test, Source: Authors' Compilation

of the CD test is that cross-sectional units are independent. The outputs of the CD tests are presented in Table 3. For robustness sake, we employ four CD tests, namely Breusch Pagan LM test, Pesaran scale LM test, bias-corrected scale LM test and Pesaran cross-sectional dependence test independently proposed by Breusch and Pagan (1980), Pesaran (2003), Baltagi et al. (2012) and Pesaran et al. (2004), respectively. Evidence from Table 3 shows that the null hypothesis of cross-sectional independence is rejected at 1% level of significance for many of the variables in the study, implying a strong evidence of cross-sectional dependence across the countries in the study. The outcomes are consistent for the variables, except for HCE that is not significant under the Pesaran cross-sectional dependence test. Hence, the study concludes that the residuals in the panel model are cross-sectionally dependent. This outcome corroborates the conclusion of Djeunankan et al. (2023), who find evidence of cross-sectional dependence in the remittance-energy poverty nexus among 79 developing countries.

4.4 Panel unit root tests

Having confirmed the existence of cross-sectional dependence among the countries in the study, the usage of traditional panel unit root tests such as Levin et al. (2002), Im et al. (2003) and Fisher-based test using ADF and PP tests might produce inconsistent and biased estimates. This study thus employs a second-generation unit test that accommodates cross-sectional dependence among the units in the panel. Given the unbalanced nature of the data, we conduct the Pesaran cross-sectional ADF test using the Stata command Pescadf proposed by Pesaran (2003). It is imperative to conduct unit root test in any econometric analysis to guide in the choice of estimation technique and to ensure that the series in the study are not integrated of higher order that can jeopardise the reliability and consistency of the estimates from such research endeavour. The output from the cross-sectional panel unit root test is presented in Table 4. Evidence from the unit root test suggests that poverty headcount (PHC), remittance (REM), real GDP (LRGDP), inflation (INF) and education

Table 4 Correctional unit root test

Variable	Pesaran cross sectional ADF Level	First Diff	Order
HCE	− 1.095	− 10.527***	I (1)
PHC	− 4.558***		I (0)
REM	− 2.169**		I (0)
LRGDP	− 5.083***		I (0)
INF	− 8.547***		I (0)
DOP	− 1.947	10.348***	I (1)
EDU	− 3.051***		I (0)

*** and ** denote 1% and 5% levels of significance. Critical Values: 1% = -2.230, 5% = -2.110, 10% = -2.040, Source: Authors' computation

(EDU) are stationary at level, while other variables such as household consumption expenditure (HCE) and trade openness (DOP) contain unit root at their level form. However, these variables (HCE and DOP) assume stationarity at their first difference.

4.5 Effect of remittance on poverty: full sample

The presence of cross section dependence among the cross-sectional units established in the previous section renders the usage of conventional panel model estimation techniques inappropriate. This implies that the conventional panel model estimation techniques such as pooled OLS, random and fixed effects would produce biased and inconsistent estimates due to their failure to account for cross section dependence. This is based on the argument that the standard error of the estimates provided by such conventional approaches is biased (De Hoyos and Sarafidis 2006; Ojeyinka & Akinlo 2021). Hence, the study uses the generalised least square (GLS) random effect technique based on the robust standard error estimation technique of Driscoll and Kraay (1998). We estimate the static model in Eq. (1) via the Driscoll and Kraay (1998) approach, and the results are reported in models 1 and 2 for the two indicators of poverty in Table 5.

For comparison and robustness purposes, we also estimate a two-step dynamic system GMM to address the endogeneity bias in the model. The results from GMM (specified in Eq. 2) are presented in models 3 and 4 of Table 5. However, it is important to establish the appropriateness of the GMM model by testing for the validity of the instruments and the possibility of autocorrelation in the residual term. The preliminary tests conducted show that the estimated GMM regressions pass all the diagnostic tests. The probability of AR (2) is statistically not significant for the two GMM models and this suggests that the models do not suffer from second-order autocorrelation. Secondly, the probability value of the Hansen test for overidentifying restrictions confirms that the instruments used are valid. The results are consistent for two specifications. Hence, the estimates obtained from the dynamic GMM are valid and reliable. Besides, the coefficients of the one-year lagged poverty level for the estimated GMM models are positive and significant. This suggests that the level of poverty in the previous year has a substantial impact on the poverty level in the current year. The positive and significance of the estimate of lag value of poverty indicators also reiterates the self-reinforcing attribute of poverty among low- and middle-income countries. This reflects the level of persistence and perpetuation in the incidence of poverty among the sampled countries.

Models 1 and 2 in Table 5 present the results when Eq. 1 is estimated using the GLS random effects based on the robust standard errors estimation proposed by Driscoll and Kraay (1998). Models 1 and 2 depict equations for the two proxies of poverty, namely household consumption expenditure (HCE) and poverty headcount (PHC), respectively. In the same vein, the estimation of the GMM version (Eq. 2) is captured in models 3 and 4 when poverty is proxied by HCE and PHC, respectively. Starting with the results from the GLS random effects model, the impact of remittance on poverty, measured by household consumption expenditure (model

Table 5 Remittance and poverty nexus- aggregate analysis

Variables	Driscroll and Kraay		System GMM	
	(1)	(2)	(3)	(4)
	HCE	PHC	HCE	PHC
Pov (-1)			0.422*	0.703***
			(0.233)	(0.101)
Rem	0.478***	−0.760***	0.592***	−0.0645
	(0.117)	(0.126)	(0.190)	(0.115)
lrgdp	−5.337***	−13.45***	−3.202*	−2.104**
	(1.712)	(3.146)	(1.900)	(1.054)
Inf	0.000622***	0.163**	0.0253*	0.0827**
	(0.000120)	(0.0767)	(0.0152)	(0.0416)
Dop	−0.0905***	−0.00460	−0.0281*	−0.0528*
	(0.0156)	(0.0289)	(0.0163)	(0.0305)
Edu	−0.0430	−0.347***	−0.00227	−0.0366
	(0.0266)	(0.0401)	(0.0382)	(0.0637)
Constant	115.4***	147.6***	62.30**	25.52*
	(10.57)	(25.52)	(27.93)	(13.74)
F-stat	135.81***	302.75***		
AR(1) test (pvalue)			0.088	0.093
AR(2) test (pvalue)			0.752	0.371
Hansen test (pvalue)			0.635	0.128
Number of c_id	38	38	38	38

Standard errors in parentheses, Source: Authors' computation

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

1), is positive and significant. This suggests that an increase in remittance inflow to the sampled countries enhances household consumption expenditure and thus reduces poverty. Similarly, there is a negative and significant impact of remittance on poverty when poverty headcount is used as a measure of poverty (model 2). For instance, from model 2, a unit increase in remittance flow reduces the percentage of people living on less than $2.15 per day by 0.76 units compared with the corresponding decline in poverty by 0.48 units when household consumption expenditure is used as a proxy for poverty (specification 2). Thus, it can be concluded that the impact of remittance on poverty is larger when poverty headcount is used as a proxy for poverty. This also implies that irrespective of the measure of poverty adopted, higher remittance inflow improves the standard of living of the poor among the selected countries in the presence of cross-sectional dependence. This finding is in consonance with the a priori expectation and aligns with the bulk of existing studies on the remittances-poverty nexus. The finding is in tandem with the outcomes from Anyanwu and Erhijakpor (2010) for Africa, Yoshino et al. (2019) for 10 Asian developing countries, Peković (2017) for the transition economies, Wagle

and Devkota (2018) for Nepal, and Arapi-gjini et al. (2020) for Kosovo. In the same way, the outcome aligns with the finding of Masron and Subramaniam (2018), who identify remittance as a strong predictor of poverty reduction among 44 developing countries. Similarly, Abduvaliev and Bustillo (2020) conclude that higher remittance reduces poverty through consumption smoothing among 10 Commonwealth Independent States between 1998 and 2016. The outcome also agrees with conclusion of Ekanayake and Moslares (2020) that workers' remittance lowers poverty rate among 21 countries in Latin America. All these studies support the optimistic theory that international remittance inflow reduces poverty in their sampled countries.

The outputs from the dynamic GMM validate the results from Driscoll and Kraay's (1998) robust standard errors as remittance reduces poverty in models 3 and 4 when HCE and PHC are used as indicators of poverty. For instance, a unit rise in remittances significantly enhances HCE (reduces poverty) by 0.59 units over the sampled period. This implies that regardless of the methodology employed, remittance is a potent weapon to fight the menace of poverty among the top remittance recipient countries. Our findings agree with the existing studies that employ dynamic GMM to control for endogeneity in the remittances-poverty nexus (seeAnyanwu and Erhijakpor 2010; Azizi 2019, 2021). However, for the GMM model (model 4), the impact of remittance on poverty headcount, though negative, is not statistically significant. This suggests that the volume of remittances received by these countries is too weak to lift a significant number of the poor below the poverty line of $2.15 per day when controlling for endogeneity bias in the model. Overall, a key revelation from the study suggests that remittance inflow constitutes a major determinant of poverty reduction among the 38 top remittance recipients examined. Our finding also validates the conclusion from the recent study by Cui et al. (2023), who buttress the crucial role of remittance inflows in poverty reduction among 15 Asian economies.

For the control variables, it is evident from Table 5 that the effect of real GDP per capita on poverty is mixed depending on the measure of poverty employed. For instance, under the GLS technique (model 1), the impact of real GDP per capita on HCE is negative and significant, indicating that higher real GDP per capita does not translate to increase in household consumption expenditure (reduction in poverty) among the selected countries. In the same way, an increase in remittance inflow is found to hurt household consumption expenditure under the GMM specification (model 3). This implies that irrespective of the method employed, increase in GDP is associated with reduction in HCE, and by extension, rise in poverty. This can be explained to mean that the effect of an increase in real GDP per capita does not trickle down to the poor among these countries but instead trickles up to the middle class and the very rich in the economy (Todaro 1997). Thus, the poor do not benefit from the increase in the productive capacity of the economy, and this conforms to the findings of Aigbokhan (2000) and Bakare and Ilemobayo (2013) that economic growth has not contributed significantly to poverty reduction in developing countries. On the other hand, the effect of economic growth, proxied by LRGDP, on poverty headcount is discovered to be negative and significant under models 2 and 4. This connotes that an expansion in productive capacity leads to appreciable poverty reduction in the sampled countries. This further suggests that real GDP per capita

is a key driver of poverty reduction in the selected countries when poverty headcount is used to proxy poverty. The result is in tandem with a priori expectations and agrees with the findings of Adams and Page (2005), Azizi (2019, 2021), Musakawa and Odhiambo (2019) and Acheampong et al. (2021) that economic growth contributes to poverty reduction in developing countries and specifically in Sub-Saharan Africa.

In addition, it can be inferred from Table 5 that the impact of inflation on household consumption expenditure and poverty headcount is positive and significant, implying that uncertainty erodes the economic power of the poor and thus worsening the poverty level in the economy. The findings align with the studies of Anyanwu and Erhijakpor (2010) and Yoshino et al. (2019). Similarly, the effect of trade openness on HCE is negative and statistically significant across different methodologies. This suggests that an increase in trade openness in the selected countries has not benefited the poor. Meanwhile, the impact of inflation on poverty headcount is negative and significant. The finding is consistent under the GLS and GMM specifications in models 2 and 4, respectively. The impact of human capital (proxied by secondary school enrolment rate) on poverty headcount is negative and statistically significant (model 2) for the GLS estimation, suggesting that increase in human capital reduces the proportion of people living below the poverty line of $2.15 per day among the sampled point. This is alignment with the conclusion of Olaniyi et al. (2023), who conclude that adequate investment in human capital can be used to increase productivity and the empowerment of the poor.

4.6 Effect of remittance on poverty: geographical analysis

To further explore the impact of remittances on poverty, we classify countries in the study into three, namely Africa, Asia and Latin America. The results of the geographical analysis using the Driscoll and Kraay (1998) robust standard errors are presented in Table 6. It is evident from Table 6 that the outcome on the effects of remittance on poverty for the three subsamples follows a similar pattern to that of the aggregate sample, except for model 1 (HCE specification) for Africa and model 6 (PHC specification) for Latin America where the estimate of remittance is found to be insignificant. Thus, the outcomes from the Asian countries overwhelmingly confirm the poverty-reducing effect of remittance irrespective of the indicator of poverty employed. Specifically, the results indicate that a unit increase in remittance stimulates household consumption expenditure by 1.20 units (model 3) and reduces poverty headcount by 0.84 units (model 4) in the Asian region. The outcome is robust to different estimation techniques and across the two measures of poverty employed. The result is in line with the existing studies on the two continents (Anyanwu and Erhijakpor 2010; Azizi 2019). Meanwhile, consistent with the outcome from the aggregate sample, the impact of remittance inflow on poverty headcount for the sampled countries from Africa is discovered to be negative and statistically significant, suggesting that an increase in remittance inflows is associated with reduction in poverty headcount in the continent. Similarly, the magnitude

Table 6 Regional analysis of the effect of remittances on poverty

Variables	AFRICA		ASIA		LATIN AMERICA	
	(1)	(2)	(3)	(4)	(5)	(6)
	HCE	PHC	HCE	PHC	HCE	PHC
Rem	0.569	−2.552***	1.198***	−0.844***	0.592*	−0.519
	(0.340)	(0.820)	(0.0698)	(0.135)	(0.306)	(0.485)
lrgdp	−18.24***	−12.63	−3.557	−10.34***	−7.731***	−10.09***
	(2.971)	(7.795)	(2.130)	(1.179)	(1.515)	(1.449)
Inf	0.358**	0.00556	−0.0863	0.530**	0.000146	0.137***
	(0.134)	(0.312)	(0.135)	(0.257)	(9.78e−05)	(0.0342)
Dop	−0.101**	−0.0997	−0.00924	−0.0204*	−0.252***	−0.116**
	(0.0432)	(0.0627)	(0.00787)	(0.0107)	(0.0380)	(0.0435)
Edu2	0.279***	−0.295*	−0.110	−0.213	−0.0322	−0.181***
	(0.0604)	(0.159)	(0.0787)	(0.157)	(0.0354)	(0.0565)
Constant	191.7***	150.8**	95.57***	114.3***	144.1***	117.1***
	(20.44)	(54.46)	(11.57)	(19.24)	(10.27)	(9.872)
F-stat	162.27***	11.22***	160.34***	42.26***	318.64***	112.01***
Observations	262	44	338	119	108	84
R-squared	0.379	0.567	0.613	0.595	0.634	0.859
Number of groups	13	13	20	20	5	5

Standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$, Source: Authors' compilation

of remittance is discovered to significantly influence HCE at the 10% level of significance among the five Latin American countries investigated (model 5).

Additional information from the control variables in Table 6 shows that real GDP per capita and trade openness are significant drivers of poverty across the three subsamples, although in mixed directions. On the impact of real GDP per capita, the results from the geographical analysis agree with the outcomes of the full sample for the three continents. However, the effect of economic growth is sensitive to the indicator of poverty adopted. In line with the findings from the full sample, trade openness is found to exert a negative and significant effect on the two indicators of poverty in all the regions, except for model 2 and model 3 for PHC (Africa) and HCE (Asia), respectively. This further implies that the financial liberalisation policy pursued in the three continents engenders poverty reduction. For the selected African countries, increase in inflation rate encourages household consumption expenditure, while the effect of inflation on the headcount poverty ratio in Asia and Latin America is estimated to be positive and statistically significant. This buttresses the fact that a rise in inflation rate increases the cost of living, which in turn aggravates poverty incidence in an economy. The effects of human capital (EDU) on poverty vary across the three regions and also depend on the indicator of poverty employed. An increase in secondary school enrolment rate is found to statistically stimulate household consumption expenditure and reduce poverty headcount ratio in Africa (model 1 and model 2, respectively). In the same way, increase in secondary school

enrolment significantly mitigates poverty incidence in Latin America (model 6). The finding is in tandem with a priori expectation because increase in human capital improves individual ability to contribute to economic expansion, which will in turn improve the standard of living. However, human capital has no impact on the two indicators of poverty for the selected countries in Asia.

4.7 Additional analysis

The study conducts a robustness test by grouping the sampled countries into two categories to assess the assertions of Mashayekhi et al. (2011) and Banga and Sahu (2013) that the effect of remittances on poverty is more reliable when the inflow is over 5% of GDP. The study uses the average contribution of remittance to GDP over the sample period (1990–2021) for the sampled countries and applies a threshold of 5% contribution of remittance to GDP to categorise countries in the study into two—countries whose remittance as a percentage of GDP accounts for 5% and above and those whose remittance accounts for less than 5% of GDP. Ultimately, average remittance accounts for 5% of GDP and above in 14 countries, while remittance contributes below 5% of GDP in 24 countries. Table 11 in the appendix presents the list of countries under each classification. The effect of remittance on the two indicators are analysed using Driscoll and Kraay's (1998) robust standard

Table 7 Additional analysis

Variables	Remittance (5% of GDP and above)		Remittance (below 5% of GDP)	
	(1)	(2)	(3)	(4)
	HCE	PHC	HCE	PHC
Rem	0.635***	−0.672***	1.188***	−3.420***
	(0.109)	(0.139)	(0.324)	(0.675)
Lrgdp	−5.166***	−13.68***	−3.721**	−9.729***
	(1.515)	(1.889)	(1.760)	(2.161)
Inf	−0.0481	−0.0218	0.00180***	0.256**
	(0.143)	(0.159)	(0.000200)	(0.112)
Dop	0.0248	0.0750**	−0.0501***	−0.0653***
	(0.0221)	(0.0316)	(0.0131)	(0.0166)
edu2	0.0852	−0.293***	−0.0641*	−0.308***
	(0.0699)	(0.0809)	(0.0330)	(0.0638)
Constant	100.5***	135.6***	97.59***	127.6***
	(9.416)	(12.81)	(11.63)	(19.99)
F-Stat	106.17***	39.77***	140.14***	21.03***
R-squared	0.373	0.770	0.310	0.656
Number of groups	14	14	24	24

Standard errors in parentheses, source: authors' compilation

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

errors for the two classifications, and the outcomes from the analysis are contained in Table 7. Models 1 and 2 contain the outcomes for the HCE and PHC specifications for countries whose remittance accounts for 5% of GDP and above, while the countries that have less than 5% remittance contribution to GDP are presented in models 3 and 4 for the HCE and PHC specifications, respectively. Evidence from Table 7 confirms the outcomes from the main analysis. Specifically, the impact of remittance on HCE and PHC remains positive and negative, respectively, suggesting that remittance inflow serves as a critical predictor of poverty reduction regardless of the contribution of remittance to GDP among the countries examined. Thus, our results refute the claims by Mashayekhi et al. (2011) and Banga and Sahu (2013) that the impact of remittance on poverty is more reliable when the contribution of remittance to GDP exceeds 5%. Similarly, the impact of other variables follows a pattern similar to that of the full sample. Thus, it can be convincingly argued that remittance inflow has a substantial reducing effect on poverty among the 38 selected highest remittance-receiving countries in Africa, Asia and Latin America.

5 Conclusion and recommendations

There is a global concern about the level of poverty. To underscore this, the first objective of the United Nations Sustainable Development Goals is to end poverty in all its forms everywhere by 2030. Remittance has been identified as one of the vehicles through which poverty can be reduced. It is on this background that this study examines the effects of international remittance inflow on poverty among the top remittance recipient countries in Africa, Asia and Latin America. To ensure the robustness of the results, the study adopts two indicators of poverty, namely household consumption expenditure and poverty headcount, using the international poverty line of $2.15 per day. Based on data availability, the study focuses on 38 countries selected from the three geographical regions—Africa, Asia and Latin America. Each of the selected countries received $1billion and above as international remittances in 2020. Unlike the previous studies on the remittances-poverty nexus, we control for cross-sectional dependence and endogeneity bias by adopting the Driscoll and Kraay (1998) robust standard errors (static model) and the generalised method of moment (dynamic model) as the estimation technique on annual data from 1990 to 2021. The implication of these findings lies in the fact that international remittance can be utilised as a strong factor in the achievement of the SDG-1 in the developing low- and middle-income countries.

Empirical findings from both the static and dynamic models overwhelmingly confirm that remittance significantly reduces poverty in the sampled countries. The findings are consistent for the two proxies of poverty, and it is also confirmed across the three geographical regions. The finding validates the optimistic hypothesis that remittance has a decreasing impact on poverty. These results imply that remittance inflows to the selected countries significantly reduce the menace and severity of poverty in Africa, Asia and Latin America. For the control variables, the study finds that the real GDP per capita (a measure of economic growth) has a reducing effect on the incidence of poverty headcount ratio among the selected countries. However,

the level of growth experienced in these countries is too weak to cause a substantial fall in the rate of poverty in these regions. Meanwhile, the study discovers that the effect of trade openness, inflation and human capital on poverty depends on the indicator of poverty employed.

The empirical findings from this study have some policy implications on how remittance can be employed in the selected countries to actualise the global goal of attaining zero poverty by the year 2030. First, the governments in Africa, Asia and Latin America are encouraged to provide a conducive environment for the beneficiaries of remittance to channel the proceeds received into productive business ventures rather than spending the inflow on consumption activities. Secondly, policymakers in these countries are advised to put in place measures to attract more remittance to lift a reasonable proportion of the population above the poverty line. Some of these measures might include reduction in the cost of sending remittance from abroad, removal of legal and institutional barriers to encourage remitters to use the formal financial channels as against the informal financial channels of sending remittance. In line with this, there is a need for the host countries, which are majorly the high-income countries, to assist in reducing the cost of remittances to encourage and incentivise international migrants to remit substantial amounts of proceeds to their home countries to achieve substantial reduction in the incidence of poverty, especially among the poor low- and middle-income countries. For instance, the global average cost of remittance is 6.25% of the amount sent, which is far above the 3% target proposed by the United Nations Sustainable Development Goals by the 2030. If this cost is reduced, developing countries will attract larger remittance inflows, which will in turn stimulate consumption expenditure and thus lift a good percentage of poor people above the poverty line. Besides, if the cost of sending remittances is reduced, it will increase the amount of remittance proceeds via the official channels, which can be directed to productive ventures to achieve an appreciable reduction in poverty rate among the remittance-receiving countries.

In terms of limitation of study, the paper considers only 38 low- and middle-income countries that received $1billion dollar as remittance inflows in 2020. However, future studies might expand the scope by including all countries in the developing world. Furthermore, future studies can also be conducted separately on low-income countries and middle-income countries to understand the dynamics of remittance and poverty along the income classifications. On the methodology, the present study employs system GMM and the robust standard error approach proposed by Driscoll and Kraay (1998), which only accounts for the linear or symmetric effect of remittances on poverty level. The recent trend in the remittances-poverty nexus has revealed the possibility of an asymmetric (nonlinear) relationship between the two variables. Thus, future studies can consider the use of an estimation technique such as nonlinear ARDL to unravel the asymmetric effect of remittance inflows on poverty level among the developing countries.

Appendix

See appendix Tables 8, 9, 10 and 11.

Table 8 Measurement and descriptive statistics of variables

Variables	Symbol	Unit of measurement	Source
Household consumption expenditure	HCE	Household Consumption Expenditure (% of GDP)	WDI
Poverty headcount	PHC	The percentage of the population living on less than $2.15 (constant 2017 US$ adjusted for PPP) a day	
Remittance	REM	Personal remittances received (% of GDP)	
Real GDP per capita	RGDP	US dollar (2010 constant price)	
Degree of openness	DOP	Total trade (% of GDP)	
Inflation	INF	Changes in consumer price index (%)	
School enrolment	EDU	Secondary (% gross)	

Source: authors compilation

Table 9 A-priori expectation of parameter estimates

Measure of poverty	Household consumption expenditure (HCE)	Poverty headcount (PHC)
β_1	Positive	Negative
β_2	Positive	negative
β_3	Positive	Negative
β_4	Positive	Negative
β_5	Negative	Positive
β_6	Positive	Negative

Table 10 List of countries

S.no.	Africa	Asia	Latin America
1	Algeria	Bangladesh	Bolivia
2	Egypt	Cambodia	Brazil
3	Ghana	China	Colombia
4	Kenya	India	Ecuador
5	Mali	Indonesia	Peru
6	Morocco	Iran	
7	Nigeria	Japan	
8	Senegal	Jordan	
9	Sudan	Kyrgyz	
10	South Africa	Lebanon	
11	Tunisia	Malaysia	
12	Uganda	Myanmar	
13	Zimbabwe	Nepal	
14		Pakistan	
15		Sri Lanka	
16		Tajikistan	
17		Uzbekistan	
18		Vietnam	
19		West Bank and Gaza	
20		Yemen	

Table 11 Classification of countries: using remittance as a % of GDP

S.no.	Remittance (5% of GDP and above)	Remittance (below 5% of GDP)
1	Bangladesh	Algeria
2	Egypt	Bolivia
3	Jordan	Brazil
4	Kyrgyz Republic	Cambodia
5	Lebanon	China
6	Morocco	Colombia
7	Nepal	Ecuador
8	Senegal	Ghana
9	Sri Lanka	India
10	Tajikistan	Indonesia
11	Uzbekistan	Iran
12	West Bank and Gaza	Japan
13	Yemen Republic	Kenya
14	Zimbabwe	Malaysia
15		Mali
16		Myanmar
17		Nigeria
18		Pakistan
19		Peru
20		South Africa
21		Sudan
22		Tunisia
23		Uganda
24		Vietnam

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References

Abduvaliev M, Bustillo R (2020) Impact of remittances on economic growth and poverty reduction amongst CIS countries. Post-Communist Econ 32(4):525–546

Acharya CP, Leon-gonzalez R (2012) The impact of remittance on poverty and inequality: a micro-simulation study for Nepal. GRIPS discussion paper, 3(9), p 1–30. http://www.aessweb.com/journals/September2013/5004/2289

Acheampong AO, Appiah-Otoo I, Dzator J, Agyemang KK (2021) Remittances, financial development and poverty reduction in Sub-Saharan Africa: implications for post-COVID-19 macroeconomic policies. J Policy Model 43(6):1365–1387

Acosta P, Calderón C, Fajnzylber P, Lopez H (2008) What is the impact of international remittances on poverty and inequality in Latin America? World Dev 36(1):89–114. https://doi.org/10.1016/j.worlddev.2007.02.016

Acosta P, Fajnzylber P, Lopez JHH (2007) The impact of remittances on poverty and human capital: evidence from Latin American household surveys. World Bank policy research working paper, 4247, p 1–36. https://books.google.com.ng/books?id=FWauxKvQYmoC&pg=PA36&lpg=PA36&dq=Yang,+D.,+and+C.+Martinez.+2006.+"Remittances+and+Poverty+in+Migrants+Home+Areas:+Evidence+from+the+Philippines."+In+International+Migration,+Remittances+and+the+Brain+Drain,+81-121,+ed

Adams RH Jr (2011) Evaluating the economic impact of international remittances on developing countries using household surveys: a literature review. J Dev Stud 47(6):809–828

Adams RH, Page J (2005) Do international migration and remittances reduce poverty in developing countries? World Dev 33(10):1645–1669. https://doi.org/10.1016/j.worlddev.2005.05.004

Aighokan BE (2000) Poverty, growth and inequality in Nigeria: a case study. AERC research paper 102

Amaka CM, Kalu CU, Machi IO (2023) Remittance and poverty reduction in Nigeria: further evidence from Nigeria. Soc Sci Res 9(1):36–55

Anyanwu JC (2011) International remittances and income inequality in Africa. Rev Econ Bus Stud 4(1):117–148

Anyanwu JC, Erhijakpor AEO (2010) Do international remittances affect poverty in Africa? Afr Dev Rev 22(1):51–91

Apergis N, Cooray A (2018) Asymmetric real exchange rates and poverty: the role of remittances. Emerg Mark Rev 35:111–119

Arapi-Gjini A, Möllers J, Herzfeld T (2020) Measuring dynamic effects of remittances on poverty and inequality with evidence from Kosovo. East Eur Econ 58(4):283–308

Arellano M, Bond S (1991) Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Rev Econ Stud 58(2):277–297

Arellano M, Bover O (1995) Another look at the instrumental variable estimation of error-components models. J Econ 68(1):29–51

Azam M (2016) The impact of foreign remittances on poverty alleviation: global evidence. Econ Sociol 9(1):264–281. https://doi.org/10.14254/2071-789X.2016/9-1/18

Azizi SS (2019) The impacts of workers' remittances on poverty and inequality in developing countries. Empir Econ. https://doi.org/10.1007/s00181-019-01764-8

Azizi S (2021) The impacts of workers' remittances on poverty and inequality in developing countries. Empir Econ 60(2):969–991

Bakare AS, Ilemobayo AS (2013) Does economic growth reduce poverty in Nigeria? Dev Ctries Stud 3(9):62–69

Baltagi BH, Blien U, Wolf K (2012) A dynamic spatial panel data approach to the German wage curve. Econ Model 29(1):12–21

Banga R, Sahu PK (2013) Impact of remittances on poverty in India: empirical evidence. In: Human capital and development: The Indian experience, p 77–102, eSocialSciences. https://doi.org/10.1007/978-81-322-0857-0_6

Banga R, Sahu PK, Banga R, Sahu P (2010) Impact of remittances on poverty in developing countries. eSocialSciences. https://econpapers.repec.org/RePEc:ess:wpaper:id:2872

Breusch TS, Pagan AR (1980) The Lagrange multiplier test and its applications to model specification in econometrics. Rev Econ Stud 47(1):239–253

Chea V (2023) Effects of remittances on household poverty and inequality in Cambodia. J Asia Pac Econ 28(2):502–526

Coon M, College H (2012) The effect of workers' remittances on poverty in Mexico: a regional analysis, 25162

Cui X, Umair M, Gayratovich GI, Dilanchiev A (2023) Do remittances mitigate poverty? An empirical evidence from 15 selected Asian economies. Singap Econ Rev 68(04):1447–1468

Dash RK (2020) Impact of remittances on domestic investment: a panel study of six South Asian countries. South Asia Econ J 21(1):7–30. https://doi.org/10.1177/1391561420903199

De Haas H (2010) Migration and development: a theoretical perspective. Int Migr Rev 44(1):227–264

De Hoyos RE, Sarafidis V (2006) Testing for cross-sectional dependence in panel-data models. Stand Genomic Sci 6(4):482–496
De Haas H (2007) Remittances, migration and social development: a conceptual review of the literature. Social policy and development programme, Paper no. 34. Geneva: UNRISD
Djeunankan R, Njangang H, Tadadjeu S, Kamguia B (2023) Remittances and energy poverty: fresh evidence from developing countries. Util Policy 81:101516
Driscoll JC, Kraay AC (1998) Consistent covariance matrix estimation with spatially dependent panel data. Rev Econ Stat 80(4):549–560
Ekanayake EM, Moslares C (2020) Do remittances promote economic growth and reduce poverty? Evidence from Latin American countries. Economies 8(2):1–26. https://doi.org/10.3390/ECONOMIES8020035
Ewubare D, Okpoi GE (2018) International remittances and poverty reduction in Nigeria. J Appl Econ Bus 6(2):5–24
Funlayo K, Benedict D (2018) Migrants' remittances and poverty in ECOWAS. IOSR J Econ Finance 9(3):39–45. https://doi.org/10.9790/5933-0903013945
Gaaliche M, Zayati M (2015) The causal relation-ship between remittances and poverty reduction in developing country: using a non-stationary dynamic panel data. J Glob Stud 1(1):30–39
Gupta S, Pattillo CA, Wagh S (2009) Effect of remittances on poverty and financial development in Sub-Saharan Africa. World Dev 37(1):104–115. https://doi.org/10.1016/j.worlddev.2008.05.007
Harris JR, Todaro MP (1970) Migration, unemployment and development: a two-sector analysis. Am Econ Rev 60(1):126–142
Hicks JR (1932) The theory of wages. Macmillan, London
Hoechle D (2007) Robust standard errors for panel regressions with cross-sectional dependence. Stand Genomic Sci 7(3):281–312
Im KS, Pesaran MH, Shin Y (2003) Testing for unit roots in heterogeneous panels. J Econom 115(1):53–74
Imai KS, Gaiha R, Ali A, Kaicker N (2014) Remittances, growth and poverty: new evidence from Asian countries. J Policy Model 36(3):524–538. https://doi.org/10.1016/j.jpolmod.2014.01.009
Inoue T (2018) Financial development, remittances, and poverty reduction: empirical evidence from a macroeconomic viewpoint. J Econ Bus 96:59–68. https://doi.org/10.1016/j.jeconbus.2017.12.001
Jongwanich J (2007) Workers' remittances, economic growth and poverty in developing Asia and the Pacific countries, vol 7(1)
Jouini J (2015) Economic growth and remittances in Tunisia: bi-directional causal links. J Policy Model 37(2):355–373. https://doi.org/10.1016/j.jpolmod.2015.01.015
Kaidi N, Mensi S, Amor MB (2019) Financial development, institutional quality and poverty reduction: worldwide evidence. Soc Indic Res 141(1):131–156
Kayani FN (2021) Role of foreign remittances in poverty reduction: a case of poverty-ridden Kyrgyzstan. Pak J Commer Soc Sci 15(3):545–558
Kennedy P (2008) A guide to econometrics. Blackwell Publishing, Oxford
Khan R, Zeeshan, Haque MI, Gupta N, Tausif MR, Kaushik I (2022) How foreign aid and remittances affect poverty in MENA countries? PLoS ONE 17(1):e0261510
Kureková L (2010) From job search to skill search: political economy of labor migration in central and Eastern Europe. Department of international relations and European studies
Le TH, Tran-Nam B (2018) Trade liberalization, financial modernization and economic development: an empirical study of selected Asia-Pacific countries. Res Econ 72(2):343–355
Le TH, Le HC, Taghizadeh-Hesary F (2020) Does financial inclusion impact CO_2 emissions? Evid Asia Finance Res Lett 34:101451
Levin A, Lin CF, Chu CSJ (2002) Unit root tests in panel data: asymptotic and finite-sample properties. J Econom 108(1):1–24
Lim S, Simmons WO (2015) Do remittances promote economic growth in the Caribbean community and common market? J Econ Bus 77:42–59. https://doi.org/10.1016/j.jeconbus.2014.09.001
Mashayekhi M, Das A, Banga R, Kumar P (2011) United Nations conference on trade and development developing countries. In: UNCTD conference
Masron TA, Subramaniam Y (2018) Remittance and poverty in developing countries. Int J Dev Issues 17(3):305–325. https://doi.org/10.1108/IJDI-04-2018-0054
Mehedintu A, Soava G, Sterpu M (2019) The effect of remittances on poverty in the emerging countries of the European Union. Sustainability 11(12):1–14. https://doi.org/10.3390/SU11123265

Mim SB, Ali MS, Ben. (2012) Through which channels can remittances spur economic growth in MENA countries? Int J Econ Perspect 6(3):279–294. https://doi.org/10.2139/ssrn.2006818
Musakwa MT, Odhiambo NM (2019) The impact of remittance inflows on poverty in Botswana: an ARDL approach. J Econ Struct 8(1):1–13. https://doi.org/10.1186/s40008-019-0175-x
Musakwa MT, Odhiambo NM (2021) The causal relationship between remittance and poverty in South Africa: a multivariate approach. Int Soc Sci J 71(239–240):37–48
Musakwa MT, Odhiambo NM (2022) Remittance inflows and poverty nexus in Botswana: a multivariate approach. J Sustain Finance Invest 12(2):475–489
Nuñez R, Osorio-Caballero MI (2021) Remittances, migration, and poverty. A study for Mexico and Central America. Investig Econ 80(318):98–125
Ojeyinka TA, Akinlo EA (2021) Does bank size affect efficiency? Evidence from commercial banks in Nigeria. Ilorin J Econ Policy 8(1):79–100
Olaniyi CO (2021) On the transmission mechanisms in the finance–growth nexus in Southern African countries: Does institution matter? Econ Change Restruct 55:1–39
Olaniyi CO, Dada JT, Odhiambo NM, Vo XV (2023) Modelling asymmetric structure in the finance-poverty nexus: empirical insights from an emerging market economy. Qual Quant 57(1):453–487
Olaoye O, Ibukun CO, Razzak M, Mose N (2021) "Poverty prevalence and negative spillovers in Sub-Saharan Africa: a focus on extreme and multidimensional poverty in the region. Int J Emerg Mark. https://doi.org/10.1108/IJOEM-01-2021-0028
Olayungbo DO, Quadri A (2019) Remittances, financial development and economic growth in sub-Saharan African countries: evidence from a PMG-ARDL approach. Financ Innov 5(1):1–25
Peković D (2017) The effects of remittances on poverty alleviation in transition countries. J Int Stud 10(4):37–46. https://doi.org/10.14254/2071-8330.2017/10-4/2
Pesaran MH, Schuermann T, Weiner SM (2004) Modeling regional interdependencies using a global error-correcting macroeconometric model. J Bus Econ Stat 22(2):129–162
Pesaran H (2003) A simple panel unit root test in the presence of cross section dependence, Cambridge working papers in economics 0346, Faculty of Economics (DAE), University of Cambridge
Pradhan BK, Mahesh M (2016) Impact of remittances on poverty: an analysis of data from a set of developing countries. Econ Bull 36(1):108–117
Sarkodie SA, Owusu PA (2020) Impact of meteorological factors on COVID-19 pandemic: evidence from top 20 countries with confirmed cases. Environ Res 191:110101
Sehrawat M, Giri AK (2015) Financial development, poverty and rural–urban income inequality: evidence from South Asian countries. Qual Quant 50(2):577–590
Shroff K (2009) Impact of remittances on poverty in Mexico. http://www.econ.yale.edu/~granis/web/PovertyWpaper.pdf
Taylor JE, Mora J, Adams RH, Lopez-Feldman A (2005) Remittances, inequality and poverty: evidence from rural Mexico (issue 05). http://www.reap.ucdavis.edu/mexico-national-rural-household-survey/Remittances.pdf
Todaro MP (1997) Economic development readings. Mass, Addison-Wesley
Tsaurai K (2018) The impact of remittances on poverty alleviation in selected emerging markets. Comp Econ Res 21(2):51–68. https://doi.org/10.2478/cer-2018-0011
Vacaflores DE (2018) Are remittances helping lower poverty and inequality levels in Latin America? Q Rev Econ Finance 68:254–265
Wagle UR, Devkota S (2018) The impact of foreign remittances on poverty in Nepal: a panel study of household survey data, 1996–2011. World Dev 110:38–50
World Bank (2021) Data/Migration data portal. https://migrationdataportal.org/data?i=remit_re_excel&t=2019
Wouterse F (2010) Remittances, poverty, inequality and welfare: evidence from the central plateau of Burkina Faso. J Dev Stud 46(4):771–789. https://doi.org/10.1080/00220380903019461
Yang D, Martínez C A (2006) Remittances and poverty in migrants' home areas : evidence from the Philippines. In: International migration, remittances and the brain drain, Washington, World Bank, p 81–121
Yoshino N, Taghizadeh-Hesary F, Otsuka M (2019) International remittances and poverty reduction: evidence from developing Asia. J Comp Asian Dev 17(2):21–42