

Impact of Remittances and International Migration on Poverty in Central Asia: The cases of the Kyrgyz Republic, Tajikistan, and Uzbekistan

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Abstract

Several studies have hitherto examined the impact of remittances and international migration on poverty in the developing world. However, the Central Asian region remains under-researched, with no country comparison study examining the impact of remittances on poverty in the region. This paper fills this research gap by analyzing a new dataset on remittances, international migration, and poverty from the Kyrgyz Republic, Tajikistan, and Uzbekistan. The results show that both international migration and remittances significantly reduce poverty in these Central Asian countries. The main issue with the standard empirical approach is potential endogeneity of migration and remittances in the model of poverty, as income has been suggested to be a significant factor in migration decisions. In practice, instrumental variables are rarely a convincing and as well as efficient solution. Therefore, we estimate the total effect of migration and remittances instead of that at the margin. Results show differences between current actual poverty rates and those under a simulated no-migration scenario.

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1. Introduction

International migration and remittances have recently become one of the most important topics in development and labor economics. Scholars found that labor migration bears far-reaching welfare implications, such as higher consumption and investment and improved health and education, among others. The scale of the impact has been increasing along with migrant numbers. The international migrant stock has increased from 154 million² in 1990 to approximately 250 million in 2015³. This amounts to a 1.9% average annual growth rate, while the world population grew at about 1.3% over the same time period. Over the past decade, the global amount of migrant worker payments to their families almost tripled to USD 441 billion⁴, three times the amount of official foreign aid. Moreover, remittances surpassed international aid and foreign direct investment for most labor-exporting countries. As such, the money that labor migrants send to their home countries is a significant share of their gross national income.

Both internal and international migration in Central Asia increased considerably after the collapse of the Soviet Union. Migration was mainly driven by significant structural changes, associated with the transition from a command to a free market economy, poverty,

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² International Migration Policies: Government Views and Priorities, UN, 2013

³ World Economic Outlook, October 2016: Subdued Demand: Symptoms and Remedies, IMF 2016

⁴ Migration and Remittances Factbook, WB, 2016

and lack of employment opportunities in labor markets. External labor migration and remittances play an especially dominant role in the economies of Kyrgyzstan and Tajikistan, two of the poorest successor states of the Soviet Union. These two countries are the top remittance recipients in terms of the share of remittances in their GDPs (gross domestic products): 42% in Tajikistan and 30% in Kyrgyzstan (World Bank (WB), 2013). Unlike Tajikistan and Kyrgyzstan, Uzbekistan's economy is less dependent on remittances with only about 12% of GDP (Parpiev, 2015). According to the World Bank, the poverty rates for Tajikistan, the Kyrgyz Republic, and Uzbekistan were 34%, 37%, and 14% in 2013, respectively (2013).

While remittances have a number of economic advantages (e.g., economic development, investment opportunities for households, poverty alleviation), academicians and practitioners argue they should be assessed with caution (Salahuddin and Gow, 2015), as they may have adverse effects on economic development in the long run. Particularly, remittances are a source of concern for Central Asian countries, because these cash inflows comprise more than 10% of their GDPs. This may in turn lead to the Dutch disease,⁵ where adverse structural changes occur due to large remittance inflows. Additionally, in the case of an economic downturn in a host country, labor-exporting states might face the return of a vast number of labor migrants, which can exacerbate their socio-economic situation, given the scarcity of job opportunities on the domestic market. Finally, a sharp reduction in remittances may lead to a drastic devaluation of the local currency.

Despite the large size of remittances, there is still a gap in the research on the welfare impact of remittances in these countries. To date, no country comparison study examined the impact of remittances on poverty in Central Asia to the best of our knowledge. There are several reasons for this. First, there is a lack of data on poverty as it is difficult to estimate accurate and meaningful poverty head counts in developing countries. The second reason is related to the nature of data on remittances and international migration (Adams and Page, 2005). Specifically, Adams and Page (2005, 1645) note that developed countries tend to undercount illegal migrants residing within their borders.

This paper is the first to generate empirical evidence on the impact of migration and remittances on poverty in Central Asia. To that end, it study relies on a unique household survey—the first in the Kyrgyz Republic, Tajikistan, and Uzbekistan—that goes beyond traditional analysis and data. The survey was developed and conducted by the World Bank and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in 2013 (World Bank, 2014). Total sample size is 6,300 households in three Central Asian countries, and the data include information on various aspects that range from employment, migration, remittances, subjective poverty, government transfers, financial services, and household expenditure to education.

The rest of this paper is organized as follows. Section 2 reviews relevant literature. Section 3 presents the dataset and describes the empirical strategy, and I also provide cross-country descriptive statistics on migration and remittances, poverty indicators, and demographic variables. Section 4 provides the results of the empirical analysis and discusses the impact of remittances on poverty in the Kyrgyz Republic, Tajikistan, and Uzbekistan. Finally, Section 5, summarizes the findings and presents policy implications.

⁵ “Dutch disease is a mechanism characterized by a real appreciation and a contraction of the traded sector, following a resource boom” (Corden and Neary, 1982). “This may in turn lower growth if there are spillover effects particular to the traded sector” (Matsen and Torvik, 2005).

2. Literature Review

The development studies literature has long recognized the importance of migration and remittances as tools used by households to secure income and improve welfare. As previously mentioned, despite the extensive literature on the relationship between poverty and remittances, to the best of our knowledge, no study explicitly addressed the link between remittances and poverty in Central Asia. Remittances are expected to reduce poverty, since they may be directly received and consumed by the poor. Nevertheless, literature findings are sometimes mixed or controversial.

For instance, Uruci and Gedeshi (2003) study long-term legal immigrants and revealed the majority of the international migrants (69.7%) sent their money to meet the essential needs of their families back home. Other economists claim the poor benefit from remittances and international migration. Adams (1991, 74) finds that, in rural Egypt, when household income includes remittances, the number of poor households declines by 9.8%. Additionally, remittances account for 14.7% of the total income of poor households (1991, 74). Further, Stark and Taylor point out that “relatively deprived” households in rural Mexico tend to participate in international migration more than “better off” households (Stark and Taylor, 1989). Serino et al. (2011) study the impact of an increase in international remittances on poverty in developing countries, finding that international remittances had an uneven effect across poverty quintiles for developing states. Specifically, the poverty-reducing impact of remittances was more noticeable in the highest quintile of poverty (90th quintile), that is, individuals in the worst-off group (Serino et al. 2011).

Conversely, Stahl (1982) argues that migration can be an “expensive venture.” Particularly, “it is going to be the better-off households that will be more capable of (producing international migrants)” (Stahl, 1982, 883). Similarly, Lipton (1980), in a study on 40 villages in India, finds “migration increases intra-rural inequalities,” and only better off households can benefit from international migration (Lipton, 1980, 4). Adams (1989) reveals remittances from abroad worsen income inequality in rural Egypt in gross and per capita terms, because the predominantly better off households earned them.

Several cross-country studies confirm remittances have a significant impact on decreasing poverty. For example, Adams and Page (2005), who use household surveys on 71 developing countries to examine the impact of international migration on poverty, conclude remittances have a statistically significant and negative impact on poverty. Notably, a 10% increase in the share of remittances in a country's GDP leads to a reduction of 1.6% of the people living in poverty (Adams and Page, 2005). Campos and Lardé de Palomo (2002) found that, in 2000, the remittances helped reduce the national poverty rate by 4.2% in El Salvador, and also the Gini coefficient from 0.55 to 0.53. According to López-Córdova et al. (2005), remittances have a statistically significant impact in reducing poverty in Mexico at municipal level.

Gustafsson and Makonnen (1993) find that 35% of household income in urban and rural Lesotho comes from remittances. Hence, if remittances were set to zero, the average per-capita household consumption would fall by 32% and the poverty head count index would increase by 26%. Moreover, a cessation of remittances would result in a 52% increase in the poverty gap. Taylor et al. (2005) show the impact of international remittances on poverty in rural Mexico and conclude that poverty headcount and poverty gap indices would decline by 0.77 and 0.53, respectively, with a 10% increase in international remittances.

Aydas et al. (2005) research the remittance situation in Turkey and reveal that the lower the income level in the recipient country, the higher the remittance volume. Semyonov and Gorodzeisky (2008) analyze the relationship between household amounts of remittances received and income levels in the Philippines and obtain a significant and positive relationship between household income levels and the amounts of remittance received. Dustmann and Mestres (2010) analyze a sample of labor migrants living in Germany and reveal households with relatively low incomes would only receive small amounts of

remittances. Brown and Jimenez (2008) conclude the estimated effects of remittances on poverty reduction are immense in Fiji and Tonga. Alvear and Yang (2007) and Pernia (2008) find that poverty is reduced by increased remittances in the Philippines, as a result of the spillover effect.

Many of these findings might not provide accurate results, due to their small sample sizes. Furthermore, the poor cannot always access migration and remittances, because not everyone possesses the initial capital to participate in migration. Undeniably, the risks as well as the expenses related to migration are obstacles for the poorest people (Stark et al., 1988). According to Adams (2011), migration appears to increase inequality, not only between international and internal migrants, but also between non-migrants and migrants. Additionally, migration and remittances increase inequalities within home countries and between central and peripheral regions (Lipton, 1980; Mishra, 2007), as "... the economic behavior of recipient households usually tends to increase the prices of goods and services in the local domestic market, potentially affecting the entire community, including non-recipient households" (Lubambu, 2014). Therefore, remittances do not necessarily imply a financial benefit for the poorest and most vulnerable.

3. Data and methodology

3.1. Data

This paper analyzes World Bank and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) household survey (CALISS) data from 2013. These surveys collected comprehensive household information that can be separated into national, regional, and/or urban/rural levels (World Bank, 2013). Data was collected for 3,300 households or 20,142 individuals in Tajikistan, 1,500 households or 8,622 individuals in Uzbekistan, and 1,500 households, or 7,706 individuals in the Kyrgyz Republic. The data make it possible to quantify remittances, poverty, and migration, as well as test for the impacts of these variables on total household income and poverty. The surveys include information on education, employment, migration, remittances, subjective poverty,⁶ government transfers, financial services, and household expenditures in Tajikistan, Kyrgyz Republic, and Uzbekistan.

Descriptive country statistics on the total number of households, as well as migrant households, are provided in the Appendices. In the survey, 19% of the sample in the Kyrgyz Republic, 33% in Tajikistan, and 27.8% of household heads in Uzbekistan received international remittances. Importantly, the majority of household heads participating in the interviews were men: women accounted for 24.9% in Tajikistan, 25.2% in Kyrgyzstan, and 18.9% in Uzbekistan. The average age of the survey respondent's household head was 50 (51 among remittance receiving households). By country, we find the average age to be 50 in Tajikistan (51 among remittance receiving households), 49 in the Kyrgyz Republic (51 among remittance receiving households), and 53 in Uzbekistan (52 among remittance receiving households). Of all households, 59%, 39%, and 36% were in urban areas, while 41%, 34%, and 26% of remittance-receiving households were in urban areas in Tajikistan, Kyrgyzstan, and Uzbekistan, respectively.

On average, when compared to non-remittance receiving households, households that receiving remittances had more family members with some secondary education in Tajikistan, Kyrgyzstan, and Uzbekistan. This was also true for the older household members in Tajikistan and Kyrgyzstan. Generally, these findings are in accordance with human capital theory, which suggests educated people are more likely to migrate, since they can enjoy greater employment and income opportunities in a destination country. The data also show migrant households have more family members than non-migrant ones.

The average monthly amount of remittances sent by migrants to their households in the Kyrgyz Republic was around USD 795 (Appendix B, Table B.2) among remittance-receiving

⁶ The respondents were asked to assess their financial situation.

households and around USD 152 among all survey respondents. In Tajikistan, the average monthly amount of remittances sent by migrants to their households was around USD 908 (Appendix A, Table A.2) among the remittance-receiving households and around USD 300 among both remittance-receiving and non-remittance receiving households. In Uzbekistan, the average monthly amount of remittances sent by migrants to their households was around USD 740 (Appendix C, Table C.2) among the remittance-receiving households and around USD 206 among all survey respondents. The black-market exchange rate in Uzbekistan prevailed until the change in government in 2016 and was abolished in 2017. Since the official exchange rate did not reflect real prices, we use the black-market exchange rate.

Average monthly per capita food expenditure in Tajikistan was TJS 259.1 (USD 54.4 USD) and average household expenditure per capita TJS 562.7 (USD 118). At the same time, remittance-receiving households' per capita food expenditure in Tajikistan was TJS 220 (USD 46 USD) and household per capita expenditure around USD 99. In the Kyrgyz Republic, monthly per capita food expenditure was KGS 4,576 (USD 93 USD), with KGS 3,628 (USD 74) among the remittance-receiving households. Household expenditures per capita were KGS 10,311 (USD 210) among all households and KGS 8,436 (USD 172) among the remittance-receiving households. In Uzbekistan, the average food expenditure per capita was UZS 143,400 (USD 53 USD) and UZS 121,000 (USD 45) among remittance-receiving households. At the same time, the per capita household expenditure was UZS 325,000 (USD 120).

More than half of the households in Kyrgyzstan, Tajikistan, and Uzbekistan reported having no migrants (72%). The number of migrants in the overall sample was 2,348 in Tajikistan, 682 in Kyrgyzstan, and 829 in Uzbekistan. In Tajikistan, age-wise, most migrants were in the third decade of their lives according to survey results. Around 38% of the total number of migrants, or 901 individuals in the sample, fall into this category. Around 28% of migrants, or 668 individuals, were between 30 and 39, and just under 20% of the migrant sample, or 461 people, were aged 40 to 49. With respect to their educational background, the majority of migrants had only completed secondary education, and only 16% of the migrants in the study reportedly had higher education. About 70% of the migrants in the sample included individuals with some secondary education. A reasonable US equivalent for this level could be the completion of junior high school. Around 55% completed education at high-school level. Those who had secondary special or secondary technical education accounted for around 15% of the migrants in the sample.

Age-wise, most migrants were in the third decade of their lives in Kyrgyzstan. Around 50% of the total number of migrants were between 20 and 29. The second largest group of migrants in the sample was of those between 30 and 39. With respect to their educational background, the majority of migrants had only completed secondary education. Only 21% of the migrants in the study reportedly had higher education. Around 74% of the migrants had some sort of secondary education, and around 5% of them did not achieve an education level beyond basic secondary.

In Uzbekistan, similar to Kyrgyzstan, more than half (65%) of the households, did not have migrants. Age-wise, the majority of migrants were in the third decade of their lives (i.e., 20–29 years old), followed by those aged 30–39. Migrant education levels are similar to Tajikistan. The majority of migrants (around 80%) possess some sort of technical education, with only 7% having completed higher education, while 8% of the migrants only had basic secondary education.

3.2. Empirical strategy

We look into how remittances received by a household affect an individual's probability of being poor. To identify the poor, individuals who reside in a household where expenditures per member are below the poverty line are designated as such. One popular way to determine the poverty line is to calculate the cost of food that allows a person a daily intake of 2,100 calories (Deaton and Drèze, 2008). However, this is a rather complicated exercise. Instead, we

opt for the poverty line the World Bank recommends for all countries except low-income ones—daily consumption of the equivalent of USD 1.9. The same poverty line is used for the calculation of headcount ratio, poverty gap index, and squared poverty gap index.

The headcount ratio indicates the percentage of population living below the poverty line. The second poverty measure is the poverty gap, measured in percentages, indicating how far the average expenses of the poor fall short of the poverty line. For instance, a poverty gap of 10% means that the average poor person's expenditure (income) is 90% of poverty line. The last measure that indicates the severity of poverty is the squared poverty gap: “It measures the mean of the squared distance below the poverty line expressed as a proportion of the poverty line, and it is sensitive to the distribution of the poor” (Serino et al. 2011, p.28), see also Adams and Page, 2003.

Following the convention (Brown and Jimenez, 2008), we estimate a binary dependent variable model with a number of regressors that include remittances received, and other household and individual characteristics. Our model can be written as follows:

$$\Pr(\text{poor}_i = 1) = \Phi(\alpha_0 + \alpha_1 \text{remit}_i + \alpha_2 X_i). \quad (1)$$

This is a typical empirical probability model, where the distribution of Φ is assumed to be normal (probit model). Remittances per household member are entered to capture their effect on individual welfare. X_i is a vector of all other household and individual characteristics that may affect being poor, and includes individual age, gender, educational attainment, household size, urban/rural setting, number of children in the household, among others. Once the coefficients are obtained, we then estimate the marginal effects of all independent variables on one's probability to fall into poverty. The model is nonlinear. Therefore, the size of the marginal effects is not constant. For analysis, we estimate marginal effects at the sample mean values of the variables. We also use the same model for one's decision to migrate.

The choice of explanatory variables follows the literature (Haughton and Khandker, 2009) and our hypotheses. Poverty is generally associated with a lack of skills and opportunities. We include the age and gender of household head, presence of children, community characteristics (urban or rural settlement), and household size, among others. These variables capture the access to economic opportunities, while the educational attainment of household head is the indicator of potential skills of household members. Finally, we include the size of remittances, if any, to test our main hypothesis.

Typically, the estimation of (1) is rather straightforward as one applies MLE to it. However, in our study, remittances may not be an exogenous factor of poverty because migration bears travel and accommodation expenses. As such, households that have their members labor migrate may not be poor in the first place. Hence, the endogeneity in the empirical model. Using instrumental variables (IV) is a common solution in such cases. Although the IV estimator is a popular tool, it is rarely entirely convincing because of the lack of sufficiently strong instruments. Therefore, we resort to estimating the total effect of migration. Following Adams (2004), we estimate income levels for families with migrants if they did not send abroad their household members as migrants. Having generated those counterfactual levels of income, we can now assess the poverty rate and the other poverty measures that would likely arise if those migrants did not have an opportunity to travel abroad for work. The results should allow us to make unbiased inferences about the welfare effects of migration and remittances without falling into endogeneity trap.

It would be straightforward to construct counterfactual incomes of the households under no migration and remittances scenario if households with no remittances are randomly drawn from the population. However, this becomes problematic, because households with and without remittances are likely to differ in their non-remittance incomes. Therefore, the regression results are likely to be biased. It is the same reason that produces endogeneity as in

the probit exercise above. Consequently, we examine the extent of the selection bias and apply a two-stage selection control model (Heckman, 1976).

To employ this model, we need to identify variables that specifically determine migration and the receipt of remittances in the first stage, and those that exclusively explain household income in the second stage. The model is identified if there is at least one independent variable in the first-stage choice equation that is not in the second-stage income equation as well. To identify the model, we need to include at least one regressor that affects the decision to migrate and transfer remittances, but not the household income. The first-stage choice function of the probability of a household that has a migrant and receives remittances can be estimated as follows:

$$\Pr(\text{migration}x_i = 1) = F(a + bC + gZ), \quad (2)$$

where X represents household head's demographic and human capital characteristics, and Z the household's general characteristics (e.g., wealth, size, age-gender composition). The vector of explanatory variables in (2) is consistent with the empirical literature on migration and remittances. We believe human capital affects migration one way or the other. One possibility is that better educated people have better chances to become employed in their home countries or face better employment opportunities in the countries where they are migrating to. Household characteristics, such as the age of the household head and the number of male and female members, are also expected to affect the migration decision. Particularly, some studies (Adams, 1993; Lipton, 1980) suggest migration is a life-cycle event, in which older household heads and members over the age of 15 are more likely to participate. Regarding wealth, the literature often suggests that households that are better off financially are more likely to produce migrants (Barham and Boucher, 1998; Lanzona, 1998).

The second-stage income function is specified as follows:

$$I = a + bY + dZ + mI + e, \quad (3)$$

where Y is community characteristics (average income, urban or rural setting), Z household characteristics, including the human capital of family members, and λ the inverse Mills ratio. In equation (2), some of the household characteristic variables identify the model. The age of household head is one of them, as it is expected to affect a household member's migration decision and the subsequent receipt of remittances. The reason behind this is that older heads are more likely to have mature children (over 16), who are more likely to migrate. Once we have estimated income equation (3) and predicted household income levels, we can calculate poverty rates and poverty under the migration and no-migration scenarios.

4. Results and discussion

The estimation results of poverty model (1) are given in Tables 1–4. The marginal effects are estimated at the sample means of the variables. Standard errors are estimated using the delta method (linearizing marginal effects around the sample means and taking the variance of the linear approximation). A larger household size increases the chances of poverty, as expected. An additional person in the family raises the probability of becoming poor by 0.97% in Kyrgyzstan, 2.06% in Tajikistan, while in Uzbekistan, the effect of an extra person in the family is insignificant.

The effect of household head's age on poverty is not statistically significant in either the Kyrgyz Republic or Uzbekistan but is significant in Tajikistan: 10 years of age increases the probability of becoming poor by 1.3%. Female family head are less likely to be poor by 1.45% in Tajikistan compared to men, which is unexpected. In Kyrgyzstan and Uzbekistan, the gender of the household head is not a significant. If a household is in an urban setting instead of a rural one, the probability of its members falling into poverty declines by 3.93% in the Kyrgyz Republic and 1.40% in Tajikistan. In Uzbekistan, the rural or urban setting does not affect one's chances of falling into poverty. The results for the education are largely as

expected. Having secondary general education compared to no education in Uzbekistan reduces individuals' likelihood of being poor by 1.41% and by 5.38% in Tajikistan. However, it is insignificant in the Kyrgyz Republic. Having vocational education compared to no education in Tajikistan reduces the probability of becoming poor by 9.87% and by 1.34% in Uzbekistan. However, it is not significant in Kyrgyzstan. Finally, having higher education compared to no education reduces the likelihood of becoming poor by 2.23% in the Kyrgyz Republic, 16.07% in Tajikistan, and 3.27% in Uzbekistan. Having children ages 7–16 in the family increases one's likelihood to be poor by 1.14% in Kyrgyzstan, 1.97% in Tajikistan, and 0.97% in Uzbekistan.

Remittances turn out to be a significant explanatory variable for poverty in all three countries. The average remittance per member in Tajikistani households that receive remittances is TJS 666 per month. By multiplying it by remittances' marginal effect (-0.00018) we obtain a 12% reduction effect in the probability of poverty for average remittances in Tajikistan. In other words, if a household with no remittances starts to receive an average amount of remittances, its members are 12% less likely to become poor. Using the same strategy for Kyrgyzstan we obtain 8.58% poverty reduction effect for average size remittances and 23.15% in Uzbekistan.

As previously mentioned, the major caveat of the estimated marginal effects of remittances is potential endogeneity bias, with the use of IV as a common solution. Although the IV estimator delivers all the desirable asymptotic properties, in practice it is often not convincing. The practical difficulty is in finding valid instruments. Alternatively, we offer estimates of the total effect instead of that at the margin.

We follow the Heckman two-step procedure to estimate a household expenditures equation. We estimate equation (3) with households that do not have migrants. The results allow us to predict household expenditures for the ones that do have migrants. The inverse Mills ratio generated based on the estimates of the first stage probit provides unbiased and consistent estimates for the main household expenditures equation. The results of this exercise are given in Appendix 2.

Table 1. Marginal estimates of probit model of poverty in the Kyrgyz Republic

	dF/dx	Std. err.	Z	p-value
Household size***	0.009714	0.001737	5.55	0.000
Age	0.000179	0.000164	1.09	0.274
Gender	0.001817	0.005802	0.31	0.754
Remittances per household member*	-0.000011	0.0000061	-1.81	0.07
Urban***	0.039281	0.007026	5.89	0.000
Education, secondary general	0.013217	0.013235	1.06	0.288
Education, secondary technical	-0.00775	0.013833	-0.53	0.593
Education, higher***	-0.02234	0.00762	-2.61	0.009
Number of children aged 0–6	0.001899	0.004042	0.47	0.638
Number of children, aged 7–16***	0.011372	0.003167	3.57	0.000
Overall significance, Wald test asymptotically ~ Chi(10)			155.90	0.000

Note: The number of observations is 7,003.

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

Table 2. Marginal estimates of probit model of poverty in Tajikistan

	dF/dx	Std. err.	z	p-value
Household size***	0.020571	0.001413	14.54	0.000
Age***	0.001318	0.000205	6.44	0.000
Gender**	-0.01446	0.00636	-2.27	0.023
Remittances per household member***	-0.00018	0.0000413	-4.38	0.000
Urban**	-0.014	0.006507	-2.15	0.031
Education, secondary general***	-0.05383	0.007641	-6.9	0.000
Education, secondary technical***	-0.09865	0.011297	-7.66	0.000
Education, higher***	-0.1607	0.008769	-14.32	0.000
Number of children, aged 0–6***	0.009546	0.003156	3.03	0.002
Number of children, aged 7–16***	0.019651	0.002731	7.19	0.000
Overall significance, Wald test asymptotically ~ Chi(10)			1763.45	0.000

Source: CALISS (2013).

Note: The number of observations is 20,122.

The inverse Mills ratio has insignificant coefficients for all three countries, which means that the pool of migrants is randomly selected from the entire population. This result is similar to one in Adams (2004).

Table 3. Marginal estimates of probit model of poverty in Uzbekistan¹

	dF/dx	Std. err.	z	p-value
Household size	-0.001294	0.001353	-0.95	0.340
Age	-0.000744	0.001507	-0.49	0.622
Gender	0.000448	0.004404	0.10	0.919
Remittances per household member***	-0.000871	0.000224	-3.74	0.000
Urban	-0.00510	0.004648	-1.08	0.280
Education, secondary general**	0.014055	0.007307	2.03	0.043
Education, secondary technical**	-0.01336	0.006132	-2.05	0.041
Education, higher***	-0.03265	0.006168	-3.56	0.000
Number of children, aged 0–6***	0.018351	0.002552	7.24	0.000
Number of children, aged 7–16***	0.00966	0.002439	3.96	0.000
Overall significance, Wald test asymptotically ~ Chi(10)			346.33	0.000

¹official exchange rate

Note: The number of observations is 8,622.

Table 4. Marginal effect of probit model of poverty in Uzbekistan¹

	dF/dx	Std. err.	z	p-value
Household size***	0.0091175	0.0024058	3.800	0.000
Age	-0.0001763	0.0002512	-0.700	0.483
Gender	-0.001521	0.0075659	-0.200	0.841
Remittances per household member***	-0.000468	0.000181	-2.590	0.010
Urban***	-0.0556528	0.0076628	-6.900	0.000
Education secondary general**	0.0251679	0.0119873	2.160	0.031
Education secondary technical***	-0.0284847	0.0105594	-2.600	0.009
Higher education***	-0.086344	0.0116616	-5.510	0.000
Number of children, aged 0–6***	0.0166695	0.0046139	3.610	0.000
Number of children, aged 7–16***	0.0218172	0.0040918	5.320	0.000
Overall significance, Wald test asymptotically ~ Chi(10)				555.39

¹Black-market exchange rate

Having predicted household expenditures for the households with migrants in case they did not have migrants, we can thus estimate poverty measures under migration and no-migration scenarios. The results are presented in Table 5. The table reports the headcount ratio, poverty gap, and squared poverty gap. The various poverty measures demonstrate that the inclusion of remittances in household expenditure reduces the level, depth, and severity of poverty in all three countries. Including remittances into household expenditure has the biggest impact on the poverty gap, which implies that remittances reduce the dispersion of income levels, bringing poor households closer to the poverty line. However, Table 5 reveals that the inclusion of remittances in the expenditure of a household has little impact on income inequality.⁷ Since we found that migrants are randomly distributed across population and different income groups, the fact that Gini coefficient is little affected by remittances is expected.

Table 5. Estimated poverty measures under migration and no-migration scenarios

Poverty measure	Uzbekistan*		Kyrgyzstan		Tajikistan	
	Migration	No migration (simulated)	Migration	No migration (simulated)	Migration	No migration (simulated)
Headcount ratio (percent)	15.8	22.8	34.5	44.2	26.9	43.3
Poverty gap (percent)	3.3	4.3	11.4	13.9	7.3	11.8
Squared poverty gap (percent)	1.1	1.3	5.4	6.2	2.9	4.6
Gini coefficients	0.28658	0.29716	0.34737	0.36702	0.39800	0.41009

Note: Uzbekistan's poverty measures are estimated using the "black-market" exchange rate. Poverty calculations are made using the 2013 World Bank poverty line of USD 1.90 USD per day. All values are weighted. In 2013, 1 USD = TJS 4.76, KGS 49, or UZS 2,720.

⁷ Measured by the Gini coefficient.

5. Policy implications and conclusion

This study provided statistical evidence that international migration and remittances reduce poverty in Central Asia. The paper has two main findings.

First, the paper found international migration and remittances have a statistically significant effect on reducing poverty in Tajikistan and Uzbekistan. It also has some positive impact on poverty reduction in Kyrgyzstan.

Second, we compared households receiving international remittances in 2013, with a counterfactual situation under which they did not receive remittances in 2013 to control for the endogeneity and selection. We found the poverty headcount falls by 38% in Tajikistan and the squared poverty gap declines by 37% in Tajikistan. These results are significantly higher than those produced by larger, cross-national studies on the correlation between remittances and poverty. For example, Adams and Page (2005) find that a 10% increase in international remittances in a country will lead, on average, to a 3.5% decline in the poverty headcount and a 2.8% decline in squared poverty gap.

As such, there is a need to look into this issue in more details. As the analysis of the existing literature has shown, despite a number of various studies on labor migration and remittances, some research gaps still exist. Particularly, while many researchers argue the impact of remittances on economic growth and poverty alleviation is evident, the views of other researchers are not in line with this statement. Therefore, this study presented the empirical evidence of the relationship between remittances and the increase/decrease of poverty levels in a country, thus attempts to fill this research gap. The study also provided empirical evidence that remittances reduce the likelihood of an individual falling into poverty.

The findings suggest appropriate policies are required to maintain a sustainable reduction of poverty. Policymakers should thus recognize the importance of migration and remittances when designing their national development strategies. To mitigate poverty, policymakers should elaborate policies that assist poor workers abroad in the short term. This will both boost income among poor families and raise foreign currency reserves. Governments should also use the developmental impact of remittances to support investments into entrepreneurship, healthcare, and education.

At the same time, remittances and migration cannot act as a panacea for poverty reduction in the long run and cannot substitute a sound economic policy. For this reason, while considering strategies to decrease poverty, governments should also focus on the most vulnerable groups and increase their resilience. This study found that, all things being equal, predominantly young, able-bodied individuals are among unemployed and participate in migration, which is viewed as an opportunity to find a job and acquire skills and experience. Gender is also a factor influencing the probability of being poor, as females face difficulties in finding jobs on the local labor markets and, as a result, are often unemployed.

One more significant factor affecting poverty is education. Men and women belonging to households with higher per capita consumption have usually completed a higher level of education. At the same time, migration rates are higher among those who have secondary general or vocational degrees. As such, there is a need to match education policies and training programs with national development needs and priorities, international development strategies, and labor market requirements. This will likely promote young people, fight extreme poverty, and allow for a maximization of globalization benefits for the youth. Governments should also develop strategies to promote remittances, engage returning migrants in national development, or shift toward urban job promotion. Finally, a range of comprehensive studies aimed at understanding the situation in the field of labor migration in Tajikistan, Uzbekistan, and the Kyrgyz Republic should be regularly conducted to increase knowledge and provide better policy options.

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Appendices

Appendix A. Descriptive statistics, Tajikistan, 2013

Table A.1 Remittance-receiving and non-remittance-receiving household data for Tajikistan (CALISS, 2013)

Variables	(1) N	(2) Mean	(3) SD	(4) Min	(5) Max
Gender	3,300	0.249	0.433	0	1
Age	3,300	50.76	13.26	16	95
Urban	3,300	0.590	0.492	0	1
Education Secondary General	3,300	0.368	0.482	0	1
Education Secondary Technical	3,300	0.205	0.404	0	1
Higher Education	3,300	0.280	0.449	0	1
Number of Children Below 6 Years of Age	3,300	0.937	1.171	0	7
Number of Children Below 16 Years of Age	3,300	2.190	1.723	0	10
Household Size	3,300	6.099	3.061	1	19
Remittances per Household	3,300	1,432	6,207	0	225,000
Remittances per Capita	3,300	220.4	773.0	0	13,235
Food Expenditures per Capita	3,300	259.1	195.9	0	3,541
Household Expenditures per Capita	3,300	562.7	462.6	2.639	7,921

Note: Exchange rate TJS 4,76 = 1 USD. N refers to the number of observations, SD is the standard deviation, and mean the mean value of the variables.

Table A.2 Remittance-receiving household data for Tajikistan (CALISS, 2013)

Variables	(1) N	(2) Mean	(3) SD	(4) Min	(5) Max
Gender	1,092	0.220	0.414	0	1
Age	1,092	51.77	11.69	18	95
Urban	1,092	0.410	0.492	0	1
Education Secondary General	1,092	0.423	0.494	0	1
Education Secondary Technical	1,092	0.249	0.433	0	1
Higher Education	1,092	0.177	0.382	0	1
Number of Children Below 6 years of Age	1,092	1.066	1.253	0	6
Number of Children Below 16 Years of Age	1,092	2.382	1.743	0	9
Household Size	1,092	7.085	3.181	2	19
Remittances per Household	1,092	4,326	10,197	100	225,000
Remittances per Capita	1,092	666.0	1,229	9.375	13,235
Food Expenditures per Capita	1,092	220.0	144.7	26.89	1,988
Household Expenditures per Capita	1,092	469.9	348.3	76.67	5,315

Note: Exchange rate TJS 4,76 = 1 USD

Appendix B. Descriptive statistics, The Kyrgyz Republic, 2013**Table B.1 Remittance-receiving and non-remittance-receiving household data for the Kyrgyz Republic (CALISS, 2013)**

Variables	(1) N	(2) Mean	(3) SD	(4) Min	(5) Max
Gender	1,500	0.252	0.434	0	1
Age	1,500	48.97	13.19	20	94
Urban	1,500	0.387	0.487	0	1
Education Secondary General	1,500	0.0453	0.208	0	1
Education Secondary Technical	1,500	0.589	0.492	0	1
Higher Education	1,500	0.106	0.308	0	1
Number of Children Below 6 Years of Age	1,500	0.708	0.868	0	4
Number of Children Below 16 Years of Age	1,500	1.505	1.237	0	6
Household Size	1,500	4.669	1.846	1	12
Remittances per Household	1,500	7,432	33,475	0	600,000
Remittances per Capita	1,500	1,487	7,273	0	125,000
Food Expenditures per Capita	1,500	4,576	15,284	0	395,060
Household Expenditures per Capita	1,500	10,311	24,043	107.3	598,630

Note: Exchange rate KGS 49 = 1 USD

Table B.2 Remittance-receiving household data for Kyrgyz Republic (CALISS, 2013)

Variables	(1) N	(2) Mean	(3) SD	(4) Min	(5) Max
Gender	286	0.241	0.429	0	1
Age	286	51.32	11.08	20	82
Urban	286	0.339	0.474	0	1
Education Secondary General	286	0.0594	0.237	0	1
Education Secondary Technical	286	0.671	0.471	0	1
Higher Education	286	0.0944	0.293	0	1
Number of Children Below 6 Years of Age	286	0.738	0.893	0	4
Number of Children Below 16 Years of Age	286	1.594	1.238	0	5
Household Size	286	5.570	1.941	2	12
Remittances per Household	286	38,979	68,264	2	600,000
Remittances per Capita	286	7,798	15,126	0.400	125,000
Food Expenditures per Capita	286	3,628	6,227	0	87,904
Household Expenditures per Capita	286	8,436	9,900	1,439	135,377

Note: Exchange rate 49 KGS = 1 USD

Appendix C. Descriptive statistics, Uzbekistan, 2013

Table C.1 Remittance-receiving and non-remittance-receiving household data for Uzbekistan (CALISS, 2013)

Variables	(1) N	(2) Mean	(3) SD	(4) Min	(5) Max
Gender	1,500	0.230	0.421	0	1
Age	1,500	53.08	13.37	19	98
Urban	1,500	0.363	0.481	0	1
Education Secondary General	1,500	0.403	0.491	0	1
Education Secondary Technical	1,500	0.319	0.466	0	1
Higher Education	1,500	0.178	0.383	0	1
Number of Children Below 6 Years of Age	1,500	0.886	1.067	0	7
Number of Children Below 16 Years of Age	1,500	1.793	1.396	0	9
Household Size	1,500	5.748	2.333	1	17
Remittances per Household	1,500	432.9	1,500	0	27,000
Remittances per Capita	1,500	74.06	256.2	0	4,500
Food Expenditures per Capita	1,500	143.4	79.88	21.08	706.6
Household Expenditures per Capita	1,500	325.0	194.3	34.35	1,702

Note: Remittances per household and remittances per capita are presented in thousands UZS. 1 USD = UZS 2,100 according to the official exchange rate 1 USD = UZS 2,720 according to the black-market rate in 2013.

Table C.2 Remittance-receiving household data for Uzbekistan (CALISS, 2013)

Variables	(1) N	(2) Mean	(3) SD	(4) Min	(5) Max
Gender	418	0.189	0.392	0	1
Age	418	52.49	11.83	27	98
Urban	418	0.256	0.437	0	1
Education Secondary General	418	0.435	0.496	0	1
Education Secondary Technical	418	0.359	0.480	0	1
Higher Education	418	0.132	0.338	0	1
Number of Children Below 6 Years of Age	418	0.964	1.136	0	5
Number of Children Below 16 Years of Age	418	1.909	1.413	0	7
Household Size	418	6.321	2.268	3	16
Remittances per Household	418	1,553	2,520	1	27,000
Remittances per Capita	418	265.8	430.1	0.111	4,500
Food Expenditures per Capita	418	121.0	58.16	27.82	706.6
Household Expenditures per Capita	418	284.2	160.7	58.89	1,702

Note: Remittances per household and remittances per capita are presented in thousands UZS. 1 USD = UZS 2,100 according to the official exchange rate 1 USD = UZS 2,720 according to the black-market rate in 2013.

Appendix D

Table D.1 Heckman two-step estimation for Uzbekistan

Variables	(1) lnhxheck ⁱ	(2) select ⁱⁱ	(3) Mills ⁱⁱⁱ
Log(Household size)	0.518*** (0.0570)		
Age	0.00222* (0.00118)		
Gender	-0.139*** (0.0368)		
Urban	0.190*** (0.0357)	0.292*** (0.0777)	
Education Secondary General	-0.0582 (0.0509)		
Education Secondary Technical	0.0548 (0.0540)		
Higher Education	0.173*** (0.0576)		
Number of Children below 6	-0.0104 (0.0190)		
Number of Children Below 16	-0.0391** (0.0168)		
Household Size		-0.0454* (0.0260)	
Adult Males		-0.184*** (0.0472)	
Adult Females		0.0718 (0.0544)	
Adult with Secondary Special Education		-0.0633** (0.0310)	
Adult with Higher Education		0.168*** (0.0473)	
Adult with Graduate Education		-0.0665 (0.787)	
Lambda			0.00265 (0.145)
Constant	6.342*** (0.0993)	1.016*** (0.107)	
Observations	1,500	1,500	1,500

Note: Standard errors are between parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table D.2 Heckman two-step estimation for Tajikistan

Variables	(1) lnhhxheck	(2) select	(3) Mills
Log(Household size)size	0.579*** (0.0454)		
Age	-0.00102 (0.000919)		
Gender	0.0119 (0.0299)		
Urban	0.0507 (0.0414)	0.476*** (0.0501)	
Education Secondary General	0.153*** (0.0384)		
Education Secondary Technical	0.258*** (0.0442)		
Higher Education	0.444*** (0.0418)		
Number of Children Below 6 years of Age	-0.0237 (0.0148)		
Number of Children Below 16 Years of Age	-0.0412*** (0.0137)		
Household Size		0.0172 (0.0140)	
Adult Males		-0.256*** (0.0270)	
Adult Females		-0.0707** (0.0293)	
Adult with Secondary Special Education		-0.0810** (0.0338)	
Adult with Higher Education		0.109*** (0.0251)	
Adult with Graduate Education		5.685 (0)	
Lambda			0.0718 (0.113)
Constant	6.678*** (0.0805)	0.684*** (0.0659)	
Observations	3,429	3,429	3,429

Note: Standard errors are between parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Table D.3 Heckman two-step estimation for Kyrgyzstan

Variables	(1) lnhhxheck	(2) select	(3) Mills
Log(Household size)	0.506*** (0.107)		
Age	-0.00321* (0.00183)		
Gender	-0.191*** (0.0531)		
Urban	0.00515 (0.0462)	-0.0431 (0.0845)	
Education Secondary General	0.150 (0.0917)		
Education Secondary Technical	0.321*** (0.0955)		
Higher Education	0.432*** (0.0987)		
Number of Children Below 6 Years of Age	0.0251 (0.0338)		
Number of Children Below 16 Years of Age	-0.0571* (0.0322)		
Household Size		-0.0657** (0.0319)	
Adult Males		-0.205*** (0.0781)	
Adult Females		-0.153* (0.0789)	
Adult with Secondary General Education		-0.0440 (0.0653)	
Adult with Secondary Technical Education		-0.0201 (0.0729)	
Adult with Higher Education		0.0797 (0.0696)	
Adult with Graduate Education		-0.162 (0.478)	
Lambda			-0.0488 (0.243)
Constant	9.049*** (0.155)	1.859*** (0.125)	
Observations	1,500	1,500	1,500

Note: Standard errors are between parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

ⁱ Log (household expenditure)

ⁱⁱ First-stage probit

ⁱⁱⁱ Mills ratio