

# Remittances, Household Welfare, and the COVID-19 Pandemic in Tajikistan

EIJI YAMADA, SATOSHI SHIMIZUTANI,  
AND ENERELT MURAKAMI\*

---

Remittance inflows are now the largest source of external financing to developing countries, but little research has yet firmly established the effect of remittances on household welfare. We investigate the case of Tajikistan, one of the most heavily remittance-dependent countries in the world. We use a panel dataset collected nationwide and employ an instrumental variable estimation to confirm a positive relationship between receiving remittances and household welfare after correcting for endogeneity. Moreover, we find that the effect of remittances on household spending is more pronounced in households whose head is male, older, and/or less educated. Then, we combine our estimated coefficients with the projected decline of remittance inflows as a result of the coronavirus disease (COVID-19) outbreak and show the pandemic's adverse effect on household spending per capita.

---

\*Eiji Yamada: Japan International Cooperation Agency (JICA) Bangladesh Office, Dhaka, Bangladesh, and JICA–Ogata Sadako Research Institute for Peace and Development (JICA-RI), Tokyo, Japan. E-mail: Yamada.Eiji@jica.go.jp; Satoshi Shimizutani (corresponding author): JICA-RI, Tokyo, Japan. E-mail: Shimizutani.Satoshi@jica.go.jp; Enerelt Murakami: JICA-RI, Tokyo, Japan. E-mail: Murakami.Enerelt@jica.go.jp. This study was conducted as part of the “Study on Remittances and Household Finances in the Philippines and Tajikistan” carried out by JICA-RI. We would like to thank our colleagues at JICA-RI, including Akira Murata, for facilitating and contributing to the survey design and data collection processes. In conducting the survey, JICA-RI is grateful to the Government of Tajikistan—especially the Ministry of Labor, Migration and Employment of Population—the World Bank, and the JICA Tajikistan Office team for their support. We also thank Ilhom Abdulloev and Shimpei Taguchi for their constructive comments and Pragma Gupta for her excellent research assistance. The views expressed in this paper are our own and do not represent the official positions of either JICA-RI or JICA. The Asian Development Bank recognizes “Vietnam” as Viet Nam and “Russia” as the Russian Federation.

This is an Open Access article published by World Scientific Publishing Company. It is distributed under the terms of the Creative Commons Attribution 3.0 International (CC BY 3.0) License which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

*Keywords:* COVID-19, household welfare, migration, remittances, Tajikistan  
*JEL codes:* F22, F24, O12, O15

---

## I. Introduction

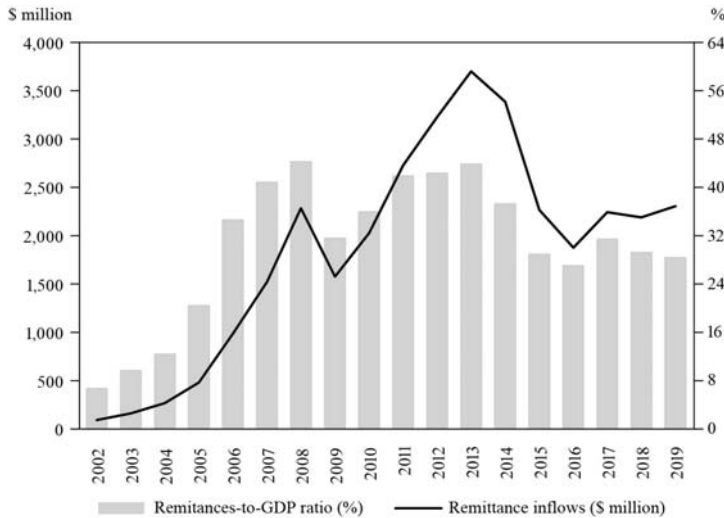
Migrants' remittances are now the largest source of external financing for developing countries. In 2019, remittance inflows to low- and middle-income countries were the largest in history at \$554 billion, which far surpassed the amount of official development assistance in these countries and even overtook foreign direct investment (World Bank 2020a). Given the growing importance of remittance inflows to developing countries, the impact of the coronavirus disease (COVID-19) is potentially devastating to them as it causes economic downturns in host countries facing lockdowns and oil price crashes, and it limits people's ability to send remittances as a result of stringent movement restrictions or even the cancellation of planned migrations (International Organization for Migration 2020). The World Bank warned in 2020 that remittances to low- and middle-income countries were projected to fall by 19.7% on average, ranging from a 27.5% decline in Europe and Central Asia to a 13% decline in East Asia and the Pacific (World Bank 2020b). Indeed, some national statistics revealed that remittance inflows to developing countries started to decline after the outbreak of COVID-19 in early 2020 (Kikkawa et al. 2020).

To our knowledge, however, there has been little research establishing a solid relationship between receiving remittances and household welfare, and thus it is difficult to argue the impact of the COVID-19 pandemic on household welfare in terms of a decline in remittance inflows. A challenge for the analysis is to establish a causal relationship between remittances and household spending; a useful approach is to utilize longitudinal data to correct unobserved factors and address endogeneity using a valid instrumental variable or exogenous shocks to households. Yang's (2008) work, which used the appreciation of the Philippine peso during the 1997–1998 Asian financial crisis as an exogenous shock to examine the effect of international remittances on households, is a representative study using this approach. He found that the episode positively and significantly affected capital accumulation, entrepreneurship, and education spending in origin households, but had no significant effect on household consumption. In recent years, there have been a variety of studies reporting the positive impact of remittances on household welfare in the context of Kenya (Jena 2018), Viet Nam (Amare and Hohfeld 2016, Cuong and Linh 2018), Malawi (Kangmennaang, Bezner-Kerr, and Luginaah 2018), Bangladesh (Wadood and Hossain 2017), Pakistan

(Javed, Awan, and Waqas 2017), and other countries. However, these studies are less rigorous in terms of empirical methodology relying on cross-sectional data. A popular way to circumvent the identification issue is to employ propensity score matching since it is difficult to find appropriate instrumental variables for remittances. An exception is Amare and Hohfeld (2016), who employed a fixed-effect estimation using gross domestic product (GDP) per capita of the destination region as the instrument in the context of domestic migration in Viet Nam.

In this paper, we focus on the case of Tajikistan. It is well known that Tajikistan is one of the countries most dependent on migration and the inflow of remittances from abroad. Figure 1 illustrates the development of remittance inflows (bar) and its share of GDP (line) over 2 decades. In 2002, remittances accounted for 6.4% of Tajikistan’s GDP; the inflow of remittances expanded shortly after, increasing as a proportion of GDP to more than 40% in 2007. This level remained high until the middle of the 2010s except for a few years during the economic turmoil triggered by the global financial crisis. While the amount of remittances and its contribution to Tajikistan’s GDP slightly declined since the middle of the 2010s, the remittances-to-GDP ratio remained close to 30% and was estimated to be 28.2% in 2019, the fifth-highest ratio

Figure 1. Remittance Inflows to Tajikistan, 2002–2019



GDP = gross domestic product.

Source: Authors’ calculations based on the World Bank. “World Development Indicators.” <https://databank.worldbank.org/reports.aspx?source=world-development-indicators> (accessed August 20, 2020).

in the world.<sup>1</sup> Migrants are prevalent in the country with two-fifths of households having at least one member working abroad (Japan International Cooperation Agency–Ogata Sadako Research Institute for Peace and Development [JICA-RI] 2020). Thus, a substantial decline in remittance inflows after the COVID-19 outbreak could have seriously affected the welfare of these households.

Of additional concern, Tajik migrants are highly concentrated in the Russian Federation (Russia) as low-skilled workers (JICA-RI 2020). As part of the former Soviet Union, Tajikistan has maintained close economic ties with Russia. Indeed, more than 90% of Tajik migrants choose Russia as their destination to work as marginal laborers in the construction and service sectors. The lack of diversification of destination countries and employment sectors makes Tajik labor migrants vulnerable to changes in the Russian economy and its migration policy. The decline of remittance inflows since the mid-2010s was due to the large macroeconomic turbulence in Russia in 2014 and the change in Russia’s migration policy in 2015, which introduced a work patent system for migrant workers from visa-free states to Russia and thereby significantly increased the cost of migration (JICA-RI 2020). Moreover, most migrants from Tajikistan are working-age men residing in rural areas who had no job before leaving the country. They were motivated to migrate since more than half of the working-age population does not participate in the labor market in Tajikistan and informal employment is dominant even among the employed (JICA-RI 2020). The jobs available in the destination countries are as simple workers, irrelevant to migrants’ educational or professional backgrounds.<sup>2</sup>

This paper utilizes a nationally representative household panel survey collected in 2013 and 2018 in Tajikistan to estimate the empirical relationship between remittance income and household welfare via two-stage least squares (2SLS), instrumenting remittance income by regional GDP per capita of the destination country for migrants and of Tajikistan for nonmigrants. Then, we combine our estimated coefficients with forecasts for the substantial decline of remittances during the COVID-19 pandemic and show that the adverse effect on household spending per capita on total and nonfood items is gauged to be a 1% decline over 1 year, with a larger 5% contraction for education spending.

---

<sup>1</sup>The share of remittance inflows as a percentage of GDP was the highest in 2019 in Tonga (37.6%), followed by Haiti (37.1%), South Sudan (34.4%), and the Kyrgyz Republic (29.2%).

<sup>2</sup>Young Tajiks who expect to migrate often refuse professional education and choose to work unskilled jobs in Russia, earning much more than they would as skilled workers in Tajikistan. This is a phenomenon known as a “forsaken schooling trap” (Abdulloev, Epstein, and Gang 2019; Abdulloev 2020).

This paper comprises the following sections. Section II explains the dataset used in this study. Section III examines the relationship between remittances and household welfare through external macroeconomic shocks. Section IV uses the estimated results to argue the potential impact of the COVID-19 pandemic on household welfare in Tajikistan. Section V concludes.

## II. Data Description

The dataset used in this study is a nationally representative household panel survey conducted in Tajikistan in 2013 and 2018. The first round of the survey in 2013 is the Tajikistan Labor, Skills, and Migration Survey, one of the surveys comprising the Central Asia Longitudinal Inclusive Society Survey (CALISS) conducted in three Central Asian countries: Tajikistan plus Uzbekistan and the Kyrgyz Republic. The CALISS 2013 survey was conducted by the World Bank and the German Federal Enterprise for International Cooperation. The second round of the survey in 2018 was implemented and sponsored by the Japan International Cooperation Agency to track the Tajikistan sample of the CALISS.

The first round of data collection was conducted in June, July, and the beginning of August 2013.<sup>3</sup> The survey comprised a nationally representative sample of 2,000 households previously included in the 2012 Tajikistan Living Standard Survey (TLSS).<sup>4</sup> The sample of the 2012 TLSS was stratified by oblast (region) and urban versus rural areas in each oblast.<sup>5</sup> The primary sampling unit was selected with a probability proportional to the number of households using the 2011 census, with 20 households in each of the primary sampling units selected at the second stage based on the census. In the survey, the most knowledgeable person in the household responded to the questionnaire, which surveys household members' educational attainment, employment, and migration status, as well as household income, expenditures, and remittances.

---

<sup>3</sup>The field survey was implemented by 150 fieldworkers from the firm Zerkalo.

<sup>4</sup>In addition, the 2013 survey oversampled the population of the capital territory of Dushanbe with 1,300 households. The 2018 survey did not track those households.

<sup>5</sup>There are nine strata: Dushanbe Urban, Gorno-Badakhshan Autonomous Region (urban and rural), Sughd (urban and rural), Khalton (urban and rural), and Rayons under Republican Subordination (urban and rural). The urban Rayons under Republican Subordination (i.e., Districts of Republican Subordination) were oversampled to ensure a sufficient number of observations to compare the results across regions.

The 2018 survey followed up with households from Tajikistan.<sup>6</sup> The survey was conducted with heads of households and migrant workers who were in the household at the time of the survey. The major part of the questionnaire replicates the questions in the 2013 survey with some additional questions focusing on migration and remittances. Among the 2,000 households surveyed in 2013, 1,716 or 86% responded to the 2018 survey and thus the attrition rate was 14%.<sup>7</sup>

Table 1 reports the summary statistics of the variables used in this study.<sup>8</sup> We use data from the households that were surveyed during both the first and second rounds. The summary statistics are presented by survey year. The outcome variables in this study are nominal monthly consumption per capita and the decomposition (food, nonfood, and education).<sup>9</sup> The average total household consumptions are TJS419.1 in 2013 and TJS506.3 in 2018. While the average food spending accounted for more than half of the total consumption in 2013, the share declined to less than half in 2018. In contrast, nonfood and education spending increased between 2013 and 2018. We use two variables for remittances that a household received. One is an indicator variable with a value of 1 for a household that received any remittances from international migrants in the past 12 months and 0 for a household without remittances. The proportions of households that received any remittance income from international migrants were 43.9% in 2013 and 38.3% in 2018. The other remittance variable is the

---

<sup>6</sup>Panel surveys at the household level were conducted in Tajikistan via the TLSS in 2007, 2009, and 2011, but no tracking effort has been made since 2013. The 2018 survey added a series of focus group discussions to get the quantitative data from the structured survey with anecdotes from the households with and without migrant workers, as well as with migrants themselves (JICA-RI 2020).

<sup>7</sup>The most common reason for replacement was difficulty in tracking and tracing the sampled households at their recorded addresses, most of which were urban households that had moved. From the 2013 survey sample, 284 households were added to make the sample size in the follow-up survey 2,000.

<sup>8</sup>We compared the characteristics between the attrite and the nonattrite, and confirmed that there were no statistically significant differences for the means of log per capita consumption, log per capita food consumption, log per capita nonfood consumption, and log per capita educational expenditure, which are our dependent variables in the regression analyses. For the summary statistics broken down between remittance-receiving households and nonreceiving households, see Table A1 in the Appendix.

<sup>9</sup>The denominator of all per capita variables from the household survey is the number of household members excluding migrating members. Nonfood consumption covers spending excluding education and health; this includes spending on cosmetics and personal care products, personal care services, household supplies and cleaning products, articles for cleaning, domestic services, laundry and dry cleaning, fuels and lubricants for personal vehicles, passenger transport by road or railway (excluding expenses to travel to school and healthcare facilities), internet and postal service expenses, pet food, supplies, and services, entertainment, cigarettes, tobacco and cigars, newspapers and magazines, clothing and footwear, household articles, books, films, hobbies and services, services for the maintenance and repair of personal vehicles and accessories and spare parts, home improvements, small electric items and appliances, other personal effects, personal effects for travel, excursions, and holidays (excluding school excursions), air or sea travel, payment for part-time courses (excluding private tutoring), insurance, taxes (excluding VAT and income tax), marriage gifts, costs for ceremonies, and gambling losses. All consumption variables are calculated at the nominal value.

Table 1. Summary Statistics—Mean and Standard Deviation in Each Year

Variable	2013			2018		
	<i>N</i>	Mean	SD	<i>N</i>	Mean	SD
Nominal per capita total consumption	1,716	419.1	345.8	1,716	506.3	435.8
Nominal monthly per capita food expenditure	1,716	240.4	187.8	1,716	241.3	183.9
Nominal monthly per capita nonfood expenditure	1,716	89.58	141.9	1,716	115.6	153
Nominal monthly per capita education expenditure	1,716	15.50	41.79	1,716	45.83	142.1
Dummy for households that received remittance from international migrants in the past 12 months	1,716	0.439	0.496	1,716	0.383	0.486
Remittance from international migrants per capita	1,598	400.1	1,295	1,598	236.8	633.2
ECON	1,716	103,715	124,838	1,716	150,642	186,076
Household size	1,716	6.233	2.979	1,716	7.069	3.409
Number of children	1,716	2.224	1.762	1,716	2.228	1.911
Number of employed household members	1,716	2.232	1.598	1,716	1.826	1.313
Number of skilled household members	1,716	0.633	0.993	1,716	0.843	1.101
Head's age	1,716	52.61	12.82	1,716	55.40	12.46
Head's age squared	1,716	2,932	1,428	1,716	3,225	1,432
Strata average wage	1,716	340.3	75.24	1,716	339.6	75.46

ECON = economic performance variable, *N* = number of observations, SD = standard deviation.

Source: Authors' calculations using data from the Central Asia Longitudinal Inclusive Society Survey.

amount of remittances per capita that a household received from international migrants in the past 12 months. When computing this variable, the households that received remittances from international migrants in the past 12 months but refused to answer, or did not know the amount of remittances received, were excluded, and the sample size was decreased from 1,716 to 1,598.<sup>10</sup> The mean remittance incomes per capita from international migrants were TJS400.1 in 2013 and TJS236.8 in 2018.

The economic performance (ECON) variable, which is used as an instrumental variable in the estimation, is constructed by taking the weighted average of per capita GDP of the country of residence of each adult household member aged 16 years or above, including overseas migrants. Since the majority of Tajikistan's migrants head to Russia and the share exceeded 98% in both 2013 and 2018 (Table A2 in the

<sup>10</sup>Zero is assigned for the households that did not receive any remittances in the past 12 months.

Appendix), we use regional Russian GDP for the destination areas for Tajik migrants in Russia. One-half of all Tajik migrants go to Moscow.<sup>11</sup>

Specifically, the ECON variable is constructed as follows:

$$\text{ECON}_{it} = \ln \frac{\sum_{k \in \mathcal{K}(i)} g_{kt} \times n_{kit}}{\sum_{k \in \mathcal{K}(i)} n_{kit}}.$$

Here,  $\mathcal{K}(i)$  refers to the set of countries where the members of household  $i$  live,  $g_{kt}$  is the log national GDP (regional GDP for Russia) per capita in country  $k$  in year  $t$  (2013 or 2018), converted into Russian rubles, and  $n_{kit}$  is the number of household  $i$ 's adult members aged 16 years or over who live in country  $k$ . The calculation of ECON includes all adult members including the nonmigrating ones for whom Tajikistan's GDP is assigned. Since ECON is the log of average destination GDP weighted by the distribution of destinations of adult household members, it increases as a larger share of adults' stay in richer countries (or richer regions in Russia). For households without any migrating members, ECON is identical to Tajikistan's log per capita GDP (in Russian rubles) either in 2013 or 2018. Therefore, ECON can be interpreted as the household's degree of exposure to the macroeconomic performance of the destination country, taking Tajikistan's economy as the reference point. The mean values of exponential of ECON were 103,715 rubles in 2013 and 150,642 rubles in 2018.

Turning to household characteristics, the number of household members averaged 6.2 in 2013 and 7.1 in 2018, and the average number of children was 2.2 in both years. The average number of employed household members was 2.2 in 2013, which fell to 1.8 in 2018. The average number of skilled members, defined as those who attained higher than a secondary technical school degree, slightly increased but was less than 1 in both years. The average ages of the head of household were 52.6 years in 2013 and 55.4 years in 2018. Lastly, to capture the time-variant regional economic situation, we use the average monthly net income from jobs at each stratum of our sampling, whose values were TJS340.3 in 2013 and TJS339.6 in 2018. This variable is the average of reported monthly wages and profit from businesses or farms across all employed adults (including the self-employed) in each of the nine strata.

Table 2 reports the proportion of households that continued to receive remittances (or not) in 2018 to describe how remittance patterns changed over the 5-year period within the sample households. A quarter of households received

---

<sup>11</sup>In 2013, the destinations of Tajik migrants spanned 12 countries and 36 Russian regions. In 2018, migrants were distributed across eight countries and 44 Russian regions. The countries include Kazakhstan, the second most common destination country for Tajik migrants.



Table 2. **Transition of Households Receiving Remittances between the Two Sampled Years**

		2018		
		Households with Remittances	Households without Remittances	Total
2013	Households with remittances	25.60%	18.30%	43.90%
	Households without remittances	12.80%	43.40%	56.10%
	Total	38.30%	61.70%	100%

Source: Authors' calculation using data from the Central Asia Longitudinal Inclusive Society Survey.

remittances in both years. More than 40% of households with remittances in 2013 no longer received them in 2018, while one-third of households with remittances in 2018 did not receive any in 2013.<sup>12</sup>

### III. Empirical Analysis

In this section, we estimate the empirical relationship between remittances received and household welfare. We start with the following specification to examine the effect of remittances on a variety of outcomes to indicate household welfare directly:

$$Y_{it} = \beta_0 + \beta_1(\text{REMITTANCE}_{it}) + \beta_2\mathbb{X}_{it} + \beta_3(\text{STR\_Wage}_r) + \epsilon_{it}, \quad (1)$$

where  $i$  indexes households, and  $t$  refers to the survey round with 0 indicating 2013 and 1 indicating 2018. The dependent variable,  $Y_{it}$ , is the logarithm of nominal monthly spending per capita on total consumption and its decomposition to food, nonfood, and education. The main explanatory variable,  $\text{REMITTANCE}_{it}$ , takes two forms: (i) an indicator with a value of 1 for households that received any remittance income and 0 otherwise, and (ii) a logarithm of nominal monthly remittance income per capita.  $\mathbb{X}$  is a vector of household characteristics that includes household size, number of children, employed and skilled adults in a household, and the squared age of the head of household. In addition, we include  $\text{STR\_Wage}_r$ , which is the logarithm of average wage at that stratum  $r$  to which a household belongs.<sup>13</sup> Lastly,  $\epsilon_{it}$

<sup>12</sup>Disaggregated summary statistics across remittance-receiving and nonreceiving households are provided in the Appendix.

<sup>13</sup>See footnote 5.

is an independent and identically distributed error term that is clustered at the primary-sampling-unit level because migration decisions are often made spatially.

Since the dataset is longitudinal, we take a first-difference estimator to control for time-invariant unobserved heterogeneity for each household. In other words, we utilize the panel nature of the dataset and implement a fixed-effect estimation using the following specification:

$$\Delta Y_{it} = \beta_1(\Delta \text{REMITTANCE}_{it}) + \beta_2 \Delta X_{it} + \beta_3(\Delta \text{STR\_Wage}_r) + \Delta \epsilon_{it}. \quad (2)$$

Our baseline model is an ordinary least-square (OLS) estimation to obtain the coefficients of equation (2). Later, we conduct a 2SLS to address the endogeneity of the remittances.

Tables 3 and 4 show the results of the estimations. Columns (1)–(4) show the coefficients using the specification without average wage at stratum, and columns (5)–(8) report those with average wage at stratum. Table 3 reports the coefficients when the main explanatory variable is an indicator for receiving remittance. We observe that the coefficients on the remittance indicator are positive but not significant for total consumption as well as food consumption and nonfood consumption. Unexpectedly, the coefficient is negative for education spending but not statistically significant. Table 4 reports the coefficients when the main explanatory variable is the logarithm of remittance income. In columns (1)–(4), we see that the coefficient on remittance income is positive and significant for both total spending and food consumption, and a 1% increase in remittances is associated with a 0.005–0.006% increase in spending. However, those coefficients are not statistically significant when we include average monthly income at stratum as a covariate in columns (5)–(8).

So far, we have examined the relationship between remittances and household welfare directly. However, there may be some concern about the endogeneity issue since household welfare outcomes are likely to be affected by remittances and vice versa, or because a third factor could affect both remittances and household welfare. Remittances are often motivated to finance spending in home countries, which makes the OLS estimate on consumption biased. Thus, we need to address the issue of endogeneity in our second specification using an instrumental variable (IV) approach. So, we turn to employ a 2SLS estimation using an index of the macroeconomic performance of the destination countries for migrants and of Tajikistan for nonmigrants as an IV (ECON variable).

We assume that ECON is exogenous to the amount of remittances in each household, conditional on household-fixed effects and other covariates. This assumption implies that ECON picks up supply-side shocks to migrant remittances,

Table 3. Ordinary Least Squares Estimation Results (Remittance Variable: Indicator for Remittance)

Variable	(1) $\Delta \ln(\text{Total Spending})$	(2) $\Delta \ln(\text{Food Spending})$	(3) $\Delta \ln(\text{Nonfood Spending})$	(4) $\Delta \ln(\text{Education Spending})$	(5) $\Delta \ln(\text{Total Spending})$	(6) $\Delta \ln(\text{Food Spending})$	(7) $\Delta \ln(\text{Nonfood Spending})$	(8) $\Delta \ln(\text{Education Spending})$
$\Delta$ Indicator to receive remittance in 12 months	0.0472 (0.0333)	0.0439 (0.0308)	0.104 (0.0734)	-0.232 (0.200)	0.0404 (0.0332)	0.0413 (0.0309)	0.0958 (0.0735)	-0.260 (0.200)
$\Delta$ Household size	-0.0863*** (0.0109)	-0.119*** (0.0103)	-0.0691*** (0.0195)	0.101 (0.0639)	-0.0885*** (0.0108)	-0.120*** (0.0103)	-0.0719*** (0.0195)	0.0917 (0.0639)
$\Delta$ Number of children	0.00498 (0.0124)	0.0262** (0.0122)	0.00916 (0.0247)	0.0145 (0.0680)	0.00770 (0.0124)	0.0272** (0.0122)	0.0126 (0.0248)	0.0259 (0.0683)
$\Delta$ Number of employed household members	0.0138 (0.0100)	0.0348*** (0.00956)	0.0188 (0.0201)	0.0247 (0.0650)	0.0121 (0.0100)	0.0342*** (0.00956)	0.0167 (0.0202)	0.0177 (0.0649)
$\Delta$ Number of skilled household members	0.0784*** (0.0192)	0.0178 (0.0171)	0.0450 (0.0410)	0.318*** (0.122)	0.0739*** (0.0191)	0.0161 (0.0171)	0.0394 (0.0411)	0.299** (0.122)
$\Delta$ Head of household age	0.0322*** (0.00988)	0.0271*** (0.00893)	0.0398** (0.0197)	0.0808 (0.0593)	0.0308*** (0.00983)	0.0266*** (0.00893)	0.0380* (0.0197)	0.0750 (0.0590)
$\Delta$ Head of household age (squared)	-0.000231*** (8.76E-05)	-0.000210*** (7.90E-05)	-0.000302* (0.000174)	-0.000625 (0.000520)	-0.000221** (8.71E-05)	-0.000207*** (7.90E-05)	-0.000290* (0.000174)	-0.000583 (0.000517)
$\Delta \ln(\text{Strata average wage})$					-4.259*** (1.258)	-1.609* (0.889)	-5.335*** (1.843)	-17.84* (10.36)
Number of observations	1,716	1,716	1,716	1,716	1,716	1,716	1,716	1,716
R <sup>2</sup>	0.077	0.131	0.015	0.012	0.084	0.132	0.018	0.016

$\Delta$  = change in the variable.

Note: Robust standard errors are in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , and \* $p < 0.1$ .

Source: Authors' calculations using data from the Central Asia Longitudinal Inclusive Society Survey.

Table 4. Ordinary Least Squares Estimation Results (Remittance Variable: Logarithm of Remittance)

Variable	(1) Δln(Total Spending)	(2) Δln(Food Spending)	(3) Δln(Nonfood Spending)	(4) Δln(Education Spending)	(5) Δln(Total Spending)	(6) Δln(Food Spending)	(7) Δln(Nonfood Spending)	(8) Δln(Education Spending)
Δln(Per capita remittance)	0.00575* (0.00340)	0.00524* (0.00315)	0.0119 (0.00771)	-0.0226 (0.0204)	0.00498 (0.00340)	0.00492 (0.00316)	0.0107 (0.00774)	-0.0262 (0.0203)
ΔHousehold size	-0.0828*** (0.0115)	-0.117*** (0.0109)	-0.0644*** (0.0205)	0.110 (0.0672)	-0.0852*** (0.0114)	-0.118*** (0.0109)	-0.0677*** (0.0206)	0.0994 (0.0673)
ΔNumber of children	0.00382 (0.0129)	0.0248* (0.0129)	-0.00499 (0.0259)	0.0204 (0.0708)	0.00635 (0.0129)	0.0259** (0.0129)	-0.00138 (0.0261)	0.0319 (0.0712)
ΔNumber of employed household members	0.0125 (0.0104)	0.0332*** (0.0101)	0.0143 (0.0211)	0.0126 (0.0674)	0.0111 (0.0104)	0.0326*** (0.0101)	0.0124 (0.0211)	0.00625 (0.0674)
ΔNumber of skilled household members	0.0763*** (0.0198)	0.0178 (0.0178)	0.0515 (0.0422)	0.328*** (0.126)	0.0716*** (0.0197)	0.0159 (0.0178)	0.0449 (0.0423)	0.307** (0.127)
ΔHead of household age	0.0311*** (0.0104)	0.0247*** (0.00931)	0.0463** (0.0213)	0.109* (0.0632)	0.0298*** (0.0104)	0.0241*** (0.00931)	0.0445** (0.0213)	0.103* (0.0629)
ΔHead of household age (squared)	-0.000217** (9.35E-05)	-0.000184** (8.27E-05)	-0.000349* (0.000190)	-0.000861 (0.000558)	-0.000208** (9.28E-05)	-0.000180** (8.27E-05)	-0.000336* (0.000189)	-0.000820 (0.000554)
Δln(Strata average wage)					-4.007*** (1.366)	-1.682* (1.006)	-5.725*** (2.130)	-18.28 (11.67)
Number of observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
R <sup>2</sup>	0.075	0.129	0.017	0.015	0.081	0.130	0.020	0.018

Δ = change in the variable.

Note: Robust standard errors are in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , and \* $p < 0.1$ .

Source: Authors' calculations using data from the Central Asia Longitudinal Inclusive Society Survey.

reflecting labor market conditions in destination countries, but we acknowledge the possibility that the variable may be correlated with demand-side shocks that would cause biases of the coefficients. Specifically, it might be the case that a household's latent characteristics and the choice of destination are closely associated; high-endowment migrants are also likely to choose a high-income destination. We also notice that it might be hard to establish an exclusion restriction here since economic performance outside Tajikistan will have a direct effect on household welfare in the country through trade and financial channels affecting wage and employment prospects.

In the first stage, we regress the remittance variables (indicator for households with remittance and the amount of remittances) on the logarithm of the ECON variable and other covariates,

$$\Delta \text{REMITTANCE}_{it} = \beta_1(\Delta \text{ECON}_{it}) + \beta_2 \Delta \mathbb{X}_{it} + \beta_3(\Delta \text{STR\_Wage}_r) + \Delta \epsilon_{it}. \quad (3)$$

The notations are the same as in equation (2) except ECON, which is weighted for the average per capita GDP of the country of residence (or the region in Russia) of each adult household member. This specification exploits variations of GDP per capita in destinations to explain variations in the amount of remittances across households.

Next, we use the estimated dependent variable of remittances at the second-stage regression,

$$\Delta Y_{it} = \beta_1(\overline{\Delta \text{REMITTANCE}_{it}}) + \beta_2 \Delta \mathbb{X}_{it} + \beta_3(\Delta \text{STR\_Wage}_r) + \Delta \epsilon_{it}. \quad (4)$$

Again, the notations are the same as in equation (2) with the exception of the main independent variable, which is now the estimated value obtained from the first-stage regression, i.e., equation (3).

Table 5 shows the results taking an indicator for households with remittances as a dependent variable. Column (1) reports the result of the first-stage regression, which shows that the coefficient on ECON is positive and significant. The first-stage *F*-statistic is 341.1, asserting that the instrument is not weak. Columns (2)–(5) of Table 5 convey the second stage of the 2SLS estimation results. In contrast to columns (1)–(4) of Table 3, these columns show that the coefficients on remittance income are positive and significant except for food spending, which is positive but not significant. The size of the coefficient for total consumption is 0.292, showing that total consumption is 29.2% higher for households with remittances than for households without remittances. The size is similar for nonfood spending (27.5%) and much larger for education spending (206.6%). Columns (6)–(10) of Table 5 show the results by

Table 5. Two-Stage Least Squares Estimation Results (Remittance Variable: Indicator for Remittance)

Variable	First Stage		Second Stage		
	(1)	(2)	(3)	(4)	(5)
	Dummy for Receiving Remittance	$\Delta \ln(\text{Total Consumption})$	$\Delta \ln(\text{Food Spending})$	$\Delta \ln(\text{Nonfood Spending})$	$\Delta \ln(\text{Education spending})$
$\Delta \ln(\text{ECON})$	0.242*** (0.0131)	0.292*** (0.0786)	-0.0142 (0.0704)	0.275* (0.165)	2.066*** (0.477)
$\Delta$ Indicator to receive remittance in 12 months		-0.0685*** (0.0120)	-0.123*** (0.0111)	-0.0567*** (0.0217)	0.268*** (0.0736)
$\Delta$ Household size	-0.0489*** (0.00693)	-0.00681 (0.0131)	0.0290** (0.0124)	0.000942 (0.0258)	-0.0964 (0.0729)
$\Delta$ Number of children	0.0343*** (0.00797)	0.00331 (0.0108)	0.0373*** (0.0102)	0.0115 (0.0215)	-0.0737 (0.0706)
$\Delta$ Number of employed household members	0.0384*** (0.00678)	0.0668*** (0.0201)	0.0206 (0.0173)	0.0369 (0.0413)	0.208 (0.130)
$\Delta$ Number of skilled household members	0.0134 (0.0123)	0.0305*** (0.0101)	0.0275*** (0.00897)	0.0386* (0.0198)	0.0651 (0.0621)
$\Delta$ Head of household age	-0.00287 (0.00768)	-0.000219** (8.86E-05)	-0.000213*** (7.95E-05)	-0.000293* (0.000175)	-0.000507 (0.000548)
$\Delta$ Head of household age (squared)	8.03E-06 (7.12E-05)				
$\Delta \ln(\text{Strata average wage})$					
Observations	1,716	1,716	1,716	1,716	1,716
$R^2$	0.279				
First-stage $F$ -statistic				341.1	

Continued.

Table 5. Continued.

Variable	First Stage		Second Stage	
	(6)	(7)	(8)	(9)
		$\Delta \ln(\text{Total Consumption})$	$\Delta \ln(\text{Food Spending})$	$\Delta \ln(\text{Nonfood Spending})$
$\Delta \ln(\text{ECON})$	0.242*** (0.0132)	0.264*** (0.0789)	-0.0267 (0.0710)	0.238 (0.166)
$\Delta$ Indicator to receive remittance in 12 months		-0.0720*** (0.0120)	-0.125*** (0.0111)	-0.0614*** (0.0218)
$\Delta$ Household size	-0.0489*** (0.00696)	-0.00334 (0.0130)	0.0306** (0.0124)	0.00553 (0.0260)
$\Delta$ Number of children	0.0344*** (0.00800)	0.00272 (0.0107)	0.0370*** (0.0102)	0.0107 (0.0215)
$\Delta$ Number of employed household members	0.0383*** (0.00678)	0.0637*** (0.0200)	0.0192 (0.0173)	0.0329 (0.0413)
$\Delta$ Number of skilled household members	0.0132 (0.0123)	0.0294*** (0.00998)	0.0270*** (0.00898)	0.0371* (0.0198)
$\Delta$ Head of household age	-0.00291 (0.00768)	-0.000211** (8.78E-05)	-0.000210*** (7.97E-05)	-0.000283 (0.000174)
$\Delta$ Head of household age (squared)	8.32E-06 (7.13E-05)	-3.831*** (1.331)	-1.739*** (0.883)	-5.063*** (1.878)
$\Delta \ln(\text{Strata average wage})$	-0.143 (0.694)	1,716	1,716	1,716
Observations	1,716	1,716	1,716	1,716
R <sup>2</sup>	0.279			
First-stage F-statistic				332.7

ECON = economic performance variable,  $\Delta$  = change in the variable.

Note: Robust standard errors are in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , and \* $p < 0.1$ .

Source: Authors' calculations using data from the Central Asia Longitudinal Inclusive Society Survey.

adding the average wage at each stratum as a covariate. The pattern of the coefficients on a dummy variable for households with remittances is almost similar.<sup>14</sup>

Table 6 shows the results when taking as a dependent variable the logarithm of per capita remittance income that a household receives. Column (1) reports the result of the first-stage regression, showing that the coefficient on ECON is positive and significant, and the *F*-test shows that the instrument is not weak. Columns (2)–(5) of Table 6 convey the second stage of the 2SLS estimation results. Similar to those of Table 5, the coefficients on remittance income are positive and significant except for food spending, which is positive but not significant. The size of the coefficient for total consumption is 0.0285, showing that a 1% increase in remittance income is associated with about a 0.03% increase in total spending. The size of the coefficient is slightly larger for nonfood spending (0.0353) and larger for education spending (0.193), implying that those spending items are more affected by a change in remittance. In particular, we see that a 1% increase in remittance income is associated with a 0.19% increase in education spending. Columns (6)–(10) of Table 6 show the results by adding the average wage at stratum as a covariate. The pattern of the coefficients on logarithm of per capita remittance income is almost the same.

So far, we have shown that remittances are not positively and significantly associated with household spending in the simple OLS estimation, but they do have a positive and significant effect on household total, nonfood, and education spending when we employ a 2SLS estimation to address endogeneity. Now, we turn to examine the relationship between remittances and household welfare by the type of household to address heterogeneous effects. Table 7 reports the estimated results across subgroups using the specification without the average wage at stratum, which corresponds to the specification in columns (2)–(5) of Tables 5 and 6 (without strata average wage as a covariate). While not shown in the table, the first-stage estimate confirms that the coefficient on the ECON variable is positive and significant. Moreover, the results do not change if we use the specification with strata average wage.

Looking at the upper part of Table 7, which uses a dummy for households with remittances as the dependent variable, we see that the coefficients are positive and significant for households headed by men but they are not for households headed by women except on education spending. If we divided the sample by the age of the household head at 52 years old (the median age of the heads in 2013), the coefficients

---

<sup>14</sup>A possible reason why the coefficient is not significant for food spending is that the baseline survey in 2013 was conducted during the month of Ramadan, when spending patterns for food differ from the normal months because of fasting.



Table 6. Two-Stage Least Squares Estimation Results (Remittance Variable: Logarithm of Remittance)

Variable	(1)		(2)		(3)		(4)		(5)
	First Stage		Second Stage		Second Stage		Second Stage		
	$\Delta \ln(\text{Per Capita Remittance})$		$\Delta \ln(\text{Total Consumption})$	$\Delta \ln(\text{Food Spending})$	$\Delta \ln(\text{Nonfood Spending})$	$\Delta \ln(\text{Education Spending})$			
$\Delta \ln(\text{ECON})$	2.710*** (0.145)								
$\Delta \ln(\text{Per capita remittance})$			0.0285*** (0.00754)	-0.00188 (0.00677)	0.0353** (0.0152)	0.193*** (0.0456)			
$\Delta \text{Household size}$			-0.0627*** (0.0128)	-0.123*** (0.0119)	-0.0437* (0.0234)	0.301*** (0.0784)			
$\Delta \text{Number of children}$			0.360*** (0.0837)	0.0285** (0.0130)	-0.0172 (0.0267)	-0.0920 (0.0759)			
$\Delta \text{Number of employed household members}$			0.443*** (0.0717)	0.00127 (0.0113)	0.00275 (0.0224)	-0.0939 (0.0743)			
$\Delta \text{Number of skilled household members}$			0.0929 (0.129)	0.0653*** (0.0208)	0.0212 (0.0180)	0.225* (0.134)			
$\Delta \text{Head of household age}$			-0.0183 (0.0835)	0.0291*** (0.0106)	0.0253*** (0.00937)	0.0906 (0.0654)			
$\Delta \text{Head of household age (squared)}$			1.81E-06 (0.000774)	-0.000203** (9.48E-05)	-0.000188** (8.34E-05)	-0.000334* (0.000191)			
$\Delta \ln(\text{Strata average wage})$									
Observations	1,598		1,598	1,598	1,598	1,598			
$R^2$	0.321								
First-stage $F$ -statistic						348.7			

Continued.

Table 6. *Continued.*

Variable	First Stage		Second Stage		
	(6)	(7)	(8)	(9)	(10)
	$\Delta \ln(\text{Per Capita Remittance})$	$\Delta \ln(\text{Total Consumption})$	$\Delta \ln(\text{Food Spending})$	$\Delta \ln(\text{Nonfood Spending})$	$\Delta \ln(\text{Education Spending})$
$\Delta \ln(\text{ECON})$	2.701*** (0.147)				
$\Delta \ln(\text{Per capita remittance})$		0.0262*** (0.00761)	-0.00315 (0.00685)	0.0318** (0.0153)	0.184*** (0.0457)
$\Delta \text{Household size}$	-0.621*** (0.0725)	-0.0662*** (0.0128)	-0.125*** (0.0119)	-0.0489** (0.0236)	0.288*** (0.0791)
$\Delta \text{Number of children}$	0.363*** (0.0840)	-0.00500 (0.0136)	0.0302** (0.0130)	-0.0127 (0.0269)	-0.0807 (0.0761)
$\Delta \text{Number of employed household members}$	0.441*** (0.0716)	0.000896 (0.0113)	0.0365*** (0.0108)	0.00219 (0.0224)	-0.0953 (0.0741)
$\Delta \text{Number of skilled household members}$	0.0880 (0.129)	0.0622*** (0.0206)	0.0195 (0.0179)	0.0354 (0.0431)	0.213 (0.135)
$\Delta \text{Head of household age}$	-0.0196 (0.0836)	0.0282*** (0.0105)	0.0248*** (0.00938)	0.0429** (0.0214)	0.0872 (0.0650)
$\Delta \text{Head of household age (squared)}$	1.15E-05 (0.000775)	-0.000196** (9.39E-05)	-0.000185** (8.35E-05)	-0.000324* (0.000191)	-0.000700 (0.000575)
$\Delta \ln(\text{Strata average wage})$	-4.993 (8.600)	-3.454** (1.446)	-1.893* (0.996)	-5.176** (2.191)	-12.80 (12.13)
Observations	1,598	1,598	1,598	1,598	1,598
$R^2$	0.321				
First-stage $F$ -statistic				337.7	

ECON = economic performance variable,  $\Delta$  = change in the variable.

Note: Robust standard errors are in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , and \* $p < 0.1$ .

Source: Authors' calculations using data from the Central Asia Longitudinal Inclusive Society Survey.

Table 7. Estimation Results by Subgroups

Subgroup	(1) $\Delta \ln(\text{Total Consumption})$	(2) $\Delta \ln(\text{Food Spending})$	(3) $\Delta \ln(\text{Nonfood Spending})$	(4) $\Delta \ln(\text{Education Spending})$
(1) Dependent variable: Dummy for households with remittance				
Male head	0.319*** (0.0941)	0.0413 (0.0791)	0.367* (0.194)	2.108*** (0.585)
Female head	0.174 (0.142)	-0.173 (0.149)	0.0212 (0.319)	1.469* (0.762)
Head's age $\geq 52$	0.225** (0.0931)	-0.0261 (0.0871)	0.0285 (0.213)	1.664*** (0.578)
Head's age $< 52$	0.172 (0.119)	-0.0861 (0.111)	0.260 (0.241)	1.284* (0.710)
Higher educated head	0.192 (0.192)	0.156 (0.146)	0.0720 (0.350)	0.775 (1.255)
Lower educated head	0.305*** (0.0859)	-0.0429 (0.0789)	0.308* (0.183)	2.287*** (0.511)
(2) Dependent variable: $\Delta \ln(\text{Per capita remittance})$				
Male head	0.0316*** (0.00902)	0.00451 (0.00757)	0.0470*** (0.0177)	0.195*** (0.0558)
Female head	0.0155 (0.0137)	-0.0202 (0.0144)	0.00267 (0.0308)	0.131* (0.0741)
Head's age $\geq 52$	0.0244*** (0.00922)	-0.000202 (0.00873)	0.0134 (0.0190)	0.168*** (0.0568)
Head's age $< 52$	0.0173 (0.0108)	-0.0109 (0.0102)	0.0340 (0.0226)	0.117* (0.0666)
Higher educated head	0.0158 (0.0200)	0.0166 (0.0159)	-0.00438 (0.0372)	0.0996 (0.135)
Lower educated head	0.0302*** (0.00811)	-0.00468 (0.00746)	0.0410** (0.0165)	0.208*** (0.0477)

$\Delta$  = change in the variable.

Note: Robust standard errors are in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , and \* $p < 0.1$ .

Source: Authors' calculations using data from the Central Asia Longitudinal Inclusive Society Survey.

on total spending are positive and significant for households whose head is older, and they are positive and significant for education spending for both older- and younger-headed households. Moreover, when we divide the sample by the educational attainment of the head of the household, the coefficients are not significant for households whose heads are more highly educated, while they are positive and significant for households whose heads are less educated, except for food spending.<sup>15</sup>

<sup>15</sup>We define a household head as higher educated if he or she completed tertiary education.

Table 8. Two-Stage Least Squares Estimation Results for Migrant Households Only (Remittance Variable: Logarithm of Remittance)

Variable	First Stage		Second Stage	
	(1)	(2)	(3)	(4)
	$\Delta \ln(\text{Per Capita Remittance})$	$\Delta \ln(\text{Total Consumption})$	$\Delta \ln(\text{Food Spending})$	$\Delta \ln(\text{Nonfood Spending})$
$\Delta \ln(\text{ECON})$	2.625*** (0.179)			
$\Delta \ln(\text{Per capita remittance})$		0.0278*** (0.00967)	-0.0122 (0.00860)	0.0373** (0.0182)
$\Delta \text{Household size}$	-0.167* (0.102)	-0.0865*** (0.0182)	-0.122*** (0.0162)	-0.0739** (0.0306)
$\Delta \text{Number of children}$	-0.138 (0.134)	0.00368 (0.0205)	0.0208 (0.0191)	-0.0136 (0.0412)
$\Delta \text{Number of employed household members}$	0.337*** (0.106)	0.00555 (0.0168)	0.00987 (0.0157)	-0.00734 (0.0318)
$\Delta \text{Number of skilled household members}$	0.286 (0.216)	0.0661** (0.0328)	0.0332 (0.0263)	0.103* (0.0603)
$\Delta \text{Head of household age}$	-0.0828 (0.125)	0.0119 (0.0162)	0.0206 (0.0155)	0.0405 (0.0288)
$\Delta \text{Head of household age (squared)}$	0.000972 (0.00124)	-5.17E-05 (0.000151)	-0.000113 (0.000140)	-0.000371 (0.000257)
$\Delta \ln(\text{Strata average wage})$				
Observations	661	661	661	661
$R^2$	0.336			
First-stage $F$ -statistic				212.2

Continued.

Table 8. *Continued.*

Variable	(6) First Stage		(7)		(8) Second Stage		(9)		(10)	
	$\Delta \ln(\text{Per Capita Remittance})$		$\Delta \ln(\text{Total Consumption})$		$\Delta \ln(\text{Food Spending})$		$\Delta \ln(\text{Nonfood Spending})$		$\Delta \ln(\text{Education Spending})$	
$\Delta \ln(\text{ECON})$	2.610*** (0.179)									
$\Delta \ln(\text{Per capita remittance})$			0.0275*** (0.00975)		-0.0127 (0.00867)		0.0364** (0.0184)		0.138** (0.0573)	
$\Delta \text{Household size}$			-0.173* (0.101)		-0.123*** (0.0162)		-0.0750** (0.0307)		-0.0290 (0.103)	
$\Delta \text{Number of children}$			-0.135 (0.133)		0.0210 (0.0191)		-0.0133 (0.0412)		6.15E-05 (0.120)	
$\Delta \text{Number of employed household members}$			0.317*** (0.106)		0.00840 (0.0156)		-0.0100 (0.0321)		-0.248** (0.108)	
$\Delta \text{Number of skilled household members}$			0.228 (0.214)		0.0287 (0.0263)		0.0945 (0.0609)		0.336 (0.223)	
$\Delta \text{Head of household age}$			-0.0899 (0.125)		0.0200 (0.0155)		0.0394 (0.0288)		0.0628 (0.0971)	
$\Delta \text{Head of household age (squared)}$			0.00102 (0.00124)		-0.000108 (0.000141)		-0.000363 (0.000257)		-0.000418 (0.000867)	
$\Delta \ln(\text{Strata average wage})$			-27.49** (13.55)		-2.212 (1.789)		-4.007 (3.336)		9.728 (9.992)	
Observations	661		661		661		661		661	
R <sup>2</sup>	0.339									
First-stage F-statistic										210.8

ECON = economic performance variable,  $\Delta$  = change in the variable.  
 Note: Robust standard errors are in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , and \* $p < 0.1$ .  
 Source: Authors' calculations using data from the Central Asia Longitudinal Inclusive Society Survey.

The pattern of the coefficients is the same in the lower part of Table 7, which takes the amount of remittances as a dependent variable.

As a robustness check, we perform the same IV estimation by limiting the sample to only households with migrants in 2013. Since we believe that the most fundamental selection bias in the decision of whether or not to migrate—and if so, where—is already well addressed by the fixed-effect estimation, we thus expect that the results of this subsample analysis will not differ from the main results. Table 8 shows the results using the logarithm of remittance income as the main explanatory variable. As expected, the coefficients are almost the same as those in Table 6.<sup>16</sup>

In summary, our results show remittances have a positive and significant effect on household total spending as well as nonfood and education spending. Moreover, we find that the effect of remittances on household spending is more pronounced in households whose heads are male, younger, and/or less educated.

#### IV. Discussion

We have examined the relationship between remittances and household spending, finding a positive relationship between them. We confirmed that remittances are associated with total spending as well as nonfood and educational expenditures, showing that remittances are closely linked with household welfare in Tajikistan. While our results align with Yang (2008) in terms of the positive effect on education spending, we show an affirmative and significant effect of remittance on total spending, which Yang found not to be significant.

Now, we discuss the implications of the COVID-19 pandemic on household welfare through remittance inflows based on our estimation results, which have not been actively explored.<sup>17</sup> The COVID-19 pandemic is an ongoing phenomenon and the situation in Tajikistan and destination countries is rapidly changing. The first case

---

<sup>16</sup>Though we omitted it to save space, we performed the analysis by type of head of household by limiting our examination to households with migrants in 2013 as well. The coefficients are virtually the same as those shown in Table 7.

<sup>17</sup>Chen, Qian, and Wen (2020) used a time-series analysis to show that the pandemic positively affects long-term remittance inflows to Samoa from Australia and New Zealand, and negatively affects remittances from the United States. There are several studies on consumption in response to the pandemic. Baker et al. (2020) showed that household spending, particularly on food, in the United States increased in March 2020, but this was followed by a sharp decline of 50%. Chen, Chand, and Singh (2020) reported a sharp decline of 32% in consumption in the People's Republic of China, on average, with as much as a 70% drop in Wuhan. There was a recovery in consumption to pre-COVID-19 levels in March 2020, which was followed by another decline of 20% in April due to the risk of a second wave of the outbreak.

was officially confirmed in Tajikistan on April 30, 2020, which was much later than in other countries. Until then, the country was slow to take measures to prevent the pandemic, imposing less-stringent restrictions on movement across national borders and lockdowns in cities compared to the neighboring Kyrgyz Republic and Uzbekistan.<sup>18</sup> In May 2020, Tajikistan closed schools, universities, and general shops while avoiding a total lockdown. During this time, the number of confirmed cases expanded rapidly, approaching 6,000 within 2 months, and the number of deaths exceeded 50. Under these circumstances, most Tajiks who had expected to migrate were forced to stay in the country because Russia, the primary destination country of Tajik migrants, was more seriously affected by the pandemic.<sup>19</sup>

On the other hand, the first case was confirmed on January 31, 2020 in Russia, 3 months earlier than in Tajikistan. The number of confirmed cases started to increase beginning in March 2020, and the country shut its national borders and declared a period of no working until May 11, 2020, which was subsequently extended twice. In addition, the Russian government imposed a variety of measures such as closing schools, museums, and theaters, as well as canceling events and implementing lockdowns in many large cities. At the end of June 2020, the confirmed number of cases in Russia ranked third in the world, after the United States and Brazil, with more than 600,000 cases and 8,600 deaths.

There is growing uncertainty about how the COVID-19 pandemic is affecting the world economy, and it is difficult to forecast the consequences of the disaster.<sup>20</sup> But we can assess the potential impact of the COVID-19 pandemic on household welfare in Tajikistan. We start with the coefficients in columns (2)–(5) of Table 6. The coefficients are 0.0285 for total spending, 0.0353 for nonfood spending, and 0.193 for education spending. In addition, there are some forecasts of the effect of the COVID-19 pandemic on remittances. In April 2020, the World Bank reported that remittance inflows to Europe and Central Asia would decline by 27.5% from 2019 as a result of the pandemic (World Bank 2020b). Later in 2020, the Asian Development Bank released a report on the effect of the pandemic and showed that remittance

---

<sup>18</sup>Tajikistan was one of the few countries to hold professional sporting matches such as soccer games in 2020.

<sup>19</sup>In 2020, according to the Nikkei Asian Review, “There were around 500,000 Tajik migrants working in Russia, but many of them are now stuck in Tajikistan,” see <https://asia.nikkei.com/Spotlight/Coronavirus/Tajikistan-finally-confronts-virus-as-Central-Asian-economies-reel>.

<sup>20</sup>Similar to this paper, Murakami, Shimizutani, and Yamada (2020, 2021) performed exercises to predict the potential impact of the COVID-19 pandemic on the receipt of remittances and household welfare in the context of migrant-sending communities in the Philippines.

inflows to Tajikistan were expected to decline by 27.9% in 2020, the second-worst decline among all economies in Asia and the Pacific (Kikkawa et al. 2020).<sup>21</sup>

Bringing our empirical relationship and the remittance forecasts together, we can assess the negative impact on household spending. Given the Asian Development Bank's forecast, we expected total spending to have decreased by 0.8% in 2020, with the negative effects largest for nonfood spending (1%) and education spending (5.4%). Given this simple computation, we see that the COVID-19 pandemic has had a serious effect on nonfood and education spending. These exercises may be conservative since we confine the channel of the COVID-19 pandemic's impact on household spending to a change in remittances. Moreover, the effect of the COVID-19 pandemic could be nonlinear and more detrimental to the economy under more devastating scenarios, depending on the lasting effect of the pandemic.<sup>22</sup> At the same time, we found that the effect of declining remittances on household spending is more pronounced in households whose heads are male, younger, and/or less educated (Table 7), suggesting that those households may be particularly affected by the COVID-19 pandemic. This finding echoes that of Gupta et al. (2021), who found heterogeneous impacts of COVID-19 lockdowns and a serious negative effect on the welfare of poor and vulnerable households in the rural areas of India.

## V. Conclusion

This paper focuses on Tajikistan, one of the most heavily remittance-dependent countries in the world, to examine the relationship between remittances and household welfare. We use a panel dataset collected nationwide prior to the outbreak and employ an IV approach to confirm a positive relationship between receiving remittances and household welfare after correcting for endogeneity. Then, we combine our estimated coefficients with forecasts on the decline of remittances made by international organizations and show the adverse effect on household spending per capita.

The pandemic is still ongoing and the situation in Tajikistan and destination countries is rapidly changing. Despite much uncertainty, we believe in the significance

---

<sup>21</sup>According to Kikkawa et al. (2020), the negative impact to Tajikistan refers to “the economy-wide remittance loss under the worst-case scenario (% of baseline).” The worst-case scenario assumes that it takes a year to control a domestic outbreak and resume economic activities, and that the economic impact of COVID-19 persists during most of the year, disappearing halfway into the final 3 months of the outbreak.

<sup>22</sup>The United Nations Development Programme (2020) showed that the pandemic negatively affected women's vulnerability and income from self-employment and informal and nonregistered jobs, as well as migrant labor.



of discussing the potential impacts of COVID-19 on international remittances and remittance-dependent households in Tajikistan, using a dataset compiled prior to the outbreak because it is difficult to perform a survey on households amid the pandemic. Future research should use actual data from migrant-sending countries after the COVID-19 pandemic has receded to quantify the adverse effects on household living standards. Migration and remittances depend on a serial decision-making process within a household that includes several steps. Thus, disentangling the effect of the COVID-19 pandemic on each migration process is no doubt an important agenda for future research.

## References

- Abdulloev, Ilhom. 2020. "Change in the Forsaken Schooling and Migration Relationship to Tajikistan." IZA Discussion Paper No. 13435.
- Abdulloev, Ilhom, Gil Epstein, and Ira Gang. 2019. "Schooling Forsaken: Education and Migration." IZA Discussion Paper No. 12088.
- Amare, Mulubrhan, and Lena Hohfeld. 2016. "Poverty Transition in Rural Vietnam: The Role of Migration and Remittances." *Journal of Development Studies* 52 (10): 1463–78.
- Baker, Scott, R. A. Farrokhnia, Steffen Meyer, Michaela Pagel, and Constantine Yannelis. 2020. "How does Household Spending Respond to an Epidemic? Consumption during the 2020 COVID-19 Pandemic." NBER Working Paper Series No. 26949.
- Chen, Haiqiang, Wenlan Qian, and Qiang Wen. 2020. "The Impact of the COVID-19 Pandemic on Consumption: Learning from High Frequency Transaction Data." <https://ssrn.com/abstract=3568574>.
- Chen, Hong, Shamal Chand, and Baljeet Singh. 2020. "Impact of COVID-19 on Remittance Inflows to Samoa." *Asian Economics Letters* 1 (3): 1–5.
- Cuong, Nguyen Viet, and Vu Hoang Linh. 2018. "The Impact of Migration and Remittances on Household Welfare: Evidence from Vietnam." *Journal of International Migration and Integration* 19 (4): 945–63.
- Gupta, Anubhab, Heng Zhu, Miki Khanh Doan, Aleksandr Michuda, and Binoy Majumder. 2021. "Economic Impacts of the COVID-19 Lockdown in a Remittance-dependent Region." *American Journal of Agricultural Economics* 103 (2): 466–85.
- International Organization for Migration. 2020. "COVID-19 Analytical Snapshot #16: International Remittances." [https://www.iom.int/sites/default/files/documents/covid-19\\_analytical\\_snapshot\\_16\\_-\\_international\\_remittances.pdf](https://www.iom.int/sites/default/files/documents/covid-19_analytical_snapshot_16_-_international_remittances.pdf).
- Japan International Cooperation Agency–Ogata Sadako Research Institute for Peace and Development. 2020. *Migration, Living Conditions, and Skills: A Panel Study—Tajikistan, 2018*. [https://www.jica.go.jp/jica-ri/ja/publication/booksandreports/175nbg000019cex3-att/report\\_20200604.pdf](https://www.jica.go.jp/jica-ri/ja/publication/booksandreports/175nbg000019cex3-att/report_20200604.pdf).

- Javed, Mohisn, Masood Sarwar Awan, and Muhammad Waqas. 2017. "International Migration, Remittances Inflow and Household Welfare: An Intra Village Comparison from Pakistan." *Social Indicators Research* 130 (2): 779–97.
- Jena, Farai. 2018. "Migrant Remittances and Physical Investment Purchases: Evidence from Kenyan Households." *Journal of Development Studies* 54 (2): 312–26.
- Kangmennaang, Joseph, Rachel Bezner-Kerr, and Isaac Luginaah. 2018. "Impact of Migration and Remittances on Household Welfare among Rural Households in Northern and Central Malawi." *Migration and Development* 7 (1): 55–71.
- Kikkawa, Aiko, James Villafuerte, Raymond Gaspar, and Badri Narayanan. 2020. "COVID-19 Impact on International Migration, Remittances, and Recipient Households in Developing Asia." Asian Development Bank Briefs No. 148.
- Murakami, Enerelt, Satoshi Shimizutani, and Eiji Yamada. 2020. "The Potential Impact of the COVID-19 Pandemic on the Welfare of Remittance-dependent Households in the Philippines." *Centre for Economic Policy Research COVID Economics: Vetted and Real-Time Papers* 24 (1): 183–204.
- . 2021. "Projection of the Effects of the COVID-19 Pandemic on the Welfare of Remittance-dependent Households in the Philippines." *Economics of Disasters and Climate Change* 5: 97–110.
- United Nations Development Programme. 2020. "Impact of COVID-19 on Lives, Livelihoods and Micro, Small and Medium-Sized Enterprises (MSMEs)." <https://www.tj.undp.org/content/tajikistan/en/home/library/impact-of-covid-19-on-lives-livelihoods-and-micro-small-and-me.html>.
- Wadood, Syed Naimul, and Amzad Hossain. 2017. "Microeconomic Impact of Remittances on Household Welfare: Evidences from Bangladesh." *Business and Economic Horizons* 13 (1): 10–29.
- World Bank. 2020a. Remittances Data. <https://www.knomad.org/data/remittances> (accessed August 20, 2020).
- . 2020b. "Remittances in Times of the Coronavirus—Keep Them Flowing." World Bank Blogs, April 3. <https://blogs.worldbank.org/psd/remittances-times-coronavirus-keep-them-flowing>.
- Yang, Dean. 2008. "International Migrations, Remittances and Household Investment: Evidence from Philippine Migrants' Exchange Rate Shocks." *The Economic Journal* 118 (528): 591–630.

**Appendix. Summary Statistics by Migrants' Status and Destination**

Table A1. Summary Statistics—Remittance-Receiving Households versus Nonreceiving Households

Variable	2013						2018					
	Receiving HHs (N = 753)			Nonreceiving HHs (N = 963)			Receiving HHs (N = 658)			Nonreceiving HHs (N = 1,058)		
	Mean	SD	Difference	Mean	SD	Difference	Mean	SD	Difference	Mean	SD	Difference
Nominal per capita total consumption	435.8	312.2		406.1	369.7	*	520.8	458.2		497.3	421.2	
Nominal monthly per capita food expenditure	248.7	147.4		234	214		245.2	171.6		238.9	191.1	
Nominal monthly per capita nonfood expenditure	99.48	156.1		81.84	129.2	**	122.5	158.1		111.3	149.6	
Nominal monthly per capita education expenditure	14.64	42.57		16.18	41.18		40.57	165.6		49.11	125.2	
ECON	176,925	147,484		46,469	57,482	***	276,882	240,926		72,130	63,314	***
Household size	6.101	3.027		6.336	2.937		6.919	3.494		7.163	3.354	
Number of children	2.271	1.766		2.188	1.759		2.365	2.026		2.144	1.832	**
Number of employed household members	2.652	1.783		1.903	1.350	***	2.093	1.437		1.661	1.200	***
Number of skilled household members	0.611	0.942		0.651	1.031		0.792	1.072		0.874	1.118	
Head's age	52.73	12.04		52.51	13.40		54.55	11.40		55.94	13.05	**
Head's age squared	2,926	1,343		2,936	1,491		3,105	1,276		3,299	1,517	***
Strata average wage	349.5	71.74		333.1	77.15	***	351.4	72.17		332.2	76.56	***

ECON = economic performance variable, HH = household, SD = standard deviation.  
 Note: Asterisks refer to the "difference" columns reporting the significance in terms of the difference of means between receiving and nonreceiving HHs by *t*-test. \*\*\**p* < 0.01, \*\**p* < 0.05, and \**p* < 0.1.

Source: Authors' calculations using data from the Central Asia Longitudinal Inclusive Society Survey.

Table A2. Distribution of Tajik Migrants in Destination Countries

2013 2018	Russia					Countries Other than Russia				
	Moscow	St. Petersburg	Sverdlovsk (Yekaterinburg)	Other Places in Russia	Other Places in Russia	Kazakhstan	Kyrgyz Republic	Türkiye	Uzbekistan	Other
47.2	9.4	5	37.5	0.51	0.35	0.01	—	0.06		
49.4	8.7	4.7	35.8	0.31	0.30	0.42	0.16	0.21		

Source: Authors' calculations using data from the Central Asia Longitudinal Inclusive Society Survey.