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# Tajik Labour Migrants and their Remittances: Is Tajik Migration Pro-Poor?\*

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[Abstract]

For the four years since 2006, Tajikistan, a former Soviet republic, has led the world in the receipt of foreign remittance as a proportion of GDP. Needless to say, key reasons for this are the low income levels in Tajikistan and the country's special relationship with Russia, which is enjoying rapid economic growth. Yet while interest in the relationship between migration and foreign remittance has existed for a long time, not many studies have looked at this region. This paper used household survey forms from two points in time to profile households in Tajikistan and international labour migration by Tajiks, and examined the relationship between household income levels in Tajikistan, the poorest of the former Soviet republics, and foreign remittance being received from international labour migrants and the likelihood of migrants being supplied. It found no correlation between household income levels and amounts of money received from abroad, which suggests that altruistic models of the relationship between migration and remittance do not apply. Moreover, it also found that households with high incomes are more likely to supply migrants, indicating that international labour migration from Tajikistan may not be conducive to reducing poverty in that country.

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## **1. Introduction**

The objectives of this paper are to use micro data from surveys of living standards conducted in Tajikistan in the late 2000s to profile households in that country and international labour migration by Tajiks, as well as to explore the relationships between household income levels in Tajikistan, the poorest of the former Soviet republics, and the supply of international labour migrants and the amounts of foreign remittance received.

A long time has already passed since international labour migration first garnered attention. Moreover, a great deal of debate has developed on the impact of foreign remittance from migrant workers on the economies of the countries from which the migrants originate. Both positive and negative effects have been addressed. On the positive side, for example, foreign remittance can boost the income levels of households receiving remittances, while it can have both a positive and negative impact on human capital accumulation in countries supplying migrants (Sharma, 2009). However, foreign remittance to transitional economies has rarely been the chief object of analysis.

Although many transitional economies have small populations and the value of their incoming foreign remittance is not particularly large in absolute terms, it is often high as a proportion of GDP. Tajikistan, in particular, has exhibited the highest percentages in the world in recent years, at more than 30 or 40 percent of GDP (Figure 1). Tajikistan is therefore a prime example of how international labour migration from former Soviet republics (which maintain close connections with Russia), and the foreign remittance that leads to, can affect the economies of countries with small populations.

Incomes in Tajikistan are the lowest of all the former Soviet republics. As a result, a key issue for the country is whether the supply of migrants and the receipt of foreign remittance can contribute to reducing its poverty. The main task of this paper will therefore be to examine the relationship between international labour migration from Tajikistan, and the foreign remittance it leads to, and household incomes there.

(Figure 1)

This paper is organised as follows. First, The author will use macro data from Tajikistan to gauge the scale of foreign remittance, and then use internal data from the Ministry of Internal Affairs of the Russian Federation, the primary destination of labour migrants from Tajikistan, to gain an overview of trends in the numbers of such migrants. The author will then conduct a review of previous research relating to remittances by migrants and household income levels in the countries supplying the workers and previous research relating to Tajik labour migration, most of the latter of which has been

performed by international organizations. The data used in this paper is from the Living Standards Measurement Survey conducted by the World Bank. Later, after employing micro data to profile Tajik households and labour migrants, the author will analyse the relationship between income levels and foreign remittance at the household level, as well as the relationship between income levels and the supply of migrants. Finally, the author will put together the findings and present the paper's conclusions.

## **2. Tajik Migrants and their Remittances as Seen through Macro Data**

Problems with using international balance of payments sheets to gauge foreign remittance are widely known (Satake and Hassine, 2005), yet it is also clear that no alternative indicators exist. According to the international balance of payments sheets produced by the International Monetary Fund (IMF), foreign remittance to Tajikistan is as shown in Table 1<sup>1</sup>. From this table, one can see that remittances into Tajikistan have expanded sharply since 2005. This situation can be viewed as follows: Although Russia began recording strong economic growth in 2002 as oil prices climbed, there was obviously a time lag during which decisions were made and information was obtained. After this, however, labour migration from Tajikistan to Russia increased, and with it foreign remittance to Tajikistan also climbed.

(Table 1)

As Table 1 shows, foreign remittance to Tajikistan is not all that large<sup>2</sup>. What is interesting is its high level as a proportion of GDP (gross domestic product). As Figure 1, which was presented earlier, shows, in 2007 it stood at more than 40 percent of GDP, and in 2008 had climbed to almost 50 percent. Between 2002 and 2008, total remittances from abroad grew far more rapidly than GDP, soaring by between 50 percent (2007-2008) and 118 percent (2005-2006) year on year. Foreign remittance is therefore likely to have made an increasingly important contribution to the Tajik economy.

However, it is difficult to obtain figures on the numbers of labour migrants. Most published statistics in CIS states on receiving migrants only include migrants who have registered as permanent residents, and these are not the kind of short-term

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<sup>1</sup> Figures for remittances by workers and compensation for employee were drawn from balance of payments sheets from the World Bank to make estimates of foreign remittance.

<sup>2</sup> In 2008, Tajikistan was 28th in the world for the receipt of foreign remittance, and received less than a fifth of the amount sent to the Philippines, which came fourth behind India, Mexico, and Nigeria. See *World Development Indicators 2009*, World Bank.

international labour migrants that are the focus of this paper<sup>3</sup>. Table 2 therefore shows figures for labour migrants from Tajikistan to Russia compiled by the Russian Federation Migration Service (Federal'naya migratsionnaya sluzhba, FMS). The figures represent total numbers of migrants who have obtained work permits and are working legally.

(Table 2)

Until 2005–2006, Russia had fewer than 100,000 labour migrants from Tajikistan. However, the number suddenly jumped in 2007. In that year the figure climbed to 250,000, and reached just under 400,000 in 2008. Tajikistan has a population of just over 7 million (7,374 thousand at the beginning of 2008), of which less than a third are economically active<sup>4</sup>, so these numbers indicate that more than 5 percent of its total population and over 16 percent of its economically active population have moved to Russia alone as international labour migrants.

Tajikistan has therefore started supplying large numbers of international labour migrants and receiving large amounts of foreign remittance, and this change is due partly to the impact of Russia's policy on the acceptance of such migrants. As Table 2 shows, between 2006 and 2007 the total number of foreign workers with work permits issued by the Ministry of Internal Affairs of the Russian Federation increased by almost 1.7 times. For almost 20 years after the collapse of the Soviet Union, Russia experienced a rapid and continuous decline in its population, which left it with a serious shortage of labour (Kumo, 2010). Against this backdrop, in 2006 it began easing restrictions on the admission of foreign workers. This change in direction was most visible in the establishment in July 2006 of new rules concerning the registration of foreign or stateless migrants in the Russian Federation<sup>5</sup>.

Tajikistan, meanwhile, does not, at least as far as the author can make out, have

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<sup>3</sup> In 2007 there were only 17,300 Tajiks who had entered Russia and given their permanent residence as Russia (see SNGSAT, 2008), so the difference between this data and the figures in Table 2 is worthy of attention. In addition, it is quite possible that destination registered upon departure will differ from the final destination country where residence is actually registered. As a result, a migration matrix based on the country of departure will differ from one based on the country of entry. The United Nations (1998) performed a detailed study of the problems with emigration and immigration statistics.

<sup>4</sup> Also see CISSTAT (2010).

<sup>5</sup> Federal'nyi zakon ot 18 iyulya 2006 g. N 109-FZ "O migratsionnom uchete inostrannykh grazhdan i lits bez grazhdanstva v Rossiiskoi Federatsii" (in Russian) <<http://base.garant.ru/12148419/>>. Residence for immigrants without visas (which include Tajiks) no longer required a permit, only registration. In addition, employers became able to hire any foreigner with a work permit. They no longer needed to hold a licence to hire foreigners themselves.

a clear policy on the export of international labour migrants<sup>6</sup>. And although in 2004 the Russian Federation and Tajikistan concluded a bilateral treaty concerning labour migration<sup>7</sup>, it contained provisions that were completely at odds with what was actually happening. For example, it called for overall migrant numbers to be limited. Obviously, the increase in the flow of labour migrants from Tajikistan to Russia after 2004, which can be seen in Table 2, may indicate that the bilateral treaty had a positive effect on migrant numbers. Nevertheless, when thinking about the reasons for the massive flow of labour migrants from Tajikistan to Russia, it is probably better to focus on factors such as the special relationship Tajikistan had with Russia under the old Soviet regime (Ryazantsev, 2007) and the rapid growth of the Russian economy and the resultant widening of income disparities between the two countries (Figure 2)<sup>8</sup>.

(Figure 2)

A great deal of debate has focused on foreign remittance to developing countries and whether it helps to cut poverty among households in the countries supplying the workers. Given Tajikistan's low levels of income<sup>9</sup> and high levels of foreign remittance received, an interesting question is whether foreign remittance is

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<sup>6</sup> Not long after the collapse of the Soviet Union, regulations making it easier for Tajiks living abroad to return home were introduced, a treaty with the aim of elevating the status of expatriate Tajiks in the countries in which they were living was concluded, and so on. However, a review of government releases from the Republic of Tajikistan and the Russian Federation as well as the GARANT legal database did not turn up any laws and regulations that would really encourage migration. On 18 August 2010, a Mr. Kuggusov, head of analysis at Tajikistan's Ministry of Labour and Social Security told the author that his government does not actually have a policy concerning labour migrants. On the same day, Mr. Sanginov, the first deputy minister at the ministry, said that Tajikistan does not compile statistics on the departure and entry of its citizens. He told the author that the government does not have any figures for international migrants at the national level, and that they do not have the ability to manage them even if they did. Even so, there are reports that the Tajikistan prime minister asked his Russian counterpart for a quota of 800,000 migrants (*RIA Novosti*, 2007.01.23, in Russian).

<sup>7</sup> Soglashenie mezhdru Pravitel'stvom Rossiiskoi Federatsii i Pravitel'stvom Respubliki Tadjhikistan o trudovoi deyatel'nosti i zashchite prav grazhdan Rossiiskoi Federatsii i v Respublike tadjhikistan i grazhdan Respubliki tadjhikistan v Rossiiskoi Federatsii (Dushanbe, 16 Oktyabrya 2004 g.) (in Russian) <<http://mirpal.org/files/files/согл%20тп%20мг%20пф%20пт.doc>>. For more details, see Ryazantsev, Horie and Kumo (2010).

<sup>8</sup> During the Soviet era a unified wage structure existed throughout the Soviet Union, and income disparities were far smaller than the differences in regional per-capita GDP shown in Figure 3. In 1980, the average wages of all employees and workers provided in official tables for the Soviet Union were only 1.22 times higher in the Russian republic than in the Tajik republic, and by 1990, at the end of the Soviet era, the multiple had only climbed to 1.43. See TsSU SSSR, *Narodnoe Khozyaystvo SSSR 1990*, 1991, p.38 (in Russian).

<sup>9</sup> In 2008, per-capita gross domestic income (shown in the Purchasing Power Parity table for that year) in Tajikistan was \$1,860, around the same level as Nigeria, Sudan, Cambodia, and Senegal. See *World Development Indicators 2009*, World Bank.

indeed having a positive impact on reducing poverty, or whether instead it is resulting in wider income disparities and having no effect on cutting poverty. If one assumes that migrants are supplied by households with low incomes, and that these low-income households receive larger amounts of remittance from overseas, then foreign remittance could probably be pro-poor. Reports from the World Bank (2009) and other organizations have focused on the relationship between foreign remittances to Tajikistan and reducing poverty there. However, it is difficult to say that they succeeded in overcoming the problems inherent in the use of a cross-sectional analysis of single-year data.

This paper will therefore use data from household surveys conducted in Tajikistan to profile the poverty dynamics of Tajik households and international labour migrants from Tajikistan in 2007 and 2009, and then analyze the relationships between (1) household income levels in and foreign remittance to Tajikistan and (2) household income levels and the supply of migrants.

### **3. Previous Research**

A wealth of research has been conducted in the broad area of migration and remittance (Mansoor and Quillin, 2006; Sharma, 2009). It is well known that the traditional Becker (1974) altruistic model of the relationship between remittance and the incomes of households receiving remittances suggests that increases in the utility levels of the people remaining in the household are linked directly to increases in the utility levels of the people sending the remittances, and that the lower the income levels of households receiving remittances, the larger the remittances they will receive. This indicates that there will always be a negative correlation between household income levels and the amount of foreign remittance received in countries that supply migrants. On the other hand, the exchange model of Lucas and Stark (1985), Cox (1987), Cox *et al.* (1998), and others holds that remittance from migrants living overseas occurs because the migrants expect to be provided with services by the members of the household in the future. This indicates that positive correlations or no correlations exist between (1) the amounts of remittance and the incomes of households receiving the remittance and (2) the existence of remittance and the incomes of households receiving remittance. This is because if the incomes of households remaining in the countries that supply migrants increase, the prices of the services provided by the members of the households will rise, resulting in a positive correlation between household incomes and amounts of remittance. They also performed an empirical analysis, and found that the data did not support the notion of a purely altruistic model.

Relying on macro data, Adams and Page (2005), Gupta *et al.* (2009), and

Adams (2009) argued that remittance serves to reduce levels and degrees of poverty, while Aydas *et al.* (2005) used data from Turkey to show that the lower the levels of income in the home country, the greater remittances would be. With regard to research based on household surveys, however, Semyonov and Gorodzeisky (2005, 2008), who analyzed the relationship between household income levels and amounts of remittance received in the Philippines, obtained a significant, positive coefficient between household income levels and the amounts of remittance received. Meanwhile, Dustmann and Mestres (2010), in an analysis of a sample of foreign workers living in Germany, and Du *et al.* (2005), in a study of rural areas in China, obtained similar results, which suggests that the exchange model is applicable. In other words, this being the case, households with relatively low incomes will receive only small amounts of remittance, which may not be pro-poor.

Labour migration and remittance in Tajikistan has also been dealt with in reports published by bodies such as the International Organization for Migration (IOM) and the Asian Development Bank (ADB). Moreover, the bulk of these studies have been based on household survey data<sup>10</sup>. While studies of international labour migration that employ micro data are by no means scarce, few of them include quantitative analyses. Justino and Shemyakina (2009) used data from one year (2007) of the Tajikistan Living Standards Measurement Survey, which the author will discuss later, to show that the more foreign remittance a household receives, the less labour it will supply. Meanwhile, Brown, Olimova and Boboev (2008) demonstrated that households receiving a lot of remittance spend more on education or invest more in small businesses, and that their children have low rates of absence from primary school. In addition, Ogawa and Nakamuro (2010) found that the receipt of remittance from migrants has a positive impact on children's school attendance.

Nevertheless, no analysis seems to have been conducted on the relationship between household income levels and foreign remittance/migration in Tajikistan. Brown, Olimova and Boboev (2008), World Bank (2009), and Khakimov and Mahmadbekov (2009), either descriptively or using t-tests of means, all showed that households with relatively low incomes were more likely to supply migrants. However, households were divided into only two income classes, so this finding cannot really be said to be robust. All the papers used cross-sectional data to describe the relationship between household incomes (excluding remittances) and the amounts of remittance, and the authors of these

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<sup>10</sup> Olimova and Bosc (2003) used an IOM-led survey of 4,000 individuals conducted in 2002–2003. Mughal (2007) also used an IOM survey, but this time it was one targeting only 712 households in Khatlon Province that was performed in 2005. Brown, Olimova and Boboev (2008) relied on survey with a sample of 3,300 households that was conducted in 2007 by the ADB. The IOM also carried out a survey of 500 households in 2008, and Khakimov and Mahmadbekov (2009) based their paper on this.



reports themselves mentioned the possibility that income might be endogenous.

Previous research has also produced a variety of profiles of international labour migrants from Tajikistan. All the previous research referred to in this paper mentions, albeit to different degrees, the concentration of Tajik migrants in Russia or Moscow. The picture drawn is that 80–90 percent of migrants have gone to Russia and around 50 percent to Moscow. While predictable, it is still worth noting that more than 80 percent of migrants are of working age, and also that over 80 percent of them are men, which are both extremely high figures. Regarding the education levels of migrants, findings are divided. While Olimova and Bosc (2003) concluded that they are higher than the national average, Khakimov and Mahmadbekov (2009) drew the opposite conclusion. This difference can probably be explained by the fact that Khakimov and Mahmadbekov (2009) used a small sample and their survey focused on rural residents.

#### **4. Data**

This paper employs forms completed for the Tajikistan Living Standards Measurement Survey (TLSS), a household survey conducted in Tajikistan by the World Bank, in order to find out whether Tajik households with relatively low incomes receive larger remittances and whether low-income households supply more migrants, or whether the reverse is true. Although the Living Standards Measurement Survey (LSMS) performed by the World Bank is well known<sup>11</sup>, the one conducted in Tajikistan, which is used in this paper, needs a brief description<sup>12</sup>.

A TLSS was performed in 1999, 2003, 2007, and 2009. Although the sample of households used for the TLSS is representative of the country as a whole, the data for 1999–2007, like most of the other LSMSs, is repeated cross-sectional data, and is not panel data. On the other hand, the survey for 2009, while employing a smaller sample about one third the size of those used for the 2003 and 2007 rounds, forms a panel with the data for 2007.

As the author has already seen, foreign remittance to Tajikistan did not expand at a steady pace. Rather, it increased rapidly between 2004 and 2005. However, the surveys during this period featured no or only a few questions about foreign remittance and migration, making it extremely difficult to compare the data with that from later

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<sup>11</sup> See “Living Standards Measurement Survey” on the World Bank website <<http://iresearch.worldbank.org/lsmssurveyfinder.htm>> for more details.

<sup>12</sup> See such documents as *Basic Information Document: Tajikistan Living Standards Measurement Survey 2007*, July 2008 and *Tajikistan Living Standards Survey 2009: Notes for Users*, May 2010 for more details about the TLSS. Both these documents can be downloaded from the website mentioned in Note 11.

surveys<sup>13</sup>. The author will therefore not employ the TLSS from 1999 and 2003. Instead, the author will focus his analysis on the two rounds of data from 2007 onwards, which can be expected to offer a strong insight into the impact of foreign remittance. The 2007 survey (TLSS2007) was carried out between September and November 2007. The 2009 survey (TLSS2009), meanwhile, was performed between September and November 2009. In addition, the households that formed the panel sample were visited in the same month they were for the 2007 survey. For TLSS2007, the sample comprised 4,860 households and 30,139 individuals, while for TLSS2009, it contained 1,503 households and 10,069 individuals. Of the 1,503 households used for the 2009 survey, 1,435 form panels with the sample for the 2007 survey, and the complete panel sample was 1,414 households. However, before moving on to the analysis, let the author first profile the households and migrants.

#### **4.1 Profiles of Tajik Households and International Migrants: Descriptive Statistics**

Table 2 shows that according to internal FMS data from the Ministry of Internal Affairs of the Russian Federation, the number of labour migrants from Tajikistan was over 250,000 in 2007 and 390,000 in 2008. Looking at the TLSS data, 4.19 percent of all the individuals in the 2007 sample had travelled abroad during that year, and in 2009 this figure had climbed to 7.42 percent of the sample. There is also no great difference between the estimate of the total number of overseas travellers in the country as a whole, as calculated based on the ratio of the sample size to the total population of Tajikistan according to CISSTAT (2010), and the number of Tajik workers in Russia according to the FMS internal data from Russia (Table 3). In 2007, the year for which both sets of data exist, the estimate for the total number of Tajik migrants abroad as calculated from the micro data (302 thousand) is a little higher than that for the number of migrant workers from Tajikistan as calculated from the FMS data (250 thousand), which may strengthen the reliability of the data used in this paper.

(Table 3)

#### **4.2 Households**

Some of the descriptive statistics from the data comprised of complete panel

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<sup>13</sup> The surveys before 2003 (TLSS2003) do not provide various types of information, e.g. income earned abroad, remittances from members of the household living abroad, names of the overseas cities where family members lived/are living, whether the family members living abroad have/had work permits, and the type of work they engaged/are engaged in, and so on.

samples from TLSS2007 and TLSS2009 are shown in Table 4. The poverty line is based on per-person expenditure, and for 2007 the base is 4.46 Tajikistan somoni, which, based on an assessment of purchasing power parity, is equivalent to 2.15 U.S. dollars was 2003. For 2009, the figure was adjusted using regional price indexes.

(Table 4)

According to Table 4, wages account for over 50 percent of income. Using averages for all the households in the panel sample, foreign remittance represented 19.2 percent (TLSS2007) and 13.2 percent (TLSS2009) of household income. However, if only those households receiving foreign remittance are included, such remittance accounts for more than 60 percent of their total income<sup>14</sup>.

A negative correlation is seen between per-person levels of consumption and the number of children in the household. The table also shows that in both rounds the average household size was more than six persons. However, as the World Bank (2005) has shown based on the 2003 TLSS, which produced similar findings, having a woman as head of the household does not seem to significantly increase the risk of the household falling into poverty. Moreover, this was even truer in 2009 than in 2007. The biggest change between TLSS2007 and TLSS2009 was probably the jump in the number of international migrants per household. Although the poverty rate was slightly lower in 2009 than 2007, it is impossible to say here whether this was due to migration and remittance.

Figure 3 shows poverty dynamics for the panel households. With the aforementioned poverty line as the cut-off point, 52.5 percent of the panel households were in poverty temporarily during the period examined, while 15.8 percent of all the panel households in the sample were in permanent poverty. In addition, with 2.92 Tajikistan somoni, which was equivalent to 1.15 U.S. dollars in 2003, denoting the extreme poverty line in terms of per-person expenditure, Figure 3 shows the relationship between poverty dynamics and the supply of international migrants.

(Figure 3)

Figure 3 does not enable one to make judgements about the relationship

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<sup>14</sup> In both years, consumption was a lot higher than income (in TLSS2007 consumption was 63.0 percent higher and in TLSS2009 it was 47.7 percent higher), and this trends was especially apparent for high-income groups. Although it is possible that information on income was inadequately gathered, this pattern was seen in both years so the overall trend is unchanged. The author will therefore proceed under the assumption that information on income was inadequately gathered from all households.

between the supply of migrants and poverty levels. What the figure reinforces is that all types of household except those under the permanent extreme poverty line (group I) were supplying more international migrants in 2009 than they were in 2007. Neither the relationship between poverty/income levels and foreign remittance shown in Table 4 nor that between the supply of migrants and household consumption shown in Figure 3 indicates that as household incomes fall, the amount of foreign remittance received increases.

### **4. 3 International Migrants**

Table 5 presents some of the data on international migrants from all the samples used in TLSS2007 and TLSS2009. Although previous research had already pointed it out, people of working age, and particularly males, make up the overwhelming majority of Tajik international migrants. Around 95 percent of those who had travelled overseas during the year and already returned when the survey was conducted had made their journeys for work purposes. On the other hand, more than 80 percent of those living abroad at the time of the survey were sending money home. Note that per-capita GDP in Tajikistan in 2008 was 400 U.S. dollars<sup>15</sup>. Given this situation, it is striking that the average amount of foreign remittance per remitter was over 2,500 U.S. dollars. The concentration of migrants in Russia is also clear from the data. Ninety-nine percent of Tajik migrants are literate, and they clearly have higher levels of education than that of the sample as a whole, a finding that is in line with most previous research as well as Olimova and Bosc (2003).

(Table 5)

Between 2007 and 2009, a clear change can be observed in the composition of international migrants. Semyonov and Gorodzeisky (2005) described how labour migrants from the Philippines were overwhelmingly men to begin with, but that with the passage of time the ratio of males to females has come to be more or less equal. A similar phenomenon has also been seen with other developing countries. In the case of Tajikistan, while there was no change in the fact that the vast majority of migrants are men, a significant increase occurred in the proportion of women<sup>16</sup>. As the chain

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<sup>15</sup> See *World Development Indicators 2009*, World Bank.

<sup>16</sup> The increase of the percentage was significant at one percent level. Tajikistan is an Islamic country, and some research has emphasised the weak position of women and their lack of freedom. Examples of such studies are Mal'tseva (2007) and Glenn (2009), the latter of which was a social science study. However, it is unclear whether such observations are really accurate. On 18 August 2010, Mr. Sanginov, the first deputy minister at the Republic of Tajikistan's Ministry of Labour and Social Security, speaking

migration theory of population migration would predict, the concentration of Tajik migrants in Russia, and especially Moscow, is striking. Furthermore, while the data used in this paper does not allow a comparison to be made between the number of international migrants in 2008 and 2009<sup>17</sup>, the increase in Tajik labour migrants to the Russian Federation between 2007 and 2008, as shown in Table 3, was, at 154 percent, smaller than the increase in international migrants at the national level estimated from TLSS2007 and TLSS2009, which was 185 percent. This suggests that the number of migrants continued to expand during 2009.

## **5. Remittance Received, Migrants Supplied, and the Income of Levels of Tajik Households**

As the author has stated repeatedly, the main objectives of this paper are to examine the relationship between household income levels and the amount of remittance they receive, and the relationship between income levels and the supply of migrants. In other words, if the amount of remittance received is relatively large for households with low incomes, the altruistic model expounded by Becker (1974) of the relationship between remittance and household income will apply, and a pro-poor situation may emerge. On the other hand, if household income and remittance are positively correlated or uncorrelated, the explanation provided by the exchange model described by researchers such as Lucas and Clark (1985) may be more appropriate. Furthermore, if migrants tend to be supplied by relatively poor households, and these households develop the potential to receive remittance, this should be pro-poor. Conversely, if migrants come from wealthy households, migration may not contribute to raising the income levels of the poor.

### **5.1 Analysis**

Here the author will investigate the effect of household income levels on amounts of remittance and the likelihood of migrants being supplied. A list of the variables used in the analysis along with their definitions is provided in Table 6.

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to the author at his office, said that while the Russian police treat Tajik men extremely harshly, they are kinder to women, and that this has resulted in women more frequently moving to Russia to work. He also told the author that while work in places like restaurants is available all year round, work typically done by men such as street cleaning and construction can only be performed at certain times of the year in Russia.

<sup>17</sup> The TLSS for both years used the expression “in the last time” to ask respondents about travel to foreign countries in that year or that month. This means that even if, for example, someone had spent several months working abroad in 2008, come home, and then gone abroad again in 2009, only the most recent stay would be recorded. As a result, the more people with experience of overseas migration in recent years, the smaller the figures of migration in preceding years will be than the actual figures.

(Table 6)

Only the amounts of foreign remittance received from people who were abroad at the time of the survey will be used in the analysis. Regarding those people who were back in Tajikistan at the time of the survey yet had been overseas previously and earned income there, the TLSS2007 and TLSS2009 data sets assume that they sent home 70 percent of the income they earned abroad. Although this is useful for making macro-level estimates of the total amount of remittance, responses concerning household income and expenditure basically relate to only the month or week before the survey, therefore for this analysis in this paper it would be more appropriate to use the amounts of remittance received immediately before the survey was conducted. The supply of migrants, meanwhile, is measured using a dummy variable, with unity being assigned if a member of the household had spent a month or more overseas during 2007 for TLSS2007 and 2009 for TLSS2009.

With regard to the location of households, Olimova and Bosc (2003) point out that the number of migrants from the Tajik capital, Dushanbe, is relatively small, and that urban areas offer a lot of opportunities to earn money and therefore supply fewer migrants than rural areas, so the author will examine this conjecture. Next, as for the explanatory variable concerning household characteristics, the author will employ the number of people in the household, as the larger a household is the easier it may be to supply migrants. A question whether having a woman as head of the household affects the amount of remittance will be also investigated. The author will also employ a dummy variable to examine whether the head of the household being in full-time employment raises the likelihood of outside information being obtained and thereby encourages the households to supply migrants. The education level of the head of the household may also have an effect on the gathering of information on foreign countries. On the other hand, the older the head of the household is, the more likely it may be that the household hesitates about supplying migrants.

Regarding household incomes, to examine the relationship between the incomes of households left behind in the mother country and the scale of foreign remittance and the supply of migrants, this paper employs monthly household income excluding foreign remittance. The author will also use logarithmic values of household income as a substitute for income and an alternative means of defining the stochastic formula. Furthermore, in light of the fact that household income includes social security benefits, grants, etc., which may distort the figures, the paper will attempt to ensure the

analysis is rigorous by making real wages alone the explanatory variable<sup>18</sup>.

## 5. 2 Results and their Interpretation

The results of the analysis on amounts of foreign remittance received are shown in Table 7, and the results of the analysis on the determinants of whether migrants will be supplied are shown in Table 8. In handling the panel data, a pooled OLS or pooling logit model was not employed with an F test and Breusch-Pagan test for the former and a Hausman test and logarithmic likelihood test for the latter. In addition, for the panel analysis, a random-effects model with a Hausman test was selected. As the table shows, it was confirmed that results were qualitatively the same when household income was used as the explanatory variable and when its logarithm or wages alone were used. Therefore, for both Table 7 and Table 8, the paper will use the results from column 2B-2 as the author proceeds with the discussion.

(Table 7)

As Table 7 shows, the level of household income does not have a significant effect on the amount of foreign remittance received. In other words, the situation predicted by a purely altruistic model, i.e. where the lower the level of household income the greater the amount of remittance received, is not seen here. In the case of Tajikistan, households with relatively low incomes do not receive more foreign remittance than others, so it must be concluded that it is possible that such remittance may not serve to reduce the degree of poverty of the poor.

When considering the relationship between income levels and remittance, the endogeneity of income needs to be taken into account. For example, if they expect to receive money from abroad, households that have supplied migrants may reduce their supply of labour, making their incomes before foreign remittance lower than before. Alternatively, if the household members with relatively high earning power become international labour migrants, the income level of the household left behind may fall. In both these cases, however, the income level of household can be expected to take a negative coefficient, which is inconsistent with the results shown in Table 7.

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<sup>18</sup> Note that while TLSS2007 includes detailed data on land, livestock, and agriculture-related assets, TLSS2009 does not. Data on assets was therefore not employed. However, with regard to 40 types of consumer durable, including cars, motorcycles, trucks, computers, air conditioners, and refrigerators, both TLSS2007 and TLSS2009 asked respondents whether they owned such items as well as the subjective question of how much they thought they could sell it for if they were sell it now. These estimates are usable, so the author compiled them and attempted to use them in preliminary analysis. However, the estimation did not obtain a significant coefficient.

Nevertheless, endogeneity may exist between remittance and income in the sense that foreign remittance received in the past may have been invested in the education of members of the household and led to higher household income now. Having said that, foreign remittance to Tajikistan only began to increase rapidly in 2006, so it is hard to imagine that such an effect would already have become apparent in 2007 or 2009, the years to which the data used here relates<sup>19</sup>.

In column 2B-2 on Table 7, a significant coefficient was obtained only for whether the household was located in an urban area. As suggested by Olimova and Bosc (2003), this means that rural households receive more remittance from migrants than urban ones do<sup>20</sup>. The fact that all the other variables were insignificant may be because foreign remittance to Tajikistan is spread among a wide variety of households.

(Table 8)

Next the author will examine Table 8 (2B-2), which shows the results of the analysis on whether households will supply migrants. Household income exerts a strongly significant positive impact on the supply of migrants. This means that households with higher incomes are more likely to dispatch migrants. Therefore, just as the Table 7 results did not show that the amount of remittance is higher, it hints at the possibility that the supply of international migrants from Tajikistan is not pro-poor.

Insignificant coefficients were obtained for both whether the household was located in the capital, Dushanbe, or in another urban area, which makes it clear that households in such locations do not supply many migrants. The number of people in the household, however, obviously has a positive effect on whether migrants are supplied. The fact that the age of the head of the household yields a significant negative coefficient may mean that, as expected, older heads of household may adopt a negative attitude towards the very notion of migration itself. The education level of the head of

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<sup>19</sup> Even when the explanatory variable was set to the 2007 value for each household, the explained variable was set to the amount of remittance received by each household in 2009 (or whether the household had supplied migrants in 2009) and a cross-sectional analysis using panel data for households for the two years, the results were qualitatively the same as those in Table 7 and Table 8. In analysing the determinants of the amount of monthly foreign remittance received by households, the author also introduced individual characteristics of migrants along with all the household factors used here. For individual characteristics, the author used (1) the gender of the migrant, (2) the age of the migrant, (3) the education level of the migrant, and (4) the monthly salary earned in the foreign location by the migrant. However, only monthly salary was significant. If the endogeneity described in this paper exists, education level can be expected to obtain a significant positive coefficient.

<sup>20</sup> The author also introduced eight dummy variables for the rural and urban regions within the four provinces comprising Tajikistan, but did not obtain any clear results. The same was true for preliminary analysis on whether migrants are supplied.



household is also insignificant, which indicates that in Tajikistan migrants are being supplied from all types of household in this aspect. Alternatively, the effect of the education level of the head of the household is probably manifesting itself in higher household income levels. The finding that the gender of the head of household does not exert a significant impact can be said to be more or less in line with that obtained from the author's examination of the descriptive statistics on Table 5 concerning the profile of households.

The results of this analysis show that households with low levels of income do not receive larger amounts of foreign remittance, and also that households that supply migrants tend to have relatively high income levels. In other words, it is difficult to argue that with respect to Tajik labour migration, a purely altruistic model is applicable to migration/remittance and household income. Regarding both amounts of remittance and the supply of migrants, households with relatively low incomes are not in a more advantageous position than other households. In Tajikistan, therefore, both the receipt of foreign remittance and the supply of migrants may not be pro-poor.

Admittedly, as Table 4 and Figure 3 show, the overall level of poverty (poverty headcount) declined by more than three percent between 2007 and 2009 (from 43.9 percent to 40.3 percent). Nevertheless, it would be rash to conclude that this was the result of the supply of migrants and the remittance of money by them. Although the number of migrants has certainly been increasing, since 2007 the country's GDP has also been growing at 3.7 percent<sup>21</sup> per year, so the factors behind the drop in poverty would need to be investigated separately.

## **6. Conclusions**

With respect to Tajik migration, which increased noticeably during the late 2000s, this paper used household survey forms to provide outline profiles of poverty in Tajik households and Tajik migrants. It then explored the relationship between the income levels of Tajik households and the amount of remittance they receive and their supply of migrants, with the aim of finding out if migration could be pro-poor.

Compared with the data up to 2007, in 2009 a change in the composition of migrants was seen, with the number of migrants rising, the proportion of migrants

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<sup>21</sup> National Bank of Tajikistan Website, "Macro Economic Indicators" <[http://nbt.tj/files/docs/statistics/macro\\_en.xls](http://nbt.tj/files/docs/statistics/macro_en.xls)>, accessed on December 28, 2010. However, according to United Nations Statistics Division <<http://unstats.un.org/unsd/snaama/Introduction.asp>> (accessed on January 18, 2011), while household consumption and overseas remittance declined by around 10 percent between 2008 and 2009, gross national income (GNI) increased. These findings are not inconsistent with those of this paper (Table 6), which found, using household survey data from 2009, that income increased and remittance declined compared with the same survey conducted in 2007.

heading to Russia increasing, and the proportion of female migrants climbing. However, this change can be surmised as being basically the extension of a trend that had already begun earlier<sup>22</sup>. Although the migration of Tajiks has continued to increase, with regard to amounts of remittance and the supply of migrants itself, this paper found that households with relatively low incomes are not receiving larger amounts of foreign remittance, even though they are dispatching more migrants. In other words, it is not the case that the receipt of foreign remittance and the supply of migrants in Tajikistan follow the pattern predicted by altruistic models relating to household income and remittance, which is that households with lower incomes receive larger amounts of remittance. It was therefore shown that it is difficult to say that foreign remittance and migration are pro-poor in Tajikistan.

Migrants are supplied by a wide variety of Tajik households. Looking at the data for household that form complete panels, the paper find that in January November 2009 (TLSS2009), 468 (33.1 percent) of the 1,414 households in the sample had at least one member who had spent a month or longer overseas. In January November 2007 (TLSS2007), however, the figure was only 341 households (24.1 percent). These figures illustrate the expansion in migration.

As the economy as a whole bottoms out, information flows increase, and more acquaintances begin living in the target destinations, it will probably become easier even for relatively low-income households to supply migrants. In fact, the household poverty dynamics shown in Figure 3 reveal that migration expanded across the board, even from extremely poor households. At the same time, however, the analysis revealed a positive correlation between income levels and whether migrants will be supplied, which may mean that if migration continues to increase in the future, it cannot be said that there is zero likelihood that the poverty of poor households will be cemented. Figure 3 also shows that although the supply of migrants increased overall, the poverty rate did not decline between 2009 and 2007 critically. In addition, the more than 30 percent of households in the top band for consumption continued to stay out of poverty. These findings may mean that income classes have already been solidified. Of course, further investigation of this will require that the situation be observed for a far longer period than the author has done in this paper.

What has been abstracted in this paper in its approach to Tajik labour migration

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<sup>22</sup> Previous research has noted that since the early 2000s, Tajik migration has been on an upward trend, and increasingly concentrated in Russia. The contention of Danzer and Ivaschenko (2010) that the increase in migration, the growing concentration of migrants in Russia, and the rise in the proportion of female migrants represents a response by households to the financial crisis of 2008 would therefore seem to be an overstatement.

is the relationship between the characteristics of individuals and decision-making<sup>23</sup>. This paper has focused on household income levels, amounts of foreign remittance, and whether migrants are supplied. However, the gauging of future trends in labour migration will require the investigation to return to a focus on what kind of people become migrants and what kind of households they come from.

Furthermore, as was mentioned in section 2 of this paper, the relationship with the Russian Federation may be having a major impact on the supply of labour migrants from Tajikistan. Russia is facing a declining population and its policy on the admission of foreign migrants is inconsistent and hard to make predictions about. Even as it accepts large numbers of foreign workers, there are frequent reports of growing xenophobia<sup>24</sup>. As a result, it is quite possible that the policy of accepting foreign workers will be affected by policymakers giving greater consideration to the domestic situation. Decisions made by individuals and households are not the only thing that makes international migration possible. To predict the future, it will therefore be essential to keep an even closer eye on government policy.

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<sup>23</sup> As already stated in Note 21, the author carried out a preliminary analysis using individual characteristics of migrants but it did not yield any results worthy of note.

<sup>24</sup> *RIA Novosti*, 2010.12.27. (in Russian)

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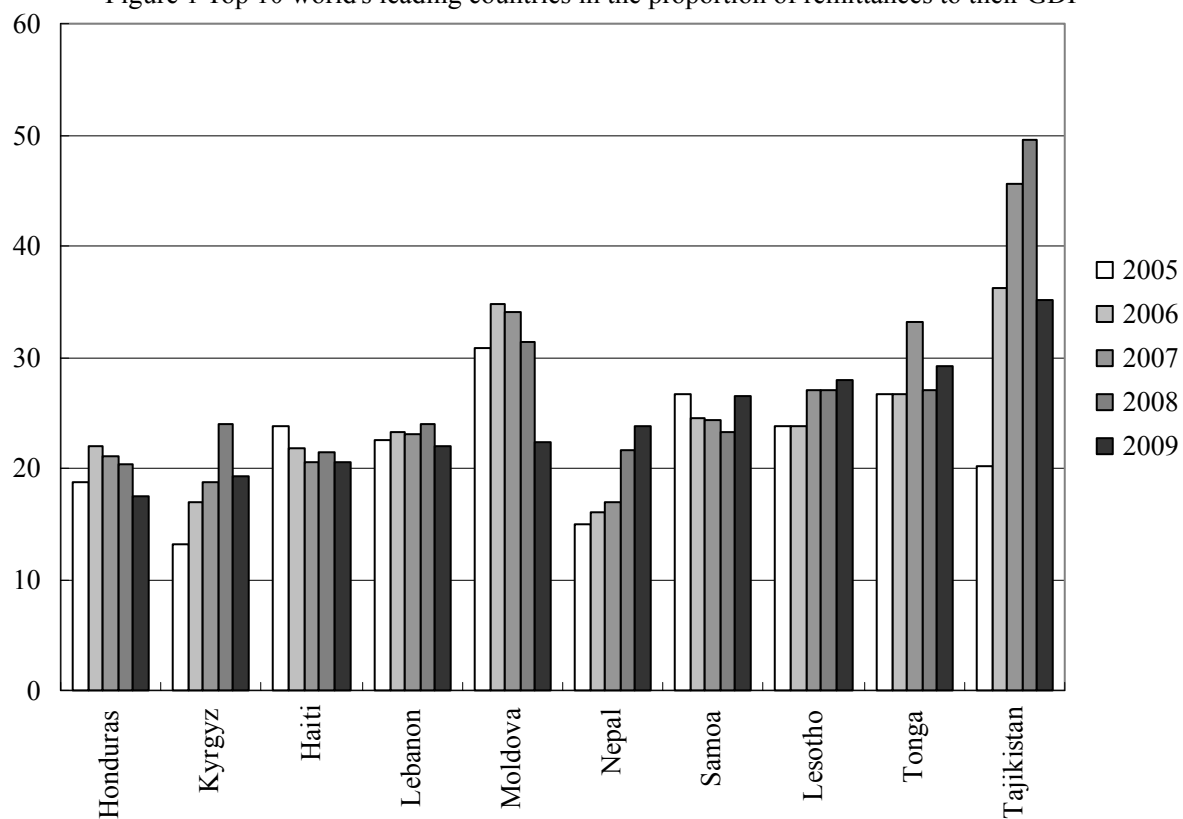
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Figure 1 Top 10 world's leading countries in the proportion of remittances to their GDP



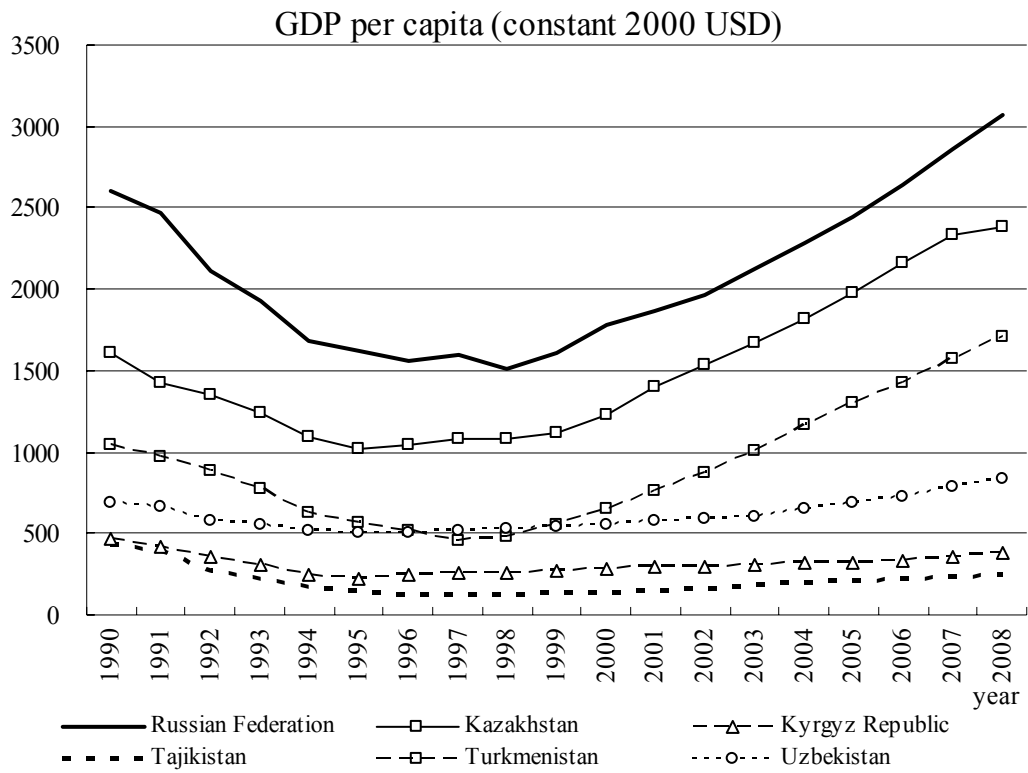
Source: Prepared by the author from the World Bank Web site, <http://data.worldbank.org/indicator>.

Table 1 Received Amount of International Remittances by Tajikistan  
viewed through *Balance of Payment Statistics*

Credit (million USD)	2002	2003	2004	2005	2006	2007	2008
Total Amount	78.5	146	252	466.6	1018.9	1690.7	2544.1
Income account							
Compensation of Employe	0.1	-	-	1.4	3.9	5.3	7.1
Current transfers account							
Workers' remittances	78.4	146	252	465.2	1015	1685.4	2537

Source: Prepared by the author from IMF, *Balance of Payments Statistics Yearbook Part 1*, 2009.

Figure 2 Per Capita GDP of Russia and Central Asia



Source: *World Development Indicators 2009*, the World Bank, 2010.



Table 2 Labor Migrants into Russia (person)

Labor Migrants into Russia				
	2005	2006	2007	2008
Total	702,500	1,014,013	1,717,137	2,425,921
of them from CIS	343,665	537,722	1,152,786	1,779,996
of them from Tajikistan	52,602	98,736	250,190	391,438

Source: Prepared by the author by internal documents obtained from FMS.

Table 3 The size of foreign passengers from TLSS samples:

Comparison of Macro- ad Micro-data

	2007	2009
All the sample	30,139	10,069
Among them who went abroad (in the households at the time of the survey)	328	501
Among them who are abroad (absent ath the time of the survey)	934	246
The number of population who went abroad during the year	4.19%	7.42%
Population of Tajikistan:	7.216 million	7.545 million
Percentage share of foreign passengers in the sample:	×4.19%	×7.42%
Estimated number of migrants from samples and national population:	=302 thousand	=560 thousand
Taijk labor immigrants to Russia based on FMS data:	250 thousand	391thousand (in 2008)

Source: Estimated from CISSTAT (2010), TLSS2007, TLSS2009.

Table 4 Poverty Profile (Panel samples) in 2007 and 2009

(Based on per capita expenditure)

TLSS2007	All Data	Extreme Poor	Poor	Non-Poor
Number of Household	1,414 (100.0)	196 (13.9%)	424 (30.0%)	794 (56.1%)
Average monthly expenditure per capita in Tajikistan somoni in 2007)	178.2	70.7	114.8	238.5
Average monthly income per household (in Tajikistan somoni in 2007)	681.2	482.7	633.9	755.5
Wage	380.4	307.7	366.4	405.7
Income Transfer	14.2	10.2	11.7	16.6
Social Security	22.5	21.0	24.6	21.7
Scholarship	0.3	0.1	0.3	0.4
Self-consumption of agricultural goods	112.7	82.6	114.1	119.5
Others	20.3	4.2	15.4	27.0
Remittances received from abroad	130.8	56.9	101.4	164.7
Average number of children (in person)	2.11	2.85	2.39	1.78
Average number of elder persons (in person)	0.3	0.36	0.38	0.25
Average number of household members (in person)	6.23	7.52	6.8	5.6
Average number of international migrants (in person)	0.33	0.32	0.34	0.33
Average age of the household head (age)	51.7	52.19	52.5	50.5
Household head is an employee (in percent)	62.4%	55.1%	59.4%	65.9%
Female household head (in percent)	19.6%	23.98%	16.3%	20.0%

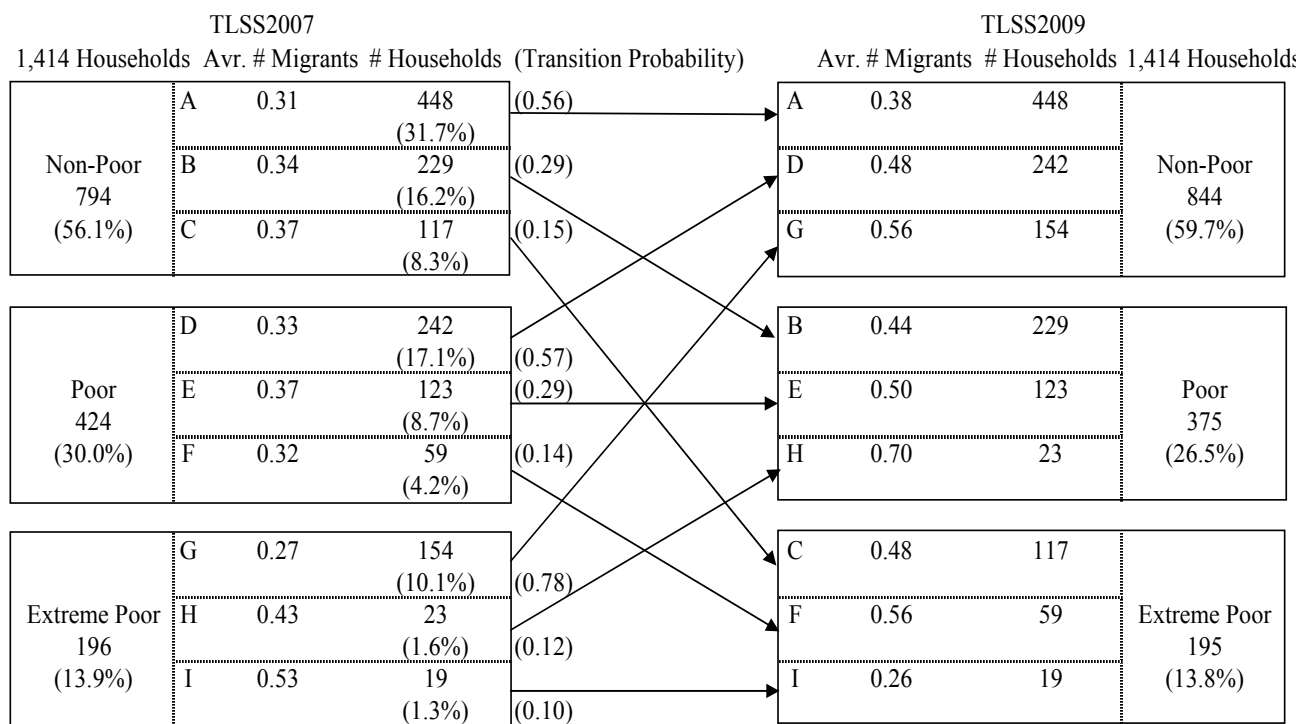
  

TLSS2009	All Data	Extreme Poor	Poor	Non-Poor
Number of Household	1,414 (100.0)	195 (13.8%)	375 (26.5%)	844 (59.7%)
Average monthly expenditure per capita in Tajikistan somoni in 2007)	170.8	62.9	100.4	227
Average monthly income per household (in Tajikistan somoni in 2007)	784.1	620.3	689.7	863.9
Wage	453.5	374.1	397.2	496.8
Income Transfer	21.2	13.0	8.9	28.5
Social Security	39.0	42.3	45.0	35.6
Scholarship	0.5	0.1	0.1	0.7
Self-consumption of agricultural goods	94.1	64.9	97.6	99.3
Others	68.0	29.3	46.2	86.6
Remittances received from abroad	107.9	96.5	94.8	116.4
Average number of children (in person)	2.22	3.07	2.66	1.82
Average number of elder persons (in person)	0.29	0.34	0.35	0.25
Average number of household members (in person)	6.78	8.33	7.63	6.04
Average number of international migrants (in person)	0.45	0.48	0.47	0.44
Average age of the household head (age)	52.8	54.5	53.8	52
Household head is an employee (in percent)	60.0%	49.7%	56.3%	63.7%
Female household head (in percent)	17.4%	20.5%	15.2%	17.7%

Source: Author's calculation from TLSS2007 and TLSS2009.

Poverty line: 4.50 somoni in 2007 prices per capita per day; Extreme poverty line: 2.92 somoni in 2007 prices per capita per day.

Figure 3 Poverty Dynamics of Households and the Number of Migrants per Household in Tajikistan  
 (The Number of Complete Panel Household Samples: 1,414)



Source: Prepared by the author from TLSS2007 and TLSS2009.

Table 5 Profile of Tajik Migrants

## Profile of Tajik Migrants through TLSS2007

	All migrants	Migrants, who live within households at the time of survey	Migrants, who are away from the household at the time of survey
All the data	1262	328	934
Female	89 (7.1%)	26 (7.9%)	63 (6.7%)
Average age*	29.7	34	28.2
Completed elementary school	147 (11.7%)+	33 (10.1%)@	114 (12.2%)#
Completed secondary school	970 (77.0%)+	252 (77.1%)@	718 (77.0%)#
Completed tertiary school	142 (11.3%)+	42 (12.8%)@	100 (10.7%)#
Went into Russia	1191 (94.4%)	303 (92.4%)	888
Went into Moscow	706 (55.9%)	177 (54.0%)	529
Aim of visit "to work/to look for	-	310 (94.5%)	-
Average wage (USD per month)	320 (of 1131)	309 (of 262)	323 (of 869)
Median of wage (USD per month)	300 (of 1131)	300 (of 262)	300 (of 869)
Average amount remitted (USD per	-	-	2836 (of 754)
Median of the amount remitted (USD per year)	-	-	1720 (of 754)

## Profile of Tajik Migrants through TLSS2009

	All migrants	Migrants, who live within households at the time of survey	Migrants, who are away from the household at the time of survey
All the data	747	501	246
Female	69 (9.2%)	37 (7.4%)	32 (13.1%)
Average age*	30.4	31.7	27.8
Completed elementary school	90 (12.1%)+	61 (12.2%)+	29 (11.8%)
Completed secondary school	565 (75.9%)+	378 (75.9%)+	187 (76.0%)
Completed tertiary school	89 (12.0%)+	59 (11.2%)+	30 (12.2%)
Went into Russia	737 (98.7%)	497 (99.2%)	240 (97.6%)
Went into Moscow	476 (63.7%)	325 (64.9%)	151 (61.4%)
Aim of visit "to work/to look for	-	491 (98.0%)	-
Average wage (USD per month)	390 (of 583)	375 (of 399)	420 (of 194)
Median of wage (USD per month)	350 (of 583)	300 (of 399)	400 (of 194)
Average amount remitted (USD per	-	-	2754 (of 199)
Median of the amount remitted (USD per year)	-	-	2400 (of 199)

- : No such question; :: lacking for three persons; @: lacking one person; #: lacking two persons; \*: aged 19-49=93.2%; \*\*: 19-49=91.8%.

Source: Calculated by the author from TLSS2007 and TLSS2009

Table 6 Variables introduces

Variables introduced in the analysis	TLSS2007		TLSS2009	
	Average	Std. Deviation	Average	Std. Deviation
<b>Explained Variables</b>				
Remittance Received Per Household Per Month (Tajikistan somoni in 2007)	130.77	786.68	107.948	440.984
Sent Migrants (Unity for households with overseas migrants in respective year, zero for others)	0.241	0.428	0.331	0.471
<b>Explaining Variables</b>				
(1) Location				
Dushanbe (Unity for households in Dushanbe, zero for others)	0.17	0.376	0.17	0.376
Urban (Unity for households in Cities, zero for others)	0.347	0.476	0.347	0.476
(2) Household Characteristics				
Number of Household Members (in person)	6.226	2.88	6.779	3.038
Employee (Unity if the household head is an employee, zero for others)	0.624	0.484	0.598	0.49
Sex of household head (Unity for the households with male head, zero for others)	0.804	0.397	0.826	0.379
Age of the household head (in age)	51.69	13.97	52.8	13.11
(3) Education attainment (Reference category: completed elementary school or less)				
Completed secondary education (Unity for households with the head completing secondary education, zero for others)	0.586	0.493	0.587	0.493
Completed tertiary education (Unity for households with the head completing tertiary education, zero for others)	0.191	0.393	0.19	0.393
(4) Income				
Real monthly income of the household <b>without international remittances</b> (1,000 Tajikistan somoni in 2007)	0.55	0.77	0.68	0.70
Logarithm of real monthly income of the household above (Treated as missing data if income is zero; The number of cases in 2007 is 120, that in 2009 is 34.)	5.9	1.0	6.1	1.0
Real monthly wage income of the household (1,000 Tajikistan somoni in 2007)	0.38	0.67	0.58	0.76

Note: For complete panel household sample of 1,414.

Source: Calculated by the author from TLSS2007 and TLSS2009

Table 7 Determinants of the volume of international remittances received by the households.  
1. Pooled OLS

Explaining variables	2. Panel								
	1A-1	1A-2	1A-3	2B-1Fixed e.	2B-2 Random e.	2C-1Fixed e.	2C-2 Randome.	2D-1Fixed e.	2D-2 Random e.
Location									
Dushanbe	-39.17 (41.12)	-43.06 (43.57)	-37.71 (41.11)	-	-39.26 (41.76)	-	-43.06 (43.57)	-	-37.79 (41.75)
Urban	-67.81 (33.03)*	-73.88 (34.96)*	-66.07 (33.04)*	-	-68.14 (33.53)*	-	-73.88 (34.96)*	-	-66.38 (33.54)*
Household characteristics									
Number of household members	-5.75 (4.43)	-4.98 (4.74)	-4.76 (43.42)	-20.43 (8.23)*	-6.00 (4.46)	-20.87 (9.22)*	-4.98 (4.74)	-19.48 (8.25)*	-5.02 (4.45)
Household head-employee	-48.12 (29.41)	-42.59 (32.09)	-42.39 (29.59)	-55.97 (44.07)	-48.18 (29.46)	-49.48 (50.74)	-42.59 (32.09)	-51.44 (44.22)	-42.47 (29.63)
Male household head	-54.69 (33.58)	-61.43 (35.61)+	-55.48 (33.57)+	-12.93 (54.47)	-53.60 (33.70)	4.73 (62.44)	-61.43 (35.61)	-12.89 (54.44)	-54.37 (33.69)
Age of the household head	0.85 (1.08)	0.82 (1.16)	0.86 (1.08)	-1.23 (1.84)	0.80 (1.09)	-0.94 (2.07)	0.82 (1.16)	-1.22 (1.83)	0.82 (1.08)
Education attainment of the household head									
Secondary ecudation	-3.10 (32.95)	-6.82 (34.86)	-3.18 (32.91)	-61.41 (50.33)	-4.77 (33.02)	-78.75 (56.18)	-6.82 (34.86)	-61.89 (50.29)	-4.88 (32.98)
Tertiary education	13.07 (41.58)	11.88 (44.05)	15.11 (41.48)	-46.56 (67.58)	11.53 (41.74)	-47.89 (75.97)	11.88 (44.05)	-45.74 (67.47)	13.53 (41.64)
Household income									
Income without remittances	-10.36 (17.05)	-	-	-17.70 (23.88)	-10.61 (17.07)	-	-	-	-
Logarithm of income without remittances	-	-16.89 (13.75)	-	-	-	-24.79 (20.64)	-16.89 (13.75)	-	-
Wage income	-	-	-28.00 (17.39)	-	-	-	-	-31.23 (24.36)	-28.15 (17.88)
Constant	222.26 (80.71)**	325.42 (103.97)**	217.99 (80.65)**	417.03 (131.63)**	227.05 (81.10)**	540.47 (168.05)**	325.42 (103.97)**	411.81 (131.58)**	222.76 (81.05)**
Observation	2828	2674	2828	2828	2828	2674	2674	2828	2828
R-sq.	0.0052	0.0063	0.006	0.0012	0.0084	0.0016	0.0096	0.0018	0.0092
F	2.65**	2.88**	2.90**	1.71	-	1.84+	-	1.86+	-
					Wald chi-2 23.40**		Wald chi-2 25.96**		Wald chi-2 25.66**
				Hausman test Chi2(7)=10.18, Prob>Chi2=0.179		Hausman test Chi2(7)=10.76, Prob>Chi2=0.149		Hausman test Chi2(7)=9.86, Prob>Chi2=0.197	

Note: \*\*: significant at 1% level, \* : at 5% level, + : at 10% level. Standard deviation is shown in the parenthesis  
Source: The authors estimation from TLSS2007 and TLSS2009.

Table 8 Determinants of Migrants Sending

Explaining variables	1. Pooling logit			2. Panel logit					
	1A-1	1A-2	1A-3	2B-1Fixed e.	2B-2 Random e.	2C-1Fixed e.	2C-2 Random e.	2D-1Fixed e.	2D-2 Random e.
Location									
Dushanbe	-0.63 (0.18)**	-0.53 (0.13)**	-0.56 (0.12)**	-	-0.74 (0.22)**	-	-0.64 (0.16)**	-	-0.69 (0.16)**
Urban	-0.54 (0.12)**	-0.82 (0.19)**	-0.64 (0.18)**	-	-0.66 (0.16)**	-	-0.95 (0.23)**	-	-0.76 (0.23)**
Household characteristics									
Number of household members	0.04 (0.02)**	0.05 (0.016)**	0.04 (0.015)*	0.08 (0.035)*	0.06 (0.020)**	0.06 (0.036)	0.06 (0.02)**	0.07 (0.035)*	0.05 (0.019)*
Household head-employee	-0.68 (0.10)**	-0.57 (0.11)**	-0.73 (0.11)**	-0.71 (0.18)**	-0.83 (0.13)**	-0.61 (0.19)**	-0.69 (0.14)**	-0.77 (0.18)**	0.89 (0.13)**
Male household head	-0.04 (0.12)	-0.06 (0.13)	-0.03 (0.12)	-0.23 (0.23)	-0.07 (0.15)	-0.22 (0.25)	-0.09 (0.16)	-0.22 (0.24)	-0.06 (0.15)
Age of the household head	-0.01 (0.004)**	-0.01 (0.0042)*	-0.01 (0.0039)**	-0.02 (0.008)*	-0.02 (0.0050)**	-0.02 (0.0089)+	-0.01 (0.0051)**	-0.02 (0.0084)*	-0.02 (0.0049)**
Education attainment of the household head									
Secondary education	0.08 (0.12)	0.07 (0.12)	0.09 (0.12)	-0.10 (0.20)	0.06 (0.14)	-0.17 (0.21)	0.04 (0.15)	-0.10 (0.201)	0.07 (0.14)
Tertiary education	-0.20 (0.15)	-0.18 (0.16)	-0.20 (0.15)	-0.46 (0.28)	-0.28 (0.19)	-0.39 (0.31)	-0.25 (0.19)	-0.46 (0.28)	-0.29 (0.19)
Household income									
Income without remittances	0.21 (0.059)**	-	-	0.16 (0.09)+	0.25 (0.07)**	-	-	-	-
Logarithm of income without remittances	-	0.12 (0.048)**	-	-	0.21 (0.081)*	-	0.16 (0.058)**	-	-
Wage income	-	-	0.30 (0.06)**	-	-	-	-	0.29 (0.09)**	0.37 (0.08)**
Constant	-0.013 (0.28)	-0.82 (0.37)*	0.0062 (0.28)	-	0.004 (0.35)	-	-0.075 (0.36)	-	0.036 (0.36)
Observations	2828	2674	2828	898	2828	800	2674	898	2828
Pseudo R-square	0.0052	0.053	0.056	-	-	-	-	-	-
Log-likelihood	-1604.41	-1506.06	-1598.06	-294.33	-1579.7	264.73	1485.48	-290.93	-1572.97
chi-2	176.83**	168.93**	189.53**	33.79**	128.55**	25.07**	122.85**	40.58**	136.91**
					Log likelihood		Log likelihood		Log likelihood
					chibar2(01)=49.42**		chibar2(01)=41.16**		chibar2(01)=50.17**
					Hausman test		Hausman test		Hausman test
					Chi2(7)=5.29, Prob>Chi2=0.624		Chi2(7)=3.44, Prob>Chi2=0.841		Chi2(7)=4.53, Prob>Chi2=0.717

Note: \*\*: significant at 1% level; \*: at 5% level; +: at 10% level. Standard deviation is shown in the parenthesis

Source: The authors estimation from TLSS2007 and TLSS2009.