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Determinants of remittances in Central Asia: evidence based on the household budget survey in the Kyrgyz Republic

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Abstract

Remittances play important role for the economy of Central Asian countries. This article uses a unique representative household budget survey from the Asian Development Bank to analyze the determinants of remittances for permanent and seasonal migrants from the Kyrgyz Republic. Empirical investigation using Tobit and OLS with instrumental variables reveals that both groups send remittances for different reasons. Altruism and insurance seem to drive remittances from seasonal migrants, while the positive relations between income, assets and remittances from permanent migrants may be a result of bequest, loan repayment and exchange motives.

1 Introduction

Remittances from international migrants have become increasingly important for development. They form an external source of finance that currently exceeds official development aid, foreign direct and portfolio investments in many developing countries. Official records demonstrate strong growth of remittances during the last decade approaching $328 billion in 2008. Unlike commercial investment flows, remittances are often countercyclical, supplying countries with foreign exchange even in case of crisis and political instabilities[1]. Conditional on the context of the recipient country, remittances have a potential to contribute to economic growth and poverty alleviation through increased consumption, savings and investment (Mansoor and Quileen, 2006; Ratha and Mohapatra, 2007).

The growing magnitude and importance of remittances stimulated high interest in the research community towards identification of the micro (Lucas and Stark, 1985; Poirine 1997, Rapoport and Docquert, 2005) and macro determinants of remittances (Solimano, 2003, Niimi and Ozden, 2006, Adams, 2009; Shahbaz and Amir, 2009). This research helps to understand the role of remittances in household strategies other and provides important information for policy makers (De la Briere et al., 2002). It helps to identify who benefits and looses in the migration process. This has important implications for poverty alleviation and inequality and may induce policy makers to adjust their programs. Knowing the determinants of remittances may also help predicting the responses of remittance flows to changing socio-economic situations abroad and at home. If, for example, migrants remit out of altruism, remittance flows are relatively stable and countercyclical, while remittances sent to invest in the home country are sensitive to rates of return (Bouhga-Hagbe, 2006).

The poorest countries in Central Asia –Kyrgyzstan, Tajikistan and Uzbekistan– are important recipients of remittances. Due to economic reasons both at home and in host countries, the region became a prominent supplier of migrants after 2002. High population pressure in rural areas and lack of employment opportunities pushed people to look for better jobs in oil-rich attractive Russia and Kazakhstan, which experienced high economic growth and demanded labor resources (Mansoor and Quillin, 2006; ADB, 2008a). Remittances were the main channels connecting migrants with their families. According to official records, Tajikistan and Kyrgyzstan were among the top 10 remittance recipients in the world in 2006

[1] According to the World Bank's projection, remittances are expected to fall by 7-9 percent in 2009, but still less than other private and official capital flows (Ratha, Mohapatra and Silwal, 2009).

with 36.2% and 27.4% of GDP respectively[2] (Ratha and Mohapatra, 2007). Insight in the determinants of these flows would clearly be of great value for the local governments and development organizations.

Yet remittance flows to Central Asia have not been researched extensively. Existing studies focus mostly on measuring migration and remittances, their impact on living standards and poverty, and the interrelationships between remittances and the financial sector (Economic Policy Institute, 2005; Olimova and Bosc 2003; Japarov and Ten, 2006; Mansoor and Quillin, 2006; Jones, Black and Skeldon, 2007; Mughal, 2007; ADB, 2008a, 2008b, 2008c).

We, therefore, analyze the micro-determinants of remittances for migrants from the Kyrgyz Republic using data from a regional study on remittances and poverty launched and financed by the Asian Development Bank in 2007. An important characteristic of recent migration in Central Asia is its seasonal character, but there is an anecdotal evidence of a gradual transformation of seasonal into permanent migrants[3]. As both types may have different motives for remitting, we analyze the two remittance flows separately. Although we use data for the Kyrgyz Republic only, the results can be discussed in the regional perspective due to the similarity of migration processes in Central Asia.

The remainder of the paper consists of five main sections. Section 2 describes the theory behind the determinants of remittances. Section 3 briefly covers the magnitude, composition of remittances, and their micro and macro effects based on the ADB study (2008a, 2008b, 2008c). Section 4 focuses on the data description, specification of the model and empirical methodology used. The empirical results are provided and discussed in section 5, followed by conclusions in section 6.

2 Determinants of remittances

The first solid theoretical basis for explaining determinants of remittances was developed by Lucas and Stark (1985). They define two broad motives: altruism and self-interest. Pure altruism and pure self-interest are inadequate to explain variation in remittances, as often the migrant and the family left behind both benefit from migration through implicit contractual arrangements. Motives then combine elements of altruism and self-interest. Examples are exchange motives, (co) insurance, and loan repayment.

[2] Official data on remittances in Uzbekistan is not available.

[3] http://www.shos2009welcome.ru/news/id208/.

Altruism implies that the migrant derives utility both from his own consumption and from the consumption of the remaining members of the household. Altruistic remittances depend positively on migrant income and negatively on household income. Funkhouser (1995) has further developed this idea and enhanced testable predictions. He hypothesizes that altruistic remittances should decrease with the number of other migrants and increase with the earning potential of the migrant. In addition, remittances should increase with the proximity between the migrant and remaining household members, since closer relationship strengthens the importance of household in the migrant's utility. If, for instance, migrant left his spouse and children at home, according to altruism, remittances should be larger. The same logic would lead to a positive relationship between intention to return and remittances.

Self-interest represents the other polar view in Lucas and Stark (1985). They distinguish between three main determinants: aspiration to inherit/bequest motives, investment in assets and their maintenance by the household, and motives to keep good relationships with relatives, social prestige or political power. Under bequest motives, the household rewards the migrant for sending remittances higher than the benchmark in the form of inheritable assets (land, houses, etc). The bequest model predicts that remittances should increase with the assets of the household and income of the migrant. In addition, remittances should decrease with the number of siblings and increase with the age of the household head, according to their effect on the probability of inheriting (Hoddinott, 2004).

A final selfish motive for sending remittances is strategic behavior. This behavior is based on the close relationship between migration and remittances. Skilled migrants usually have higher incentives to leave the country due to larger economic gains. However since their productivity is not observed by employers in host countries, migrants are paid the average salary of the group they are identified with. In these circumstances, skilled migrants try to "pay" unskilled workers to keep them at home. Remittances play this role and should be positively related to education and migrant income (Hagen-Zanker and Siegel, 2007).

Exchange motives combine elements of self-interest and altruism and lead to informal contractual agreements between the migrant and the household left behind. The migrant provides remittances in exchange for services provided by the household (Rapoport and Docquer, 2005). These services may include taking care of the migrant's assets or relatives. The relationship depends on the bargaining power of both parties. Thus, for instance, higher unemployment at home should negatively influence the amount of remittances due to weaker bargaining power of the remaining household members. In contrast, higher wealth of the household increases bargaining power and may lead to larger remittances.

Loan repayment is another form of contractual agreement. The idea resembles that of exchange motives, but includes an intergenerational and social perspective (Rapoport and Docquer, 2005). The family invests in the education or migration of a future migrant to enable finding a better-paid job abroad or in urban areas, and the migrant repays by sending remittances. Poirine (1997) argues that under the loan repayment motive, remittances should not decrease with time. Remittances should depend on the amount of the loan (the cost of education), and they should not be invested.

Finally, the insurance motive implies that migrants enter into coinsurance agreements with the remaining members of their household. This motive is formalized in the New Economics of Labor Migration (Stark, 1991), which hypothesizes that market failures (credit, insurance) in source countries lead to migration to non-correlated labor markets abroad. The migrant supplies remittances in case of negative shocks to the household and receives support in financing costs of migration and/or during unemployment. Coinsurance agreements assume close ties between the migrant and the family. In addition, remittances should be associated with communities that have some infrastructure for the household investment to be effective (Sana and Massey, 2005).

Rapoport and Docquer (2005) predict that under insurance motives the timing of remittances is irregular, while the amount decreases with the expiration of the contract. In line with altruism, lower income or occurrence of shocks should lead to higher remittances at the household level under the insurance motive. If each migrant subscribes the contract with household individually, the number of other migrants would not necessarily have a negative impact on the size of remittances as altruism predicts. This argument is valid, however, only we assume exogeneity of the number of migrants and the recipient's income, which is questionable for households living in a risky environment and facing liquidity constraints (Rapoport and Docquer, 2005:24)

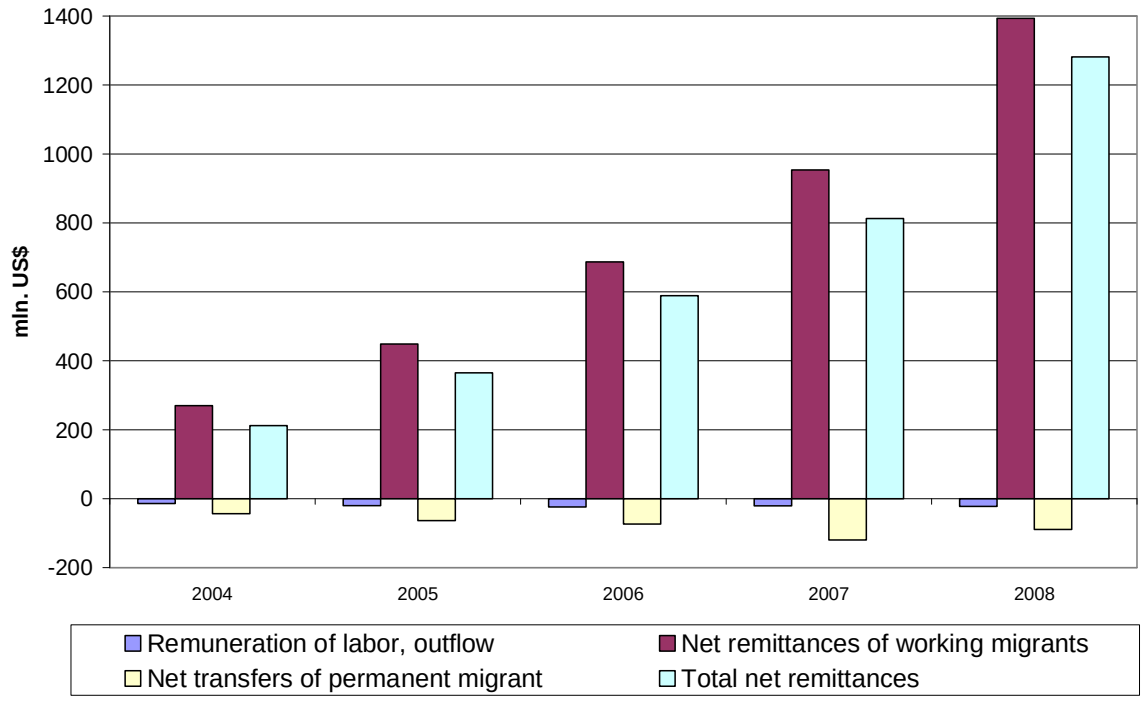
3. Labor migration and remittances in the Kyrgyz Republic

Kyrgyzstan is a small, landlocked mountainous country with a population of about 5.2 million people and a Gross National Income per capita of US$780 (Atlas method). 31.7 % of the population is classified as poor in 2008 (NSC, 2009). The country is predominantly rural with 65% of the population residing in rural areas. Agriculture plays an important role in country's economy and accounted for 32% of GDP in 2006 (ADB, 2009). The Kyrgyz Republic is very heterogeneous in terms of socio-economic development. Due to the collapse of the Soviet mode of agriculture with high subsides from the center, rural areas are characterized by higher poverty and unemployment levels than urban areas (36.8% of poor

among the rural population in 2008). The poorest regions are located in the South, which is densely populated and predominantly rural.

Boosting Russian and Kazakh economies made international labor migration a natural response to economic difficulties at home, and labor migration became an important factor of socio-economic development of the Kyrgyz Republic. The International Organization for Migration estimates that there are more than 350,000 international labor migrants from the Kyrgyz Republic. Official statistics from the National Bank of the Kyrgyz Republic (2009) demonstrate an exponential growth of net remittances flows[4], approaching US$588.9 or 20.8 % of GDP in 2006 and US$1281.4 million or 25.3% of GDP in 2008, which would make remittances the second largest source of foreign currency in the country after the export of goods and services (Figure 1). However, these statistics do not capture informal transfers and involve the risk of misinterpretation of the economic nature of financial transfers. The ADB representative household budget survey provides a considerably lower but still substantial number on the magnitude of remittances for 2006 - USD256.4 million or 9% of GDP, with 12.8% of households receiving remittances from migrants members of households (ADB, 2008a).

Figure 1. Net remittances and their components to the Kyrgyz Republic, mln, USD



[4] This includes remuneration of labor, net remittances of working migrants and net transfers of permanent migrants.

Note: three main flows are based on fifth sources of information: remittances of working migrants consist of cross-border monetary transfers through money transfer companies (MTC), banking accounts and the Kyrgyz Post Office. Remuneration of labor includes salaries of foreign employers of large companies in the Kyrgyz Republic. Transfers of permanent migrants are based on the data from the National Statistical Committee[5] on the number of permanent migrants and estimated value of their property.
Source: NBKR

Analysis of 865 migrants - household members in the ADB survey shows that in 2006 the typical migrant was a young man (16-34) with secondary education from a rural area with high population pressure. Migrants mostly migrated to Russia and Kazakhstan and often found employment in construction or trade. 78% of migrants sent cash remittances, with an average value of US$970 for seasonal and US$1089 for permanent migrants per year. The average size of remittances was higher for heads of household and for people with completed higher education. Years of travelling or staying abroad seems positively related to remittances.

Seasonal migrants, who return home after the working season and include 46% of all migrants in the sample, were more likely to remit than permanent migrants were: 87% of seasonal migrants sent remittances compared to 71% of permanent migrants. On the other hand, seasonal migrants sent less money annually, and the majority of seasonal migrants remitted no longer than one year, while 40% of permanents migrants remitted between one and three years. There was no significant difference between two groups of migrants with regards to marital status, age and gender, but there were more heads of household and rural inhabitants among seasonal migrants. Permanent migrants were better educated: they studied on average seven months longer and a larger share obtained education. The short-term character of work of seasonal migrants is reflected in the main sector of their employment. More than half of seasonal migrants were employed in construction, while only 37% of permanent migrants are employed in this sector.

Permanent and seasonal migrants may have different motives to remit. Althuogh the academic literature does not make the distinction, but we will formulate some hypotheses based on the theoretical overview and the socio-economic characteristics of the migrants.

The majority of seasonal migrants are from rural areas with widespread market imperfections and income volatility. We expect that these households are interested in entering interfamilial (co)-insurance agreements with seasonal migrants who are employed outside agriculture. Migrants insure the remaining household members against drops in rural

[5] From the third quarter of 2005 it is based on estimation by the National Bank of the Kyrgyz Republic.

income, while obtaining assistance in case of economic difficulties abroad. As mentioned by Rapoport and Docquer (2005), these agreements should be self-enforcing, which is possible if there is a sufficient degree of altruism in the family. Therefore, we hypothesize that for seasonal migrants insurance and altruism are important determinants of remittances.

Permanent migrants consist of two groups of people: those who left Kyrgyzstan to change citizenship (like ethnic Russians or Ukrainians) and ethnic Kyrgyz who managed to find permanent well-paid jobs and stay abroad. Since the prevailing number of permanent migrants in our sample stayed abroad less than three years and only 10% are Slavic, the second group is dominant. These migrants may send remittances for several reasons. Firstly, taking into account the age of migrants, bequest motive seem relevant. Secondly, migrants can send remittances to pay household members for taking care of their assets, as the exchange motive predicts. Finally, remittances may be repayment of loan household offered migrants by financing their migration costs.

Based on the conditions and types of migration in the Kyrgyz Republic, insurance, and altruism seem to be the most relevant motives behind remittances from seasonal migrants, while loan repayment, exchange and bequest motives seem to be potential determinants of remittances from permanent migrants. These hypotheses will be checked based on the Kyrgyz data.

4. Data and methodology

This chapter describes general information about the sample, the specification of the regressions and the expected sign of the explanatory variables. Afterwards, empirical methods used for estimation are discussed.

4.1 General information on the sample

The database used for this research was collected in the framework of the regional study on remittances and poverty organized and financed by the Asian Development Bank. The selection of households was conducted on the basis of stratified two-stage random sampling. The target sample was 4200 households, but the actual number was 3997 households divided into three strata: the capital, other urban areas and rural areas proportionally to their share in the total number of household in each category. This procedure resulted in three representative samples at country, rural and urban areas and also allows estimating indicators at the community level.

The survey was conducted in early 2007 based on 207 questions split into 19 sections. The questionnaire covered information about the migrants and their households, such as social-demographic characteristics, the amount of remittances sent, income, expenditure,

savings, living conditions, borrowing, accessibility of health services, and school attendance. Migrants are divided into seasonal and permanent migrants and into members of household and external migrants.

4.2 Specification and variables used

The dependent variable for the empirical model is the sum of cash remittances sent by individual migrants during 2006. The choice for the individual migrant and not the household as a unit of analysis has two advantages. As a substantial number of households has more than one migrant, it increases the number of observations. More importantly, it allows testing of the impact of migrant characteristics on remittances. We ran separate regressions for the sub-samples of seasonal and permanents migrants. This allows testing for differences in motives between seasonal and permanent migrants.

Table 1 contains a description of the explanatory variables and the expected signs of the coefficients in the context of potential motives. Variables are divided into two broad groups of migrant and household characteristics. Migrant characteristics include personal characteristics, information on the migration process and the relationship with the household. Household characteristics include information on assets, income, residence and other migrants in the household.

Table 1. Dependent and explanatory variables, explanation and expected sign of coefficient

	Type of the variables	**Potential motive**
Dependent variable		
	Amount of cash remittances sent home by the migrant during 2006	
Explanatory variables		
Migrant characteristics	*Personal characteristics*	
	Age of the migrant	
	Gender of the migrant, 1 female.	
	Migrant's years of education, years	
	Ethnicity of the migrant, 1 if Slavic.	
	Migration characteristics	
	Dummy for the country of residence of migrant abroad	
	Dummy for employment status	
	Dummy for sector of employment	
	Number of month worked abroad in 2006	
	Duration of stay abroad	**A(-)**
	Relationship with household	

	Migrant is head of the household (yes =1)	**A(+)**
	Migrant is a son (yes = 1)	**B(+)**
	Migrant in registered marriage (yes = 1)	**A(+)**
Household characteristics	Number of other migrants	**A(-), I(?), B(+)**
	Income of the household without remittances	**A(-),I(-), L (+/-)**
	Age of the head of the household	**A(+), B(+)**
	Dummy, if any weddings, funerals or other ritual ceremonies took place in this household in 2006	**A(+), I(+)**
	Total assets	**B(+), E(+)**
	Capital city (yes =1)	**I(-)**
	Rural areas (yes = 1)	**I(+)**

Note: A stands for altruism, B for bequest, E for exchange, I for insurance and L for loan repayment

The altruism motive assumes that a migrant's utility depends positively on the consumption of other household members. This implies a negative relationship between the size of remittances, the size of pre-transfer income and the number of other migrants. Being a head of household should increase remittances because remaining household's members become more vulnerable. The same logic applies to married migrants who left their spouses and children at home. More migrants in the household should decrease remittances since transfers from migrants substitute each other. Finally, if one expects altruism to vanish in time, duration of stay abroad should have negative influence on the size of remittances.

In order to test insurance motives, we used a slightly different set of variables . Similarly to altruism, insurance motives imply negative relationship between the size of remittances and the pre-transfer income of the household. Remittances should also increase in case of sudden income shocks, which can be proxied by ritual ceremonies. In contrast to altruism, remittances should not gradually decrease over time, but rather be irregular with a sharp decline after the end of informal contract between the migrant and his family

Due to similar correlates with of altruism and insurance, it is difficult to distinguish between them. Theoretically, the number of other migrants may help. Insurance-related remittances need not decrease with more migrants as in case of altruism, if we assume that each migrant has a separate individual insurance contract with the household. However, according to Rappoport and Docquer (2005), this logic works only if the number of migrants is exogenous, which is questionable in the context of rural areas in Kyrgyzstan.

Several variables are used to test for bequest motives. Bequest theory predicts a positive relationship between the remittances and the pre-transfer wealth. As sons are

traditionally the inheritors, we add a dummy for migrant - sons. Finally, the age of the head of household is expected to be positively correlated with remittances, since the probability of death and consequently inheritance increases with age.

Unfortunately, we do not have proper variables and data to test the loan repayment and exchange motives. The only available indicator for loan repayment would be a positive relationship between remittances and household income. The idea is that households may invest resources into financing the migration and settlement costs of the migrant. Those who can afford larger sums can also expect larger remittances in return. A positive relationship between the income or wealth of the household and remittances may also indicate the presence of exchange motives. Higher income increases the bargaining power of households, while larger assets may indicate that the migrant has much at stake at home.

The other explanatory variables in the table 1 are used as controls and include household and migrant characteristics that can influence the size of remittances through the earning capacity of the migrant. An important limitation of the existing database is the lack of information on the income of migrants abroad. However, this will be substituted for by information about sector, type of employment, education, age, country of residence and gender.

4.3 Estimation method

Estimating the determinants of remittances requires addressing two econometrics issues. Firstly, not all migrants send remittances, which could bias the results of OLS estimates. Secondly, two of the main independent variables, income and assets, could cause endogeneity problems.

There are two main solutions to the problem of censored remittances. It is possible to use a two-stage Heckman selection procedure, which estimates the decision to remit using a Probit regression (selection equation) and the amount of remittances using corrected OLS (see, for instance Hoddinott, 1994 for Kenya). This method allows separating the determinants of the decisions whether and how much to remit. However, as Hoddinott (1992) notices, theoretically there are no distinctions between these factors. In addition, Kennedy (2003: 291) indicates that the Heckman procedure does not perform well if errors are not normally distributed, the sample is small, the amount of censoring is small, or there is high correlation between explanatory variables in the selection and regression equation. Perhaps more importantly, the procedure does not perform well when the variables in the two equations are identical. This means that to obtain reliable estimates at least one instrument is required for the selection equation and this is often difficult to find. Kennedy (2003: 291)

therefore concludes that the Heckman procedure often does more harm than good, and that subsample OLS is surprisingly efficient.

Alternatively, it is possible to use Tobit regression, which –in contrast to the Heckman selection modeling procedure– assumes identical sign and size of the effect of explanatory variables for the decision to remit and the decision how much to remit, but does not require instruments (see, for instance, Funkhouser, 1995; de la Briere et al., 2002). The Tobit regression has the following form:

$$R_i^* = \beta' X_i + u_i \qquad u_i \approx N(0, \sigma^2)$$

where

$$R_i = \begin{cases} R_i^*, if\ \mathrm{R}^* > 0 \\ 0, otherwise \end{cases}$$

X_i is the set of explanatory variable. R_i^* is latent dependent variable which is observed for values higher than zero, and R_i is actual value of remittances. The model is solved using maximum likelihood estimation techniques. Because there is no reason to assume that the determinants of the probability and the size of remittances are different and because of the difficulty to find instruments for the decision to remit, we use Tobit regression in this paper.

The second econometric issue involves the inclusion of income and assets, which are among the most important variables to discriminate between different motives but are potentially endogenous to the regression. The only available information in the database is income without remittances in 2006 (which include cash income, income from agricultural activities[6], dividends, interests and government transfers) and assets bought before 2006. Still, these variables may be endogenous, since remittances from previous years, which are correlated with 2006 transfers, and even expectation of remittances may have influenced income generating activities and expenditures. In order to solve this problem, we use Tobit regression with instrumental variables. The first instrument is the number of children before the migration. The number of children is a strong predictor of household income and expenditure in Kyrgyzstan (see, for instance Dang and Jha, 2009). The second instrument is years of education of the household head, and finally we use two variables at the community level, namely average distance to infrastructural objects and average hours of access to

[6] Agricultural income includes also own consumption of crops and cattle. Income from hunting, fishing and collecting of mushrooms is also taken into account.

electricity at winter period. Results from ordinary Tobit and OLS with and without IV are presented for comparison.

5 Estimation results

This section covers the results from the four estimation methods (IV-OLS and OLS, IV-Tobit and Tobit) for two different groups of observations: seasonal and permanent migrants[7]. The dependent variable in all models is the size of cash remittances sent by migrant-members of the household in 2006. Table 2 contains results from the empirical models. Full results with first stage regressions and different tests for instruments are also provided in the Annex.

The results confirm our hypothesis that for permanent migrants, altruism and insurance are not important reasons for sending remittances. These motives would lead to negative coefficients for income and assets, as *ceteris paribus* larger remittances would go to poorer people. In contrast, we find significant and positive coefficients in the IV-Tobit regression. Moreover, altruism theory predicts that married migrants send more remittances. We, however, find that married migrants send smaller remittances, even if you control for migrants who brought their spouses with them and include an interaction term between the head of household dummy and the dummy for being married. Finally, the occurrence of ritual events did not have a significant relationship with remittances, which directly questions the insurance motive.

We hypothesized that loan repayment, exchange and bequest motives were potentially important determinants of remittances from permanent migrants. The regressions provide partial support for this hypothesis.

[7] 5 observations with extremely high remittances and income per capita were excluded from the regression.

Table 2. Second stage regressions from IV Tobit and OLS, and results from ordinary the Tobit and OLS[a]

	Permanent migrants				Seasonal migrants			
	IV Tobit	Tobit	IV OLS	OLS	IV Tobit	Tobit	IV OLS	OLS
Migrant characteristics								
Age	7410***	5153***	4849***	3152**	-581.9	-527.2	-263.4	-260.9
	[2144]	[1686]	[1839]	[1453]	[1131]	[1178]	[985.3]	[884.0]
Age squared	-88.57***	-60.74***	-56.99**	-36.69*	4.507	3.73	2.076	1.405
	[28.42]	[22.98]	[23.76]	[18.74]	[14.78]	[16.34]	[13.70]	[11.92]
Dummy, gender, male is base	-4311	-5511	-5674	-6975	-3353	-33.68	-2173	878.9
	[9211]	[7695]	[6991]	[5959]	[6496]	[5336]	[5762]	[4936]
Dummy, in registered marriage	-17993**	-16255***	-14609**	-14278***	5237	4969	4670	4745
	[7268]	[5728]	[5925]	[5397]	[5630]	[4601]	[4463]	[4344]
Years of education	-2748	-286.2	-1772	-72.6	1432	764.4	1336	704.1
	[1803]	[1165]	[1534]	[1071]	[1246]	[962.1]	[1399]	[1162]
Months worked in 2006	4131***	4242***	2098***	2002***	3715***	3885***	3010***	3141***
	[974.5]	[818.7]	[714.6]	[554.5]	[769.5]	[659.2]	[685.9]	[702.2]
Duration of stay abroad	272.8	-1065	1264	607.3	-1619	-431.2	-1308	-175.8
	[2588]	[2333]	[1831]	[1454]	[4840]	[3177]	[5243]	[5039]
Dummy, migrant is Slavic	-7342	1057	-5412	983.2	-20885	-24975**	-21283*	-25901**
	[13315]	[9862]	[11489]	[8359]	[13594]	[11745]	[11675]	[10825]
Dummy, head of household	24665**	23262***	17957**	16121**	12825*	16104***	10654*	13566**
	[9933]	[8095]	[8556]	[7392]	[6671]	[5881]	[6112]	[5723]
Migrant is the son	-6724	-282.3	-7765	-4474	8507	7300	8882	7085
	[9809]	[8188]	[7494]	[5376]	[7297]	[5986]	[8422]	[6158]
Household characteristics								

	Permanent migrants				Seasonal migrants			
	IV Tobit	Tobit	IV OLS	OLS	IV Tobit	Tobit	IV OLS	OLS
Dummy, rural areas	13458	15066*	7312	10558**	4942	5374	4251	4872
	[8199]	[7821]	[6522]	[4853]	[4494]	[4593]	[4345]	[4048]
Age of the head of household	-518.8*	-343.2	-451.2*	-274.7	-151.1	-186.6	-109.6	-134.2
	[295.5]	[217.5]	[261.7]	[184.3]	[160.9]	[176.5]	[136.3]	[134.6]
Dummy, occurrence of ritual events	1992	5274	-1338	1678	8142	6929	8659*	7238*
	[6606]	[6196]	[5768]	[5322]	[5259]	[5087]	[5152]	[4360]
Number of other migrants	5071	-225.6	6108	417	-4585**	-2898	-4341*	-3313**
	[3991]	[2723]	[4512]	[2155]	[1900]	[1919]	[2225]	[1652]
Income per capita without remittances	2.663**	-0.197	2.431	-0.256	-2.202*	-0.591**	-1.743**	-0.417
	[1.358]	[0.313]	[1.501]	[0.242]	[1.146]	[0.264]	[0.867]	[0.312]
Assets	18292**	6670***	11634	6661***	[b]	3300**	-1309	3398*
	[9243]	[2070]	[8862]	[2109]		[1636]	[7899]	[1769]
Sigma		44853***				31137***		
Uncent. R^2/ R^2			0.35	0.22			0.6	0.29
Observations	465	465	465	465	395	395	395	395

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

[a] Intercepts are not reported in this table. Detailed results with first stage regressions are presented in the annex

[b] The variable for assets is excluded from IV-Tobit regression for seasonal migrants, since otherwise it did not converge.

Income per capita without remittances and assets are instrumented using the number of children before migration, years of education of the household head, average distance to infrastructural objects, and average hours of access to electricity at winter period at the community level.

The positive relationships between assets, the number of migrants and remittances support the bequest motive. However, contrary to expectations, the age of the household head had a significant negative effect on remittances. Migrants with aspiration to inherit would presumably demonstrate more loyalty closer to the probable death of the head of household. Moreover, being a son also does not have any significant impact on remittances. In total, bequest motive is thus only partially supported by the data.

Alternatively, the positive relationship between assets, household income and remittances may indicate exchange or loan repayment motives, when the migrant pays the household for taking care of his assets or repays the money to finance his migration costs. Unfortunately, possession of cross-section data does not allow us making any decisive conclusion about these motives and discriminate between them.

In total, there is no clear empirical evidence for one particular motive behind remittances from permanent migrants, but loan repayment, exchange and bequest motives are probable factors influencing the patterns of remittances.

The empirical results provide strong support for our hypothesis that seasonal migrants would send remittances because of altruism and insurance motives. Variables to test altruism and insurance are mostly significant and have expected sign. Instrumented household income per capita without remittances had a significant negative impact on the size of remittances, implying that richer households receive less remittances, which can be an indication of both altruism and insurance motives. Slavic migrants sent significantly less remittances, which is consistent with the idea that weaker family coherence and family ties in Slavic families would result in less altruistic behavior. Also in line with altruism, the number of other migrants has significant negative effect on remittances: their transfers substitute each other. Finally, the occurrence of ritual events had a positive effect on remittances, implying that migrants contributed to household welfare in case of shocks. We find no evidence for other motives. Hence, for seasonal migrants altruism and insurance seem to have been the main motives for sending remittances.

The control variables do not present large surprises. Migrants who worked more months presumably had higher incomes and thus sent more remittances. Gender and education apparently did not affect earning capacity and thus remittances. Migrants mostly worked in trade and construction, which do not require high qualifications. Age affected only remittances of permanent migrants*: ceteris paribus* migrants of the age 42 sent the largest amount of remittances.

In sum, our estimates reveal that remittances from permanent and seasonal migrants are driven by different motives. In case of permanent migrants empirical evidence is blurred, but suggestive of loan repayment, exchange and bequest motives. For seasonal migrants altruism and insurance were identified as main reasons behind remittances.

6 Conclusions

Migration and remittances play and important role in Central Asia. Kyrgyzstan, Tajikistan and Uzbekistan are among the top remittance recipients in the world and the largest suppliers of migrants to Russia and Kazakhstan. While remittances play an important role in the local economy, little is know about the motives of the migrants who send them. Does their money help decreasing poverty? And how will they respond to changing economic situations? This paper therefore analyzes the micro determinants of remittances from the Kyrgyz Republic based on the representative household budget survey collected by the Asian Development Bank.

We test five different motives using both migrant and household characteristics for seasonal and permanent migrants separately. Individual cash remittances sent in 2006 were analyzed using instrumental Tobit and OLS, where endogenous household income per capita without remittances and assets, were instrumented by the number of children before the migration, years of education of the head of household, average distance to infrastructural objects and average hours of access to electricity at winter period at the community level.

The analysis reveals that for permanent migrants neither altruism nor insurance were driving forces, because wealthier households got higher remittances, married migrants were found to remit less, and remittances were not connected with the occurrence of ritual events. In line with the bequest motive, household assets and the number of migrants were positively related to remittances. Yet several other variables did not fully confirm this: In contrast to predictions of bequest motives, remittances were decreasing with the age of the head of household. The positive association between household income per capita, assets and remittances may also indicate the existence of other motives, such as loan repayment or exchange, but longitudinal data is needed to test explicitly for these motives and to discriminate between them.

The estimates reveal that, contrasting the results for permanent migrants, altruism and insurance were the most probable determinants of remittances for seasonal migrants. Wealthier household received lower remittances, which supports both altruism and insurance motives. More migrants in the household decreased the size of remittances, which is consistent with altruism. Finally, the positive association of the occurrence of ritual events

and remittances is indicative of insurance motives. We found no evidence of other remittance motives for seasonal migrants.

Differences in the motives among permanent and seasonal migrants may lead to different socio-economic effects. Remittances from seasonal migrants are driven by altruism and can thus be expected to benefit the poor and decrease income inequality in rural areas. Moreover, the insurance motive may make them countercyclical. Remittances from permanent migrants are more driven by bequest and loan repayment motives. They may thus have the opposite effects and be more beneficial for wealthier households.

The current economic crisis has worsened the economic situation both at home and abroad and can thus adversely affect remittances from seasonal and permanent migrants. Yet we expect that remittances from seasonal migrants will be less affected as they are guided by altruism and insurance motives. If, as anecdotic evidence suggests, seasonal migrants transform into permanent ones, the amount, frequency and stability of remittance flows, could change, which will affect the socio-economic situation in their home countries. Policy makers in Central Asia should then take these changes into account. These hypotheses, however, require further research and testing.

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Annex

Table A1. First stage regressions results

	Permanent migrants				Seasonal migrants		
	IV Tobit		IVOLS		IV Tobit	IVOLS	
Variables	Income per capita without remittances	Assets	Income per capita without remittances	Assets	Income per capita without remittances	Income per capita without remittances	Assets
Dummy, migrant is of Slavic ethnicity	1105	0.23	1106	0.23	1376	1466	0.482
	[2356]	[0.224]	[2671[	[0.224]	[3661]	[4012]	0.333
Dummy, rural areas	2407**	-0.241	2412**	-0.24	368.8	446	-0.068
	[1019]	[0.156]	[1179]	[0.156]	[699.9]	[853]	0.197
Dummy, Bishkek	5448**	-0.796***	5431**	-0.797***	2767	2874	-0.107
	[2444]	[0.280]	[2815]	[0.280]	[3426]	[4067]	0.384
Age of the migrant	-275.6	-0.0655*	-274.6	-0.0654*	93.86	92	0.026
	[271.5]	[0.0383]	[286]	[0.0383]	[296.0]	[322]	0.039
Dummy, gender of migrant, male is base	-905.5	-0.0199	-906.2	-0.02	-1873	-1871	-0.189
	[1246]	[0.167]	[1229]	[0.167]	[1345]	[1377]	0.17
Dummy, in registered marriage	-23.12	0.206	-17.19	0.207	1090	1104	-0.078
	[900.0]	[0.141]	[937]	[0.141]	[1031]	[1140]	0.143
Years education, migrant	286.3	0.0770***	287.1	0.0771***	219.7	227	0.035
	[178.7]	[0.0271]	[195]	[0.0271]	[213.2]	[244]	0.031
Month worked in 2006	-108.9	0.0296*	-109.2	0.0296	-143.7	-143	0.006
	[117.4]	[0.0178]	[129]	[0.0178]	[116.1]	[126]]	0.024
Duration of stay abroad/ visits	-141.6	-0.0833	-141.5	-0.0833	-515.4	-509	-0.094
	[296.8]	[0.0535]	[339]	[0.0535]	[583.6]	[647]	0.133
Age of the head of household	69.6	0.00447	69.5	0.00446	28.11	25	0.001
	[43.11]	[0.00509]	[50]	[0.00509]	[31.65]	[36]	0.007
Dummy, head of household	-1230	0.0806	-1229	0.0807	-1585	-1557	-0.125
	[1263]	[0.198]	[1299]	[0.198]	[1283]	[1340]	0.205
Migrant is son	-283	0.352*	-286.1	0.352*	-400.1	-344	0.329*
	[1516]	[0.181]	[1545]	[0.181]	[1576]	[1588]	0.201
Age squared	2.665	0.000871*	2.649	0.00087*	-1.954	-2	0

	Permanent migrants				Seasonal migrants		
	IV Tobit		IVOLS		IV Tobit	IVOLS	
Variables	Income per capita without remittances	Assets	Income per capita without remittances	Assets	Income per capita without remittances	Income per capita without remittances	Assets
	[3.734]	[0.000524]	[3.90]	[0.000524]	[4.150]	[4]	0.001
Duration of stay abroad/ visits squared	-13.22	0.00528*	-13.21	0.00529*	-24.27	-27	0.003
	[14.94]	[0.00289]	[16]	[0.00289]	[95.19]	[111]	0.165
Dummy, occurrence of ritual events	702.6	-0.0156	707.5	-0.0151	886.3	860	0.02
	[786.6]	[0.143]	[997]	[0.143]	[831.0]	[1023]	0.163
Number of other migrants	-2252***	0.105*	-2253***	0.105	-1583***	-1582***	0.199**
	[361.5]	[0.0556]	[508]	[0.0556]	[277.6]	[348]	0.084
Children before migration	0.0038		-900.6***	0.0038	-1218***	-1225***	-0.064
	[0.0483]		[256]	[0.0483]	[247.7]	[309]	0.061
Years of education of the household head	0.0698***		183.4	0.0695***	97.02	70	0.0541**
	[0.0195]		[139.1]	[0.0195]	[114.8]	[142]	0.027
Hours access to electricity, winter	-0.0145		205.2*	-0.0147	205.6***	228.8***	0.003
	[0.0138]		[123]	[0.0138]	[76.30]	[91]	0.017
Average distance to infrastructure	-0.0148**		-24.49	-0.0149**	133.3	125	-0.0192*
	[0.00642]		[49]	[0.00642]	[98.01]	[112]	0.012
Constant	6751	2.984***	6839	2.982***	8291	8184	1.018
	[6387]	[0.822]	[6975]	[0.822]	[6798]	[7590]	1.127
N	465	465	465	465	395	395	395
Test of excluded instruments, F(prob)			4.76(0.001)	3.51(0.008)		5.46(0.0003)	2.12(0.078)
Hansen J statistic, chi2(prob)			0.095(0.95)			1.36(0.50)	

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

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