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Remittances and welfare in Tajikistan

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Abstract: In many developing countries, migration and remittances have become an important option for households facing poverty, unemployment and lack of opportunities. This raises the question of how effective this strategy is in improving welfare in countries sending migrants abroad and receiving remittances back. Of particular interest is the case of countries that have become highly dependent on the remittance income. Among them, Tajikistan registered the highest percentage of received remittances on the Gross Domestic Product in 2009, about 35%. This paper thus focuses on the evaluation of the remittance effect on three welfare indicators for Tajikistan in 2007: poverty, inequality, and schooling. This is done by estimating a contrafactual consumption aggregate for households in the hypothetical case they stop receiving remittances and re-calculating the poverty and inequality indicators. The effect of remittances on schooling is evaluated by estimating how receiving remittances in the household affect the probability of a child to be enrolled at school. The results point to a positive relationship between remittances and poverty reduction, but also a relationship with an increase in inequality. Remittances are found to be related to an increase in the likelihood of children aged 7 to 15 years to be enrolled at school, with a stronger effect for girls.

Keywords: remittances, poverty, inequality, school enrollment, Tajikistan

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1. INTRODUCTION

In many developing countries, internal and external migration has become an important option for people facing poverty, unemployment and lack of opportunities. For the families left behind, remittances sent back represents an important flow of financial resources that help them to deal with harsh economic conditions, lack of access to capital markets and negative shocks in their lives. The estimations of the World Bank show that for the year 2010 around 3.2% of the world population have taken the decision of living outside of their country of birth (about 215.9 million people), and the inward remittances to developing countries were around 325.5 billion US$[1].

Migration and remittances have called the attention of numerous authors dating back to several decades ago. The initial literature about the effect of migration and remittances on development, however, had a somewhat pessimistic view, as it was concerned with the reduction of the labor supply in countries with migratory outflows, a predominant non-productive use of the remittances, the development of remittance dependency, and the "brain drain" from developing countries. Nevertheless, more recent literature has a more optimistic view, as it has been argued the possibility of a "brain gain", and remittances are now considered to possible have positive short-run and long-run effects, as they might contribute to poverty reduction and facilitate household investments in human and physical capital[2].

This more recent literature recognizes that the effect of remittances depends on the specific conditions of the country or region under analysis. Thus, specific country case analysis is necessary to discern the effect of remittances on the welfare of the population. It is precisely in that direction this research seeks to contribute, with the assessment of the migration and remittances effects on the welfare of the population of a developing country, Tajikistan.

This former Soviet republic in Central Asia offers an excellent opportunity for such research since its economy is highly dependent on remittances, and the country has experienced important advances in poverty reduction and schooling coverage. Officially recorded remittances had soared from 17.9 Million USD in 2002 to 1,748 Million USD in 2009. In terms of the GDP, remittances represented 9.4% of the GDP in 2002, but seven years later, in 2009, they were up to 35%, the highest proportion in the world in that year[3]. On the side of household's welfare,

[1] The World Bank, (2011)
[2] See De Hass (2005) for a review of the migration and remittances "myths and facts"
[3] The World Bank, (2011)

poverty levels experienced a sharp decline from 96% in 1999 to 47.2% in 2007, and secondary school enrollment have increased, from 74% in 1999 to 84% in 2009[4]

Such figures raise the question if the increase of remittances is indeed associated with the poverty reduction, the schooling increase, and in general with welfare improvements in Tajikistan. Shading some light on that question is precisely the overall objective of this research. Since remittances might affect multiple dimensions of welfare, the research needs to focus on some key aspects. Among all the possible dimensions, three are selected: poverty levels, income inequality, and education. Poverty is chosen since remittances, which constitute an income transfer to the household, is expected to exert a more or less direct impact on income and consumption levels. Nevertheless, since remittances are not necessarily received by low-income households, they might, in fact, increase inequality in the country. Thus, their effect on income inequality needs to be examined. Finally, remittances, by allowing young household members to attend school and possibly reaching higher levels of education, might affect their quality of life as well as their ability to take advantage of future income opportunities (and hence having enduring effect on the development process of the economy).

More formally, the question this paper tries to answer is: What has been the impact on poverty, inequality and human capital accumulation of migrant workers remittances in Tajikistan? Certainly, previous research has explored the effect of remittances on poverty and schooling in the country. Nonetheless, some methodological limitations prevented such research to yield a consistent evaluation of the effect of remittances. For instance, poverty levels without remittances have been estimated without considering an alternative source of income for the households. This procedure is likely to overestimate the effect of remittances on poverty since households probably would have looked for an alternative source of income if they had not resorted to migration and remittances. This paper seeks to contribute to the assessment of the effect of remittances on poverty in Tajikistan by addressing this issue. Generally speaking it will use available personal and labor information of migrants to construct a hypothetical consumption aggregate in the case the migrants stop remitting and reincorporate to their households, simulating in this form how much the household consumption would have been without remittances.

The paper also tries to contribute to the evaluation of the effect of remittances on school enrollment by overcoming some limitations in the previous literature. The problems, in this case, are more subtle as they are related to the specification of econometric models. However, possible

[4] The World Bank (2012)

inconsistencies are promptly recognized. For instance, despite girls in Tajikistan have an enrollment rate around 40% lower than boys in secondary school, a previous study found that girls with similar individual characteristics, and living in similar households than boys, have actually higher probabilities to be enrolled at school[5]. Although possible, such result immediately calls for a revision of the estimation.

A new contribution made by this paper is the evaluation of the effect of remittances on inequality on Tajikistan. During the revision of previous literature, no specific paper dealing with the topic was found. This is a rather interesting gap since as, it will be argued in the following sections, the effect of remittances on poverty and schooling depends on the distribution of income (or consumption).

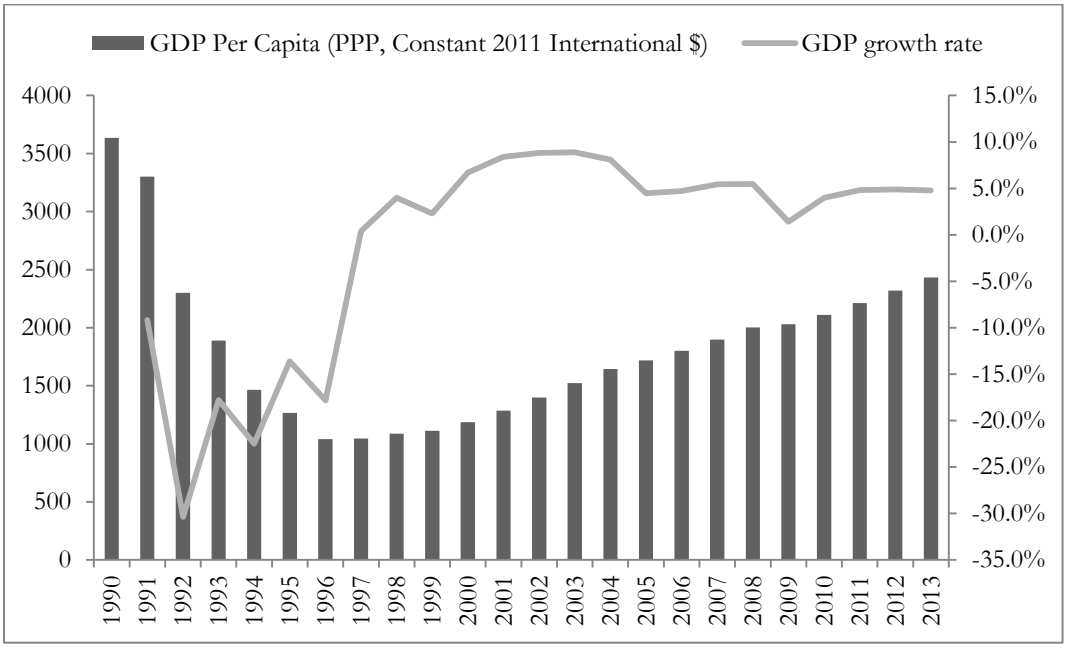
The rest of the paper is structured as follows. Section two gives a general context of Tajikistan, including its recent migratory patterns, as well as recent developments in poverty, inequality and schooling. Section three makes a review of the previous empirical literature on the relationship between remittances, poverty, inequality and schooling. Section four presents a summary of the theoretical framework for the analysis of the effect of remittances on poverty, inequality, and human capital investments. Section five discusses the data and methodology used in this paper. Section seven describes some of the major characteristics of poverty, inequality and schooling in Tajikistan. Section eight presents and discusses the results of the estimation process. It starts with poverty, continues with inequality and finishes with schooling. Section eight concludes.

[5] See Nakamuro, (2010)

2. COUNTRY CONTEXT

The Republic of Tajikistan has the lowest income per capita among the former Soviet Republics and the highest proportion of people living with less than two dollars a day among the Central Asian Republics. Its income per capita, however, has experienced sustained increases after the end of the civil war in 1997, and poverty was reduced from a headcount ratio of 96% in 1999 to 47.2% in 2009.

Chart 1 – GDP and Remittances in Tajikistan



Data source: World Development Indicators (2015)

Administratively, the country is divided into 5 different regions: two provinces, Sughd and Khatlon; the autonomous province of Gorno-Badakhshan (GBO); the Region of Republican Subordination (RRS), and the capital city of Dushanbe.

Accordingly to the national population census of 2010, the population of the country was 7,564,502 people. The Khatlon region has the larger population with 2, 150,136 people, followed by the Suhgd region. Dushanbe, the capital city, is also the biggest city in population terms, with 747,500 inhabitants.

2.1 Migration and Remittances in Tajikistan

Accordingly to Olimova & Bosc (2003) in a report prepared for the International Organization for Migration, Tajikistan, as other ex-Soviet Republics, started to experience important labor emigration after the collapse of the Soviet Union. During the soviet period, emigration consisted mainly of youth migrants pursuing vocational training or higher education in Russia or Ukraine.

During the 1970 and 1980, apart from this student outflow, other Tajiks migrated to participate in construction projects in the URSS, as well as to settle in remote areas of Russia, and to develop gas and oil field in Siberia.

After the break-up of the Soviet Union, Tajikistan experienced a civil war that lasted from 1991 to 1997. The conflict had terrible human consequences and severely affected economic activity. It is estimated that over 50,000 people were killed, and around 1.2 million people become refugees or internally displaced persons[6]. The income per capita contracted to less than one-third of its level in the year previous to the beginning of the war.

To the initial population movement caused by the civil war, further migrations have followed in the post-conflict years. The devastation of the war, and the deterioration of previous important economic activities during the transition to a market economy, caused a harsh economic situation, with high levels of unemployment, low salaries that were usually delayed and widespread poverty.

Olimova & Bosc (2003), after conducting several interviews with migrants and their families, conclude:

> "*Thus the main reasons why Tajiks enter labour markets elsewhere in the CIS[7], particularly in Russia, are the negative conditions they face at home: high levels of unemployment and poverty, especially among youth (30%); the collapse of former sources of employment caused by structural changes; low salaries and disruptions of payment; and social stratification (growing gap between rich and poor)*"

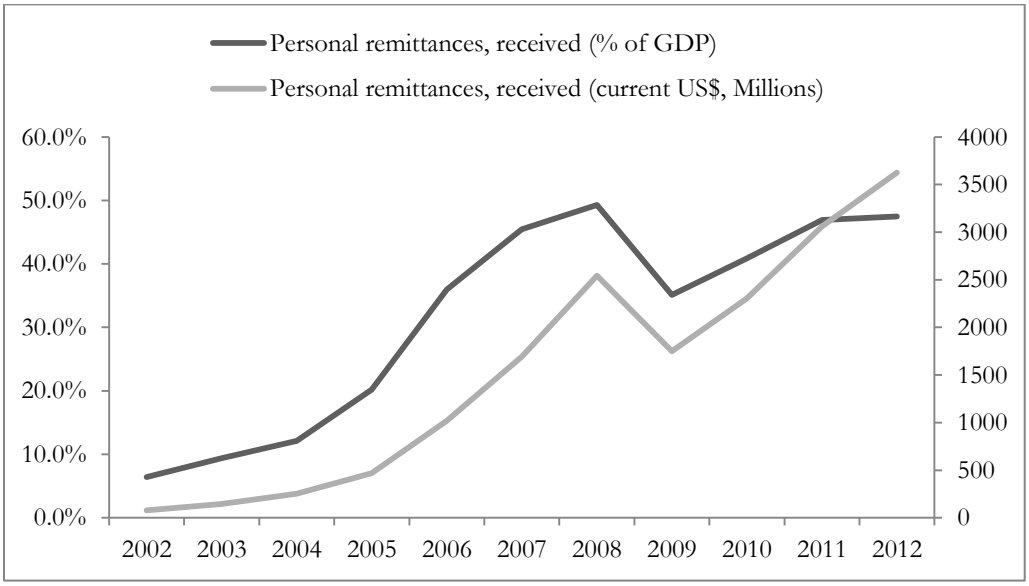
The population structure and high birth rates add to the migration incentives. The average age was 22.8 years old in 2001, and the working-age population (15 to 64 years old) made up to 54.2% of the inhabitants. The majority of the Tajik people lives in rural areas (73.5%), but the mountainous geography of the country makes the most of them live in only 7% of the territory. Relatively young population, living mainly in rural areas in a relatively small portion of the country increases competition for jobs, even though the population growth has diminished in the previous decade (from 3% between 1981 and 1990, to 1.85% between 1991 and 2000, and 2% in 2001)[8]

[6] United Nations (s.f.)
[7] CIS stands for "Commonwealth of Independent States"
[8] Olimova & Bosc (2003)

It is estimated that more than 80% of Tajik labor migrants choose the Russian federation as their destiny[9]. There are several factors explaining this pattern. Suitable job opportunities with a higher salary than in Tajikistan, in an expanding Russian economy, are the main reason. A visa-free regime and the ability to speak Russian are also factors that facilitate the migration process. Also, migrant networks have been established in Russia, in part due to the displacement during the civil war and in part due to previous migration during the soviet period[10].

Most of the migrants send remittances back home. The aggregate estimated figures for officially recorded remittances are presented Chart 2. Probably, the low levels registered in the former years are partially due to the widespread use of informal channels to remit. What is more, prior to 2000, the government charged remittances with a 30% of its nominal value, and even after the suppression of such tax and the ease of the banking transfer produces, many still did not trust the banking system as Olimova & Bosc (2003) pointed out. In any case, by 2008 remittances were equivalent to a 49% the country's GDP. And, although in 2009 the country received a lower amount of remittances, mainly due to the effects of the global economic crisis in Russia, they represented 35% of the GDP, the highest percentage in the world in that year.

Chart 2 - Personal Remittances received in Tajikistan



Source: Data from World Development Indicators, 2015

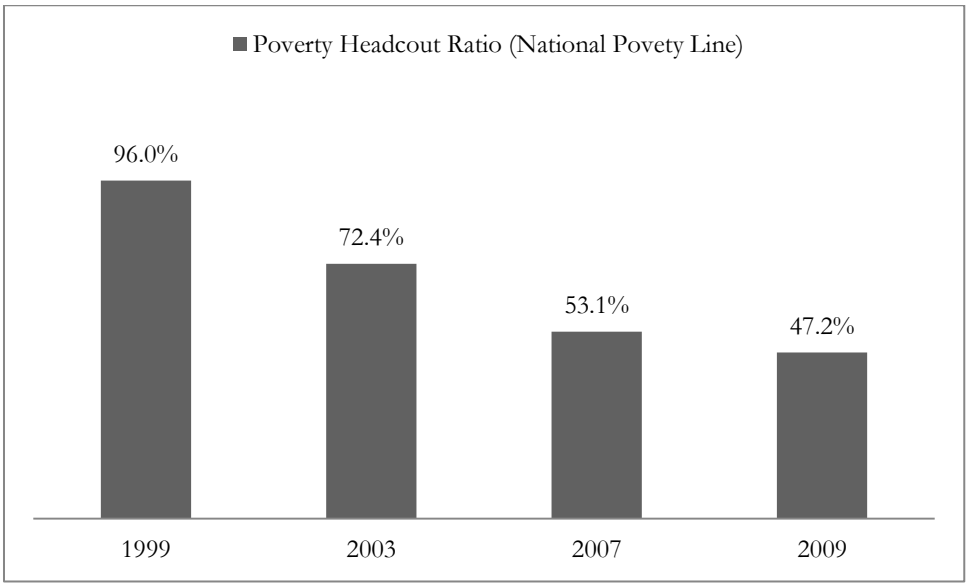
[9] The World Bank (2005)
[10] Olimova & Bosc (2003)

2.2 Poverty and Inequality

The data from the World Bank shows an acute poverty reduction since 1999. In that year, the vast majority of the population, up to 96%, lived under the poverty line. Since then, the proportion of the population living under the poverty has been reduced to 72% in 2003, 53.1% in 2007 and 47.2% in 2009.

Accordingly to the World Bank poverty assessment of 2009, which is based on the Living Standard Survey of 2007, the data suggest a strong correlation between increasing remittances and migration and the observed poverty reduction. Indeed, as can be observed in Chart 2, the volume of remittances in current US$ rose from 146 million in 2002 to 1,690.7 million in 2007. Accordingly to their analysis, remittances account as much as 35% of the household consumption (and even more for the households at the lower end of the consumption distribution). Similarly to other literature, the World Bank conducted simulations in which the amount of remittances declines. Depending on the assumptions made (how many migrants return to the home country and whether or not they are able to find a job), the poverty could increase to 54.8% in the most optimistic scenario, or 59.6% in the worst case. Nevertheless, as with other literature, these simulations do not take into account possible self-selection of the households into migration and remittances[11].

Chart 3 - Poverty in Tajikistan



Source: Data from World Development Indicators, The World Bank

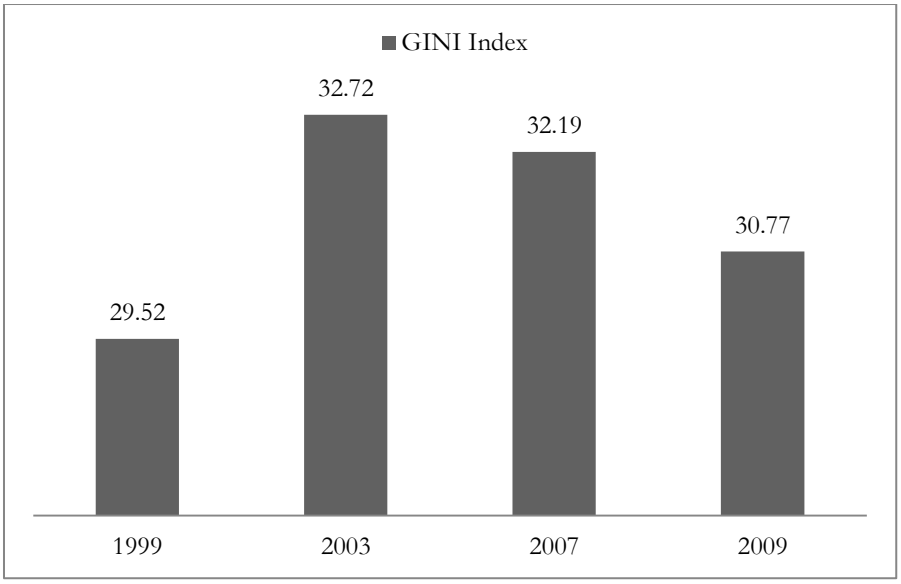
[11] For a discussion of the estimations problems raised by households self-selection into migration and remittances see section 7.2.1

Social protection programs are not well developed in Tajikistan. The social assistance spending accounts only for 5% of the GDP accordingly to the World Bank and it is concentrated in providing old-age pensions, received to one-third of the households. Another social assistance, such as gas or electricity subsidies is received for only 1% of the households.

Inequality, as measured by the Gini Index, however, does not show a clear trend as the headcount ratio. Between 1999 and 2003, when poverty experienced a pronounced decline, inequality was on the rise, with the Gini index growing from 29.52 to 32.72. On 2007, inequality showed a small decrease, with the Gini index at 32.19. A further decrease was registered at 2009. Nevertheless, the inequality levels were still higher than in 1999.

The behavior of the Gini index raises the question if remittances, although probably helping in the reduction of poverty, are also provoking an increase in inequality. This could be the case if remittances are not equally distributed among the population. Even when some poor households receive remittances than allow them escaping poverty, if the majority of the remittances are captured by the middle or high-income households, inequality will increase.

Chart 4 - Inequality in Tajikistan



Source: Data from World Development Indicators, The World Bank

2.3 Schooling

The educational system of Tajikistan consists of four different levels, as can be seen in Table 1. Preschool education; general education, which is subdivided in general primary, general basic (or middle school), and general secondary (or high school); Professional education might follow the completion of general basic education, in the primary and secondary levels. Access to higher

education might be granted after the completion of secondary education (either general or professional).

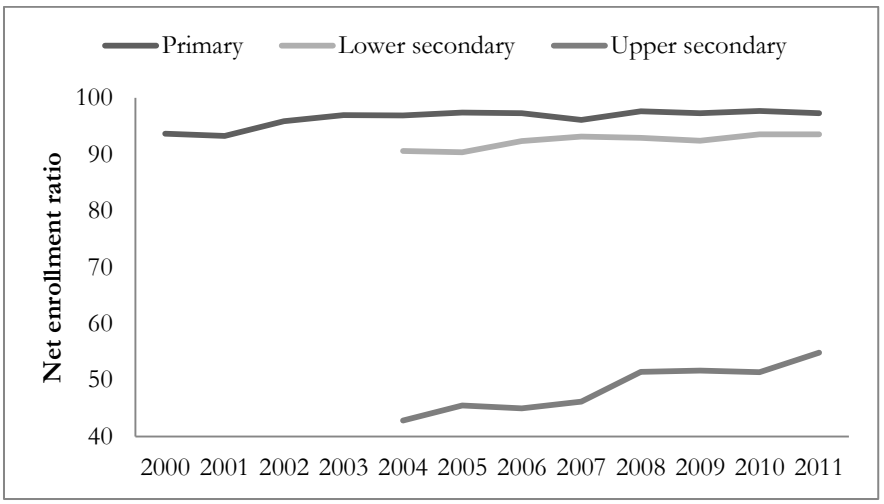
Table 1 - Levels of education in Tajikistan

Levels of Education	Duration of studies	Age	Educational Institutions
Pre-school training and education	1-3, 3-6	1-6(7)	Kindergarten/nursery
General education	11 years	7-18	General education schools, gymnasiums, lyceums
• **Primary**	4 years	7-11	
• **General basic**	5 years	11-16	
• **General secondary**	2 years	16-18	
Professional education			Vocational schools, centers, technical colleges, colleges, special secondary schools, Universities, academies, institutes
• **Primary**	1-4 years	From age 16	
• **Secondary**	2-4 years	From age 16	
• **higher**	4-6 years	*	
Post-diploma education			Master courses, post-graduate courses, doctorate courses
Additional (extra education)			**

* is conducted on the basis of general secondary, primary and secondary professional education
** is conducted in regular schools of general and professional education, outside main educational curricula or in the establishments for additional education (small research academies, palaces, stations, clubs, centers, art and musical schools, etc).
Source: Ministry of Education of the Republic of Tajikistan (2005)

Access to education has increased in the past years. The primary education net enrollment has gone from around 94.5% in the year 2000 to 97.3 in the year of 2011. Basic education (or lower secondary) has also maintained relatively high net enrollment ratios with some growth over the years. Upper secondary, however, still report relatively low enrollment ratios, despite the growth from 42.8% in 2004 to 54.4% in 2011.

Chart 5 - Net Enrollment rates in Tajikistan



Source: Data from UNESCO (2015)

3. RELATED LITERATURE

The following section includes a review of some of the relevant literature dealing with the assessment of the effect of remittances on poverty, inequality and schooling. The objective of the section is not only to offer a summary of the present literature and their results, but also discuss some of the main methodological problems faced by the authors.

3.1 Poverty and Inequality

There are several studies assessing the role of migrant remittances in poverty reduction. Some of these studies explore the subject in a cross-country perspective. For example, Adams Jr. & Page (2005) using a dataset for 71 developing countries find that a 10% increase in the per capita remittances received by a country will decrease its percentage of people living in poverty by an average of 3.5%. Most of the literature, however, focuses on case studies of countries with a high percentage of migrant workers and which economies are highly dependent on their remittances. Among this literature, it is possible to find papers about Guatemala, Mexico, El Salvador, Bangladesh, Nigeria, Ethiopia, among others.

Since Tajikistan is one of those countries whose economy is highly dependent on migrant remittances, it is not strange to find at least one paper evaluating the effect of remittances on poverty. Betti & Lundgren (2012) do these by using data from the "Migration, Remittances and Poverty Survey" [12] collected by the Tajik State Statistical Office in 2009. As their main finding, they argue that without remittances poverty incidence will rise from 55% of the population to 82% or 85%, depending upon the assumed scenario.

To reach the previous conclusion, Betti & Lundgren (2012) apparently assumed that the income coming from the remittances is exogenous (i.e. independent of the characteristics of the households). Then, in the first scenario they simply reduce remittances from the household income and re-estimate the headcount ratio. In the second scenario, migrants are assumed to return to the household. This adds one or more members to each remittance-receiving household, which in most of the cases is a poor household or became poor due to the lack of remittances. Apparently no alternative income source is assumed. Once again, the headcount ratio is re-estimated.

[12] This was a sampling-adaptative survey (based on the Tajik Integrated Household Budget Survey) aimed to secure information of houses with migrants. However it has the disadvantage (recognized by the authors) that it is not necessary representative of the whole country, due to the fact that areas with frequent migration are over-represented See pag. 396 in Betti & Lundgren (2012).

However, the previous results are not likely to provide an unbiased estimate of the effect of migrant remittances on income and poverty levels. First, the construction of the contrafactual scenario (what would have been the income of the income remittances-receiving household in the case no family member had migrated and remitted?) does not consider possible income generated by the returned members. Second, as explained by Beyene (2014), income from remittances is not likely to be exogenous. The characteristics of the individuals and households are likely to affect the decision to migrate and the status of the household as a remittance recipient. This implies that not all individuals have the same probability to migrate and remit, and not all the household have the same probability to receive remittances. For instance, more educated individuals might be more willing to migrate, but also receive a higher salary if they stay in the home country. Hence, just adding or subtracting remittance to the household income and then re-estimating the poverty levels will not give a reliable result for the impact of remittances on poverty.

In order to deal with this issue of household and individual self-selection into migration and remittances Beyene (2014) uses a two-stage Heckman selection method in his paper on the effects of remittances on poverty and inequality in Ethiopia. The first stage consists in a probit model for the probability of a household of no receiving remittances. The second stage uses information from the first stage to estimate a consumption equation for the remittance recipient households only. This equation is then used to compute the consumption in the no-remittances contrafactual scenario[13].

Beyene (2014) results, which are based on data from an household survey collected in the capital city of Ethiopia, Addis Ababa during 2004, show a poverty reduction effect of remittances of three percentage points in the headcount ratio (from an observed 38% to a contrafactual scenario of 41%). The author also estimated the effects on inequality. In order to do this, he calculated Gini indexes using consumption per capita for the observed and contrafactual scenario. Nevertheless, no reduction or increase in the Gini index was found.

Limitations of the data regarding migrants' characteristics forced Beyene to make the assumption that returnee migrants have no employment and count with secondary education. These assumptions, however, are likely to underestimate the consumption levels of those households with hypothetical returnee migrants, and hence overestimate the effect of remittances on poverty.

[13] Beyene (2014, p. 1383)

As with the impact of remittances on poverty, the impact on inequality might differ from country to country. Differently to Beyene, Acevedo & Cabrera (2014) argue that the decreasing inequality in El Salvador between the years of 1994 and 2009, it is mainly due to the remittances that increased the income of the bottom half and migration of highly skilled individuals that reduced the skill premium.

However, no specific study relating migrant remittances and income inequality was found for Tajikistan.

3.2 Human Capital

Previous literature on the effect of remittances and migration on households' human capital investment have reached different conclusions: some have found a positive effect on school enrollment and attainment, whereas others have found a negative or null effect. The studies differ in their methodology, making difficult to directly compare or generalize their results.

An influential paper that finds a positive effect of remittances on school attendance is that of Cox-Edwards & Ureta (2003) for El Salvador. The authors used household survey data for 1997 and the Cox proportional hazard model to estimate the effect of different household characteristics over the hazard of dropping school, including income from remittances. The main results show that if a household receives the median remittance, the hazard that a child drops the school is lowered between 24% and 54%

Nevertheless, not considering the possible endogeneity of the remittances is an important limitation in the paper. For instance, if households receiving remittances systematically differ in unobservable characteristics that are positively correlated with remittances and school attendance, the estimated effect of the remittances over school attendance would be biased upwards. In order to deal with this problem, Acosta (2006) uses instrumental variables along with a Probit model as the estimation method. He reaches different results for El Salvador in 1998: children aged 11 to 14 years old in household receiving remittance are more likely to be enrolled in school than their peers from non-receiving household; however, there is no significant effect for children ages 15 to 17.

McKenzie & Rapoport (2006) argue that, since school attendance does not take into account possible grade repetition, delays in starting schooling, or catch-ups, a preferable dependent variable would be school attainment (as in completed years of education). Using a "Instrumental Variable - Censored Ordered Probit" model these authors find a negative, and in general statistically significant, effect of living in a migrant household over school attainment for children

aged 12 to 18 years in rural Mexico, although the specific effect depends on the educational level, age, and sex. Negative effects are also found in school attendance.

There is one paper dealing with remittances, migration, and human capital investment in Tajikistan in 2003. Similarly to previous studies, Nakamuro (2010) uses instrumental variables along with a Probit model as main estimation technique. The results show a positive effect of remittances on the probability that individuals aged 7 to 22 years are enrolled in the school.

However, the estimation method chosen by Nakamuro (2010) is rather inappropriate for the analysis of the effect of receiving remittances over school enrollment. In short, the estimation of an "IV probit" needs the assumption of a continuous endogenous regressor in order to yield consistent results. Obviously, when the endogenous regressor is a categorical variable taking the value of one when the household receives remittances and zero otherwise, this assumption is violated[14].

There is at least other problem with the estimations of Nakamuro. He incorporates the observable income of the household as a determinant of children's school enrollment. This would not be a problem if the interest were other than establishing the effect of remittances on school enrollment. Remittances are indeed a source of extra income for the household, which is incorporated in the observable income. But, if one is interested in how enrollment would be for a household that receives remittances in the hypothetical case of not receiving any remittances, the observable income is no longer an accurate measure of the earnings of the household.

4. THEORETICAL FRAMEWORK

Although the main objective of this paper is not to explain migratory or remitting decisions, some words are needed to clarify why these decisions are likely to be affected by the household characteristics, something that was implicit in many of the literature reviewed in the previous section. The "new economics of migration" argues that migration decisions, especially in developing countries, are taken by families or households rather than isolated individuals. In their decisions, households not only attempt to maximize the expected income, but also to reduce risk and constraints associated with market failures. In order to do so, the household is likely to diversify the allocation of its resources, including household labor supply. In that sense,

[14] Angrist & Pischke (2009) call this type of regression "forbidden regressions". See pages 188 to 215 on their book for more details.

individuals in the household might collectively decide to send a member to work in a country in where wages are not correlated with wages in the home country[15].

In principle, remittances constitute an income transfer to households, and as such, the logical effect is an increase in the income and consumption levels of the households. Nevertheless, when it comes to the effect on poverty and income distribution, the remittances impact is not that straightforward. Since migration, especially internationally, is a costly and risky process, it is not necessarily the poorest people who migrate the most. However, non-migrant poor households might be affected indirectly by the economic-wide effect of remittances, such as new employment opportunities[16].

Similarly, the effect of migration and remittances on income distribution depends on the selectivity of the migrants. If migrants come mostly from relatively high-income households, remittances are likely to increase income inequality. On the contrary, if migrants come mostly from relatively low-income households, remittances are likely to decrease income inequality. De Hass (2007), explain that the selectivity of the migrants (and hence the impact of remittances on poverty and income distribution) is closely related to the previous migratory history or experience in the communities. Migration in communities with little previous migratory experience is likely to be undertaken by individuals in relatively wealthy households due to the high cost and risk involved in the migration process. With further experience, migratory networks tend to appear, diminishing the cost and risk of the migration process, and hence making possible for individuals in less wealthy households to migrate.

Other factors affecting the migration selectivity are the destination and type of work. International migration, compared with internal migration, implies a higher cost and thus tends to be undertaken by individuals in wealthier households. Low skilled or undocumented work in the host country is likely to attract a higher proportion of individuals coming from low-income households[17].

The long-run effects of remittances on development are recognized to depend to a large extent in whether remittances are spent on consumption or investment, either physical or human.

At the individual level, the standard human capital theory gives a general framework to understand the possible effect of remittances on schooling. In general terms, Becker (1962) explains that individuals decide to invest in human capital if the present value of the future

[15] Graeme, et al. (1993)
[16] De Hass (2007)
[17] Idem

earnings is higher than the cost incurred. In this computation, the individual weights future earnings, discounted at the appropriate rate, against direct costs of schooling, such as tuition fees, books or transportation, and the forgone earnings, that is what he or she could have earned if he or she were not attending school.

In taking his or her decision, the individual has stronger incentives to invest in human capital the lower the cost of the investment, the longer the period in which the individual can collect its benefits, the larger the returns to education (that is the larger the wage differential between people differencing only by their schooling), and the lower the risk associated with the returns.

A point made by Becker is how difficult obtaining external funding for human capital investments could be for the individual. Even when the rate of return is expected to be positive, it is still uncertain. Possible borrowers are then reluctant to lend financial resources because the very "illiquid" nature of human capital (it cannot be sold as it is embodied in the person), and thus makes a poor collateral. This makes internal funding to be more common, and hence wealthier households are likely to invest more in human capital than poor households.

The "new economics of migration" adds that the household lack of access to capital markets in developing countries is also a reason for the households to send some of their members abroad. With the remittances send back, the household acquire the necessary capital to invest in human or physical capital.

Following a similar way of reasoning, Rapoport & Docquier (2006) present a simple model relating the investment in human capital under liquidity constraints and remittances. Individuals chose not to enroll in educational programs because the cost of the programs is beyond their financial capabilities, and they cannot use credit markets to cover the cost. Nevertheless, if migration to a high-wage country is possible, the resources remitted by the migrants might allow their descendants to access education, increasing their wages in the next period. Moreover, if a large portion of the population becomes educated, wage rates are likely to increase for the whole population.

Additionally, McKenzie & Rapoport (2006) call the attention to the fact that migration might have implications for human capital investment other than the effect of remittances. First, the absence of one household member could translate into less support to children's school activities, or even lead children to involve in labor activities, especially if the remittances received are low or irregular. Second, having a migrant parent might increase the probability that children become migrants themselves, due to networks and information lowering the cost of migration. Third,

depending on how education is economically rewarded in the migration destination, households could choose to invest more or less in children education.

Chart 6 below summarizes the main conclusions of the theoretical framework.

Chart 6 - Expected effect of remittances on inequality, poverty, and schooling

Who receives remittances		
	Middle - High income households	Increase in inequality
		Null or small poverty decrease
		Null or small increase on schooling
	Equally distributed	Null effect on inequality
		Some poverty decrease
		Some increase on schooling
	Middle - Low income households	Decrease in inequality
		Decrease in Poverty
		Increase in schooling

5. METHODOLOGY AND DATA

7.1 Data Source Review

The data of households and individuals characteristics in Tajikistan used in this paper comes from the Tajikistan Living Standards Measurement Survey (TLSMS) of 2007 conducted by the Tajik State Statistical Office with assistance from the World Bank. This survey includes topics of migration, education, labor market, financial services, expenditures, agricultural assets, among others that are thought to be useful to analyze the welfare of the household. The units of analysis in the survey include households and individuals. The sample is representative of the population at the national, regional and urban/rural level. It counts with 4,860 interviews for 2007.

Despite the advantage of the wide spectrum of topics covered by the survey and the country representativeness, as practically every household surveys, the TLSMS 2007 has some limitations. Deaton (1997) explains how the necessity to really on recalled data for measuring consumption and income, rather than direct observations, induce some measurement error, especially for long

recall periods. In households that produce some goods for self-consumption, the price imputation process induce some extra measurement errors for the consumption and income aggregates, a problem that becomes more pervasive in developing countries and rural areas where markets are not well developed. If the household is involved agriculture or a family business, the consumption and income for the family, and the costs and revenues from the business are likely to be confused, inducing even more problems for the estimation of the household consumption and income.

No evaluation of the magnitude of the previous problems was found for the TLSMS. Nevertheless, as explained in the reference documentation of the TLSMS 2007, after two previous surveys in 1999 and 2003, several modifications were made to the questionnaire in order to improve the data collection. A migration module was added for the first time, which collects several characteristics of the absent migrants and previous migration history of the household, the labor market module was redesigned to better look at informal activities, and several food items were added to the food expenditure section. Thus, at least compared with surveys of previous years, the TLSMS 2007 information appears to be more suitable to the objective of this paper.

However, a valuable piece of information about remittances is missed by the TLSMS 2007 questionnaire. Although the questionnaire asks for the previous migratory experience of present members of the households, it does not ask if they used to remit during their time abroad or if they have brought part of their wages back home. The survey only asks for remittances received from migrants currently abroad. Since temporary migration is quite common in Tajikistan, estimation of the proportion of households receiving remittances using only data of migrants abroad at the time of the survey is most likely underestimated. Some of these unreported remittances in the migration module might have been collected in the section regarding other income, as it asks for "donations and gift" made by family members and friend during the past 12 months, but money brought back is not counted in that or any other section.

Fortunately, however, the time in which the survey was made (September to October in the first stage, and October to November for the second stage) does not coincide with the wintertime in the Northern hemisphere in which many temporary migrants return home. This is still no guarantee that every remittance or money brought back home is collected in the survey, but as the percentage of households with migrants and the percentage of households receiving remittances is very similar, it seems that at least the remittances of migrants currently abroad are mostly registered.

Since the poverty line used in this paper was estimated by the World Bank using the same data collected in TLSMS 2007[18], a word is deserved in here. The methodology used for the construction of the poverty line followed the cost of basic need approach. In short, this method requires finding a reference group for which consumption patterns can be drawn, set the required caloric intake per person, give a monetary value for the caloric requirements (this constitutes the value of the food poverty line), and set allowances for non-food consumption (to obtain the complete poverty line).

Although the method is intuitive, the specific poverty line obtained for Tajikistan has some limitations. First, the caloric consumption has been set for an average person in an average household. Thus, it might not be appropriate to evaluate the situation of households with an unusual composition (for instance single adult households). Moreover, if economies of scale in the household size and composition are assumed, the poverty line should be adjusted. Second, the poverty line has no allowance for housing or durable goods expenditures, hence in classifying households above or below the poverty line, its consumption needs to exclude such components as well

7.2 Estimation Method

7.2.1 Poverty and Inequality

When the welfare of individuals or households is the main concern, poverty and inequality are usually measured in terms of income or consumption. Both measures have their advantages and disadvantages. However, for developing countries consumption is commonly preferred, mostly due to practical reasons. As explained by Deaton (1997) consumption estimates are likely to be more accurate than income estimates in developing countries since the measurement problems of recall bias, price imputation or the separation between business and household activities, are less acute for consumption than for income. Haughton & Khandker, (2009) would argue in favor of consumption as a more appropriate measure of welfare than income since the former is less susceptible to pronounce seasonal variations or unexpected shocks. Following this reasons, this paper uses consumption to compute poverty and inequality measures.

Using only observed consumption, however, does not allow for a proper evaluation of the effect of remittances on poverty and inequality, even if measures of poverty and inequality are computed separately for households receiving remittances and households that do not receive

[18] The procedure followed for the construction of the poverty line is described in detail in The World Bank Group (2008)

remittances. The problem is that only the consumption with remittances is observable. But for evaluating the impact of the remittances, the consumption before or without remittances is needed.

Since the data at hand do not contain information about the situation of the households before they started to receive remittances[19], a hypothetical no-remittances consumption aggregate need to be constructed using the available information. Once this hypothetical or contrafactual consumption aggregate is estimated, poverty and inequality measures can be computed using the contrafactual aggregate for households receiving remittances and actual consumption for those households not receiving remittances. This constitutes the contrafactual, or no-remittances scenario, measures of poverty and inequality. Finally, the actual poverty and inequality measures can be compared with the contrafactual, and the difference can be attributed to the change in remittances.

The real challenge to the process explained above is how to estimate the hypothetical no-remittances consumption aggregate. A practical solution is to predict the consumption of a household (or the per capita consumption of the household) as a function of its observable characteristics using regression methods. Intuitively, a regression using Ordinary Less Squares (OLS) will give how much the expected consumption aggregate of a household is, given its observable characteristics. Notice that since the no-remittances consumption is not observable for household receiving remittances, the regression will need to be estimated using information of non-receiving households.

However, in order to give unbiased results, OLS requires, among other conditions, that the unobservable characteristics to be uncorrelated with the observable characteristics included in the regression and/or uncorrelated with the explained variable. It also requires that the estimation sample to be randomly selected (conditional on the included explanatory characteristics). Unfortunately, these two conditions are not likely to hold in the context of households receiving remittances. The main problem is the self-selection of the households into migration and remittances, which yield a non-random sample. Take for instance two households equal in every observable characteristic likely to affect consumption (household composition, employment and education to list a few), but when faced with the possibility of migration, just one of them choose to send a member abroad and receive remittances. Most likely, the household that decided to send a member abroad do so because it expects that its consumption will be higher if remittances

[19] Some of the households visited in the TLSMS 2007 where revisited in 2009, however, the sample is drastically reduced from 4,860 households to 1,500

are received from a migrant, than if the migrant stay in the home country. Perhaps household's members lack the right contacts in the home country or have better information about job opportunities abroad. If variables capturing these characteristics were available, they could be incorporated in the consumption regression to condition the sample. Nevertheless, it is precisely this type of characteristics (motivation, contacts, information, etc.) that are almost never observable.

Therefore, if the hypothetical consumption for the no-remittance case is predicted using OLS with the information available the results would not be consistent because those in the sample (the household that decided not to migrate) are systematically different to those who decided to migrate.

A standard solution for the self-selection problem is to use a Heckman Selection Model[20]. In short, for the case at hand, consumption per capita (in logarithms) is modeled as a function of the observable characteristics (*X*) of the non-receiving households:

$$\log C = X_j\beta + u_{1j} \qquad (1)$$

However, the no-remittance consumption is observable only for those who do not receive remittances. This, selection decision is modeled again as a function of some of the household characteristics.

$$S = 1(\gamma' Z_j + u_{2j}) \qquad (2)$$

Notice that consumption and selection in no-remittances are modeled using observable characteristics of the households in the vectors *X* and *Z*. Unobservable characteristics that are likely to affect consumption or selection are in the error terms *u*. Most likely such unobservable characteristics (such as contacts or motivation) affect both, selection and consumption, making the correlation between the error terms (ρ) different from zero.

$$u_1 \sim N(0, \sigma)$$

$$u_2 \sim N(0,1) \qquad (3)$$

$$corr(u_1, u_2) = \rho$$

[20] Heckman (1979)

Assuming the error terms have a normal distribution with mean zero and variance equal to σ and 1 for u1 and u2 respectively, the conditional expectation of the consumption for the households not receiving remittances can be written as:

$$E\left[\log C \,|X_j, Z_j = 1\right] = X_j\beta + \rho\lambda_j\left(\gamma' Z_j\right) \qquad (4)$$

Where λ is what Heckman referred as the inverse Mill's ratio

$$\lambda_j = \frac{\phi(\hat{\gamma}' Z_j)}{\Phi(\hat{\gamma}' Z_j)} \qquad (5)$$

Where ϕ and Φ are the normal density function and cumulative density function respectively.

Intuitively, including λ shifts the conditional expectation of consumption of those households that decided not to send a migrant abroad and not receive remittances due to unobservable characteristics in the right direction. For instance, assuming that ρ is larger than zero, a household for which consumption is observed, but with a low $\gamma' Zj$ (low probability of not receiving remittances) is likely to have chosen not to send any migrants due to unobservable characteristics, and also it is more likely to have a higher consumption in the sample due to unobservable characteristics. The parameter λ is capturing such effect.

Finally, notice that is probable that the same observable characteristics that affect consumption also affect the selection into no-remittances. However, in order to estimate the model at least one variable needs to be incorporated into the selection equation but not in the consumption equation. Ideally, this variable needs to affect the selection but does not affect the consumption. The instrument used in this paper is the proportion of households in the settlement that has at least one migrant member abroad. The rationality behind this instrument is that settlements with a higher proportion of households with migrants have thicker migratory networks that reduce the cost associated with migration. Household living in such areas are more likely to have sent migrants abroad and to receive remittances. On the other hand, once other observable characteristics have been controlled, living in areas with relatively more households with migratory experience should not affect consumption patterns, other than via the possibility of receiving remittances.

Despite the advantages of this procedure, it still has some limitations. First, the contrafactual consumption aggregate has an artificially lower variance since it comes from the predicted values

of a regression[21]. Therefore, in judging the statistical significance of poverty and inequality indexes constructed with this aggregate, it would be advisable to narrow the confident levels. Second, and most importantly, the general equilibrium effects are missing. That is, households receiving remittances increase the aggregate demand in the economy, which is likely to generate new jobs and increase the income and consumptions of non-migrant families.

7.2.2 Human capital

In evaluating the effect of remittances on households' human capital investments decisions, the methodological problems are slightly simpler than in the case of poverty and migration. The chosen variable to be explained is whether or not a child is enrolled at school. The basic question to be responded then is whether or not a child living in a household that receives remittances is more or less likely to be enrolled at school than other child living in a household that does not receive remittances.

Obviously, characteristics of the child and household, other than the remittance receiver status, affect enrollment. What is more, many of the characteristics that affect enrollment are also likely to affect whether or not the household receives remittances. If all the characteristics were observable, they could be incorporated into a regression model explaining how they affect the probability of a child to be enrolled. Unfortunately, this is almost never the case. This is a classic case of endogeneity problem in one of the explanatory variables. Since remittance status is correlated with some unobservable characteristics, it is not easy to distinguish between its true effect on school enrollment and the effect the unobservable characteristic exert on enrollment via remittance status.

The basic econometric models commonly used when the main interest is to explain how a set variables affect the probability of a certain binary outcome is the Probit, Logit or Linear Probability model. The main difference between the first two and the linear probability model is the introduction of non-linear relationships in the first two, which allow restricting the predicted probabilities between zero and one. This is not to say that the linear probability model is useless. Despite the possibility of predicted probabilities larger than one or lower than zero, it still gives unbiased estimations of the effect of the covariants if the classical OLS assumptions are met. Probit and Logit model differ from each other in the distributional assumptions made. The Probit model assumes probabilities to behave like a normal distribution, whereas the Logit as in logistic distribution.

[21] In order to deal with this issue, a random noise term is added to the predicted consumption aggregate. This component has the variance of the errors of the consumption regression. This method has been also used by Barham & Boucher (1998) , Acosta, et al. (2007) and Beyene (2014)

Nevertheless, none of the previous model by itself will give unbiased results in the presence of an endogenous regressor. To deal with this problem, the standard approach is to use instrumental variables (IV). That is, a variable that is correlated with the endogenous variable, but uncorrelated with the other unobservable characteristics affecting the outcome variable. In short, the IV process breaks the variation of the endogenous regressor in two parts, one correlated with the instrument, and one correlated with the unobservable characteristics; and use only the part related to the instrument in the regression with the outcome variable.

Many of the authors reviewed previously[22] decided to use an instrumental variable approach along with a Probit Model to estimate the effect of migration on school attendance. However, the estimation of a so-called "IV-Probit" assume that the endogenous regressor is continuous, and therefore is not appropriate for a discrete variable as an endogenous regressor, as in the case of the status of the household as a remittance receiver.

To deal with such problem, this paper follows the suggestion of Lewbel, et al. (2012) by estimating two simultaneous Probit equations. The first [is] for the probability of a child to be enrolled at school as a function of the observable individual, household and community characteristics, including the remittance-receiving status of the household. And the second for the probability of the household to receive remittances as function of the same variables used in the first Probit model, plus one exogenous regressor which is assumed not to affect the probability of school enrollment (other than via the remittances status) and hence do not appear in the first model. In short, the model can be written as follows:

$$\Pr(E_j = 1|X_j, R_j) = \Phi(X_j\beta + R_j\gamma) \qquad (6)$$

$$\Pr(R_j = 1|X_j, R_j) = \Phi(X_j\beta + Z_j\delta) \qquad (7)$$

Where *Ej* represents a categorical variable equal to one if the child *j* is enrolled at school, and zero otherwise, *Xj* is a vector of variables representing observable characteristics of the child, household, and community; *Rj* is a categorical variable equal to one if the household receives remittances, and zero otherwise; Zj is an exogenous variable that influence the probability of the household to receive remittances, but do not affect enrollment in another way; and Φ is the standard normal cumulative distribution function.

As with consumption modeling, the instrument is the proportion of the household in the settlement that has at least one migrant member abroad. The logic is also the same. Thicker

[22] Acosta (2006) and Nakamuro (2010), for instance

migrant networks decrease the cost of migration and make more likely that a house decide send some of their members abroad and receive remittances, but on the other hand migrant's networks should not influence the probability of a child to be enrolled at school, other than via the remittance effect.

Notice, however, that if the parents consider the child old enough, migratory networks might affect the likelihood of a child to become a migrant and, therefore, drop out from school. Since, only small portion of the migrants are below 18 years old (1.63%), this does not seem to be a serious problem for children at school age. Nevertheless, in order to minimize this possible threat to the design of the research, the analysis will be focused on children between 7 and 15 years old although some mentions are done for higher ages.

As mentioned before, McKenzie & Rapoport, (2006) pointed that children in households with migrant members might have higher motivation to become migrants and drop out of school, or stayed enrolled if education is rewarded abroad. Nevertheless, this is partially why remittances have an apriori indeterminate effect on education, rather than an effect of the migratory networks outside the household.

7. DESCRIPTIVE STATISTICS

Section two gave a gross picture of the evolution of poverty, inequality and school enrollment in Tajikistan. This section presents some extra figures for the year 2007 directly computed from the TLSMS 2007. It also presents the indices of poverty, inequality, and school enrollment divided accordingly to the remittance receiver status of the household, as directly observed in the TLSMS 2007. These figures will be later useful to guide the discussion of the results in section 8[23].

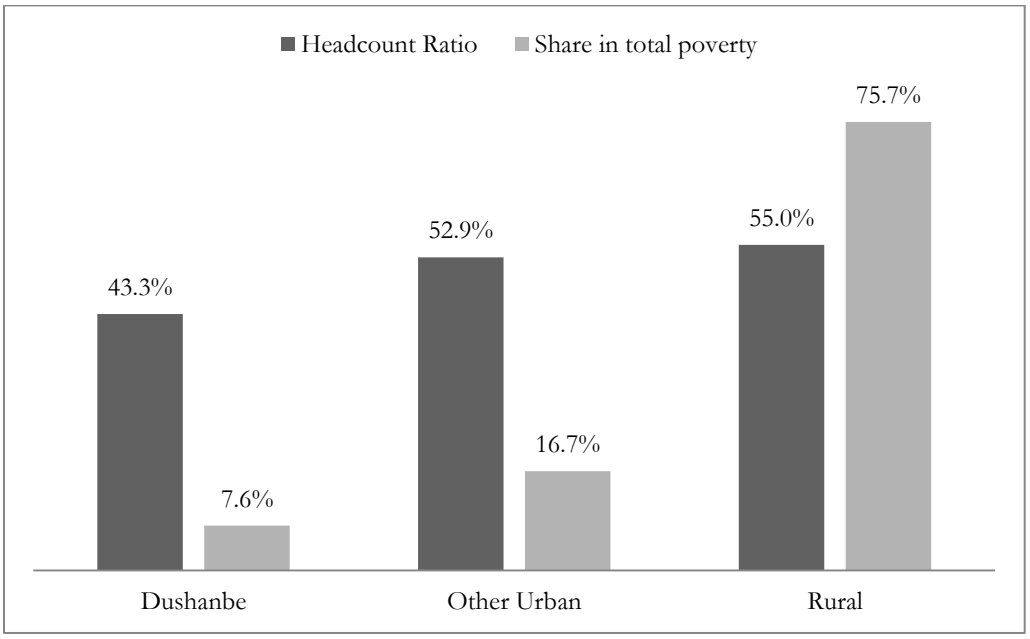
7.1 Poverty

In Tajikistan, rural and urban areas other than the capital city have a similar proportion of people living in poverty, 55%, and 52.9% respectively. Moreover, statistically speaking, it is not possible to reject that the difference between both areas is different from zero[24]. Nevertheless, since the majority of the population (over 70%) lives in rural areas, the number of people living in poverty in such areas account for as much as 75.7% of the total population living in poverty. On the other hand, in the capital city Dushanbe, the headcount ratio is lower, although is still

[23] For a complete poverty profile of Tajikistan in 2007 see The World Bank (2009)
[24] An adjusted Wald test for the difference between both indexes gives a F-statistic of 0.26 with a p-value of 0.6126

considerably high at 43.3%. Thus, it seems then that poverty is not exclusively a problem of rural (or urban) areas.

Chart 7 – Poverty by area



Data source: TLSMS 2007

Regionally speaking, the highest poverty rate is found in Suhgd with 68.8% of its population living under the poverty line. The Districts of Republican Subordination follows Suhgd with 48.8%, then the Khatlon region with 47.3%, the Gorno-Badakhshan Autonomous Region with 43.4% and finally Dushanbe with 43.3%

Table 2 – Poverty rates by region

	Dushanbe	Suhgd	Khatlon	DRS	GBAO
Headcount Ratio	43.3%	68.8%	47.3%	48.8%	43.4%
Share in total poverty	7.6%	38.1%	31.5%	20.2%	2.5%

Data source: TLSMS 2007

Other relevant characteristics of households below the poverty line are a female head and low levels of education of the head. Households with a female head have a poverty incidence of 57.2%, whereas households with a male head have a poverty incidence of 52.8%. Households with a head with completed secondary education have a poverty incidence of 54.5%, significantly lower than households with a head with the immediately lower level (basic education) which have a poverty incidence of 61.2%. Even more difficult is the situation for households in which the head has no formal education: 67% of such households are below the poverty line. On the other

extreme, households with a head with higher education have a poverty incidence of around 37%. Although, this indicates that even a higher education diploma is not an automatic pass out of poverty.

Table 3 – Poverty and sex of the household head

	Male Head	Female Head
Households	84.3%	15.7%
Headcount ratio	52.8%	57.2%

Data source: TLSMS 2007

Table 4 – Poverty and education of the household head

	None	Primary	Basic	Secondary	Higher
Percentage of Households	4.5%	6.6%	12.8%	59.1%	17.1%
Headcount ratio	67.0%	62.8%	61.2%	54.6%	37.0%

Data source: TLSMS 2007

The directly observed poverty indicators for the general population and the population divided by remittance-receiver status are presented in Table 5 below. As can be observed, a lower proportion of people below the poverty line is found among those living in households receiving remittances, in comparison with people living in non-receiving households, as reflected by the headcount index. The Poverty Gap Index shows that even poor households receiving remittances are better in average than poor households not receiving remittances, as the former ones are in average closer to the poverty line than later ones. In other words, the average consumption per capita of poor households that receive remittances is higher than the average consumption per capita of poor households not receiving remittances. The poverty severity index tells a similar story since more households with not receiving remittances "fall well below" the poverty line than households with remittances.

Table 5 - Poverty indicators complete poverty line (138.7 Tajik Somoni per month per person)

Index	General population	Remittances receiving Population	Non-remittance receiving population	Difference
Headcount Ratio	0.535 (0.0123)	0.482 (0.0203)	0.545 (0.0139)	-0.063*** (0.0236)
Poverty Gap Index (FGT 1.0)	0.150 (0.0059)	0.13 (0.0082)	0.154 (0.0063)	-0.024*** (0.0084621)
Poverty Severity Index (FGT 2.0)	0.058 (0.0031)	0.048 (0.0039)	0.060 (0.0034)	-0.012*** (.00424)

Data source: TLSMS 2007
Notes: Linearized Standard Errors reported in parenthesis for HCR, FGT 1 and FGT2. Bootstrapped standard errors reported for the difference of the indexes.
*** Significant at 1%, **Significant at 5%, *Significant at 10%

7.2 Inequality

Although urban areas (excluding the capital) and rural areas have fairly similar poverty incidence, there are significant differences in terms of inequality. All the considered measures of inequality point at the urban areas other than the capital as the most unequal areas in the country, the rural areas as the less unequal, and Dushanbe in the middle, although closer to the inequality levels of other urban areas.

Table 6 - Inequality by geographical area

	(1) General Population	(2) Dushanbe	(3) Other Urban	(4) Rural	Differences		
					(2)-(3)	(2)-(4)	(3)-(4)
Gini coefficient	0.288***	0.328***	0.376***	0.254***	-0.048**	0.074***	0.122***
	(0.0068)	(0.0125)	(0.0219)	(0.0063)	(0.0251)	(0.0136)	(0.0232)
Mean log deviation (GE 0)	0.140***	0.180***	0.241***	0.107***	-0.061**	0.073***	0.134***
	(0.0068)	(0.0138)	(0.0293)	(0.0064)	(0.0326)	(0.0147)	(0.0307)
Theil Index (GE 1)	0.176***	0.202***	0.333***	0.123***	-0.132**	0.079***	0.210***
	(0.0068)	(0.0201)	(0.0539)	(0.0135)	(0.0582)	(0.0230)	(0.0573)

Data source: TLSMS 2007
Notes: Bootstrapped standard errors reported in parentheses.
*** Significant at 1%, **Significant at 5%, *Significant at 10%

One advantage of the mean log deviation and the Theil index is the possibility to split their values in two: a part due to inequality between groups (or geographical areas), and a part due to inequality among individual's within-groups. Doing so for the general population indexes shows that almost all the observable inequality is explained by the variation of expenditure of individuals within the geographical areas. Only around 2% or 3% of the observed inequality is attributable to differences between the rural and urban areas.

Table 7 - Inequality by geographical area, decomposition

	General population	Within group Inequality	Between-group Inequality
Mean log deviation (GE 0)	0.140	0.137	0.0037
Theil Index (GE 1)	0.176	0.172	0.0038

Data source: TLSMS 2007

Regarding inequality in Tajikistan regions, all the measures presented in Table 8 agree in the fact that the most unequal region is Suhgd, which is also the region with the highest poverty incidence. Nevertheless, statistically speaking, the differences between the Gini and the mean log deviations in Suhgd and the indexes in Dushanbe are not significant. However, the difference

between Theil indexes is statistically significant[25]. This is interesting since the Theil index is known to be more sensitive to the changes in the upper part of the distribution than the mean log deviation. Thus, this indicates that in Suhgd the upper part of the distribution is more unequal than in any other region of Tajikistan. Indeed, by computing an entropy index with a higher sensitivity to changes in the upper part of the distribution (a GE 2), the value for Suhgd is 0,797 followed by Dushanbe with 0.299.

Table 8 - Inequality by geographical region

	Dushanbe	Suhgd	Khatlon	DRS	GBAO
Gini coefficient	0.328***	0.358***	0.211***	0.273***	0.252***
	(0.0119)	(0.0188)	(0.0050)	(0.0106)	(0.0114)
Mean log deviation (GE 0)	0.1797***	0.219***	0.073***	0.123***	0.108***
	(0.0133)	(0.0245)	(0.0035)	(0.0114)	(0.0111)
Theil Index (GE 1)	0.202***	0.316***	0.076***	0.146***	0.123***
	(0.0194)	(0.0477)	(0.0041)	(0.0259)	(0.0182)

Data source: TLSMS 2007
Notes: Bootstrapped standard errors reported in parentheses.
*** Significant at 1%, **Significant at 5%, *Significant at 10%

Decomposing the mean log deviations and the Theil index shows that, similarly to the case of the decomposition by rural and urban areas, most of the inequality corresponds to inequality within regions, rather than inequality between regions.

Table 9 - Inequality by geographical regions, decomposition

	General population	Within group Inequality	Between-group Inequality
Mean log deviation (GE 0)	0.140	0.138	0.002
Theil Index (GE 1)	0.176	0.174	0.002

Data source: TLSMS 2007

In the same way as with the actual poverty levels, some of the most common inequality measures, estimated using the observable data, are presented in Table 10 below. The Gini coefficient, the mean log deviation, and the Theil index are presented for the general population, as well as for the population in households receiving remittances and in households not receiving remittances.

[25] The P-values for the null hypothesis that the difference between Ginis is equal to zero is 0.181; for the difference between mean log deviations: 0.163; and for Theil indexes: 0.026.

Table 10 - – Inequality measures for actual consumption

	General Population	No Receiving Remittances	Receiving Remittances	Difference	Decomposition	
					Within Group inequality	Between-group inequality
Gini coefficient	0.288 (0.0068)	0.285 (0.0072)	0.298 (0.0201)	-0.012 (0.0212)	-	-
Mean log deviation (GE 0)	0.140 (0.0068)	0.138 (0.0079)	0.152 (0.0238)	-0.014 (0.0528)	0.1398	0.00045
Thail Index (GE 1)	0.176 (0.0068)	0.169 (0.0153)	0.206 (0.0509)	-0.037 (0.0249)	0.1756	0.00046

Data source: TLSMS 2007
Notes: Bootstrapped standard errors reported in parentheses.
*** Significant at 1%, **Significant at 5%, *Significant at 10%

The Gini coefficient for both subpopulations is fairly similar, and, as a result, both indexes are similar to the general population Gini. Moreover, the difference between both Ginis is not statistically significant. The mean log deviation and the Theil Index show a slightly higher inequality for households receiving remittances, but again the difference is not statistically significant. The decomposition of these last two measures indicates that the inequality between groups (households receiving remittances, and households not receiving remittances) is considerably lower that the inequality within each group.

All in all, the reported measures indicate that there are not significant differences in inequality between households receiving remittances and households not receiving remittances.

7.3 School Enrollment

The data for school enrollment by age group coming from the TLSMS 2007 resembles the data of enrollment by school level presented in Chart 8 in section two. After all, the age groups are constructed to follow the expected age range at each level of education accordingly to table 11. Nevertheless, a difference in primary education is evident. This difference arises mainly due to children recently having turned seven years old by the time survey and not enrolled in any previous school program, as well as late starters. The enrollment rate for the ages of seven and eight years old depict this situation quite clearly. By the age of seven, only 28% of the children are enrolled at school, but by the age of eight the proportion has soared up to 95%.

Another point made by the data of enrollment by age group is the low percentage of children attending to preschool: Only 6.3% of those children between three and five years old were enrolled in preschool during the time frame of the survey.

Table 11 - Enrollment rates by age group.

	3 to 6	7 to 10	11 to 15	16 to 19	20 to 24	25 +
Percentage enrolled at school	6.29%	78.13%	95.02%	48.71%	10.78%	1.03%
Standard error	0.009	0.0100	0.0063	0.0129	0.0077	0.0016

Data source: TLSMS 2007

In a comparison by sex and age group of the individuals, boys have consistently lower enrollment rates than girls. Although the difference in the age group from 7 to 10 years old is not statistically significant, the gap is expanded for the two next age groups, and remains significant for the age group from 20 to 24 years old and for the population in school age in general. It is noticeable how during the age corresponding to secondary school, at the end of compulsory education, girls are the ones who suffer the most acute reduction, more than 54 percentage points, while boys' enrollment is reduced by (a still large) 37% percentage points.

Table 12 - Enrollment by age group and sex

	3 to 6	7 to 10	11 to 15	16 to 19	20 to 24	25 +	6 to 24
Boys	7.67%	7.87%	97.3%	60.3%	18.1%	1.1%	63.3%
	(0.0136)	(0.0143)	(0.0050)	(0.0161)	(0.0142)	(0.0019)	(0.0080)
Girls	4.94%	7.75%	92.6%	38.0%	5.3%	1.0%	49.3%
	(0.0081)	(0.0129)	(0.0103)	(0.0190)	(0.0065)	(0.0018)	(0.0089)
Difference	2.73%**	1.28%	4.64%***	22.37%***	12.77%***	0.11%	13.98%***
	(0.0125)	(0.0186)	(0.0086)	(0.0195)	(0.0126)	(0.0022)	(0.0099)

Data source: TLSMS 2007

Notes: Linearized Standard Errors reported in parenthesis for the enrollment rates by sex and age. Bootstrapped standard errors reported for the difference between rates.

*** Significant at 1%, **Significant at 5%, *Significant at 10%

Finally, of especial interest are the differences in enrollment rates among children living in households that receive remittances and children living in households not receiving remittances. As can be appreciated in Table 12, for individuals aged 6 to 24 years old and living in households that no receive remittances, the enrollment rate is higher than for those living in households receiving remittances. Interestingly, this difference is driven by girls. While boys have no significant difference in their enrollment rates, a girl living in households that receive remittances have a significant lower enrollment rate than girls living in households that do not receive remittances.

Table 13 - Enrollment by remittance-receiving status and sex of the child

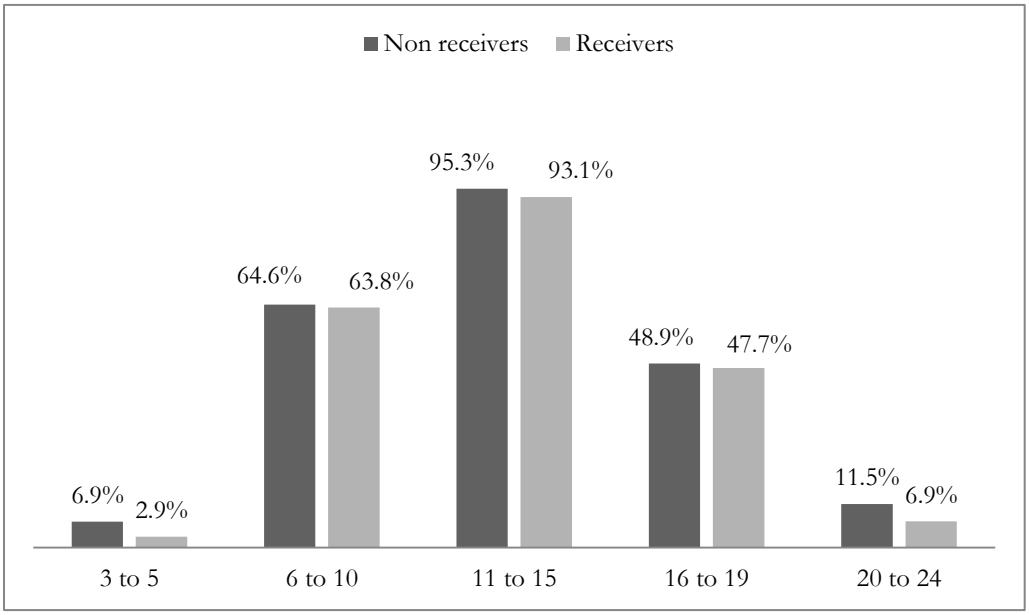
	Boys and Girls	Boys	Girls
No remittances receivers	56.6% (0.0056)	63.3% (0.0080)	50.2% (0.0077)
Remittances receivers	53.2% (0.0125)	63.6% (0.0183)	44.5% (0.0165)
Difference	3.4%** (0.0136)	-0.3% (0.0197)	5.7%*** (0.0182)

Data source: TLSMS 2007

Notes: Bootstrapped standard errors reported in parentheses for the difference between enrollment rates.
*** Significant at 1%, **Significant at 5%, *Significant at 10%

A negative correlation is also noticeable between remittances and enrollment by age group, as is depicted in Chart 8. Nonetheless, the difference is only statistically significant for the age groups from 3 to 5 years old and from 20 to 24 years old[26].

Chart 8 - - Enrollment by remittance-receiving status and age group



Data source: TLSMS 2007

7.4 Migrants Characteristics

Households that receive remittances represent 15.5% of households in Tajikistan. Geographically speaking, these households represent up to 12.2% in urban areas and 16.6% in rural areas. Across

[26] P- values for the adjusted Wald test with the null hypothesis of the difference between enrollment rates is equal to zero: Ages 3 to 5: 0.0078 ; ages 6 to 10: 0.7616; ages 11 to 15: 0.1750; ages 16 to 19: 0.7031; ages 20 to 24: 0.0100

regions, Dushanbe, Suhgd, and Khatlon have a similar proportion of households receiving remittances while RRS and GBO have the heist proportion with 20.9% and 28.1% respectively.

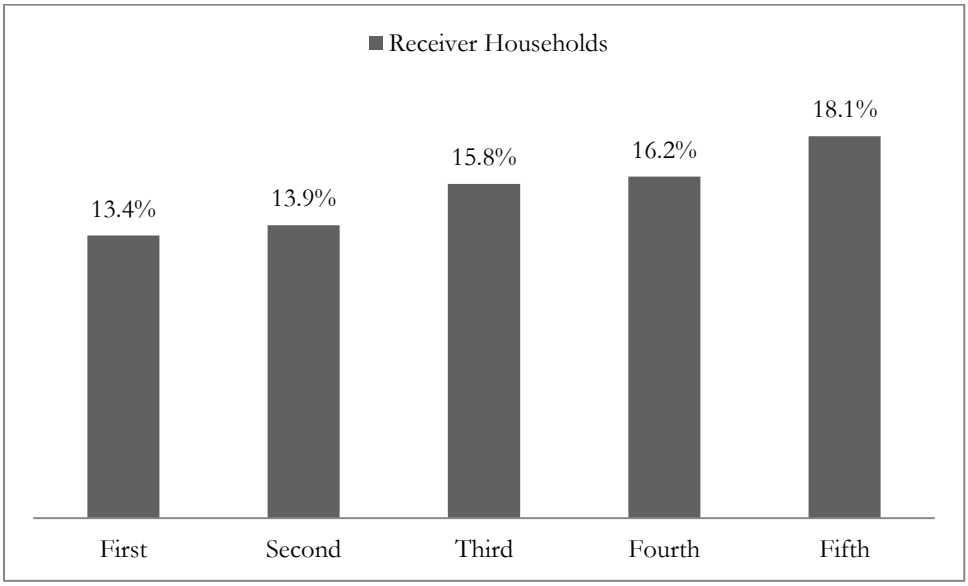
Table 14 – Household receiving remittances by area and region

	Total	Urban	Rural	Dushanbe	Suhgd	Khatlon	RRS	GBAO
Receiver Households	15.5% (0.0090)	12.2% (0.0118)	16.6% (0.0115)	13.5% (0.0127)	13.5% (0.0186)	13.1% (0.0127)	20.9% (0.0233)	28.1% (0.0344)
NonReceiver Households	84.5% (0.0090)	87.8% (0.0118)	83.4% (0.0115)	86.5% (0.0127)	86.5% (0.0186)	86.9% (0.0127)	79.1% (0.0233)	71.9% (0.0344)

Data source: TLSMS 2007
Notes: Standard errors reported in parentheses

In the expenditure distribution, households that receive remittances are found in practically the same proportion in the lowest two quintiles, around 13% or 14%. The third and fourth quintiles have a slightly higher proportion, although due to sampling error, is not possible to assure that the difference is significant. The fifth quintile has the highest proportion of households receiving remittances, and the gap between this quintile and the bottom two is statistically significant[27].

Chart 9 - Remittances receiver households by expenditure quintile



Data source: TLSMS 2007

Finally, the TLSMS 2007 includes some characteristics of the migrants that are relevant for this paper. First, the average age of the migrants registered in the survey was 28.3 years old, with a standard deviation of 9.3 years. The median age was 26 years old. The youngest migrant registered was only one-year-old while the oldest migrant was 86 years old. However, the 80% of

[27] P-values for the adjusted Wald test are: difference between the fourth and first quintile, 0.1346; difference between the fifth and the first quintiles, 0.0191; difference between the fifth and the second quintiles, 0.0255

the migrants are between 20 and 40 years old. The vast majority of migrants are males; with up to 93.48% of the registered migrants were men.

In educational terms, for the migrants aged 20 to 40 years old, 2.3% have completed only primary education, 14.5% basic education, 75.6% secondary education and 7.6% higher education. The completion rates for the general population in Tajikistan aged 20 to 40 years old are 2.6% for primary, 17.1% for basic, 71.6% with secondary education, and 8.4%with higher. This comparison suggests a slightly better-educated migrant than those staying in Tajikistan. However, a conclusion is not possible without knowing the properties of the migrant's sample.

As was pointed out in the previous section most of the migrants choose the Russian Federation as their destiny. There is no difference in this regard with the migrants registered in TLSMS 2007. Up to 95.3% of all migrants are currently living in the Russian Federation. Also, as explained before, the ability to speak Russian seems to play an important role in the decided destiny: almost 85% of the migrants speak Russian.

Finally, almost 27% of the registered migrants were working before leaving the country while 66.4% were unemployed, 5.6% were students, and 1% were in the military. The most common occupation declared were "Building finishers and related trades", with 24.3%, and "Market gardeners and crop growers" with 18.75%

8. RESULTS

This section presents and discusses the results of the estimation process made to evaluate the effects of remittances on poverty, inequality and school enrollment. The first subsection deals with poverty and inequality, and is further divided into: first, the description of variables used to compute the per capita consumption level in the case of no remittances and the results of the estimations, and, second, the results of the computation of the poverty and inequality measures using the contrafactual consumption and its comparison with the actual poverty and inequality measures.

The second subsection is devoted to the effects of remittances on school enrollment. Again, the subsection starts by discussing the variables incorporated in the estimation model and continues with the discussion of the results.

9.1 Poverty and Inequality

9.1.1 Estimating the no-remittance household expenditure

In order to estimate the poverty and inequality levels in the hypothetical case of no remittances, per capita consumption levels need to be estimated for households as if they were not receiving remittances. To do so, consumption per capita is modeled as a function of observable regional, community and household characteristics known to be likely to affect per capita expenditure levels.

Haughton & Khandker (2009) in the World Bank's Handbook on Poverty and Inequality classify a series of characteristics affecting per capita expenditure levels. Among the regional (or national) characteristics, the authors highlight the role of geographic variables such as the isolation of the territory, the relative resource abundance, or the climate. Institutional variables, such as effective protection of property rights, good governance, among others, also play a role in the national or regional level. In the community level, infrastructure is a key element affecting poverty, for instance, access to electricity, paved roads, schools and medical clinics. Social capital, "which includes, for instance, the level of mutual trust in the community" [28] have also an important role in poverty since facilitates cooperation and conflict resolution.

Household, and individual, characteristics affecting consumption per capita include demographic, economic and social aspects. Demographic characteristics include the size of the household, the age of its members, and the gender of the household head. Economic characteristics are mostly related to the employment status of the household members, their employment characteristics (such as the hours worked), and the property of the household. Social indicators include health, education and shelter (mostly housing) characteristics.

For the particular case of Tajikistan, the household characteristics to be included in the consumption equation mainly follow the previous literature with the number of children (14 years or younger), adults (between 15 and 64 years old) and elderlies (more than 65) in the household. Educational attainment is captured by the educational level of the adult members of the household (number of people with primary, secondary or higher education).

Other variables included are the number of people employed in the household and geographical location variables (identifying provinces) to capture regional characteristics that might affect consumption levels and poverty.

[28] Putnam (1995) in Haughton & Khandker (2009, pp. 148)

Household head characteristics such as sex, educational level and employment status are also included separately in the characteristics of the other adult members, since the head of the household usually plays a determinant role in the household decisions regarding consumption and resource allocation.

Wealth characteristics of the household proved to be more difficult to include, as the TLSMS does not contain information regarding savings, debts or assets in non-agricultural businesses. Most of the people report to be owners of the dwelling they inhabit, but most of them refuse or do not know the approximate market rent value of the dwelling[29]. The only mostly complete information is the approximate value of the house, captured by the question of how much the owner have paid or will pay for the dwelling. Nevertheless, even this information seems noisy with some values as low as 1 or 2 Tajik Somoni. There is, however, complete information on the physical characteristics of the dwelling and the durable goods owned by the household. Since wealthier families are likely to live in dwellings built with better quality construction materials, with more rooms and other amenities, and durable goods owned by the family are directly related to its wealth, this information is used to construct an asset index using the principal component method[30].

At the community level, isolation and geographic characteristics are considered by including the altitude in which dwellings are located. Rather than measure isolation in a more common way by using the distance to the capital city and/or to the administrative center or the region, for the particular case of Tajikistan, one of the most mountainous countries in the world, altitude is preferred since it is likely to capture how difficult the access to a settlement could be. Households in higher altitudes in Tajikistan are also likely to face more adverse climatic conditions than other households in lower altitudes.

Access to running water and shorter time to travel to medical services might facilitate the household members to engage in economic activities, thus having a positive effect on expenditure. These variables, although normally associated with the community level, are rather taken from the household questionnaire since considerable less missing values are found, as well as more variation in the data and possible more accurate estimations.

[29] A simple OLS regression was adjusted on the value of the reported rent and the characteristics of the household, but the adjustment of the regression was extremely low (R-square of 0.024)

[30] Intuitively, the first principal component is a linear combination of a set of variables that captures the largest amount of information common to such variables. See Filmer & Pritchett (2001) for a description of the method and its empirical validation, and Appendix 1 for the variables included in the index.

One usual variable included in many of the poverty analysis, but the absence of this one is electricity access. The reason to exclude such variable was the lack of variation in the sample. From the households surveyed, less than 2% did not have access to electricity. What is more, the relevant question was made only at the community level (as "what part of the houses in this population point have electricity or generators"), so it is not accurate measure for whether or not the surveyed household had electricity or not.

A summary of the variables used in the consumption and selection equation is given in the table below

Table 15 - Variables included in the estimation of expenditure aggregate

Variable	Definition
lppcd	Log per capita expenditure
	- **Household composition -**
ch14r	Number of children aged 14 or younger
ad14r	Number of adults aged 15 to 64 years old
elder	Number of adults aged 65 years or older
	- **Household Social**
nprimaryr	Number of adult members with primary education as last educational level coursed (excluding the household head)
nbasicr	Number of adult members with basic education as last educational level coursed (excluding the household head)
nsecondr	Number of adult members with secondary education as last educational level coursed (excluding the household head)
nhigherr	Number of adult members with higher education as last educational level coursed (excluding the household head)
	- **Household economics**
empl_propr	Proportion of employed people in the household
Index_ha	Household asset idex
Land1	Own land are used for farming (sotka)
	- **Household Head Characteristics**
HH_sex	Sex of the household head
hh_primary	Household head last /maximum educational level is primary school
hh_basic	Household head last /maximum educational level is basic school
hh_second	Household head last /maximum educational level is secondary school
hh_higher	Household head last /maximum educational level is higher education
	- **Community level Characteristics**
acwatter	Household has access to piped water
timesch	Time to the nearest primary school (household questionnaire)
timedoc	Time to the nearest doctor (household questionnaire)
	- **Regional level Characteristics**
i.Oblast	Categorical variable for each Oblast
	- **Additional variables for the selection equation**
non_receiver	Categorical variable equal to one for non-remittance receiver households, zero otherwise
migr_hh2	Proportion of households in the community that receive remittances (estimated from the household survey)

As explained in the methodology section, simple OLS would yield bias result due to self-selection problems in the sample. To control for this issue, a Heckman Selection Model was used to estimate consumption per capita. The results, reported in Table 16, are interesting in their own right. Results are reported for the whole country (columns 1A and 1B) as well as for the urban and rural areas separately (columns 2A and 2B, and 3A and 3B respectably).

In the selection equations (columns B), the proportion of households in the settlement that receive remittances is negatively and significantly related to the probability of not receiving remittances. In the consumption equation (columns A), the number of people in the household, regardless of its age, is negatively related to the consumption per capita in the household, although its significance vary depending if the sample considers all the households or just rural or urban households.

The number of people by educational level has a positive and significant effect on consumption per capita for the whole sample, and for the urban households. Nevertheless, for the rural households no significant effect is found. This, however, is not a usual result accordingly to Haughton & Khandker (2009). Indeed, Glewwe (1991) for Côte d'Ivoire found that human capital stock in the household (approximated by the educational level of the most educated male and female) have little or no effect on household consumption. One of the hypotheses advanced by Glewwe is that education has few returns in agriculture, as many of the crops cultivated in the country (root crops) are not susceptible to intensive modern agricultural techniques. Nevertheless, further research would be needed to make this point completed clear in Tajikistan. Specially, considering that up to 60% of the working population in rural areas is employed in activities other than agriculture. On the other hand, the high unemployment rate (around 37% in Tajikistan rural area) might bring wage differences down and reduce the education premium in activities other than agriculture.

All the household economic characteristics considered, the per capita area of land used for agricultural activities, and the household asset index, have a positive and significant relationship with the expenditure per capita. As explained before, land and assets are indicators of the wealth of the household. Wealthier households are expected to have higher incomes (since wealth have been accumulated trough pass earnings), but also wealth can be used to "smooth" consumption in the case of negative shocks to current earnings.

Among the household head characteristics, only its sex and whether or not the head has higher education have a significant effect on expenditure per capita. If the household head is a woman,

the expenditure per capita in the household is expected to decrease an average of 14% for the whole sample, and 18% of the rural sample. Nevertheless, no significant effect was found for the urban sample. If the household head has a higher education diploma, the expenditure per capita is expected to increase by 11% for the whole sample and for the urban sample.

At least two explanations for the lower consumption of households headed by a female seem reasonable. First, female heads have much lower labor participation than their male counterparts: 30% are employed against 69% of the males. Second, even when females decide to participate in the labor market, their earnings are in average lower than for males. A gross average of monthly earnings by sex shows that females have an average wage of 167.4 Somoni, while males earned an average of 411.0 Somoni. A simple wage regression also shows that females with the same education and age (as a proxy of experience) than males, would earn approximately half of the wages of the males. Of course, assessing correctly the magnitude of the difference and why this is the case requires further research.

Regarding the community level characteristics, none of them seems to have a significant effect on the household consumption per capita. Altitude apparent negative correlation disappears, once other controls are included. Thus, it seems that more than the altitude itself, household characteristics such as education and wealth, and regional particular characteristics, has a larger effect on household expenditure. A similar argument is valid for the lack of significance for the time necessary to visit a doctor or attend the nearest school. What is more, the travel time is not extremely long for the majority of the households: 90% of them have to travel less than 30 minutes to reach the nearest primary school, and less than 40 minutes to visit the nearest doctor. Hence, it seems that households, in general, do not have to divert too much time from economic activities for their children to attend school or access medical care.

Interestingly, however, the access to piped water has a negative sign, although statistically not significant. This seems to be the result of introducing the household asset index, which contains many variables that are closely related with the access to piped water. For instance, if the dwelling has a flush toilet, it is almost certain that it will have access to piped water.

Finally, the regional dummies show that households in the Khatlon region have a higher expenditure per capita, once the other characteristics have been taken into account.

Table 16 - Heckman selection Model Results

VARIABLES	(1A) Consumption Country	(1B) Selection Country	(2A) Consumption rural	(2B) Selection rural	(3A) Consumption Urban	(3B) Selection urban
Selection variable						
migr_hh2		-1.818***		-1.393***		-2.268***
		(0.233)		(0.443)		(0.257)
Household Composition						
ch14r	-0.0688***	0.00569	-0.114***	0.00709	-0.0562***	0.00959
	(0.00524)	(0.0188)	(0.0119)	(0.0335)	(0.00478)	(0.0233)
ad14r	-0.0972***	-0.146**	-0.0702*	-0.0231	-0.0816**	-0.202**
	(0.0165)	(0.0709)	(0.0409)	(0.147)	(0.0328)	(0.0895)
elder	-0.0946***	-0.0443	-0.109**	-0.0914	-0.0874***	-0.0472
	(0.0226)	(0.0838)	(0.0540)	(0.188)	(0.0230)	(0.102)
Household education characteristics						
nprimaryr	0.0411**	0.0641	-0.0397	-0.0526	0.0500**	0.114
	(0.0202)	(0.0829)	(0.0480)	(0.177)	(0.0230)	(0.103)
nbasicr	0.0387**	-0.0505	-0.0394	-0.106	0.0504***	-0.00315
	(0.0155)	(0.0733)	(0.0397)	(0.150)	(0.0189)	(0.0937)
nsecondr	0.0528***	-0.0125	-0.00732	-0.140	0.0592***	0.0501
	(0.0156)	(0.0735)	(0.0413)	(0.154)	(0.0179)	(0.0951)
nhigherr	0.115***	0.0371	0.0715	-0.113	0.118***	0.112
	(0.0204)	(0.0784)	(0.0463)	(0.151)	(0.0269)	(0.103)
Household economic characteristics						
emplr	0.0234***	0.114***	0.0484**	0.136**	0.00393	0.124***
	(0.00873)	(0.0245)	(0.0185)	(0.0541)	(0.0207)	(0.0297)
Land_pc	0.00440***	-0.00190	0.00514***	-0.016***	0.00435***	0.00274
	(0.00118)	(0.00380)	(0.00172)	(0.00308)	(0.00126)	(0.00582)
index_ha	0.0760***	-0.0346*	0.0590***	-0.089***	0.0746***	-0.0163
	(0.00849)	(0.0205)	(0.00777)	(0.0257)	(0.0144)	(0.0474)
Household head characteristics						
HH_sex	-0.117***	-0.686***	-0.181***	-0.537***	-0.0326	-0.758***
	(0.0317)	(0.0812)	(0.0405)	(0.127)	(0.139)	(0.0985)
HH_age	-0.000715	0.0156	0.00153	0.0192	0.000797	0.00528
	(0.00454)	(0.0157)	(0.00982)	(0.0267)	(0.00490)	(0.0250)
sqHH_age	1.57e-05	-0.000142	-6.83e-06	-0.000193	3.09e-06	-3.58e-05
	(4.23e-05)	(0.000145)	(9.80e-05)	(0.000252)	(4.42e-05)	(0.000233)
hh_primary	0.0177	-0.0392	0.184	-0.382	-0.0205	0.00522
	(0.0577)	(0.167)	(0.175)	(0.466)	(0.0533)	(0.199)
hh_basic	-0.0149	-0.275*	0.199	-0.501	-0.0335	-0.275
	(0.0609)	(0.156)	(0.179)	(0.458)	(0.0561)	(0.180)
hh_second	0.00565	-0.225	0.138	-0.459	0.00163	-0.219
	(0.0592)	(0.154)	(0.185)	(0.394)	(0.0498)	(0.182)
hh_higher	0.106*	-0.211	0.241	-0.142	0.0933	-0.299
	(0.0634)	(0.178)	(0.182)	(0.429)	(0.0592)	(0.220)
Uzbek	-0.0336	0.00930	-0.0440	-0.170	-0.0337	0.0381
	(0.0247)	(0.0846)	(0.0658)	(0.162)	(0.0247)	(0.0971)
Other	0.0814	0.157	0.00220	0.109	0.111	0.0972
	(0.0698)	(0.225)	(0.0870)	(0.234)	(0.203)	(0.522)
Comunity level characteristics						
acwatter	-0.0270	0.113	-0.0422	0.167	-0.0188	0.0574
	(0.0299)	(0.0847)	(0.0463)	(0.167)	(0.0359)	(0.121)
altitude	9.15e-05	-0.0004**	-0.000648	-0.00174	0.000143*	-0.000151
	(7.36e-05)	(0.000172)	(0.000496)	(0.00105)	(8.28e-05)	(0.000234)

VARIABLES	(1A) Consumption Country	(1B) Selection Country	(2A) Consumption rural	(2B) Selection rural	(3A) Consumption Urban	(3B) Selection urban
sqaltitude	-2.41e-08	6.11e-08	3.48e-07	5.23e-07	-3.52e-08	5.12e-09
	(2.00e-08)	(5.56e-08)	(2.59e-07)	(5.37e-07)	(2.56e-08)	(6.33e-08)
timesch	0.000363	-0.00105	0.00165	0.00745	0.000154	-0.00138
	(0.000623)	(0.00178)	(0.00225)	(0.00731)	(0.000627)	(0.00210)
timedoc	0.000321	0.00170	0.000872	0.00228	9.60e-05	0.00115
	(0.000275)	(0.00145)	(0.000881)	(0.00242)	(0.000372)	(0.00157)
Regional dummies						
Dushanbe	-0.149	0.0320	0.245	0.225	-	-
	(0.0949)	(0.175)	(0.400)	(0.805)		
DRS	-0.0535	0.206	0.238	0.0235	-0.0703	0.313*
	(0.0964)	(0.177)	(0.379)	(0.713)	(0.107)	(0.189)
Sughd	0.231**	0.0866	0.529	0.105	0.246**	0.198
	(0.0891)	(0.178)	(0.374)	(0.753)	(0.102)	(0.211)
Kathlon	0.155**	0.146	0.421	0.0804	0.167*	0.147
	(0.0784)	(0.168)	(0.393)	(0.783)	(0.0909)	(0.168)
Location	0.161***	-0.115	-	-	-	-
	(0.0489)	(0.104)				
Constant	4.964***	2.918***	5.158***	3.161***	5.092***	3.010***
	(0.194)	(0.554)	(0.360)	(1.059)	(0.230)	(0.620)
/athrho	0.787***		1.051***		0.0878	
	(0.196)		(0.200)		(1.328)	
/lnsigma	-0.818***		-0.668***		-0.967***	
	(0.0459)		(0.0652)		(0.0462)	
rho	.6568582		.7821424		.0875801	
	(0.111401)		(.077827)		(1.31755)	
sigma	(0.441236)		.5129674		.3803061	
	.0202402		(0.033458)		(.017564)	
lambda	(0.28983)		.4012136		.0333072	
	(0.060684)		(0.062824)		(.502097)	
Observations	4,857		1,708		3,149	

Notes: Standard errors reported in parenthesis. The Region omitted in regressions (1) and (2) is GBAO
*** Significant at 1%, **Significant at 5%, *Significant at 10%

A word about the lambda coefficient is in place. This coefficient gives the direction of the selection bias. The statistical significance is not directly reported, but it 95% confident interval does not comprise zero. This implies that OLS estimates would have indeed been biased. The sign is indicating a positive selection into no-remittances. This can be interpreted as households that decide not to send any migrant abroad and receive remittances, do so because they unobservable characteristics are positively correlated with their consumption.

9.1.2Poverty Measures for contrafactual consumption

The results from the previous Heckman selection model are used to estimate the non-remittances per capita expenditure for households that are actually receiving remittances. In such scenario, returnee migrants and their characteristics are "added" to the computation of the household per capita consumption. The returnee migrants are assumed to retake their previous employment if they use to have one.

The predicted consumption for a remittance-receiving household is used, along with the actual consumption for non-receiving households, to recalculate the poverty indexes. Results are displayed in Table 17 below.

The results indicate that in the case that no household would receive remittances, the percentage of households living in poverty would increase from 53.5% to 57.1%. The poverty gap index indicates that the average consumption per capita of households under the poverty line would experience a decrease. The poverty severity index, however, shows a no significance reduction.

Table 17 - Poverty indicators no remittance scenario complete poverty line (138.7 TJS per month per person)

Index	Actual Measure	No remittances scenario	Difference
Headcount Ratio	0.535 (0.0089)	0.571 (0.0089)	-0.036 *** (0.0043)
Poverty Gap Index (FGT 1.0)	0.1500 (0.0034)	0.1527 (0.0034)	-0.0027** (0.0014)
Poverty Severity Index (FGT 2.0)	0.05798 (0.0018)	0.05718 (0.0018)	0.0008 (0.0007)

Data source: TLSMSM 2007
Notes: Bootstrapped standard errors reported in parenthesis.
*** Significant at 1%, **Significant at 5%, *Significant at 10%

An even worse situation is depicted if poverty levels are estimated only for household receiving remittances. For such households, poverty levels would increase from the observed 48.2% up to 67.1%.

A reduction in the poverty incidence of around 3.6% due to remittances (although arguably a lower bound for it), is considerably lower than the previous estimates made by Betti & Lundgren (2012). In their paper, as mentioned above, they argue that without remittances poverty incidence in Tajikistan would increase between 27% and 33%. Several reasons explain this difference, many of which help to better understand the results of the current estimation procedure.

First, the survey used by Betti & Lundgren (2012) was conducted in 2010, so in principle is possible that more households have migrants abroad, which could increase the observed effect of remittances on poverty. Their survey also has the advantage to come from an adaptive sample, that is, they sampled households in areas that previous surveys have identified as having a higher proportion of migrants. This makes a sample that better capture the characteristics of households with migrants (since more of them are included).

However, the sample is not necessary representative of the general population, and, in fact, in their particular case it is not[31]. Thus, their inferences about the percentage of households receiving remittances in Tajikistan are most likely overstated since they come from a sample that was designed to overrepresented such households. They registered 73% of the households with one or more members living abroad while the TLSMS 2007 registered only 15.5%. Probably the percentage has increased between 2007 and 2010, but it is unlikely that in such large extent. Logically, if a larger proportion of households cease to receive remittances, provided that the same fraction of such household are below the poverty line, the increase in poverty would be higher.

A second difference is how Betti & Lundgren constructed their "no-remittances" scenario. They simply assumed in their first scenario that remittances stop flowing, and in their second scenario that remittances stop flowing, and migrants have come back to their households. No income substitution is computed. On the contrary, on this paper, working with consumption, the returnee migrants are incorporated in the computation of the contrafactual consumption.

A third different is the measure used to estimate poverty. While Betti & Lundgren prefer income, this paper uses expenditure. As previously explained, expenditure is less volatile to shocks in earnings while current income suffers the whole impact. This makes that the effect of a reduction in remittances (or any other source of income) larger on the measures of poverty based on income.

It possible to argue that the capacity of the household to smooth consumption decreases as time passes without new sources of income. Thus, the effect found in the present evaluation might be thought as the immediate effect of the reduction of remittances. The long run effect is likely to be larger.

Apart from the differences with previous research, the relatively low effect of remittances is also explained by the segments in the expenditure distribution where households receiving remittances are located. As shown in the previous section, a higher proportion of migrants is found in households in the upper quintile of the expenditure distribution. Similarly, a higher proportion of households receiving remittances are found in the upper quintiles[32]. This in principle suggests that many households receiving remittances were not poor in the first place, and, therefore, although their consumption would decrease in the no-remittance scenario, not all of them will fall into poverty.

[31] Betti & Lundgren, 2012 (p. 403)
[32] See Table 19 in the next section

All in all, remittances are found to be associated with the reduction in poverty incidence, as well as the reduction of the poverty gap. The reduction in poverty incidence, however, seems to be relatively small compared with the previous estimations of Betti & Lundgren (2012). Two reasons explain this. First, methodological aspects likely overstate Betti & Lundgren estimations, and second, consumption (used in this paper) is less volatile than income (used in the Betti & Lundgren's paper), and thus poverty measures based on income are also more volatile than those based on consumption. Apart from the differences with previous research, two considerations might prevent the results presented in here to capture the full effect of remittances on poverty. First, the methodology used in this paper is not capable to capture general equilibrium effects, and second, the data set possibly underestimate the households receiving remittances. However, more interestingly, as will be explored in depth in the next section, since many of the household receiving remittances are found in the middle and upper part of the expenditure distribution, stopping the remittances inflow does not necessary implies falling into poverty for them. Considering the previous arguments, the poverty reduction found should be treated as evidence of the effect of remittances on poverty and thought as a lower bound, rather than a definitive figure.

9.1.3 Inequality measures for contrafactual consumption

In the same fashion as with the effect of remittances on poverty, the assessment of the effect of remittances on inequality was made using the predicted per capita expenditure out of the Heckman selection model for household actually receiving remittances, and the observed per capita expenditure for households not receiving remittances.

All of the indexes presented in Table 18 indicate that in the case that no household would receive remittance the inequality would be reduced. This implies that remittances are not being received equally by every segment of the consumption distribution, or by mostly households in the lower parts of the consumption distribution. On the contrary, households in upper parts of the distribution seem to receive more remittances.

As with poverty, part of the explanation for the observed pattern is given by where in the expenditure distribution the households receiving remittances are coming. In the actual distribution, as the Table 19 shows, the highest the quintile the highest the proportion of households receiving remittances is. Certainly, the difference between the two first quintiles is not

statistically different from zero, but that is not the case for the difference between the fifth and first or second quintiles[33].

Table 18 – Inequality measures

Index	Actual Measure	No remittances scenario	Difference
Gini coefficient	0.2878 (0.0069)	0.2696 (0.0062)	0.01823*** (0.0037)
Mean log deviation (GE 0)	0.1402 (0.0077)	0.1237 (0.0066)	0.0165*** (0.0042)
Theil Index (GE 1)	0.1759 (0.0160)	0.1540 (0.0136)	0.0219 ** (0.0096)

Data source: TLSMS 2007
Notes: Bootstrapped standard errors reported in parenthesis.
*** Significant at 1%, **Significant at 5%, *Significant at 10%

Without remittances, many of the households that use to receive them move to lower quintiles in the distribution. However, only those households moving to the second (or first) have the chance to become poor since the average per capita expenditure is some Tajik Somony below the poverty line. As can be inferred from Table 19, many of the households in the fifth quintile left it, for the fourth or third quintile[34], but still above the poverty line. Similarly, some in the fourth quintile moved to the third, and some indeed to second.

On the other hand, movements to upper quintiles or just no movement are also possible. Since, some of the migrants are assumed to return to their previous jobs, consumption per capita does not necessary has to decrease when migrants return.

Table 19 - Household receiving remittances and average expenditure per capita by quintile

	Quintile	1	2	3	4	5
Observed distribution	Households receiving remittances	13.4% (0.0167)	13.9% (0.0149)	15.8% (0.0164)	16.2% (0.0128)	18.1% (0.0153)
	Average Expenditure per capita	73.96 (0.6807)	106.39 (0.2800)	133.18 (0.3593)	169.77 (0.5236)	301.54 11.76139
Contrafactual distribution	Households that used to remittances	12.4% (0.0175)	21.8% (0.0185)	24.7% (0.0186)	15.9% (0.0142)	2.6% (0.0057)
	Average Expenditure per capita	74.95 (0.7029)	105.73 (0.2501)	129.18 (0.2830)	160.66 (0.4897)	280.16 (9.5482)

Data source: TLSMS 2007 and author estimations.
Notes: Bootstrapped standard errors reported in parenthesis.

[33] P-values for the adjusted Wald test are difference between: first and second quintiles 0.8204 ; first and fifth 0.0191; fifth and second 0.0255
[34] in one of the replication, around 75% of the movements were to the two immediately inferior quintile

As explained in section 4, these findings are congruent with a situation in which the cost of migration prevents a higher proportion of poor households to send members abroad. Nevertheless, the differences in the proportion of households with migrants among the quintiles are not extremely large, and the type of work made by the migrants (mostly construction-related works), although not an unskilled job, is not a high qualified job. Thus, it is likely that the picture in 2007 shows part of the transition process in which lowering migration costs, for instance due to the development of thicker migrant networks, allow more migrants from the lower parts of the distribution to migrate. Survey data from following years would be needed to confirm this hypothesis.

In general terms, remittances are associated with an increase in consumption inequality in Tajikistan. As with poverty, an explanation to this is the fact that a higher proportion of households receiving remittances is found in the middle and higher part of the expenditure distribution. Since households already in a better economic position receive most of the remittances, this has the logical effect of increase inequality.

9.1.4 Robustness checks

As a manner to corroborate the previous results, the comparison between the observed poverty measures and those in the no-remittances scenario were performed again using an alternative poverty line. The alternative poverty line was set at two-thirds of the mean consumption, giving a result of 88.9 Somoni per person per month, and roughly coincides with the "food poverty line"[35] of 87.6 Somoni estimated by the World Bank using the TLSMS 2007

The detailed results of the calculations are presented in Appendix 2. A few comments are in place here. By changing the poverty line to 87.6, the actual headcount ratio decreases 19.73% and the contrafactual headcount ratio to 19.11%. The small difference of 0.006, although statistically significant at 5% in the simulation, indicates an almost null effect of remittances on poverty. This is congruent with the position of households receiving remittances in the expenditure distribution. Since with the new poverty line the vast majority of recipient households were not poor in the first place, remittances have little or no effect on poverty.

9.2 School Enrollment

In order to inquire the effect that receiving remittances has on the probability of a child to be enrolled at school, the household decision regarding children's schooling need to be modeled

[35] This poverty line is based in the cost of a basket of food items necessary for satisfy a 2,250 caloric intake per person per day.

using a series of variables expected to influence such decision. If education, as in the human capital theory, is considered as a kind of investment decision in which present cost (actual disbursements as well as opportunity cost) are weighted against expected future benefits, variables affecting either the costs that the household faces, and variables affecting the possible benefits should have to be included.

Since the parents have to allocate limited resources to their children, the composition of the household, household earnings, and the preferences of the parents need to be taken into account.

For the particular case at hand, the age and sex of the children are incorporated into the decision model. It is likely that the older the children, the higher the labor opportunity cost for the household, and thus the probability of being enrolled at school diminish with the age of the child. Similarly, as the individual grow older, he or she has a shorter time to ripe the benefits of their investment in education. In a context of limited resources, parents might have to choose to invest in those children more likely to have the highest returns from education. Since typically, and in particular in Tajikistan, men have a larger labor force participation and have higher wages, this might bright a preference to invest in boys rather than girls as has been found in previous research for developing countries[36].

The parent's educational level is likely to influence their perception of possible future returns of education for their children. Provided that education returns are positive, parents with more education are expected to dedicate more resources for the education of their children.

Self-employment status of the parents is included as a measure of alternative activities for the children. If the parents have their own business, it would be easier for them to incorporate other members of the family including children.

Other household characteristics are also likely to affect the enrollment of children. The number of children in the household, and the household size, in general, might increase the competition for resources, and hence decrease the individual probability to attend school. The sex of the household head is also included since, as previously saw, households with a female head face, on average, worse economic conditions that households with a male head.

Intuitively, the earnings of the household directly affect the possibilities that parents have to send their children to school. However, directly observed earnings might not be the best indicator of the availability of resources of the household in the educational context. For instance, in the

[36] Previous research have also found a gap between education investments for boys and girls, see for instance Maitra (2010) for Bangladesh and Sawada & Loksbin (2001) for rural Pakistan

occurrence of an unexpected temporary income shock, parents are not likely to immediately withdraw their children from school. Instead, they might resort to savings or selling other types of assets in order to maintain the household level of expenditure, including the educational expenditure. Thus, a more appropriate indicator for resource availability would be the wealth of the household. This is incorporated as it was done in the poverty and inequality analysis by using a household asset index.

The distance or time that children need to travel to attend school is also likely to affect the enrollment of children. If children need to travel long distances, parents might regard the journey as inappropriate for young children. If the distance is too long, as it requires to be done by using public or private transportation vehicles, the cost of the journey might discourage parents to send their children to school.

In the community and the regional level, the quality of the school infrastructure and teaching materials are likely to affect the views of the parents about the quality of the education and the future benefits to be perceived. It is also possible that parents in the rural area, as a higher proportion of the population work in agriculture, place less value on education than parents in urban areas where the benefits of higher education through higher salaries is more visible.

Finally, remittances, as explained before, provide financial resources that would not be available for the households by income from labor activities or via access to credit markets. However, there is no guarantee that such extra resources would be spent on the education of the children. Other needs might be more urgent, or other uses might be preferred by the household.

The list of the variables included in modeling the probability of a child to be enrolled in school is presented in Table 20

Table 20 – School enrollment model variables

Variable	Definition
	Child characteristics
age	Age of the child
agesq	Age of the child squared
sex	Sex (for different regressions)
	Parents Characteristics
educ_mon	Father's years of schooling
educ_dad	Mother's years of schooling
self_empl_f	Father self-employed
self_emp_m	Mother self-employed
	Household Characteristics
chl##_##	Number of children (in different age ranges, apart from the individual)
HH_sex	Sex of the household head
HH_empl	Employment status of the household head
index_hh	Assets index of the household (as a proxy for permanent income)
HHsize	Household size

Variable	Definition
distance_psch	Distance to primary school
receiver	Remittance receiver status
	Community Characteristics
Index_sch	Index of school resource index
	Regional Characteristics
Location	Rural area categorical variable
i.oblast	Regional categorical variables

As explained before, the remittance receiver status of a household is not likely to be independent of the household characteristics. And most likely, many of the same household characteristics that affect the receiver status also affect whether or not a child attend school, and unfortunately, is almost for sure that it is not possible to observe every characteristic affecting both outcomes. In order to deal with this endogeneity problem, two simultaneous Probit equations are estimated. The first equation models the probability of a child to be enrolled at school as a function of the previously listed variables, including the remittance-receiving status of the household. The second models the probability of the household to receive remittances as a function of the same variables listed before, plus the proportion of the households in the community that receive remittances.

The marginal effects resulting from the estimation procedure are presented below in Table 21, columns (3) onwards. Columns (1) and (2) shows the IV-2SLS results as reference. The sample consisted of 6,641 children in school age (between 7 and 15 years old). The coefficients in the Table can be interpreted as the effect of a marginal change in the explanatory variable on the probability of a child to be enrolled in school, while keeping the rest of the variables at their mean values. Additional regressions by age groups are presented in Appendix 3

The first set of variables incorporates the children characteristics. As can be observed, age has a nonlinear significant effect for all children in school age (Column 3), as well as for boys and girls separately (Columns 4 and 5). This probably reflects the fact that parents tend not to enroll their children as soon as they turn seven years old, but rather wait until they consider the child old enough, as explained in the section 7. On the other hand, the negative sign for older ages is consistent with children experiencing an increasing opportunity cost and tend to drop out of school, and a shorter time to collect the benefits of education. The direct cost of attending school is also higher for lower secondary (basic) school since those are not as available as primary schools, especially in the rural areas.

Interestingly, the sign of the coefficients for the age variable are the contrary of those found by Nakamuro (2010) for Tajikistan in 2003. Nevertheless, the signs of Nakamuro contradict the

marked pattern of school enrollment by age observed in the unrestricted data in section 7. One possible source of different is the sample considered. Nakamuro prefers a smaller sample from 7 to 22 years old, whereas this paper prefers a larger sample from 7 to 24 years old. However, restricting the sample to match that of Nakamuro makes no difference in the sign or significance of the coefficients presented in table 21 below[37].

Another difference with Nakamuro comes with the effect of the sex of the children: he found a no significant effect. In the present estimation girls have a significant lower probability to be enrolled at school: Around 10% fewer probabilities to be enrolled when compared with boys with the same age and coming from similar backgrounds. This again is in line with the observation of the raw data, in which girls have a 14 percentage points lower enrollment rate.

The labor market outcomes offer an explanation for this phenomenon. Women have a much lower participation in the workforce than men (28.3% against 54.4%), and even those who work have considerably lower average earnings than those of males with similar education, age, and experience. As previously mention, a gross average of monthly earnings by sex shows that females have an average wage of 167.4 Somoni while males earned an average of 411.0 Somoni. A simple wage regression also shows that for females with the same education and age (as a proxy of experience) than males, would earn approximately half of the wages of the males

Mother's education has, in general, a positive effect on the enrollment probabilities, especially if the mother has higher education. Noticeable, however, it seems that mother's education tend to favor more to girls. For every educational level completed by the mother, the probabilities of girls attending school increase in a significant way. Nevertheless, only higher education for the mother exerts a positive and significant effect on the enrollment of boys.

The education of the father has a non-significant effect on the school enrollment probabilities for the general sample. Nonetheless, when the sample is divided by sex of the children, the father education has a significant and positive effect on the education of girls, but a negative effect on the education of boys (although only statistically significant for parents with basic education).

If the parents are self-employed seems to have no significant effect on school enrollment. The employment status of the household has a non-significant effect, except for the Girls' sample.

[37] See Appendix 3.3

The household head sex has a significant effect. Interestingly, this effect comes mainly from the sample of boys. If the household head is a woman, this will increase the probabilities of a boy to be enrolled at school up to 4%

The number of other children in the household in school age has no significant effect for the age group from 7 to 10 years old, but it has a positive and significant effect in the group from 11 to 15 years old. This is contrary to the expectation that more children in the same age group decrease the probabilities of an individual child to attend school. A possible explanation, although not properly tested, is the existence of economies of scale in sending children to school. Sending just one child might be costly to the household, but once the first child is enrolled, the extra cost of sending the following ones is decreasing, perhaps due to shared cost such as school materials or transportation.

The wealth of the household, as captured by the asset index, has a positive and significant effect, which is expected. Households with higher wealth are capable to keep their children enrolled at the school, even when facing a negative income shock since they can resort to their wealth to smooth this and other expenditures. On the other hand, the size of the household has a negative and significant effect, probably reflecting the difficulty that larger households have to allocate scarce resources among their numerous needs. The distance from the household to the nearest primary school has a small, but statistically significant effect, which is consistent with the hypothesis that higher costs to attend to school diminish the probability of a child to be enrolled. The quality of the school facilities has only a small positive effect for girls.

Finally, remittances have a significant positive effect on school enrollment for the whole sample. However, this effect comes mainly due to a strong positive effect of remittances on the girl's school enrollment. A girl living in a household that receives remittances has around 10% higher chances to attend school than another girl with similar characteristics and living in a similar household and community.

To understand the different results for boys and girls is useful to compare them with the base case scenario in which both are taken together. As the coefficient for the sex indicates, keeping everything else equal, girls have a lower probability to be enrolled at the school. Or put it the other way, under equal circumstances, boys have more probabilities to attend school. What is more, since boys are more likely to be enrolled, it makes little difference for them if the household receive or not remittances (as depicted by the lack of significance of the coefficient of remittances in column 5). On the other hand, since girls have lower probabilities to be enrolled,

the extra resources coming from remittances do have a positive effect on their probabilities to be enrolled.

Table 21 - Marginal effects over probability of school enrollment

VARIABLES	(1) IV First Stage	(2) IV	(3) Biprobit All	(4) Biprobit Girls	(5) Biprobit Boys
Child characteristics					
age	-0.0189	0.551***	0.370***	0.403***	0.340***
	(0.0136)	(0.0227)	(0.0158)	(0.0234)	(0.0216)
agesq	0.000742	-0.0230***	-0.0157***	-0.0172***	-0.0144***
	(0.000619)	(0.000971)	(0.000710)	(0.00107)	(0.000964)
sex	0.00490	-0.0320***	-0.0390***		
	(0.00972)	(0.00886)	(0.00889)		
Mother educational level					
Primary	0.0696	0.0982	0.0942	0.160	0.0727
	(0.0734)	(0.113)	(0.0871)	(0.115)	(0.0742)
Basic	-0.0270	0.123	0.114	0.202*	0.0701
	(0.0550)	(0.111)	(0.0843)	(0.108)	(0.0718)
Secondary	-0.0356	0.162	0.150*	0.256**	0.0910
	(0.0548)	(0.111)	(0.0849)	(0.109)	(0.0725)
Higher	-0.0443	0.170	0.166*	0.257**	0.118
	(0.0630)	(0.112)	(0.0864)	(0.112)	(0.0753)
Father educational level					
Primary	-0.161**	0.0399	0.0423	0.133*	-0.0368
	(0.0813)	(0.0528)	(0.0476)	(0.0799)	(0.0418)
Basic	-0.101	0.0322	0.0289	0.142*	-0.0735***
	(0.0804)	(0.0412)	(0.0380)	(0.0730)	(0.0269)
Secondary	-0.130*	0.0475	0.0463	0.116	-0.0217
	(0.0722)	(0.0423)	(0.0391)	(0.0731)	(0.0285)
Higher	-0.143*	0.0540	0.0555	0.142*	-0.0330
	(0.0738)	(0.0426)	(0.0399)	(0.0747)	(0.0307)
Self employment					
Mother self-employee	-0.00537	0.00549	0.00660	0.0115	0.00244
	(0.0257)	(0.00963)	(0.00978)	(0.0148)	(0.0131)
Father self-employee	-0.0225	0.00568	0.00600	-0.00263	0.00839
	(0.0199)	(0.00985)	(0.00980)	(0.0163)	(0.0117)
Household head characteristics					
HH_EMPL	0.00994	0.0148	0.0110	0.00259	0.0221*
	(0.0217)	(0.0106)	(0.00957)	(0.0151)	(0.0121)
HH_sex	0.151***	0.000397	0.00259	-0.0241	0.0464**
	(0.0294)	(0.0139)	(0.0120)	(0.0194)	(0.0192)
Other children in the household by age group					
7 to 10	0.00150	-0.00633	-0.00392	-0.00535	0.00333
	(0.0123)	(0.00574)	(0.00556)	(0.00917)	(0.00688)
11 to 15	-0.0134	0.0299***	0.0205***	0.0282***	0.0150***
	(0.0110)	(0.00664)	(0.00550)	(0.00909)	(0.00567)
Other household characteristics					
index_ha	0.0103**	0.00666**	0.00842***	0.00626	0.0123***
	(0.00434)	(0.00266)	(0.00275)	(0.00405)	(0.00350)
HHsize	-0.000293	-0.00742***	-0.00617***	-0.00882***	-0.00378*
	(0.00323)	(0.00217)	(0.00176)	(0.00316)	(0.00192)
distance_psch	-0.000108	-0.000950*	-0.000911**	-0.00169***	-5.13e-05
	(0.000550)	(0.000503)	(0.000354)	(0.000567)	(0.000420)
Comunity and regional variables					
index_sch	0.00198	0.001000	3.89e-05	-0.00300	0.00522*
	(0.00441)	(0.00237)	(0.00227)	(0.00324)	(0.00266)
DRS	-0.0182	0.0451*	0.0601**	0.102***	0.0159

VARIABLES	(1) IV First Stage	(2) IV	(3) Biprobit All	(4) Biprobit Girls	(5) Biprobit Boys
	(0.0330)	(0.0230)	(0.0255)	(0.0372)	(0.0277)
Sughd	0.00708	0.0448**	0.0582**	0.0831**	0.0339
	(0.0353)	(0.0190)	(0.0235)	(0.0351)	(0.0259)
Kathlon	0.0413	0.0255	0.0392*	0.0698**	0.0156
	(0.0339)	(0.0195)	(0.0233)	(0.0351)	(0.0269)
GBAO	0.150***	0.0303	0.0549**	0.0887**	0.0424
	(0.0439)	(0.0237)	(0.0266)	(0.0390)	(0.0305)
location	0.0258	0.0257	0.0286	0.0325	0.0212
	(0.0262)	(0.0241)	(0.0194)	(0.0254)	(0.0192)
Remittance receiver status of the household					
receiver			0.0602**	0.0997**	-0.0975
			(0.0266)	(0.0434)	(0.0671)
Migr_hh2 (Instrument)	0.452***				-0.0975
	(0.0638)				
Constant	0.264**	-2.453***			
	(0.107)	(0.165)			
Sub pop observations	6641	6641	6641	3439	3202

*** Significant at 1%, **Significant at 5%, *Significant at 10%
Standard errors reported in parenthesis

Table 22 below presents the associated change in the probabilities to be enrolled at a school that children experience by living in a household receiving remittance, divided by age group and sex. As can be appreciated, girls aged seven to eleven years old have the larger increase: almost 18% more probabilities to be enrolled at school than another girl with similar characteristics but living in a household not receiving remittances.

Table 22 - Remittances coefficient by sex and age group

	7-11		**12-15**	
	Girls	Boys	Girls	Boys
Remittance	0.178**	-0.0785	0.0815	0.0332
	(0.0779)	(0.0922)	(0.0685)	(0.0314)

Source: TLSMS 2007

How does this compare with the results of the previous literature? The general results differ from those presented by Nakamuro (2010) mainly in the statistical significance for boys. However, as explained before in the literature review section, there are several methodological reasons to doubt about his estimates. What is more, while comparing the coefficients for sex and age, his results are contradictory with the large patterns in the data, and no explanation was given by the author. Certainly, his data set and the year of collection is different from the one used in this paper. Nevertheless, the methodology of collection and the relevant sections of the questionnaire are similar, and the representativeness is supposed to be equal. Thus, it seems that the major source of discrepancy is the methodological part.

Finally, is useful to remember the wherein the consumption distribution households receiving remittances are located. The results of the model show that wealth is positively related to enrollment. Thus the families with fewer resources, those in the bottom quintiles have fewer opportunities to send their children to school. But those households are not the households that receive the higher proportion of remittances. Instead, households in the upper quintiles receive a larger portion, but they already have more resources to send their children to school. Thus, as in the case of poverty and inequality, if in the future more remittances flow to the lower quintiles of the income distribution. The effect on education could be larger.

In summary, the evidence shows that boys are in a better position than girls in Tajikistan when it comes to school attendance. Nevertheless, the educational level of the mother, although increases the chances of enrollment for both boys and girls, it has a larger effect on the enrollment of girls. Likewise, remittances have a larger positive effect on girls. Since children in wealthier households have larger chances to be enrolled at school, and a larger proportion of this households receive remittances, the overall effect of remittances is likely to be lower than in a scenario in which a larger proportion of households in the lower quintiles of the expenditure distribution receive remittances.

9. CONCLUSIONS

At the household level, remittances constitute an income transfer likely to increase consumption levels, serve as a form to spread risk and deal with market imperfections (such as the capital market). Thus, in general terms, they are expected to increase the welfare of the family, not only by increasing consumption, but also by allowing them to face negative shocks in the local economy and sort the lack of financial means to invest in human or physical capital. At the aggregate level, the effect of remittances on poverty and inequality depends to a large extent of where the households receiving remittances are located in the income or expenditure distribution. If a larger portion of households receiving remittances is located in the upper part of the distribution, the effects of poverty would be small, and inequality will increase. On the other hand, if a larger portion of recipients is located in the lower part of the distribution poverty and inequality will decrease.

All in all, remittances in Tajikistan are found to be associated with the reduction in poverty incidence, as well as the reduction of the poverty gap. The reduction in poverty incidence, however, seems to be relatively small when compared with previous estimations of Betti & Lundgren (2012). Two main reasons explain this. First, methodological aspects, such as the oversampling of household receiving remittances, are likely to inflate Betti & Lundgren estimations, and second, consumption is less volatile than income, and thus poverty measures based on income (such as those presented by Betti & Lundgren) are also more volatile than those based on consumption.

More interesting than methodological differences is the empirical relationship between consumption distribution and poverty reduction. Since as much as 34% of the households in the fourth and fifth quintile receive remittances and the no-remittances scenario move the majority of them to the fourth or third quintile, poverty does not increase much. This is precisely what is expected from theory, a more or less equal location of households receiving remittances along the consumption distribution or a slightly higher proportion of the upper part, should have little effect on poverty.

A word is deserved to the limitations of the study. The methodology used in this paper is designed to construct consistent contrafactual consumption for the individual household, in which what varies is no more than remittances and returnee migrants, so the difference between the actual consumption and the contrafactual can be assigned to those changes. These individual results are then aggregated to infer the effect of poverty (and inequality). Nevertheless, in this

process general equilibrium effects are not incorporated. For instance, if higher food demand coming from household receiving remittances increases the earnings of local farmers is, unfortunately, not capture by the method. Therefore, the poverty reduction found should be treated as evidence of the effect of remittances on poverty and thought as a lower bound, rather than definitive figure. Identifying such general effects in the economic activity of specific geographical areas as well as for the aggregate economy of Tajikistan is an exciting field for further research.

Regarding inequality, in general, terms, remittances are associated with an increase in consumption inequality in Tajikistan. As with poverty, an explanation to this is the fact that a higher proportion of households receiving remittances is found in the middle and higher part of the expenditure distribution. Since households already in better economic positions receive most of the remittances, inequality increases.

Remittances are found to have a positive effect on school enrollment, especially for girls. The evidence from the TLSMS 2007 shows that boys are in general in a better position than girls in Tajikistan when it comes to school attendance. However, when a girl lives in a similar household than a boy, and both households receive remittances, the girl will experience a higher increase in her chances to attend to school. A possible explanation for this is that boys would attend to school regardless or not the household receives remittances, whereas the extra resources coming from remittances do matter for girls.

Similarly to poverty and inequality, the effect of remittances on school enrollment is related to the expenditure distribution. Since children in wealthier households have larger chances to be enrolled at school, and a larger proportion of this households receive remittances, the overall effect of remittances is likely to be lower than in a scenario in which a larger proportion of households in the lower quintiles of the expenditure distribution receive remittances.

It remains to further research how the effect of remittances on poverty, inequality and school enrollment changes over time. As argued before, thicker migratory networks are likely to decrease the cost of migration, allowing more less wealthy households to send migrants abroad and receive remittances. If this is indeed the case, poverty in Tajikistan will further decrease, inequality could diminish, and school enrollment could increase even more. For now, however, the evidence points out to a mild effect of remittances on poverty reduction, a positive effects on girls enrollment at school, but also to an increase in inequality.

References

Lewbel, A., Dong, Y. & Yang, T. T., 2012. Comparing features of convenient estimators for binary choice models with endogenous regressors. *Canadian Journal of Economics,* 45(3), pp. 809-829.

Acevedo, C. & Cabrera, M., 2014. Social Policies or Private Solidarity? The Equalizing Role of Migration and Remittances in El Salvador. In: *Falling Inequality in Latin America: Policy Changes and Lessons.* s.l.:Oxford Scholarship Online.

Acosta, P., 2006. Labor supply, school attendance, and remittances from international migration: The case of El Salvador. *World Bank Policy Research Working Paper,* Issue 3903, pp. 1-57.

Acosta, P., Calderón, C., Fajnzylber, P. & López, H., 2007. What is the Impact of International Remittances on Poverty and Inequality in Latin America?. *World Development,* 36(1), pp. 89-114.

Adams Jr., R. H. & Page, J., 2005. Do International Migration and Remittances Reduce Poverty in Developing Countries?. *World Development,* pp. 1645-1669.

Adams Jr., R. H. & Page, J., 205. Do International Migration and Remittances Reduce Poverty in Developing Countries?. *World Development,* pp. 1645-1669.

Adams Jr., R. H., 1998. Remittances, investment, and rural asset accumulation in Pakistan. *Economic Development and Cultural Change,* 1(47), pp. 155-173.

Amuedo-Dorantes, C. & Pozo, S., 2006. Remittance receipt and business ownership in the Dominican Republic. *The World Economy,* pp. 939-956.

Angrist, J. D. & Pischke, J.-S., 2009. *Mostly Harmless Econometrics: An Empiricist's Companion.* Princeton, New Jersey: Princeton University Press.

Barham, B. & Boucher, S., 1998. Migration, remittances, and inequality: estimating the net effects of migration on income distribution. *Journal of Development Economics,* Volume 55, pp. 307-331.

Becker, G. S., 1962. Investment in Human Capital: A Theoretical Analysis. *Journal of Political Economy,* 70(5), pp. 9-49.

Beine, B., Docquier, F. & Rapoport, H., 2001. Brain drain and economic growth: theory and evidence. *Journal of Development Economics,* Volume 64, pp. 275-289.

Betti, G. & Lundgren, L., 2012. The impact of remittances and equivalence scales on poverty in Tajikistan. *Central Asian Survey,* pp. 395-408.

Beyene, B. M., 2014. The effect of International Remittances on Poverty and Inequality in Ethiopia. *The Journal of Development Studies,* pp. 1380-1396.

Buckley, C. & Hofmann, E. T., 2012. Are remittances an effective mechanism for development? Evidence from Tajikistan, 1999 - 2007. *Journal of Development Studies,* 48(8), pp. 1121 -1138.

Chaaban, J. & Mansour, W., 2012. The impact of remittances on education in Jordan, Syria, and Lebanon. *The Economic Research Forum. Working paper series,* Issue 684, pp. 1-31.

Cox-Edwards, A. & Ureta, M., 2003. International migration, remittances, and schooling: evidence from El Salvador. *Journal of Development Economics,* Volume 72, pp. 429-461.

De Hass, H., 2005. International Migration, Remittances, and Development: myths and facts. *Third World Quarterly,* 26(8), p. 1269 – 1284.

De Hass, H., 2007. Remittances, Migration and Social Development. A Conceptual Review of the Literature. *Social Policy and Development Programme Paper,* Issue 34, pp. 1-46.

Deaton, A., 1997. *The Analysis of Household Surveys: A Microeconometric Approach to Development Policy.* Washington, D.C.: The World Bank.

Dustmann, C. & Kirchkamp, O., 2002. The optimal migration duration and activity choice after re-migration. *Journal of Development Economics,* Volume 67, pp. 351-372.

Filmer, D. & Pritchett, L. H., 2001. Estimating wealth effects without expenditure data -or tears: An application to educational enrollments in states of India. *Demography,* 38(1), pp. 115-132.

Funkhouser, E., 1995. Remittances from international migration: a comparison of El Salvador and Nicaragua. *Review of Economics and Statistics,* 77(1), pp. 137-146.

Glewwe, P., 1991. Investigating the determinants of household welfare in Côte d'Ivore. *Journal of Development Economics,* Volume 35, pp. 307-337.

Graeme, H. et al., 1993. Theories of International Migration: A Review and Appraisal. *Population and Development Review,* 19(3), pp. 431-466.

Haughton, J. & Khandker, S. R., 2009. *Handbook on Poverty and Inequality.* Washington, DC: The World Bank.

Heckman, J. T., 1979. Sample Selection Bias as a Specification Error. *Econometrica,* 47(1), pp. 153-161.

Maitra, P., 2010. Schooling and Educational Attainment: Evidence from Bangladesh. *Education Economics,* 11(2), pp. 129-153.

McKenzie, D. & Rapoport, H., 2006. Can migration reduce educational attainment?. *World Bank Policy Research Working Paper,* Issue 3952, pp. 1-42.

Nakamuro, M., 2010. School attendance and migrant remittances in transition economies: The case of Albania and Tajikistan. *International Development Planning Review,* 32(3), pp. 333-361.

Olimova, S. & Bosc, I., 2003. *Labour Migration from Tajikistan.* Dushanbe: International Organization for Migration.

Özden, Ç. & Schiff, M., 2006. *International migration, remittances & the brain drain.* Washington DC & Hampshire: The World Bank and Palgrave Macmillan.

Perkins, J. A., 1966. Foreign Aid and the Brain Drain. *Foreign Affairs,* 44(608), pp. 608-619.

Rapoport, H., 2002. Migration, credit constraints and self-employment: A simple model of occupational choice, inequality and growth. *Economics Bulletin,* 15(7), pp. 1-5.

Rapoport, H. & Docquier, F., 2006. The economics of migrants' remittances. In: *Handbook of the economics of giving, altruism and reciprocity.* s.l.:s.n., pp. 1135-1198.

Sawada, Y. & Loksbin, M., 2001. Household Schooling Decisions in Rural Pakistan. *World Bank Policy Research Working Paper,* Issue 2541, pp. 1-36.

The World Bank Group, 2008. *Tajikistan Living Standards Measurement Survey 2007: Basic Information Document.* [Online]
Available at:
http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTLSMS/0,,contentMDK:21878045~pagePK:64168445~piPK:64168309~theSitePK:3358997,00.html
[Accessed 15 January 2015].

The World Bank Group, 2011. *Migration and remittances factbook 2011.* 2 ed. Washington DC: s.n.

The World Bank, 2005. *Republic of Tajikistan Poverty Assessment Update,* s.l.: s.n.

The World Bank, 2009. *Republic of Tajikistan Poverty Assessment,* s.l.: The World Bank.

The World Bank, 2011. *Migration and Remittances Factbook 2011.* Washington DC: The World Bank.

The World Bank, 2012. *World Development Indicators 2012.* World Bank Publications. ed. s.l.:s.n.

United Nations, n.d. *Tajikistan: rising from the ashes of civil war.* [Online]
Available at: http://www.un.org/events/tenstories/06/story.asp?storyID=600#
[Accessed Mayo 2015].

Yang, D., 2005. International migration, human capital, and entrepreneurship: evidence from Philippine migrants' exchange rate shocks. *University of Michigan, Ford School of Public Policy Working Paper No. 02-011* .

Appendix

Appendix 1 -Variables Included in the Household Asset Index

- Construction material of the walls of the dwelling
- Construction material of the roof of the dwelling
- Construction material of the floor of the dwelling
- Number of rooms of the dwelling
- Kitchen as a separate room in the dwelling
- Central heating system available in the dwelling
- Use of biomass fuels for heating
- Use of Gas for different proposes in the dwelling
- Mainline Telephone available in the dwelling
- Cellphone owned by a member of the household
- Plumped water available in the dwelling
- Flush toilet available in the dwelling
- Pit latrine available in the dwelling
- No latrine available in the dwelling
- Land extension owned by the household
- Ownership of: gas oven, electric oven, gas hobb, electric stove, electric water heater, outdoor metal stove, kerosene stove, wood stove, earthen stove, sandalee, generator, radiator electric, refrigerator, freezer, washing machine, electric iron, vacuum cleaner, air conditioner, electric fan, electric room heater, electric lamp, kerosene lamp, electric water boiler, gas water boiler, microwave oven, electrical sewing machine, color television, TV black & white, radio, stereo, video player, computer, satellite dish, tape/cd player, video camera, motorcycle/scooter, car, truck, bicycle.

Appendix 2 - Poverty with the alternative poverty line

Index	Actual Measure	No remittances scenario	Difference
Headcount Ratio	0.1973*** (0.0072)	0.1912*** (0.0073)	0.0061** (0.0031)
Poverty Gap Index (FGT 1.0)	0.0399*** (0.0020)	0.0371*** (0.0019)	0.0028*** (0.0006)
Poverty Severity Index (FGT 2.0)	0.0122*** (0.0008)	0.0112*** (0.0008)	0.0010*** (0.0002)

Data source: TLSMSM 2007

Notes: Bootstrapped standard errors reported in parenthesis.

*** Significant at 1%, **Significant at 5%, *Significant at 10%

Appendix 3 – Biprobit Model for sex and Age Group

Appendix 3.1 - Marginal effects over probability of school enrollment - Girls

VARIABLES	(1) Girls	(2) Girls Aged 7 - 10	(3) Girls Aged 11 - 15
Child characteristics			
age	0.403***	1.824***	0.171
	(0.0234)	(0.173)	(0.109)
agesq	-0.0172***	-0.100***	-0.00726*
	(0.00107)	(0.0104)	(0.00413)
Mother educational level			
Primary	0.160	0.144	0.164
	(0.115)	(0.120)	(0.123)
Basic	0.202*	0.158	0.209*
	(0.108)	(0.101)	(0.114)
Secondary	0.256**	0.218**	0.270**
	(0.109)	(0.103)	(0.113)
Higher	0.257**	0.209*	0.287**
	(0.112)	(0.117)	(0.115)
Father educational level			
Primary	0.133*	0.104	0.213*
	(0.0799)	(0.0881)	(0.128)
Basic	0.142*	0.183***	0.191
	(0.0730)	(0.0611)	(0.126)
Secondary	0.116	0.0861	0.201
	(0.0731)	(0.0584)	(0.125)
Higher	0.142*	0.120**	0.217*
	(0.0747)	(0.0591)	(0.127)
Self-employment			
Mother self-employee	0.0115	-0.0235	0.0321
	(0.0148)	(0.0228)	(0.0209)
Father self-employee	-0.00263	0.00859	-0.00950
	(0.0163)	(0.0220)	(0.0203)
Household head characteristics			
HH_EMPL	0.00259	0.00698	-0.00420
	(0.0151)	(0.0207)	(0.0178)
HH_sex	-0.0241	-0.0145	-0.0228
	(0.0194)	(0.0349)	(0.0258)
Other children in the household by age group			
7 to 10	-0.00535	0.00192	-0.00273
	(0.00917)	(0.0128)	(0.0102)
11 to 15	0.0282***	0.0239**	0.0211
	(0.00909)	(0.0116)	(0.0128)
Other household characteristics			
index_ha	0.00626	0.000462	0.00744
	(0.00405)	(0.00638)	(0.00464)
HHsize	-0.00882***	-0.0117***	-0.00555
	(0.00316)	(0.00350)	(0.00389)
distance_psch	-0.00169***	-0.000781	-0.00162***
	(0.000567)	(0.000854)	(0.000497)
index_sch	-0.00300	0.00406	-0.00798**
	(0.00324)	(0.00460)	(0.00401)
Comunity and regional variables			
DRS	0.102***	0.0426	0.127**
	(0.0372)	(0.0432)	(0.0551)
Sughd	0.0831**	0.0282	0.113**
	(0.0351)	(0.0470)	(0.0531)
Kathlon	0.0698**	0.00584	0.0942*
	(0.0351)	(0.0440)	(0.0524)

VARIABLES	(1) Girls	(2) Girls Aged 7 - 10	(3) Girls Aged 11 - 15
GBAO	0.0887**	-0.00923	0.162***
	(0.0390)	(0.0531)	(0.0556)
location	0.0325	-0.0136	0.0610**
	(0.0254)	(0.0323)	(0.0263)
Remittances receiver status of the household			
receiver	0.0997**	0.178**	0.0815
	(0.0434)	(0.0779)	(0.0685)
Observations	3,202	1,382	1,820

*** Significant at 1%, **Significant at 5%, *Significant at 10%
Standard errors reported in parenthesis

Appendix 3.2 - Marginal effects over probability of school enrollment - Boys

VARIABLES	(1) Boys	(2) Boys Aged 7 - 10	(3) Boys Aged 11 - 15
Child characteristics			
age	0.340***	1.406***	-0.121*
	(0.0216)	(0.129)	(0.0640)
agesq	-0.0144***	-0.0757***	0.00447*
	(0.000964)	(0.00770)	(0.00243)
Mother educational level			
Primary	0.0727	0.0421	0.0918
	(0.0742)	(0.0640)	(0.0578)
Basic	0.0701	0.101**	0.0510
	(0.0718)	(0.0507)	(0.0571)
Secondary	0.0910	0.103*	0.0627
	(0.0725)	(0.0538)	(0.0572)
Higher	0.118	0.120	0.0918
	(0.0753)	(0.0727)	(0.0578)
Father educational level			
Primary	-0.0368	-0.0208	-0.0139
	(0.0418)	(0.0709)	(0.0334)
Basic	-0.0735***	-0.0901	-0.0407**
	(0.0269)	(0.0595)	(0.0177)
Secondary	-0.0217	-0.0404	-0.00479
	(0.0285)	(0.0573)	(0.00987)
Higher	-0.0330	-0.0634	0.00296
	(0.0307)	(0.0583)	(0.0144)
Self-employment			
Mother self-employee	0.00244	-0.0128	0.00211
	(0.0131)	(0.0195)	(0.0113)
Father self-employee	0.00839	-0.0133	0.0190*
	(0.0117)	(0.0175)	(0.0108)
Household head characteristics			
HH_EMPL	0.0221*	0.0463***	0.00283
	(0.0121)	(0.0174)	(0.0108)
HH_sex	0.0464**	0.0393*	0.0111
	(0.0192)	(0.0238)	(0.0174)
Other children in the household by age group			
7 to 10	0.00333	0.0187*	-0.000153
	(0.00688)	(0.0106)	(0.00458)
11 to 15	0.0150***	0.00674	0.00809
	(0.00567)	(0.00873)	(0.00606)
Other household characteristics			
index_ha	0.0123***	0.0133**	0.00717**

VARIABLES	(1) Boys	(2) Boys Aged 7 - 10	(3) Boys Aged 11 - 15
	(0.00350)	(0.00583)	(0.00304)
HHsize	-0.00378*	-0.00524*	0.000596
	(0.00192)	(0.00277)	(0.00206)
distance_psch	-5.13e-05	-0.000500	0.000106
	(0.000420)	(0.000489)	(0.000553)
index_sch	0.00522*	0.00769*	0.00104
	(0.00266)	(0.00438)	(0.00215)
Comunity and regional variables			
DRS	0.0159	0.0602	-0.00936
	(0.0277)	(0.0369)	(0.0260)
Sughd	0.0339	0.0343	0.0171
	(0.0259)	(0.0372)	(0.0227)
Kathlon	0.0156	0.0104	0.00652
	(0.0269)	(0.0385)	(0.0245)
GBAO	0.0424	0.0300	0.0305
	(0.0305)	(0.0448)	(0.0236)
location	0.0212	0.000177	0.0231
	(0.0192)	(0.0281)	(0.0171)
Remittances receiver status of the household			
receiver	-0.0975	-0.0785	0.0332
	(0.0671)	(0.0922)	(0.0314)
Observations	3,439	1,510	1,929

*** Significant at 1%, **Significant at 5%, *Significant at 10%
Standard errors reported in parenthesis

Appendix 3.3 - Marginal effects over probability of school enrollment – Ages 6 to 22

VARIABLES	(1) All	(2) Boys	(3) Girls
Child characteristics			
age	0.231***	0.226***	0.236***
	(0.00710)	(0.00832)	(0.00983)
agesq	-0.00935***	-0.00890***	-0.00985***
	(0.000250)	(0.000294)	(0.000360)
sex	-0.102***		
	(0.00837)		
Mother educational level			
Primary	0.0768	0.135**	0.00210
	(0.0595)	(0.0649)	(0.0714)
Basic	0.0597	0.0887	0.0477
	(0.0556)	(0.0572)	(0.0674)
Secondary	0.0973*	0.111*	0.104
	(0.0548)	(0.0572)	(0.0671)
Higher	0.173***	0.195***	0.172**
	(0.0578)	(0.0602)	(0.0733)
Father educational level			
Primary	0.0612	-0.00250	0.139**
	(0.0433)	(0.0513)	(0.0669)
Basic	0.00252	-0.0669*	0.0708
	(0.0344)	(0.0389)	(0.0561)
Secondary	0.0317	-0.00255	0.0654
	(0.0328)	(0.0333)	(0.0574)
Higher	0.0983***	0.0742**	0.118*
	(0.0345)	(0.0346)	(0.0615)
Self-employment			

VARIABLES	(1) All	(2) Boys	(3) Girls
Mother self-employee	0.00968	0.00534	0.0177
	(0.0108)	(0.0137)	(0.0156)
Father self-employee	0.00767	0.0172	-0.00672
	(0.00991)	(0.0121)	(0.0164)
Household head characteristics			
HH_EMPL	0.0165	0.0104	0.0203
	(0.0105)	(0.0131)	(0.0149)
HH_sex	0.00364	0.0151	-0.0234
	(0.0223)	(0.0157)	(0.0258)
Other children in the household by age group			
7 to 10	0.00544	0.0104	0.00111
	(0.00542)	(0.00708)	(0.00728)
11 to 15	-0.00331	-0.00614	0.00273
	(0.00567)	(0.00659)	(0.00855)
Other household characteristics			
index_ha	0.0135***	0.0128***	0.0136***
	(0.00309)	(0.00403)	(0.00354)
HHsize	-0.00635***	-0.00601***	-0.00546*
	(0.00193)	(0.00222)	(0.00299)
distance_psch	-0.000541**	9.65e-05	-0.00119**
	(0.000264)	(0.000414)	(0.000500)
index_sch	0.000901	0.00323	-0.00150
	(0.00354)	(0.00327)	(0.00440)
Comunity and regional variables			
DRS	0.00770	-0.0696***	0.0818***
	(0.0217)	(0.0262)	(0.0300)
Sughd	0.0327*	-0.00892	0.0673**
	(0.0193)	(0.0253)	(0.0285)
Kathlon	0.0167	-0.0276	0.0467
	(0.0226)	(0.0273)	(0.0310)
GBAO	0.0868***	-0.00271	0.168***
	(0.0278)	(0.0297)	(0.0347)
location	0.0178	0.0233	0.00502
	(0.0179)	(0.0186)	(0.0228)
Remittances receiver status of the household			
receiver	0.0312	-0.0722	0.219**
	(0.128)	(0.0628)	(0.0949)
Observations	11,642	5,789	5,853

*** Significant at 1%, **Significant at 5%, *Significant at 10%
Standard errors reported in parenthesis