THE IMPACT OF REMITTANCES ON CHILDREN EDUCATION IN KYRGYZSTAN

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Abstract

This study investigates the impact of remittances on the education of left-behind children in Kyrgyzstan. Particularly, the study focuses on school expenditure. The effect of remittances is isolated from the effect of migration. Using the household - level survey "Life in Kyrgyzstan" for 2013, this study proposes the Instrumental Variable 2SLS procedure to address possible endogeneity bias arising from simultaneity between remittances receipts and education expenditures. The results suggest that there is not any statistically significant effect of remittances on educational expenditure of left-behind children in Kyrgyzstan. The results are in line with the prevailing belief in a literature on remittances that the latter are not spent on educational purposes, but rather spent on consumption of goods and purchase of durables.

Keywords: migration, remittances, education, Kyrgyzstan

Table of Contents

Abstracti
Chapter 1: Introduction
Chapter 2: Theoretical considerations and recent empirical findings
2.1. Potential impact of remittances on children education
2.2. Recent empirical findings
Chapter 3. Background and data
3.1 Educational system and remittances inflows in Kyrgyzstan
3.2. "Life in Kyrgyzstan" dataset
Chapter 4: Empirical methodology 12
4.1 Empirical specification
4.2. Identification strategy
Chapter 5: Results
Chapter 6: Conclusion
References

List of Tables

Table 1: Reasons why children are not enrolled in school	.9
Table 2: Distribution of children across grade levels	10
Table 3 Number of migrants and mean value of remittances across regions	11
Table 4 Distribution of migrants across destination cities	11
Table 5 List of variables in the model	13
Table 6 Regression results (full sample)	18
Table 7 Regression results (rural sample)	20

Chapter 1: Introduction

In recent years, there has been a significant increase in migration from poor to rich counties. According to the United Nations statistics, in 2015 there were 244 million international migrants living outside their places of birth worldwide. For the past few decades, remittances sent by migrants back home have represented one of the largest sources of finance inflows to developing countries, thus attracting a keen interest of researchers and policymakers (Ambler et al., 2015). The World Bank estimates that officially recorded global remittances worldwide reached \$575 billion in 2016, from which \$439 billion were sent to developing countries. Taking that in account, the effect of remittances on the recipient economies (economic growth, employment, poverty, etc.) has been studied extensively. However, relatively few studies addressed the effect of remittances on human capital formation in recipient country. Particularly, the impact of remittances on education of children in remittances receiving families requires a thorough analysis with important policy implications. As investment in human capital of children is one of the main components for countries' future well-being, it is of high importance to determine what impact remittances have on children education.

This paper provides an empirical investigation of the effect of remittances and migration on the education of children in Kyrgyzstan. Kyrgyzstan provides a good setting to study the impact of remittances on various socio-economic indicators and on education, in particular. The reason is that Kyrgyzstan is one of the most remittances - depending countries with annual remittances inflows equaled to a quarter of GDP in 2015, according to the World Bank statistics. To study the impact of remittances on children education, I use the representative survey of households in Kyrgyzstan for 2013. To the best of my knowledge, there is only one recent study estimating the impact of remittances on education of children in Kyrgyzstan conducted by Kroeger et al. (2014). This paper contributes to the existing research, at least, in three ways: 1) it extends the scope of previous literature by focusing on children schooling expenditure instead of enrollment status; 2) it separates the impact of remittances from that of migration of adult members in a household; 3) it employs Instrumental Variable estimation to address possible endogenous relations of variables of interest. I specifically concentrate on educational expenditure because Kyrgyzstan has high school enrollment rates, as its education system is compulsory for the first nine years of primary and lower secondary education, from age 7 to 15. Moreover, school enrollment does not imply school attendance, and does not provide evidences on quality of education obtained. School expenditures, on the contrary, usually positively correlates with the quality of education.

The rest of the paper proceeds as follows. In section 2, the paper describes the channels, through which remittances can affect education, and summarizes recent empirical findings on the topic. Section 3 provides the background information of Kyrgyzstan and describes the "Life in Kyrgyzstan" household survey used to construct a dataset. In section 4, I discuss the possible endogeneity problems and propose the model specification that accounts for endogeneity of variables of interest. Section 5 gives interpretation of the results. Finally, section 6 makes concluding remarks.

Chapter 2: Theoretical considerations and recent empirical findings

2.1. Potential impact of remittances on children education

Since there are many different channels through which remittances and migration may affect the recipient families, the theoretical impact of remittances on children education is ambiguous. On the one hand, remittances provide an additional source of relatively stable income and, thus, lead to alleviating of household's credit constraints. Eased credit constraint, in its turn, leads to increase in consumption of normal goods and to investment in education (McKenzie and Sasin, 2007). Those children who have to work to support their families can afford attending schools if remittances are large enough to compensate for the foregone child earnings (Koska et al., 2013).

On the other hand, remittances inevitably come with migration of adult household members. This fact may lead to some detrimental effects on education. One of the reasons is restructuring of the roles in the households and family disruption, which places an increased burden of domestic chores on non-migrant members of a household and mostly on children (Koska et al., 2013). In addition, the absence of a parent or both may lead to lack of control over children's studying process and may decrease an academic performance of children (Kandel and Kao, 2001). Another negative effect of migration over child education is the creation of incentives for children to migrate with belief that unskilled labor is rewarding without getting an education. In other words, children may decide to substitute migration for education because compensation for unskilled labor abroad outweighs returns to education in their countries of origin (McKenzie and Rapoport, 2010).

2.2. Recent empirical findings

The empirical findings of the existing literature also do not yield uniform results. There prevails a belief in a literature that remittances do not play any role in forming both physical and human capital, and households spend remittances mostly on consumption of goods (Wael

Mansour et al., 2011). However, some researchers challenge the established views and find positive effects of remittances on children's schooling. For example, Feng Hu (2012) explores the impact of rural-urban migration on a high school attendance in China using household level data for children aged 17-19. His results suggest that there is positive statistically significant effect of remittances on children school attendance, especially for girls and for children from "poor" households. At the same time, Feng Hu (2012) finds negative impact of migration of households' adult members on school attendance of left-behind children in rural areas. In a similar manner, Amuedo-Dorantes and Pozo (2010), and Bouoiyour and Miftah (2016) explore the remittances impact on children's school attendance on the sample of Dominican Republic and Morocco children respectively. Both studies conclude that remittances promote children's school attendance via income effect.

Other studies (Koska et al., 2013; Mansour et al., 2011; Kroeger et al., 2014; Bansak, 2009; Calero et al., 2008) concentrate on a school enrollment as an educational outcome of interest. Among them, Koska et al. (2013), Mansour et al. (2011), Bansak (2009), Calero et al. (2008) find that remittances positively and statistically significantly affect school enrollment for children in remittances receiving households in cases of Egypt, Jordan, Nepal, and Ecuador respectively. Others (Kroeger et al., 2014) do not find any significant impact of remittances on children's schooling.

Several studies (Ambler et al., 2015; Salas, 2014; Cebotari et al., 2016) have attempted to capture the quality component of children's education. Ambler et al. (2015) investigates how remittances channeling stimulates migrant families to spend on education in El Salvador, and find that remittances result in a "crowd-in" effect, thus boosting expenditures on children education. Salas (2014) explores whether remittances inflows influence a decision between sending children to a private or to a public school in Peru. Salas (2014) finds that remittances receiving households have a higher likelihood of sending children to private schools. Cebotari

et al (2016) concentrates on school performance of children, and concludes that parents' migration in Georgia and Moldova worsen education of migrants' children.

Because of the possible endogeneity problem, most of the studies on the topic use Instrumental Variable estimation techniques with the different instruments for the value of remittances and a household's migration status (number of migrants in a family, binary variable having any migrants in a household, binary variable for receiving any remittances, etc.). For example, Feng Hu (2012), Mansour et al. (2011), McKenzie and Rapoport (2011) use community-level (state-level) migration rates as instruments for a household's migration status. At the same time, Kroeger et al. (2014), Salas (2014) use community-level historical migration rates as instruments for the value of remittances received. This latter case may not be appropriate, as there can be low correlation between historical migration rates and the value of current remittance received, while past migration highly correlates with current migration tendency (Calero et al., 2008). Some of the authors (Koska et al., 2013; Bansak, 2009; Calero et al., 2008; Amuedo-Dorantes and Pozo, 2010) invented different instruments for the value of remittances. In case of Egypt, where most of the migrants tend to migrate to developed oil-rich Arab countries, Koska et al. (2013) employs the average oil supply in migrants' host countries. Bansak (2009) uses historical literacy rates and political instability by district as instruments for remittances. According to Calero et al. (2008), transaction costs of money transfers can be a good instrument for the volume of remittances sent. To reflect the transaction costs Calero et al. (2008) use the province-level availability of Western Union branches in remittances receiving provinces. With different approach for identifying instrument for remittances, Amuedo-Dorantes and Pozo (2010) use the state-level real earnings and unemployment levels in the countries hosting migrants.

Chapter 3. Background and data

3.1 Educational System and Remittances inflows in Kyrgyzstan

Kyrgyzstan represents a good setting to study the impacts of international migration and consequent remittances flows on the education of children. Starting from early 2000, the international out-migration in the Kyrgyz Republic increased significantly. The Kyrgyz Republic was the second mostly remittances-dependent country in 2014, receiving remittances equivalent to 30.3% of GDP, as the World Bank statistics suggests. Figure 1 shows the dynamic of remittances inflows to Kyrgyzstan. As we can see, starting from 2006 remittances inflows to Kyrgyzstan experienced sustainable growth dropping only in 2008-2009 due to Global Financial Crisis.

The high migration rates in Kyrgyzstan are primarily motivated by economic factors. Particularly, there is a large wage gap with the Russian Federation, Turkey, Kazakhstan, and United Arab Emirates – usual destinations of Kyrgyz migrants (Antje Kroeger et al., 2014). The wage gap has been relatively stable for the last decade. The main hosting country for Kyrgyz migrants is the Russian Federation. Though there has been the economic crisis and the depreciation of the Russian ruble value recently, the outflow of migrants from Kyrgyzstan has not changed significantly (Ibraeva and Ablezova, 2016). The recent entry of Kyrgyzstan into the Eurasian Economic Union in 2015 facilitated and boosted the migration process even further. With its GDP per capita of \$1269.1 in 2015, Kyrgyzstan is a way behind its EEU partners (WDI, 2015). There were also demographic issues explaining the recent increase in migration. For instance, Ibraeva and Ablezova (2016) note that the very large labor force, born in Kyrgyzstan between 1985 and 1994, has entered the internal labor market since the early 2000s. The internal labor market was unprepared to absorb and employ the new work force, which resulted in massive migration abroad as the only alternative to earn money.

What makes Kyrgyzstan's case particularly interesting to analyze is its migration patterns. Migrants from Kyrgyzstan usually do not intend to settle and obtain a permanent residence in the hosting countries, which means their families remain at home (Ibraeva and Ablezova, 2016). That provides a perfect natural setting to analyze the impact of migrants' remittances on the education of their children, if any, left behind.



Figure 1

The school education system in Kyrgyzstan is divided into three levels: *primary school* (1 - 4 forms, for 6 - 10 years old); *basic secondary school* (5 - 9 forms, for 10-15 years old); and *complete secondary school* (10 - 11 forms, for 15-17 years old). School education in Kyrgyzstan is compulsory for nine years: four years in a primary school, and five years in a lower secondary school. In Kyrgyzstan, there are *state, municipal* and *private schools*. By status, the educational organizations are classified into *general education schools, gymnasiums* and *lyceums*.

Due to lack of finance to maintain schools, Kyrgyz government transferred the financing of primary and secondary public education to local governments and parents (UNICEF, 2010).

Source: World Bank, 2016

To compensate for low salaries of teachers, there are informal fees to be paid for the compulsory education (general education schools) officially declared free. Besides those fees, students have to acquire reading materials and textbooks, which were formerly provided free (UNICEF, 2010). Those total fees on education represent the outcome variable I concentrate on in this study. Expenditures on education usually highly correlate with the quality of human capital formation and reflect more information than mere school enrollment or attendance.

3.2. "Life in Kyrgyzstan" dataset

In this paper, I employ the 2013 wave of Life in Kyrgyzstan (LIK) longitudinal data set. The LIK project was carried out by DIW Berlin (German Institute for Economic Research), and the American University of Central Asia. It is nationally representative survey tracking about 3000 households and 8000 individuals over time. The sampling procedure is random and twostage stratified: the country breaks up into 14 strata (cities, and rural areas of seven oblasts); strata are divided into population points (communities, districts, etc.). Then 25 households are drawn from each population point.

The LIK survey contains rich information about main socio-economic and demographic characteristics of households and individuals, which I use in this study. The main interest of this study is the quality of education measure by the total school expenditures on a child. Each household in the sample reports how much did they spend on each child's education in the past academic year (2012-2013). To measure the remittances, each household reports how much money they received during the last 12 months. These remittances can be sent via bank/money transfer offices, carried by migrant himself (herself), or carried by friends/relatives. This questionnaire has a large advantage in a sense that it measures both officially recorded and unreported money transfers, which are difficult to track otherwise. It is important to note that reporting of how much remittances was received is fully at a household's disposal. is For

migration status, each household answers the question of how many adult members of a household are currently employed abroad, excluding business trips.

To determine the effect of remittances on school expenditures, I focus only on children aged 6-17 in the sample, as these are main audience for attending primary and secondary schools. The children under observation live in both, remittances receiving and non-receiving households. Overall, I have 2936 observations, among which 2608 children are enrolled in school and 328 are not. Table 1 provides summary statistics of why some children were not attending a school in 2013. We can see that the majority of those not enrolling at school are going to either start "next year" or have already finished a school. This fact is the main reason why I employ school expenditures rather than school enrollment.

Table 1

Reasons	why	children	are n	ot en	olled	in school
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Why a child is not studying at the moment?	Frequency	Percent (%)	Cumulative (%)
	(num.)		
Costs too much	5	1.52	1.52
School is too far	8	2.44	3.96
Illness	5	1.52	5.49
Does not like study	21	6.40	11.89
Works to support family	15	4.57	16.46
Conflict with pupils, teacher	1	0.30	16.77
Will start next year	169	51.52	68.29
Finished	80	24.39	92.68
Other	24	7.32	100.00
Total	328	100.00	

Source: LIK 2013

The dataset I use in this study covers students ranging from first to eleventh forms and, thus provides a full scope of data representation. Table 2 shows in what grade children were enrolled in the 2011-12 academic year. We can see that distribution of students across school grade

levels is approximately even ranging from 6.90% for 11th grade students to 13.34% for 1st grade students.

Table 3 depicts the distribution of migrants across regions and the mean values of remittances and school expenditures per child in Kyrgyz soms (KGS). To assess the magnitude of these values, one can compare them to the average monthly salary of 11 341 soms in Kyrgyz Republic for 2013 (National Statistical Committee of KR). We can see a large misbalance in a sense that the majority of migrants are coming from Southern regions: Djalal-Abad, Osh, and Batken.

Table 2

Grade	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th
Freq.	348	289	192	240	240	210	227	235	259	188	180
Percent	13.34	11.08	7.36	9.20	9.20	8.05	8.70	9.01	9.93	7.21	6.90
Cumul.	13.34	24.42	31.79	40.99	50.19	58.24	66.95	75.96	85.59	93.10	100
Source: L	IV 2012										

Distribution of children across grade levels

Source: LIK 2013

The average value of remittances does not differ significantly across regions: the largest average value is in Djalal-Abad region and the lowest one in Talas region. As for the school expenditures, we can observe moderate differences across regions. The highest mean value of school expenditures per child corresponds to Bishkek, the capital of Kyrgyz Republic, while the lowest one – to Djalal-Abad region. Urban households (Bishkek, Osh city) tend to spend more on children education due to both higher schooling costs and higher average income relative to rural dwellers (Salas, 2014). Significant difference in mean school expenditures between urban and rural households suggests us analyzing the rural subsample separately, as rural households are more likely to experience budget constraints.

Table 3

Region (oblast)	Number of	Mean value of	Mean value of school
	migrants	remittances	expenditures per child
		(soms, year)	(soms, year)
Issyk-Kul	16	145 520	3 863
Djalal-Abad	301	158 300	2 574
Naryn	2	120 000	4 388
Batken	44	132 212	3 695
Osh	192	115 882	3 070
Talas	20	66 075	4 168
Chui	15	82 720	3 457
Bishkek	12	112 500	7 030
Osh city	23	98 400	5 633
Total	625	-	-

Number of migrants and mean value of remittances across regions

Official exchange rate (1 USD to KGS) as for 01.01.2013: 47.3868

Source: LIK 2013, National Bank of Kyrgyz Republic

As for the migrants' destinations, migrants in the sample are unevenly distributed across more than 10 cities of several countries. The main hosting country is the Russian Federation. Table 4 depicts migrants' distribution over hosting cities. We can see that the largest part of migrants reside in Moscow, the capital of the Russian Federation.

Table 4

Distribution of migrants across destination cities

City	Moscow	St. Petersburg	Novosibirsk	Krasnoyarsk	Almaty	other
Freq.	406	53	37	16	14	75
Source:	LIK 2013					

Chapter 4: Empirical methodology

4.1 Empirical specification

To estimate the causal relationship between remittances and children school expenditures, this study follows, though slightly modifies, the model specification proposed by Feng Hu (2012), and McKenzie and Rapoport (2011) estimating the following equation:

$$E_{i} = \beta_{0} + \beta_{1}R_{h} + \beta_{2}M_{h} + \beta_{3}I_{i} + \beta_{4}H_{h} + \beta_{5}W_{h} + u_{i,h}$$
(1)

Where E_i is the value of school expenditure per one particular child. R_h and M_h are the variables of interest: the value of remittances and the number of migrants in a household. Based on the theoretical consideration and recent empirical studies, I expect remittances to have positive effect on school expenditures. I_i stands for the set of individual-level child characteristics. Following other similar studies (Feng Hu, 2012; Koska et al., 2013; Bansak, 2009; McKenzie and Rapoport, 2011), this set includes a child's age, gender, and number of siblings. Besides what have suggested by previous studies, I also include two dummy variables of a child being an oldest and being an only child in a family. I expect these dummy variables to have an influence on a household's decision of how much to spend on a particular child, because of cultural and economic motives. For instance, the oldest children in rural households tend to start working after reaching a high-school age. H_h is the set of household characteristics. It includes standard socio-demographic description: location (urban/rural), region (oblast), and several characteristics of a household's head (a household head's age, gender and a highest education degree obtained). Regional (oblast) and locational (urban/rural) dummies capture possible cultural and income differences between households. As pointed by Salas (2014), educated household heads are more likely to send their children to better and, thus more expensive, schools. Therefore, I expect more educated household heads to have higher school expenditures. There are seven levels of household head's education: illiterate, primary, basic, secondary general, primary technical, secondary technical, and university degree (bachelor, master). Finally, W_h is the set of binary variables reflecting the wealth of a household (refer to table 4 for the complete list of variables).

Table 5

List of variables in the model

Variable description	Type of variable
Dependent variables	
Child school expenditure	continuous
Variables of interest	
Remittances	continuous
Number of migrants in a household	natural
Child characteristics	
Age	natural
Gender (male)	binary
Being an only child	binary
Being an oldest child	binary
Number of siblings	natural
Household characteristics	
Household head's age	natural
Household head's gender (male)	binary
Household head's highest education degree obtained	ordered
Region (oblast)	ordered
Location (urban/rural)	binary
Household's wealth indicators	
Number of rooms in a main dwelling	natural
Alternative housing	binary
Car	binary
Personal computer	binary
Internet connection	binary
Instrumental variables	
Historical community-level migration rate	continuous
Community's norm to remit	continuous

Source: LIK 2013

I do not include the total income of a household in the list of controls, since it can cause an endogeneity and multicollinearity problems. School expenditures and household income may jointly be determined by some unobserved factors (social status, for instance) in the error term. To remediate this endogeneity issue, I employ controls representing wealth effect. To control for the wealth effect, I included the dummy variables indicating possession of certain assets: an alternative housing, a car, a personal computer, and a home internet connection. The wealthier is the household, the more likely it possesses those assets. Another benefit of using "wealth effect" dummies instead of household income is that those indicate more longterm "well-being" of a household (Feng Hu, 2012). That means they influence not only current educational expenditures, but have affected past expenditures, as well.

4.2. Identification strategy

The model (1) can suffer from endogeneity. There are two potentially endogenous variables: remittances and the number of migrants in the family. There are, at least, two sources for the endogeneity issue.

The first source of the endogeneity is the potential reverse causality between variables of interest (remittances, number of migrants) and school expenditure. Reverse causality may arise because independent variables (remittances, number of migrants) are jointly determined with the dependent variable. For example, parents may decide to migrate and send remittances if they have to pay high tuition costs for their children's education. At the same time remittances and migration, as was discussed earlier, may have an impact on school expenditure. In the presence of endogeneity, OLS estimators produce bias results.

The second source of endogenous relationship of remittances and school expenditures is the omitted variable bias. There may be unobserved characteristics in the error term, which are related to both the value of remittances received and children school expenditures. For instance, there are unobserved cultural and individual attitudes, such as ambitions, that may influence the decision to spend more on children education and to migrate (Salas, 2014).

To solve the above listed endogeneity concerns, I use Instrumental Variables estimation, in line with other studies (Feng Hu, 2012; McKenzie and Rapoport, 2011; Salas, 2014). A good instrument should have two properties: it should be relevant (correlated with a variable being instrumented), and it should be exogenous (uncorrelated with the error term). As an instrument for the number of migrants in a family, I used the historical migration rates on a community level for the year of 2010. There are 120 communities in the dataset: each has its own value for historical migration in 2010. As Feng Hu (2012) and McKenzie and Rapoport (2010) argue, historical migration rates indicate the development of a migration network in a community. The more developed migration network lowers the migration cost for future migrants and therefore facilitates migration of households in a community. Therefore, this instrument should be relevant. At the same time, historical migration rates of 2010 should not have any reasonable direct effect on children school expenditures in 2013, thus indicating the exogeneity of the instrument.

To instrument the value of remittances I used the community's norm to remit. This instrument was computed as an average remittances value in a community dropping the observed household. The identification assumption is that the community's norm to remit should positively affect the probability of a household to receive remittances, while not affecting the household's school expenditures as an observed household was dropped when computing the instrument. Next, I assume that the community's norm to remit does not correlate with some unobserved community-level shocks, which might influence households' expenditures on children schooling. Some studies (Antman, 2011; Amuedo-Dorantes, 2010) propose using the economic characteristics of hosting countries (where migrants are working) as instruments for remittances. For instance, Antman (2011) uses US city-level employment rates when examining Mexican migration. Amuedo-Dorantes (2010) uses US state-level average real earnings when examining Haitian migration. However, in my dataset more than 65% of migrants are residing in the capital of the Russian Federation, Moscow (see Table 4). Then, if I used city-level economic indicators as instruments, there would be high correlation in the matrix of instrumental variables, which would result in the problem of weak instruments.

So, I estimate the equation (1) using Instrumental Variables 2SLS procedure with two endogenous variables (remittances, and number of migrants in a household) and two instruments (historical migration rates, and community's norm to remit) for two different samples: 1) full sample; 2) sample for rural households.

Chapter 5: Results

Table 6 reports the estimation results. The first column (1) reports results from IV 2SLS regression with two endogenous and two instrumental variables for the full sample. We can see that none of the variables of interest (*remittances, migrants*) is statistically significant. The postestimation test for endogeneity, Wu-Hausman, indicates that the variables I suspected to be endogenous are, in fact, exogenous. This can be explained by two reasons: 1) the variables remittances and migrants are indeed exogenous; 2) the instrumental variables are weak and distort Wu-Hausman test. To check the second hypothesis I ran the same regression but with only one endogenous variable remittances and two instruments, and report F-statistics from that regression. The results of this second modified regression are presented in the second column (2) of Table 6. F-statistics from the first-stage regression is equal to 3.9121, indicating that an F-test is significant at 5% significance level. Next, I drop migrants variable and run the same 2SLS IV model with two instruments and one endogenous variable. F-statistics from that regression is 4.4926 with p-value of 0.011. That confirms our hypothesis that instruments are relevant (correlated with the endogenous variables) and the variables of interest, remittances and *migrants* are exogenous. Since there is no evidence that *remittances* and *migrants* are endogenous variables, I ran the Ordinary Least Squares estimation (with robust standard errors) and provide results in the fourth column (4) of Table 6.

We can see that the effect of *remittances* is positive, though economically and statistically insignificant. This result is consistent with the prevailing belief that households spend remittances on consumption and do not invest in human capital. The effect of *migrants* is negative, meaning that the migration of adult members distorts families and decreases school expenditures.

Table 6

Regression results (full sample)

	(1)	(2)	(2)	(4)
	(1)	(2)	(3)	(4)
	IV 2SLS (a)	IV 2SLS (b)	IV 2SLS (c)	OLS (a)
Remittances	-0.067	-0.016		0.0005
	(0.190)	(0.032)		(0.0004)
Migrants	-3167.161		-701.438	-140.023*
C	(11470.6)		(1789.524)	(86.495)
Age (child)	122.105	145.368***	155.2034***	161.234
rige (enna)	(10/ 153)	(36 508)	(24, 620)	(20.914)
Mala (abild)	115 256	118 420	114 427	101 248
Male (clilid)	-115.250	-118.430	-114.437	-101.348
	(240.03)	(142.938)	(132.622)	(130.118)
Siblings	-198.074	-37.834	15.938	21.041
	(618.906)	(128.241)	(61.807)	(52.791)
Being an only child	1004.474	532.77	359.036	303.738
	(1894)	(488.267)	(258.48)	(253.946)
Being an oldest child	585.887*	495.434*	450.98*	411.336***
	(296 865)	(222,724)	(174.41)	(139.612)
Age (household head)	13 /36	10.260	6 / 83	-0.689
Age (nousenoid nead)	(24,700)	(10.592)	(19 922)	-0.08)
	(34.799)	(19.582)	(18.822)	(5.977)
Primary education	-1205	-845.412	212.08	-702.935
	(1781.451)	(723.951)	(191.00)	(387.90)
Secondary general	-676.239	-490.004	-721.79	-606.797
	(1187.163)	(582.460)	(625.65)	(389.041)
Primary technical	-716.331	-190.715	-606.58	-242.2
, , , , , , , , , , , , , , , , , , ,	(2194.881)	(651,437)	(540.065)	(448,172)
Secondary technical	-201 862	05 811	-478 85	113 615
Secondary teeninear	(1464.045)	(500 564)	(577.09)	(169 219)
TT 1 1/ 1	(1464.045)	(590.564)	(577.98)	(408.318)
University degree	-485.370	-88.645	-82.135	-48.408
	(1748.66)	(594.242)	(690.94)	(441.095)
Urban	627.72	267.655	170.316	220.106*
	(1370.526)	(251.420)	(238.119)	(105.846)
Number of rooms	115.69	57.996	33.86	19.582
	(258.362)	(90.6)	(61.98)	(61.890)
Alternative housing	973 469	-40 549	-392 568	19 583
Thermalive housing	(3916 617)	(811 605)	(272.63)	(61 801)
Com	(3710.017)	128.008	167.605	112.00
Car	-27.930	158.908	107.003	(112.09
G	(641.038)	(156.673)	(184./8)	(112.97)
Computer	877.311	1239.811***	1348.49	1326.248***
	(1415.518)	(315.571)	(251.74)	(283.817)
Home internet	2046.711**	1859.39***	1842.648***	1957.041***
	(923.546)	(373.542)	(396.937)	(736.904)
Dialal-Abad	269.025	-292.955	-641.292	-1075.761***
j	(3075 35)	$(1374\ 529)$	(916 926)	(170.874)
Naryn	331 431	606 096	722 253*	793 573***
i vai yii	(1212.77)	(511 725)	(286 082)	(222, 944)
D (1	(1515.77)	(311.723)	(380.982)	(233.044)
Batken	449.414	322.902	241.870	137.246***
	(901.192)	(462.66)	(376.253)	(210.013)
Osh	-539.053	-293.3	-282.845	-462.806***
	(1101.195)	(386.6)	(456.176)	(160.973)
Talas	-14.529	374.033	472.795	402.694
	(1551.812)	(389.977)	(385,545)	(273.254)
Chuy	-771.016	-562 776	-496 657	499 834*
Chuy	(034707)	(329,206)	(284 288)	(227 118)
Dishkak	065 826	(327.200)	(204.200)	(22/.110)
DISIIKEK	903.830	(271,002)	1437.87	(262.004)
	(1550.545)	(3/1.093)	(368.853)	(362.084)
Observations	2513	2513	2513	2513
Wu-Hausman p-value	0.7195	0.5531	0.6228	
F-stat from 1st stage		3.9121	4.4926	
p-value from 1st stage		0.0201	0.011	

Standard Deviations are in parentheses. * Significant at 10%; ** Significant at 5%; Significant at 1%.

The coefficient on a binary variable of *being an oldest child* is positive and significant, meaning that parents spend more on their oldest children. The educational degree of a household head does not affect the school expenditures (the base category is *illiterate* household head). As was expected, urban households tend to have higher school expenditures on their children. The wealth indicators *computer* and *home internet* turn out to have positive and statistically significant correlation with school expenditures. In all four specifications, the effect of *remittances* is insignificant, and the effect of *migrants* is negative and significant only for the OLS estimation.

Next, as was discussed previously, I restrict the sample to only those households living in rural areas dropping the variables indicating household head's education status (as these dummies appeared insignificant in all previous specifications) and oblast dummies (as I restrict the sample only to rural households). Table 7, column (1) provides the results. Wu-Hausman statistics after the regression suggests that the variables of interest, remittances and migrants, are exogenous as in the previous case. Therefore, I ran Ordinary Least Squares estimation to get more efficient estimates and report results in Table 7, column (2). We can see the effect of both *remittances* and *migration* to be statistically insignificant, while other household and child characteristics remain significant as in the case of full sample (*being an oldest child, computer, home internet*), which provides an evidence of a robustness of results.

The insignificance of *remittances* can be explained by the fact that the majority of Kyrgyz schools are public and have relatively low tuition costs. So, the school expenditures may be insensitive to change in remittances.

Table 7

	(1)	(2)
	IV 2SLS	OLS
Remittances	-0.010	-0.000
	(477.683)	(0.000)
Migrants	-477.683	99.177
-	(4574.09)	(81.369)
Age (child)	140.523***	153.375***
	(21.455)	(17.043)
Male (child)	-77.572	-110.165
	(166.323)	(96.543)
Siblings	-35.75	-14.079
C	(134.40)	(48.977)
Being an only child	710.250	539.10**
	(655.174)	(266.10)
Being an oldest child	344.40***	283.567***
•	121.608	(105.448)
Age (household head)	13.206	4.289
	(15.28)	(4.005)
Number of rooms	60.320	-8.770
	(66.592)	(45.161)
Alternative housing	-244.49	-288.25
-	(290.952)	(174.334)
Car	274.232	282.79**
	(290.952)	(109.325)
Computer	871.753*	936.993***
-	(495.376)	(265.613)
Home internet	904.537	1221.415***
	(507.754)	(429.312)
Observations	1829	1895
Wu-Hausman p-value	0.1686	
F-stat from 1 st stage		
p-value from 1st stage		

Regression Results (Rural sample)

Standard Deviations are in parentheses. * Significant at 10%; ** Significant at 5%; Significant at 1%.

Chapter 6: Conclusion

As the number of migrants leaving their homes in Kyrgyzstan and the remittances inflows have increased during the last decade, it is important to analyze the consequences of this phenomenon on the education of children left behind. This paper analyzes the effect of remittances on child education using the nationally representative "Life in Kyrgyzstan" survey for 2013. The empirical results show that remittances do not have any significant impact on school expenditures. This finding confirms the prevailing belief that remittances are mostly spent on consumption of goods and purchase of durables (Kroeger et al., 2014).

Some improvements can be made to advance this study. Due to lack of data on the topic, this paper employs only school expenditures, while there can also be expenditures on off-school education (e.g. language courses, extracurricular activities , etc.). Second, in this study I used only 2013 wave of LIK longitudinal survey since I used instrumental variables from the same data for 2010, and the survey is only conducted for 2010-2013. However, the panel data estimation, which is correctly specified and accounts for the simultaneity bias, may produce results that are more precise.

The findings of this study may have some policy implications aimed at increasing the awareness of education importance among remittances receiving households, especially in rural areas. Matching the value of remittances to the school expenditures (Table 3), it turns out that mean school expenditures do not reach even a tenth of the mean remittances value. Therefore, there exists a large potential for increasing the education expenditures in households with migrants.

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