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## Emigration, remittances and the education of children staying behind: Evidence from Tajikistan

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Arbeitsbereich Ökonomie

## **IOS Working Papers**

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### **Emigration, remittances and the education of children staying behind: Evidence from Tajikistan**

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## **Abstract**

We study the relationship between migration and children's education in Tajikistan – one of the poorest and most remittance-dependent economies in the world. The analysis of a unique three-wave household panel survey reveals that emigration of family members is negatively associated with children's school attendance. Receiving remittances does not offset this negative effect. Migration of non-parent family members (such as siblings) is particularly detrimental to school attendance, especially among older children and children from less educated households. This supports a conjecture that emigration in Tajikistan has a negative signaling effect on the education of children staying behind.

**Keywords:** migration, remittances, schooling, Tajikistan



## **1 Introduction**

Many developing countries experience high rates of labor migration, and the livelihoods of hundreds of millions of households around the world depend on migrant remittances. Among the numerous impacts of labour emigration and remittances on sending countries, repercussions on the educational attainment of children and adolescents are of particular importance: it is widely acknowledged that education and skill formation among the younger generation are key factors for the economic and social advancement of developing economies (Hanushek, 2013; Rapoport and Docquier, 2006).

A growing literature has suggested several channels through which migration and remittances may affect the educational attainment of children and youths left-behind (see, for example, Antman, 2012; Dustmann and Glitz, 2011; Giannelli and Mangiavacchi, 2010; McKenzie and Rapoport, 2011; Zhang et al., 2014). On the one hand, migration may have a positive effect on education because remittances that migrants send back home help relax budget constraints and migrant families can afford more education for their children. On the other hand, migration might have a negative effect on schooling, as the absence of one or both parents implies a reduction in parental supervision. Migration of parents may also result in lower earnings and labor inputs at home. If this is a case, children might be forced to work – at the expense of schooling – to replace parents who stay abroad. This is particularly likely when the decisions about children’s education are delegated to household members who are less likely than parents to appreciate the value of investment in schooling.

Such conflicting theoretical predictions find reflection in mixed empirical findings. Numerous studies have uncovered a positive relation between emigration and education of left-behind children. For example, Hanson and Woodruff (2003) find that, in Mexico, children in migrant households complete more years of schooling than children in non-migrant households. In addition, they obtain a stronger positive effect for the education of girls, although this only applies for families where parents have low levels of education. A later study by Antman (2012) confirms a significant positive effect of paternal migration from Mexico to the US on the education for girls. Mansuri (2006) shows that, in rural Pakistan, children from migrant households are more likely to stay in school and accumulate more years of education than children in non-migrant households. A study for El Salvador reveals large and significant positive effect of remittances on the school attendance and retention (Cox Edwards and Ureta, 2003), which was also demonstrated for Mexico (Lopez-Cordova, 2005). Similarly, Calero et al. (2009) show that, in Ecuador, the receipt of remittances increases the school enrolment for children, especially for girls in rural areas. The positive effect of remittances on schooling is further confirmed by Yang (2008), who examines remittance spending in the Philippines



during the 1997 Asian financial crisis, and Alcaraz et al. (2012), who find that, in Mexico, the fall in remittances due to the 2008–09 global economic crisis decreased school attendance of children in remittance-recipient households.

A negative relationship between migration and children's education has been documented in other country contexts. Cortes (2015) finds that emigration of mothers reduces educational attainment of children in the Philippines. Amuedo-Dorantes et al. (2010) show that receiving remittances raises children's school attendance in both migrant and non-migrant children in Haiti; however, the effect is much smaller when a close family member is abroad (as opposed to cases where more distant relatives or friends are abroad). Bennett et al. (2013) find that, in Tajikistan, children's school enrolment is positively associated with parental migration, but negatively with the migration of siblings (especially when siblings send remittances back home) and other family members. Mastrorillo and Fagiolo (2015) show that migration has a negative effect on school enrolment of children left-behind in Albania. Similar conclusions are obtained by Giannelli and Mangiavacchi (2010), who find that parental migration increases the probability of dropping out of school in Albania, especially among girls. One of the explanations provided by Giannelli and Mangiavacchi (2010) is that in traditional societies fathers are more involved in education decisions of children than mothers; when fathers migrate, the decision power passes to older men (e.g. grandfathers) who are more likely to hold traditional values and attach low value to girls' education. Kroeger and Anderson (2014) demonstrate that emigration reduces school enrolment of boys in Kyrgyzstan. One of the explanations provided for this finding is that migration from Kyrgyzstan is male-dominated which motivates boys to leave school and start working abroad, where the expected earnings are higher. Similarly, McKenzie and Rapoport (2011) explain the negative effect of migration on children's educational attainment in Mexico with the fact that Mexican migrants are predominantly low-skilled workers in the US, which conveys children a signal that low levels of education facilitate entry into the US labor market. McKenzie and Rapoport (2011) substantiate this signaling effect of migration with the evidence that boys who leave school at age 16-18 are more likely to move abroad. In addition, various studies have proven that not only parental but also older siblings' migration experiences affect aspirations and behavior of younger children. For example, Kandel and Kao (2001) show that, in Mexico, temporary migration of both parents and older siblings negatively affects the educational outcomes of younger children. Migration here provides an example of alternative route to economic mobility, while education beyond secondary school is devalued as it has high opportunity costs.

It should be noted that the signaling effect of migration on schooling, revealed in Kroeger and Anderson (2014), McKenzie and Rapoport (2011), and Kandel and Kao (2001) will be negative when the prevalent and most successful type of emigration is low-skilled. In contrast, if it is more educated people who find it easier to emigrate (e.g. because immigration policies of destination countries favor high-skilled people), children staying in the countries of origin may decide to obtain more education in order to increase their chances of emigration in the future (Beine et al., 2008; Ivlevs and King, 2012).

We contribute to this growing body of literature by studying the effect of labor migration and remittances on human capital formation of children in Tajikistan. Since mid-1990s this low-income post-Soviet country has witnessed massive labor out-migration, making the country one of the most remittance-dependent economies in the world. Despite the high prevalence of migration and remittances, relatively little is known about the effects of migration on human capital formation in Tajikistan.<sup>1</sup> Using household survey data from a unique and large three-wave panel study conducted in Tajikistan in 2007, 2009 and 2011, we contribute to this underexplored case by providing an answer to the question: Do labor migration and remittances help to enhance human capital in Tajikistan? Furthermore, our findings contribute to a better understanding of broader questions: Does labor migration in Tajikistan contribute to a sustainable economic development? How does migration experience of household members affect the choice of life-course trajectory of the young generation?

The panel dimension of the survey allows us to control for unobserved heterogeneity – individual and household level factors affecting both migration of family members and the education of children – and effectively determine the relationship between the change in the household migration status and the change in the educational outcomes for children. We are also able to differentiate between remittance-recipient and non-recipient households, parent and non-parent migration, legal and illegal employment of migrants at destination, and conduct analysis for the subsamples of younger and older children, girls and boys, low and high-skilled households, and the ethnic majority and minority. This allows us to carry out a nuanced analysis, and get a better understanding, of the relationship between the emigration of family members and the education of children staying behind.

Our results reveal a negative relationship between emigration and school attendance of children left behind in Tajikistan. It is the non-parent (most likely, older siblings) and legal migration that is the most detrimental to children schooling. Furthermore, the most negatively affected appear to be children aged 12–17, as well as those from low-skilled and ethnic mi-

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<sup>1</sup> Bennett et al. (2013) represent an exception. However, their study is based on cross-sectional data, potentially suffering from the omitted variable bias.

nority households. The combination of these findings makes us conclude that emigration in Tajikistan has a negative signaling effect on the education: children are inspired by the ‘successful’ migration episodes and are encouraged by families to follow the tested paths and go abroad for work. In this way, a more attractive option of the labor migration to Russia reduces the attractiveness of completing secondary education. Our findings, thus, cast doubt on the idea that the low-skilled labor emigration from Tajikistan is an appropriate development pathway: it reduces investment in human capital, and remittances appear to play no role in counteracting this negative effect.

The remainder of the paper is structured as follows. Section two provides background information on labor migration and education in Tajikistan and elaborates the hypotheses. Section three describes data, variables and estimation strategy. Section four presents the empirical results, followed by a conclusion and discussion in section five.

## **2 Labor migration and education in Tajikistan**

### **2.1 The context of labor migration in Tajikistan**

Tajikistan is a small, landlocked country in post-Soviet Central Asia with a population of little more than 8.2 million people. 84 percent of them are ethnic Tajiks, with the largest – Uzbek – minority accounting for 14 percent. Both internal and international migration in Tajikistan increased markedly after the country proclaimed its independence in 1991. While internal migration was driven mainly by a civil war of 1992-1997, international migration was driven by ethnic motivations (e.g. return of ethnic Russians) in the first years after independence and became labor-dominated soon after. External labor migration and remittances play a dominant role in sustaining the economy of Tajikistan, which is the poorest country among the successor states of the Soviet Union. According to the World Bank, nearly half (47 percent) of Tajikistan's population lived below the poverty line in 2009. While Russia had a GDP per capita of 14,612 US\$ in 2013, GDP per capita in Tajikistan amounted to only 1,037 US\$ in that year (World Bank 2015).

Labor migration from Tajikistan is characterized by circular and return movements. The majority of Tajik labor migrants are men and migrate predominantly for low-skilled, often irregular, work in Russia. According to the 2009 Tajikistan Living Standards Measurement Survey (TLSS), 9 percent of the population of Tajikistan worked abroad in 2009, and 28 percent of all households included at least one migrant (Danzer and Ivaschenko, 2010). The same survey indicates that rural and poorer locations were likely to have a bigger share of households with migrants. The analysis of the 2011 Tajikistan Household Panel Survey (THPS) showed that migration activities have intensified since 2009 despite of the global economic crisis – not only more households were involved in labor migration but more members of the same households went abroad for work (Danzer et al., 2013a). In 2011, more than 90 percent of all migrants chose Russia as the destination, and more than half of those (58%) went to Moscow. A very high percentage of these labor migrants are men, working predominantly in low-skilled jobs, such as construction, trade and services.

For more than a decade, Tajikistan has been heavily dependent on remittances. According to the official statistics, the inflow of remittances to Tajikistan amounted to 4.15 billion US\$ in 2013, or about 49 percent of the country's GDP (World Bank, 2015). Such high intensity of remittances makes Tajikistan one of the most remittance-dependent economies in the world. Among remittance receiving households, the share of yearly consumption which actually becomes affordable through remittances exceeds 35 percent in all welfare quintiles (Danzer and Ivaschenko, 2010). The poorest rural households finance on average 80 percent – and urban households about 50 percent – of their yearly consumption through remittances. Ac-

According to the THPS 2011, households used remittances for purchasing food and basic necessities (59.7%), building and renovating houses (28%), and covering wedding expenses (6%). Only a negligible share of households (1.8%) channeled remittances to child support and education (Danzer et al., 2013b).

The majority of Tajik labor migrants working in Russia send remittances to their families back home. According to the THPS 2011, less than 1 percent of returned migrants and about 22 percent of those who were still abroad at the moment of interview reported no remittances (Danzer et al., 2013b).

Labor migration in Tajikistan is driven by unemployment, low wages and economic insecurity. Unemployment is a widespread phenomenon, also among the better qualified. According to Jansova and Quddusov (2012), 39 percent of graduates of professional and higher educational institutions and over half of graduates of primary and secondary schools were not able to find a job during 12 months after graduation. Labor migration in Tajikistan is a response to poverty and social deprivation and a way to enhance the household income and to cope with economic risk – especially among poorer families. This household strategy appears to be tacitly accepted by the Tajik government which has so far had little success in stabilizing the economy and reducing poverty.

## **2.2 Education system of Tajikistan**

As a post-Soviet country, Tajikistan inherited the Soviet educational system, which consisted of the four major parts: pre-school, school, vocational, and higher education. As a rule, the education at school embraced three years<sup>2</sup> of primary school education (age 7 to 10 years), five years of basic secondary education (age 11 to 15), and two years of upper secondary education (age 16 to 17). Pupils with low levels of academic progress could stay in the same grade for another year.

Accompanying the process of rapid industrialization and responding to the strategic goal of elimination of inequality, education played a prominent role in the Soviet Union (Whitsel, 2009) and the level of universal compulsory education was gradually increasing. In 1958 the compulsory cost-free basic secondary education (eight years) was introduced by constitutional change. In the 1970s the duration of compulsory secondary education was extended to ten years, however pupils could choose whether to complete secondary general education or obtain vocational education after the 8th grade. In the latter case, the educa-

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<sup>2</sup> In some schools, where the “accelerated” educational programs were not introduced, primary education took four years.

tional programs of the vocational education institutions incorporated both learning a particular occupation or trade and participating in the school program of the last two years of secondary education (Zajda, 1979).

As a result of these USSR-wide educational policies, Tajikistan enjoyed almost universal literacy at the moment of independence in 1991 (Baschieri and Falkingham, 2009). However, after gaining independence, the length of compulsory schooling in Tajikistan was reduced to eight years (basic secondary education). Several factors, including the underfinancing of the educational system – which considerably increased the cost of schooling for families – and the civil war of 1992-1997, negatively affected the Tajik system of education after the dissolution of the Soviet Union, resulting in lower school attendance rates, greater gender gap and increasing geographical variation in levels of school enrolment (Baschieri and Falkingham, 2009; Whitsel, 2009).

### **2.3 Hypotheses**

Drawing on the empirical evidence on the effects of migration and remittances on the education of children left behind, three confounding effects may be expected. On the one hand, *the effect of a having a migrant in the household, implying less supervision of children and more work for those left behind, is likely to be negative* (H1). On the other hand, *the effect of remittances on education is likely to be positive where liquidity constraints are binding* (H2). Furthermore, *having a migrant in the household and receiving remittances may reduce the education of children if labor migration is seen as an alternative to schooling* (H3). The latter, signaling, effect of migration on education is expected to be negative where the prevailing form of migrant employment is low-skilled, which is the case for Tajikistan.

We will check the signaling hypothesis by testing for differences in the emigration-education relationship across types of migration and across socio-economic groups. For example, young people may want to engage in migration – and leave school early – if the observed migration experience is represented by a legal employment abroad (legal employment status may be considered more successful than illegal employment status). The migration of siblings would have a stronger signaling effect than the migration of parents, if siblings are more important role models for children than parents.<sup>3</sup> The signaling effect would also be more pronounced among older children (they are mature enough to think about or undertake migration) and boys (out-migration from Tajikistan is predominantly male). Children from the

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<sup>3</sup> This conjecture would be consistent with Bennett et al. (2013), who show that the long-term emigration of parents in Tajikistan increases children's school enrolment while the long-term emigration of siblings has a significant negative effect. The authors focus on a cross-section of children aged 11 and 17 years.

low-educated households may also be more likely to use observed migration as a signal, as the low-skilled people are less likely to obtain better paid jobs at home and the net gain from migration for them is particularly high. Similar arguments could be applied to the ethnic minority (ethnic Uzbeks), who may, in a number of cases, feel disadvantaged in the Tajik labor market because of the insufficient knowledge of the state language.

### **3 Data, variables and estimation strategy**

#### **3.1 Data**

To test our hypotheses, we use data from a large household panel survey carried out in Tajikistan in 2007, 2009 and 2011. The first two waves of the panel come from the Tajikistan Living Standards Measurement Survey (TLSS), which was administered by the World Bank and UNICEF (TLSS, 2007; TLSS, 2009). The third wave of the panel, the Tajikistan Household Panel Survey 2011 (THPS 2011), was designed and implemented by the Institute for the East and Southeast European Studies as a follow-up to the TLSS (Danzer et al., 2013a; Danzer et al., 2013b). The first 2007 TLSS wave contained a representative sample of 4,860 households, and the second and third wave included a representative subset of 1,503 households. All three waves were collected in autumn in order to respect the seasonality patterns in agriculture and migration flows. The household selection was based on a representative probability sampling procedure, following the urban/rural and the regional distribution of population in Tajikistan. The TLSS 2009 and the THPS 2011 questionnaires largely reproduced the TLSS questionnaire used in 2007, with a small number of questions changed and added. The surveys provide extensive information on household characteristics, migration, education, health, labor market status and consumption.

#### **3.2 Variables**

We examine the effect of migration and remittances on human capital investment of school-aged children in migrant families left behind. As an indicator of the human capital investment we consider child's school attendance. Our dependent variable is a dummy variable which is equal to 1 if the child was attending school in the last academic year and 0 otherwise.

The main regressors of interest are the variables capturing the incidence of labor migration and the receipt of remittances in a household. Because labor migration from Tajikistan in many cases is seasonal and circular, it is important to consider both the migrants who are working abroad at the time of the interview and those who have recently returned. To account for both groups we create a dummy variable, migrant in the household, indicating that at least one household member was working abroad at the moment of the interview or a household member was working abroad in the two years prior to the interview. Another dummy variable, remittances, captures the receipt of remittances from labor migrants working abroad at the moment of the interview.

Since we do not restrict our analyses to the case of parental migration, we introduce two dummy variables – 'parent migrant' and 'non-parent migrant' – that allow us to differentiate between migration of child's parents and that of other household members. To identify



whether a migrant is a child's parent we draw on the question "Does the mother/father of the household member live in the household now?", which was asked about each household member including children. 'Parent migrant' equals 1 if there is at least one migrant in the household and either mother or father of the child is not living in the household.<sup>4</sup> 'Non-parent migrant' equals 1 if there is at least one migrant in the household and parents of the child live in the household. Although we are not able to define unambiguously what kind of relatives are 'non-parent migrants' to children in our sample, there are strong reasons to believe that these household members are siblings of the children. First, Tajik migrants are predominantly young people: according to the THPS 2011, the average age of return and current migrants was 31.6 and 28.9, respectively (Danzer et al., 2013a). Second, literature suggests that households send mostly fathers and elder sons to work abroad (Khuseynova, 2013; Olimova and Bosc, 2003). Given that families consist of a large number of children and the number of migrants per household has grown over time (Danzer et al., 2013b), it is reasonable to assume that, alongside parents, siblings increasingly get involved in migration.

Given the individual-fixed effects estimation that we adopt in our empirical analysis, the set of control variables includes only those respondent and household characteristics which change over time; all time-invariant characteristics are captured by the individual fixed effects. At the individual level, we control for the age of the child and his or her health status, proxied by whether a child needed hospitalization or ambulatory assistance in the four weeks prior to the interview. At the household level, we control for the size of the household, the share of children in the household, the share of elderly in the household, the share of household members in employment, income net of remittances and subjective financial satisfaction.<sup>5</sup> The latter is measured by using a 5-item scale, where 1 means "not at all satisfied" and 5 is for "fully satisfied".

### **3.3 Estimation strategy**

Our objective is to estimate the effect of migration on the child's likelihood of attending school. Our estimations thus include only school-age children (age 7–17). Given that the same children are observed over time, we adopt a fixed-effects estimation methodology, where all time-invariant child and household characteristics are accounted for by the child fixed effects and all common time influences on both education and migration are accounted for by the

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<sup>4</sup> This approach has a limitation – mother or father of a child can be absent for reasons other than migration, in which the variable would capture migration of other household members.

<sup>5</sup> We include the subjective financial satisfaction to have a better-rounded control of the household income situation. Estimating the model without this variable leaves the results qualitatively unchanged.

year (wave) fixed effects.<sup>6</sup> This effectively allows us to estimate the relationship between the change in household migration status on the change in child's school attendance.

Formally, we express the probability of attending school for child  $i$  from household  $j$  in year  $t$  can be expressed as follows:

$$\begin{aligned}
 \textit{Attending school}_{i,j,t} = & \textit{migration-related variables}_{j,t} + \\
 & \textit{age}_{i,j,t} + \textit{hospitalisation}_{i,j,t} + \textit{ambulatory assistance}_{i,j,t} \\
 & \textit{household size}_{j,t} + \textit{share of children}_{j,t} + \textit{share of elderly}_{j,t} + \\
 & \textit{share of employed}_{j,t} + \textit{household income}_{j,t} + \textit{financial satisfaction}_{j,t} + \\
 & \textit{child fixed effects}_i + \textit{year fixed effects}_t + \textit{error term}_{i,j,t}
 \end{aligned} \tag{1}$$

To account for the interdependencies in schooling attendance for children from the same households, we cluster standard errors at the household level.

Our benchmark specification includes, alongside the individual and household level controls and the individual and year fixed effects, only the *migrant in the household* dummy. To test whether parental migration affects child school attendance differently from the migration of other household members, we will split the *migrant in the household* dummy into *parent migrant* and *non-parent migrant* dummies. To test whether monetary remittances play a role, we include the remittances dummy alongside the *migrant in the household* dummy (as remittances are a subset of migration, the remittances dummy is effectively the interaction term of remittances and migration). Finally, we test whether the effects of migration on the children's school attendance is different for migrants employed abroad *legally* and *illegally*, information on which is also available in the survey.

We estimate the models for the whole sample, as well as for different subsamples: girls and boys; younger (age 7–11) and older (age 12–17) children; households with the head of household educated to the basic, secondary and tertiary level; and ethnic Tajiks (ethnic majority) and Uzbeks (the largest ethnic minority group).

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<sup>6</sup> As our individual-fixed-effect model includes both the age variable and year fixed effects, concerns may arise over the perfect collinearity between the two variables. This is, however, not the case as the interviews with the same households were not conducted during the same dates of the year. We have also estimated additional models excluding either the age variable or the year fixed effects; the results relating to the variables of interest remained unchanged.

## 4 Results

Our analysis draws on households which are observed in all three waves of the survey and which have children aged between 7 and 17. A high proportion of children (94 percent) in our sample attend school (see appendix for summary statistics). The families are comparatively large and young: on average a household has 7 members, half of whom are children. The majority of household heads have secondary education (63 percent), followed by tertiary (17 percent) and basic education (16 percent). While almost every third household has a migrant, a parent is working abroad only in 12 percent of households. Every seventh household receives remittances from abroad.

**Table 1: Migration and children's school attendance. OLS fixed effects regression**

	Dependent variable: Attending school (0/1)
Migrant in the household	-0.027**
<i>Individual controls</i>	
Age	-0.007
Hospitalised in the past month	-0.008
Ambulatory assistance in the past month	-0.036
<i>Household (HH) level controls</i>	
Number of HH members	0.013***
Proportion of children in the HH	0.049
Proportion of elderly in the HH	-0.130
Proportion of working in the HH	-0.040
HH income net of remittances	0.000
Financial satisfaction	0.004
Year-fixed effects	✓
Child-fixed effects	✓
Constant	0.930***
<i>Observations</i>	3,293
<i>Number of children</i>	1,312
<i>R-squared overall</i>	0.048
<i>R-squared within</i>	0.00216
<i>R-squared between</i>	0.0148
<i>F (Prob &gt; F)</i>	4.678 (0.000)

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Standard errors (not reported) clustered at the household level.

Table 1 reports the results of the baseline fixed-effects OLS<sup>7</sup> estimation. The results indicate that migration of a household member is associated with a decrease in the probability of attending school. This finding would support hypothesis H1 (migration of family members results in inferior education outcomes because of less supervision of children and more work for those left behind, as well as hypothesis H3 (the negative signaling effect of migration).

Table 2 reports the coefficients of different migration-related variables (receiving remittances, parent and non-parent migrant, legally and illegally employed migrant) for the full sample, as well as for the sub-samples of boys, girls, younger (age 7–11) and older (age 12–17) children. Receiving remittances is not associated with better school attendance: the coefficient of remittances is not significant for the full sample or any sub-samples. This would refute hypothesis H2 that remittances relax educational budget constraints allowing children to attend school and be consistent with the evidence that remittances in Tajikistan contribute little to educational expenses (Clement, 2011; Danzer et al., 2013b; Meier, 2014). Next, looking at the full sample (Column 1), it is the non-parent and legal-employment migration that are the most detrimental for the children's school attendance. This would support the signaling hypothesis, if the assumption is made that most non-parent migrants are siblings, who act as role models for children, and that legal migrants are considered to be more successful than illegal ones.

Estimations for boys and girls (columns 2 and 3 of Table 2) reveal that emigration, and especially emigration of non-parent family members, is negatively associated with the school attendance of both groups. While the negative signaling effect could explain the finding for boys, the finding that non-parent migration is negatively associated with school attendance for girls is more puzzling. A possible explanation is related to the effect of cultural norms. Parents of girls in Tajikistan expect their daughters to become housewives and perform domestic work, which does not require more than compulsory education. Moreover, in-depth interviews uncovered that many parents kept their girls out of school because they were worried about girls becoming better educated than boys, which could be a negative factor in the marriage market (Whitsel, 2009). Tajikistan belongs to traditional societies where husbands are expected to be better educated than their wives. Hence, if fewer boys complete higher levels of education, more girls are kept out of higher levels of education to secure their future marriage prospects.

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<sup>7</sup> Although our dependent variable is binary, the fixed-effects OLS estimation (linear probability model) is the only feasible option; the logit and probit models do easily accommodate fixed effects.

Estimations by age group (columns 4 and 5 of Table 2) suggest that the negative association between migration and children's school attendance is driven by older children (aged 12-17). This provides support both for more-work-at-the-expense-of-schooling hypothesis (arguably, older children can help/perform more work at home than younger children) and the negative signaling effect hypothesis (older children are mature enough to consider the option of emigration).

**Table 2: Migration and children's school attendance, full sample and by gender and age**

	Full sample	Gender		Age	
		Boys	Girls	7-11	12-17
<i>Specification 1</i>					
Migrant in the household	-0.027**	-0.023*	-0.034*	0.017	-0.047**
<i>Specification 2</i>					
Migrant in the household	-0.029**	-0.030*	-0.031	0.013	-0.049**
Remittances	0.005	0.019	-0.007	0.013	0.005
<i>Specification 3</i>					
Parent migrant	0.002	0.004	-0.001	0.006	-0.004
Non-parent migrant	-0.043***	-0.036**	-0.052**	0.022	-0.068***
<i>Specification 4</i>					
Migrant employed legally	-0.065**	-0.065	-0.061	-0.110	-0.081
Migrant employed illegally	0.004	-0.013	0.013	0.031	0.016

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The table shows the results of 20 estimations (OLS individual fixed effects regressions). In each estimation, the dependent variable is 'attending school'. Only the regressors of interest (migration-related variables) are reported; the same controls as in Table 1 are included in all estimations. Standard errors (not reported) clustered at the household level. Full econometric output is available on request.

Table 3 reports the results of different model specifications by the education level of the head of household and ethnicity. The negative association between migration, in particular non-parent migration, and a decrease in the probability of school attendance is most evident in the low-educated households (column 1); the coefficient of legal-employment migration is also negative and large (-0.148) but only marginally significant ( $p = 0.104$ ). The coefficients of the migration-related variables for better educated households are smaller and largely insignificant (columns 2 and 3). Overall, these findings support the negative signaling hypothesis. Children from less educated households, observing their family members migrating, may expect particularly large net gains from migration and decide to drop out from school to undertake migration. In contrast, children from better educated households may have access to better paid jobs at home and view migration as a less attractive option.<sup>8</sup>

<sup>8</sup> In addition, children in better educated families will tend to obtain higher levels of schooling because of the intergenerational transmission of educational attainment (Becker and Tomes, 1986; Van Doorn et al., 2011).

**Table 3: Migration and children’s school attendance, by head of household education and ethnicity**

	Education of head of household			Ethnicity	
	Basic	Secondary	Tertiary	Tajik	Uzbek
<i>Specification 1</i>					
Migrant in the household	-0.060**	-0.021	-0.007	-0.017	-0.060**
<i>Specification 2</i>					
Migrant in the household	-0.086**	-0.015	-0.009	-0.022	-0.038
Remittances	0.067	-0.016	0.006	0.013	-0.047
<i>Specification 3</i>					
Parent migrant	-0.003	0.002	0.029	0.016	-0.043
Non-parent migrant	-0.100**	-0.032*	-0.016	-0.039**	-0.077**
<i>Specification 4</i>					
Migrant employed legally	-0.148	-0.052	-0.007	-0.078**	-0.006
Migrant employed illegally	-0.055	0.033	-0.028	0.003	-0.013

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The table shows the results of 20 estimations (OLS individual fixed effects regressions). In each estimation, the dependent variable is ‘attending school’. Only the regressors of interest (migration-related variables) are reported; the same controls as in Table 1 are included in all estimations. Standard errors (not reported) clustered at the household level. Full econometric output is available on request.

Finally, columns 4 and 5 of Table 3 report the results for the ethnic majority (Tajiks) and the largest ethnic minority (Uzbeks). The migration on non-parent family members is negatively associated with children’s school attendance for both groups. However, legal migration has a negative association with children’s schooling only for the ethnic Tajiks, while having a migrant in the household in general is a negative and significant predictor of school attendance only for ethnic Uzbeks. The latter result might be explained by the relatively disadvantaged economic position of the Uzbek minority in Tajikistan. Ethnic Uzbeks may find it more difficult than ethnic Tajiks to gain access to better paid and more secure public sector jobs, where the proficiency of the state language (Tajik), as well as ethnic discrimination, are playing an increasingly important role (Ergasheva, 2014). The combination of these results suggests the ethnic minority children are particularly likely to view labor migration as an alternative to attending school.

## **5 Discussion and conclusion**

Tajikistan is one of the poorest and most remittance-dependent economies in the world, yet little is known on how migration and remittances in this country affect the educational outcomes of children staying behind. This paper has explored the relationship between emigration and children's school attendance using a unique three-wave household panel survey conducted in Tajikistan in 2007, 2009 and 2011.

The results of the individual-fixed estimations suggest that emigration is associated with a decrease in school attendance of children staying behind. This supports the hypothesis that emigration of family members leads to less supervision and more domestic work for children, both of which could result in lower school attendance. It is also possible that Tajik emigration – consisting mostly of young men working in low-skilled occupations in Russia – sends a credible signal to children that migration is a more attractive option than completing school.

A more nuanced analysis by migrant, children and household group lends additional support to the negative signaling hypothesis. In particular, we find that it is the migration of non-parent family members that is the most detrimental for school attendance. Given that most non-parent migrants in our sample are elder siblings and assuming that they act as powerful role models, children with older siblings abroad may be willing to imitate these migratory experiences. Our findings also suggest that migration of non-parent family members is a negative predictor of school attendance for older children while the coefficient for younger children is insignificant. Our explanation here is that older children are mature enough (both physically and mentally) to consider emigration as an alternative for schooling. Next, we find that migration is associated with lower school attendance for children particularly from less-educated as well as ethnic minority households. This further supports the signaling hypothesis. Labor migrants from Tajikistan typically end up in low-skilled jobs in Russia that are often better paid than some high-skilled occupations in their home country. As a result, a person's choice to become a low-skilled labor migrant discourages her investment in education, because higher levels of education do not improve labor market outcomes in Tajikistan (especially, when the access to better paid jobs is limited, as could be the case for the low-skilled and ethnic minority households) and it does not pay off to have high levels of schooling in the destination country.

We also find that it is the legal (as opposed to illegal) employment of migrants that is associated with lower school attendance of children. This would support the signaling hypothesis, if one assumes that children consider legal migration more successful and desirable and want to imitate it. Interestingly, emigration of non-parent family members is negatively associated with school attendance of both boys and girls. Given that most migrants from Tajikistan are

men, the signaling hypothesis could explain the result for boys. The result for girls is puzzling from the theory point of view and alarming from policy perspective. While the increasingly conservative Tajik cultural norms, whereby girls are expected to have lower levels of education than boys, could provide one explanation for this result, other mechanisms might also be at work. It is beyond the scope of this study to fully explain these mechanisms, and we leave a detailed gender analysis of the emigration-schooling nexus for future research.

Our analysis has also shown that the receipt of remittances does not improve school attendance of children staying behind: when included jointly with the migration variable, the estimated coefficient of the remittances variable is always statistically insignificant. This finding does not support the hypothesis that remittances in Tajikistan relax budget constraints allowing children to go to school. It is, however, consistent with the evidence that remittances in Tajikistan are used for the purchase of food and basic necessities, house construction and renovation, and organization of weddings, and not as investment into the education of children (Clement, 2011; Danzer et al., 2013b; Meier, 2014). It is likely that households which are the most likely to receive remittances in Tajikistan consider education as a high-risk investment, as it is not clear to them whether higher levels of education will lead to better employment outcomes at home. Instead, these households choose emigration to Russia, which may be perceived as a relatively easy and secure (monetary) investment. Whether similar tendencies prevail in other low-income and developing countries would depend on how easy it is for the most disadvantaged people to move for work abroad. While in many countries the poorest people find it hard to emigrate because immigration policies of destination countries tend to target high-skilled people, emigration in Tajikistan is affordable for people from a wide range of socio-economic backgrounds. This echoes the situation in countries like Kyrgyzstan and Mexico, where low-skilled people have access to well-established migration corridors (to Russia and the US, respectively) and emigration of household members was found to reduce educational attainment of children staying behind (Kroeger and Anderson, 2014; McKenzie and Rapoport, 2011).

While our work represents an important step towards understanding the relationship between migration and human capital investment in Tajikistan – one of the most remittance-dependent economies in the world, it is not without limitations. Although the fixed-effects estimations allowed us control for the unobserved child and household heterogeneity and thus mitigate the endogeneity due to time-invariant omitted variables, the estimated coefficients should still be interpreted as conditional correlations rather than causal effects running from migration to education. In particular, the fixed-effects estimation cannot address endogeneity due to time-varying unobserved variables influencing both migration and education, as well as endogeneity due to reverse causality. This said, we would be more concerned about the



reverse causality bias if the estimated coefficient of migration on education was positive (in such a case one could argue that people emigrate *because* they want to raise money and invest it in children's education). In our case, the statistically significant coefficients of the migration-related variables are negative, and it would be difficult to conceive that people emigrate *because* they want their children to have less education. Whatever the case, instrumental variable techniques, in conjunction with panel data, would be more appropriate to establish precise causal effects. We leave it for future research.

Summing up, labor migration does not lead to human capital enhancement in Tajikistan and remittances from the labor migration cannot be regarded as an effective tool of sustainable economic development. Remittances allow coping with economic deprivation but may not help to overcome the major structural problems of the economy, which is in an urgent need of reforms. Although several studies uncover a positive effect of remittances on education of children in many developing countries, such findings do not find reflection in Tajikistan. We suggest that the crucial role in explaining the relationship between migration and education investment is played by the migration pattern. In the case of Tajikistan, the low-barrier, low-skilled, circular labor migration discourages investment into education of the young generation, because the returns to education in the main country of destination are low and the risk of unemployment at home is high regardless of the educational level of the job-seekers.

## Annex

**Table A1: Summary statistics (only children included in the analysis, n = 3,305)**

	Mean	Std. dev.	Min	Max
Attending school	0.940	0.238	0	1
Any migrant in the HH	0.305	0.460	0	1
Parent migrant	0.119	0.324	0	1
Non-parent migrant	0.185	0.388	0	1
Remittances	0.131	0.338	0	1
Migrant in the HH, no remittances	0.173	0.379	0	1
Migrant legal	0.036	0.187	0	1
Migrant illegal	0.057	0.232	0	1
Age	13.111	2.638	7	17
Hospitalised in the past month	0.023	0.151	0	1
Ambulatory assistance in the past month	0.037	0.189	0	1
Number of HH members	7.091	2.606	1	20
Proportion of children in the HH	0.514	0.151	0.091	1
Proportion of elderly in the HH	0.029	0.066	0	0.4
Proportion of working in the HH	0.127	0.147	0	1
HH income net of remittances	626.728	874.533	0	10566.7
Financial satisfaction	3.498	0.791	1	5
Girl	0.483	0.500	0	1
Boy	0.517	0.500	0	1
Head of HH: basic education	0.161	0.367	0	1
Head of HH: secondary education	0.631	0.483	0	1
Head of HH: Tertiary education	0.172	0.378	0	1
Tajik	0.828	0.378	0	1
Uzbek	0.172	0.377	0	1

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