UNITED NATIONS UNIVERSITY
UNU-WIDER

WIDER Working Paper 2017/104

Does migration affect education of girls and young women in Tajikistan?

Kseniia Gatskova,[1] Artjoms Ivlevs,[2] and Barbara Dietz[1]

April 2017

United Nations University World Institute for Development Economics Research
wider.unu.edu

Abstract: We study how migration affects education of girls in Tajikistan—the poorest post-Soviet state and one of the most remittance-dependent economies in the world. Using data from a three-wave household panel survey conducted in 2007, 2009, and 2011, we find that the effect of migration on girls' school attendance differs markedly by age. School attendance of young girls (ages 7–11) improves when either parents or sibling migrate, as well as when the household starts receiving remittances. In contrast, school attendance of teenage girls (ages 12–17) falls when siblings migrate, while parental migration and remittances have no effect. Having a grandmother as the head of household after parents (typically fathers) migrate improves school attendance of young and teenage girls, but reduces school attendance of young women (ages 18–22). We also find that in localities where the share of migrants is already high, an increase in the share of migrant households is associated with an increase in the marriage rate. Our results support various channels through which emigration of household members may affect girls' and young women's education: relaxation of budget constraints, increase in household work, change in the head of household, and pressure to marry early. Overall, our study suggests that the net effect of migration on girls' schooling turns from positive to negative with girls' age; this implies that migration may be detrimental to women's empowerment in Tajikistan and casts doubts on whether migration is an appropriate long-term development strategy for this country.

Keywords: female empowerment, girls' education, migration, remittances, Tajikistan
JEL classification: F22, F24, I21, J16, J24

Acknowledgements: We thank Christiane Timmerman, Jean-Philippe Platteau, and the participants of the UNU-WIDER workshops in Namur and Helsinki, and 14th Biannual EACES Conference in Regensburg for many useful comments and suggestions. Support from UNU-WIDER is gratefully acknowledged.

[1] Leibniz-Institute for East and Southeast European Studies (IOS), Regensburg, Germany; [2] Bristol Business School, University of the West of England, Bristol, UK; corresponding author: gatskova@ios-regensburg.de

This study has been prepared within the UNU-WIDER project on 'Gender and development'.

Information and requests: publications@wider.unu.edu

ISSN 1798-7237 ISBN 978-92-9256-328-8

Typescript prepared by Gary Smith.

Katajanokanlaituri 6 B, 00160 Helsinki, Finland

1 Introduction

Education and skill formation of women are important resources for the economic and social advancement of developing economies (Hanushek 2013; World Bank 2012). There is vast evidence that better-educated women have higher rates of labour market participation, earn more income, and provide better education and healthcare for their children. In this context, equal education opportunities are crucial for women's economic participation and empowerment. Yet, across the developing world, girls' access to education continues to be hampered by a number of factors, ranging from household income constraints and involvement in household tasks to restrictive cultural and social norms.

Recent literature suggests that the migration of family members and migrant remittances are important factors affecting girls' educational outcomes (Antman 2012, 2015; Giannelli and Mangiavacchi 2010; McKenzie and Rapoport 2011). From an economic perspective, migration and associated remittances may have a positive impact on girls' education, since remittances from migrant workers relax household budget constraints and additional resources might be invested in girls' schooling (Hanson and Woodruff 2003). In addition, a migration-induced change in the head of household (for example, from male to female) may shift expenditure preferences, resulting for example in higher spending on girls' education (Antman 2015). On the other hand, the departure of family members to work abroad may imply a reduction in the supervision of children and/or more work at home for children staying behind (Giannelli and Mangiavacchi 2010). Typically, girls have to take over domestic chores and the burden of caring duties, which might negatively affect their school attendance (McKenzie and Rapoport 2011). While a considerable number of empirical studies have uncovered significant effects of migration and remittances on female education (Antman 2012; Giannelli and Mangiavacchi 2010; McKenzie and Rapoport 2011), the exact channels through which migration and remittances influence the schooling of girls remain underexplored (Antman 2015).

Focusing on Tajikistan—the poorest post-Soviet Central Asian state and one of the most remittance-dependent economies in the world[1]—the main objective of this paper is to identify the net effect of family migration on the educational outcomes of girls staying behind. In addition, and to the extent that the data allow us to do so, we explore the likely channels through which migration affects girls' education in this country. Our analysis is based on household survey data from a unique three-wave panel study conducted in Tajikistan in 2007, 2009, and 2011. Large out-migration (predominantly of men working in low-skilled occupations in Russia) and increasing gender disparities in educational outcomes that Tajikistan witnessed in the last 20 years make the country particularly suitable for an examination of the link between migration and the schooling of girls. For example, in 2014 the share of young women in tertiary education in Tajikistan was only 31.6 per cent of all students enrolled (TransMonEE 2016). This is alarming in a country that had a comparatively high participation rate of girls in education when it became independent in 1991 (Baschieri and Falkingham 2009).

Our results reveal that the effect of household member migration on girls' schooling depends on the girl's age. Migration of parents and older siblings, as well as receiving remittances, improves school attendance of young girls (ages 7–11). In contrast, sibling migration is detrimental for school attendance of teenage girls (ages 12–17), while parental migration and remittances do not play a significant role. Notably, school attendance of both young and teenage girls improves with

[1] Remittances in Tajikistan were equivalent to 29 per cent of its GDP in 2015 (World Bank 2016).

parental migration where the head of household is the girl's grandmother, but the opposite effect is true for schooling of young women (ages 18–22). We also find that, in high out-migration areas, an increase in the local share of migrant households is associated with higher marriage rates, which may indirectly reduce schooling of young women.

The remainder of the paper is structured as follows. Section 2 reviews theoretical channels and related literature. Section 3 provides background information on female education and labour migration in Tajikistan. Section 4 describes data, variables, and estimation strategy. Section 5 presents and discusses the empirical results, followed by the outline of limitations and further research in Section 6, and conclusions in Section 7.

2 Migration, remittances, and girls' education: literature review

The literature has identified various channels through which migration and remittances may affect the educational attainment of girls left behind (see, for example, Antman 2012, 2015; Giannelli and Mangiavacchi 2010; Hanson and Woodruff 2003; McKenzie and Rapoport 2011). On the one hand, migration may have a positive effect on girls' education if remittances that migrants send back home help relax budget constraints and are invested in the schooling of girls. This has been found to be the case in Mexico, where children in migrant households complete more years of schooling than children in non-migrant households and where girls in families with low levels of education benefit more from parental migration than do boys (Hanson and Woodruff 2003). The study argues that in lower-educated households, which tend to have fewer financial resources, migrants' remittances are a crucial source of finance for girls' schooling. Antman (2012) confirms a significant positive effect of paternal (mostly fathers) migration from Mexico to the United States on girls' education. In a further study, Antman (2015) attributes this beneficial effect of migration on girls' education to the greater say of women in the household decision-making and resource allocation after the male household head migrates. Specifically, a greater share of resources is allocated to girls' schooling when fathers are away from home. Interestingly, a higher investment of additional household resources in girls' education was not observed in the case of Jordan (Mansour et al. 2011). Although Mansour et al. (2011) found that remittances in migrant households in Jordan alleviated budget constraints and had a positive impact on education, boys' schooling had a higher priority. Vogel and Korinek (2012) obtain a similar result for Nepal, where remittances sent by migrants were spent on the education of children, but disproportionately more on boys. The exception is higher-income remittance-recipient households, which allocated greater resources to girls' schooling.

The change in the head of household following migration may also have a negative effect on girls' education. In the case of Albania, Giannelli and Mangiavacchi (2010) show that parental migration increases the probability of children's dropping out of school, especially among girls. One of the explanations is that in traditional Albanian society the decision power in migrant households passes to older men (e.g. grandfathers) who are more likely to hold traditional norms and attach less value to the education of girls than that of boys.

It is also possible that girls drop out of school when the migration of family members results in extra work, previously undertaken by the migrant, for those staying behind. Girls may be particularly likely to be forced to work at home—at the expense of schooling—to replace family

members going abroad.[2] McKenzie and Rapoport (2011) report a significant negative effect of migration on the school attendance of 16–18-year-old girls in Mexico, which they complement with a further finding that girls in migrant households take on more household chores. Chang et al. (2011) corroborate the latter finding, showing that in China parental migration leads to greater increase in domestic and farm work among girls (and elderly women) than boys (and elderly men). Similarly, a recent study from Georgia found that male migration leads to exacerbation of gender differences with respect to the division of household tasks (Torosyan et al. 2016). This study revealed that left-behind women not only do more housework when the migrant is abroad, but they also get accustomed to the new tasks and persist in doing them even after the migrant returns.

Summing up, there are three major mechanisms through which migration of household members can affect the girls' education: relaxation of financial constraints through remittances, change in the head of household with a related shift of the decision-making power, and increase in domestic work for those staying behind. Importantly, these three mechanisms are contingent on the type of migration (e.g. male versus female) as well as on the social and cultural norms prevailing in the migrant's country of origin.[3] Given the importance of the context in explaining the effect of migration on girls' education, we turn to Tajikistan—the country we focus on in this study—and discuss the directions in which migration may affect girls' education, taking into account Tajikistan's historical, social, cultural, and migration contexts.

3 Girls' education and migration in post-socialist Tajikistan

Education and gender equality were actively promoted in Tajikistan in Soviet times, but the Soviet achievements have been eroding since the country's independence in 1991 (Silova and Abdushukurova 2009). At the same time, traditional norms have gained ground, especially in rural areas, partially facilitated by the Islamic revival. Traditional gender norms have been strengthening, manifesting themselves in earlier marriages, higher levels of domestic violence, and higher fertility. Women in Tajikistan are expected to be primarily devoted to household chores and child-rearing (Harris 2011; Hegland 2010; Popova and Pulikova 2013).

In addition, there has been a continuous decline in girls' school enrolment rates, especially at higher levels of schooling (Silova and Abdushukurova 2009). According to the United Nations Children's Fund (UNICEF 2011), 20 per cent of girls in Tajikistan drop out of school without completing a full course of basic education, i.e. grade 9 (14 years old). It is argued that the public awareness of the advantages of girls' education is still very low, especially in rural and remote areas. Many girls have to carry out chores at home instead of attending school. A recent survey study reported that 69 per cent of the girls in grades 7–9 (12–14 years old) attended school irregularly because they had to work at home (UNICEF 2013). Girls were mostly engaged in cleaning, washing dishes, laundry, and cooking. In addition, they have an important role as caregivers, looking after younger siblings and sick relatives. Eldest daughters still living in the household often assist with preparing community events such as weddings and funerals (UNICEF 2013). Girls are also active in agriculture, for example in working in the fields (Falkingham and Baschieri 2006; UNICEF 2013:

[2] The theoretical model of household decision-making, originally formulated by Becker (1965), supports this consideration. In the framework of household decision-making it is argued that adult household members decide on the schooling of children to maximize the household's utility. Typically, girls are taken out of school if their contribution to household chores or farmwork is expected to produce higher benefits than further education.

[3] For example, in case of multi-generational families the decision-making power may be passed either to the migrant's spouse, the elderly, or other family members post-migration.

48). This is consistent with a traditionally high female participation in agricultural work in Tajikistan; according to the World Bank, in 2009 nearly 70 per cent of all agricultural employees in the country were women (World Bank 2016).

According to the Asian Development Bank's School Mapping Study, the physical condition of school buildings is another major problem affecting school attendance in Tajikistan (UNICEF 2013). Sanitation is an important issue, especially for teenage girls. Many schools have very basic latrines and washing facilities. Lack of clean water, poor-quality toilets, lack of sanitary facilities, and lack of privacy may discourage teenage girls from attending school.

Labour emigration of family members—mainly fathers and elder brothers—in Tajikistan is likely to leave many girls with less educational support and to bring additional responsibilities at home, potentially resulting in increased dropout rates. In cases where fathers are away and mothers have to work to make a living, girls have to do the cooking, look after younger children, milk cows, bake bread, prepare fuel, and fetch water (UNICEF 2013).

Anthropological and sociological evidence suggests that labour migration in Tajikistan has strengthened gender and generational hierarchies and reduced the well-being of migrant wives staying behind (Hegland 2010; Popova and Pulikova 2013; Whitsel 2009). In multigenerational households, the decision-making power, including control over remittances, often passes to the migrant's parents (for example, to the mother-in-law) rather than the spouse (Hegland 2010). As remittances are not immediate and are often erratic, migrant wives and children have to work more and become frequently more dependent on parents-in-law (Hegland 2010; Whitsel 2009).

Education of girls can also be affected by migration through early marriages. Early marriages are common in Tajikistan, with a typical marriage age between 16 and 22 years (Popova and Pulikova 2013). Generally, in areas where traditional norms dominate, married women become part of the household of their husbands. Many parents, therefore, consider investing in their daughters' education unnecessary (Amjad n.d.). Emigration of young men results in a shortage of marriageable men and increases the pressure, on both parents and girls, to marry early. As early marriages come at the expense of education, one might expect greater falls in girls' schools attendance in areas with higher rates of out-migration.

There is a further traditional cultural dimension that may affect girls' dropping out of school. Because of the violence and sexual abuse risks,[4] girls are not supposed to walk alone after reaching puberty. Many girls in rural areas choose to stop schooling at the level provided in their village rather than walk unaccompanied to a school that provides further levels of education but is farther away from home (UNICEF 2013). From this perspective, teenage girls will be particularly likely to drop out of school when male siblings or relatives, who previously accompanied them to school, migrate abroad.

Moreover, migration of the male household members may be associated with a higher exposure of left-behind females and children to bullying and abuse. Qualitative evidence suggests that teenage children whose fathers work abroad may experience mockery from peers, while migrants' wives are left with less protection offered by their husbands, which leads to a decrease in their status at the community and family level (UNICEF 2011). Thus, a marriage of a girl in a migrant

[4] A general feeling of insecurity is likely to persist after the civil war in 1992–97, during which rape and kidnapping of young women was a serious problem (Shemyakina, 2013). Haarr (2005) stresses that parents in Tajikistan are very concerned about their daughters having sexual experience prior to marriage, because such experience would go against tradition and would mean a loss of family honour.

household may be seen as a preferable strategy, not only to improve the financial situation of the household by cutting subsistence costs, but also to increase her personal safety when male family members go abroad.

The final channel through which migration might affect the education of girls in Tajikistan is related to the signalling effect of emigration (Dietz et al. 2015) and a specific cultural norm that girls cannot be better educated than boys (Whitsel 2009). Tajik emigrants, predominantly male and working in low-skilled occupations in Russia, send a credible signal to teenage boys that good education is not essential for a successful migratory move. Boys considering migration are therefore more likely to drop out of school early (Dietz et al. 2015). Studies on international migration suggest that this process is typical for countries with low-skilled, male-dominated out-migration (Kroeger and Anderson 2014; McKenzie and Rapoport 2011). Girls, in turn, may be kept out of school to avoid situations in which they become better educated than boys, which, among other things, could be a negative factor in the marriage market (Qodir 2012). Shemyakina (2013) states that girls are frequently pressured to drop out of school because of a preference for less-educated daughters-in-law who are expected to be submissive to their husbands and parents-in-law and are deemed to be more obedient and easier to control. This channel could operate both at the household level and the community level. In the first case, emigration of male siblings would be associated with a decrease in girls' school attendance if parents want to ensure that girls are not better educated than their brothers. In the second case, emigration of young men in the community without completing education narrows the pool of potential husbands if girls continue to attend school.

The negative effect of migration on girls' education may appear not only in the households with current migrants, but also in those with returned migrants. According to the bargaining theory, migrants, by achieving higher incomes abroad, may increase their bargaining power within the households after return. In line with this argument, the study of Torosyan et al. (2016) demonstrates that male migration reinforces gender inequality in the households, while female migration tends to decrease it.

Drawing on the reviewed literature, various confounding effects of migration and remittances on the education of girls left behind may be expected in the context of Tajikistan. On the one hand, the effect of having a migrant in the household, implying less supervision of children and more work for those left behind, is likely to be negative. In the case of male siblings' migration, the education of teenage girls might additionally be hampered in families where traditional norms do not allow teenage girls to walk alone to school. On the other hand, the effect of remittances on education is likely to be positive where liquidity constraints are binding. A higher household income might improve the school attendance of girls whose families are otherwise not able to afford their education, and who have to take over household chores or work at the expense of schooling. A positive impact of migration and remittances on girls' schooling might additionally be attributed to the change of the household head after migration. If women have a greater say in household decision-making and resource allocation after male household heads migrate, a greater share of resources might be allocated to girls' schooling. Finally, marriage practices might impact upon the education of girls left behind. Because the emigration of young males puts pressure on females to marry early, Tajik communities with high shares of emigration can be expected to experience high rates of early marriages. As marriage is typically associated with leaving school, higher migration rates might negatively impact upon girls' educational attainment.

4 Data, variables, and estimation strategy

4.1 Data

The data we use in this study come from a large household panel survey carried out in Tajikistan in 2007, 2009, and 2011. The first two waves of the Tajikistan Living Standards Measurement Survey (TLSS) (TLSS 2007, 2009) were administered by the World Bank and UNICEF. The third wave of the panel, the Tajikistan Household Panel Survey 2011 (THPS 2011), was designed and implemented by the Institute for East and Southeast European Studies as a follow-up to the TLSS (Danzer et al. 2013a, 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, following the seasonality patterns in agriculture and migration. 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, labour market status, and consumption.

4.2 Variables

Outcome variables

The objective of our empirical analysis is to estimate the effect of household migration on girls' education and to provide an overview of the possible channels through which migration may affect girls' education. To capture education, we use information on whether the child was enrolled in an educational institution in the last academic year, and construct a corresponding dummy variable.[5]

Migration may affect education of girls through an increased pressure for marriage as young marriageable males emigrate. To capture this effect, we focus on the marriage rate at the local level. Specifically, we compute the *hukumat* (district)-level ratio of married respondents over the sum of married and single respondents.[6] The divorced and widowed respondents are excluded from the denominator of this ratio to better account for transitions from singlehood into marriage.

Regressors of interest

Following our discussion of theoretical channels, the focal regressors include the incidence of migration at the household level, parental migration, sibling migration, the receipt of remittances, and the gender of the head of household after the parental migration takes place (all are dummy

[5] In designing the dummy variable, we addressed the question of whether in some cases girls dropped out from school but returned later. We found that 4 per cent of all girls had actually left education at some point in time but returned (in total, 24 per cent of girls between 7 and 22 years did not attend school). However, this pattern differed strongly between age groups. While 7 per cent of young girls (7–11) dropped out and returned, this rate amounted to 1 per cent in the case of teenage girls (12–17) and to 7 per cent in the case of young women (18–22). It has to be taken into account that 2 per cent of young girls, 26 per cent of teenage girls, and 62 per cent of young women did not attend school. This indicates that school attendance is sharply decreasing with age, although the share of those who dropped out and returned is similar in the youngest and oldest age group.

[6] Note that the marital status question was asked to respondents aged 15 and older.

variables). Due to the seasonal and circular nature of labour migration in Tajikistan, we consider both the migrants who are working abroad at the time of the interview and those who have recently (in the 12 months prior to the interview) returned.

Literature on labour migration from Tajikistan suggests that migrants are mostly young men—the average age of returned and current migrants is 31.6 and 28.9 years, respectively (Danzer et al. 2013a)—and it is the fathers and/or eldest sons who are most likely to move abroad (Khuseynova 2013; Olimova and Bosc 2003). We therefore construct two variables: 'parent migrant' and 'sibling migrant'. Sibling migrants are defined in a broad sense, including both siblings of the child (typically brothers) and other migrant family members whose age difference with the child does not exceed 15 years (typically cousins and young uncles).[7] We include other family members as siblings as they may have an influence on the educational choices of girls staying behind similar to that of migrating brothers.

The variable remittances captures the receipt of remittances from at least one international labour migrant (in the 12 months prior to the interview). The survey also contains information on the relationship between the child and the head of household (grandmother, grandfather, mother, father) in each wave, which we use to capture the change in the household head gender after parental migration.

Control variables

We only include time-variant individual and household-level characteristics as control variables. This is because the model to be estimated includes individual fixed effects, which will capture all time-invariant influences. Individual-level controls include child's age[8] and health status (whether a child needed hospitalization or ambulatory assistance in the four weeks prior to the interview). Household-level controls include household size, share of children in the household, share of elderly in the household, share of household members in employment, income net of remittances, and subjective financial satisfaction measured on a 1–5 scale (1 = 'not at all satisfied'; 5 = 'fully satisfied'). The summary statistics of all the variables included in the analysis are reported in the appendix.

4.3 Descriptive statistics

Before specifying our econometric model, in this section we briefly comment on the means of variables included in the analysis (Table 1), and report the school attendance rates by migrant status and type (Table 2). In both cases, we present the statistics for the whole sample of girls and young women (ages 7–22),[9] as well as for the subsamples of young girls (ages 7–11), teenage girls (ages 12–17), and young women (ages 18–22).

Our panel dataset includes 1,086 girls and young women between the ages of 7 and 22, leading to a whole sample of 2,620 observations in the 7–22 age range; i.e. each girl is present in

[7] The age difference of 15 years was chosen because this is a minimum difference between the age of a typical parent and a child. Our results do not change substantially if the age difference is reduced to 10 years or if the cousins/uncles are excluded from this category.

[8] Note that our individual fixed-effect models include both the age variable and year fixed effects. While concerns may arise over the perfect collinearity between the two variables, this is not the case as the interviews with the same households were not conducted during the same parts 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.

[9] Full summary statistics for the whole sample are reported in the Appendix.

approximately 2.5 survey waves. On average, girls are about 13 years old, and 75 per cent of them attend school (Table 1). Concerning age groups, 32 per cent are 7–11 years old, 46 per cent are 12–17 years old, and 22 per cent are 18–22 years old. In the group of young girls (7–11), 95 per cent attend school, while only 88 per cent of teenage girls (12–17) and 20 per cent of young women (18–22) are in education. Most girls live in a household in which the head has secondary education (66 per cent), 15 per cent belong to a household in which the head has basic education, and another 14 per cent are part of a household in which the head has tertiary education. Nearly 80 per cent of girls in our sample are Tajik, while close to 20 per cent belong to the Uzbek minority, which reflects the ethnic composition in Tajikistan. More than two-thirds of girls and young women live in rural areas (69 per cent)—this is comparatively close to the share of the rural population in Tajikistan (74 per cent). On average, girls' household size is seven members, nearly half of family members are children, and one household member is working. Almost one-third of girls live in a migrant household, and in half of these families migrants are currently away, while in the others migrants have recently returned. As is typical for labour migration in Tajikistan, nearly all migrants are male. In slightly more than half of migrant households, a parent left home for working abroad; in the others, girls' siblings emigrated. Only half of migrant households receive remittances, the others obtain no financial transfers, although they have a migrant in the family. As can be expected, in most cases the girls' father is the household head (66 per cent), followed by the mother (10 per cent), the grandfather (9 per cent), and the grandmother (8 per cent). This, however, changes in the case of parental migration. Although the father is still the household head in 47 per cent of families with parental migration, reflecting emigrated fathers who recently returned and the rare cases of migrant mothers, in one-fifth of households with parental migration the mother is the household head, followed by grandmothers (15 per cent) and grandfathers (13 per cent).

A descriptive analysis of the proportion of girls attending school by migration status reveals that, in the whole sample (ages 7–22), girls in non-migrant households have on average a slightly higher school attendance rate than girls in migrant households (see Table 2). But a breakdown by age group shows that this is not the case for the youngest age group (7–11), where more girls in migrant households are in education. Whereas in the case of parental migration we observe a higher than average school attendance rate of girls (except for the 18–22 age group), siblings' migration is associated with a lower school attendance of girls. In the event of parental migration, school attendance rates of girls are apparently influenced by gender and generation of household heads. Mothers and grandmothers as household heads improve school attendance rates of girls in all age groups, but for fathers this applies only to young and teenage girls (7–17) and for grandfathers to the teenage group (12–17).

Table 1: Means of variables included in the analysis, for full sample and by age group

	Whole sample (age 7–22) *n* = 2,620	Age 7–11 (*n* = 831)	Age 12–17 (*n* = 1,202)	Age 18–22 (*n* = 587)
Attending school	0.752	0.954	0.881	0.199
Age	13.966	9.214	14.381	19.842
Head of household is girl/young woman's father	0.663	0.651	0.712	0.579
Head of household is girl/young woman's mother	0.104	0.078	0.108	0.133
Head of household is girl/young woman's grandfather	0.089	0.146	0.087	0.012
Head of household is girl/young woman's grandmother	0.079	0.111	0.077	0.037
Head of household: basic education	0.152	0.171	0.144	0.143
Head of household: secondary education	0.663	0.639	0.675	0.675
Head of household: tertiary education	0.146	0.152	0.139	0.152
Tajik	0.798	0.788	0.807	0.792
Uzbek	0.198	0.206	0.192	0.199
Rural	0.699	0.691	0.688	0.734
Urban	0.301	0.309	0.312	0.266
Number of household members	7.285	7.486	7.134	7.312
Proportion of children in the household	0.472	0.549	0.509	0.288
Proportion of elderly in the household	0.028	0.032	0.027	0.023
Proportion of working members in the household	0.131	0.113	0.131	0.157
Household monthly income net of remittances (in somoni)	642.705	609.526	629.225	717.277
Financial satisfaction	3.512	3.497	3.525	3.506
Hospitalized in the past month	0.026	0.016	0.020	0.051
Ambulatory assistance in the past month	0.052	0.046	0.040	0.085
Migrant in the household (currently away or returned in the last 12 months)	0.312	0.302	0.299	0.353
Migrant currently away	0.170	0.160	0.158	0.210
Returned migrant (in the last 12 months)	0.170	0.170	0.164	0.184
Male migrant	0.304	0.292	0.293	0.342
Female migrant	0.023	0.019	0.017	0.039
Parent migrant	0.173	0.230	0.170	0.101
Sibling migrant	0.139	0.072	0.129	0.252
Remittances	0.147	0.143	0.136	0.174
Migrant in the household, no remittances	0.165	0.159	0.162	0.179
Parental migration, head of household grandmother	0.026	0.042	0.022	0.010
Parental migration, head of household grandfather	0.023	0.042	0.017	0.005
Parental migration, head of household mother	0.044	0.052	0.046	0.031
Parental migration, head of household father	0.082	0.095	0.085	0.056

Source: authors' calculations based on TLSS 2007 and 2009, and THPS 2011.

Table 2: Proportion of girls attending school, by migrant status/type and age group

	Whole sample (age 7–22)	Age 7–11	Age 12–17	Age 18–22
Non-migrant household	0.769	0.948	0.901	0.229
Migrant in the household (currently away or returned)	0.714	0.968	0.881	0.145
Migrant currently away	0.702	0.970	0.866	0.187
Returned migrant	0.713	0.957	0.891	0.102
Male migrant	0.714	0.967	0.884	0.139
Female migrant	0.617	1.000	0.800	0.217
Parent migrant	0.833	0.973	0.914	0.155
Sibling migrant	0.565	0.950	0.834	0.142
Remittances	0.712	0.966	0.866	0.196
Migrant in the household, no remittances	0.715	0.970	0.894	0.095
Parental migration, head of household grandmother	0.866	0.971	0.931	0.000
Parental migration, head of household grandfather	0.915	0.943	1.000	0.000
Parental migration, head of household mother	0.827	1.000	0.900	0.278
Parental migration, head of household father	0.804	0.975	0.900	0.152

Source: authors' calculations based on TLSS 2007 and 2009, and THPS 2011.

4.4 Estimation strategy

The model estimating the relationship between household member migration and school attendance for child i from household j in year t takes the following form:

$$\text{Model 1: } Attending\ school_{i,j,t} = \beta_0 + \beta_1 Migration_{j,t} + \beta_2 I'_{i,j,t} + \beta_3 H'_{j,t} + \nu_i + \tau_t + u_{i,j,t} \quad (1)$$

where I' and H' are vectors of individual and household-level characteristics, ν_i are child fixed effects, τ_t are year fixed effects and $u_{i,j,t}$ is the error term.

To test alternative hypotheses, we will run the following model specifications: (1) differentiate between parental and sibling migration; (2) differentiate between remittances-remitting and non-remitting migrants; and (3) interact parental migration with the relationship between the child and the head of household (grandmother, grandfather, mother, father).

We estimate the models for the subsamples of girls aged 7–11, 12–17, and 18–22; these age cut-offs are chosen to have balanced (in terms of size) subsamples; in addition, the contribution to household tasks as well as puberty considerations would be more applicable to teenage girls (12–17) than young girls (7–11). Furthermore, to get a better understanding of what is driving our results, we estimate the models for households headed by persons educated to the basic, secondary, and tertiary levels; ethnic Tajiks (ethnic majority) and Uzbeks (the largest ethnic minority group); and respondents living in urban and rural areas.

The model estimating the relationship between the marriage rate and the share of migrant households at the hukumat (district) h in year t can be expressed as:

$$\text{Model 2: } Marriage\ rate_{h,t} = \delta_0 + \delta_1 Migration\ rate_{h,t} + \eta_h + \tau_t + u_{h,t} \quad (2)$$

where *Migration rate* is the share of households with at least one migrant (as defined above) in the total number of interviewed households in hukumat h and year t, η_h are hukumat fixed effects, τ_t are year fixed effects, and $u_{h,t}$ is the error term.

5 Results

Table 3 reports the results of the baseline fixed effects ordinary least squares (OLS)[10] estimation for the full sample of girls and young women (ages 7–22), as well as for the three age groups. For the full sample, the results indicate that migration of a household member is associated with a decrease in the probability of attending school of 4.6 percentage points. This would support theoretical channels suggesting that emigration of household members leads to the decrease in school attendance. However, the coefficient differs markedly for the three age categories: the emigration of a household member is associated with a 7.5 percentage points higher probability of attending school among young girls, 6.6 percentage points lower probability among teenage girls, and the migration variable is insignificant for young women. This would suggest that different channels linking migration and girls' education prevail for different age groups. In what follows, we try to understand these channels by examining more closely the relationship between the school attendance of girls/young women and different types of migration.

[10] 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.

Table 3: Migration of household members and school attendance of girls and young women, full sample and by age group, OLS fixed effects results

	Dependent variable: attending school (0/1)			
	Full sample (age 7–22)	Age 7–11	Age 12–17	Age 18–22
Migrant in the household	−0.046**	0.075**	−0.066**	0.018
	(0.019)	(0.032)	(0.029)	(0.056)
Individual controls				
Age	−0.011	0.007	−0.058**	0.030
	(0.014)	(0.027)	(0.025)	(0.048)
Hospitalized in the past month	−0.039	0.002	0.023	−0.048
	(0.045)	(0.055)	(0.068)	(0.061)
Ambulatory assistance in the past month	−0.045	0.071	−0.074	0.055
	(0.033)	(0.050)	(0.072)	(0.052)
Household-level controls				
Number of household members	0.008	0.009	0.021*	0.011
	(0.007)	(0.012)	(0.011)	(0.015)
Proportion of children in the household	0.465***	−0.283*	0.138	−0.285
	(0.081)	(0.160)	(0.150)	(0.182)
Proportion of elderly in the household	−0.184	0.204	−0.488**	−0.793
	(0.188)	(0.305)	(0.237)	(0.997)
Proportion of employed in the household	0.081	−0.171	−0.032	0.130
	(0.059)	(0.123)	(0.091)	(0.114)
Household income net of remittances	−0.000	0.000	0.000	−0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Financial satisfaction	0.012	0.007	0.026*	0.020
	(0.010)	(0.014)	(0.016)	(0.030)
Constant	0.664***	0.909***	1.445***	−0.307
	(0.180)	(0.284)	(0.341)	(0.894)
Year fixed effects	Yes	Yes	Yes	Yes
Person fixed effects	Yes	Yes	Yes	Yes
Observations	2,620	831	1,202	587
Number of girls/young women	1,086	547	638	386
R-squared	0.160	0.119	0.178	0.096

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses.

Source: authors.

5.1 Migration and school attendance of young girls (ages 7–11)

Table 4 shows the results of different specifications of the school attendance model for girls aged 7–11. Here and in what follows we only report the coefficients of interest; full econometric output is available upon request. We find an overall positive effect (of about 7 percentage points) of parental migration on the school attendance (Table 4, Panel A); this effect, however, differs considerably across sociodemographic groups. While no impact is observed in low- and middle-educated households, parental migration has a strong positive influence on young girls' school

attendance where heads of households are educated to the tertiary level. Furthermore, when parents migrate young girls' school attendance increases in Uzbek and rural households.

Thus, young girls in both better educated and more deprived households (Uzbek and rural) seem to benefit from parental migration. On the one hand, this points to a relaxation of budget constraints, which allows investment in the education of young girls. This channel is supported by the specification that includes remittances (Table 4, Panel B): school attendance of young girls increases with remittances in rural areas in particular. However, the positive effect of having a migrant in the family but receiving no remittances on young girls' school attendance indicates that, besides lifting budget constraints, migration may affect school attendance of young girls in other ways. The change in the head of household after a parent (usually the father) migrates is one such channel: mothers and grandmothers might be more supportive of the education of young girls than are fathers and grandfathers, implying that a change in the head of household might increase the schooling of girls, even if no remittances are received.

The results reported in Panel C of Table 4 provide partial support of the head of household gender channel. When parents (in most cases fathers) migrate, school attendance increases if the household is headed by a grandmother but not mother, grandfather, or father[11] of the girl. This somewhat unexpected result may be interpreted in the context of women's educational aspirations and education value in Tajikistan. While in Soviet Tajikistan (the generation of the grandmothers) female education was relatively highly valued, in post-Soviet Tajikistan (the generation of the mothers) girls' education was progressively losing value—as reflected, for example, by a downward trend in girls' enrolment at higher levels of education. Thus, grandmothers may attach greater value to education than do mothers, and encourage school attendance of young girls when fathers migrate.

Finally, we find that sibling migration also has an overall positive impact on the young girls' school attendance (Table 4, Panel A). As in the case of parental migration, this effect is strong for better educated (tertiary educated) households. However, only girls in Tajik households benefit from an older sibling moving abroad.

This might be related to the fact that sibling migration most likely does not lead to a change in the household head, i.e. the impact on young girls' education might primarily depend on the lifting of budget constraints (see estimation on remittances in Table 4, Panel B).

[11] Note that a girl can have a father who is a migrant and head of household at the same time. This is because migrants include those household members who are at home at the time of the interview but had worked abroad in the 12 months prior to the interview.

Table 4: Migration and school attendance of young girls (ages 7–11), OLS fixed effects results

	All	Education of household head			Tajik	Uzbek	Urban	Rural
		Basic	Secondary	Tertiary				
Panel A								
Parental migration	0.068**	0.023	0.045	0.488***	0.061	0.119*	0.064	0.077*
	(0.034)	(0.073)	(0.036)	(0.108)	(0.038)	(0.069)	(0.057)	(0.044)
Sibling migration	0.097**	−0.021	0.082	0.355***	0.118**	−0.026	0.099	0.083
	(0.045)	(0.100)	(0.057)	(0.094)	(0.053)	(0.086)	(0.075)	(0.051)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	831	142	531	126	655	171	257	574
Number of girls	547	98	345	82	433	118	167	380
R-squared	0.120	0.277	0.124	0.516	0.119	0.217	0.107	0.152
Panel B								
Remittances	0.096**	0.022	0.106*	0.289***	0.134***	0.009	0.071	0.095**
	(0.042)	(0.066)	(0.055)	(0.088)	(0.051)	(0.064)	(0.065)	(0.046)
Migrant, no remittances	0.064*	0.016	0.036	0.568***	0.057	0.175**	0.068	0.069*
	(0.035)	(0.079)	(0.034)	(0.125)	(0.040)	(0.082)	(0.059)	(0.041)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	831	142	531	126	655	171	257	574
Number of girls	547	98	345	82	433	118	167	380
R-squared	0.121	0.276	0.130	0.532	0.125	0.232	0.106	0.153

Panel C								
Parental migration, HH grandmother	0.187**	0.140	0.170	0.718***	0.188	0.244**	0.396	0.155*
	(0.090)	(0.152)	(0.149)	(0.105)	(0.117)	(0.120)	(0.282)	(0.087)
Parental migration, HH grandfather	−0.025	0.021	−0.048	0.127	−0.168	0.108	0.001	−0.070
	(0.075)	(0.166)	(0.104)	(0.098)	(0.119)	(0.079)	(0.070)	(0.096)
Parental migration, HH mother	0.080	−0.243	0.087	–	0.091	0.295	0.109	0.123
	(0.071)	(0.167)	(0.083)	–	(0.079)	(0.208)	(0.079)	(0.101)
Parental migration, HH father	0.045	−0.091	0.035	0.238**	0.050	0.004	0.012	0.060
	(0.032)	(0.154)	(0.029)	(0.118)	(0.038)	(0.087)	(0.017)	(0.047)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	831	142	531	126	655	171	257	574
Number of girls	547	98	345	82	433	118	167	380
R-squared	0.135	0.306	0.138	0.564	0.145	0.262	0.172	0.167

Notes: HH, household head. *** significant at 1 per cent, ** at 5 per cent, * at 10 per cent. Robust standard errors in parentheses. Dependent variable: whether the child attends school (0/1). The same individual and household-level controls as in Table 3 included in all regressions. Regressions in Panel C also control for siblings' migration. Complete econometric output available on request.

Source: authors.

5.2 Migration and school attendance of teenage girls (ages 12–17)

Table 5 reports the results for teenage girls (aged 12–17). While in this group the coefficient of parental migration is not statistically significant, a negative association with school attendance is obtained for sibling migration (Panel A). This finding supports the argument that girls, reaching the age of puberty, would stay at home rather than go to school unaccompanied. Noteworthy, the sibling effect is significant only for urban households, which is likely to reflect the fact that rural households have larger household sizes and even after migration of the eldest siblings there are still other brothers who can take over the task of accompanying sisters to school. The negative effect of sibling migration would also support the conjecture that after the migration of brothers (who may drop out of school because they leave the country) girls are kept out of school because of the social norm that girls cannot be better educated than boys.

Considering the role of the head of household change after parental migration, grandmothers again appear to be the most beneficial for girls' schooling, especially in Tajik households. At the same time, where the head of household is the father, teenage girls are more likely to drop out of school. To some extent, this would capture female (mothers') migration—it is gradually increasing but is still far from a prevalent form of migration in Tajikistan[12]—after which girls would need to undertake extra household work, at the expense of schooling. Our definition of a migrant includes recent (probably, circular) migrants who are at home at the moment of the interview; it is, therefore, possible to have fathers who are both migrants and households heads. In such cases, the temporary/circular nature of fathers' migration may be associated with a weaker engagement of fathers in household work, meaning that children, including girls, would take over tasks normally performed by (non-migrant) fathers.

[12] According to Danzer et al. (2013b), about 10 per cent of Tajik migrants to Russia in 2011 were women.

Table 5: Migration and school attendance of teenage girls (age 12–17), OLS fixed effects results

	All	Education of household head			Tajik	Uzbek	Urban	Rural
		Basic	Secondary	Tertiary				
Panel A								
Parental migration	−0.042	0.022	−0.052	−0.127	−0.042	−0.057	−0.080	−0.023
	(0.036)	(0.098)	(0.041)	(0.085)	(0.046)	(0.056)	(0.080)	(0.040)
Sibling migration	−0.094**	−0.053	−0.070	−0.140	−0.069	−0.228	−0.280**	−0.055
	(0.042)	(0.098)	(0.054)	(0.120)	(0.042)	(0.153)	(0.122)	(0.044)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,202	173	811	167	970	231	375	827
Number of girls	638	93	428	92	522	121	202	439
R-squared	0.179	0.235	0.219	0.290	0.180	0.284	0.259	0.181
Panel B								
Remittances	−0.061	0.032	−0.063	−0.213*	−0.041	−0.119	−0.125	−0.035
	(0.041)	(0.091)	(0.050)	(0.112)	(0.046)	(0.099)	(0.116)	(0.044)
Migrant, no remittances	−0.069**	−0.028	−0.058	−0.084	−0.067*	−0.073	−0.138*	−0.042
	(0.031)	(0.076)	(0.040)	(0.067)	(0.038)	(0.057)	(0.072)	(0.035)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,202	173	811	167	970	231	375	827
Number of girls	638	93	428	92	522	121	202	439
R-squared	0.178	0.236	0.219	0.305	0.180	0.274	0.245	0.181

Panel C								
Parental migration, HH grandmother	0.189***	0.169	0.145	−0.033	0.193**	0.105	0.127**	0.224***
	(0.061)	(0.110)	(0.140)	(0.170)	(0.080)	(0.086)	(0.058)	(0.081)
Parental migration, HH grandfather	0.037	0.136	−0.081	−0.098*	0.137	−0.043	0.258	−0.047
	(0.086)	(0.177)	(0.083)	(0.053)	(0.135)	(0.073)	(0.180)	(0.093)
Parental migration, HH mother	−0.060	−0.310	−0.023	0.034	−0.106	0.038	−0.255	0.017
	(0.064)	(0.226)	(0.071)	(0.119)	(0.083)	(0.117)	(0.158)	(0.067)
Parental migration, HH father	−0.126***	−0.065	−0.090*	−0.156	−0.113**	−0.189**	−0.141*	−0.121**
	(0.045)	(0.096)	(0.048)	(0.116)	(0.053)	(0.090)	(0.082)	(0.055)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,202	173	811	167	970	231	375	827
Number of girls	638	93	428	92	522	121	202	439
R-squared	0.193	0.279	0.223	0.296	0.195	0.313	0.290	0.199

Notes: HH, household head. *** significant at 1 per cent, ** at 5 per cent, * at 10 per cent. Robust standard errors in parentheses. Dependent variable: whether the child attends school (0/1). The same individual and household-level controls as in Table 3 included in all regressions. Regressions in Panel C also control for siblings' migration. Complete econometric output available on request.

Source: authors.

5.3 Migration and school attendance of young women (ages 18–22)

Table 6 reports the results for young women. We notice a low number of significant coefficients, reflecting the fact that attendance of post-secondary educational institutions is generally low among young women in Tajikistan, irrespective of the household migration status. The negative coefficient of sibling migration in better-educated households (Table 6, Panel A) probably points to the devaluation of education: if siblings in such households engage in migration, household heads' higher levels of education are unlikely to translate into higher wealth domestically and education of children is not seen as a strategy to reach a decent standard of living.[13]

In contrast to the case of young and teenage girls, the coefficients of female heads of household—grandmothers, but also mothers in low-educated households—are negative, suggesting that mothers and grandmothers may be discouraging young women from pursuing education after fathers migrate.[14] It is possible that mothers and grandmothers in such households are particularly interested in young women getting married. As a young wife usually joins her husband's house, a married (grand-)daughter means less financial hardships for the household and, possibly, more protection when fathers are away.

[13] It must be considered that the share of young women (18–22) who are enrolled in educational institutions is much higher in households with tertiary-educated household heads (29 per cent) than in households with secondary- (15 per cent) or primary-educated household heads (8 per cent). Thus, it can be concluded that migration significantly hampers the education of young women in better-educated families that are traditionally expected to foster the education of females.

[14] Due to the small sample size of grandmothers, these results have to be treated with care.

Table 6: Migration and school attendance of young women (ages 18–22), OLS fixed effects results

	All	Education of household head			Tajik	Uzbek	Urban	Rural
		Basic	Secondary	Tertiary				
Panel A								
Parental migration	−0.049	−0.134	−0.002	−0.206	−0.008	−0.184	−0.023	−0.070
	(0.117)	(0.129)	(0.156)	(0.211)	(0.157)	(0.152)	(0.122)	(0.146)
Sibling migration	0.032	−0.064	0.108	−0.409**	0.058	−0.074	−0.138	0.053
	(0.054)	(0.087)	(0.070)	(0.166)	(0.070)	(0.106)	(0.150)	(0.057)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	587	84	396	89	465	117	156	431
Number of young women	386	54	257	60	313	75	104	284
R-squared	0.099	0.599	0.120	0.587	0.107	0.267	0.366	0.106
Panel B								
Remittances	0.041	−0.059	0.096	−0.407***	0.093	−0.074	−0.073	0.070
	(0.061)	(0.073)	(0.080)	(0.148)	(0.073)	(0.122)	(0.164)	(0.062)
Migrant, no remittances	−0.007	−0.085	0.071	−0.362	−0.009	−0.116	−0.139	−0.007
	(0.063)	(0.101)	(0.091)	(0.225)	(0.081)	(0.116)	(0.162)	(0.073)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	587	84	396	89	465	117	156	431
Number of young women	386	54	257	60	313	75	104	284
R-squared	0.098	0.598	0.116	0.578	0.116	0.262	0.364	0.107

Panel C								
Parental migration, HH grandmother	−0.755***	–	−0.786***	–	–	−1.020***	–	−0.886***
	(0.092)	–	(0.089)	–	–	(0.161)	–	(0.079)
Parental migration, HH grandfather	–	–	–	–	–	–	–	-
	–	–	–	–	–	–	–	-
Parental migration, HH mother	0.071	−0.411***	0.222	–	0.151	0.018	0.030	0.168
	(0.162)	(0.132)	(0.204)	–	(0.184)	(0.193)	(0.135)	(0.209)
Parental migration, HH father	−0.028	−0.022	−0.001	−0.206	−0.099	−0.032	−0.185	−0.052
	(0.098)	(0.095)	(0.140)	(0.211)	(0.138)	(0.126)	(0.196)	(0.112)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	587	84	396	89	465	117	156	431
Number of young women	386	54	257	60	313	75	104	284
R-squared	0.119	0.677	0.157	0.587	0.118	0.356	0.370	0.148

Notes: HH, household head. *** significant at 1 per cent, ** at 5 per cent, * at 10 per cent. Robust standard errors in parentheses. Dependent variable: whether the child attends school (0/1). The same individual and household-level controls as in Table 3 included in all regressions. Regressions in Panel C also control for siblings' migration. Complete econometric output available on request.

Source: authors.

5.4 Migration and marriage

Table 7 presents the estimates of the relationship between the *hukumat*-level marriage rate and the share of migrant households. The inclusion of the *hukumat* and year fixed effects in a (three-year) panel estimation means that the results are not driven by the time-invariant hukumat-level factors or year-specific influences, and instead capture the local-level relationship between the change in marriage rates and the change in the share of migrant households.

Column 1 shows the results of a linear model. The estimate of the share of migrant households is negative but statistically insignificant. A quadratic model (column 2) provides a better fit: the share of migrant households is negative, its square is positive, and both are statistically significant (at 5 and 10 per cent, respectively). This implies a U-shaped relationship between the two variables, with the predicted values of the marriage rate, as a function of the share of migrant households, shown in Figure 1. Specifically, the marriage rate decreases from 71 to 65 per cent as the share of migrant households in a *hukumat* grows from 0 (the lowest in our sample) to 55 per cent, and increases from 65 to 68 per cent as the share of migrant households grows from 55 to 90 per cent (highest in our sample).

The results thus suggest that, in the regions with relatively low emigration rates, the local-level marriage rates decrease as emigration rates rise. It could be because emigration decreases the supply of marriageable men. However, after a certain threshold marriage rates start increasing with migration. This could indicate that in areas with high out-migration girls and young women are subject to a particularly high pressure to marry. As unmarried girls/young women are more likely to attend school (or a post-secondary education institution) than their married counterparts,[15] emigration in these localities is likely to deter girls' and young women's school attendance through marriage.

Table 7: Migration and marriage at the *hukumat* level, OLS fixed effects results

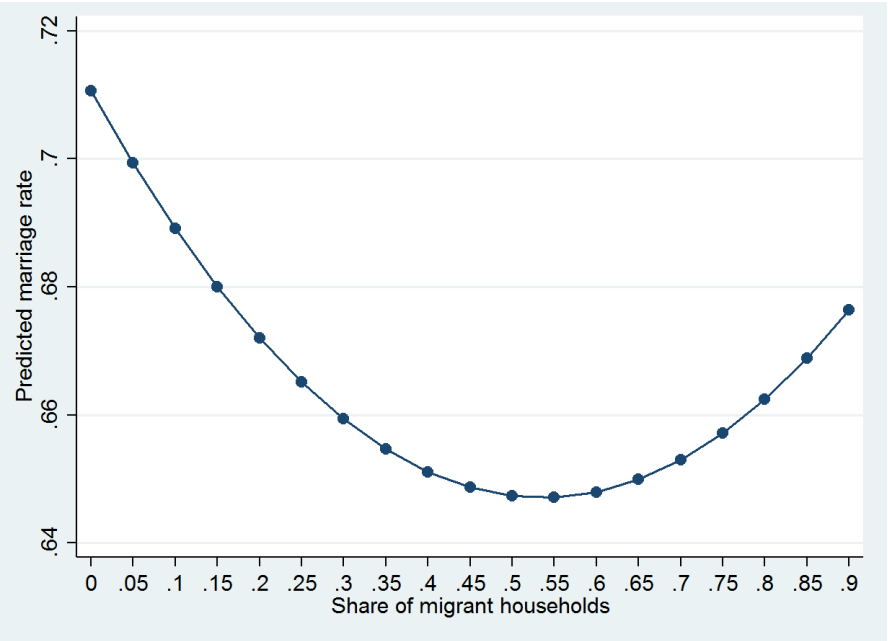
	Linear model	Quadratic model
Share of migrant households	−0.058	−0.237**
	(0.037)	(0.105)
Share of migrant households squared		0.221*
		(0.125)
Hukumat fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	177	177
Number of *hukumats*	69	69
R-squared	0.763	0.770
Prob. > *F*	0.000	0.000

Notes: * significant at 10 per cent. Unit of analysis: *hukumat*-year. Dependent variable: *hukumat*-level marriage rate.

Source: authors.

[15] According to our data, in the age category 16–22, 42 per cent of non-married and only 3 per cent of married women were in education; 26 per cent of women in this age group were married.

Figure 1: Predicted probability of the marriage rate as a function of the share of migrant households



Source: authors.

5.5 Robustness and sensitivity checks

Results for boys/young men

So far we have exclusively explored the impact of migration on the educational attainment of girls and young women in Tajikistan. One may wonder if the effects shown are typical for females or if we also observe similar results for boys and young men. To test this proposition, we estimate the same models as above for boys and young men; all the results can be found in the supplementary information. Our panel dataset includes 1,165 boys and young men between the age of 7 and 22, leading to a whole sample of 2,870 observations; i.e. each male is present in approximately 2.5 survey waves (Table S1). On average, boys are about 14 years old (1 year older than girls), and their overall school attendance rate is 80 per cent; that is 5 per cent higher than that of girls (Table S1). While in the group of young boys (7–11), school attendance rate is identical to that of girls (7–11), school enrolment among teenage boys (12–17) is nearly 7 per cent higher than that of their female peers. In the group of 18–22-year-olds, educational enrolment rate by gender widens considerably: 35 per cent of boys and young men in this age cohort visit educational institutions as compared to 20 per cent of young women in the same age range. Concerning household characteristics, migration relations, ethnic affiliation and rural/urban distribution, no notable differences could be detected between 7–22-year-old males and females in our sample (Table S1). As in the case of girls and young women, boys and young men in non-migrant households have on average a slightly higher school attendance rate than their peers in migrant households; sibling migration is associated with a lower, and parental migration with a higher, school attendance rate (Table S2).

The results of the baseline fixed effects OLS estimation for the full sample of boys and young men (ages 7–22) reveal that migration of a household member is associated with a decrease in the probability of attending school of 3.1 percentage points as compared to 4.6 percentage points in the case of girls and young women (Table S3). In the group of young boys (7–11), parental and sibling migration have no overall effects on school attendance (Table S4), in contrast to young girls in this age group who experience a positive impact on education. Although for teenage boys

and girls aged 12–17 a significantly negative effect of sibling migration is observed (Table 5 and S5), we interpret the outcomes differently. For teenage boys, sibling migration is expected to send a strong signal to drop out of school and prepare for migration (Dietz et al. 2015), whereas for teenage girls social norms (not going unaccompanied to school, not being allowed to receive a better education than boys) play the decisive role. Finally, in the group of young men (18–22) we notice—as in the case of young women—a negative coefficient of sibling migration in better-educated households (Table S6). This suggests that young men in better-educated households do not receive a strong incentive to pursue a higher education, but tend to drop out of school and join the labour force abroad.

Current and return migration

So far, our migration variable has incorporated migrants away at the moment of the interview as well as migrants who returned within the 12 months prior to the interview. In a further robustness check we distinguish between current and return migration, and estimate the models for both girls and boys (Tables S7 and S8).

Table S7 presents the results for girls and young women by age group. In general, the revealed effects demonstrate a high degree of correspondence to the effects discussed in the previous sections and indicate that the age of a girl has a high predictive power for her school attendance. The school enrolment of girls from the youngest cohort (girls aged 7–11) is positively associated with presence of current and returned migrants. On the other hand, there are few negative coefficients that appear significant for the groups of teenage girls (aged 12–17) and young women (aged 18–22). Teenage girls in the households with returned migrants have in general lower chances to be enrolled into educational institutions, contrary to households with current migrants, where school enrolment of teenage girls is not affected. This result echoes our finding that in this age cohort the return of fathers who take over the role of the household head is related to girls' dropping out of school. Educational attainment of young women seems to be less affected by migration in general, with the exception of young women from higher educated households. In such households, having current migrants negatively affects educational attainment of young women.

The estimates for boys are reported in Table S8. The analysis based on the full sample of boys by age cohort shows that the presence of current or returned migrants in a household plays almost no role for boys' educational attainment.[16] There is only one slightly significant negative effect, which appears in the cohort of youngest boys (aged 7–11 years) in the households with recently returned migrants. These results stress that migration has a distinct gender-specific effect on the education of children. While girls—in contrast to boys—seem to profit from migration in early age, their education is most likely hampered in the case of returning migrants in teenage years.

6 Limitations and further research

Our study is not without limitations. First, while interpreting the results for young women (aged 18–22) caution should be applied because of the attrition of young women if they get married.

[16] A more precise look on the estimation results for boys in households with different characteristics reveals several interesting patterns. However, for brevity reasons they may not be discussed in the present paper and are left for further research.

After getting married young women in Tajikistan usually leave their parental household and move to the household of their husband or parents-in-law.

Second, our estimation of the relationship between the marriage rate and the share of migrant households at the *hukumat* level should also be treated with caution as we constructed these variables using responses from our survey rather than official statistics. The estimation based on the official statistics data would be more precise; however, the official marriage data are not reliable because many marriages in Tajikistan are not officially registered and the official, yearly data on *hukumat*-level out-migration are not available.

Finally, the uncovered U-shaped relationship between migration and marriage rates does not allow establishing the direction of causality. On the one hand, migrants may choose to move for work abroad to earn money to organize a wedding, which would suggest a self-selection of young unmarried men with definite marriage plans. In this case, marriage plans would drive migration. On the other hand, families may put more pressure on their unmarried daughters in the locations where the numbers of marriageable men decrease due to emigration, which would lead to an increase of marriage rates. Although establishing causality was not among the aims of our study, future research could explore in greater detail the relationship between migration and marriage patterns. In addition, further research could study the links between migration and the transformation of norms and values in sending societies, shedding light on the largely understudied process of 're-traditionalization' of many developing countries.[17]

7 Conclusion and policy recommendations

Tajikistan is one of the world's poorest and most remittance-dependent countries, which underwent a continuous decline in educational outcomes since it gained independence in 1991. Girls and young women have been particularly affected by this development, experiencing growing school dropout rates, especially at the higher levels of education. This paper studied the role played by emigration and remittances in explaining school attendance of girls staying behind in Tajikistan, using data from a unique three-wave household panel survey conducted in 2007, 2009, and 2011.

Our results suggest that migration has a positive impact on school attendance of young girls (7–11), but it is mostly negatively associated with school attendance of teenage girls (12–17) and young women (18–22). A more nuanced analysis shows that schooling of young girls improves if parents (mostly fathers) and siblings migrate. However, in the case of teenage girls, migration of siblings reduces school attendance while parents' migration has no effect. When the household starts receiving remittances, teenage girls and young women experience no educational enhancement, in contrast to young girls whose school attendance increases. In sum, we find that the effect of household migration on girls' education differs by age, with the younger age groups benefiting from migration and older age groups being disadvantaged.

We have obtained empirical support for a number of explanations of the channels through which migration of household members might have affected girls' schooling. On the one hand, migration of household members leaves more work at home for those left behind; thus household chores for girls in migrant households may increase at the expense of schooling (an exception would be very young girls who often lack the physical strength to perform additional household duties). The

[17] However, there is literature on the persistently high popularity of migration marriages within large immigrant populations in Western Europe (Timmerman et al. 2009).

negative effect of siblings' migration (mostly boys) on the education of teenage girls most likely points to a higher workload for this age group at home. The negative effect of siblings' migration on the schooling of teenage girls may also reflect Tajik traditional norms, whereby girls (especially at the age of puberty) are not allowed to go to school unaccompanied by male relatives, or that girls cannot be better educated than boys.

The positive effect of migration on the education of young girls is partially explained by migrant remittances that are likely relaxing budget constraints and encouraging families to invest in the education of children. Interestingly, in the case of Tajikistan, additional money from remittances seems to be only invested in the education of girls below puberty age (7–11). The rationale behind this strategy most likely relates to traditional norms and gender hierarchies in Tajikistan that put high value on girls getting married and assuming household responsibilities as opposed to receiving a better education. This is reinforced by the fact that marriage chances of young women seem to be severely hampered if they are better educated than potential husbands.

Furthermore, in the case of young girls, the migration of household members also encourages school attendance if the family does not receive remittances. This finding is most likely related to a change in the household head after parents (typically fathers) migrate, potentially leading to higher support for the education of girls by the new head of household. As in the case of Mexico, we expected that mothers or grandmothers would be more supportive of the education of girls than are fathers and grandfathers. Although our results provide strong support for the change of household head gender channel, somewhat unexpectedly we found that school attendance of young and teenage girls improved only if households were headed by grandmothers after the migrant left. We interpret this result in the context of women's educational aspirations and education value in Tajikistan. While in Soviet Tajikistan, in the generation of today's grandmothers, female education was relatively highly valued, in post-Soviet Tajikistan, i.e. in the generation of today's mothers, girls' education is progressively losing value—as reflected, for example, in a downward trend in girls' enrolment at the higher levels of education. Thus, the younger generation of mothers is likely to attach lower value to female education and not to encourage school attendance of young and teenage girls when fathers migrate.

We furthermore found that marriage rates increase with migration in those districts where migration prevalence is already high. This indicates that in high out-migration areas, where a shortage of marriageable men exist, young women are subject to a particularly high pressure to marry. As unmarried young women are more likely to attend school (or a post-secondary education institution) than their married counterparts, emigration at the local level is likely to deter girls' and young women's school attendance through marriage.

In sum, our results indicate that, although international migration is a widespread livelihood strategy for many households in Tajikistan, it is associated with a decrease in human capital accumulation among teenage girls and young women. In the long run, this negative trend may result in exacerbation of gender inequality, a deterioration of the well-being of children and a slowdown in economic development. To reverse the adverse impact of migration on the human capital formation of girls in Tajikistan, a broad investment strategy in educational institutions—ranging from improvements in school facilities to enhancements in the quality of education—would be imperative. Furthermore, labour market prospects, particularly for females, would have to be developed and strengthened to make a higher educational investment worthwhile. Finally, social policies have to be designed to prevent women in independent Tajikistan losing the advances they made in the Soviet period. In order to achieve this, girls and women have to (re)gain equal access to the opportunities provided by the economic and social system.

References

Amjad, S. (ed.) (n.d.) 'Challenges and Policy Responses in Girl's Education in Tajikistan'. Out-of-school Children Paper 9. New York: UNICEF.

Antman, F.M. (2012). 'Gender, Educational Attainment, and the Impact of Parental Migration on Children Left Behind'. *Journal of Population Economics*, 25(4): 1187–214.

Antman, F.M. (2015). 'Gender Discrimination in the Allocation of Migrant Household Resources'. *Journal of Population Economics*, 28(3): 565–92.

Baschieri, A., and J. Falkingham (2009). 'Staying in School: Assessing the Role of Access, Availability and Economic Opportunities—the Case of Tajikistan'. *Population, Space and Place*, 15(3): 205–24.

Becker, G. (1965). 'A Theory of the Allocation of Time'. *The Economic Journal*, 75(299): 493–517.

Chang, H., X.-Y. Dong, and F. MacPhail (2011). 'Labor Migration and Time Use Patterns of the Left-Behind Children and Elderly in Rural China'. *World Development*, 39: 2199–210.

Danzer, A.M., B. Dietz, and K. Gatskova (2013a). 'Migration and Remittances in Tajikistan: Survey Technical Report'. IOS Working Paper 327. Regensburg: IOS.

Danzer, A.M., B. Dietz, and K. Gatskova (2013b). 'Tajikistan Household Panel Survey: Migration, Remittances and the Labor Market'. Survey report. Regensburg: IOS. Available at: www.ios-regensburg.de/fileadmin/doc/VW_Project/Booklet-TJ-web.pdf (accessed 25 April 2017).

Dietz, B., K. Gatskova, and A. Ivlevs (2015). 'Emigration, Remittances and the Education of Children Staying Behind: Evidence from Tajikistan'. IZA Discussion Paper 9515. Bonn: IZA.

Falkingham, J., and A. Baschieri (2006). 'Child Poverty in Tajikistan'. Report for UNICEF Country Office. Dushanbe: UNICEF.

Giannelli, G.C., and L. Mangiavacchi (2010). 'Children's Schooling and Parental Migration: Empirical Evidence on the "Left-Behind" Generation in Albania'. *Labour*, 24: 76–92.

Haarr, R. (2005). 'Violence and Exploitation of Children in Tajikistan'. *Central Asian Survey*, 24(2): 131–49.

Hanson, G.H., and Woodruff, C. (2003). 'Emigration and Educational Attainment in Mexico'. Available at: www.childmigration.net/files/Hanson_2003.pdf (accessed 25 April 2017).

Hanushek, E.A. (2013). 'Economic Growth in Developing Countries: The Role of Human Capital'. *Economics of Education Review*, 37: 204–12.

Harris, C. (2011). 'State Business: Gender, Sex and Marriage in Tajikistan'. *Central Asian Survey*, 30(1): 97–111.

Hegland, M. (2010). 'Tajik Male Labour Migration and Women Left Behind: Can They Resist Gender and Generational Hierarchies?' *Anthropology of the Middle East*, 5: 16–36.

Khuseynova, G. (2013). 'Social and Economic Impacts of Labor Migration on Migrants' Households in Tajikistan: Working out Policy Recommendations to Address its Negative Effects'. Working Paper 26. Amherst, MA: Center for Public Policy Administration Capstones.

Kroeger, A., and K. Anderson (2014). 'Remittances and the Human Capital of Children: New Evidence from Kyrgyzstan During Revolution and Financial Crisis'. *Journal of Comparative Economics*, 42(3): 770–85.

Mansour, W., J. Chaaban, and J. Litchfield (2011). 'The Impact of Migrant Remittances on School Attendance and Education Attainment: Evidence from Jordan'. *International Migration Review*, 45(4): 812–51.

McKenzie, D., and H. Rapoport (2011). 'Can Migration Reduce Educational Attainment? Evidence from Mexico'. *Journal of Population Economics*, 24: 1331–58.

Olimova, S., and I. Bosc (2003). 'Labor Migration from Tajikistan'. Geneva: International Organization for Migration.

Popova, J., and N. Pulikova (2013). 'Life in Domination: Stay or Escape? What Wives of Tajik Migrants Think and Do'. Master's thesis. Lund: Lund University.

Qodir, H. (2012). 'Education Hampers Marriage for Rural Tajik Women'. Washington, DC: Institute for War & Peace Reporting. Available at: https://iwpr.net/global-voices/education-hampers-marriage-rural-tajik-women (accessed 25 April 2017).

Shemyakina, O. (2013). 'Patterns in Female Age at First Marriage and Tajik Armed Conflict'. *European Journal of Population/Revue européenne de Démographie*, 29(3): 303–43.

Silova, I., and T. Abdushukurova (2009). 'Global Norms and Local Politics: Uses and Abuses of Gender Quotas in Tajikistan'. *Globalization, Societies, and Education*, 7(3): 357–76.

THPS (2011). 'Tajikistan Household Panel Survey 2011'. Available at: www.lambda.ios-regensburg.de/doi/thps_2011.html (accessed 25 April 2017).

Timmerman C., I. Lodewyckx, and J. Wets (2009). 'Marriage in a "Culture of Migration": Emirdag Marrying into Flanders'. *The History of the Family*, 14(2): 232–44.

TLSS (2007). 'Tajikistan Living Standards Measurement Survey 2007'. Available at: http://microdata.worldbank.org/index.php/catalog/72 (accessed 25 April 2017).

TLSS (2009). 'Tajikistan Living Standards Measurement Survey 2009'. Available at: http://microdata.worldbank.org/index.php/catalog/73 (accessed 25 April 2017).

Torosyan, K., T.P. Gerber, and P. Goñalons-Pons (2016). 'Migration, Household Tasks, and Gender: Evidence from the Republic of Georgia'. *International Migration Review*, 50(2): 445–74.

TransMonEE (2016). 'TransMonEE Database 2016'. Available at: www.transmonee.org (accessed 25 April 2017).

UNICEF (2011). 'Impact of Labour Migration on "Children Left Behind" in Tajikistan'. New York: UNICEF. Available at: www.unicef.org/tajikistan/Web_Migration_Report_Eng_light.pdf (accessed 14 July 2016).

UNICEF (2013). 'Global Initiative on Out-of-School Children. Tajikistan Country Study'. New York: UNICEF.

Vogel, A., and K. Korinek (2012). 'Passing by the Girls: An Assessment of Remittance Allocation for Educational Expenditures and Social Inequality in Nepal's Households'. *International Migration Review*, 46(1): 61–100.

Whitsel, C.M. (2009). 'Family Resources, Sitting at Home and Democratic Choice: Investigating Determinants of Educational Attainment in Post-Soviet Tajikistan'. *Central Asian Survey*, 28(1): 29–41.

World Bank (2012). *World Development Report 2012: Gender Equality and Development*. Washington, DC: World Bank.

World Bank (2016). 'World Development Indicators'. Available at: http://data.worldbank.org/data-catalog/world-development-indicators (accessed 25 April 2017).

Appendix

Table A1: Summary statistics of variables included in the analysis (based on a sample of girls and young women aged 7–22, *n* = 1,086)

	Mean	Std dev.	Min.	Max.
Attending school	0.752	0.432	0	1
Age	13.966	4.164	7	22
Head of household is girl/young woman's father	0.663	0.473	0	1
Head of household is girl/young woman's mother	0.104	0.306	0	1
Head of household is girl/young woman's grandfather	0.089	0.285	0	1
Head of household is girl/young woman's grandmother	0.079	0.270	0	1
Head of household: basic education	0.152	0.359	0	1
Head of household: secondary education	0.663	0.473	0	1
Head of household: tertiary education	0.146	0.353	0	1
Tajik	0.798	0.402	0	1
Uzbek	0.198	0.399	0	1
Rural	0.699	0.459	0	1
Urban	0.301	0.459	0	1
Number of household members	7.285	2.831	1	22
Proportion of children in the household	0.472	0.185	0	1
Proportion of elderly in the household	0.028	0.065	0	0.5
Proportion of working members in the household	0.131	0.153	0	1
Household monthly income net of remittances (in somoni)	642.705	815.620	0	10,060
Financial satisfaction	3.512	0.805	1	5
Hospitalized in the past month	0.026	0.158	0	1
Ambulatory assistance in the past month	0.052	0.222	0	1
Migrant in the household (currently away or returned in the last 12 months)	0.312	0.463	0	1
Migrant currently away	0.170	0.376	0	1
Returned migrant (in the last 12 months)	0.170	0.376	0	1
Male migrant	0.304	0.460	0	1
Female migrant	0.023	0.150	0	1
Parent migrant	0.173	0.379	0	1
Sibling migrant	0.139	0.346	0	1
Remittances	0.147	0.354	0	1
Migrant in the household, no remittances	0.165	0.371	0	1
Parental migration, head of household grandmother	0.026	0.158	0	1
Parental migration, head of household grandfather	0.023	0.148	0	1
Parental migration, head of household mother	0.044	0.206	0	1
Parental migration, head of household father	0.082	0.274	0	1
***Hukumat*-level variables (*n* = 69)**				
Share of migrant households	0.326	0.188	0.000	0.889
Share of married respondents (= married / (married + single), divorced/widowed excluded)	0.665	0.080	0.467	0.842

Source: authors.

Supplementary information

1 Descriptive statistics and regression results for boys/young men (Table S1–S6).
2 The effects of current and return migration for both girls/young women and boys/young men (Table S7 and S8).

Table S1: Means of variables included in the analysis, for the full sample of boys/young men and by age group

	Whole sample (age 7–22) *n* = 2,870	Age 7–11 (*n* = 869)	Age 12–17 (*n* = 1,250)	Age 18–22 (*n* = 587)
Attending school	0.798	0.954	0.957	0.354
Age	14.275	9.211	14.416	19.899
Head of household is boy/young man's father	0.706	0.611	0.717	0.796
Head of household is boy/young man's mother	0.095	0.064	0.096	0.130
Head of household is boy/young man's grandfather	0.114	0.206	0.102	0.028
Head of household is boy/young man's grandmother	0.072	0.104	0.076	0.028
Head of household: basic education	0.169	0.162	0.179	0.158
Head of household: secondary education	0.584	0.586	0.578	0.590
Head of household: tertiary education	0.197	0.188	0.193	0.214
Tajik	0.833	0.807	0.838	0.856
Uzbek	0.166	0.193	0.162	0.141
Rural	0.682	0.657	0.699	0.683
Urban	0.318	0.343	0.301	0.317
Number of household members	7.181	7.367	7.010	7.250
Proportion of children in the household	0.452	0.524	0.502	0.286
Proportion of elderly in the household	0.029	0.035	0.029	0.021
Proportion of working members in the household	0.125	0.122	0.119	0.137
Household monthly income net of remittances (in somoni)	706.337	695.399	685.787	753.199
Financial satisfaction	3.511	3.534	3.482	3.531
Hospitalized in the past month	0.028	0.024	0.028	0.033
Ambulatory assistance in the past month	0.043	0.046	0.038	0.048

Migrant in the household (currently away or returned in the last 12 months)	0.309	0.298	0.308	0.325
Migrant currently away	0.160	0.150	0.170	0.156
Returned migrant (in the last 12 months)	0.179	0.171	0.168	0.205
Male migrant	0.307	0.296	0.303	0.328
Female migrant	0.020	0.023	0.018	0.020
Parent migrant	0.169	0.223	0.178	0.091
Sibling migrant	0.141	0.075	0.130	0.234
Remittances	0.134	0.128	0.145	0.125
Migrant in the household, no remittances	0.175	0.170	0.163	0.200
Parental migration, head of household grandmother	0.022	0.035	0.026	0.001
Parental migration, head of household grandfather	0.029	0.053	0.028	0.003
Parental migration, head of household mother	0.035	0.038	0.038	0.027
Parental migration, head of household father	0.083	0.098	0.086	0.060

Source: authors.

Table S2: Proportion of boys/young men attending school, by migrant status/type and age group

	Whole sample (age 7–22)	Age 7–11	Age 12–17	Age 18–22
Non-migrant household	0.813	0.956	0.961	0.387
Migrant in the household (currently away or returned)	0.766	0.950	0.945	0.287
Migrant currently away	0.780	0.946	0.953	0.282
Returned migrant	0.750	0.953	0.943	0.292
Male migrant	0.763	0.953	0.945	0.285
Female migrant	0.724	0.850	1.000	0.133
Parent migrant	0.880	0.954	0.968	0.382
Sibling migrant	0.629	0.938	0.914	0.250
Remittances	0.790	0.946	0.950	0.298
Migrant in the household, no remittances	0.747	0.953	0.941	0.280
Parental migration, head of household grandmother	0.969	0.933	1.000	1.000
Parental migration, head of household grandfather	0.964	0.957	1.000	0.500
Parental migration, head of household mother	0.830	0.939	0.957	0.350
Parental migration, head of household father	0.849	0.967	0.954	0.378

Source: authors.

Table S3: Migration of household members and school attendance of boys and young men, full sample and by age group, OLS fixed effects results

	Dependent variable: attending school (0/1)			
	Full sample (age 7–22)	Age 7–11	Age 12–17	Age 18–22
Migrant in the household	−0.031*	−0.012	−0.035	−0.042
	(0.018)	(0.029)	(0.023)	(0.052)
Individual controls				
Age	−0.028**	−0.034	−0.006	−0.041
	(0.014)	(0.030)	(0.011)	(0.043)
Hospitalized in the past month	0.012	0.073	−0.019	−0.146
	(0.039)	(0.045)	(0.066)	(0.092)
Ambulatory assistance in the past month	0.016	0.033	−0.022	0.145
	(0.039)	(0.055)	(0.036)	(0.123)
Household-level controls				
Number of household members	0.001	0.004	0.017*	0.006
	(0.006)	(0.010)	(0.009)	(0.015)
Proportion of children in the household	0.415***	−0.193	0.042	−0.377
	(0.081)	(0.186)	(0.096)	(0.253)
Proportion of elderly in the household	−0.034	−0.193	−0.332	1.191*
	(0.222)	(0.173)	(0.317)	(0.667)
Proportion of employed in the household	−0.004	−0.069	−0.063	−0.055
	(0.059)	(0.134)	(0.072)	(0.144)
Household income net of remittances	−0.000	−0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Financial satisfaction	−0.008	0.006	−0.003	0.003
	(0.010)	(0.018)	(0.012)	(0.032)
Constant	1.059***	1.233***	0.969***	1.258*
	(0.178)	(0.249)	(0.177)	(0.763)

Year fixed effects	Yes	Yes	Yes	Yes
Person fixed effects	Yes	Yes	Yes	Yes
Observations	2,870	869	1,250	751
Number of boys/young men	1,165	541	672	453
R-squared	0.114	0.117	0.070	0.086

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses.

Source: authors.

Table S4: Migration and school attendance of young boys (age 7–11), OLS fixed effects results

	All	Education of household head			Tajik	Uzbek	Urban	Rural
		Basic	Secondary	Tertiary				
Panel A								
Parental migration	−0.019	0.218***	−0.030	−0.116	−0.050	0.130*	−0.132**	0.008
	(0.034)	(0.080)	(0.045)	(0.119)	(0.032)	(0.078)	(0.064)	(0.041)
Sibling migration	0.003	0.075	0.023	−0.146*	0.002	0.247**	0.055	0.019
	(0.053)	(0.106)	(0.067)	(0.076)	(0.060)	(0.111)	(0.064)	(0.066)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	869	141	509	163	701	168	298	571
Number of boys	541	93	314	102	447	112	183	362
R-squared	0.118	0.431	0.131	0.219	0.144	0.490	0.186	0.170
Panel B								
Remittances	−0.015	0.060	0.024	−0.127	−0.052	0.151*	0.042	−0.038
	(0.038)	(0.086)	(0.040)	(0.154)	(0.040)	(0.081)	(0.072)	(0.046)
Migrant, no remittances	−0.010	0.221**	−0.031	−0.128	−0.016	0.139**	−0.150**	0.043
	(0.034)	(0.089)	(0.048)	(0.103)	(0.039)	(0.066)	(0.074)	(0.041)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	869	141	509	163	701	168	298	571
Number of boys	541	93	314	102	447	112	183	362
R-squared	0.117	0.447	0.133	0.219	0.143	0.480	0.205	0.181

Panel C								
Parental migration, HH grandmother	0.037	0.060	0.209	−0.482	0.076	0.010	−0.039	0.053
	(0.048)	(0.080)	(0.139)	(0.371)	(0.079)	(0.050)	(0.050)	(0.061)
Parental migration, HH grandfather	0.027	0.391***	0.056	−0.178	−0.070	0.192	−0.046	0.045
	(0.074)	(0.064)	(0.055)	(0.189)	(0.083)	(0.124)	(0.041)	(0.095)
Parental migration, HH mother	−0.041	−0.293	−0.022	0.085	−0.088	0.269	−0.148*	−0.039
	(0.072)	(0.323)	(0.089)	(0.144)	(0.057)	(0.216)	(0.082)	(0.100)
Parental migration, HH father	−0.067	0.189	−0.084	0.179	−0.082*	0.042	−0.231*	−0.023
	(0.049)	(0.133)	(0.059)	(0.124)	(0.049)	(0.069)	(0.118)	(0.051)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	869	141	509	163	701	168	298	571
Number of boys	541	93	314	102	447	112	183	362
R-squared	0.124	0.488	0.159	0.258	0.153	0.539	0.200	0.175

Notes: HH, household head. *** significant at 1 per cent, ** at 5 per cent, * at 10 per cent. Robust standard errors in parentheses. Dependent variable: whether the child attends school (0/1). The same individual and household-level controls as in Table 3 included in all regressions. Regressions in Panel C also control for siblings' migration. Complete econometric output available on request.

Source: authors.

Table S5: Migration and school attendance of teenage boys (ages 12–17), OLS fixed effects results

	All	Education of household head			Tajik	Uzbek	Urban	Rural
		Basic	Secondary	Tertiary				
Panel A								
Parental migration	−0.012	−0.022	−0.001	−0.033	0.007	−0.036	−0.069	0.014
	(0.027)	(0.053)	(0.036)	(0.036)	(0.028)	(0.059)	(0.055)	(0.032)
Sibling migration	−0.075*	−0.317***	−0.016	0.009	−0.056	−0.200	−0.258*	−0.053
	(0.041)	(0.116)	(0.045)	(0.021)	(0.042)	(0.138)	(0.135)	(0.041)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,250	224	723	241	1,048	202	376	874
Number of boys	672	114	392	132	566	123	210	470
R-squared	0.075	0.277	0.084	0.501	0.076	0.248	0.152	0.083
Panel B								
Remittances	−0.020	−0.095	−0.001	0.041	0.004	−0.111	−0.126*	0.005
	(0.034)	(0.077)	(0.046)	(0.037)	(0.038)	(0.075)	(0.067)	(0.041)
Migrant, no remittances	−0.044*	−0.181**	−0.009	−0.036	−0.028	−0.076	−0.097	−0.028
	(0.026)	(0.074)	(0.032)	(0.029)	(0.026)	(0.053)	(0.068)	(0.024)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,250	224	723	241	1,048	202	376	874
Number of boys	672	114	392	132	566	123	210	470
R-squared	0.071	0.210	0.084	0.521	0.072	0.228	0.128	0.079

Panel C								
Parental migration, HH grandmother	0.070	0.045	0.007	−0.323**	0.092	−0.007	0.081	0.071
	(0.048)	(0.087)	(0.049)	(0.156)	(0.062)	(0.117)	(0.076)	(0.063)
Parental migration, HH grandfather	−0.022	−0.063	−0.095*	–	−0.007	−0.018	0.002	−0.051
	(0.022)	(0.070)	(0.051)		(0.027)	(0.109)	(0.067)	(0.033)
Parental migration, HH mother	0.004	0.017	0.061	0.022	0.008	−0.037	−0.151	0.062
	(0.071)	(0.076)	(0.077)	(0.020)	(0.089)	(0.077)	(0.133)	(0.085)
Parental migration, HH father	−0.034	−0.083	−0.015	0.008	−0.010	−0.053	−0.085	−0.009
	(0.029)	(0.052)	(0.035)	(0.017)	(0.025)	(0.064)	(0.067)	(0.025)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,250	224	723	241	1,048	202	376	874
Number of boys	672	114	392	132	566	123	210	470
R-squared	0.080	0.285	0.090	0.553	0.079	0.249	0.163	0.089

Notes: HH, household head. *** significant at 1 per cent, ** at 5 per cent, * at 10 per cent. Robust standard errors in parentheses. Dependent variable: whether the child attends school (0/1). The same individual and household-level controls as in Table 3 included in all regressions. Regressions in Panel C also control for siblings' migration. Complete econometric output available on request.

Source: authors.

Table S6: Migration and school attendance of young men (ages 18–22), OLS fixed effects results

	All	Education of household head			Tajik	Uzbek	Urban	Rural
		Basic	Secondary	Tertiary				
Panel A								
Parental migration	0.021	0.187	0.052	−0.311	−0.032	0.153	−0.278	0.071
	(0.108)	(0.378)	(0.119)	(0.253)	(0.143)	(0.130)	(0.331)	(0.106)
Sibling migration	−0.062	0.018	0.013	−0.594***	−0.091	0.222**	−0.084	−0.072
	(0.055)	(0.120)	(0.069)	(0.158)	(0.061)	(0.108)	(0.143)	(0.064)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	751	119	443	161	643	106	238	513
Number of boys	453	73	265	98	393	70	149	304
R-squared	0.088	0.280	0.074	0.371	0.108	0.475	0.194	0.086
Panel B								
Remittances	0.007	−0.229	0.162	−0.610***	−0.081	0.587**	0.020	0.006
	(0.085)	(0.154)	(0.108)	(0.182)	(0.078)	(0.258)	(0.158)	(0.100)
Migrant, no remittances	−0.058	0.214	−0.026	−0.493***	−0.078	0.090	−0.211	−0.050
	(0.056)	(0.170)	(0.066)	(0.147)	(0.062)	(0.100)	(0.186)	(0.059)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	751	119	443	161	643	106	238	513
Number of boys	453	73	265	98	393	70	149	304
R-squared	0.088	0.353	0.087	0.350	0.107	0.560	0.199	0.081

Panel C								
Parental migration, HH grandmother	–	–	–	–	–	–	–	–
Parental migration, HH grandfather	0.103	−0.540	–	–	–	0.116	–	0.039
	(0.129)	(0.501)				(0.697)		(0.138)
Parental migration, HH mother	−0.131	–	−0.125	−0.337	−0.179	−0.066	−0.921**	0.026
	(0.235)		(0.240)	(0.403)	(0.268)	(0.236)	(0.384)	(0.236)
Parental migration, HH father	0.055	0.321	0.077	−0.287	0.012	0.193	−0.122	0.083
	(0.110)	(0.435)	(0.130)	(0.263)	(0.140)	(0.160)	(0.366)	(0.111)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	751	119	443	161	643	106	238	513
Number of boys	453	73	265	98	393	70	149	304
R-squared	0.091	0.300	0.077	0.371	0.111	0.480	0.212	0.087

Notes: HH, household head. *** significant at 1 per cent, ** at 5 per cent, * at 10 per cent. Robust standard errors in parentheses. Dependent variable: whether the child attends school (0/1). The same individual and household-level controls as in Table 3 included in all regressions. Regressions in Panel C also control for siblings' migration. Complete econometric output available on request.

Source: authors.

Table S7: Current and return migration and school attendance of girls/young women, OLS fixed effects results

	All	Education of household head			Tajik	Uzbek	Urban	Rural
		Basic	Secondary	Tertiary				
7–11 years								
Migrant currently away	0.069*	−0.007	0.088*	0.285**	0.115**	−0.045	0.053	0.071
	(0.038)	(0.072)	(0.050)	(0.129)	(0.047)	(0.053)	(0.045)	(0.045)
Migrant returned in the last year	0.058*	0.042	0.044	0.361***	0.052	0.126*	0.055	0.058
	(0.032)	(0.075)	(0.032)	(0.128)	(0.037)	(0.066)	(0.058)	(0.037)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	831	142	531	126	655	171	257	574
Number of girls	547	98	345	82	433	118	167	380
R-squared	0.118	0.279	0.130	0.476	0.125	0.212	0.105	0.149
12–17 years								
Migrant currently away	−0.046	0.043	−0.052	−0.179	−0.030	−0.089	−0.110	−0.016
	(0.039)	(0.080)	(0.049)	(0.113)	(0.045)	(0.094)	(0.106)	(0.042)
Migrant returned in the last year	−0.072**	−0.023	−0.056	−0.034	−0.053	−0.157**	−0.074	−0.065*
	(0.032)	(0.069)	(0.041)	(0.054)	(0.038)	(0.068)	(0.071)	(0.038)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,202	173	811	167	970	231	375	827
Number of girls	638	93	428	92	522	121	202	439
R-squared	0.178	0.235	0.219	0.291	0.179	0.296	0.236	0.183

18–22 years								
Migrant currently away	0.029	−0.058	0.084	−0.478***	0.034	0.046	−0.105	0.072
	(0.048)	(0.078)	(0.063)	(0.153)	(0.058)	(0.106)	(0.143)	(0.048)
Migrant returned in the last year	0.009	0.007	0.031	−0.166	0.019	−0.057	0.064	−0.003
	(0.050)	(0.088)	(0.075)	(0.100)	(0.059)	(0.119)	(0.108)	(0.056)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	587	84	396	89	465	117	156	431
Number of young women	386	54	257	60	313	75	104	284
R-squared	0.097	0.595	0.116	0.644	0.104	0.251	0.361	0.107

Notes: *** significant at 1 per cent, ** at 5 per cent, * at 10 per cent. Robust standard errors in parentheses. Dependent variable: whether the child attends school (0/1). The same individual and household-level controls as in Table 3 included in all regressions. Complete econometric output available on request.

Source: authors.

Table S8: Current and return migration and school attendance of boys/young men, OLS fixed effects results

	All	Education of household head			Tajik	Uzbek	Urban	Rural
		Basic	Secondary	Tertiary				
7–11 years								
Migrant currently away	0.034	0.001	0.083**	−0.112	0.017	0.112	0.070	0.019
	(0.038)	(0.094)	(0.040)	(0.141)	(0.044)	(0.068)	(0.070)	(0.046)
Migrant returned in the last year	−0.054*	0.187**	−0.116**	−0.073	−0.075**	0.087	−0.138*	−0.018
	(0.032)	(0.078)	(0.047)	(0.101)	(0.037)	(0.056)	(0.077)	(0.038)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	831	142	531	126	655	171	257	574
Number of boys	547	98	345	82	433	118	167	380
R-squared	0.118	0.279	0.130	0.476	0.125	0.212	0.105	0.149
12–17 years								
Migrant currently away	−0.004	−0.062	0.026	0.042	0.017	−0.112	−0.024	−0.001
	(0.027)	(0.074)	(0.039)	(0.033)	(0.030)	(0.074)	(0.056)	(0.034)
Migrant returned in the last year	−0.036	−0.106	−0.010	−0.036	−0.023	−0.071	−0.061	−0.023
	(0.025)	(0.068)	(0.030)	(0.027)	(0.026)	(0.046)	(0.067)	(0.024)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,250	224	723	241	1,048	202	376	874
Number of boys	672	114	392	132	566	123	210	470
R-squared	0.069	0.168	0.086	0.521	0.072	0.229	0.103	0.077

18–22 years								
Migrant currently away	−0.011	−0.263*	0.149	−0.565***	−0.093	0.439*	−0.205	0.037
	(0.081)	(0.140)	(0.107)	(0.156)	(0.076)	(0.229)	(0.162)	(0.091)
Migrant returned in the last year	0.006	0.177	0.034	−0.432***	−0.016	0.090	0.059	−0.019
	(0.057)	(0.178)	(0.076)	(0.150)	(0.064)	(0.113)	(0.162)	(0.066)
Individual and household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	751	119	443	161	643	106	238	513
Number of young men	0.084	0.334	0.085	0.335	0.105	0.534	0.187	0.079
R-squared	453	73	265	98	393	70	149	304

Notes: *** significant at 1 per cent, ** at 5 per cent, * at 10 per cent. Robust standard errors in parentheses. Dependent variable: whether the child attends school (0/1). The same individual and household-level controls as in Table 3 included in all regressions. Complete econometric output available on request.

Source: authors.