Migration and Forsaken Schooling in Former Soviet Central Asia

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Large international earnings differentials negatively impact human capital investments in migrant-origin countries. We find that three Central Asian migrant-sending countries – the Kyrgyz Republic, the Republic of Tajikistan and the Republic of Uzbekistan – are facing a forsaken schooling phenomenon. Once completing their compulsory schooling at ages 16-17, young people in these countries are forsaking additional schooling because of opportunities to migrate to high paying low-skilled jobs in the Russian Federation. The countries face a loss in human capital formation, falling into a trap.

Key words: migration, traps, poverty, inequality, education, skill

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1. Introduction

The phenomenon of forsaken schooling results from very large earnings differentials between potential migrants' host and home countries. The opportunity to migrate to high paying often low-skilled jobs (regardless of schooling) leads to reduced home country educational investment as people forgo schooling beyond enforced compulsory levels (Abdulloev, Epstein, Gang, 2019). In this paper, we examine forsaken schooling in three Central Asian countries, which are supplying labor migrants to the Russian Federation.

Over the past several decades, the concepts of brain-drain and brain-gain have dominated the discussion of the effects on the home country of the highly schooled emigrating abroad. The brain-drain highlights the negative direct impacts of skilled/educated emigration on those left behind, not necessarily the immediate family for whom there is an direct and obvious trade-off, but the whole economy (Bhagwati and Hamada, 1974; Grubel and Scott, 1966). The brain-gain emphasizes the second-round positive impacts on the source country of international emigration through remittances, enhanced returned migrants' skills (Co, Gang and Yun, 2000; Dai, Liu, and Xie, 2015), and skills acquisition by those intending to migrate (Beine, Docquier and Rapoport, 2008). Migrant's household members may use remittances to boost educational attainment as migrant families can afford to pay school fees, transportation and school essentials, or hire labor to work in households, businesses and farms. This frees children from such work, allowing them continue their education (Dimova, Epstein and Gang, 2015; Duryea, Cox and Ureta, 2003; Acosta, 2006; Calero, Bedi, & Sparrow, 2009; Amuedo-Dorantes & Pozo, 2010; Yang, 2005). Other studies argue that emigration induces more human capital formation in home countries (Mountford, 1997; Stark, Helmenstein, and Prskawetz, 1997, 1998; Stark and Wang, 2002; Edwards and Ureta, 2003; Piracha, Randazzo and Vadean, 2013; Hines and Simpson, 2018). Beine, Docquier and Rapoport (2001, 2008) suggest that emigration might lead to a "beneficial brain-drain" through a "demonstration effect" if the benefits of increased investments in education exceeds the costs of skilled labor emigration. There is also discussion of a brain-waste phenomenon when immigrants work at lesser skilled jobs then their home country training would suggest (Weiss, Sauer and Gotlibovski, 2003; Özden, 2006).

We examine three Central Asian republics, Tajikistan, Kyrgyzstan and Uzbekistan. All three are major migrant-sending countries to the Russian Federation. This migration is a relatively new phenomenon as these countries were formerly part of the Soviet Union, which

generally restricted migration. After the Union's dissolution, countries with large natural resource endowments (Russia, Kazakhstan and Turkmenistan), industries (Ukraine and Belarus) and favorable geographic location (Lithuania, Estonia and Latvia) did comparatively well economically. After an initial large drop, their real wages grew relatively rapidly, while wages in more labor abundant countries such as Tajikistan, Kyrgyzstan and Uzbekistan grew more slowly. The income differential between Russia and these Central Asian countries along with free (no-visa) entry policies draw many of their economically active populations to Russia.[1] Remittances and migration are playing an important augmenting role in lives families in these countries: migrants' households finance a significant portion of their consumption through remittances.

The issue of migration and educational attainment in Central Asian countries has been the focus of several studies. Danzer, Dietz, and Gatskova (2013) report that the large share of Tajikistani migrants (approximately 60%), have general secondary education but no professional education. Gatskova, Ivlevs and Dietz (2017) find that the effect of migration on girls' school attendance differs by age: school attendance by girls ages 7-11 in families with migrants improves, but that of girls ages 12-17, the ages when girls need to prepare for professional school admission, falls. Kroeger & Anderson (2012) find that international remittances do not have a significant positive impact on the school enrollment of children from migrants' families in Kyrgyzstan, but reduce girls ages 14-18 secondary school enrollment in the North of the country, and girls ages 3-6 preschool programs enrollment in the South of the country. Ahunov et.al (2015) did not find a significant income effect of remittances on education spending in Uzbekistan. A series of World Bank's Skills Road reports (Ajwad, Hut, et.al., 2014; Ajwad, de Laat, et.al., 2014; and Ajwad, Abdulloev, et.al., 2014) show that those planning to migrate have on average better cognitive and non-cognitive skills than others in the working-age population. Similarly, returned migrants have significantly higher cognitive and non-cognitive skill outcomes than non-migrants. Both results suggest that migrants do not necessarily acquire cognitive skills during their stay abroad.

Abdulloev, Epstein and Gang (2019) look at Tajikistan's professional education and migration decisions, finding that with existing international wage differentials for low skilled labor in higher income Russia, individuals and families in migrant sending Tajikistan may

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[1] Extreme pay gaps exist and can be sustained over the long term as argued by Kravis and Lipsey (1983), Bhagwati (1984), Panagariya (1988), and Feldman and Gang (1990).

forgo professional or continued education, opting to migrate to high paying unskilled jobs in Russia, especially when those jobs are paying multiples of their home pay, even for skilled migrants taking unskilled host country jobs. Such an income gap might lead to the rejection of professional education and training by individuals in the migrants' origin country in expectation of migrating. Where the existence of high paying low-skilled jobs abroad reduces educational investment at home, this can give rise to a *forsaken schooling trap* phenomenon in migration. In this paper we examine this phenomenon with regard to all three migrant sending countries of Central Asia. In the next section, we discuss the role migration may be playing in schooling decisions in these three former Soviet countries in the Central Asia. In Section 3 we analyze the phenomenon using unique data from all three countries. Section 4 discusses several empirical robustness checks. Section 5 concludes.

2. Central Asian Schooling and Choice

Kyrgyzstan, Tajikistan and Uzbekistan inherited a socialist educational system which guaranteed free basic education. All children are required to attend elementary schools at age 6-7, and guaranteed free compulsory education: 9 years in Kyrgyzstan (changed to 10 in 2014) and Tajikistan, 12 years in Uzbekistan. With enforced free compulsory education, there is no significant effect of migration on children's education. After completing their general education at ages 16-18, a young adult can choose either to enter the labor force or continue their schooling. Schooling up to this point is referred to as compulsory, and includes primary education (grades 1-4) and basic education (grades 5-9) for Tajikistan and Kyrgyzstan, and the secondary education (grades 10-12) in Uzbekistan. The ambiguity of the final grade here depends on the month of birth.

If the young adult decides to continue their schooling, there are several paths they can follow. The young adult may choose whether to continue studying for complete (upper) secondary education for next two years. Its completion provides the entry requirements for tertiary education. Alternatively, a young adult may choose to enter to primary or secondary professional education. Primary professional education is provided at lyceums and vocational schools; secondary professional education is provided at technical schools and colleges. Higher education is tertiary education which is provided at universities, where students can pursue bachelor, master and PhD degree education.

[GRAPH 1]

The delivery of some units offering professional schooling was problematic. State-owned vocational schools (Lyceums and Colleges), faced major difficulties in moving from a socialist system to a market-based one. These schools were operating with support from specific state-owned enterprises (SOEs) during the Soviet era. These SOEs were major contributors to the schools' curricula, equipment and internship programs. After privatization of SOEs, vocational schools lost these linkages, and have had to rely on either state support or provide new market-oriented educational services. Due to lack of interest from private companies in schools' services, and contracting support from the state, the curricula and equipment base in these schools became outdated, and the schools became less popular among the young.

Tertiary schools (universities), in contrast, have developed positively in both curricula and equipment. With the help of international donors and private investors, tertiary schools underwent significant reforms, and began providing educational services for pay. They increased the number of branches in both urban and rural areas, adding to competition and improving services. By establishing good relations and internship programs with various employers, as well as good job placement, the tertiary schools in contrast to vocational schools have gained popularity among the young people, and their graduates have better social status.

While the schooling systems in these countries are similar in history, there are some differences worth noting. Compulsory education in Uzbekistan is 12 years, in Kyrgyzstan is 9 years (10 starting from 2014), and in Tajikistan is also 9 years. Kyrgyzstan has more private high education institutes and a higher rate of tertiary students to the total population. With a population of 5.9 million (2015), Kyrgyzstan has 53 high education institutions, out of which 19 are private. The number of enrolled students in the 2013/2014 academic year was 214.4 thousand, with 188.7 thousand in public and 25.6 thousand in private institutes. Uzbekistan has a larger population of 31 million people (2015) and 82 high education institutes. All institutes are public, and there is no private high education institute in Uzbekistan. The number of enrolled students is 260.9 thousand in the academic year of 2014/2015. With a population of 8.4 million in 2015, Tajikistan had only 39 high education institutes, only one of which is private. The number of enrolled students is 157.8 thousand people, with 1.4 thousand studying in a private institute.[2]

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[2] See Education, Audiovisual and Culture Executive Agency of the European Union (2017)

So, what is the role that migration plays in educational choice and how might this vary with the amount of schooling? Jobs reward workers not only with earnings, but they also convey reputation and status. We can think about a simplified circumstance where the highest schooling achievers obtain status and reputation, while the middle achievers do not.[3] The greater the reputation and status that a worker obtains from jobs requiring high schooling, the more people will obtain higher education. This, of course, takes time and the higher their time preference, people place less weight on the future and care more about the present. In this case people may forego the schooling and eventual high status positions. Of course, if the status, reputation and income one receives in a high-skilled job is high enough, people will stay in school. However, what if the low-skilled wage abroad (say in Russia) is very high compared to low- and high-skilled jobs in the home country? If the income of a non-professional worker in the host country is higher than in the home country, then an increasing migration probability will increase the chances an individual will choose a non-professional educational track. If host-country wages exceed those of home country high-skilled, the move away from higher schooling is further exacerbated.

3. Empirical analysis

To study the choice decision between professional education and migration, we use fresh data from the unique *Jobs, Skills, and Migration Surveys* that were implemented jointly by a team from the World Bank and the German Society for International Cooperation (GIZ) in three Central Asian republics, Tajikistan, Kyrgyzstan and Uzbekistan in 2013 (Ajwad, Hut, et.al., 2014; Ajwad, de Laat, et.al., 2014; and Ajwad, Abdulloev, et.al., 2014). The surveys collect comprehensive information at the individual and household levels and are representative at the national, regional, and urban/rural levels. Combining the information from the three countries into a single cross-country survey, the sample size for the core questionnaire is 6,300 households with 35,770 individuals.

We limited our sample to those respondents who are ages 25-47 as we want to distinguish between schooling and migration decisions. By the age of 25, an individual normally finishes his/her professional education (either vocational or tertiary). The upper age limit of 47 is defined to assess the impact on the choice of migration and schooling after the collapse of the Soviet Union in 1991 (as the migration within Soviet Union was strictly

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[3] See Abdulloev, Epstein and Gang (2019) for a complete specification

controlled and even prohibited by the central government). Our total sample size is 10,122 people, with 1,586 migrants (14.4%) and 8,536 non-migrants. Migrants are defined as those individuals who are working in the Russian Federation at the time of the survey. We excluded from the sample those who migrated to countries other than Russia (2.73%), and restricted the non-migrants sample to those who have never migrated internationally.

We start by indicating the initial condition of wages migrants receive in Russia in comparison to their home country. Using the data from the 2013 *Jobs, Skills, and Migration Surveys* (described in the next section), in Graph 2 we compare the mean monthly wages of migrants currently working in the Russian Federation to wages of those who never migrated and remain and work in their home countries, Tajikistan, Kyrgyzstan and Uzbekistan. In particular, we look at the mean of wages by education and sector wages. The mean differences of wages by education are statistically significant for all wages. The mean differences of wages are not statistical significant from zero for some sectors due to the small migrant sample in these sectors. This implies that the Central Asian migrants working as unskilled workers earn more than professionals in their home countries.

[GRAPH 2]

In Table 1 we report sample statistics both for the overall sample and divide our data into migrant and non-migrant subsamples. Migration in Central Asia is male dominated; about 85.3% of migrants are men. In the non-migrant sample, 60% are women. Levels of education are defined using dummy variables for individually completed degrees. The comparison of education levels shows that people with no education or primary and basic education mainly remain in their home country. In contrast to those with low schooling levels, comparatively more people with secondary or vocational (secondary special and technical) schooling are migrants. People with the highest schooling levels (degrees received from universities) tend to remain in the country due to their higher social status and access to higher income home country jobs. The sample statistics show an inverted-U relationship between education and migration. People at lower and higher levels of education do not migrate, while at middle levels (secondary) more people choose to migrate.

[TABLE 1]

We now turn to a more detailed look at our sample in order to further study the education-migration relationship. The forsaken schooling phenomenon occurs as low-skilled and skilled workers accept low-skilled positions in host countries, forgoing high professional schooling in their home country. We expect, therefore, migrants will not have completed professional schools (technical-vocational or tertiary). To examine this expected negative relationship, we estimate a probit model on the individual's decision to migrate as an index function of schooling, individual and household characteristics. Other individual characteristics include variables on individual age, age-squared, and gender. Household characteristics include variables on the number of children in the household with ages less than 18, and whether the household lives in the rural areas (the reference group is living in urban areas). To control for unobserved country level factors such as differences in education systems, economic income, geography, etc., we use the country dummies for Tajikistan and Uzbekistan, and their interaction with the completed vocational and tertiary education (the reference country is Kyrgyzstan). The dependent variable is whether an individual is a current migrant in Russian versus those who never migrated. We consider two samples: the entire sample with men and women and a male subsample. The coefficient estimates and their marginal effects for both samples are reported in Table 2.

Here, we find a negative relationship between the decision to migrate and tertiary education. Although this relationship is not significant for the entire sample, it becomes significant at 90% confidence interval in the male sample. The reference group is individuals who have not completed professional education, either vocational or tertiary (6,213 respondents). The coefficients of the dummy variable on vocational education remain insignificant, while the coefficient on dummy for tertiary education remains negative and statistically significant at the 10% level. Migration in Central Asia is male-dominated and the majority of migrants are from the rural areas; the coefficients and marginal effects of being a male or living in rural areas is positive and statistically different from zero. Both the household (not family) head ages 25-47 and living in female headed households negatively correlate with the migration decision.

[TABLE 2]

To estimate the effect of migration on tertiary (high) education choice we reverse the model: the probit is now the choice of tertiary education for the entire and male samples. The dependent variable is whether the respondent has completed tertiary education or not. Here too,

after controlling for country unobserved effects, we find a significantly negative correlation between being a migrant in Russia and the decision to obtain tertiary education. Despite country differences in education systems discussed earlier, Central Asian migrants choose not to obtain high professional education, but instead migrate. Other significant factors affecting the choice of tertiary education are (1) a negative correlation with living in rural areas reflecting the difficulties in accessing universities, which are mainly located in urban areas; (2) a positive correlation with being male, as families choose to invest in the professional education of sons; (3) a negative correlation with living in Uzbekistan compared to Kyrgyzstan which undertook successful educational reforms; (4) a negative correlation with having more children in the household especially for women as they have to care about their younger siblings or own children; (5) a negative correlation with share of male members of the household, if there are more men in the household there are fewer opportunities for receiving high education as families need to pay.

[TABLE 3]

We further analyze the choice between education and migration using Ordered Probit for four types of education: less than secondary (compulsory), secondary, vocational and tertiary. The marginal effects for both samples are reported in Table 4. The results suggest an inverted-U relationship between the decision on migrating to Russia and educational choice. The marginal effects of migration on educational choice increases until the secondary general education level and then decreases with professional (vocational and tertiary) education. People choose to migrate when they obtain a middle level education, but are less likely to migrate with lower or higher professional education.

Other factors suggest that men have more access to professional education than women. Living in rural areas is positively correlated with less than secondary and secondary education, and negatively with professional education both at vocational and tertiary levels. Tajikistan, in comparison to Kyrgyzstan, shows higher attainment of lower secondary and general secondary education, and lower attainment of professional education, even when excluding women from the sample, implying that this negative tendency is uniformly true for the entire population in Tajikistan. Uzbekistan similarly shows higher attainment of lower secondary and complete secondary education, and lower attainment of professional education for the entire sample, but these relationships are not significant for the male sample. This implies that women in Uzbekistan experience lower attainment of professional education than women in Kyrgyzstan.

Living in households with more children or with more male members or in female headed household is associated with lower attainment of professional education. But, being the household head is positively associated with professional education attainment.

[TABLE 4]

An issue with our regression analysis is the potential endogeneity of schooling and migration: perhaps the decision on schooling is taken simultaneously with the migration decision. If this is the case, the estimated effects may be biased. In order to account for endogeneity we use the instrumented variable Bivariate Probit model, where the structural equation is on the migration decision and the reduced form equation is the tertiary education decision.

The excluded explanatory variable in the structural equation is the dummy variable whether the household head has completed tertiary education. Here we exclude household heads from our sample, using their completed tertiary education as an instrument for the tertiary education decisions of remaining members.

The migration decision structural equation estimates and the decision about the tertiary education reduced form equation are from an instrumental variable Bivariate Probit based on Maximum Likelihood Estimation and are reported in Table 5. The coefficients on completed tertiary education of the household heads strongly predict decisions on tertiary education by other household members. The coefficient on the corresponding variable tertiary education of the household head is positive and statistically significant. This result from the reduced form equation estimation indicates that individual schooling has a strong correlation with the education of the household head. After controlling for the endogeneity of the decisions about the tertiary education, the estimates on completed tertiary education shows a negative relationship which is statistically different from zero. The marginal effect of years of schooling is negative too.[4]

[TABLE 5]

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[4] Including the variable *education of the household head* in the probit model of completed tertiary education substantially increases the estimate value of ρ, suggesting that including the education of the household head reduces the correlation of unobservables between completed tertiary education and migration.

An alternative specification is the linear probability model, the instrumental variable regression based on two-stage least square estimation. The estimates, average marginal effects, are reported in Table 6. The estimate on tertiary education from this estimation still shows a negative relationship at the 10% significance level after controlling for the endogeneity of the decisions about the tertiary education.[5]

[TABLE 6]

We have already addressed several robustness issues centering around the possible endogeneity of migration and educational choices. Our thinking was to look for consistency and robustness in our estimates when using approaches that might, on their own, expose such biases. Our strategy was to first estimate a probit regression on the migration decision (Table 2), do the converse probit regression on the tertiary education decision (Table 3) and a more detailed analysis of the same with an ordered probit (Table 4). We directly take on the endogeneity issue between migration and tertiary education using the instrumented variable Bivariate Probit model (Table 5), as well as the instrumental variable regression based on two-stage least square estimation (Table 6). From an initial examination of sample statistics and onwards through each estimation, we find the same consistent story of forsaken schooling.

4. Conclusion

Our analysis argues that with higher earnings of low skilled labor in higher income host countries, individuals may forgo higher education, opting to migrate abroad to work at unskilled occupations, especially when these occupations are paying multiples of their home pay. Such wage differentials may lead to the rejection of professional education and training by individuals in the migrants' home countries in expectation of migrating. Where the existence of high paying low-skilled jobs abroad reduces educational investment at home, this can give rise to a *forsaken schooling trap*.

Our empirical analysis of three former Soviet countries in Central Asia suggests that these countries face a loss in human capital formation. These Republics have high general education completion rates (i.e. up to the stage of deciding on continuing to professional studies

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[5] Linear probability model estimations produce biased, inconsistence estimates, and marginal effects (Horrace & Oaxaca, 2006).
Also see http://www.mostlyharmlesseconometrics.com/2012/07/probit-better-than-lpm/

or entering the labor force) and significant external migration involving a significant share of their labor force. Existing wage differences, job availability and the existence of regional free labor movement agreements between the Russian Federation and these Central Asian countries induced many young people to forgo professional education, opting to migrate to Russia for high paying unskilled work. The forsaken schooling phenomenon limits the extent to which these countries have been able to turn this youth bulge into their own demographic dividends. To the extent economic development is driven by skills formation and education, foregone schooling leaves these migrant-sending countries with less progress than they might otherwise have had towards building a knowledge-based economy.

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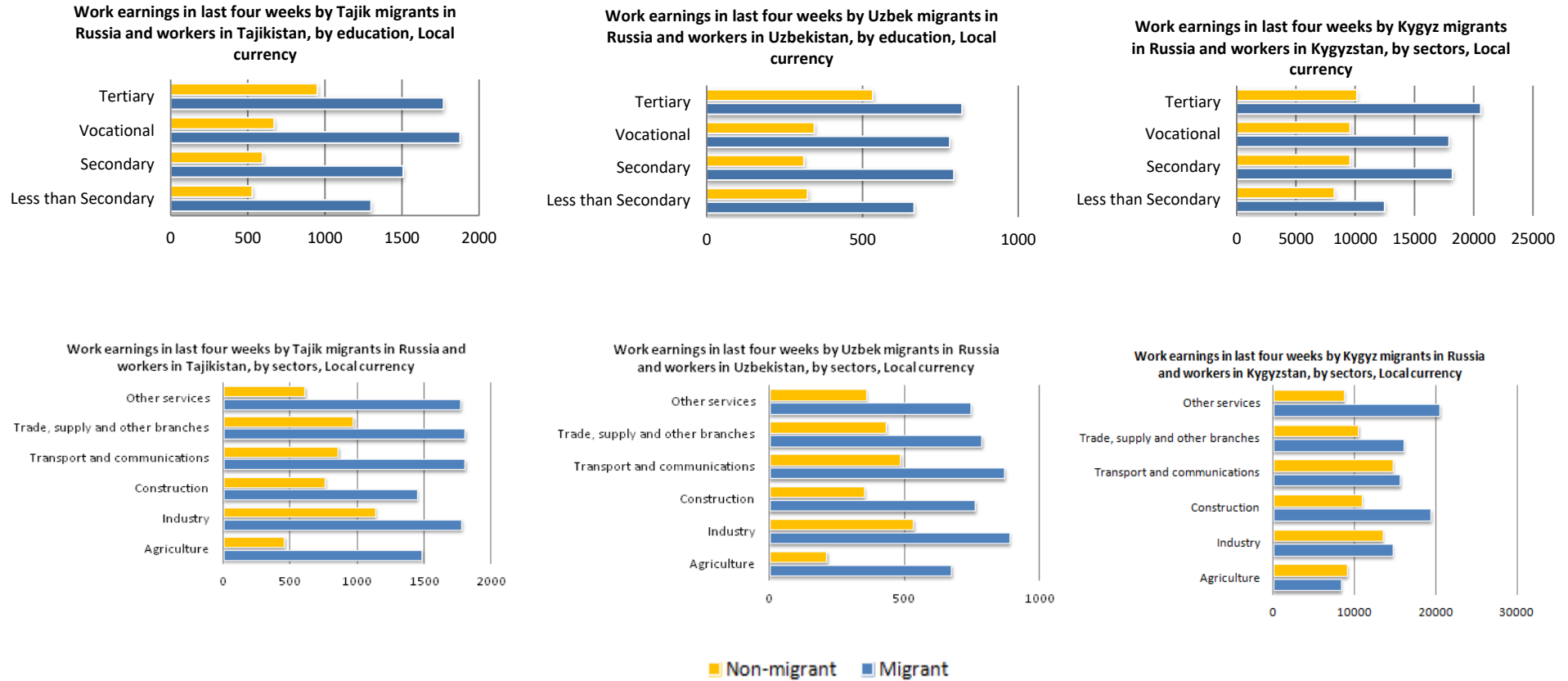
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Graph 1. Schooling, age and degrees in Tajikistan

Years		Age
9		24
8		23
7		22
6	Universities, Institutions and the Conservatorium	21
5	Technical schools & Colleges	20
4	Lyceums & Vocational schools	19
3		18
2	Complete Secondary Education	Lyceums &Vocational schools	17
1		16
Years	Compulsory - Basic Secondary Education - 9 years - until the age of 16	Age
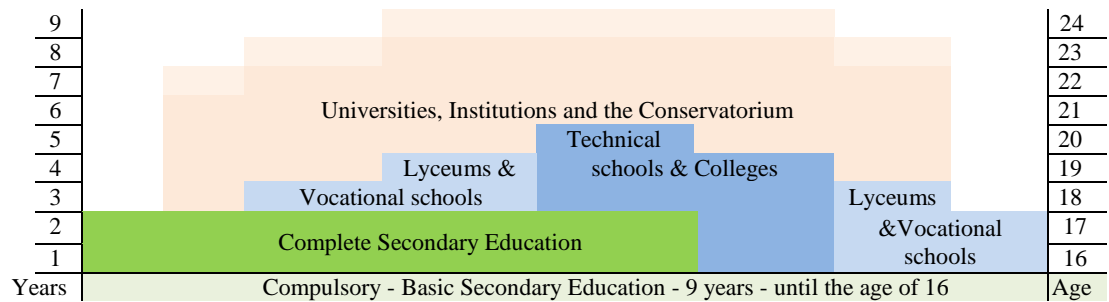
Note: This chart lays out the structure of Tajikistan's educational system, the translation of degrees into years of schooling, and the normal corresponding students' ages. In this paper, professional education starts at years of schooling category "Professional lyceums and Vocational schools" corresponding to age 16 or 9 years of compulsory basic education. These are the lower band for the professional education categories. With professional education from lyceums and vocational schools, people work at lower professional occupations.

Graph 2. Mean wages between migrants in the Russian Federation and non-migrants in their home countries (by education and sectors)

Work earnings in last four weeks by Tajik migrants in Russia and workers in Tajikistan, by education, Local currency

Work earnings in last four weeks by Uzbek migrants in Russia and workers in Uzbekistan, by education, Local currency

Work earnings in last four weeks by Kygyz migrants in Russia and workers in Kygyzstan, by sectors, Local currency

Work earnings in last four weeks by Tajik migrants in Russia and workers in Tajikistan, by sectors, Local currency

Work earnings in last four weeks by Uzbek migrants in Russia and workers in Uzbekistan, by sectors, Local currency

Work earnings in last four weeks by Kygyz migrants in Russia and workers in Kygyzstan, by sectors, Local currency

■ Non-migrant ■ Migrant

Table 1. Sample Statistics

Variables	Men & Women	Current migrant	Never Migrated	Male	Current migrant	Never Migrated
Education variables						
No Education	0.00976	0.00311	0.0109	0.0101	0.00320	0.0126
	[0.00218]	[0.00114]	[0.00247]	[0.00290]	[0.00113]	[0.00388]
Compulsory education:						
Primary education (grades 1-4)	0.00431	0.00270	0.00458	0.00396	0.00311	0.00427
	[0.000833]	[0.00107]	[0.000959]	[0.00140]	[0.00125]	[0.00188]
Basic education (grades 5-8(9))	0.0946	0.0908	0.0953	0.0802	0.0807	0.0801
	[0.00809]	[0.0118]	[0.00817]	[0.00729]	[0.00959]	[0.00807]
Non-compulsory education:						
Secondary general education (grades 9-10(11))	0.461	0.507	0.453	0.442	0.523	0.413
	[0.0156]	[0.0239]	[0.0164]	[0.0186]	[0.0273]	[0.0205]
Professional Education						
Secondary special education	0.236	0.238	0.235	0.232	0.240	0.230
	[0.0162]	[0.0221]	[0.0176]	[0.0189]	[0.0237]	[0.0224]
Secondary technical education	0.0489	0.0583	0.0474	0.0570	0.0549	0.0578
	[0.00629]	[0.00948]	[0.00704]	[0.00708]	[0.0109]	[0.00836]
Higher education	0.145	0.1000	0.153	0.173	0.0953	0.201
	[0.0114]	[0.0126]	[0.0126]	[0.0119]	[0.0126]	[0.0139]
Graduate school/aspirantura	0.000618	0	0.000722	0.000949	0	0.00129
	[0.000300]		[0.000348]	[0.000571]		[0.000769]
Grouped variables on professional education						
Vocational (secondary special & technical) education	0.284	0.297	0.282	0.289	0.295	0.288
	[0.0161]	[0.0237]	[0.0173]	[0.0193]	[0.0274]	[0.0219]
Tertiary (higher and graduate education)	0.146	0.1000	0.154	0.174	0.0953	0.202
	[0.0115]	[0.0126]	[0.0127]	[0.0119]	[0.0126]	[0.0140]
Completed Formal Professional Education (vocational or tertiary)	0.430	0.397	0.436	0.464	0.390	0.490
	[0.0173]	[0.0265]	[0.0183]	[0.0185]	[0.0289]	[0.0202]
Individual characteristics						
Currently Migrant in Russia	0.144	1	0	0.262	1	0
	[0.00890]			[0.0151]		
Household Head	0.163	0.232	0.151	0.338	0.272	0.362
	[0.00854]	[0.0207]	[0.00924]	[0.0194]	[0.0225]	[0.0231]
Married/*nikoh*	0.851	0.834	0.854	0.868	0.852	0.874
	[0.00673]	[0.0146]	[0.00787]	[0.00872]	[0.0164]	[0.0109]
Age	34.35	33.53	34.48	34.20	33.55	34.44
	[0.164]	[0.338]	[0.164]	[0.215]	[0.336]	[0.238]
Age-square	1224.8	1166.0	1234.6	1214.4	1167.6	1231.0
	[11.48]	[23.60]	[11.55]	[15.27]	[23.62]	[16.93]
Male	0.468	0.853	0.403	1	1	1
	[0.00506]	[0.0160]	[0.00663]			
Female	0.532	0.147	0.597	0	0	0
	[0.00506]	[0.0160]	[0.00663]			
Household characteristics						
Lives in capital	0.102	0.0391	0.112	0.104	0.0384	0.127
	[0.0177]	[0.00632]	[0.0196]	[0.0177]	[0.00619]	[0.0218]
Lives in other urban area	0.387	0.341	0.395	0.386	0.319	0.410
	[0.0221]	[0.0387]	[0.0223]	[0.0246]	[0.0380]	[0.0252]
Lives in rural area	0.553	0.639	0.539	0.558	0.661	0.521
	[0.0217]	[0.0382]	[0.0219]	[0.0240]	[0.0376]	[0.0245]
Number of children age <18	2.322	2.463	2.298	2.312	2.467	2.257
	[0.0487]	[0.0836]	[0.0501]	[0.0535]	[0.0731]	[0.0634]
Female headed household	0.0457	0.0543	0.0442	0.0462	0.0564	0.0425
	[0.00383]	[0.00740]	[0.00384]	[0.00413]	[0.00789]	[0.00438]
Ratio of male members in the household	0.495	0.508	0.493	0.513	0.516	0.512
	[0.00380]	[0.00822]	[0.00410]	[0.00422]	[0.00843]	[0.00437]
Lives in Tajikistan	0.173	0.247	0.160	0.168	0.261	0.135
	[0.00756]	[0.0204]	[0.00733]	[0.00818]	[0.0208]	[0.00801]
Lives in Uzbekistan	0.704	0.649	0.714	0.708	0.655	0.727
	[0.0172]	[0.0267]	[0.0186]	[0.0179]	[0.0257]	[0.0210]
Lives in Kyrgyz Republic	0.123	0.104	0.126	0.124	0.0837	0.138
	[0.0175]	[0.0114]	[0.0195]	[0.0173]	[0.00929]	[0.0214]
Observations	10122	1586	8536	4649	1354	3295

Table 2. Probit Regression on Migration Decision

Currently Migrant in Russia=1(=0 if never migrated)	Coefficients		Marginal effects	
	All	**Male**	**All**	**Male**
Vocational education	-0.0672	0.1168	-0.0130	0.0361
	[0.1540]	[0.1485]	[0.0297]	[0.0459]
Tertiary education	-0.2353	-0.3225**	-0.0454	-0.0997**
	[0.1479]	[0.1470]	[0.0284]	[0.0452]
Completed vocational education in Tajikistan	0.3126*	-0.0458	0.0603*	-0.0142
	[0.1808]	[0.1799]	[0.0351]	[0.0556]
Completed tertiary education in Tajikistan	0.0368	-0.1820	0.0071	-0.0563
	[0.1646]	[0.1657]	[0.0317]	[0.0514]
Completed vocational education in Uzbekistan	0.0833	-0.1340	0.0161	-0.0414
	[0.1751]	[0.1820]	[0.0338]	[0.0562]
Completed tertiary education in Uzbekistan	-0.2046	-0.1615	-0.0395	-0.0499
	[0.2108]	[0.2073]	[0.0407]	[0.0641]
Married/*nikoh*	-0.1697*	-0.0851	-0.0327*	-0.0263
	[0.0952]	[0.1303]	[0.0186]	[0.0403]
Age	0.0002	-0.0083	0.00004	-0.0026
	[0.0497]	[0.0550]	[0.0096]	[0.0170]
Age-square	-0.0001	0.00005	-0.00002	0.00002
	[0.0007]	[0.0008]	[0.0001]	[0.0002]
Male	1.2054***		0.2326***	
	[0.0675]		[0.0131]	
Lives in rural area	0.1605*	0.2642***	0.0310*	0.0817***
	[0.0959]	[0.0981]	[0.0184]	[0.0304]
Lives in Tajikistan	0.2578***	0.6955***	0.0497***	0.2150***
	[0.0898]	[0.1014]	[0.0172]	[0.0319]
Lives in Uzbekistan	-0.0026	0.2556**	-0.0005	0.0790**
	[0.1045]	[0.1142]	[0.0202]	[0.0364]
Number of children age <18	0.0207	0.0118	0.0040	0.0036
	[0.0257]	[0.0239]	[0.0050]	[0.0074]
Household Head	-0.1732*	-0.1650*	-0.0334*	-0.0510*
	[0.0892]	[0.0945]	[0.0173]	[0.0290]
Female headed household	-0.1299*	-0.1722*	-0.0251*	-0.0532*
	[0.0773]	[0.0997]	[0.0150]	[0.0311]
Ratio of male members in the household	-0.0818	0.0082	-0.0158	0.0025
	[0.2474]	[0.2895]	[0.0476]	[0.0895]
Constant	-1.6490**	-0.7095		
	[0.8371]	[0.9460]		
Observations	10122	4649	10122	4649

Standard errors in brackets
* *p* < 0.1, ** *p* < 0.05, *** *p* < 0.01

Table 3. Probit Regression on Decision of Tertiary Education

Completed tertiary education=1(=0 if lower education)	Coefficients		Marginal effects	
	All	**Male**	**All**	**Male**
Currently Migrant in Russia	-0.3422***	-0.4360***	-0.0730***	-0.1062***
	[0.0866]	[0.0891]	[0.0188]	[0.0213]
Married/*nikoh*	-0.0016	0.0876	-0.0003	0.0213
	[0.0768]	[0.1171]	[0.0164]	[0.0286]
Age	-0.0517	-0.0856	-0.0110	-0.0208
	[0.0444]	[0.0595]	[0.0095]	[0.0146]
Age-square	0.0007	0.0010	0.0001	0.0002
	[0.0006]	[0.0008]	[0.0001]	[0.0002]
Male	0.3098***	0	0.0661***	0
	[0.0596]		[0.0126]	
Lives in rural area	-0.3895***	-0.3517***	-0.0831***	-0.0856***
	[0.0834]	[0.0869]	[0.0187]	[0.0219]
Lives in Tajikistan	-0.4280***	-0.0676	-0.0913***	-0.0165
	[0.0919]	[0.1063]	[0.0206]	[0.0260]
Lives in Uzbekistan	-0.6668***	-0.4364***	-0.1422***	-0.1063***
	[0.1010]	[0.1024]	[0.0199]	[0.0238]
Number of children age <18	-0.0641***	-0.0391	-0.0137***	-0.0095
	[0.0226]	[0.0260]	[0.0046]	[0.0062]
Household Head	0.0805	0.1907*	0.0172	0.0464*
	[0.0998]	[0.1090]	[0.0213]	[0.0267]
Female headed household	-0.2230*	-0.1924	-0.0476*	-0.0468
	[0.1248]	[0.1717]	[0.0269]	[0.0417]
Ratio of male members in the household	-0.4188**	-0.1455	-0.0893**	-0.0354
	[0.1755]	[0.2829]	[0.0388]	[0.0692]
Constant	0.8398	1.4267		
	[0.7238]	[0.9781]		
Observations	10122	4649	10122	4649

Standard errors in brackets

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4. Ordered Probit of the Choice of Education: Average Marginal Effects

Completed education	Men and Women				Male Sample			
	Less than Secondary	Secondary	Vocational	Tertiary	Less than Secondary	Secondary	Vocational	Tertiary
Currently Migrant in Russia	0.0185*	0.0209**	-0.0182*	-0.0212**	0.0253***	0.0340***	-0.0230***	-0.0363***
	[0.0099]	[0.0097]	[0.0093]	[0.0103]	[0.0091]	[0.0114]	[0.0084]	[0.0122]
Married/*nikoh*	-0.0103	-0.0122	0.0102	0.0123	-0.0243	-0.0314	0.0221	0.0336
	[0.0101]	[0.0117]	[0.0103]	[0.0115]	[0.0171]	[0.0197]	[0.0156]	[0.0212]
Age	0.0096	0.0120	-0.0096	-0.0120	0.0197***	0.0290***	-0.0179***	-0.0307***
	[0.0075]	[0.0096]	[0.0077]	[0.0094]	[0.0058]	[0.0088]	[0.0056]	[0.0090]
Age-square	-0.0001	-0.0002	0.0001	0.0002	-0.0003***	-0.0004***	0.0002***	0.0004***
	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]
Male	-0.0296***	-0.0374***	0.0295***	0.0375***				
	[0.0077]	[0.0090]	[0.0075]	[0.0092]				
Lives in rural area	0.0320***	0.0408**	-0.0319***	-0.0408**	0.0278***	0.0417**	-0.0252***	-0.0443**
	[0.0112]	[0.0169]	[0.0119]	[0.0161]	[0.0102]	[0.0165]	[0.0094]	[0.0173]
Lives in Tajikistan	0.1385***	0.0886***	-0.1198***	-0.1073***	0.0504**	0.0581***	-0.0451**	-0.0634***
	[0.0251]	[0.0107]	[0.0182]	[0.0149]	[0.0208]	[0.0185]	[0.0176]	[0.0217]
Lives in Uzbekistan	0.0470***	0.0675***	-0.0471***	-0.0674***	0.0189	0.0295	-0.0171	-0.0312
	[0.0139]	[0.0215]	[0.0128]	[0.0227]	[0.0128]	[0.0207]	[0.0112]	[0.0224]
Number of children age <18	0.0110***	0.0137***	-0.0110***	-0.0137***	0.0072*	0.0106*	-0.0066*	-0.0113*
	[0.0036]	[0.0038]	[0.0034]	[0.0040]	[0.0040]	[0.0056]	[0.0036]	[0.0060]
Household Head	-0.0222*	-0.0311*	0.0224*	0.0309*	-0.0358***	-0.0573**	0.0323***	0.0608**
	[0.0114]	[0.0178]	[0.0116]	[0.0176]	[0.0128]	[0.0224]	[0.0116]	[0.0236]
Female headed household	0.0307*	0.0312**	-0.0297*	-0.0322**	0.0217	0.0277	-0.0197	-0.0297
	[0.0172]	[0.0133]	[0.0154]	[0.0151]	[0.0239]	[0.0255]	[0.0210]	[0.0284]
Ratio of males in the household	0.0692***	0.0863***	-0.0691***	-0.0864***	0.0275	0.0405	-0.0251	-0.0429
	[0.0248]	[0.0297]	[0.0224]	[0.0320]	[0.0338]	[0.0488]	[0.0299]	[0.0526]
Observations	10122				4649			

Marginal effects; Standard errors in brackets
* p<0.1; ** p<0.05; *** p<0.01

Table 5. Bivariate Probit of Choice of Migration and Tertiary Education

Choice of Migration and Tertiary Education	Men and Women			Male Sample		
	(1) Currently Migrant in Russia	(2) Tertiary education	Marginal effects of (1)	(1) Currently Migrant in Russia	(2) Tertiary education	Marginal effects of (1)
Tertiary education	-0.8587***		-0.0203***	-0.9344***		-0.0435***
	[0.1987]		[0.0077]	[0.2131]		[0.0124]
Married/*nikoh*	-0.1280	-0.0623	-0.0065	0.0555	0.0247	0.0049
	[0.0983]	[0.0818]	[0.0049]	[0.1301]	[0.1204]	[0.0119]
Age	0.0376	-0.0958	-0.0017	0.0573	-0.1294	-0.0076
	[0.0669]	[0.0593]	[0.0031]	[0.0927]	[0.0827]	[0.0101]
Age-square	-0.0007	0.0014	0.0000	-0.0011	0.0017	0.0001
	[0.0010]	[0.0009]	[0.0000]	[0.0014]	[0.0012]	[0.0002]
Male	1.1820***	0.2837***	0.0576***			
	[0.0715]	[0.0627]	[0.0087]			
Lives in rural area	0.0179	-0.2427***	-0.0069	0.1348	-0.1302	-0.0034
	[0.1034]	[0.0907]	[0.0052]	[0.1037]	[0.1148]	[0.0110]
Lives in Tajikistan	-0.0194	-0.6413***	-0.0168***	0.3923***	-0.2846**	-0.0061
	[0.0966]	[0.0920]	[0.0051]	[0.1100]	[0.1219]	[0.0118]
Lives in Uzbekistan	-0.3531***	-0.7756***	-0.0468***	-0.1332	-0.5897***	-0.0646***
	[0.0999]	[0.1009]	[0.0107]	[0.1182]	[0.1113]	[0.0167]
Number of children age <18	-0.0054	-0.0722***	-0.0024*	-0.0189	-0.0578*	-0.0058*
	[0.0275]	[0.0227]	[0.0012]	[0.0250]	[0.0295]	[0.0029]
Female headed household	-0.0852	-0.1410	-0.0063	-0.1381	-0.1529	-0.0177
	[0.0779]	[0.1281]	[0.0041]	[0.1041]	[0.1825]	[0.0124]
Ratio of male members in the household	0.1450	-0.8434***	-0.0213*	0.6444	-0.6464	-0.0188
	[0.2649]	[0.2040]	[0.0121]	[0.4279]	[0.4148]	[0.0452]
Household head with tertiary education		1.0480***			1.1515***	
		[0.0733]			[0.1200]	
atanh ρ	0.3358***			0.2752**		
	[0 .1166]			[0.1221]		
ρ	0.3237***			0.2685**		
	[0.1044]			[0.1133]		
Observations	8269			2896		

Coefficients in (1)& (2); Standard errors in brackets

* p<0.1; ** p<0.05; *** p<0.01

Table 6. Linear Probability Model of Choice of Migration and Tertiary Education

Two Stage Least Square IV Regression	Men and Women		Male Sample	
	First stage: Tertiary education	Second stage: Currently Migrant in Russia	First stage: Tertiary education	Second stage: Currently Migrant in Russia
Tertiary education		-0.0615*		-0.151**
		[0.0366]		[0.0705]
Married/*nikoh*	-0.00836	-0.0248***	0.0466**	0.0256
	[0.0103]	[0.00930]	[0.0190]	[0.0230]
Age	-0.00361	0.00632	-0.00442	0.00764
	[0.00749]	[0.00676]	[0.0150]	[0.0179]
Age-square	0.000015	-0.000117	0.00001	-0.000199
	[0.000106]	[0.0001]	[0.000218]	[0.000261]
Male	0.0805***	0.287***		
	[0.00858]	[0.00823]		
Lives in rural area	-0.115***	0.0228**	-0.141***	0.0676***
	[0.00838]	[0.00931]	[0.0152]	[0.0220]
Lives in Tajikistan	-0.131***	0.0215**	-0.0411*	0.154***
	[0.0112]	[0.0109]	[0.0218]	[0.0261]
Lives in Uzbekistan	-0.177***	-0.0361***	-0.143***	-0.00377
	[0.0121]	[0.0127]	[0.0228]	[0.0287]
Number of children age <18	-0.0197***	-0.00339	-0.0135***	-0.00655
	[0.00238]	[0.00229]	[0.00406]	[0.00497]
Female headed household	-0.0156	0.0209	-0.0539**	0.00737
	[0.0150]	[0.0136]	[0.0235]	[0.0288]
	-0.0989***	0.0351	-0.0635	0.161**
Ratio of male members in the household	[0.0263]	[0.0238]	[0.0560]	[0.0669]
	0.255***		0.327***	
Household head with tertiary education	[0.0103]		[0.0193]	
Constant	0.500***	-0.0245	0.481*	0.120
	[0.128]	[0.117]	[0.250]	[0.302]
Observations	8,269	8,269	2,896	2,896
R-squared	0.151	0.168	0.160	0.055
IV F-stat		606.7		289.4
Durbin pval		0.821		0.778

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1