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Male Labor Migration and Fertility of Women Left Behind in Rural Armenia

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Abstract

The literature on the influence of migration on fertility in origin areas is scarce, and most studies deal with high-fertility settings. This study addresses the effects of male labor migration on fertility outcomes and preferences among women in low-fertility settings. It is based on data from surveys conducted in 2005 and 2007 in rural Armenia, a part of the former Soviet Union that saw a dramatic fall in fertility rates and a rapid rise in migration after its independence in 1991. The results of event-history analysis indicate that husband's migration significantly depresses the probability of birth, net of other factors. Migrants' wives are significantly less likely to desire more children than non-migrants' wives, but this difference is largely explained by age and number of children that they already have. We reflect on the implications of the results for the migration-fertility relationship in low-fertility high-migration societies.

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Background

This paper is looking at the association between seasonal labor migration of men and fertility of women left behind. The literature on migration and fertility offers four main hypotheses to explain the relationship between migration and fertility outcomes. Socialization hypothesis suggests that fertility levels of migrants are similar to that of non-migrants at origin, as the fertility behavior of migrants reflects the fertility preferences and behavior dominant in their childhood. The adaptation hypothesis suggests that migrants adapt to the fertility behavior dominant in the destination environment. The selection hypothesis argues that migrants are a special group of people whose fertility preferences are more similar to the preferences of people at destination than at origin. Finally, the disruption hypothesis suggests that immediately following migration, migrants show particularly low levels of fertility due to the disruptive factors associated with the migration process.

While selection and disruption hypotheses may explain the associations between fertility outcomes and temporary, as well as, long term migration, socialization and adaptation hypotheses only refer to long term migration. In case of short term migration, disruption hypothesis argues that spousal separation due to migration of the husband or wife affects the timing and spacing of births. Selection hypothesis suggests that men with more and younger children are more likely to migrate for work, and that women with fewer children are more likely to migrate.

Though the association between migration and fertility has been studied widely, the research has mainly focused on the fertility of migrants in the areas of destination (Brockerhoff

1995, Brockerhoff and Yang 1994, Chattopadhyay et al. 2006). The research on fertility and temporary migration in the areas of origin is scarce and mostly refers to high-fertility areas. The evidence that short-term migration disrupts childbearing was found in numerous studies (Agadjanian, Yabiku and Cau, 2007; Lindstrom and Saucedo, 2007; Lindstrom and Saucedo, 2002; Massey and Mullman, 1984; Millman and Potter, 1984; Chen et al., 1974). Lindstrom and Saucedo (2002) find, however, that despite the decrease in birth rates following migration, couples are able to adjust for their fertility after the return of migrants in Mexican settings. Agadjanian et al. (2007) along with disruptive effects of short term migration found that male migration positively affects fertility preferences as a guarantee of better economic conditions and stability. The research also provides evidence for reverse causation between migration and fertility. Migration may offer a way to meet family needs. It was shown in Mexico, for example, that male migration rates are higher among families with more and younger children and that the frequency of migration decreases with time as the children grow older (Massey et al., 1993; Massey et al., 1994).

In the areas with high migration and low fertility rates continuing large-scale male labor migration may further decrease already low fertility rates, especially because much of this migration originates from rural areas, where fertility has been traditionally higher than in cities. To add to the research on the associations between seasonal labor migration and fertility of women left behind, and to explore the consequences of large scale male labor migration for fertility levels in low fertility areas we look at the association between men's labor migration and their wives' fertility outcomes and preferences in rural Armenia. We expect that migration will be associated with lower fertility rates due to spousal separation. However, because migration holds a promise of better economic conditions, we expect migration to be positively associated with fertility preferences.

The setting

Billingsley (2008) has observed that several countries in Eastern Europe and Asia have recently seen a dramatic fertility decline to below -replacement levels. In Armenia, according to national statistics, the total fertility rate declined from 2.6 in 1990 to 1.2 in 1999, one of the lowest levels in the world, and has seen a slight increase to 1.35 since then (Innocenti Research Centre, UNICEF). Billingsley (2008) did not found support for contraceptive revolution or the second demographic transition to be the explanation of the fertility decline in Armenia (Billingsley, 2008). Instead, the author argued that decline in fertility in Armenia was due to the collapsing socio-economic household conditions and uncertainty about the future in the early 1990s.

Armenia, a nation of three million residents and a Gross National Income per capita estimated at $2,640 (World Bank, 2008), gained independence after the dissolution of the USSR in 1991. The collapse of the Soviet rule and the war with neighboring Azerbaijan in the early 1990s led in a severe socioeconomic crisis that affected the migration patterns and scope. Seasonal labor migration to Russia and other parts of the Soviet Union, popularly known as *khopan*, was common in Armenia even before its independence, but the hardships of the early 1990s largely replaced it with massive permanent emigration (Yeganyan and Shahnazaryan, 2004; Poghosyan, 2003). It is estimated that since the dissolution of the USSR about 15% of the Armenian population left the country on the permanent basis (Heleniak, 2008). However, since the mid-1990s, as the economic situation in the country stabilized and then started to improve, permanent emigration began to subside while temporary labor migration began to rise again. The net migration rate[1] rose from -10.4 in 2000 (of which -9.9 was to CIS[2] countries) to -6.4 in 2006 (-4.7 to CIS countries) (Statistical Yearbook of Armenia, 2005; Statistical Yearbook of Armenia, 2008). Today, two main international migration patterns can be distinguished: permanent emigration from Yerevan, Armenia's capital city and by far the largest city, to Europe and the U.S., and seasonal labor migration from rural areas to Russia and, to a lesser extent, other countries of the Soviet Union (Gevorkyan, Mashuryan and Gevorkyan, 2006). According to Heleniak (2008), there is a well developed seasonal pattern of migration mostly to Russia, whereby people leave from January to August for seasonal work in construction and agriculture and return between the months of September and December.

[1] The net migration rate is the difference of in-migrants and out-migrants of an area in a year per 1,000 inhabitants. A positive value indicates more people entering an area than leaving it, while a negative value means more people leaving it than entering it.
[2] The Commonwealth of Independent States (CIS) is a regional organization that includes most of the former Soviet Republics.

Data and methods

This study uses combined data from two surveys of married women in rural Armenia. First survey on Migration, Social Capital, and Reproductive Behavior and Outcomes in Armenia was conducted in 2005. The survey was carried out in 52 villages of two provinces (marzes). One of the marzes, Ararat, is located close to the capital city of Yerevan and can be described as a more prosperous marz of the two. Tavush, the other marz, located at the border with Georgia and Azerbaijan, has been influenced by the military conflict between Armenia and Azerbaijan and is among the poorest regions in the country. In each village twenty households (1040 households in total) with women 18 to 45 years old, married to migrants and non-migrants, were selected randomly through a random walk algorithm. The sampling strategy was designed so as to achieve a more or less balanced representation of migrants' and non-migrants' wives.

The second survey on Labor Migration and STD/HIV Risks in rural Armenia was conducted in the summer of 2007, at the height of migration season. The survey was conducted in rural areas of Gegharkunik marz (province), one of the poorest provinces of Armenia which is also believed to have among the highest rates of labor migration in the country, due to soil and climatic conditions unfavorable for agriculture, lack of alternative employment, and a well developed tradition of seasonal migration (Yeganyan and Shahnazaryan, 2004).

A three-stage sampling procedure was used to select a sample of 1,240 married women aged 18 to 40 years. First, 31 villages were selected with a probability proportional to village population size. Then, in each village all households with at least one married woman of eligible age were assigned to two lists—one with migrant husbands and another with non-migrant husbands. Finally, twenty households were selected randomly from each of the two lists and in each of those forty households one woman was interviewed. This sampling procedure was designed to assure a balanced representation of migrant and non-migrant households.

The data include detailed retrospective information on women's reproductive history, husband's work history in the five years preceding the survey, fertility preferences and demographic and socioeconomic characteristics at the individual and household levels.

To test the effect of husband's migration on fertility we start with survival analysis followed by event-history approach using Cox regression model is employed. The model predicts the probability of having a birth in a given year with husband's migration status in the same year as the birth. Since the collected data on the history of husband migration goes back five years preceding the survey date or the year of their marriage if they married in less than five years before the survey, we can only look at that time period. The risk of the event starts at marriage, if the birth of interest is the first birth of the woman and if her marriage happened during the five years preceding the survey. If her marriage dates back more than five years prior to survey, and/or the first birth occurred before then, the risk starts at five years preceding the survey. If the birth is not the first one, the risk starts at the end of the previous pregnancy if it happened during the five years prior to the survey; otherwise it starts at five years preceding the survey. Husband's migration status is a time-varying variable measured for each year of risk exposure.

The event-history analysis controls for biological and socio-economic factors. Biological factors include woman's age, the age difference between husband and wife and number of births prior to the start of exposure to risk (coded 1, if had any prior births; and coded 0, if didn't have any). Socioeconomic controls include woman's and her husband's education (coded 1, if has vocational and higher education; coded 0, if has secondary and less education), her current employment status (coded 1, if she is currently working; coded 0, if otherwise), household income (logged), and marz as a control for the region-level wellbeing (reference is Tavush marz). We first fit the baseline model with only husband's migration status as a predictor, and later add the biological factors in the second model, and include all controls in the third model.

To test the effect of husband's migration status on the fertility preferences of women we use logistic regression for binary outcomes. Husband's migration status at the time of the survey is the main predictor and the dichotomy if the woman wants to have more children vs. does not want or not sure as the outcome. The model controls for biological factors, such as woman's age, the age difference between husband and wife, the number of living children, and the status of woman's health (coded 1, if has bad health; and coded 0, if has good health) and for socioeconomic factors, such as woman's and her husband's education (coded 1 if has vocational and higher education; coded 0, if has secondary and less education), woman's current employment status (coded 1 if she is currently working; coded 0, if otherwise), co-residence with in-laws (coded 1 if lives with at least one parent in law; and coded 0, if otherwise), household income (logged) and marz (reference is Tavush marz). We first fit the baseline model with only migration status as a predictor, later we add biological controls to the second model, and add other socioeconomic controls to the third model. To control for unobserved effects of clustered data and avoid bias we employ a random-intercept approach, allowing the intercept of an outcome variable to vary randomly by village in the model on fertility preferences.

Table 1 presents the descriptive statistics of the main variables.

(Table 1 about here)

Results

Husband's migration and the probability of birth

Survival analysis presented in Figure 1 shows that women with migrant husbands have higher survival to birth than non-migrants' wives; the difference between two groups is statistically significant. In other words, birth rates among women with migrant husbands are significantly lower compared to women with non-migrant husbands.

(Figure 1 about here)

The results of the event-history analysis are presented in Table 2. Model 1 in Table 2 shows that the effect of husband's migration status on the probability of birth in a given year is negative at a statistically significant level, not controlling for other factors. However, when the biological factors are added to the analysis (Model 2, Table 2) the effect of husband's migration status becomes weaker and not significant, indicating that the strong negative association between husband's migration status and probability of birth in a given year in the baseline model is attributable to biological factors, such as age and number of prior births. A bivariate analysis of woman's age and number of prior births by husband's migration status (Table 1) shows that compared to women married to non migrants, the mean age of women married to migrants is higher by about year and a half, and the mean number of children is higher by about 0.2, and the differences are statistically significant.

Socioeconomic variables, when added to the analysis (Model 3, Table 2), do not affect the association between husband's migration status and hazard of birth as strongly as do biological factors. Woman's education is the only significant factor affecting the hazards of a birth in a given year. The level of income, even though is significantly higher among migrants' households than among non-migrants' households, has no significant effect on the hazards of birth. The outcomes of the analysis are similar if the effects of husband's migration status are lagged by a year (results not presented).

These results partially support the hypothesis that husband migration leads to lower fertility due to spousal separation. In addition, the results of this study suggest that the differences in the hazard of having a birth of women with migrant husbands and those with non migrant husbands are more strongly affected by age and number of children rather than by spousal separation.

(Table 2 about here)

Husband's migration status and women's reproductive preferences

The results of the logistic regression for the desire to have more children are presented in Table 3. Model 1 in Table 3 shows that husband's migration status significantly decreases the odds of women wanting to have for more children, not controlling for other factors. Interestingly, however, when the biological controls are added to the model (Model 2, Table 3) the association between husband's migration status and women's desire for more children changes its direction. Husband's migration status increases the odds of women preferring more children, controlling for biological factors. The effect, however, is not statistically significant. These results indicate that the negative effect of husband's migration and woman's childbearing preferences are attributable to age and the number of children they already have. Further analysis of women's fertility preferences shows that woman's and her husband's education, and household economic characteristics are not significant predictors for the desire for more children. The region effects show statistically significant differences, so that living in Gegharkunik and Ararat is associated with higher odds of women desiring to have more children, compared to Tavush, the least prosperous marz among the three marzes. Similar to the outcomes for the hazard of birth, despite significant differences in the income level between the households of migrants and non migrants, the effect of husband's migration on the desire to have more children is not explained by the economic benefits that migration provide, but rather by the differences in age and the number of children between the two groups of women.

(Table 3 about here)

Conclusion

To add to the literature on migration and fertility we looked at the associations between male seasonal migration and fertility rates and preferences in the sending areas. The results of our study partially support the view that migration is associated with lower birth rates. However, the outcomes of our study suggest that the negative effect is mostly attributable not to spousal separation, but rather to higher average age and mean number of children of women with migrant husbands, compared to those married to non-migrants. Similar results for the fertility preferences indicate that reverse causation might be the possible explanation for the negative association between migration and fertility rates and preferences. Research on migration has shown that labor migration is often initiated to meet family needs rather than in pursuit of income maximization (Wood, 1981; Massey et al., 1993; Massey et al., 1994). In line with this logic, the results of our study might be the indication of higher fertility driving migration, rather than migration decreasing fertility. Perhaps, in rural settings in Armenia, couples with more children, and probably already completed fertility, turn to seasonal migration as a way to struggle with economic hardships related to larger family needs, compared to those with fewer children.

Several limitations apply to the study. In the event-history analysis some of the variables are time-invariant, while others vary over time. However all variables used are measured only at the time of survey. We acknowledge this limitation, but considering that the period of time we are looking at is not very long, we suppose that the variables have not changed too much to bias the results greatly. Also, this is not a nationally representative data so we should be careful when making generalizations. Moreover, the study uses combined data from two different surveys using somewhat different sampling procedures. However, since both of the procedures considered balanced representation of women with migrant and non migrant husbands, we assume the results will not be too biased.

Finally, our results indicate that for low-fertility high-migration setting with restricted economic possibilities, migration is possibly not a factor further depressing already low fertility rates, but rather a household strategy to deal with economic hardships driven by higher fertility. However, to better understand fertility- migration reverse causation in the low-fertility countries of origin more research is needed.

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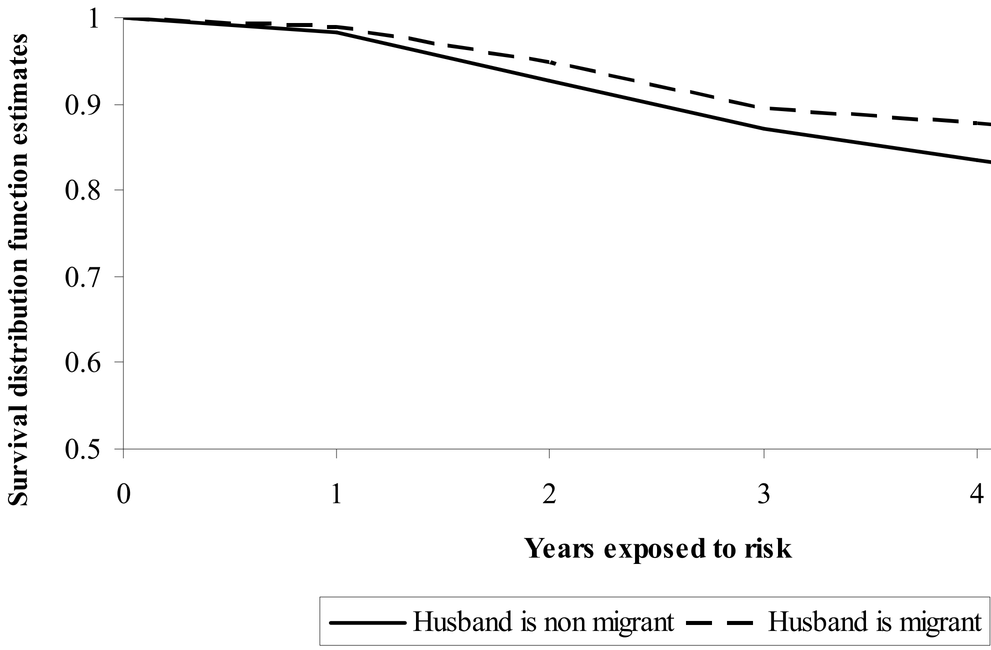
Figure 1. Survival to birth by husband's migration status in five year period (person-years)



-2LL = 91.62 (p<.0001)

Table 1. Descriptive statistics of the main independent variables by husband's migration status.

	Husband is not migrant	Husband is migrant
Woman's age (mean)	31.99	33.63
Age difference between husband and wife (mean)	4.93	5.09
Number of children (mean)	2.34	2.47
Bad health	19.45	26.85
Woman's education (%)		
Secondary and less (ref.)	59.2	62.4
Vocational and higher	40.8	37.6
Husband's education (%)		
Secondary and less (ref.)	63.35	65.95
Vocational and higher	36.65	34.05
Woman's employment (%)		
Currently not working (ref.)	85.19	89.04
Currently working	14.81	10.96
Co-residence with parents in-law (%)		
Does not live with in-laws (ref.)	35.83	41.03
Lives with in-laws	64.17	58.97
Household income (mean)	176.16	221.09

Table 2. Cox regression of the probability of childbirth in five year period (odds ratios).

	Model 1	Model 2	Model 3
Husband's migration status			
Non migrant (ref.)	1	1	1
Migrant	0.721**	0.923	0.905
Woman's age		0.762**	0.761**
Age difference between husband and wife		0.953**	0.962**
Prior births			
Haven't had prior births (ref.)		1	1
Have had prior births		2.307**	2.260**
Woman's education			
Secondary and less (ref.)			1
Vocational and higher			1.234**
Husband's education			
Secondary and less (ref.)			1
Vocational and higher			0.866†
Woman's employment			
Currently not working (ref.)			1
Currently working			1.082
Household income (logged)			1.047
Marz			
Tavush			1
Gegharkunik			1.101
Ararat			1.125

Significance levels: † *p*< .1, * *p*< .05, ** *p*< .01

Table 3. Logistic regression predicting desire to have more children with husband's migration status as the main predictor (odds ratios)

	Model 1	Model 2	Model 3
Intercept	0.346**	170.941**	95.137**
Husband's migration status			
Non migrant (ref.)	1	1	1
Migrant	0.779*	1.108	1.077
Woman's age		0.887**	0.883**
Age difference between husband and wife		0.959*	0.955*
Number of live children		0.304**	0.302**
Woman's health			
Good health (ref.)		1	1
Bad health		1.283	1.321†
Woman's education			
Secondary and less (ref.)			1
Vocational and higher			0.964
Husband's education			
Secondary and less (ref.)			1
Vocational and higher			1.218
Woman's employment			
Currently not working (ref.)			1
Currently working			1.245
Co-residence with parents in-law			
Does not live with in-laws (ref.)			1
Lives with in-laws			1.034
Household income (logged)			1.068
Marz			
Tavush (ref.)			1
Gegharkunik			1.522*
Ararat			1.611*

Significance levels: †$p < .1$, *$p < .05$, **$p < .01$