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in Kyrgyzstan:
Exploring interdependencies**

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Marriage, childbearing, and migration in Kyrgyzstan: Exploring interdependencies

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Abstract:

In our study we investigate interdependencies between entry into a marital union, childbirth, and migration. We apply event-history techniques to retrospective data on women aged 18-29 from a survey conducted in northern Kyrgyzstan in 2005 to examine how these events can influence one another, with a special focus on the effects of duration of exposure. In addition we analyze the impact of some individual characteristics on the propensity to get married, to become a mother, and to migrate. In our analysis we account for several duration dependences ('clocks'). The results illustrate that months since marriage formation is the most important duration variable in the first-birth propensities model. Out-of-wedlock conception is associated with increased marriage risks. Migration is often a part of the family building process: high first-birth propensities of recent migrants as well as high migration risks among pregnant women are due to marriage-related migration.

***Keywords:** childbearing; marriage; migration; duration dependence; Kyrgyzstan*

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Introduction

In this paper we investigate the links between entry into marriage, childbearing, and internal migration (hereafter referred to as migration). We analyze the duration interdependencies of these demographic events in women's lives and estimate the effects of various categorical covariates on the propensity to get married, to have a child, and to migrate.

While earlier research dealing with the interplay between demographic events usually links childbearing either with migration (Goldstein and Goldstein 1984, Hervitz 1985, Kahn 1988, Andersson 2004, Andersson and Scott 2005, Kulu 2005, Kulu 2006, Kulu and Vikat 2007) or with union formation (Lillard 1993, Brien *et al.* 1999, Le Goff 2002, Baizan *et al.* 2004), our study connects all three of these events. It is also aimed to contribute to the limited research on demographic behavior in transitional settings, especially those of the former Soviet Union: we use unique, high-quality survey data from Kyrgyzstan to study how family formation and migration are interconnected in the lives of young women in that country.

The paper is organized as follows. First we present the theory and hypotheses which guided our analysis. Then we provide an overview of recent demographic developments in Kyrgyzstan, describe our data, the study population, and the analytical method. We proceed to present and discuss the results of our study and end with brief conclusions.

Theoretical considerations and hypotheses

Dealing in this study with three closely interlinked demographic events we summarily refer to the theoretical considerations on interdependencies of marriage, childbearing, and migration as 'the triangulation framework'. It should be noted, though, that such interdependencies are too complex to be covered in one paper; therefore we limit our discussion only to those of them that can be tested with the data at hand.

One of the central issues fitting the triangulation framework is the family building process, to which the literature on demographic behaviors has devoted considerable attention. Thus the link between the entry into a union and the birth of [a] child(ren) has often been analyzed. As long as these two demographic events are manifestations of the same life career (i.e. when a union is formed for or because of children), their timings are interdependent. First, the desire to have a child and to provide them the social and economic protection, which accompanies family life, is a known possible factor in accelerating the process of union formation (Baizan *et al.* 2004, Guzzo 2006). Second, elevated rates of union formation, and especially of entry into formal marriage, are also related to out-of-wedlock pregnancy, even though a strong effect of a pregnancy on the rate of entry into marriage can be misleading as a causal explanation – what often matters is not the high

marriage rate among pregnant women but the high pregnancy rate among brides (Santow and Bracher 1994).

Since in Kyrgyzstan, as in many other similar transitional settings, most children are born in marital unions and marriage is perceived as the main institution for childbearing and childrearing by the majority of the population, we expect to find the following manifestations of interdependence between entry into marriage and childbirth:

- Marriage risks will be the highest among pregnant women: to legitimize a child and to avoid stigma (as norms prescribing that a child should be born within a marital union are still strong) women who experience out-of-wedlock pregnancy will tend to get married before the birth of a child, particularly during the early months of a pregnancy. On the contrary, women with [a] child(ren) will have the lowest first marriage risks.
- Birth risks will be higher among married women than among single women.
- With respect to the duration dependence, guided by universal evidence, we expect to find an elevated first-birth propensity within one or two years following marriage.

The next topic that we address under the triangulation framework is the interdependence between migration and childbearing. The demographic literature has provided a broad theoretical and empirical grounding for virtually every aspect of this interdependence. Thus to explain the difference between fertility of migrants and non-migrants, reported in many studies, researchers often refer to ‘assimilation’ (also called ‘socialization’), ‘adaptation’, ‘disruption’ and ‘selectivity’ hypotheses (e.g., Goldstein and Goldstein 1984, Hervitz 1985, Kahn 1988, Stephen and Bean 1992, Singley and Landale 1998, Lindstrom and Saucedo 2002, Kulu 2005, Kulu 2006). In the earlier study, based on the same data that we use in the current analysis, Nedoluzhko and Andersson (2007) tested some of these hypotheses. Here we refer to the issue once again with a special focus on the duration dependence between two demographic events – migration and the birth of a first child. In fact, only two of the hypotheses listed above, namely the ‘disruption’ and ‘selectivity’ hypotheses, posit the importance of such dependence. The former considers the effect of a migration event as interfering with fertility (Goldstein and Goldstein 1984, Chattopadhyay *et al.* 2006): since residential change requires necessary adjustments (e.g., finding housing, getting a job, etc.), union formation and childbirth are expected to be delayed until such adjustments are made. Disruptive effects can also result from spousal separation (Lindstrom and Saucedo 2002).

A counter-argument to the ‘disruption’ hypotheses, which also emphasizes the role of migration, suggests that since migration is often motivated by union formation or couple reunification (i.e. migrants tend to be ‘selected’ with respect to their motivations and/or fertility

intentions), it might result in increased fertility shortly after the move. These patterns of association have been found in a number of studies: by Andersson (2004) and Andersson and Scott (2005) for female immigrants in Sweden; by Milewski (2007) and Lindstrom and Saucedo (2007) for immigrants to Germany and the U.S., respectively; and by Kulu (2006) for female internal migrants in Austria and Poland.

The results of the previous research by Nedoluzhko and Andersson (2007) also revealed the increased first-birth propensity of female internal migrants in Kyrgyzstan (particularly within the first year after migration). The high first-birth risks of recent migrants suggest that some women migrate while they are pregnant, and we investigate this possibility in the current study. We expect that:

- Pregnant women will have a higher propensity to migrate than non-pregnant women. If it is indeed the case, then the most reasonable explanation for this would be migration for marriage. It should come as no surprise that like marriage itself, marriage-related migration can be sped up by out-of-wedlock pregnancy. Migration in such cases would most likely take place during the early stages of pregnancy.
- Unless women migrate for (or because of) marriage, the first years after their moves will be associated with relatively low first-birth propensity. Other manifestation of the disruption effect is also possible: women who migrate to get married (for whom the duration of marriage and the duration since migration are the same) might have lower first-birth risks shortly after marriage formation than married non-migrants with the same duration since marriage.
- Because children raise the costs of moving, childless (not pregnant) women will have higher migration risks than women with [a] child(ren). Alternatively one could argue that parents' concern for the future of their offspring might increase their propensity to migrate either permanently with [a] child(ren) or temporarily, to earn cash to support [a] child(ren) back home (Agadjanian *et al.* 2008). However, because our study deals with young individuals, whose children, if they had any, were too young to be left behind, we believe that we will find support for the former hypothesis.

Our hypotheses on the link between marriage and migration somewhat replicate those with respect to the interplay between migration and childbearing. We believe that:

- Recent migration is related to a low propensity to get married: unless marriage is the very reason for a move, some time is needed before a migrant finds or returns to a partner and sets up a necessary base for family life (what we have already discussed as the 'disruptive' influence). Disruption in such cases can arise from the necessity to

adapt to the new environment and/or from the forces that push an individual to migrate: if migration is motivated by educational or earning opportunities, i.e. careers which often compete with family life, a delay in marriage is predictable.

In the case of the effect of the marital status on migration, we expect that:

- Single women who, other things equal, have less ties that hold them back and therefore are more flexible in migration decision making than married women, will have a higher propensity to migrate.

We have no theoretical basis which would allow us to formulate hypotheses concerning the influence of duration since marriage formation on migration; migration obviously can take place at any time before and/or after formation of a marital union. However, the sequence of these events as well as their mediating effects in the marriage-migration-childbearing nexus might be of importance. Thus Hoem and Nedoluzhko (2008) explained why the effects of migration before and after marriage on the propensity to have a first child might be distinct from each other. In the current study we present some illustrations of the respective analyses.

With regard to the effects of individual characteristics, our hypotheses and expectations can be formulated as follows:

- Given that study and family formation are often incompatible (Hoem 1986, Thornton *et al.* 1995, Edwards 2002, Kantorová 2004), women enrolled in education are expected to have lower marriage and birth risks than those who have completed their studies. Migration risks should also be lower for studying women, who in a certain sense are ‘attached’ to the place where they are receiving education.
- We expect to find a negative correlation between educational attainment and childbearing: more educated women, due to longer time spent in education, will have lower birth risks than less educated women. Higher, i.e. prolonged education, in its turn might also signal career aspirations related to delayed parenthood or to family size limitation. The association between educational attainment and marriage, on the contrary, will be positive: because completion of vocational and, especially, higher education takes place around a time when a woman already ‘ought’ to be married¹, we anticipate to find increased marriage risks among more educated women.
- As education is often one of the central motives for migration, particularly among the youth, we expect that less educated women will have higher risks of migration.

¹ Mean age at first marriage in Kyrgyzstan for women in 2005 (the year of the survey) was 23.2 years (National Statistical Committee 2007).

- Our hypothesis on the employment-marriage nexus is based on the current labor market context: we suppose that under the circumstances of high unemployment and unstable and low-paid jobs, employed women are particularly attractive as marital partners and therefore will have higher marriage risks than non-employed women. Alternatively, one could hypothesize that employment, as a marker of women's financial independence, is related to delayed or even forgone marriage: lower propensity to marry among the employed (particularly well-positioned in the labor market) women is usually explained by declining gains to gendered division of labor within a family (Becker 1981, Hoem 1986), while a delay of marriage is often attributed to a prolonged spouse-search process (Oppenheimer 1988, Oppenheimer and Lew 1995).
- Because nowadays migration in Kyrgyzstan is often motivated by economic considerations, particularly by the search for a [better] job (Kumskov 2002, Schmidt and Sagynbekova 2008, Ruget and Usmanalieva 2008), we expect to find higher migration risks among non-employed women.
- Finally, as shown in previous research on Kyrgyzstan and similar settings (Agadjanian and Qian 1997, Agadjanian 1999, Nedoluzhko and Andersson 2007), demographic behavior is strongly dependent on individuals' ethno-cultural background. In this study we distinguish between respondents of European and Asian origin (hereafter also referred to as Europeans and Asians, respectively). To account for cultural distinctions within the latter ethnic group, Asians are further split into 'russified' and 'non-russified' according to language use¹. We expect to find that marriage and birth risks for Europeans will be lower than for either group of Asians. Due to their cultural characteristics, russified Asians, however, should be closer to Europeans in their family building behavior than non-russified Asians. With respect to ethnic differences in migration, our expectation is based on the fact that Europeans have been more likely to emigrate from the country, while internal migration has been a more probable option for Asians. Cultural distinctions in migration activity are also likely to show up since various groups of respondents might evaluate their prospects related to resettlement differently.

¹ This type of approach was first proposed in a demographic study on Kazakhstan (Agadjanian and Qian 1997).

The setting

Our study focuses on Kyrgyzstan – a post-Soviet Central Asian country with a population of just over five million people. The population of Kyrgyzstan is multiethnic, which makes it an intriguing site for a demographic study since the various ethnic groups have developed and preserve specific family building and migration strategies. In addition to ethnic Kyrgyz, who comprise 70 percent of the population, the country has a sizable minority of ethnic Uzbeks and other smaller groups autochthonous to the region. Kyrgyzstan is also home to a considerable number of ethnic Russians and other people of European origin, who altogether constitute about 10 percent of the country's population (National Statistical Committee 2008).

Since its independence, Kyrgyzstan has lived through spells of political instability and deep economic crisis, which has impoverished large segments of the population (Huskey 1997, Falkingham 2005). Currently about 40 percent of Kyrgyzstanis can be classified as poor (Ruget and Usmanalieva 2008). The hardships of the post-Soviet period, in their turn, have spurred dramatic changes in population dynamics and structure.

One of the noticeable features of the demographic situation after the breakup of the Soviet Union is a rapid fertility decline that often has been considered a response to the adverse socio-economic developments (Sarygulov 2001, Denisenko 2004). Total fertility in Kyrgyzstan decreased by some 30 percent between 1990 and 2006, even though together with Uzbekistan and Tajikistan it still remains a relatively high-fertility country with a Total Fertility Rate (TFR) in 2007 of 2.75 children per woman (National Statistical Committee 2008). High fertility, however, characterizes the population of Asian origin; Europeans have fertility below the replacement level.

Marriage dynamics since the country's independence underwent three stages that somewhat mirrored trends in fertility. There was a significant decrease in the number of registered unions and in the crude marriage rate during the first years of independence, followed by a period of stability between the mid-1990s and about 2000, after which came a gradual increase. Most of the post-Soviet period has seen an increasing postponement of marriage: the mean age at first marriage in Kyrgyzstan between 1990 and 2006 increased by almost two years for men – from 24.9 to 26.8 years and by more than one year for women – from 22.2 to 23.4 years (Kudabaev *et al.* 2004, National Statistical Committee 2007).

Another distinctive feature of the demographic situation of the post-Soviet period has been the increased geographic mobility of the population. Like other Central Asian states, Kyrgyzstan has experienced large-scale net out-migration. Right after the breakup of the Soviet Union emigration flows mostly contained Europeans. As a result of this ethnic-specific migration the share

of Europeans in the country's population has declined considerably (Tishkov 1994, Kumskov 2002). Recent studies also indicate an increasing number of native Kyrgyz and other Asians among international migrants who are attracted by the employment and business opportunities mostly in the Russian Federation and in neighboring Kazakhstan (Shuler and Kudabaev 2004, Ruget and Usmanalieva 2008).

Mass emigration in the post-Soviet period has been accompanied by rising internal migration, which can largely be explained by the unbalanced economic development of the country's different regions. Although the deep economic crisis following the disintegration of the Soviet Union has strongly affected the entire country, rural areas of it are much slower to recover. As a result, the main direction of the internal moves, mostly motivated by economic considerations¹, has been from rural to urban areas, particularly to the capital Bishkek and the surrounding Chui *oblast* (province). Reflecting the ethnic structure of the population, most internal migrants are ethnic Kyrgyz.

Data, study population, and research method

Data and study population

We use retrospective data from the survey 'Marriage, Fertility, and Migration in Kyrgyzstan' conducted in 2005. The main aim of this survey was to reflect ethnic differences in demographic behavior and aspirations of the Kyrgyz and European (mainly Russian) subgroups of the population; therefore it was carried out in the northern regions of the country, where over 90 percent of Europeans reside. The survey covered three areas - the capital city of Bishkek and two *oblasts* (provinces) - Chui and Issyk-Kul—each of which constituted a separate sampling domain. A three-stage cluster sample was used in each domain; rural and urban areas were sampled separately. (For details of the sample design see Agadjanian *et al.* 2006, 2008.)

Because to allow for a sound representation of different ethnic groups ethnic minorities in rural areas were oversampled, the survey is not representative of the rural population of northern Kyrgyzstan. Nevertheless it provides unique information on employment, education, migration, and family formation histories of young Kyrgyzstanis.

With a remarkably low non-response of about six percent (counting both refusals and unavailability), the effective sample consists of 755 men and 771 women; 1526 individuals in all, at ages ranging between 18 and 29 years, with a mean age of 23.1 years. As we have already

¹ Recent survey data suggests that (self)employment, earning opportunities, higher (than in other regions of the country) living standards plus the prestige of living in the capital are the main reasons for moving stated by internal migrants to Bishkek (Kumskova *et al.* 2004).

mentioned, in the current study we employ only data on women: We model their demographic behaviors starting from age 15. Despite their relatively young age at interview, 41 percent of our female respondents had already formed their first and sometimes even a subsequent marital (i.e. officially registered) union; 42 percent had at least one child; and 45 percent had experienced a migration.

Data limitations

The survey provides rich and high-quality data that can be of diverse use to both the scientific community and to policy-makers; however, it has some limitations that constrain our analysis. Thus we do not consider cohabitational unions because information on them is incomplete. The young age of the respondents and the brief segments of their lives covered by the survey limit our chances to research higher-order marriages and births. As a result, our modeling of second births is based on a rather small number of observations. We do not analyze formation of second marital unions since few respondents experienced divorce/separation and even fewer remarried by the time of the interview. The same problem – the narrow age range of the respondents – precludes us from accounting for a calendar period effect in our study: any attempt to split our observation time would lead to an unbalanced distribution of the age groups in the various sub-periods.

Another problematic issue is the information on employment: while details of employment histories were collected, more complete characteristics (full- or part-time employment, occupation, income, etc) were obtained only for the current job. Thus we cannot estimate the influence of such characteristics, which can have had distinct impacts on marital union formation, childbearing and possibly on migration (Bernhardt 1993, McLaughlin and Lichter 1997), since information on them refers to the time of interview and not to the entire period at risk of demographic events of interest. We can not examine the effects of partners' characteristics either because the survey provides information only on the partner with whom the respondent was living when interviewed, and again, this information refers exclusively to the time of interview.

Finally, our data is subject to some selectivity as it only contains information on the respondents who stayed in the study population up to the time of the interview. Individuals who had permanently emigrated from the country were not interviewed; such individuals of course are likely to differ substantially from those remaining in their demographic, socio-economic and cultural characteristics.

Analytical method

In the analysis we use hazard regression (Hoem 1987, Yamaguchi 1991, Hoem 1993, Blossfeld and Rohwer 1995). Our main models can be specified in the following general form:

$$\ln h_i(t) = \psi(t) + \sum_k z_k(t-u_{ik}) + \sum_l \alpha_l x_{il} + \sum_m \beta_m w_{im}(t) \quad (1)$$

where

$h_i(t)$ denotes the hazard of a selected event for individual i at time t ;

$\psi(t)$ is a piecewise linear spline that represents the effect of process time t (i.e. age of the respondent for first-order events and time since the previous event for subsequent events);

$z_k(t-u_{ik})$ is a spline representation of a time-varying variable which is a continuous function of t with origin at u_{ik} ; the functions z_k are specified in such a manner that they have value zero for negative arguments, i.e. $z_k(\tau) = 0$ for negative τ ; these functions are called ‘kick-in’ functions, meaning that they operate starting from the time when a respective event occurs, and have no effect before that time (Lillard and Panis 2003, Pp. 293-294);

$\alpha_l x_{il}$ is the value (x_{il}) and parameter (α_l) for the effects of time-constant covariates;

$\beta_m w_{im}(t)$ is the value (w_{im}) and parameter (β_m) for the effects of time-varying covariates other than a ‘kick-in spline’.

Description of the covariates

Parity/pregnancy status

To test our hypotheses concerning interlink between childbearing and marriage or between childbearing and migration, we introduce a time-varying covariate that accounts for parity/pregnancy status. This covariate has three levels: ‘no children (not pregnant)’, ‘pregnant’ and ‘with [a] child(ren)’¹. Because we believe that it normally takes 1 to 2 months for a woman to be certain that she is pregnant and thus her behavior is likely to be motivated by pregnancy a few months past conception, we consider only the seven last months of a pregnancy that precedes a live birth².

¹ In the model for migration we account for any pregnancy/child, and in the model for marriage formation we account only for the first pregnancy/child. The latter decision is motivated by the fact that we have only one respondent who married at parity 2, and no one who married during a second pregnancy.

² 90 percent of the pregnancies reported in our survey resulted in live births. Accounting for pregnancies that resulted in live births only is anticipatory of the event of childbearing, but we have no information on the duration of pregnancies for which outcome was abortion or miscarriage.

Marital status

Based on the marital status information we have constructed a time-varying covariate with two levels, namely ‘not married’ and ‘married’¹. The former level includes single, divorced/separated and widows. We have grouped these different categories of non-married women together because the fraction of divorced/separated and widows in this young sample is very small.

Migration

We define migration as a residential change for a period of at least 6 months that involves crossing an administrative border of a settlement and control for any internal migration past age 15. International migration is not in the scope of this study (as we have only few cases of such migration reported in our survey); observations are censored at the time of first international migration.

Education

The survey data provide information on the dates of completion of every educational stage. Based on this information we have constructed a time-varying covariate that reflects both educational enrolment and attainment at the same time. We assume continuous enrollment for a standard duration prior to graduation. In the cases when the time between the completion of successive educational stages exceeded standard duration, breaks in the educational process were coded. Because the distribution of our respondents by educational level is heavily skewed towards lower attainment, we only differentiate between (i) those who have completed general secondary education (the lowest educational level in the sample) and (ii) those with vocational or higher education.

Employment

We use only two levels for the employment covariate, namely ‘employed’ and ‘not employed’. We have coded respondents as employed regardless of whether they were in a full- or part-time job. Being employed also includes temporary employment. For example, individuals who are currently studying can be ‘employed’ and ‘in education’ at the same time if they also reported any work (including seasonal work and self-employment) for which they received money or other recompense. Finally, women who reported a pregnancy or birth as the reason for interrupting work are coded as ‘employed’ from the start of employment until the occurrence of the reported birth.

¹ For modeling first and second births we censor observations at the time of first divorce, i.e. the category ‘marital status’ has levels ‘never married’ and ‘in the first marital union’.

Ethno-cultural background

As we have mentioned already, we have defined three levels of the ‘ethno-cultural background’ covariate (‘European’, ‘russified Asian’, and ‘non-russified Asian’) to reflect both respondents’ ethnicity and the language they usually speak outside of the home. Individuals of Asian origin who usually speak Russian are classified as ‘russified’ and those who speak other languages (mostly Kyrgyz) as ‘non-russified’. In the ‘European’ and ‘Asian’ categories, ethnic Russians and ethnic Kyrgyz, respectively, represent overwhelming majorities (about 90 percent). Reflecting the fact that rural areas with high shares of Europeans were oversampled in the survey, the study population is relatively evenly distributed between the three ethno-cultural groups.

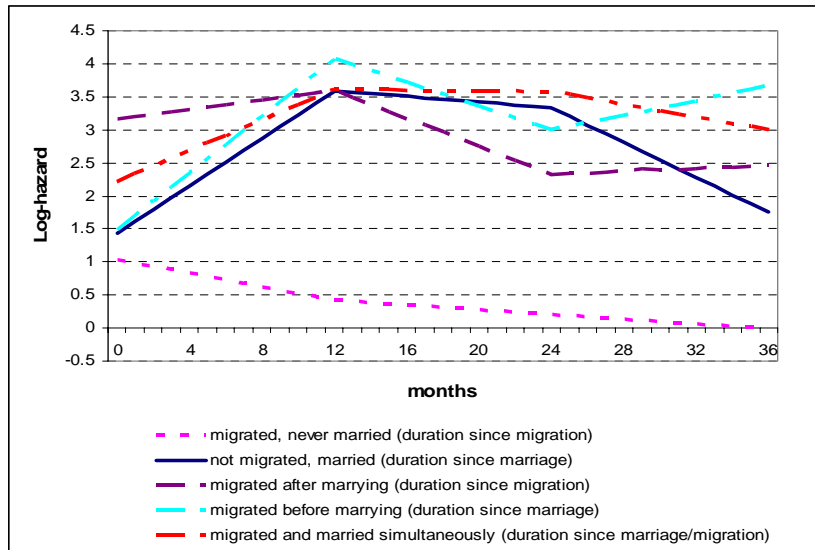
Europeans in our study are thought to be most ‘westernized’ in terms of family building behavior and thus ‘russification’ serves as a marker of Asians’ cultural and demographic westernization, operating through the socialization process, as language and related cultural norms and values are often learned from parents and through everyday communication (as a necessity/opportunity to speak Russian, which is the language of interethnic communication in the country, is related to a presence of Russian-speakers in the respondent’s network).

Results

Multiple clocks in the analysis of the first-birth propensity

When considering interconnected demographic events one inevitably faces the problem of ‘multiple clocks’, i.e. dependence of the propensity of interest on several durations. Hoem and Nedoluzhko (2008) presented a known technique for dealing with such multiple clocks. Figure 1 illustrates an application of this technique: beside the respondent’s age, we keep track of time since marriage and time since migration, and we account for the sequence of these events in modeling a first birth. With an aim of empirical comparison we estimated (in the same model) five duration splines that correspond to first-birth propensities of those respondents who: (1) migrated without being married; (2) married without experiencing migration; (3) migrated after marriage; (4) migrated before marriage; and (5) migrated and married in the same month (marriage related migration).

Figure 1: Effects of duration since migration and since marriage on the first-birth propensity, women aged 18-29



Note: controlled for age, ethno-cultural background, education, and employment.

Notably, all the splines that refer to the married respondents resemble each other closely, meaning that regardless of whether a woman migrated (before, after or for marriage) or did not migrate, her risks of getting a child dramatically increase as soon as she gets married. Relatively high at marriage and rising within the first year of the registration of a union first-birth propensities can be explained by the ‘contribution’ of out-of-wedlock pregnancies.

Splines for married non-migrants and for those who moved and married in the same month have very similar shapes, i.e. whether marriage resulted from migration or not, it exerts quite similar influence on the first-birth propensity. Because the latter spline has higher values at low durations of marriage, we can conclude that there is no disruptive effect related to migration.

We find no evidence of a ‘disruption effect’¹ in the case of non-married migrants either, because for them first-birth propensities are in general higher than for non-married non-migrants (which is the reference category at level 0). Two possible explanations for this finding are:

a) There might be a contribution to the respective spline of migration that, similarly to marriage related migration (as we define it) results in elevated first-birth risks. For instance, migration and the birth of a child can be closely spaced in time if a woman moves to enter a cohabitational union or a union formed by a religious ceremony, or if her marriage follows shortly

¹ Ideally, to test the ‘disruption’ hypothesis one needs to model first conception and not first birth as we do in this paper. Hoem and Nedoluzhko (2008) presented such a model, but it also reveals no disruptive effect. Modeling of the first conception, however, has a serious shortcoming as it cuts off from the model the events motivated by pregnancy. Because in the current paper we consider the links between demographic events, we opt for modeling the first birth.

after migration, but not necessarily in the same month. Couple migration is also likely to be associated with high first-birth risks;

b) Migrants are characterized by an earlier age at first birth than non migrants. This supposition makes sense when we take into account the fact that the majority of migrants are from rural areas, where the mean age at first marriage and first birth is lower than in urban settlements.

One more question to be answered here is whether for those who experienced both migration and marriage (but not in the same month) the first-birth propensity depends on the sequence of these events. Note that using a specification like (1) we assume that there is no such dependence. To estimate splines picking up respective effects we must expand (1) by adding a term that allows to differentiate between (i) those who first experienced migration and then marriage and (ii) those for whom the order of these two events was the reverse (Hoem and Nedoluzhko 2008). For the former, the effect of duration since marriage is estimated and for the latter, the effect of duration since migration. The corresponding splines are rather distinct, particularly for the first year since marriage (or since migration, respectively). A simple explanation of this finding is the time spent in the marital union: those who first married and then migrated¹ enter observation with some experience of marital life (and thus have considerably higher propensity at low durations since entry into the current state), while for those who first migrated and then married, the spline ‘kicks in’ only at the time of first marriage. For them propensities steadily increase within the first year – the same pattern that we have already seen in the example of other splines picking up the effect of marital union duration.

The spline corresponding to the first-birth propensities of never married migrants is considerably different from all other splines presented in the Figure 1, in that contrary to them it reflects the effect of not being married.

The close similarity of some of the splines in Figure 1 allows us to reduce their number from what we present in the figure. Thus splines picking up the effect of marriage for migrants and non-migrants (including those who experienced these two events in the same month) are basically the same, i.e. they provide no more information than if we just estimated a single spline for all married women regardless of their migration experience. Splines for duration since migration by marital status of the respondents are rather distinct from each other and thus should be estimated separately.

¹ There are few respondents in this category; therefore the corresponding results should be treated with caution.

Transition to first and second births

Our results for the transitions to first and second births are presented in Table 1. They show clear ethno-cultural differences in the fertility behavior of the respondents. Asians are more likely to delay birth of a first child but have much higher propensity to have a second child compared to Europeans. The latter fact simply reflects the difference between low and high fertility groups in our study population. The risks of a second birth for russified Asians are 80 percent lower than for non-russified Asians, which might be the result of either delayed second birth or limitation of the family size by the former group. First-birth risks for married women are more than 17 times higher than for never married women. In the model of second birth the effect of marital status appears much more moderate due to the difference in reference categories for the ‘marital status’ covariate. While in the model of first birth the ‘never married’ category refers to all women who have not yet been married (including those who do not have a permanent sexual partner); in the model of second birth the same category is limited to women who have already had their first child and thus are likely to be in a cohabitational or other type of unregistered union.

Table 1 Relative risks of first and second births, women aged 18-29

	First birth	Second birth
Ethno-cultural background		
European	1	1
Russified Asian	0.74**	1.90**
Non-russified Asian	0.83	2.69***
Employment		
employed	1	1
non-employed	1.54***	1.24
Education		
in education	1	1
out of education		
general secondary education	1.99***	1.04
vocational or higher	1.76***	0.95
Marital status		
never married	1	1
in the first marital union	17.55***	1.57*

Note: The model of first birth also controlled for women’s age; the model of second birth for the age of the first child.

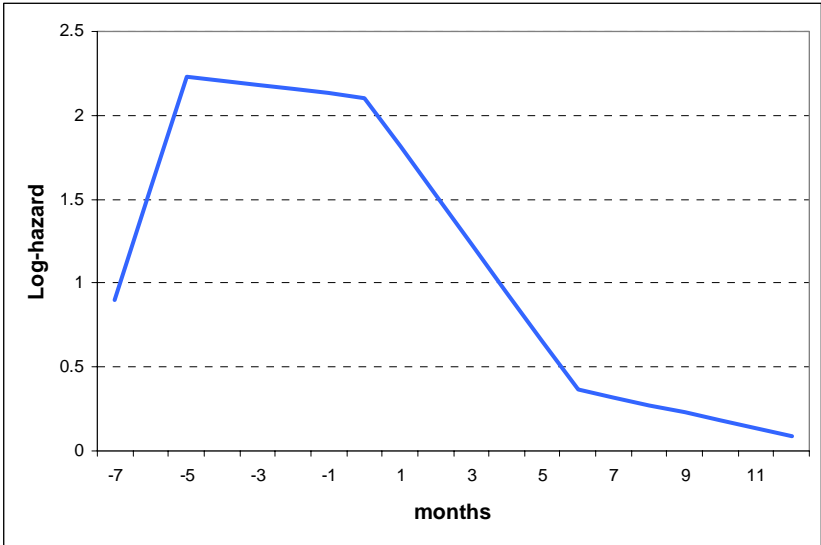
Employment tends to be related to delayed childbearing. Women are also likely to delay birth of a first child till completion of their education, i.e. the incompatibility of educational enrollment with childbearing reported for other settings (Edwards 2002, Baizan *et al.* 2004, Kantorová 2004) applies to Kyrgyzstan as well. Educational attainment has a relatively moderate

negative influence on first-birth risks. At the same time, neither education nor employment has a statistically significant effect on the propensity to have a second child.

Transition to first marriage

We first test the hypothesis that out-of-wedlock pregnancy is related to high marriage risks. Figure 2 depicts the duration effect of pregnancy/age of the first child on the propensity to get married. Marriage risks increase starting from the first months of pregnancy, peak in the middle of pregnancy and decline slightly during its last months. The dramatic drop of marriage risks right after birth of a child indicates that ‘single’ mothers have difficulties in finding a marriage partner or in converting a non-marital partnership into marriage. Results very close to the ones we present here were previously reported for women in Sweden and Germany (Baizan *et al.* 2004) and apparently are of a universal nature.

Figure 2: Duration effects of pregnancy/age of the first child on first marriage, women aged 18-29



Note: controlled for age, ethno-cultural background, education, employment, and migration experience. The X-axis reflects time before (negative X-values indicate a pregnancy) and after (positive X-values indicate the age of a child) childbearing; month 0 is the month of childbearing.

To account for the effect of a pregnancy on the propensity to get married, we can also include the respective covariate in the model. Thus Table 2 shows that the marriage risk for pregnant women is almost 8 times higher than for childless women and for ‘single’ mothers – a result suggesting that pressure to have children within marriage in Kyrgyzstan coexists with acceptability of premarital sex. As for the other individual characteristics that we control for in the model, the most interesting results are related to educational attainment. More educated women in

our study have higher marriage risks than less-educated women. This finding obviously challenges a common Western assumption that good educational attainment and related employment prospects reduce a woman’s benefits from marriage, enhance her ability to remain single and, respectively, lower marriage risks (Thornton *et al.* 1995). In our setting, however, it comes as no surprise: early age at marriage and traditional family values still prevailing in Kyrgyzstan explain why women ‘rush’ to get married right after completion of higher (i.e. most prolonged) education so that they would exceed the acceptable marriage age. Women enrolled in education tend to delay marriage. There is no effect of employment status on the propensity to get married.

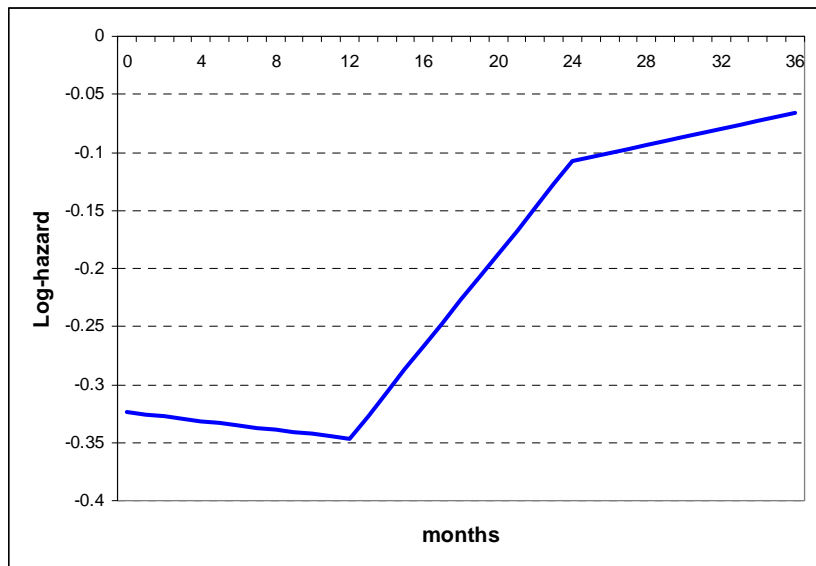
Table 2 Relative risks of first marriage, women aged 18-29

Ethno-cultural background	
European	1
Russified Asian	1.08
Non-russified Asian	2.30***
Employment	
Employed	1
non-employed	1.08
Education	
in education	1
out of education	
general secondary education	1.60***
vocational or higher	2.32***
Pregnancy/parity status	
no children (not pregnant)	1
first pregnancy	7.88***
one child	1.05
Migration experience	
not migrated after age 15	1
migrated after age 15 (any migration)	0.87

Note: controlled for age

The effect of migration experience is not statistically significant. However, to provide more insights into the link between marriage and migration, we estimate the corresponding duration spline (see Figure 3). Supporting our expectation that recent migration is associated with a low propensity to get married (i.e. with a ‘disruptive’ effect), marriage risks of migrants start to increase only one year past migration gradually approaching the level of non-migrants (the reference category at level 0).

Figure 3: Effects of duration since migration on the risk of first marriage, women aged 18-29



Note: controlled for age, ethno-cultural background, education, employment, and pregnancy/parity status. Marriage related migration (i.e. migration that took place in the same month as the marriage) does not contribute to this spline.

The ‘ethno-cultural background’ covariate again proves out to be a strong determinant of family building strategies; it indicates that non-russified Asians are less likely to delay marriage than the other two groups of our study population¹. The results in Table 3 provide further insight on ethno-cultural differentials of marital behavior. Non-russified Asians have the highest marriage risks regardless of parity. The difference between Europeans and russified Asians is noticeable only at first pregnancy, i.e. in critical situation. The first pregnancy which is a critical cultural test stacks three groups of our study population in an order reflecting the strength of the pressure to marry before the birth of a child. As expected, this pressure is strongest for non-russified Asians, weakest for Europeans while russified Asians hold an intermediate position. In the case of the ‘one child’ category, the ethno-cultural differences are much less pronounced, as this is already a very select group, namely those who resisted cultural pressure to get married at first pregnancy. In any case, this group constitutes only 2.6 percent of our sample.

Table 3 Relative risks of first marriage, women aged 18-29: risks by ethno-cultural background and pregnancy/parity status (interaction effects)

Pregnancy/parity status	Ethno-cultural background		
	European	Russified Asian	Non-russified Asian
no children	1	0.99	2.21***
first pregnancy	5.67***	12.92***	16.35***
one child	1.11	0.67	2.70***

Note: controlled for age, education, employment, and migration experience

¹ We interpret the relatively low marriage risks as an indication of delayed family formation and not as a possible retreat from marriage, because in Kyrgyzstan almost everyone eventually marries. Thus, according to the 1999 census, only 2.0 percent of women at age 45-49 had never been married (Denisenko 2004).

First internal migration

Table 4 presents the results for first migration within the country. The relative risks of experiencing this event are higher for the respondents of Asian origin, most of whom in our study are ethnic Kyrgyz, reflecting the ethnic composition of migration flows. Non-employed women have higher propensity to migrate than employed women, i.e. migration is likely to be driven by the desire to find a [better] job. Women who completed higher education or the intermediary educational stage have higher migration risks than those who are still studying.

Table 4 Relative risks of first migration, women aged 18-29

Ethno-cultural background	
European	1
Russified Asian	2.62***
Non-russified Asian	3.29***
Employment	
employed	1
non-employed	2.34***
Education	
in education	1
out of education	
general secondary education	2.22***
vocational or higher	2.67***
Marital status	
not married	1
married	0.49***
Pregnancy/parity status	
no children (not pregnant)	1
pregnancy (any)	2.28***
child(ren)	1.12

Note: controlled for age

With respect to educational attainment, contrary to our expectation, we find that women with university degrees are more prone to migrate. This result suggests that such women might have a more positive perception of their prospects related to migration than less educated women. One can also argue that the well-educated can better afford to move, if educational attainment is taken as an indicator of earning opportunities.

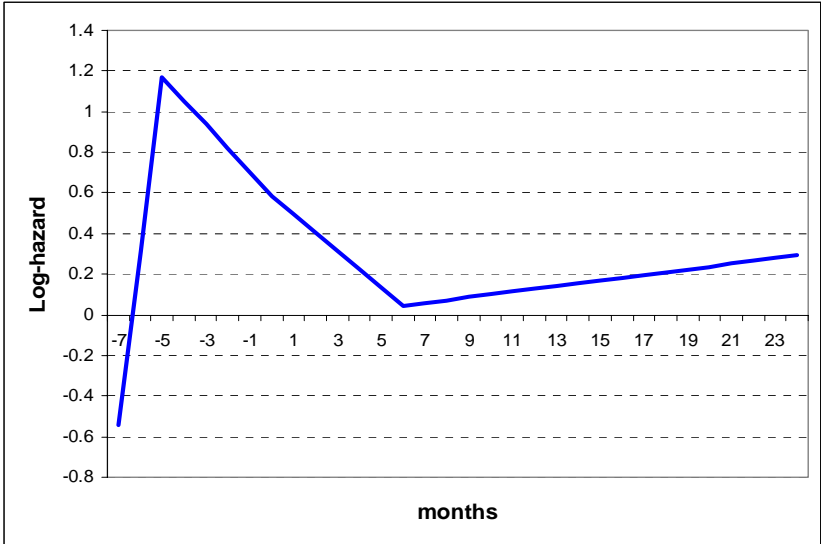
We also found lower migration risks for married women: apparently responsibilities related to family life limit married women's mobility. This finding suggests a lower propensity toward couple migration versus moves by individuals. It can also indicate gender differences in migration behavior: we would anticipate that for married individuals temporary migration is more likely to be driven by male partners. Bearing in mind the specificity of our data (i.e. the young age of the respondents and the fact that most moves were reported as motivated by study), we propose another

possible explanation: marriage itself might be a manifestation of particular preferences or choices – in favor of family life over an educational/employment career that often involves migration.

Our results for the pregnancy/parity status covariate show that pregnant women have migration risks more than twice higher than childless non-pregnant women and mothers. Though migration in such cases can have various motivations, we argue that family formation is the main of them: pregnant women migrate before the birth of a child in order to marry/join a partner residing in another settlement.

Figure 4 depicts the duration effect of pregnancy/age of the youngest child on the propensity to migrate. Migration risks dramatically increase in the early months of a pregnancy, reaching the maximum value in the middle of pregnancy (in the 5-th month) and then drop. Having a newborn baby, not surprisingly, entails low migration risks.

Figure 4: Effects of the pregnancy/age of the youngest child on first migration, women aged 18-29



Note: controlled for age, ethno-cultural background, education, marital status, and employment. The X-axis reflects time before (negative X-values indicate a pregnancy) and after (positive X-values indicate the age of a child) childbearing; month 0 is the month of childbearing.

Summary and discussion

Our study extends existing research on the dynamic interplay between demographic events and adds to the sparse knowledge on marriage, childbearing, and migration in post-Soviet Central Asia. Some of our results (e.g. the delay of family formation by studying individuals, a dramatic increase of first-birth risks associated with marriage, and high marriage risks of pregnant women) seem to be universal as they agree with evidence from a large number of studies. However, other results reveal the specifics of the population under study.

With respect to the triangular link between demographic events, the most interesting, though not entirely surprising, result of our study is the high propensity toward internal migration among pregnant women. Another factor also pointing to the tendency to migrate while pregnant is the relatively high first-birth risk shortly after migration (particularly among those who migrated to get married). Clearly, migration is a part of a family building strategy: women migrate to join a partner and, just like marriage itself, marriage-related migration is sped up by an out-of-wedlock pregnancy.

Though marriage-related migration seems to be an obvious explanation for the increased first-birth risks of recent migrants, we believe that this issue deserves special attention as it connects migration, marriage, and childbearing. Following up on the analysis by Hoem and Nedoluzhko (2008) of the role of marriage as a mediating process between migration and childbearing, in this study we compare various duration effects of marriage and migration on the first-birth propensity. The results indicate that married women have very similar first-birth risks irrespective of their migration experience, which suggests that in the case of marriage-related migration, migration is simply a mechanism that joins the partners and does not interfere to any considerable degree with the connection between marriage and onset of childbearing.

As we expected, recent migration is associated with low marriage risks. Though the respective results are not statistically significant, they suggest that a disruptive effect of migration on fertility, which is often discussed in the literature (e.g. Goldstein and Goldstein 1984), might occur not only because migrants delay birth of a child but also because they delay marriage, and as such, is an issue to be taken into account when dealing with the migration of single individuals.

The results concerning the ethno-cultural background of the respondents are specific to our study population; they indicate pronounced differences of family-building strategies among Europeans, russified Asians, and non-russified Asians. The distinctions between the two Asian subgroups are particularly intriguing as they reflect the degree of cultural and demographic westernization and, respectively, the degree of adherence to traditional family norms and cultural pressures related to them. Obviously what we see are the manifestations of these differences in family formation choices; the norms, values and attitudes shaping these choices require special investigation.

Russified Asians, as we hypothesized, tend to occupy an intermediary position between the two other groups in our analysis, i.e. to have risks of experiencing the events of interest which are in general higher than the corresponding risks among Europeans and lower than those among non-russified Asians. On most indicators, however, Asian subgroups are closer to each other (though with considerable gaps between them) than to Europeans. Even in some instances, such as marriage

risks, where russified Asians appear to be more similar to Europeans, there are hidden differentials which become evident when we account for interaction effects between ethno-cultural background and pregnancy/parity status covariates: the effect of out-of-wedlock pregnancy on marriage propensity is much stronger for Asian subgroups than for Europeans, i.e. the ethnic gulf between Europeans and Asians is again wider compared to the cultural gap between russified and non-russified Asians.

Our analysis also indicates the positive association between educational attainment and marriage: women with university education have the highest marriage risks. We explain this finding by the cultural pressure to marry at a ‘proper age’: the mean age at marriage for women is relatively low in Kyrgyzstan, and the completion of higher (i.e. most prolonged) education takes place around this age. Still, there is always room for an alternative explanation: better educated women can simply be more attractive as potential marital partners (South 1991). Along with the lack of effect of employment, the positive correlation between educational attainment and the marriage risk contradicts the notion of high educational level and labor force participation as proxies for economic independence and the corresponding assumption that well-educated, employed women can better afford either not to marry or to spend more time searching in the marriage market for a suitable partner and, therefore, should have relatively low marriage risks (Preston and Richards 1975, Oppenheimer 1988, Oppenheimer and Lew 1995). Our results also challenge the assumption that in societies with sharply differentiated gender roles, such as Kyrgyzstan, the association between economic independence (approximated by educational attainment and employment) and marriage should be negative among women because for them in such situations it is difficult to combine career and family life (Blossfeld 1995, Raymo 2003). We would argue though that in the context of poor labor market prospects (i.e. a high unemployment rate and a high prevalence of low-paid jobs), neither an achieved educational degree nor employment can serve sufficiently well as a proxy for economic independence.

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