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Ethnic-specific Reproductive Behavior in Independent Kazakhstan

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Abstract: This study examines the risks of first, second and third birth in Kazakhstan since the collapse of the Soviet Union through general and ethnic-specific perspectives. Special attention is paid to the economic recovery time after 2000. The most remarkable finding is the similarity of the paces of first, second and third birth risks among the major ethnicities of Kazakhstan across the time periods. In particular, continued declines of first birth risks and slight increases of second birth risks occurred in tandem for all ethnic groups during the economic recovery period after the turn of the century.

Keywords: Fertility, Ethnicity, Kazakhstan, Economic Crisis, Economic Recovery

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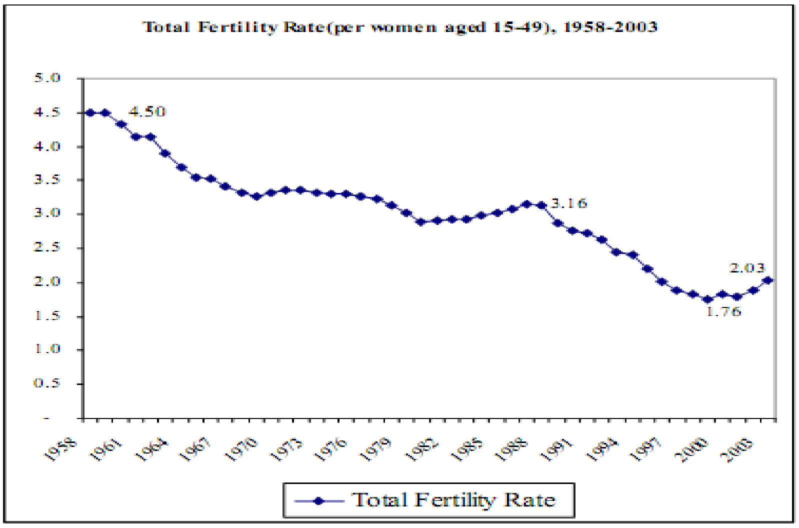
Introduction

Kazakhstan is one of many countries of the post-communist region that experienced fertility decline, which has been explained in various ways, such as worsening economic conditions (Kohler and Kohler, 2002), ideational changes corresponding to the second demographic transition (Zakharov and Ivanova, 1996; Zakharov, 2008) or uncertainty driven postponement transition (Kohler et al. 2002).

Figure 1: Total fertility rate in Kazakhstan, 1958-2003



Source: Becker and Seitenova.2005

Like the other countries of the former Soviet Union Kazakhstan passed through economic crisis during the transition to market economy. The following changes characterized this period: setback in production, growth of unemployment, acceleration of inflation, and deterioration of standards of living. In addition to the high uncertainty in the markets there were huge wage arrears in Kazakhstan until the end of the XX century. Thus, by 1998 Kazakhstan had budgetary arrears equivalent to 5 per cent of GDP (Alam and Banerji, 2000). Moreover, in comparison with the relatively generous welfare regime of the Soviet time the institutional factors in the independent state, such as childcare subsidies, taxation policies and other forms of family support degraded to an enormous extent during the economic crisis of the 1990s. It is very likely that all these structural and institutional changes influenced the fertility outcomes of the country.

Table 1: Macroeconomic data, Kazakhstan 1991-2003

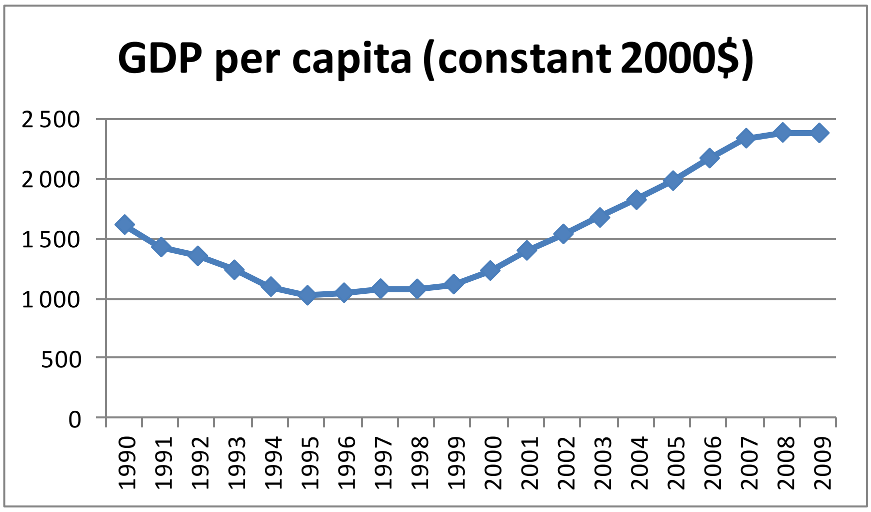
MACROECONOMIC DATA
(a) *Output Growth and Inflation (%)*

	1991	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2002* (1989 = 100)
Growth in Real GDP	−11	−5	−9	−13	−8	1	2	−2	3	10	14	10	9	86
Inflation	79	1,381	1,662	1,892	176	39	17	7	8	13	8	6	6	

Source: Pomfret, 2005.

Reversal trends occurred after the turbulent 1990s and the state was able to manage wage arrears and unemployment and decrease inflation. Thus, during the economic recovery and growth time since 2000 employment became more available (see figure A in Appendix) and wage arrears were reduced thereby increasing costs of leaving the labor market. On the other hand, improved economic conditions should have also increased the feasibility of childbearing.

Figure 2: GDP per capita, Kazakhstan, 1990 - 2009



Source: UNICEF's TransMonee database

However, not only the economic changes could be the driving forces of the fertility decline. After the collapse of the Soviet Union "Western" lifestyles and social norms penetrated post-communist societies through the huge influence of mass media (Sobotka, 2008) and brought behavior which could be associated with the second demographic transition. The imitation of new lifestyles could boost changes in reproductive patterns that have started earlier with immigration of European-origin people to Kazakhstan according to the 1954-1960's program of the development of the Virgin Lands of the country.

In addition to the above-mentioned processes which are associated with fertility decline, there is a significant ethnic-specific differentiation in the reproductive behavior among two major ethnicities of the country: Kazakhs and Russians. These two ethnicities have differed in reproductive behavior even in the Soviet time: Kazakhs had a more "oriental" family system, while Russians were closer to an "occidental" family structure. The nation-building characterized the independent time and Russians as a non-titular ethnicity may have perceived it as discriminatory. Indeed the 1990s were associated with the huge emigration of Russians and other European-origin people from the country. The effect of emigration of co-ethnics and discriminatory perception of the nation-building could lead to fertility adjustments of the minority group. Thus, the ethnic-specific factor could also be the driving force of the fertility decline.

The objective of this paper is to study the first, second and third birth risks in Kazakhstan. The main focus will be on the independence time while the reproductive patterns of the Soviet period will be a reference category, at least for the first parity. Special attention will be given to the time of economic recovery, which started since early 2000s. The period under investigation will allow studying two dimensions: the general and ethnic-specific fertility trends. Fertility trends during the economic recovery time could shed light on the general reasons of decline during economic crisis. Moreover, the ethnic gradient and a possible different reaction on improvements during the economic recovery could show coherence with the previous studies (Agadjanian 1999, Agadjanian et al., 2008) of the adjustments of the disadvantaged ethnic groups to the social and economic upheaval, while an absence of ethnic-specific deviations would suggest more universal changes of the Kazakhstani society.

Literature review/Theoretical perspective

Two main approaches, “assimilationist” or “social characteristics” perspective (Bogue, 1969 cited in St.John, 1982) and the minority group status hypothesis (Goldscheider and Uhlenberg, 1969), are employed extensively to describe ethnic differences in reproductive behavior. According to the former approach, different social, demographic and economic characteristics cause fertility differences between majority and minority groups. Moreover, when a minority group acquires corresponding characteristics of a majority group the reproductive behavior will converge with the patterns of the majority group. The conflicting approach suggests an independent effect of minority status even when corresponding characteristics become similar. Goldscheider and Uhlenberg (1969) point out that the independent role of minority group status was disregarded. Hence they elaborated a new perspective arguing that a disadvantaged and marginal status of a minority group has an independent effect on fertility outcomes. Some key conditions should be followed within a specific context to operate such an association:

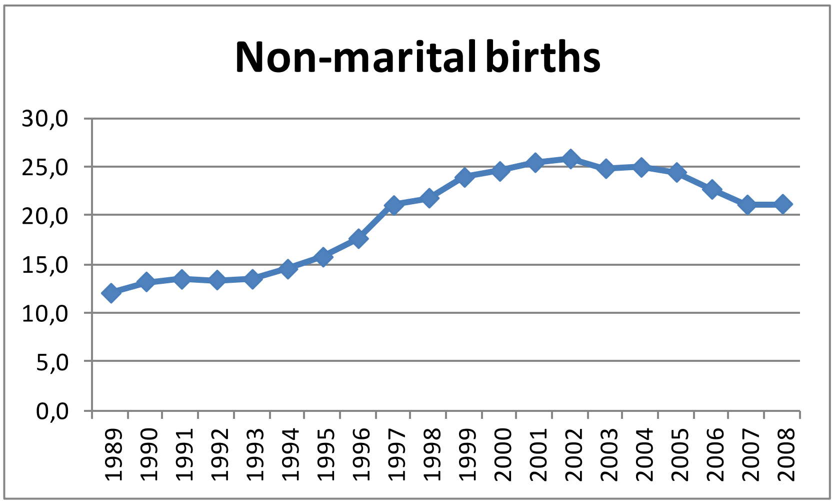
> (1) acculturation of minority group members has occurred in conjunction with the desire for acculturation; (2) equalization of social and economic characteristics occurs, particularly in middle and upper social class levels, and/or there is a desire for social and economic mobility; and (3) there is no pronatalist ideology associated with the minority group and no norm discouraging the use of efficient contraceptives (p.372).

Moreover, one of the main triggers of this relationship is an extent of marginalization of members of a minority group in comparison with members of the majority group. Nevertheless, both hypotheses could be quite contextual and reflect racial and ethnic differentials in the US context, while an applicability of these perspectives towards Russians in the context of the former Soviet Union republics is rather arguable. Russians were the biggest ethnic group in the whole USSR and in Kazakhstan they even outnumbered the titular ethnicity for a considerable period of time, that’s why they “hardly felt themselves to be minorities or outsiders” during hat time (Oka, 2007). However, the political transformation after the fall of the USSR could attach this status to them.

Taking into account that two ethnic groups have been different for a long period of time in their cultural attitudes towards family formation and reproductive behavior, more general theories of fertility decline are also relevant for understanding differences. Based on the initial cultural differences two ethnicities could perceive various societal and economic changes differently. Thus, one of the explanations of fertility decline is purely economic and it is associated with low incomes during the economic crisis time of the 1990s and a high cost of childbearing (Becker 1960, 1991). Meanwhile, several studies of the post-communist region (Kreyenfeld 2003, Sobotka 2008, Billingsley 2010, 2011 a) found that contrary to the economic crisis explanation further decline occurred under improved economic conditions due to further fertility postponement.

Another possible explanation is a change of values and attitudes associated with the Second Demographic Transition, SDT (Van de Kaa, 2002). SDT is characterized by lower commitment in relations, a postponement of marriage and first birth, a substantial decline in period fertility, partly resulting from postponement of births. People of Russian ethnicity could be more prone to the changes of values because they were on the higher stage according to the level of modernization, secularization and urbanization (Agadjanian and Qian 1997) even before the collapse of the USSR. Indeed, some researchers argue that the second demographic transition is on the way in Russia (Zakharov and Ivanova 1996, Zakharov 2008). Assuming that Russians of Kazakhstan were not really different from co-ethnics in Russia the same processes could be on the way in Kazakhstan as well. In addition, the increase of such feature of reproductive behavior as non-marital births could also propose that changes in values and attitudes associated with SDT are ongoing in Kazakhstan.

Figure 3: Share of non-marital births (% of total live births), Kazakhstan,1989-2008



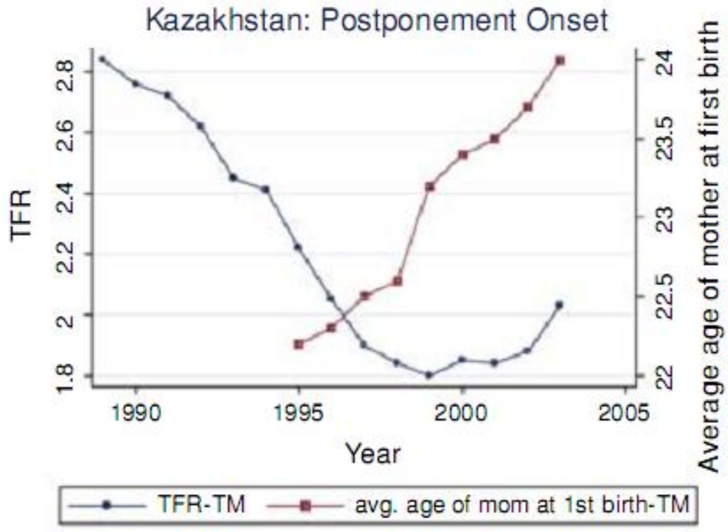
Source: UNICEF's TransMonee database

Further researchers elaborated more inclusive explanations of the fertility decline in the post-communist region. Thus, Sobotka (2008) points out that some countries of the region could follow the second, not the classic pathway of SDT when behavioral changes preceded changes of values. Thereby a decline of fertility and the changes of reproductive behavior during the economic crisis time could lead to an alteration of the cultural dynamics during the economic recovery time. Quite similar, a so-called "root cause" explanation is given by Frejka (2008), who argues that the political and economic changes altered norms and attitudes in Central and Eastern Europe. In addition, a cross-sectional macro-data analysis of Billingsley (2010) shows that the fertility decline across the post-communist region from 1990 to 2003 cannot be fully explained by only one theoretical perspective, either by the economic crisis, SDT, or economic uncertainty-driven postponement. It is more probable that some explanations are relevant to some points of time during the transition while other could drive the fertility patterns at other periods of time. Billingsley (2010) finds that a postponement ratio[1] for Kazakhstan was 1 in 1989 and decreased in the early 1990s and even further in the late 1990s. A modest increase to 1.3 occurred in the subsequent period. In this macro-data analysis Kazakhstan belongs to a group of countries that also includes Belarus, Georgia, Moldova, Romania, Russia and Ukraine. Billingsley proposes

[1] a sum of live births to women ages 25+ over the number of live births to women ages 15-24

that postponement occurred in these countries by the end of the 1990s, and that only very recent fertility developments can be explained by the postponement transition, while the economic crisis is a more credible explanation for the trends in the 1990s. Moreover, a deterioration of economic conditions could cause stopping behavior, while improvements in the economic context could lead to postponement.

Figure 4: Postponement onset and TFR in Kazakhstan, 1989-2003

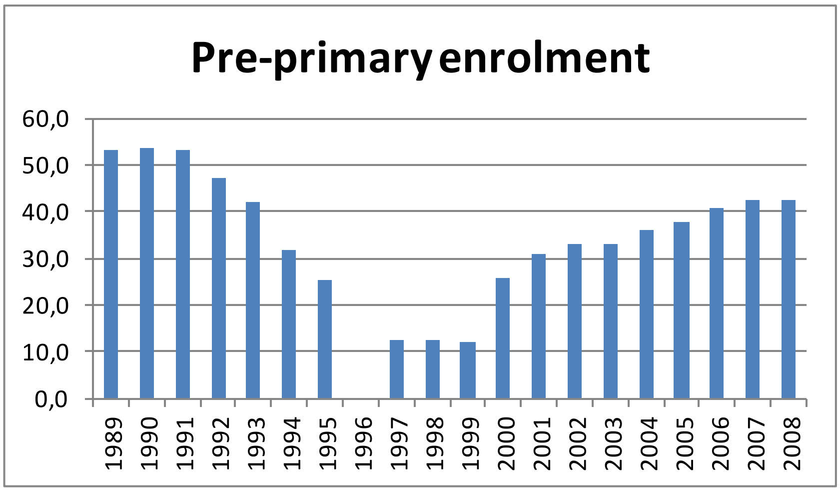


Source: Billingsley, 2010

While the transition to first birth can be associated with postponement of parenthood or choice of childlessness, the transition to second and third births can be driven by the desire of fewer children or increased constraints to realizing the desired family size, that could lead to stopping behavior or postponement of childbearing. Thus, economic circumstances can influence not only decision of first childbearing but also the timing of the next childbirth. According to Hotz et al. (1997), parents will prefer to have the next child under high income conditions, and this will increase the incentive to space birth. Another way is that parents will postpone the subsequent child until the price of childbearing is low. Consequently, there is a possibility that the previous postponement of higher order births during the economic crisis time could have caused a subsequent modest increase in TFR in Kazakhstan.

In addition, during the economic recovery time an improvement of institutional factors such as pre-primary enrolment of children may have influenced the decision and timing of subsequent childbearing. With higher opportunities of child care provision during the economic recovery women may have more desire to have another child because they are not obliged to leave the labor market for a longer period.

Figure 5: Pre-primary enrolments (net rates, % of population aged 3-6), Kazakhstan, 1989-2008



Source: UNICEF's TransMonee database, information about 1996 is missing

For a better understanding of possible differentiation in perceptions of the above-mentioned processes it is important to take into account the historical continuity and differences in culture, religion, values and attitudes towards family and childbearing between Kazakhs and Russians. It is also crucial to understand the local context and new policy directions in nation-building. This is described in the next section.

The case of Kazakhstan

Kazakhstan went through the classic demographic transition with relatively fast speed, at least according to its fertility decline: the Total Fertility Rate (TFR) was 4.5 in 1960, 3.0 in 1979; 2.7 in 1990; 2.03 in 2003 (Gali, 2002). In addition, the fertility level of Russian women was always below the level of Kazakh women. As regards the TFR of women of Kazakh ethnicity, it was the highest in the entire Soviet Union in the end of 1950s (7.4), it decreased to 4.8 in the end of 1970s (Alekseenko, 2004). Further, TFR of Kazakhs and Russians were 3.58 and 2.24 respectively in 1989, while in 1999 the TFR of Kazakhs was 2.5 and for Russians it was 1.38[2]. This can be explained by differences in cultural and religious norms and attitudes towards family formation and reproductive behavior.

To understand the differences between Kazakhs and Russians it is crucial to know some traditions of Kazakhs regarding kinship ties, family formation, childbearing and gender roles. Making a start from the nature of ethnic relations in the Soviet Union and the dominance of Russian culture and language, the breakdown of the USSR resulted in searching for self-identification by Kazakhs. The restoration and preservation of traditions played an important role in this. It is arguable to assert that Russians follow the European trend of gender equity and other important value systems, but at least they are closer than Kazakhs to European patterns of reproductive behavior. Research on the developments of Russians from the first to the second demographic transition partly confirms this (Zakharov, 2008).

To understand the role of others and the influence of social networks, it is important to consider that in spite of cultural Russification during Soviet time Kazakhs retain a strong sense of heritage. In general, Kazakhs keep extensive information about their genealogy, which is traced back on the male side. Moreover, we can observe the traditional importance of family and kinship ties in the grandparents influence. It was formerly the custom among Kazakhs to give a first-born child to the child's paternal grandparents after weaning to ease the burden involved in rearing children. Despite the fact that nowadays children usually grow up in their parents' home, grandparents have kept their customary caregiver's role (DLILFC report 2009).

Gender roles can be observed in family formation and the status of daughter-in-law. Traditionally parents and kinship members arranged marriage. Though nowadays it is rare that marriages are strongly arranged in this way the approval of parents is crucial. Such concept as "kalym" (in Kazakh), or bride price in exchange for the bride and her dower still exists, while

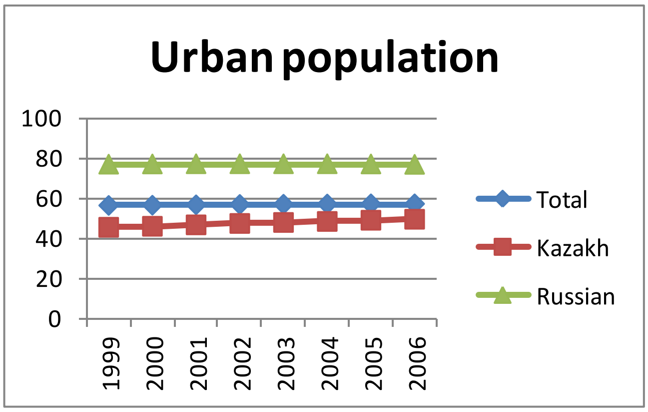
[2] Kazakhstan: Demographic and Health Survey, 1999 Final Report

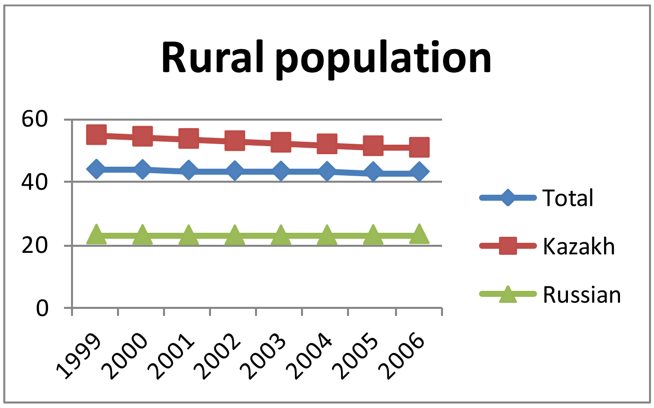
another tradition to avoid the process of familial arrangements, “alyp qashu”, or bride kidnapping, literally “take and run”, still happens mostly in Southern Kazakhstan. Moreover, the term “kelin”, or daughter-in-law, also has a special meaning in the Kazakh language. Literally it is an “incomer” and reflects a woman’s origins from a different kinship (Werner, 2003)

We can observe divisions between “strong” and “weak” family systems. Thus, as opposed to Russians, Kazakhs have stronger kinship ties, larger families, which of course influence fertility patterns through the impact of parents on fertility intentions and the peer effect of ideal family size. There is more pressure from older generations and kinship among Kazakhs than among Russians. Thus the influence of others (Watkins, 1990) is stronger among Kazakhs. Thereby we can expect that the structures of interpersonal communication can play a more significant role in reproductive behavior of Kazakhs.

A certain spatial variation and regional differences can be observed even among Kazakhs. Those Kazakhs who live in northern and eastern parts of Kazakhstan, that are geographically closer to Russia, have more convergence in attitudes and values with Russians than Kazakhs who live in the southern and western parts of Kazakhstan, which are closer to other Central Asian states. The same holds for rural-urban differences. Most urban centers of Kazakhstan are to a large extent the result of the Russian and Soviet development and thus most Russians are urban. Migration streams into the region during the Soviet period were concentrated in the central cities. As a result, the rural areas are more ethnically homogeneous than the urban, with the exception of northern Kazakhstan (Buckley, 1998). Thus, during 1999-2006 we can observe that there is a stable percentage of urban Russians – 77%, while a percentage of urban Kazakhs only slightly increased from 45.4 % to 49.4 %.

Table 6: Urban and rural population in Kazakhstan, 1999-2006





Source: Agency of Statistics of the Republic of Kazakhstan

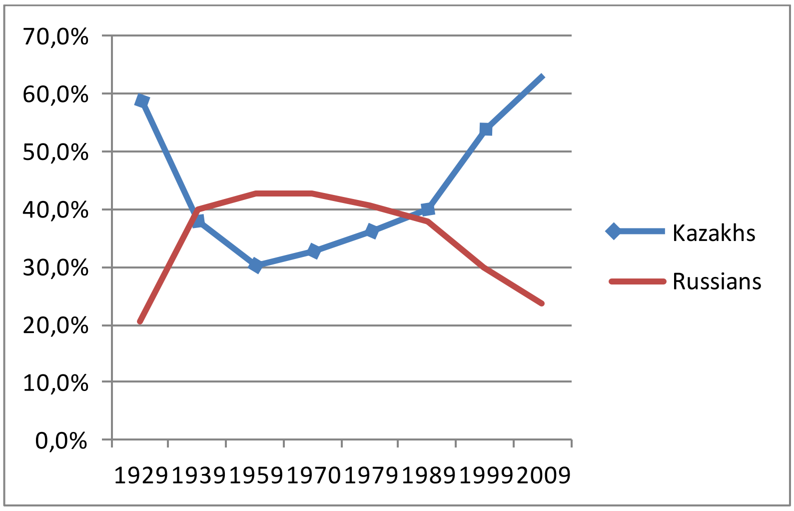
In addition, it is important to take into account an increase of religious attitudes among Kazakhs after the collapse of the Soviet Union. Traditionally most Soviet people were counted as non-believers even if this was not the case and there was less influence of religion in the Soviet time. After the collapse of the Soviet Union, Kazakhs were searching for their own identity and increasing religiousness was one of the steps. This factor could be associated with preserving reproductive behavior from significant drops even in the crisis time. Muslim norms and values could preserve intentions for larger families and stimulate childbearing. Thus, Telebaev (2003) found that ethnic groups stating their closeness to Islam were generally more religious than those close to Russian Orthodox Church or Catholicism. The results on religious affiliation, by ethnicity, of a sociological survey conducted in 2002 are available in table A in Appendix.

The last issue that could influence the fertility decline is the political transformation, which in previous literature is extensively related to the decline of fertility among Russians (Agadjanian and Qian, 1997; Agadjanian, 1999; Agadjanian et al., 2008). The collapse of the

Soviet Union led to cardinal changes in self-identification of the people of Kazakhstan regarding their ethnicity, religion and nationality. Moreover, economic crisis and deterioration of standards of living accompanied the process of nation-building. Under such conditions, people who belonged to ethnic minorities felt that they were treated differently. Especially the language reform and initiation of implementation of the Kazakh language was counted as discriminatory. Indeed, many scholars define the Russian emigration during the 1990s as an indicator of ethnic tensions and discrimination. It is important to give some background information for understanding the nation-building and Russians' reactions to it.

During Soviet time there was an officially sponsored inter-republic migration (Rakowska-Harmstone, 1977). A big influx of Russians and other European origin people occurred during the 1954-1960's program of development of the Virgin Lands in Kazakhstan. The linguistic prevalence of Russian language in all Soviet cities boosted Russian mobility and allowed Russians to perceive the entire Soviet Union as their motherland (Oka, 2007). Kazakhstan was even a unique case among the other Soviet republics because Russian and other European-origin people outnumbered the titular ethnicity for a long time. From the population composition in figure 7 we see that people for a long time actually found themselves as living in a predominantly Russian republic, culturally closer to Russia than to Central Asia.

Figure 7: Population composition of Kazakhstan, 1929-2009



Source: constructed on the data from Agency of Statistics of the Republic of Kazakhstan and *Demoscope Weekly*, 2003

As a result, the subsequent implementation of Kazakh language was perceived as discriminatory and Russians emigrated in large numbers. Nevertheless, it is important not to exaggerate the purely ethnic tension factor; a significant decrease of the Russian emigration after the beginning of economic recovery in the early 2000s supports the argument that previous emigration was caused mostly by economic reasons. Still, an uncertainty of the future and the economic difficulties resulted in the emigration of “less rooted” Russians. Thus, Sadovskaya (2006) argues that in the 1990s mostly there were more people among emigrants who were not deeply rooted in Kazakhstan society and were suspicious about the future ethnic policy with increasing usage of Kazakh language and Kazakh identification. The degree of “rootedness” is very important, because it is crucial to differentiate Russians who came to Kazakhstan during the mid-XX century immigration, from those who lived there for generations (the descendants of those who came in XVIII and XIX centuries). The Russian ethnic group is not homogeneous and different people accepted changes differently primarily because of their different degree of “rootedness” in Kazakhstan. Many Russians in Kazakhstan reacted to their new minority status in other ways. They begun cultural and linguistic assimilation, become loyal to the new state, and even developed a double “Russian-Kazakh” identity **(**Peyrouse, 2007)**.** Those Russians’ families have lived in Kazakhstan for many generations and feel themselves "indigenous". They have their roots in Kazakhstan and have less connection with Russia as their "historical motherland". Peyrouse (2007) argues that these "historical" Russians will prefer to remain in Kazakhstan.

A very detailed demographic analysis of the ethnic differences in Kazakhstan was given by Victor Agadjanian (1999, 2008). He argues that people of Russian or other European origin were more vulnerable and politically and economically disadvantaged after the collapse of the Soviet Union and the beginning of independence of Kazakhstan and as a minority group their fertility adjustments were more noticeable than the adjustments of the titular ethnic group – Kazakhs.

In his early work (1999) he studied the ethnic differences in marriage and fertility in Kazakhstan, based on data from the Demographic and Health Survey 1995. For the purpose of the analysis Agadjanian defined two ethnic conglomerates – Europeans and Kazakhs. The first group includes ethnic Russians, Ukrainians, Germans, Belarusians, and other ethnic groups of European extraction. The second group is composed mainly of ethnic Kazakhs as well as small groups of other, closely related, indigenous Central Asian groups, such as Uzbeks and Uigurs. The author restricts the analysis to women who have ever been in a marital union with no live births prior the first union. The period under investigation is developed into two categories: married before 1987 and married after 1987, taking disturbances in the capital in 1986[3] as a benchmark. Assuming limited socioeconomic and spatial mobility Agadjanian uses information about educational level, type of employment, and place of residence collected at the time of the interview as control variables to study age at the first marital union and risk of having a first child over the above-specified periods. Ordinary least squares regression is employed to study age at first union while a proportional hazards model is used to examine the probability of having a first birth.

According to the findings the negative association between being a European and age at first marriage increases after the beginning of crisis. Another finding is that Europeans who married in or after 1987 experienced a particular increase in the interval before first birth, while education had no statistically significant effect on the hazard of having a first child. One of the findings refers to differences in contraception and abortion. Agadjanian finds that across time Europeans were 3.8 to 3.4 times more prone to use contraception than Kazakhs. Moreover, Europeans attempt to postpone first childbearing by using contraception, while Kazakhs use it for delaying second and higher order births. In addition, Agadjanian finds that 61 % of surveyed Europeans had at least one abortion in comparison with only 25 % of Kazakhs. The abortion ratios for second pregnancy also show this difference: more than 60 % among Europeans and

[3] Agadjanian refers to the clashes with the police in protest against the appointment of an ethnic Russian to the post of the first secretary of the Communist Party of Kazakhstan.

around 18 % among Kazakhs. The author argues that these results support the hypothesis about ethnic-specific reproductive responses to the social crisis and that Europeans were demographically more susceptible to the multifaceted crisis.

In more recent work (Agadjanian et al. 2008) the authors continue using the minority group status hypothesis and expect that fertility adjustments of disadvantaged Europeans to be more pronounced than for Kazakhs. Nevertheless, they urge the importance of contextualizing "short-term variations in fertility behavior within longer-term, secular fertility trends, thus establishing parallels with other cases of advanced demographic transition and thereby setting limits to 'crisis' interpretations of reproductive changes in post-Soviet societies" (p.231). In this study they examine ethnic-specific probabilities of having first, second and third marital births in Kazakhstan in the end of the XX century using the DHS Surveys of 1995 and 1999. Thus, the analysis excludes births that occurred before first marriage and also births to never married women. The authors define three ethnocultural groups in Kazakhstan: European (all ethnicities of European origin) and ethnic Kazakhs who are distinguished as Russified and non-Russified. Agadjanian and colleagues identify the cultural Russification of Kazakhs by using the language of the interview. Meanwhile, the authors assume that "language-use preference and corresponding cultural characteristics are established during childhood and adolescence" (p.216).

Agadjanian does not find a significant difference between non-Russified and Russified Kazakhs for the first parity progression. The same pace is found in the transition to the second birth where the probabilities among the two Kazakh groups are almost identical while Europeans show overall lower second-birth probability. Nevertheless, contrary to the minority-status hypothesis, all three ethno-cultural groups show the same pace of post-independence fertility decline. Regarding the transition to third birth, all three groups again show a noticeable decline with a more considerable drop for non-Russified Kazakhs who have the highest third-birth probability both in the beginning and in the end of the period.

We can observe in Agadjanian's work a shift from the categorical association of ethnic-specific differences with the disadvantaged position of Russians to taking into account a general trend of demographic transition and exposing specific features that can arguably be associated with the minority group status hypothesis. Based on more general theories but without denying the possibility of minority-specific reaction, I will study the reproductive behavior in independent Kazakhstan and pay special attention to the time of economic recovery since 2000. The economic recovery period can show how reproductive behavior and transitions to first, second and third births changed under improved economic conditions. This could also shed light on the previous behavior during the economic crisis time by revealing continued fertility-postponement trends. Thus, the study will follow the previous research but it will cover a longer period including the economic recovery time, it will use general perspectives rather than focusing purely on the minority status hypothesis and employ other data – MICS 2006 with a bigger sample: 14560 respondents in comparison with the 3771 in DHS 1995 and 4800 in DHS 1999 (Agadjanian et al. 2008).

The following hypotheses will be tested:

H1. Period relative risks of first birth would continue to decrease during the economic recovery time.

H2. The relative risks of first birth would change under improved economic conditions with the same pace for both ethnicities.

H3. Economic recovery time would be associated with increased second birth risks.

H4. Recovery of second birth risks would occur at the same pace for Kazakhs and Russians.

H5. The third birth risks would continue to decrease during the economic recovery time.

H6. The further decline of third birth risks during the economic recovery time would be more pronounced among Kazakhs than among Russians.

Data and Methods

Having retrospective data, an event-history approach is used to study general and ethnic-specific trends in fertility outcomes. The data is Kazakhstan Multiple Indicator Cluster Survey (MICS) "Monitoring the situation of children and women" 2006[4]. The Survey was administered from January through March 2006. 14 984 households out of 15000 selected for the sample[5] were found to be occupied. 14 564 were successfully interviewed for a household response rate of 97.2 percent. In the interviewed households, 14 719 women (age 15-49) were identified. Of these, 14 570 were successfully interviewed, yielding a response rate of 99.0 percent. Reporting is virtually complete with only 3.2 % of missing information on the date of first marriage/union formation (Kazakhstan MICS final report, 2006).

Only completed interviews will be used for analysis. Thus the sample consists of 14560 (98.8% response rate) women age 15-49 (10 cases/women were excluded because the interviews were only partly completed and there was no information suitable for the analysis). A random imputation was made for the following cases: missing month of birth of women (4 cases); missing month of first birth (19 cases).

After event-history format arrangements using Stata12 software[6] the total number of women eligible for analysis are as follows: first birth – 14532 (some cases out of initial 14560 were excluded if the first birth was earlier than age 15 or the same month she turned 15), second birth – 5619, third birth - 3408

Description of variables:

Woman's age is the basic time factor to study the risk of first birth and it is a time-varying variable. The trajectory is followed since age 15 until the arrival of the first birth or the

[4] It was conducted by the Agency of the Republic of Kazakhstan on Statistic in collaboration with the Republican State Enterprise "Data Computing Centre". Financial, methodological and technical support was provided by the United Nations Children's Fund (UNICEF) and with financial support of the United States Agency for International Development (USAID), the United Nations Population Fund (UNFPA), the UN Resident Coordinator Fund (UN ResCor) and the International Labour Organization (ILO). Initial dataset was made using the Statistical Package for Social Sciences (SPSS) software program, version 14, and the model syntax and tabulation plans developed by UNICEF for this purpose

[5] The number of Primary Sampling Units (PSUs) for oblast (territorial entity) and main cities depended on the total population at the beginning of 2005. At the first stage, the mentioned number of PSUs was randomly selected for each stratum. In general, 625 PSUs were selected within the country. At the second stage, 24 households were systematically selected in each sampled primary sampling unit. Thus, the total number of sampled households made 15,000.

[6] Stata Corporation, Data Analysis and Statistical Software

time of the interview, whichever comes first (the file consists only of women aged 15-49, so there is no need to create an upper age limit of 50).

Duration since first birth is the basic time factor to study the risk of second birth and it is a time-varying variable. The trajectory is followed since the first birth until the arrival of the second birth or the time of the interview, whichever comes first.

Duration since second birth is the basic time factor to study the risk of third birth and it is a time-varying variable. The trajectory is followed since the second birth until the arrival of the third birth or the time of the interview, whichever comes first.

Age at first/second birth is a time-constant variable to study second/third birth risks.

Ethnicity is one of the main predictors of the study and it is a time-constant variable. The actual description of the variable in the raw dataset is the ethnic group of household head, this is the best variable available in the dataset and it is used also for UNICEF reports on MICS data. There is also a variable "Mother tongue of household head", which can be arguably chosen as an ethnic variable. In the light of the transition and language reforms in Kazakhstan and the process of self-identification after the collapse of the Soviet Union the preference is given to the former one. Moreover in contrast to DHS data, MICS data does not include specific information of other than Kazakh and Russian ethnicities and all other ethnicities are combined in a third group "others". This does not allow using the same approach as in previous research to merge all European-origin ethnicities into one group while merging Uzbeks and Uigurs with Kazakhs (Aganjanian 1999). I include the "other" ethnicities in my analysis by using them in a combined category even though they belong to very different cultures and religions. This group is still included in controls for other variables. In addition, it is not possible to distinguish Russified and Non-Russified Kazakhs as in previous research. MICS questionnaires do not give information on the language of interview.

The possible limitation of the whole study concerning ethnicity is the emigration of Russians during 1990s, while there was an immigration of ethnic-Kazakhs according to the State program of repatriation. However, according to Andersson and Sobolev (2001) selective migration and selective survival have small effects in retrospective studies of fertility.

Education. To avoid anticipatory analysis for the first birth risks the study follows the suggestion of Hoem and Kreyenfeld (2006) for a dynamic modeling of education. Thus, educational histories are reconstructed using variables of the dataset, which give information about the highest educational level a respondent has achieved at the time of the interview. The reconstruction of educational histories implies a quite rigid educational system. It certainly causes some limitations because it is assumed that there are no breaks in study, repeating of school year, or postponement of the entrance to a subsequent level. The reconstruction is based on tracing respondents since the legal age of entrance of primary school (age 6) to the highest achieved level. The variable “the highest grade at that level” helps to specify an exact number of years a respondent has spent at the highest attained educational level, which gives an opportunity not to equalize all respondents at their highest level. A new academic year starts in September and ends the following June. Primary school consists of 4 years; secondary school consists of 7 years, but if a student chooses the subsequent level as secondary specialized (vocational) school instead of university he/she finishes 5 years of secondary school; secondary specialized (vocational) school consists of 3 years. Higher education can consist of 4 to 6 years. Before joining to the Bologna educational system people were supposed to study 5 years for the “specialist” degree; nowadays it is 4 years for Bachelor degree and 2 additional years for Master degree. The highest grade at the highest attained level gives an opportunity to differentiate between these tracks. A time-varying binary variable was constructed to indicate periods in and out of education. The respondents are coded as being in education all the time before they attained the level reported in the interview. Thus, the variable “education” is time-varying and consists of 5 levels: in education, none/primary/not completed secondary, completed secondary, secondary specialized, and higher.

For the second and third parity, education at the time of interview is used. This is a time-constant variable with the following levels: none/primary/not completed secondary; completed secondary; secondary specialized (vocational); and higher.

Calendar year is a time-variant covariate and a main variable of interest in this study. Calendar years are aggregated into the following groups to study first birth risks: 1971-1980, 1981-1991, 1992-1995, 1996-1999, and 2000-2006. The first two groups cover the Soviet time and are split in two to see the dynamics in reproductive behavior over this long time period; the next two groups cover the economic crisis time but also 1995 as a critical juncture of political transformation (the enactment of new constitution in 1995); the last group covers the economic recovery time. The separation of the economic crisis time into two periods is to cover the political transformation and to check the trend as proposed by Agadjanian of the ethnic adjusted reaction to the political transformation after the collapse of the Soviet Union. The combination of calendar years into periods is slightly different for the study of second/third birth risks because of the peculiarities of the dataset and the possibility to study only the younger cohorts for higher order births. The reasons are described below. Thus, to study second/third birth risks calendar years are aggregated into three groups: 1989-1995, 1996-1999, and 2000-2006. The last three years of the Soviet time were combined with the first group of the economic crisis time, because for the second and third parity the study is restricted to those who gave first birth not earlier than 1989. Thus it is not possible to create a separate "Soviet" category as for the first parity.

MICS data do not have complete fertility histories and there are only dates of the first and the last birth in the women's file. Thus, the survey does not provide information on exact birth dates of children who are not the last or first unless they live in the household. Hereby, to study second and third parity progressions, the women's file was merged with the household file. However, there is information about mother's identification number only for children under 18. Thus the study has to be reduced to the youngest cohorts, i.e., those who gave birth to their first child no earlier than in 1989. Nevertheless, this allows studying both the economic crisis and economic recovery influence.

Moreover, the sample is slightly selected on the basis of survival or living together with children in-between the first and the last birth. Thus, for women who experienced child death or have children living apart we do not possess information about the dates of birth in the household dataset if they were children “in-between” births (between the first and last birth). Thus, for example, if women’s second child died/left the house and she has ever given three births we cannot study her risks of second (or third) birth, because there is no information about the age of the second child. If a child died or left the household, but he/she was the last or the first in order, it does not make any problems. Also, the child death and living apart do not influence those who have only one or two children in their life, because both dates (first and last) are known. Thereby some cases with unidentifiable in-between births were deleted.

Thus, to study the second birth risks of 5794 one-child mothers, 358 had experienced either child death or living apart. Only in 162 cases were these children neither the first nor the last child and thus had to be deleted. No further deletion was made to study the third birth risks, because all unidentified cases were already deleted at this earlier stage. As a result, the omission of the missing-info births produces a slight under-estimation of the level of second/third births.

Table 2: Dropped cases for the study of second/third birth risks

Total # cases	#cases with some children out(deadkid or living apart)	#deleted(non-identified) cases	% of deleted cases out of total
5794	358	162	2,8

Moreover, for in-between births we do not have information on the month of birth. For women with only one or two children there is both month and year of birth available and this group of respondents constitutes the major part of the dataset (75.1%). Missing month of birth was randomly imputed for 24.9 % of cases for the study of second birth risks and for 14.6% of cases for the study of third birth risks.

Table 3: Imputation results, parity 2, month of birth

	#cases	percentage
Not imputed	4231	75,1
Imputed	1401	24,9
Total	5632	100

Table 4: Imputation results, parity 3, month of birth

	#cases	percentage
Not imputed	2910	85,4
Imputed	498	14,6
Total	3408	100

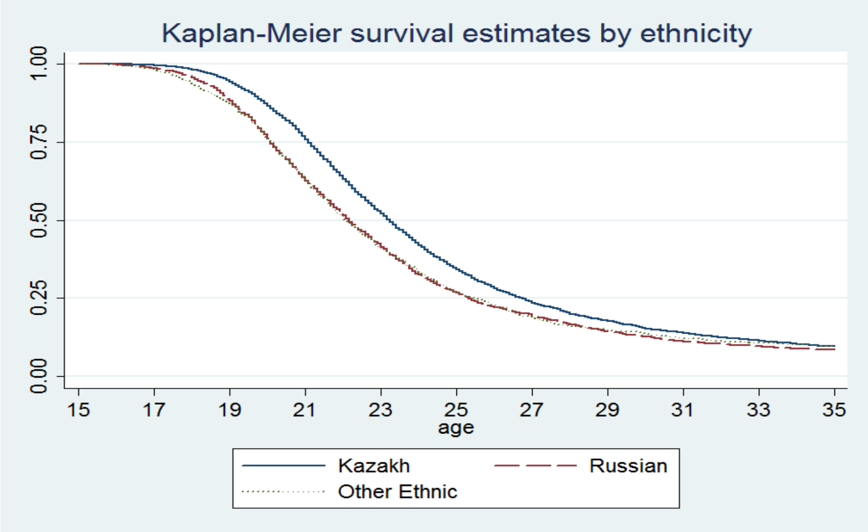
Summary statistics of exposures and occurrences by every variable and each parity are presented in tables B, C, and D in the Appendix.

Results

First birth risks

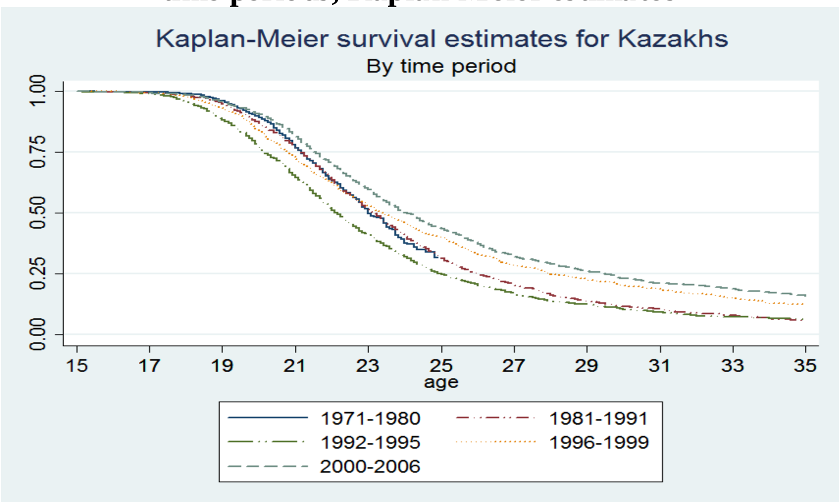
First I display Kaplan-Meier estimates for the transition to fist birth for all ethnic groups. Only results for Kazakh and Russian women are discussed in more detail. The results for the combined "other" group are not interpreted as this group consists of different ethnicities of different cultures and is only used to control for other variables.

Figure 8: First birth estimates for ethnic groups in Kazakhstan, Kaplan-Meier estimates



In general we observe that Russian women give first birth earlier than Kazakh women do. This can be associated with the fact that Russian women start union formation and sexual life earlier than Kazakh women, who are more restricted by cultural and traditional values.

Figure 9: First birth estimates for Kazakh and Russian women in Kazakhstan across five time periods, Kaplan-Meier estimates



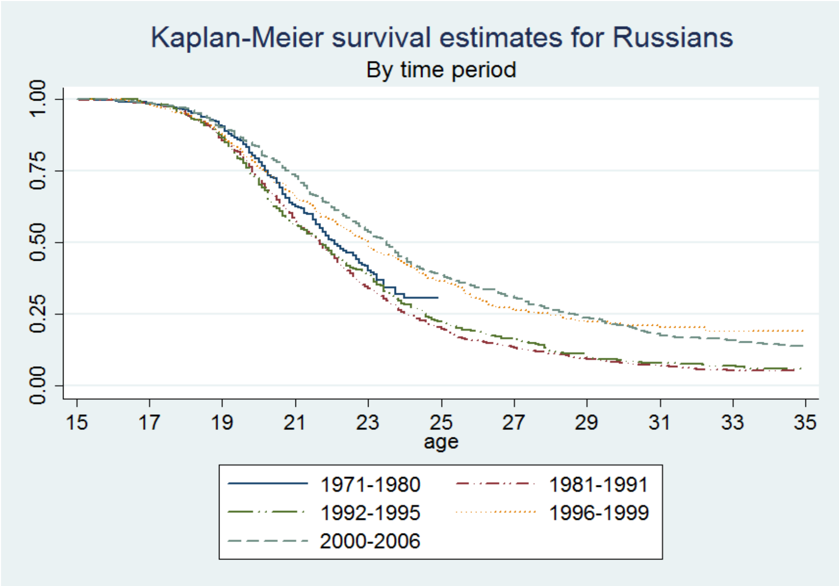


Figure 9 shows the description for a set of synthetic cohorts of women. Across these time periods we can observe a gradual increase in the median age at first birth for both Kazakh and Russian women. Meanwhile, there are some peculiarities among the two ethnicities. During both Soviet time periods Kazakhs show a similar median age at first birth (23), while during the first years of independence the median age decreased by almost one year. It was a short-time variation and in the subsequent calendar periods 1996-1999 and at the time of economic recovery (2000-2006) the median age increased above 23 years. There was a slight difference between the two periods during Soviet time for Russian women, with a lower median age in the latter period 1981-1991 that can be associated with the Soviet pro-natalist policies of the 1980s. It kept the same pace during 1992-1995. During the two latter periods under investigation we can observe an increase of one year in the median age at first birth for Russian women.

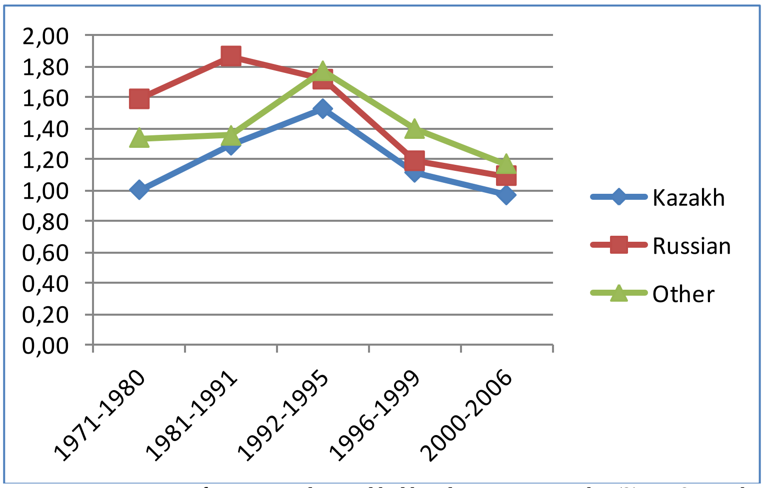
The next results are those of a multivariate model of risks of first birth that includes covariates and controls such as age, ethnicity, education as well as a calendar period to capture the impact of time periods.

Table 5: Relative risks of first birth for Kazakhstan women by age, ethnicity, education and calendar period 1971-2006

	Relative risk	S.E.	P>z
Age			
15-17	0.08	0.00	0.000
18-20	0.50	0.01	0.000
21-23	1.00		
24-26	0.87	0.03	0.000
27-29	0.64	0.03	0.000
30-32	0.44	0.03	0.000
33-35	0.37	0.04	0.000
36-38	0.18	0.03	0.000
39-41	0.11	0.03	0.000
42+	0.02	0.01	0.000
Ethnicity			
Kazakh	1.00		
Russian	1.29	0.03	0.000
Other	1.15	0.04	0.000
Education			
in education	0.36	0.01	0.000
none/primary/not completed secondary	0.91	0.05	0.073
Secondary	1.00		
secondary vocational	0.79	0.02	0.000
Higher	0.74	0.03	0.000
calendar period			
1971-1980	1.00		
1981-1991	1.20	0.05	0.000
1992-1995	1.37	0.06	0.000
1996-1999	0.99	0.04	0.901
2000-2006	0.87	0.04	0.001
# of subjects	14532		
# of failures	9583		
time at risk	1312515		
Log Likelihood	-10065.51		
Prob > chi2	0.0000		

According to table 5, we can observe that the first birth risks are the highest at relatively young ages, 21-26. As expected, women of Russian ethnicity have higher relative risks than women of Kazakh ethnicity. In accordance with expectations, education shows an inverted U-shape pattern with lower risks for those who are still in education and then the risks increase for those who achieve secondary education. Later on, the higher educational level achieved the lower are the risks of first birth. As regards to calendar period we can observe that there was an increase in 1981-1991 that can be associated with the pro-natalist policies of the last period of the Soviet time. Moreover the first years of independence show a continued increase even though the economic crisis had already started. Nevertheless, women were more vulnerable on the labor market than men during the time of economic deterioration and taking into account that having children was still a universal value across the country this pattern is understandable. Moreover, women were to a great extent involved in informal or part-time work during the economic crisis, which may have allowed them to continue their reproductive career simultaneously. During the later stage of economic crisis and a high level of wage arrears we can observe a decline, though it is not statistically significant. During the economic recovery time, contrary to the economic crisis explanations of fertility decline, the risks of firth birth decreased further.

Figure 10: Relative risks of first birth, interaction between ethnicity and calendar period (reference Kazakh 1971-1980), controlling for all other factors

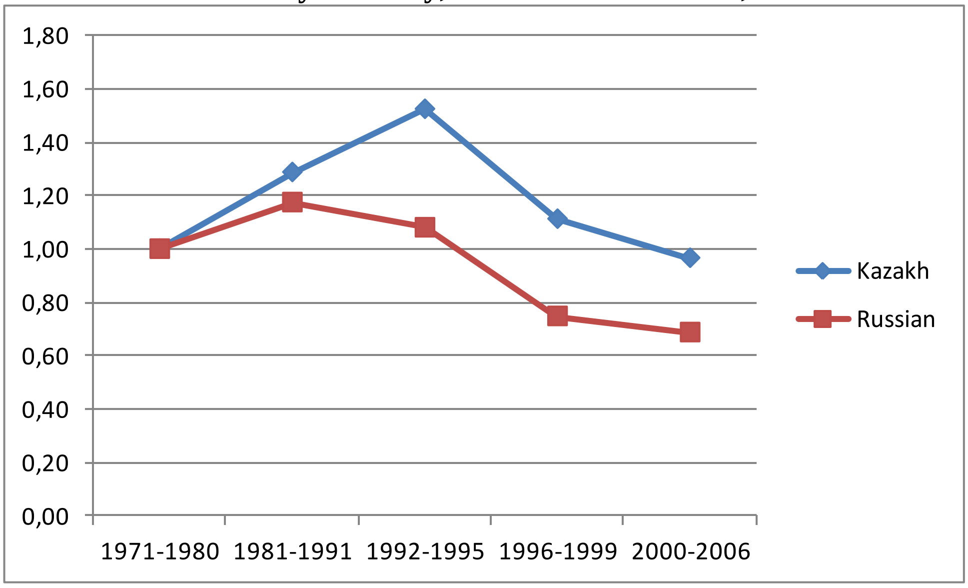


Note: the entire interaction is significant according to likelihood-ratio test. LR chi2(8)=44.85. Prob>chi2=0.000

Figure 10 shows that both Kazakhs and Russians had the same pace in trends during the Soviet time with an increase during 1980s, while we can observe a different reaction during the first years after independence: there was a further increase for Kazakhs while Russians experienced a relative decline. Nevertheless, we can observe that the relative risks for Russians are still higher than for Kazakhs over all periods. Both ethnicities show the same pace of development during the last two periods. The 1996-1999 period shows that women of the two ethnicities reacted quite similarly, and it is likely that economic factors prevailed in the decline. During the economic recovery time we can see a further gradual decline among Russians and Kazakhs alike.

The following figure shows *relative* changes in relative risks of first birth by ethnicity and calendar period. We see that Kazakh women had higher relative changes than Russian women in 1992-1995 right after independence. However, we again observe the same pace of decline during 1996-2006.

Figure 11: First birth risks by ethnicity, relative to 1971-1980, Kazakhstan

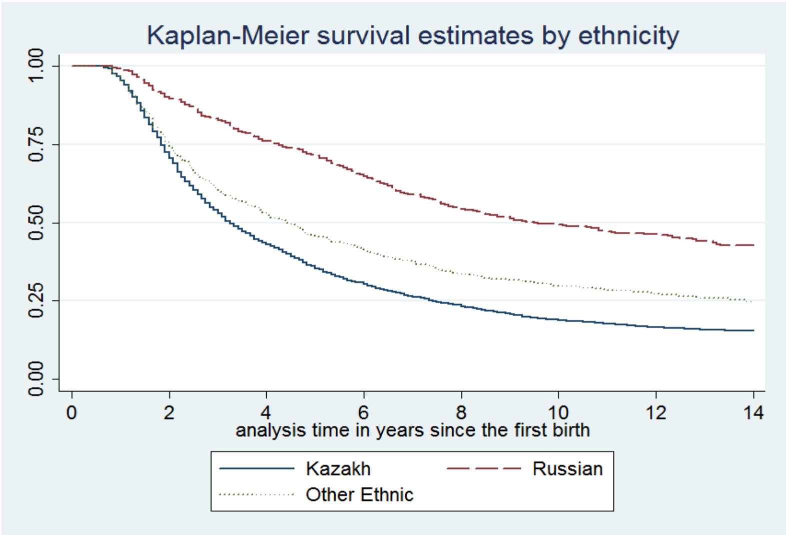


Note: Risks are relative to women of the same ethnicity in 1971-80. Model controls for age and education

Second birth risks

Again first of all, Kaplan-Meier estimates for the transition from the first to the second birth for all ethnic groups are presented.

Figure 12: Second birth estimates for ethnic groups in Kazakhstan, Kaplan-Meier estimates



From Figure 12 we can conclude that Kazakh women in general are more prone to have a second child than are Russian women. Moreover, the timing is shorter for Kazakhs. 75 % of Kazakh women give the second birth less than 8 years after the first birth, while only 50% of Russian women give the second birth 9 years or less after their first birth.

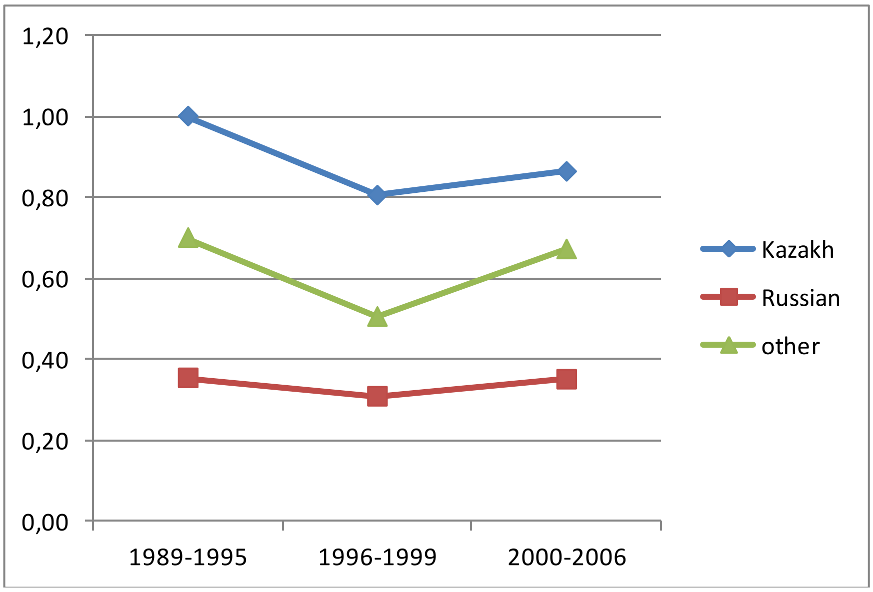
The next results are those of a multivariate model of the risks of second birth that includes covariates and controls such as duration since the first birth, age at the first birth, ethnicity, education as well as a calendar period to capture the impact of time periods.

Table 6: Relative risks of second birth for Kazakhstan women by duration since first birth, age at first birth, ethnicity, education, and calendar period 1989-2006

	Relative risk	S.E.	P>z
duration			
0-1 year since first child born	0.60	0.02	0.000
1-3 years since first child born	1.00		
3-5 years since first child born	0.75	0.04	0.000
5-7 years since first child born	0.67	0.05	0.000
7-9 years since first child born	0.46	0.04	0.000
9+ years since first child born	0.26	0.03	0.000
age at first birth			
19 and less	0.85	0.04	0.001
20-24	1.00		
25-29	0.84	0.04	0.000
30-34	0.52	0.05	0.000
35+	0.18	0.05	0.000
ethnicity			
Kazakh	1.00		
Russian	0.39	0.02	0.000
other	0.71	0.04	0.000
education			
none/primary/not completed secondary	1.00	0.08	0.976
secondary	1.00		
secondary vocational	0.73	0.03	0.000
higher	0.63	0.03	0.000
calendar period			
1989-1995	1.00		
1996-1999	0.80	0.04	0.000
2000-2006	0.89	0.04	0.007
# of subjects	5619		
# of failures	3403		
time at risk	304409		
Log Likelihood	-6295.14		
Prob > chi2	0.0000		

The relative risks for most control variables demonstrate expected relationships: second birth rates decreased as the age at the first birth increased; the higher educational level achieved the lower are the second birth rates; and the transition rate increased within the first three years after the first child was born and decreased after this. We observe that the second birth risks are around 2.5 times higher for Kazakh women than for Russian women. Another variable of main interest, the calendar period shows that there was a lower transition rate from 1996 to 1999, while during the economic recovery time there was an increase.

Figure 13: Relative risks of second birth, interaction between ethnicity and calendar period (reference Kazakh 1989-2006), controlling for all other factors

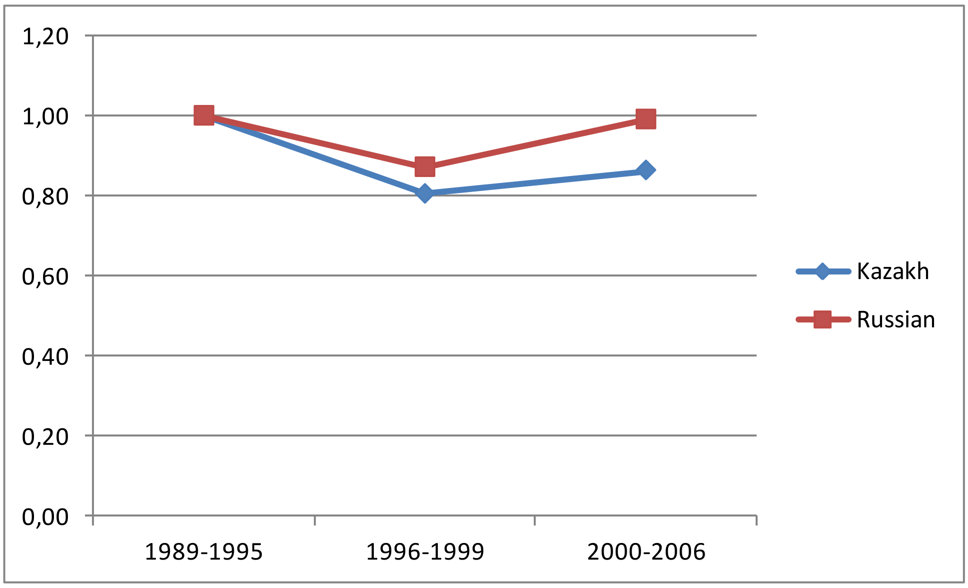


Note: the interaction is not significant according to likelihood-ratio test. LR chi2(4)=3.83. Prob>chi2=0.4291

A likelihood-ratio test of the interaction between ethnicity and calendar period shows that this interaction is not significant at the 5 % level. This supports the assumption that the main model reflects the paces of changes of relative risks of second birth both for Kazakhs and Russians. Figure 13 shows that all ethnic groups show a similar pace of development over the three periods. Kazakhs had a more considerable decline in absolute levels during the 1996-1999 period, but they have had a higher initial rate during the previous periods. During the economic recovery time all ethnic groups show an increase in second birth rates and Russians achieved the same rate as in the initial period. These results show that Russians reacted on improved economic conditions in the same pace, and they also show that the trend of increase and decrease in second birth rates across the three periods were more universal than ethnic-specific.

The following figure shows *relative* changes in relative risks of second birth by ethnicity and calendar period. We see that the relative recovery in relative risks of second birth were slightly more pronounced among Russians in the latter period of economic recovery.

Figure 14: Second birth risks by ethnicity, relative to 1989-1995, Kazakhstan



Note: Risks are relative to women of the same ethnicity in 1989-1995. Model controls for time since first birth, age at first birth and education.

Third birth risks

First I display Kaplan-Meier estimates for the transition from the second to the third birth for all ethnic groups.

Figure 15: Third birth estimates for ethnic groups in Kazakhstan, Kaplan-Meier estimates

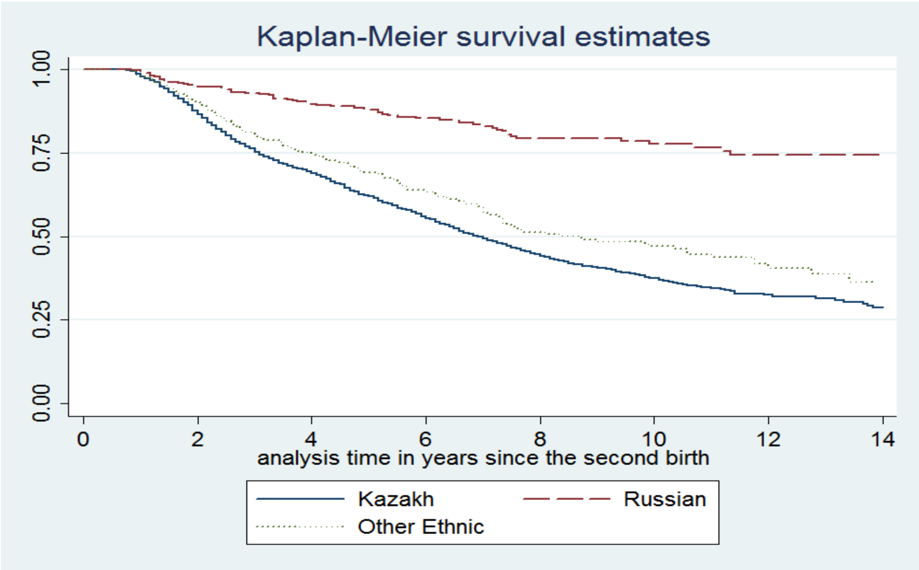


Figure 15 shows that Kazakh women are much more prone to give third birth than Russian women. 50% of Kazakh two-child mothers give third birth less than 7 years after second birth, while in general during the analysis time almost 75% of them gave third birth. Only 25% of Russian women gave third birth during the analysis time.

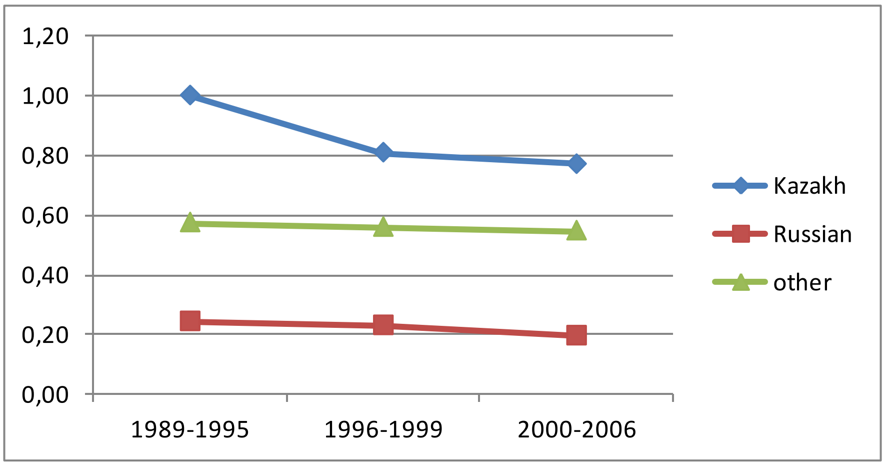
The next results are those of a multivariate model of risks of third birth that includes covariates and controls such as duration since the second birth, age at second birth, ethnicity, and education as well as a calendar period to capture the impact of time periods.

Table 7: Relative risks of third birth for Kazakhstan women by duration since second birth, age at second birth, ethnicity, education, and calendar period 1989-2006

	Relative risk	S.E.	P>z
duration			
0-1 since second child born	0.56	0.04	0.000
1-3 since second child born	1.00		
3-5 since second child born	0.94	0.08	0.452
5-7 since second child born	1.08	0.10	0.373
7-9 since second child born	0.71	0.09	0.006
9+ since second child born	0.60	0.09	0.001
age at second birth			
19 and less	0.76	0.14	0.139
20-24	1.00		
25-29	0.77	0.05	0.000
30-34	0.56	0.06	0.000
35+	0.38	0.09	0.000
ethnicity			
Kazakh	1.00		
Russian	0.26	0.03	0.000
other	0.69	0.06	0.000
education			
none/primary/not completed secondary	1.13	0.16	0.382
secondary	1.00		
secondary vocational	0.67	0.04	0.000
higher	0.62	0.05	0.000
calendar period			
1989-1995	1.00		
1996-1999	0.83	0.07	0.032
2000-2006	0.79	0.07	0.005
# of subjects	3408		
# of failures	1363		
time at risk	207184		
Log Likelihood	-2978.6447		
Prob > chi2	0.0000		

Table 7 shows that Kazakh women are three times more prone to give third birth than Russian women. The relative risks for most of the control variables demonstrate expected relationships: third birth rates decreased as the age at second birth increased; the higher educational level achieved the lower are the third birth rates; and the transition rate increased within the first seven years after the second child was born and decreased after this. The gradual decline of third birth rates is observed through all calendar periods. Thus, the economic recovery time is characterized by further decline in third birth risks, as expected.

Figure 16: Relative risks of third birth by ethnicity and calendar period (reference category – Kazakh 1989-1995), controlling for all other factors

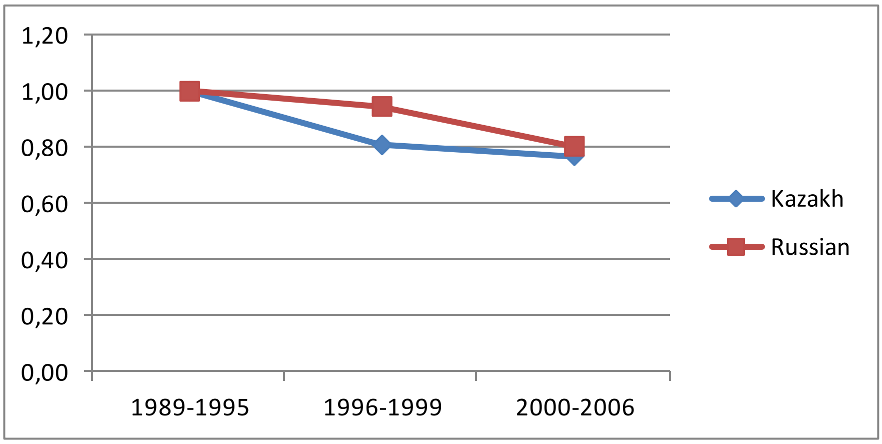


Note: the interaction is not significant according to likelihood-ratio test. LR chi2(4)=0.86. Prob>chi2=0.9309

A likelihood-ratio test of the interaction between ethnicity and calendar period shows that this interaction is not significant at the 5 % level. This supports the assumption that the main model reflects the paces of changes of relative risks of third birth both for Kazakhs and for Russians. Thus, figure 16 shows that all ethnic groups experienced similar pace of gradual decline over all three periods. Kazakhs experienced a more considerable absolute decline because of initial higher third birth rates. Overall we can see that Kazakhs are still eager to have the third child but relative risks of having the third child are more than 20% lower in 2000-2006 than in 1989-1995.

The following figure shows *relative* changes in the relative risks of third birth by ethnicity and calendar period. We can see that the relative changes in the relative risks of third birth across the period were very similar for Kazakh and Russian women.

Figure 17: Third birth risks by ethnicity, relative to 1989-1995, Kazakhstan



Note: Risks are relative to women of the same ethnicity in 1989-1995 . Model controls for time since second birth, age at second birth and education

Discussion and conclusions

This study assessed how first, second and third birth risks varied over time in Kazakhstan after independence was declared in 1991. The last decade of the XX century was associated with the economic crisis and political transformation of Kazakhstan, which influenced reproductive behavior in the country. Ethnic differentiation was highly articulated among scholars who studied fertility change in Kazakhstan during the economic crisis time. This study contributes to the understanding of ethnic fertility differentials in Kazakhstan by also covering the economic recovery time after the turn of the century. Moreover, the coherence with general demographic trends is analyzed.

First of all, the results of ethnic-specific first birth risks differ from previous research (Agadjanian 1999, Agadjanian et al.2008), who found lower risks for Russians as the result of a different starting point of the event-history analyses. In the present study, women are analyzed since age 15 rather than since the start of first union. Thus, it also covers women who gave birth before their first union and those who gave birth, but never married. These cases were excluded from analysis in previous research. I believe that the study of first birth risks since age 15 is better to capture changes in ethnic-specific reproductive behavior, because in accordance with a more advanced level of demographic transition Russian women are more prone than Kazakhs to premarital childbearing. Thus, the exclusion of these cases would mostly bias results of Russian women. As previously shown in figure 3, the share of non-marital births is increasing in Kazakhstan.

Nevertheless, a robustness check was conducted with the starting point at union formation: the ethnic-specific results were in coherence with previous research. Indeed Russian women start union formation earlier, but as soon as Kazakh women start their first union they give birth sooner than Russian women. The recently presented work of Agadjanian and colleagues (2012) confirms this pattern and shows that the predicted probability of entry into first marital union in Kazakhstan is higher for Russians across calendar years (see figure B in Appendix).

According to my findings, further decline of first birth risks is observed during the economic recovery time. Moreover, according to Kaplan-Meier estimates the median age of first childbearing is gradually increasing over time periods, suggesting a general postponement of first birth. This should not be overestimated because in general both Kazakh and Russian women still give the first birth at relatively young ages. In addition, the further decline in first-birth risks during the economic recovery time supports the proposals that behavioral changes during economic crisis time can precede value changes (Sobotka, 2008). Under improved economic conditions and with more opportunities for women's employment we may anticipate further declines. Women have been more vulnerable on the labor market during the economic crisis time and improved economic conditions could further boost behavioral changes that have already occurred. During the economic crisis women were to a great extent involved in informal and part-time work, which still allowed them continuing their childbearing careers. Moreover leaving the labor market was not associated with high costs because of huge wage arrears for those involved in formal work. Inversely, during the economic recovery new opportunities aroused to realize oneselves from professional points of view and to find jobs according to ones educational level, which could influence childbearing decisions because of higher costs of leaving the labor market. Thus, we can say that we observe a counter-cyclical fertility in Kazakhstan at least in terms of childbearing behavior for the first parity.

Concerning ethnic-specific changes of first birth risks over the calendar periods, we observe that in coherence with previous research (Agadjanian 1999, Agadjanian et al. 2008) Russian women experienced a decline in first-birth risks during the first years of independence after some increase during the last decade of the Soviet Union. However, after 1995, which is specified as a critical juncture of political reforms to check the validity of minority status adjustments of Russians, both Kazakhs and Russians were impacted similarly and showed the same pace of further decline. Thus, we do not see any evidence of the importance of the political situation. These findings support the importance of a more universal pattern of fertility-related changes in Kazakhstan society, rather than that of minority group adjustments.

The findings on second birth risks show that, different from results for Russia (Billingsley 2011a) there is no further postponement of second childbearing in Kazakhstan during improved economic conditions. Quite the contrary, the economic recovery time is associated with an increase in second birth risks. These findings support a proposition of uncertainty driven postponement during socioeconomic crisis (Kohler et al. 2002). Thus, during economic crisis time second births were postponed, while under improved economic conditions, people appear to be more prone to have a second child. The postponement of second births during the economic crisis, which subsequently leads to an increase of second birth risks in improved economic conditions, could explain a recent modest recovery of aggregate fertility rates as reported in official statistics (Becker and Seitenova 2006).

As regards ethnic differentials in second birth risks, Kazakh women are in general more prone to give second birth across all time periods. The results for all ethnicities show that there was a universal pace in change over time. This is not surprising as the impact of high inflation and huge wage arrears were universal rather than targeting specific ethnic groups. The economic recovery is characterized by universal increases of second birth risks for all ethnicities.

The results for third birth risks show a further gradual decline across all ethnic groups during the economic recovery. It is worth mention that during 1996-1999, the most considerable decline is observed for Kazakhs, who had the highest risks at the beginning of the study period. It shows that even more-family oriented Kazakhs gradually decrease the number of children and acquire less traditional lifestyles by moving from more traditional Central Asian patterns to more European/Western family patterns.

The limitations of the data at hand do not allow for a more comprehensive analysis of general and ethnic-specific trends in reproductive behavior in Kazakhstan across time periods. The data suffer from a lack of socioeconomic characteristics such as employment, religious affiliation, etc. Moreover, the period changes can be biased because of out-migration of Russians during 1990s: the findings mainly show the patterns for so-called “rooted” Russians who are “indigenous” to the country.

The importance for society of coping with fertility decline is highly articulated in the discourse of contemporary Kazakhstan. It is crucial to collect better data, which can cover broader socioeconomic characteristics and allow further research on general and ethnic-specific fertility trends in Kazakhstan. This would help us better detect the mechanisms and processes behind recent fluctuations in reproductive behavior and to allow for the formulation and implementation of more effective social and family policies in Kazakhstan.

Acknowledgments

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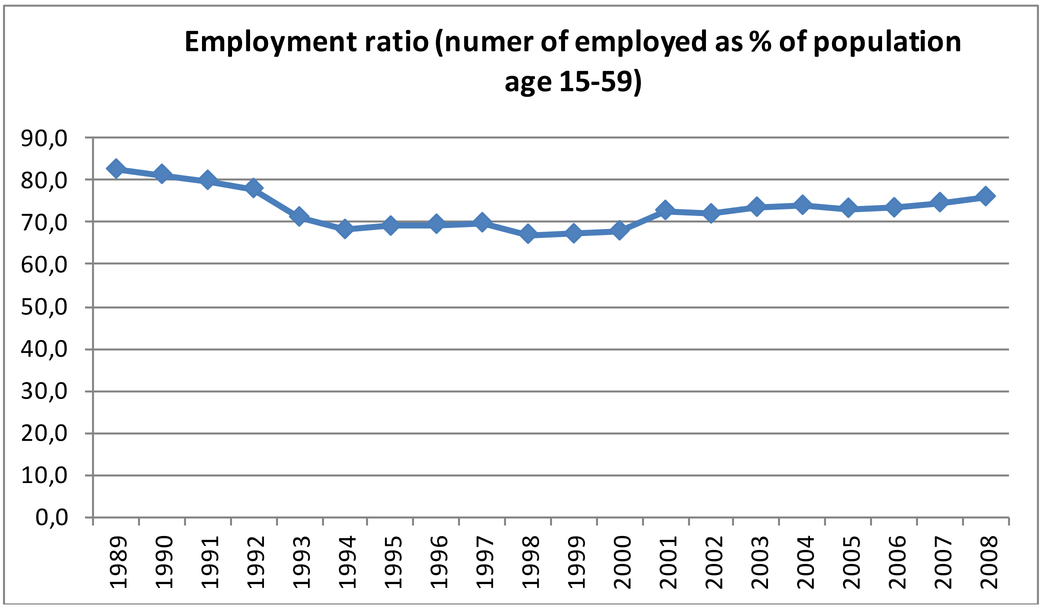
Appendix

Figure A: Employment ratio, Kazakhstan, 1989-2008



Source: UNICEF's TransMonee database

Table A: Religion affiliation by ethnicity in Kazakhstan, survey, 2002

Religion	Kazakh	Russian
Islam	82.2	5.4
Russian Orthodox	1.1	62.0
Catolicism	0	1.2
Buddism	0.1	0.5
Protestantism	0.1	0.3
Ateism	4.1	5.7
No affiliation	7.7	18.8

Source: Telebaev, 2003

Table B: Exposure distributions for all variables to study first birth risks

	person-month	% of total exposures	occurrences	rate	[95% Conf. Interval]	
age						
15-17	491266	37.4	397	0.000808	0.000732	0.000892
18-20	383728	29.2	3127	0.008149	0.007868	0.00844
21-23	212939	16.2	3510	0.016484	0.015947	0.017038
24-26	98990	7.5	1569	0.01585	0.015085	0.016654
27-29	50964	3.9	585	0.011479	0.010585	0.012448
30-32	28970	2.2	225	0.007767	0.006815	0.008851
33-35	18166	1.4	119	0.006551	0.005473	0.00784
36-38	11441	0.9	35	0.003059	0.002197	0.004261
39-41	7910	0.6	13	0.001643	0.000954	0.00283
42+	8141	0.6	3	0.000369	0.000119	0.001143
ethnicity						
Kazakh	884684	67.4	6145	0.006946	0.006775	0.007122
Russian	266188	20.3	2145	0.008058	0.007724	0.008407
Other Ethnicity	161643	12.3	1293	0.007999	0.007575	0.008447
education		100.0				
in education	533003	40.6	1040	0.001951	0.001836	0.002074
none/primary/not comp. sec.	72591	5.5	437	0.00602	0.005481	0.006612
secondary	330864	25.2	3930	0.011878	0.011512	0.012255
secondary vocational	255970	19.5	2875	0.011232	0.010829	0.01165
higher	120087	9.1	1301	0.010834	0.010261	0.011439
calendar period						
1971-1980	211231	16.1	916	0.004336	0.004065	0.004627
1981-1991	446032	34.0	3995	0.008957	0.008683	0.009239
1992-1995	159243	12.1	1556	0.009771	0.009298	0.010269
1996-1999	174873	13.3	1186	0.006782	0.006407	0.007179
2000-2006	321136	24.5	1930	0.00601	0.005748	0.006284
total	1312515	100	9583	0.007301	0.007157	0.007449

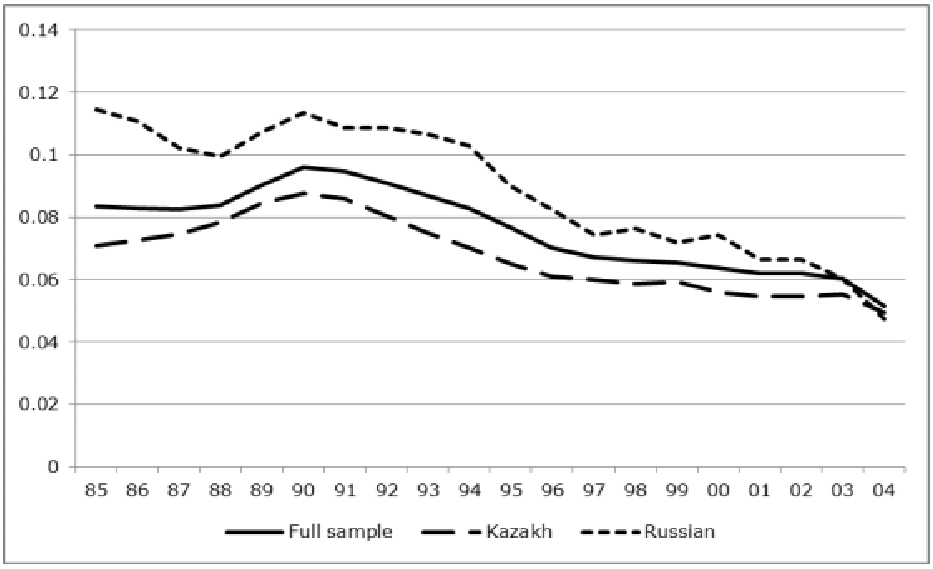
Table C: Exposure distributions for all variables to study second birth risks

	person-month	% of total exposures	occurrences	rate	[95% Conf.Interval]	
duration						
0-1 year since first child born	118417	38.90	1293	0.01091904	0.0103398	0.0115307
1-3 years since first child born	68376	22.46	1123	0.01642389	0.0154909	0.0174131
3-5 years since first child born	43471	14.28	492	0.01131789	0.0103607	0.0123635
5-7 years since first child born	28712	9.43	275	0.00957788	0.0085102	0.0107795
7-9 years since first child born	19690	6.47	128	0.00650076	0.0054667	0.0077304
9+ years since first child born	25743	8.46	92	0.00357379	0.0029133	0.004384
age at first birth						
19 and less	50359	16.54	541	0.01074287	0.0098747	0.0116874
20-24	162895	53.51	2052	0.01259707	0.0120637	0.0131541
25-29	62245	20.45	655	0.01052293	0.0097471	0.0113605
30-34	22852	7.51	141	0.00617014	0.0052313	0.0072774
35+	6058	1.99	14	0.00231099	0.0013687	0.003902
ethnicity						
Kazakh	178095	58.51	2503	0.0140543	0.0135144	0.0146158
Russian	82823	27.21	447	0.00539705	0.0049192	0.0059213
Other Ethnicity	43491	14.29	453	0.01041595	0.0094996	0.0114207
education						
none/primary/not comp. sec.	13533	4.45	160	0.01182295	0.0101259	0.0138045
secondary	108774	35.73	1550	0.01424973	0.0135577	0.0149771
secondary vocational	96351	31.65	947	0.00982865	0.0092222	0.010475
higher	85751	28.17	746	0.00869961	0.0080972	0.0093468
calendar period						
1989-1995	78444	25.77	1084	0.01381878	0.0130202	0.0146664
1996-1999	78408	25.76	837	0.01067493	0.0099757	0.0114232
2000-2006	147557	48.47	1482	0.01004358	0.009545	0.0105682
total	304409	100	3403	0.01117904	0.0108097	0.011561

Table D: Exposure distributions for all variables to study third birth risks

	person-month	% of total exposures	occurrences	rate	[95% Conf.Interval]	
duration						
0-1 since second child born	73305	35.38	365	0.0049792	0.0044937	0.0055171
1-3 since second child born	49584	23.93	417	0.00840997	0.0076403	0.0092572
3-5 since second child born	34123	16.47	256	0.00750227	0.0066373	0.0084799
5-7 since second child born	22835	11.02	191	0.00836435	0.0072584	0.0096388
7-9 since second child born	14710	7.10	78	0.00530252	0.0042472	0.0066201
9+ since second child born	12627	6.09	56	0.00443494	0.003413	0.0057628
age at second birth						
19 and less	4819	2.33	34	0.00705541	0.0050413	0.0098742
20-24	87153	42.07	717	0.00822691	0.0076462	0.0088517
25-29	82713	39.92	490	0.0059241	0.0054221	0.0064726
30-34	26571	12.82	105	0.00395168	0.0032637	0.0047846
35+	5928	2.86	17	0.00286775	0.0017828	0.004613
ethnicity						
Kazakh	148117	71.49	1136	0.00766961	0.0072363	0.0081288
Russian	32101	15.49	66	0.00205601	0.0016153	0.002617
Other Ethnicity	26966	13.02	161	0.00597048	0.0051159	0.0069678
education						
none/primary/not comp. sec.	7616	3.68	58	0.00761555	0.0058875	0.0098507
secondary	86667	41.83	727	0.00838843	0.0078003	0.0090209
secondary vocational	65311	31.52	347	0.00531304	0.0047824	0.0059025
higher	47590	22.97	231	0.00485396	0.0042667	0.0055221
calendar period						
1989-1995	29257	14.12	217	0.00741703	0.006493	0.0084725
1996-1999	55508	26.79	393	0.00708006	0.0064136	0.0078158
2000-2006	122419	59.09	753	0.00615101	0.005727	0.0066064
total	207184	100	1363	0.00657869	0.0062385	0.0069374

Figure B: Predicted Probability of Entry into First Marital Union in Kazakhstan. KazMICS 2006



Source: Agadjanian et al. 2012