Same outcome, different narratives.

A comparative microsimulation study of fertility change in Bulgaria, Poland and Russia

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Extended abstract

NOTE: The results presented in this abstract are preliminary. For detailed analyses on Bulgaria and Russia, see http://www.demogr.mpg.de/papers/working/wp-2007-001.pdf.

1. Introduction

As former Socialist countries, Bulgaria, Poland and Russia had many similarities in terms of their family formation patterns before the change of the political regimes around 1990 (1989 in Bulgaria and Poland, 1991 in Russia). At the starting point of the transition, we find almost identical demographic patterns in the three countries, characterized by very early and universal marriage, universal parenthood with remarkably stable period fertility around replacement level[1], and a strong two-child norm. (see for example Avdeev and Monnier 1995, Kotowska et al. 2008, Philipov 2002, Zakharov 1999).

After the political and economic transition, period fertility dropped rapidly to lowest low levels, in Bulgaria nearing a TFR of 1 in 1997. Russia and Poland joined the lowest low

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[1] Period total fertility levels averaged around 2.2 in Poland, 2.05 in Russia, and 2.0 in Bulgaria through the 1980s (Council of Europe 2001).

fertility countries in 1993 and 1999, with lowest TFR levels ever observed in 1999 and 2003 (1.16 and 1.22 respectively).

In this paper, we aim at comparing three countries with almost identical demographic patterns before the political and economic transformation at the end of the 1980s. The era of demographic stability was followed by sharp fertility decline reaching its lowest level at the end of the millennium. By quantifying the individual contributions of various changes in union formation, union stability, and fertility risks in different life-course constellations to the overall drop in fertility, we will investigate what are the behavioral changes leading to the fertility decline in Bulgaria, Poland and Russia.

2. Data and modeling strategy

Our study is based on Generations and Gender Survey (GGS) data collected from October to December 2004 in Bulgaria and from June to August 2004 in Russia, and on the Polish Fertility Survey conducted together with the census in Mai 2002. We only included women born in or after 1950 who are of Bulgarian and Russian ethnicity (nationality) respectively. In the Polish data set there is no information on ethnicity, but Polish population is ethnically homogenous. We estimated the intensities of six events by means of piecewise constant hazard regression models. The events are first and second births, first and second union formations, and first and second union dissolutions. All processes are censored at age 40 and at second birth. We exclude from the sample all women, who reported a birth or first union before their 15th birthday. The sample size for the study of first births and first union formations is n=4258 for Bulgaria, n=179430 for Poland, and n=3693 for Russia (see Table 1 bellow).

We limit our analysis to first and second births and first and second unions due to the very small number of higher order events in the Bulgarian and Russian survey. All models but second union dissolution (due to the small sample size in Bulgaria and Russia) include a control variable for calendar period. We distinguish three periods, namely the "socialist period" (before 1989), and the periods 1989 - 1998, and 1999+. All hazard regression models are then synthesized into a continuous time cohort microsimulation model. By running various scenarios, we then explore the individual contribution of the various processes to the overall fertility decline observed in the three countries.

Table 1. Sample sizes and proportion of occurrence of events in the sample[2]

Event	Bulgaria		Poland		Russia	
	n	event	n	event	n	event
First births	4258	71%	179743	69%	3693	81%
Second births	3022	56%	123122	74%	2975	52%
First union formation	4258	75%	179383	72%	3693	85%
First union dissolution	3180	11%	129336	11%	3145	33%
Second union formation	331	47%	13648	37%	982	61%
Second union dissolution	149	15%	4995	19%	577	32%

Source: own calculations.

3. Preliminary results

In order to study the individual contribution of the period effects estimated for the various processes to the overall decline in first and second births we compare synthetic cohorts generated by means of microsimulation. We distinguish two main scenarios: the baseline scenario of a "Socialist Cohort", i.e. a cohort of women who have lived in a pre-1989 world for the whole of their life, and a "Market Cohort", which is a cohort for which the parameters estimated for the period 1999+ apply over the whole life course.

In Table 2, we present the proportion of the total difference in births between the "socialist" and "market cohort" which would be lost by changing only one set of parameters each. For instance, in Bulgaria the change of union formation risks alone would cause 38.8% of the total loss in first births.

The results indicate that the postponement of first union formations is among the main drivers of the fertility decline in Bulgaria. This change is almost absent in Poland where the drop of fertility is predominantly an effect of declining first birth intensities within unions. In Russia on the contrary, it is the decrease of the second birth hazard which contributes most to the drop in fertility. Interestingly, the steep increase of union dissolution risks observed in Russia has no effect on fertility: the new partner effect is compensated by the low second birth risk within the same union.

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[2] Note that all processes are censored at age 40 or at second conception.

Table 2. Proportion of total fertility decline lost by change of single processes.

Parameters modified	Total loss in:		
	1st births	2nd births	1st and 2nd births
	Bulgaria		
S1: first birth risks	41.2%	25.1%	30.5%
S2: second birth risks		62.0%	40.9%
S3: union formation risks	38.8%	26.1%	30.4%
S4L union dissolution risks	0.2%	0.4%	0.3%
	Poland		
S1: first birth risks	82.2%	49.7%	61.5%
S2: second birth risks		57.4%	36.5%
S3: union formation risks	8.3%	7.0%	7.5%
S4L union dissolution risks	0.0%	0.1%	0.1%
	Russia		
S1: first birth risks	85.4%	22.6%	34.4%
S2: second birth risks		83.0%	67.4%
S3: union formation risks	-1.3%	0.3%	0.0%
S4L union dissolution risks	4.1%	4.1%	4.1%

Source: own calculations

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