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Research Article

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Levels of recent union formation: Six European countries compared

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Abstract

We offer a comparison between the age profiles of rates of formation of marital and non-marital unions among women in Russia, Romania, Poland, Hungary, Bulgaria, and Italy. We show that there is considerable variability across these populations in the levels and age patterns of union entry rates, ranging (i) from high and early rates in Russia to slow and late entries in Italy; and (ii) from the emphasis on marriage seen in Russia, Poland, Italy, and particularly Romania, to the dominant role of cohabitation reported for Bulgaria. Although this paper mainly discusses known features (like the patterns for Italy), these features are displayed with an unusual degree of clarity in the comparative framework, which also highlights unusual patterns, such as those seen in Bulgaria. We do not find much commonality in union-entry rates among ex-communist countries.

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1. Introduction

Event-history analysis has become the method of choice for the analysis of demographic behavior based on individual life-course histories. In its several variants, this method is geared to the study of the simultaneous effects of selected covariates on the rate of event occurrence for a single type of event, or for multiple events experienced by members of a single population. In the present paper, we extend this approach to the comparison of event occurrences across several populations. The extension is very simple, and consists of a comparison of curves of age-specific occurrence/exposure rates of marital and non-marital union formation for the populations in question. We apply this method in a comparison of the intensities of first union formation in six selected countries (Russia, Romania, Poland, Hungary, Bulgaria, and Italy) in which we have a substantive interest, and for which we have data conveniently available. We find that first union formation is early and quick in Romania, in Bulgaria, and particularly in Russia (but that it operates at different intensities across these populations); slow and late in Italy; and somewhere in between in Poland and in Hungary. We have a particular interest in a comparison between Italy and Poland, as we expect to find a dominating influence of the Roman Catholic Church in these two countries that is missing in the other countries. The effect is clearest when we focus on entry into consensual unions, as rates of entry into these unions is considerably lower (though not negligible) in Italy and Poland than in the other four countries.

We also offer as a summary measure the probability that a respondent will have formed a union by age 35. Our analysis shows that, despite their tardy union transitions, some 80% of Italian women have formed a union by age 35. For the other countries, the percentages are roughly the same; though for Romania and Russia, the percentages are in the nineties.

2. Data and method

For a comparison across countries, it is important that the national data are reasonably comparable, particularly in terms of uniformity of principles of data collection. For our comparative study of recent entry into a first marital or non-marital union among women in European countries, the Gender and Generations Program appears to be a plausible source, and thus we have selected it for our analysis of trends in Russia, Romania, and Bulgaria. For Italy and Hungary, we have used very similar surveys conducted in the same period, while for Poland we have used data from that country's recent Employment, Family and Education Survey.[6] In all of these data sets, events are dated to the accuracy of a calendar month.

Studies of the data from each individual country have been provided by Hoem et al. (2009a, 2009b), Matysiak (2009), and Gabrielli and Hoem (2009). Those authors furnish analyses of the patterns of union formation dynamics by educational attainment, by characteristics of the respondent's parental home, and by other issues specific to each of the various national data sets, as well as of their trends over time since about 1960. In the present paper, we offer a different perspective: namely, comparisons between the country-specific entry hazards. To minimize the effects of behavior in older periods, we have only used data for 1985 and later years. We cover all life segments between ages 15 and 35. We stopped our analysis just before exact age 35 mainly because that is as far as we can reasonably go for all countries in our data; indeed for Bulgaria we stop with the age group 31-32. The data were collected around 2004 (with minor variations across the various countries)[7].

We essentially used a simplified intensity-regression approach with age attained as process time. In Hungary, Romania, and Bulgaria, data on self-defined ethnicity was collected, and for the present paper we only used the data for female respondents who reported membership in the main ethnic group, e.g., ethnic Romanians in Romania. In each case, this was by far the largest ethnic group recorded.[8] We have only used the data for life segments in which the woman reported being childless and not pregnant. Since we focus on the time up through entry into a woman's first union, this was by far the dominant set of exposures in each data set; the total exposures were much smaller

[6] For a general description of the national Gender and Generations surveys, see Vikat et al. (2007). For Italy and Hungary, see ISTAT (2006) and Spéder (2001), respectively. For the Polish survey, see Kajcińska (2008).

[7] Due to the somewhat varying dates of data collection, our data therefore covers Hungary for 1985-2001, Italy 1985-2003, Russia and Bulgaria 1985-2004, Romania 1985-2005, and Poland 1985-2006. Except for Poland, all cohorts that <u>can be</u> observed in 1985 and later <u>are</u> observed at all ages between 15 and 35. For the other five countries, the risk population fills a rectangle for the period from the beginning of 1985 through the time of interview, and the ages between 15 and the stopping age, which is the end of age 34 (also for Poland). The exception is Bulgaria, where we stop at the end of age 32 because for this country the person-years at risk are so small at ages above 32 that the rates are dominated by random variation. For practical purposes, we may as well assume that the entry rates are zero above age 32 in Bulgaria. For Poland, the observational design was a bit different, in that only women born in 1966-81 were included. In 1985, the Polish data therefore only cover women aged 15-19; in 1986, only women aged 15-20; in 1987, only women aged 15-21; and so on. As a consequence, the Polish risk population fills a trapeze rather than a rectangle in the Lexis diagram.

[8] In Hungary, the majority group constituted 96.6% of the population; in Romania, 89.1%; and in Bulgaria, 83.6%. In each country, the minorities were too small for much separate analysis, though they were large enough to reveal that their union-formation patterns differed substantially from those of the majority population. We have not wanted to "contaminate" our analyses of the latter by letting the minorities remain in the data we have used, though it turns out that the diagrams are not much affected by whether we retain the minorities in our analysis or leave them out. Such minorities are much less of an issue in the other countries we study.

for life segments where a non-partnered female respondent reported that she was childless but pregnant or at a positive parity.

Our main tool for the comparison of union formation levels in the six countries is a collection of sets of age-specific rates of first union entry for marital and non-marital unions separately, as well as for entry into any first union irrespective of type, in either case for the period that we cover. From a more general perspective, we can regard each collection of first entry rates as the baseline hazard of an intensity regression without any covariates. This means that we need a representation of the baseline hazard that is amenable to such a comparison. The simplest (and still fully adequate) way to attain that representation is to work with piecewise-constant baseline hazards; other possibilities do exist but require much more work. In their study of union formation in Italy, Gabrielli and Hoem (2009) used a non-parametric specification of the baseline hazard. This does not lend itself easily to inter-country comparisons, so for the present study we re-processed the Italian data to get the type of baseline representation that was already available for the other countries. To minimize random variation, we have operated with two-year intervals of hazard constancy: namely, age groups 15-16, 17-18, …, 33-34.

As this description suggests, we could have used the baseline intensity of any hazard regression with covariates for our comparisons instead of leaving out all covariates. This approach might be seen as desirable because it allows us to avoid compositional effects by ensuring that the data are standardized with respect to the covariates included. Unfortunately, such a desirable feature would come at considerable cost. To ensure comparability, the procedure would have had to have used only the covariates that were available, and that had been defined in the same manner in all national data sets (i.e., any idiosyncratic covariates would have to be left out). The most obvious and straightforward of these covariates would be calendar period, which in our case fortunately has been defined uniformly across all data sets. Another important and interesting covariate which is available for all countries is the respondent’s own educational attainment. However, we would immediately run up against two potential problems if we tried to include this covariate in the intensity regression: namely,

(i) educational groups defined by the same labels (such as ‘respondents with middle-level education’) could easily fail to have the same meaning in all countries because of national differences in educational systems; and

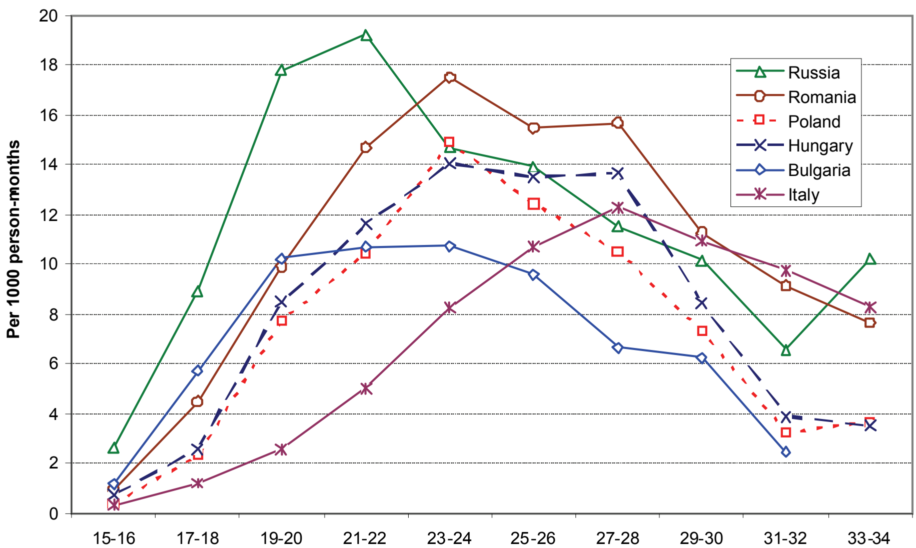
(ii) since educational attainment is a time-varying covariate, it is by no means obvious how one would define a baseline level for it, and how a corresponding baseline hazard is to be understood. (Remember that the baseline hazard is the transition intensity for the group of respondents who have the baseline level on all covariates; how would one understand what it represents if respondents can move in and out of the baseline level on the educational covariate?).

Our procedure, which essentially consists of operating without any covariates, avoids such problems of definition and interpretation. It has the virtue of simplicity.

As will become clear in the following, we find different levels and different age profiles of the intensities of union formation in the different countries. Instead of spending our energy on testing whether these differences are statistically significant (which we have avoided for reasons outlined elsewhere; see Hoem 2008), we have focused our attention on discovering interesting contrasts between the countries.

Figure 1 contains the age profiles for first union entry in the six countries when we do not take union type into consideration. Such a curve is a plot of estimated age-specific, first union formation intensities (rates). We described the pattern seen in Figure 1 briefly toward the end of our introductory section.

Figure 1: Age profiles of entry into first union, six countries, 1985+



3. Summary measures of union formation

The age profiles in Figure 1 give a reasonably rich picture of the levels and patterns of union formation rates in our six countries. In addition, it may be useful to have a single summary measure of the level of union formation represented by each curve. To produce such a measure, we propose that for each country one can estimate the probability of ever entering a union by the (exact) age of 35 for a woman who is not partnered at age 15. If we let *h(s)* be her union formation intensity (hazard) at exact age *s*, then the probability in question is

$$1-\exp\{-\int_{15}^{35} h(s)ds\}\ , \tag{1}$$

just as

$${}_tq_x = 1 - \exp\{-\int_{15}^{35} \mu(s)ds\} \qquad \text{(with } x\text{=15 and } x+t = 35\text{)}$$

is the usual non-survival probability (i.e., the probability of experiencing death) over the same life segment for a woman who is alive at age 15 and who has a force of mortality $\mu(s)$ at exact age *s*. If h_i is the ordinate (the *y*-value) of the curve point for the age interval from integer age *i* to *i*+1 in Figure 1, given per 1,000 person-months for each selected country, then

$$z = 24\sum_i h_i \ /1000 \tag{2}$$

(with the sum taken over all available two-year intervals) is an estimator of the integral in (1) and $1 - \exp\{-z\}$ is an estimator of the probability in (1). The factor 24 is included in (2) because the ordinate h_i refers to a two-year age interval (i.e., to 24 months) for which we behave as if the entry intensity *h(s)* is constant. The first numerical column in Table 1 contains the union formation probabilities estimated in this manner for the six curves in Figure 1. If instead we let h_i be the corresponding ordinate (*y*-value) for a curve in Figure 2, which gives age profiles of marriage formation, we can use (2) and the exponential formula just below it to estimate single-decrement probabilities of ever entering a first marriage by age 35, and we get a corresponding result for entry into non-marital cohabitation if we let $\{h_i\}$ be ordinates from Figure 3. The outcomes are given in numerical columns 2 and 3 in Table 1. Chapter 4 contains a discussion of items in Table 1, along with our other empirical results.

Table 1: Probability of entering a first union by age 35

	Percent entering		
	any union	marital union[a]	non-marital union[a]
Romania	92	84	51
Poland	83	75	32
Russia	94	77	73
Bulgaria	78	41	63
Italy	81	75	23
Hungary	86	64	60

Note: [a] Single-decrement probability

4. Union formation by type

So far we have focused on union formation as an event of a single type: namely, entry into either a first marital or a first non-marital union, with no distinction made between the two union forms. The same methodology can be used to study entry into first marital and non-marital unions separately, as we indicated at the end of Section 3. All that was necessary was to separate the two entry events and run single-decrement event histories for each of them, using the converse event as a cause of censoring. After doing this for our six national data sets, we produced Figure 2 for marriage formation and Figure 3 for entry into cohabitation. Note how the units on the *y*-axis have been adjusted for the smaller values of type-specific entry rates.

When looking at Figure 3 (for entry into first non-marital unions), we can see that Poland and Italy largely group themselves into a class apart from the other countries. They both have very low (but not negligible) entry rates for first consensual unions. For ethnic Bulgarians,[9] we see that non-marital unions have taken over from marriage formation as a preferred mode of first union entry (compare Figure 2). For this population, the age profile of first marriage formation is much lower than even that of Italians, while the rates of entry into first cohabitation are easily among the highest in our data sets. Features of this nature are easily reflected in Table 1. What the table does not reveal, but the diagram does (Figure 2), are certain patterns: for example, we can see from the diagram that the Italian age profile for marriage formation peaks at about the same level as the Russian profile, but is shifted toward higher ages by some six years. Indeed, the Italian curve appears to show that marriage formation continues well beyond age 35 in that country, which is no surprise given previous evidence presented by other authors. We can also see that ethnic Romanians generally have a higher

[9] Remember that our analysis excludes the Roma and other non-majority sub-populations in Bulgaria and Romania.

propensity to form a first union than, for example, the Italians at the ages covered by Figure 1. Furthermore, the Hungarians appear to have a slightly higher probability of entering a first cohabitation than the Romanians, but also to be generally less likely to enter any first union (and, at most ages, ethnic Bulgarians have a low rate of entering any first union).

Figure 2: Age profiles of entry into first marriage, six countries, 1985+

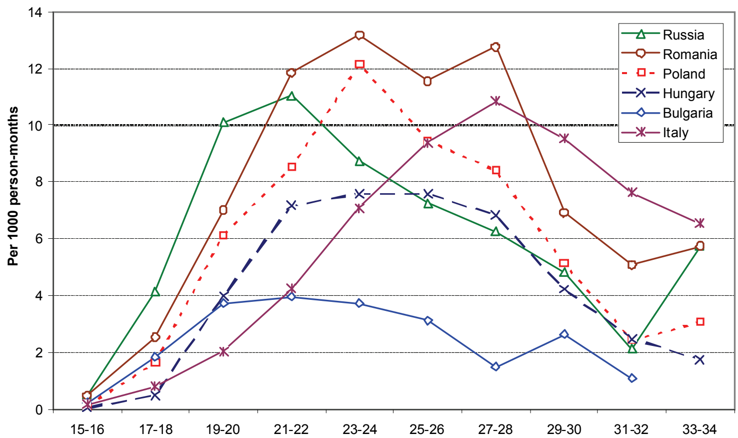
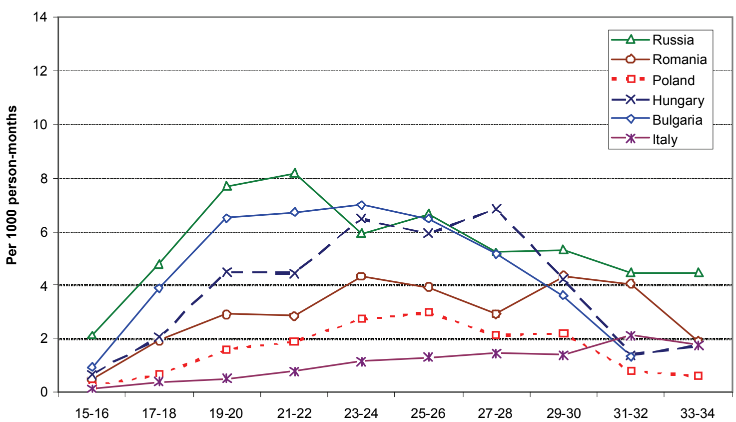


Figure 3: Age profiles of entry into first cohabitation, six countries, 1985+



In Table 1, we see that, according to our computations, only about one-quarter of female Italian respondents are likely to enter a consensual union before age 35, and that the corresponding fraction of female Polish respondents is about one-third. These small percentages are computed by the single-decrement life table method, which means that they are fictitious numbers computed under the counterfactual assumption that the women enter first non-marital unions according to their life table rates, and that they cannot marry first. Applying the same reasoning to the rates for ethnic Bulgarian women, we see (Table 1) that only 41% of them would have married by age 35, while as many as 63% would have entered a consensual union.

5. Reflections

Some general features of our findings are well known from the literature, such as the slow and late union entry in the Italian population, but they acquire additional poignancy when contrasted to behavior in the other populations that we cover. We find that the Italians do not appear to have a systematically lower chance of ever entering a union than others in our study, particularly as their entry activity evidently is not completed by age 35, the point at which we close our investigation.[10] It would be interesting to make a comparison with other Mediterranean countries; unfortunately, we do not know of any similar data available for, say, Spain or Greece. We are somewhat puzzled by our findings for ethnic Bulgarian women, who stand out as having a particularly low chance of entering a first marital union by our closing age. This finding is partly counteracted by evidence of a robust probability among Bulgarian women of entering a first consensual union instead, and by the possibility of subsequent conversion of non-marital into marital unions (a behavior that we do not address in this paper). However, we feel that what now looks like a behavioral deviation in the Bulgarian population deserves more attention in subsequent work, perhaps when the data from the second round of the Gender and Generations program is available. Meanwhile, we speculate that we have caught union formation behavior in Bulgaria in the middle of a transition from (i) a "traditional" and early pattern in the generations born in and before the 1960s, to (ii) a later pattern in subsequent generations, where a postponement of marriage was only partially compensated for by the modern emergence of cohabitation.

We would welcome analyses corresponding to ours of data for more countries. This could contribute to a better understanding of recent developments in union formation behavior in Europe and beyond.

[10] For previous studies of recent union-formation behavior in Italy, see DiGiulio and Rosina (2007), Kertzer et al. (2009), and Castiglioni and Dalla Zuanna (2009).

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References

Castiglioni, M. and Dalla Zuanna, G. (2009). Marital and reproductive behavior in Italy after 1995: Bridging the gap with Western Europe? *European Journal of Population* 25(1): 1–26. doi:10.1007/s10680-008-9155-9.

Di Giulio, P. and Rosina, A. (2007). Intergenerational family ties and the diffusion of cohabitation in Italy. *Demographic Research* 16(14): 441-468. doi:10.4054/DemRes.2007.16.14.

Gabrielli, G. and Hoem, J.M. (2009). Italy's non-negligible cohabitational unions. *European Journal of Population* (in print). doi:10.1007/s10680-009-9193-y.

Hoem, J.M. (2008). The reporting of statistical significance in scientific journals: A reflexion. *Demographic Research* 18(15): 437-442. doi:10.4054/DemRes.2008.18.15.

Hoem, J.M., Kostova, D., Jasilioniene, A., and Mureşan, C. (2009a). Traces of the Second Demographic Transition in four selected countries in Central and Eastern Europe: Union formation as a demographic manifestation. *European Journal of Population* 25(3): 239-255. doi:10.1007/s10680-009-9177-y.

Hoem, J.M., Kostova, D., Mureşan, C., and Jasilioniene, A. (2009b). The structure of recent first-union formation in Romania. *Romanian Journal of Population Studies* 1/2009: 33-44.

ISTAT (2006). La vita di coppia. *Informazioni* 23. (Roma).

Kajcińska, B. (2008). Badanie retrospektywne 'Biografie zawodowe, rodzinne i edukacyjne' – analiza podstawowych rozkładów zmiennych demograficzno-ekonomicznych [Employment, Family and Education Survey – descriptive analysis of socio-demographic characteristics of respondents]. Interim report. Institute of Statistics and Demography, Warsaw School of Economics.

Kertzer, D.I., White, M.J., Bernardi, L., and Gabrielli, G. (2009). Italy's path to very low fertility: The adequacy of economic and Second Demographic Transition theories. *European Journal of Population* 25(1): 89-115. doi:10.1007/s10680-008-9159-5.

Matysiak, A. (2009). Is Poland really 'immune' to the spread of cohabitation? *Demographic Research* 21(8): 215-234. doi:10.4054/DemRes.2009.21.8.

Spéder, Z. (2001). Turning points of the life course. Concept and design of the Hungarian social and demographic panel survey. *Demográfia* 44(2–3): 305–320. (in Hungarian).

Vikat, A., Spéder, Z., Beets, G., Billari, F.C., Bühler, C., Désesquelles, A., Fokkema, T., Hoem, J.M., MacDonald, A., Neyer, G., Pailhé, A., Pinnelli, A., and Solaz, A. (2007). Generations and Gender Survey (GGS): Towards a better understanding of relationships and processes in the life course. *Demographic Research* 17(14): 389-440. doi:10.4054/DemRes.2007.17.14.