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**Levels of recent union formation: six  
European countries compared**

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**Levels of recent union formation:  
Six European countries compared**

by Jan M. Hoem

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Abstract

We offer a comparison between the age profiles of risks of formation of marital and non-marital unions in Russia, Romania, Poland, Hungary, Bulgaria, and Italy. We show that there is considerable variability across these populations in the level and age pattern of union-entry risks, ranging (i) from the high and early risks in Russia to the slow and late entries in Italy, and (ii) from an emphasis on marriage in Russia, Poland, Italy, and particularly Romania, to the dominant role of cohabitation reported for Bulgaria. Some of this mostly re-iterates known features (like the patterns for Italy), but they are displayed with unusual clarity in the comparative framework, which also highlights unusual patterns like those for Bulgaria. We cannot see much commonality in union-entry risks among ex-communist countries.

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 impacts 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 in 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 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 union formation is early and quick in Romania, Bulgaria, and particularly Russia (but that it operates at different intensities across these populations), slow and late in Italy, and somewhere in between in Poland and Hungary. We have a particular interest in a comparison between Italy and Poland, in both of which we expect to find a dominating influence of the Roman Catholic Church that is missing in the other countries. The effect is clearest when we focus on entry into consensual unions, where the incidences are radically much lower (though not negligible) in Italy and Poland than in the four other countries.

We also offer as a summary measure the probability that a respondent will have formed a union by age 35. We then find that despite their tardy union transitions, some eighty per cent of the Italian women have formed a union by age 35 according to the data we analyze. For the other countries the percentages are largely of the same size order; 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 decently comparable, particularly in terms of uniformity of principles of data collection. For a comparative study of recent entry into a first marital or non-marital union in European countries, on which we focus, the Gender and Generations Program offers itself as a plausible source, and this is what we have used for Russia, Romania, and Bulgaria. For Italy and Hungary we have used closely similar surveys conducted in the same period,<sup>1</sup> and for Poland we have used data from their recent Employment, Family and Education Survey.<sup>2</sup> 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. (2009ab), 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 other issues idiosyncratic 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 periods with little recency, we have only used the data for 1985 and later years. This covers all life segments after age 15 in our data sets. Since the data were collected around 2004 (with minor variations across the various countries)<sup>3</sup> the respondents whose reports we use were up to about 35 years old when the data were collected. We stopped our analysis before age 35 mainly because that is as far as we can sensibly go for all countries in our data; in fact for Bulgaria we stop with the age group 31-32.

We essentially use a simplified intensity-regression approach with age attained as process time. In Romania and Bulgaria, data on self-defined ethnicity was collected, and for the present paper we only used the data for respondents who reported membership in the main ethnical group, i.e., ethnic Romanians in Romania and ethnic Bulgarians in Bulgaria; in each case this was by far the largest ethnical group recorded. We have only used the data for life segments in which the respondent reported to be childless and not pregnant. Since we focus on the time up through entry into a respondent's first union, this was by far the dominant set of exposures in each data set; the total exposures were much smaller for life segments where a non-partnered 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 union entry for marital and non-marital unions separately as well as for entry into any union irrespective of type for the period that we cover. From a more general perspective we can regard each collection of 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 comparison. The simplest (and still fully adequate) way to attain that is to work with piecewise-constant

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<sup>1</sup> See footnote 3.

<sup>2</sup> 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 (2007), respectively. For the Polish survey, see Kajcińska (2008).

<sup>3</sup> 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.

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 our language intimates, we could have used the baseline intensity of any hazard regression with covariates for our comparisons instead of leaving out all covariates. This could be motivated by a desire to avoid compositional effects by making sure the data were 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 use only covariates that were available and 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 such covariate 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, but we would immediately run up against two problematic issues if we tried to include it in the intensity regression, namely

(i) educational groups defined by the same labels (such as 'respondents with a 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 value 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 in operating without any covariates, avoids such problems of definition and interpretation. It has the virtue of simplicity.

Figure 1 contains the age profiles for 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 union-formation intensities (rates). We described the pattern seen in Figure 1 briefly toward the end of our introductory section.

**<Figure 1 in about here>**

### 3. Summary measures of the union-formation risks

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 (exact) age 35 for a woman who is unpartnered at age 15. If we let  $h(s)$  be her union-formation intensity (hazard) at exact age  $s$ , then the probability in question is

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

just as

$${}_xq_x = 1 - \exp\left\{-\int_{15}^{35} \mu(s) ds\right\} \quad (\text{with } x=15 \text{ and } x+t=35)$$

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 1000 person-months for each selected country, then

$$z = 24 \sum_i h_i / 1000 \quad (2)$$

(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 union by age 35**

	Per cent entering		
	any	marital	non-marital
	union	union <sup>a</sup>	union <sup>a</sup>
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: <sup>a</sup> 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 a marital or a non-marital union without distinction. The same methodology can be used to study entry into marital and non-marital unions separately, as we indicated already at the end of Section 3. All we need to do is 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. Doing so for our six national data sets we produce 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.

**<Figures 2 and 3 in about here, preferably both on the same page>**

Contemplating Figure 3 (for entry into non-marital unions) we 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 consensual unions. For ethnic Bulgarians<sup>4</sup> we see that non-marital unions have taken over from marriage formation as a preferred mode of union entry (compare Figure 2). For this population the age profile of marriage formation is much lower than even that of Italians, while the rates of entry into cohabitation easily are 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 patterns like that the Italian age profile for marriage formation peaks at about the same level as the Russian profile does but is shifted toward higher ages by some six years; indeed the Italian curve looks like marriage formation continues well beyond age 35 in that country; no surprise given previous evidence by other authors. Notice also how ethnic Romanians generally have a higher propensity to form a union than (say) the Italians at the ages covered by Figure 1. Furthermore, the Hungarians have a slightly higher probability of entering cohabitation than our Romanians but are generally less likely to enter any union (and at most ages ethnic Bulgarians have a low risk of entering any union).

In Table 1 we see that according to our computations only about one-quarter of our Italian respondents would enter a consensual union before age 35 and that the corresponding fraction of 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 anti-factual assumption that the women enter 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 per cent of them would have married by age 35, while as many as 63 per cent 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 get additional poignancy by being contrasted to behavior in the other populations that we cover. We find that the Italians do not end up with a systematically lower chance of ending up in a union than others in our study, particularly as their entry activity evidently is not completed by age 35 at which we close our investigation. It would be interesting to make a comparison with other Mediterranean countries; unfortunately we are not aware that closely similar data are available for, say, Spain or Greece. We find ourselves nonplussed at our findings for ethnic Bulgarian women, who stand out as having a particularly low chance of entering a marital union by our closing age. This is partly compensated by their robust probability of entering a consensual union instead and by subsequent conversion of non-marital into marital unions (a behavior that we do not address in this paper), but we feel that what now looks like a behavioral deviation needs more attention in subsequent work, perhaps when the data from the second round of the Gender and Generations program is available.

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<sup>4</sup> Remember that our analysis excludes the Roma and other non-majority sub-populations in Bulgaria and Romania.

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

#### Acknowledgements

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Figure 1. Age profiles of union formation, six countries, 1985+

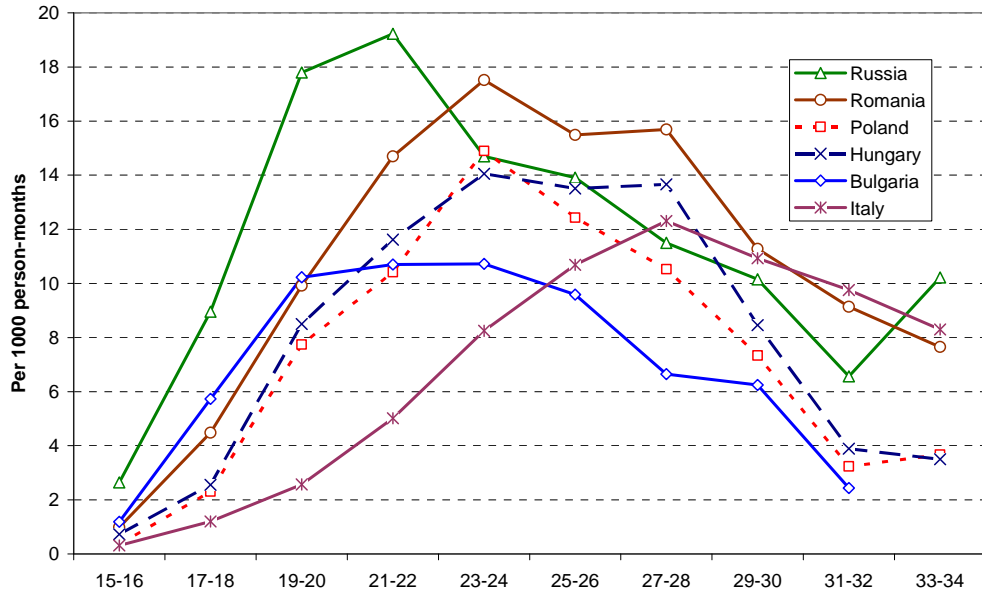


Figure 2. Age profiles of marriage formation, six countries, 1985+

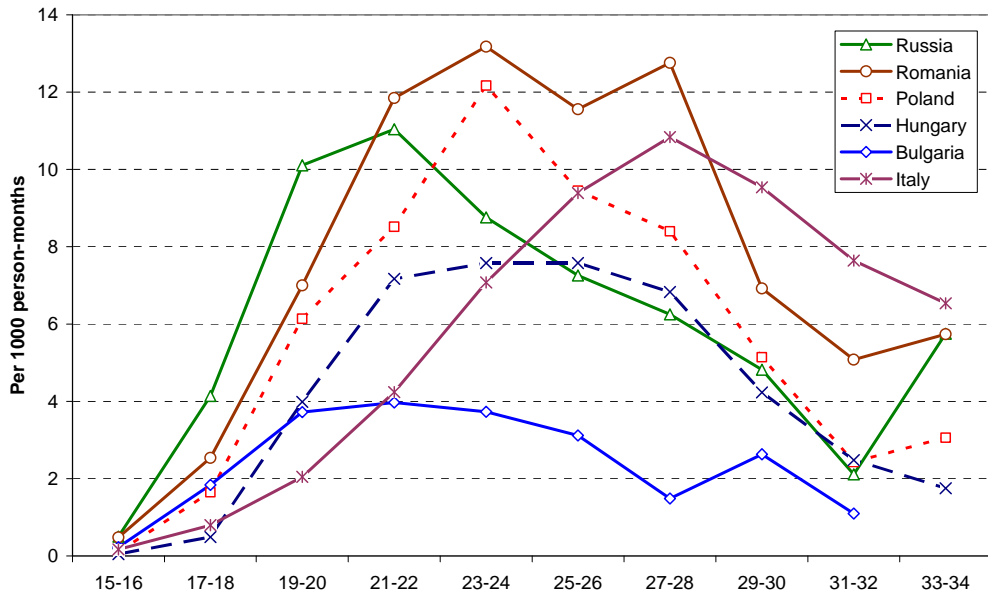


Figure 3. Age profiles of entry into cohab., six countries, 1985+

