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Tajikistan shows the biggest collapse of all: comparing declines in first union formation in post-Soviet Central Asia

Short title: Union formation in post-Soviet Central Asia

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Abstract

The republics of Central Asia experienced dramatic economic and social change after the end of the Soviet Union, but little is known about trends in union formation in the region. This paper, based on the analysis of recently available survey data, presents rates of first union formation from the late-1980s to mid-2000s for Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. It finds a significant decline in union formation across the region, but also clear differences between the republics in terms of the extent of the decline. Tajikistan and Uzbekistan, which experienced the most severe post-Soviet declines in food security, have also seen the sharpest declines in union formation. Indeed, Tajikistan – which experienced the most acute nutritional declines of all - had the highest rate of union formation in the late-Soviet period but the lowest rate by the turn of the millennium, reflecting a collapse in rates of union formation across age groups.

Keywords: post-Soviet, Central Asia, Tajikistan, union formation, food insecurity, drought

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Introduction

The collapse of communism and the associated changes in the countries affected offer 'potentially rich material for an examination of the effects of dramatic sociopolitical and economic transformations on marital and fertility behaviour' (Agadjanian 1999, p.426). However, while the declines in union formation after communism in Central and Eastern Europe are well documented, there is not a comparable literature on nuptiality in post-Soviet Central Asia.

Union formation in post-communist Central and Eastern Europe

In Central and Eastern Europe, marriage rates declined sharply after the fall of communism (Sobotka 2004). In most countries this was accompanied by an increase in the rate of non-marital union formation but, since this did not fully offset the decline in marriage, the proportion of adults living in union decreased (Sobotka and Toulemon 2008). Explanations for these changes in family formation have tended to stress the importance of post-communist economic crisis, or of ideational change, new opportunities and the 'Westernisation' of behaviour, or of both.

Frejka (2008, p.166) links these two explanations to one underlying root cause: 'the replacement of the state socialist regimes by market economies and by fledgling democratic institutions of governance'. This perspective is helpful in a number of respects. First, it allows for a creative tension between economic and cultural explanations which accommodates differences among

different post-communist countries. Indeed, ideational change is considered more important in explaining demographic changes in Central Europe, which experienced a relatively successful transition, with the depth of social and economic crisis more important to changes in ex-Soviet European states (Macura 2000; Philipov and Dorbritz 2003; Sobotka 2004). Second, in a similar way, it allows for flexibility in assessing the relative importance of economic and cultural factors over time - and therefore for the possibility that, for example, cultural factors will come to dominate as the economic situation improves (Lesthaeghe and Surkyn 2002). Third, it also explicitly considers the importance of economic changes which do not fit neatly within 'crisis' explanations. In particular, the longer-term transition from socialism and central planning to market economy conditions – encompassing, for example, more expensive housing, increased private responsibility for child costs, reduced job security and an increased pressure to acquire more education – is seen as fundamental. As Frejka (2008) points out, these emerging market conditions represent important economic influences on union formation which persist after, and become no longer necessarily associated with, the initial post-communist crisis period of massive inflation and sharp increase in unemployment.

It is also important to recognise the diversity of the post-communist context. Culturally, in Central and Eastern Europe there is a distinction between countries that are more secular and liberal (e.g. the Czech Republic, Estonia, Slovenia and the former German Democratic Republic) and those which tend to be more socially conservative and where religion is more important (e.g. Poland, Romania, Slovakia) (Sobotka 2008). This is reflected in recent demographic behaviour: the diffusion of non-marital unions is relatively slow in Poland (Kotowska et al. 2008) and Romania (Muresan et al. 2008), for example, compared to the Czech Republic (Sobotka et al. 2008) and Slovenia (Stropnik and Šircelj 2008). Economically, too, there have been big differences in the economic performance of former Communist states. Sobotka (2003) notes that it is those countries that managed to maintain relative economic stability in the 1990s that also

showed the most significant 'postponement' of family formation. Overall, in terms of both behavioural and attitudinal measures relating to family formation, the differences amongst post-communist countries are now such that their diversity stands out in comparison with the other European regions - Nordic, German-speaking and Southern and Western European - which show more compact clusters of union formation behaviour and attitudes (Sobotka 2008).

Union formation in post-Soviet Central Asia

While there is an established literature on union formation in post-communist Central and Eastern Europe, there has been relatively little research on changes in post-Soviet Central Asia. Agadjanian (1999) provides insights into ethnic differences in marriage behaviour in Kazakhstan. Agadjanian and Makarova (2003), using retrospective survey data from 1996, show that women in Uzbekistan who reached marriageable age during the *perestroika* period before independence were more likely to have married by a given age than those from preceding cohorts - but, for those reaching marriageable age during the post-independence era, marriage dropped back to pre-*perestroika* levels. Most recently, Dommaraju and Agadjanian (2008) provide a valuable description of trends in marriage in Uzbekistan (up to 2001), Kazakhstan (up to 1998) and Kyrgyzstan (up to 1996). Again, their results point towards an increase in the marriage rate during *perestroika* – particularly in Uzbekistan and Kyrgyzstan – to a peak in the early post-independence years, followed by a subsequent decline. They suggest that, at least for Uzbekistan, this decline was not simply a short-term response to economic crisis but rather 'a long-term change in marriage patterns' (p.205). However, they acknowledge that 'a clearer assessment of recent marriage patterns in Central Asia will have to wait for new data' (p.210).

This paper hopes to build on Dommaraju and Agadjanian's (2008) research in three main ways. First, by using more recent survey data and extending the period of analysis to the mid-2000s, a

clearer assessment can be made as to the nature of post-Soviet changes in nuptiality. Second, by including Tajikistan as well as Uzbekistan, Kazakhstan and Kyrgyzstan in the analysis, the potential for cross-country comparison is extended to four of the five Central Asian Republics[1]. Tajikistan is an interesting case: it had the highest rate of population growth of all the Soviet republics at the time of independence (Anderson and Silver 1989). It was also the poorest Soviet republic, with average income in 1988 around 50% of that in Russia (Atkinson and Micklewright 1992, p.134), and experienced the most severe economic crisis post-independence - by 1996, Gross Domestic Product was just 39% of 1989 levels (TransMONEE 2006), the biggest decline in Central Asia. Unlike the other republics, it also experienced a civil war, with peak fighting in 1992 but lasting until 1997, in which an estimated 60,000 to 100,000 people died (International Crisis Group 2001). Third, the paper relates the trends in marriage rates to the nature of post-Soviet change in the republics – and, in particular, to changes in food security.

Context: Food insecurity in post-Soviet Central Asia

The post-communist economic crisis is well documented. In both Central and Eastern Europe and Central Asia, Gross Domestic Product declined, inflation soared, real wages sharply declined and unemployment increased (see TransMONEE 2006). However, just as there were differences in the extent of the crisis between different countries – with, for example, those in Central Europe on the whole faring better than the ex-Soviet European states – so there were differences in the nature of the crisis. In particular, the implications of the crisis for food security were different for the ex-Soviet states in Central Asia than for the ex-communist states in Europe.

[1] While Multiple Indicator Cluster Survey (MICS) data for Uzbekistan, Kazakhstan, Kyrgyzstan and Tajikistan are available for academic research, data for Turkmenistan are restricted (http://www.childinfo.org/mics3_surveys.html).

During the Soviet period, even though most people in the region live in rural areas and agriculture is the largest economic sector, Central Asia was not self-sufficient in basic agricultural foodstuffs. This reflected the Soviet division of labour amongst its 15 republics, assigning cotton production to Central Asia (in particular, to Uzbekistan, Tajikistan and Turkmenistan) at the expense of food production (Peimani 2006). The region became heavily dependent on food imports from the rest of the Soviet Union. The end of the Soviet period meant the breakdown of these trading relationships; in addition, a severe shortage of foreign currency limited the Central Asian republics' ability to fund the necessary basic imports. Therefore, they became increasingly dependent on locally produced food for meeting their food security needs (Babu and Sengupta 2006). However, compared with other countries in transition, the Central Asian republics had the smallest share of arable land and the lowest amount of land per rural inhabitant (Peimani 2006) – limiting the extent to which local food production could meet the countries' needs. While food availability fell in post-communist Europe, it did not fall below the minimum requirements established by the Food and Agriculture Organisation of the United Nations[2]; in contrast, the food availability decline in Central Asia was such that these minimum energy levels were compromised (Rokx et al. 2002). The result was, with the partial exception of Kazakhstan, a region 'unable to feed its peoples' (Peimani 2006, p.66).

[2] Of course, nutrition is a function not only of food availability but also of accessibility. Food availability remained above minimum energy requirements in post-communist Europe, but certain marginalised groups of the population in certain countries may still have had insufficient energy intakes (Rokx et al. 2002). Nevertheless, the sharper decline in post-Soviet Central Asia does serve to illustrate the particular problem with food availability in this region, compared to post-socialist Europe.

Accompanying the decline in food availability in Central Asia were changes in accessibility. Food and nutrition programs, that had ensured minimum food consumption levels during the Soviet period, were eliminated (Babu and Rhoe 2006). In addition, the liberalisation of previously subsidised food prices was particularly significant. January 1992 saw the liberalisation of prices across the then Commonwealth of Independent States (Kaser 1997), leading to dramatic rises in the cost of a number of foodstuffs (Rokx et al. 2002). With real wages declining, an increasing proportion of family income came to be spent on food. There was also a change in diet composition, with particularly sharp decreases in meat and milk consumption (Pomfret and Anderson 1997; Falkingham et al. 1997; Djalalov and Gemma 2006) while expenditures on bread and vegetable products were relatively stable (Babu and Reidhead 2000). This reflects a 'reductive' response to the crisis (Howell 1996) as the population became even more reliant on the traditional staple of bread as a cheap source of calories. Therefore the liberalisation of bread prices, in 1994 in Kazakhstan, Kyrgyzstan and Uzbekistan and in 1995 in Tajikistan (Economist Intelligence Unit 1995a; Kaser 1997), which had remained subsidised in the early post-independence years, had a further negative effect on nutrition levels, particularly in Tajikistan and Uzbekistan.

Indeed, while all the Central Asian republics suffered from food insecurity in the early post-independence years, the severity of the crisis varied. The Soviet legacy was different. In terms of grain, the base of the region's diet, Kazakhstan was a net exporter during the Soviet period and, indeed, remains the sixth largest producer in the world (Peimani 2006). At the other end of the extreme, of all the Soviet republics Tajikistan was most dependent on subsidies from Moscow during the Soviet era and had the highest inter-republic trade deficit (Foroughi 2002), relying on other republics for the vast majority of its grain supply. Uzbekistan, too, was a major importer of grain during the Soviet period, similarly relying on imports for around three-quarters of its supply (Economist Intelligence Unit 1997). In contrast, while Kyrgyzstan was also

dependent on grain imports, this only tended to make up a third of the country's total supply (Babu et al. 2006) since local production catered for most of the domestic need[3]. The republics also vary in terms of the proportion of their land which is suitable for household subsistence arable use. People with access to land to grow their own food have been better able to cope during times of economic stress - but while such 'gardening' is especially common in the ex-Soviet Europe, and in Kazakhstan one-third of food is produced at home (Rokx et al. 2002), Tajikistan and Uzbekistan are severely limited in the amount of land suitable for household agricultural use: in Tajikistan, by the mountainous terrain; in Uzbekistan, by the availability of irrigated land (Duncan 2000; Spoor 2006). Further, while both Tajikistan and Uzbekistan have devoted an increased share of agricultural land to food production, they also face pressure to maintain a large share for cotton, a valuable source of external currency. Overall, the differences in trends in food insecurity between the Central Asian republics are illustrated by differences in the share of consumer expenditure devoted to food. In 1991, a similar share of expenditure was spent on food in all five republics (between 40 and 50%). By 1996, the share in Kazakhstan and Kyrgyzstan was around 55-60%, but in Tajikistan it had increased to approaching 90%; no data are provided for Uzbekistan after 1995, but in this year the share was 70%, well above that in Kazakhstan and Kyrgyzstan (Djalalov and Gemma 2006). Indeed, relating to food security, Rokx et al. (2002, p.59) report that 'certain areas are particularly vulnerable and should receive

[3] In 1992, just after independence, cereal production in Kyrgyzstan was 679,000 tonnes, compared to 170,400 tonnes in Tajikistan, 964,000 tonnes in Uzbekistan and 18.3 million tonnes in Kazakhstan (FAO 2008b). Considering their respective populations (4.3m, 5.1m, 19.9m and 16.7 million at the time of the 1989 census), this translates to 0.16 tonnes of locally produced grain per head in Kyrgyzstan, and just 0.03 and 0.05 tonnes per head in Tajikistan and Uzbekistan. For Kazakhstan, a traditional exporter of grain, the figure was 1.09.

top priority', identifying Tajikistan and Uzbekistan as countries where nutritional status is 'very poor'.

The differences in food insecurity are also reflected in the estimated prevalence of undernourishment in the different countries[4] (FAO 2008a; Table 1). In Kazakhstan, levels have been relatively low throughout the period. Kyrgyzstan has actually made significant progress, after the shock of the initial few years of independence, in reducing undernourishment. But in Uzbekistan and Tajikistan, the prevalence of undernourishment significantly increased from 1993-95 to 2001-03. Indeed, as FAO (2006, p.26) conclude, of the post-communist countries in Europe, the Caucasus and Central Asia, the most serious declines in food security have been in Tajikistan and Uzbekistan. As the data show, Tajikistan was worst affected of all.

[Table 1 about here]

Data and Method

Official data on first union formation in Central Asia are inadequate for a reliable assessment of temporal trends. In Tajikistan, for example, even before independence, the date of marriage registration with Soviet authorities was never a reliable indicator of the date of the religious

[4] These are the only years for which estimates are available. FAO's estimates of the prevalence of undernourishment are 'essentially a measure of food deprivation based on the calculation of three key parameters for each country: the average amount of food available for human consumption per person, the level of inequality in access to that food and the minimum number of calories required for an average person'. See http://mdgs.un.org/unsd/mdg/Metadata.aspx (Goal 1, Target 1.C) for further details.

ceremony *nikoh*, after which the couple would live together. Underage marriages were concealed from the authorities by delaying registration at the civil registry office (ZAGS), sometimes for several years. Even for 'legal' marriages, there might be a gap before registration, while some couples disregarded registration altogether. As Harris (2004, p.39) summarises, compared to the *nikoh*, 'civil registration was of little importance to Tajiks' and was viewed simply as a means of providing access to resources like family allowances. In the post-independence context, with the virtual collapse of the social security system (see Falkingham 2000), the motivation for registration has further reduced – particularly given the introduction of a registration fee. Qualitative accounts suggest that polygamy in Tajikistan has increased since independence (Tabyshalieva 1997), but since this is illegal these unions are also unrecorded. Overall, Dikaev (2005) reports one estimate which suggests that only half of all marriages in Tajikistan are now officially registered. Under-registration is also a problem in other Central Asian states (Dommaraju and Agadjanian 2008).

Therefore, because of the inadequacy of official data, survey data are used to calculate rates of first union formation in late- and post-Soviet Central Asia. The latest round of Multiple Indicator Cluster Surveys (MICS3), carried out by UNICEF, represent the most recent data available. They are nationally representative sample surveys with a women's questionnaire, for those aged 15-49 at the time of the survey, which included questions on union formation. Specifically, women were asked the question 'In what month and year did you first marry or start living with a man as if married?' This is a more accurate reflection of the date of first union than the date of marriage registration and, given the significant under-registration issues, a more complete one. Surveys were carried out in Tajikistan (2005), Kyrgyzstan (2005/6), Kazakhstan (2006) and Uzbekistan (2006), with 10,626, 7,043, 14,719 and 14,205 women interviewed

respectively. In a small number of cases where month or year of first union was missing, these data were imputed[5].

For each country, rates of first union, specific to those women who have never been in union (hereafter, 'unmarried' women), are calculated using a simple proportional hazards exponential model:

$$\lambda_i = \lambda \ \exp\{\mathbf{x}_i'\beta\} \qquad (1)$$

In this model, λ_i is the hazard corresponding to individual *i*, λ is the baseline hazard when $\mathbf{x}_i$=0, and $\exp\{\mathbf{x}_i'\beta\}$ is the relative risk, a proportionate increase or decrease in the rate associated with the covariate characteristics $\mathbf{x}_i$. Taking logs, we obtain the additive log-linear model:

$$\log \lambda_i = \alpha + \mathbf{x}_i'\beta \qquad (2)$$

where α is the log of the baseline hazard. Initially, since interest lies in describing overall trends in first union formation, dummy variables for calendar year are the only covariates and age intervals are not included. This is equivalent to assuming a constant baseline hazard across process time *t*, time since 15th birthday. However, since each survey collects information for women aged 15-49 at the time of the survey, data are truncated in periods before the survey (see

[5] Age at first union, which was also asked in the surveys, was used as the basis for imputation. The Tajikistan survey data contained the highest proportion of missing dates: of 6571 women ever to have been in a union, 282 months of union and 216 years of union were imputed, while 12 women missing both date of union and age at union information were excluded.

Ní Bhrolcháin 1993). To ensure comparability across time, rates are calculated based on first unions, and exposure to first unions, for women aged 29 or under, for periods where the age distribution of women is complete up to age 30. Thus rates are reconstructed for a period of 20 years before each survey. Since first unions in Central Asia are concentrated at a relatively young age - traditionally an unmarried woman over the age of 20 is in danger of being considered an 'old maid' (Tabyshalieva 1997, p.52) - truncation is not a significant problem.

Interest also lies in examining trends in first union formation for different age groups. A piecewise exponential model can be specified where the process time *t*, time since 15th birthday, is split into age intervals *j*, assuming a constant hazard within these intervals:

$$\log \lambda_{ij} = \alpha_j + \mathbf{x}_i' \beta \qquad (3)$$

The age intervals chosen broadly reflect 'early' (15-17), 'peak' (18-20) and 'late' (21-29) ages at first union. Implicitly, under the proportional hazards assumption, the effect of the calendar year covariates is assumed to be the same for all age intervals *j*. However, the model is extended to allow for the relaxation of this assumption. Specifically, an interaction between the age intervals and calendar year is included in the model to allow for differences in trends in first union formation for different age groups of unmarried women:

$$\log \lambda_{ij} = \alpha_j + \mathbf{x}_i' \beta_j \qquad (4)$$

where β_j represents the effect of a calendar period for age interval *j*.

The survey also collected information on, for example, place (urban/rural) and region of residence, and the woman's educational background, but these were not used as covariates since all relate to the time of the survey only. Hoem and Kreyenfeld (2006a; 2006b) warn against an anticipatory approach which conditions on the future. In any case, the focus here is on national-level trends.

Results

Trends in overall rate of first union formation

[Figure 1 and Table 2 about here]

Figure 1 presents trends in first union formation for women in late- and post-Soviet Tajikistan, Uzbekistan, Kyrgyzstan and Kazakhstan. A number of specific results stand out. First, in the late Soviet period, marriage rates were higher in Tajikistan and Uzbekistan than in Kyrgyzstan and Kazakhstan. This is consistent with the results of Dommaraju and Agadjanian (2008), which showed that the predicted probability of first marriage for unmarried women had, in almost every year from the mid-1970s until the late-Soviet period, been higher in Uzbekistan than in Kazakhstan and Kyrgyzstan. These differences may in part reflect differences in economic development and levels of urbanisation. However, they also might reflect longer-standing cultural differences regarding gender and familial systems. In pre-Soviet times, as Jones and Grupp (1987) explain, sex roles tended to be more egalitarian among the semi-nomadic Kyrgyz and Kazakhs - with women playing a more active economic role and with more independence in everyday life - than in the oasis cultures of the Uzbeks and Tajiks, where female roles were more restrictive, women occupied a more subordinate role within the household system and daughters were married off at an earlier age.

Second, in all four republics but particularly in Tajikistan, Uzbekistan and Kyrgyzstan, there is a marked increase in the rate of first union formation in the late-Soviet period, with the rate peaking in the early 1990s. Again, this is in line with Dommaraju and Agadjanian's (2008) results for Uzbekistan, Kyrgyzstan and Kazakhstan, which also illustrate the distinctiveness of this increase compared to earlier periods, and those of Agadjanian and Makarova's (2003) study focusing on Uzbekistan. This increase in marriage rates is the focus of a different paper (Clifford 2008) and will not be further elaborated upon here.

Third, in all four republics, there has been a sharp decrease in the rate of first union formation since this peak in the early post-independence years. Dommaraju and Agadjanian (2008) also noted an incipient decline in marriage rates in post-Soviet Kyrgyzstan and Uzbekistan, but levels were still above or similar to those in the pre-*perestroika* period. The more recent results presented here show that, such has been the decline in first union formation, by the turn of the millennium rates in all four republics were significantly lower than in the late 1980s (see Table 2, which complements Figure 1 by providing relative risks of first union formation compared to the 1988 level). Thus the marriage decline does not simply represent a reversion to a pre-*perestroika* norm.

The results also show clear differences between the republics in terms of the nature of the decline. Most notably, Tajikistan, which had the highest rate of first union formation pre-independence, had the lowest rate by the early years of the new millennium. This represents a dramatic collapse in the rate of first union formation: the rate in 2003 represented a fall of 46% from the late 1980s (Table 2), and of 58% from the peak in the early post-independence years. Uzbekistan, too, experienced a particularly sharp decline: the risk of first union formation in 2003 was 34% lower than the late-1980s level, and more than 50% lower than the early post-

independence peak. In contrast, while there were significant declines in Kazakhstan and Kyrgyzstan, these were smaller in comparison: for Kazakhstan (Kyrgyzstan) in 2003, the risk of first union formation was 27% (18%) lower than in the late 1980s, and around 38% (38%) lower than the peak. Overall, there is a distinction in terms of the timing and scale of the decline: in Tajikistan and Uzbekistan the decline started later and – especially in the case of Tajikistan - was particularly acute; in Kazakhstan and Kyrgyzstan the decline started earlier but was smaller in scale.

Trends in rate of first union formation for different age groups

While there have been significant declines in marriage rates in post-communist Europe, a significant portion of the decline in period rates has been attributed to a 'postponement' of marriage, particularly in Central Europe, since the decline in the marriage rate has been mostly at younger ages – such that the mean age at marriage has been increasing (for example, Sobotka 2008; Sobotka and Toulemon 2008). Indeed, if a subsequent increase in the marriage rate at later ages compensates to some extent for earlier declines at younger ages, a period decrease in marriage rates need not translate into a comparable decrease in the cohort measure of the proportion of women ever married. To explore changes in the rate of first union formation for different ages in Central Asia, an interaction was included between calendar year and age group in the survival model of first union formation for each country (equation 4). In each case, adding these interaction terms significantly improved the fit of the model.

In all four republics, the increase in rates of first union formation in the early 1990s was most marked at younger ages. By the early-to-mid 1990s, rates for unmarried women aged 18-20 had exceeded the rates for those aged 21-29 (for Tajikistan, Uzbekistan and Kyrgyzstan) or had drawn level with them (for Kazakhstan) (Figure 2; Table 3). From the mid-1990s, in Kyrgyzstan

and Kazakhstan decreases in the overall rates of first union formation were effected through decreases in the rate for the two youngest groups (15-17 and 18-20) while rates remained stable in the 21-29 group, and even started to increase in Kyrgyzstan. By the turn of the millennium, rates of first union formation were much higher for this older group than for those aged 18-20, indicative of an increase in the mean age of first union formation to accompany the decrease in the overall rate. In Uzbekistan and Tajikistan, rates also fall more sharply amongst the youngest age groups from the mid-1990s but, unlike Kyrgyzstan and Kazakhstan, the decline in the rate at the older ages continued. In particular, Tajikistan has seen sharp declines in this 21-29 age interval since independence, part of a general collapse in the rate of first union formation across age groups.

In Central Asia, as elsewhere, the extent to which - consistent with the 'postponement' scenario from the cohort perspective - any future increases in the rate of first union formation at older ages compensate for recent declines at younger ages is, essentially, an empirical question for future research. However, the length of time in which period rates of first union formation have been at a level significantly lower than that of the 1980s would seem to indicate a long-term change in union behaviour rather than simply a temporary 'timing' effect. This is most clear in the case of Tajikistan, where an acute decrease in rates of first union formation, together with the preservation of the age-at-first-union distribution, will inevitably translate into a sharp increase in the proportion of women who remain never-married – a marked departure from the Soviet era, where marriage remained nearly universal, and from historical norms.

[Figure 2 and Table 3 about here]

Discussion

Response to food insecurity

Rates of first union formation have declined significantly across post-Soviet Central Asia. Interestingly, it is in Tajikistan and Uzbekistan, where female roles have traditionally been more conservative (Jones and Grupp 1987) and where Islam has perhaps the strongest tradition (Tazmini 2001), that have seen the greatest declines in rates of first union formation. Indeed, while Tajikistan is distinctive in terms of the scale of decline, the pattern of change in Uzbekistan shows certain parallels with the Tajik case - both in terms of the timing of decline and in outstripping the declines in Kazakhstan and Kyrgyzstan. In this context it is significant that, of the countries in transition, Tajikistan and Uzbekistan have seen the most serious declines in food security (FAO 2006). There is an established literature on the demographic implications of food scarcity – and a decrease in the rate of union formation is an established response to such a crisis. Galloway (1988), for example, examining the response to annual fluctuations in grain prices in nine pre-industrial countries, reports a clear decline in nuptiality during years of grain price shocks, while Lee (1981) notes comparable trends in historical data for England. In a similar way, the particularly sharp declines in first union formation in Tajikistan and Uzbekistan may in large part reflect a response to decreases in food security.

Annual (non-smoothed) fluctuations help to further illustrate the parallels between Tajikistan and Uzbekistan (Figure 3). In particular, 1995 seems to have been a watershed year in both countries. In just one year, the rate of first union formation decreased by 31% in Tajikistan (p=0.003)[6] and by 27% in Uzbekistan (p<0.001) (Table 4). The context of this decline for

[6] This, and subsequent, p-values are results of Wald tests assessing the significance of a calendar year coefficient, compared with a reference comparison year. Standard errors were adjusted to take account of the surveys' sample design.

Tajikistan is described by Clifford et al. (2008). Heavily dependent on imports of grain during the Soviet period, stocks of grain were drawn down rapidly in the early post-independence years. After the collapse of central planning, trading relationships took time to develop and the indebted government struggled to fund the necessary grain imports – particularly following a poor cotton harvest in 1994 and the associated reduction in valuable foreign revenues. Imports in 1994-95, even after being supplemented by aid, were just half of the 1994 level (World Food Programme 1996). The shortage of grain in the republic prompted dramatic increases in prices. The price of open market bread increased sixfold in the first six months of 1995 (Grand et al. 2001), while price controls on rationed state bread were lifted in August of the same year. Overall, the scarcity of flour and bread, and price increases, in 1995 had an acute impact on the welfare of the population, such that 'many people suffered significant hunger over a period of many months' (Harris 2004, p.29), and it was only aid from international agencies that prevented famine. Given past studies of the relationship between periods of food scarcity and nuptiality, it is not surprising that the rate of first union formation dropped dramatically at this time.

[Figure 3 and Table 4 about here]

The similarity of the demographic response in Uzbekistan, meanwhile, reflects the similarity of the pressures that it experienced. Like Tajikistan, it had been dependent on imports for the majority of its grain during the Soviet period (Economist Intelligence Unit 1997). Like Tajikistan, it was heavily reliant on cotton exports as a source of external revenue, and therefore vulnerable to changes in crop levels and in world prices. Indeed, while in the early years of independence, the cotton sector was helped by rising prices, by 1995 this trend in prices was reversing (Economist Intelligence Unit 1995d, p.61). Like Tajikistan, imports of grain to Uzbekistan declined sharply from 1994 to 1995 - in this case by more than half (FAO 2008c; Figure 4). This decline seems to stem not only from difficulty in funding the necessary imports,

but also from over-optimism in estimates of domestic wheat production[7]. Like Tajikistan, bread prices were liberalised, although at the earlier date of November 1994, leading to immediate and significant price rises (Economist Intelligence Unit 1994, p.70), which continued in 1995 (Economist Intelligence Unit 1995c, p.46). Like Tajikistan, there were reports of food shortages by early 1995 - to such an extent that rationing, which had been abolished at the end of 1994, was re-introduced (Economist Intelligence Unit 1995e, p.53; Pomfret and Anderson 1997). Overall, just as in Tajikistan, the population had become even more reliant on bread during the early years of independence – and just as in Tajikistan, in 1995 the population were faced with a 'perfect storm' of decreases in overall grain availability accompanied by the liberalisation of bread prices. The significant drop in nuptiality in this year should be understood within this context.

[Figure 4 about here]

[7] The aim to become more self-sufficient had led to an increase in the amount of land sown to wheat. The initial estimate of the 1995 harvest was 3.3m tonnes (Economist Intelligence Unit 1996b, p.53), a significant chunk of domestic demand of 4m tonnes. At the end of the year it was officially recorded as 2.85 million tonnes, a doubling of 1994's 1.42m tonne crop (Economist Intelligence Unit 1995b, p.64). However, the figure for 1995 was subsequently revised downwards to 2m tonnes, the poor harvest reflecting the lowest yield in a decade (Economist Intelligence Unit 1996b, p.53). Faced with an unexpected shortfall in grain supplies in the winter of 1995-96, the government had no option but to order further grain from abroad, despite the fact that wheat prices at this point had reached a 16-year high (Economist Intelligence Unit 1996c, p.46).

In both Tajikistan and Uzbekistan, the marriage rate remained at a low level after 1995. Even though food shortages eased somewhat from mid-1996 in Tajikistan, after the end of subsidies bread was much more expensive than before (Clifford et al. 2008). Further, the collapse of the collective and state farms, following the rapid inflation in 1995 after the introduction of a new currency, led to persistent under-and non-payment of wages in subsequent years (Grand et al. 2001). Similarly in Uzbekistan, while in the first half of the 1990s agriculture provided a buffer for growing unemployment in other sectors, from the mid-1990s unemployment and underemployment increased in rural areas as the sector became increasingly 'under strain' (Spoor 2006, p.198). The government retained the Soviet state order system for cotton and for grain, purchasing these products well below official market prices, which exacerbated hardship in rural areas (Economist Intelligence Unit 1996a, p.44). Large-scale state and co-operative farms, many of them insolvent, started to shed labour, while their remaining employees - on very low wages - became the 'working poor' (Spoor 2006, p.201). Thus in both Tajikistan and Uzbekistan, with bread much more expensive than pre-1995 and rural incomes declining, food insecurity remained a major issue. Given also that in both countries wedding ceremonies are traditionally very expensive and a focus for conspicuous demonstrations of wealth (Tett 1996; Agadjanian and Makarova 2003), this undermined people's ability to finance the costs of a wedding and of family formation.

From the mid-1990s onwards, the countries became increasingly reliant on locally produced grain as imports remained well below Soviet levels. Both pursued a policy of increasing the share of agricultural land devoted to wheat production – although, while production levels started to increase, productivity was actually declining (Economist Intelligence Unit 2000). In both countries, household garden plots provided a safety net for many households, providing a

valuable means of subsistence in the absence of sufficient income[8], although the small amount of suitable land available has restricted the size of the individual plots (Spoor 2006). Families therefore became increasingly dependent on, and therefore vulnerable to short-term disruptions in, the quality of the local food harvest.

In 2000 and 2001, both Tajikistan and Uzbekistan were affected by a severe drought, estimated to be the worst for 70 years, and part of a regional shortage of rainfall which also affected Iran, Afghanistan, Western Pakistan and Turkmenistan (IRI 2001), but not Kazakhstan and Kyrgyzstan. This led to an almost total failure of the rainfed wheat crop and significant drops in the irrigated wheat yield (FAO/WFP 2000). Indeed, water flows in the two main sources of irrigation, the Amu Darya and Syr Darya, were reported to be only 40% of the average (FAO 2001). Overall wheat production, which had increased since the mid-1990s, dramatically declined - in Tajikistan from 475,000 tonnes in 1999 to 255,000 tonnes in 2000 (Economist Intelligence Unit 2001b) and 300,000 tonnes in 2001 (World Food Programme 2003), and in Uzbekistan from 3.6 million tonnes in 1999 to 3.2 million in 2001 (FAO 2001). These declines had a serious effect on food security. In Tajikistan, for example, there was a 63.6% increase in the price of foodstuffs in 2000 (Economist Intelligence Unit 2001b). Especially vulnerable were those in rural areas whose household crop had failed. The situation was particularly acute in the second year of drought in 2001, reflecting the cumulative effect of persistent water and food shortage, as people had exhausted whatever coping strategies remained.[9] As many as one

[8] For example, following the 1995 crisis, Harris (1998, pp.665-6) notes that villagers in Khatlon, Tajikistan decided to devote more of their private household plots for growing wheat rather than vegetables.

[9] The UN's humanitarian aid co-ordinator in Dushanbe, Tajikistan, pointed out that 'families who survived last year by selling their cows and chickens now have no other means of coping.

million people in Tajikistan faced malnutrition and potential starvation (Economist Intelligence Unit 2001a) and were dependent on international aid. About 40% of Uzbekistan's population lived in the affected areas (WHO 2000). While there is no evidence for a change in the rate of first union formation during the first year of drought, the effect on nuptiality in the second year was significant. The rate of first union formation in 2001, during the second year of the drought, was just 75% (p=0.030) of pre-drought (1999) levels in Tajikistan, and 84% (p=0.047) of pre-drought levels in Uzbekistan (Figure 3; Table 4). Following the drought, rain during the 2001-2002 cropping season was in line with the long term average, and production in 2002 recovered to 1999 levels. Rates of first union formation have increased gradually since 2001, but in 2005 had yet to recover to pre-drought levels.

The annual pattern of trends in first union formation therefore highlights the importance of particular crisis periods in Tajikistan and Uzbekistan. However, the impact on nuptiality has also been long-lasting, with no immediate significant rebound following sharp declines. As Palloni et al. (1996, p.107) argue, 'when the economic effects of the crisis are long-lasting, a more permanent disequilibrium in the marriage markets sets in, and the making up of postponed marriages ceases to be a feasible option. The consequence is an increase in the proportion of members who never marry'. Indeed, underlying the specific crises in 1995 and 2000-2001 was the longer-term economic shift away from Soviet-style central planning, which co-ordinated trade between republics, to increased self-reliance in food supply – both at the national level (as imports declined) and at the household level (as families increasingly came to rely on household

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Some households have sold the glass out of their windows and the wooden beams from their roofs to raise money for food' (Reported in the *Guardian*, 'Drought hit states facing famine', October 30 2001).

plots). At the same time, there was a shift from subsidised and stable food prices to market-driven pricing, prone to fluctuations.

Overall, these changes represented a shift from a situation in which minimum consumption levels were assured to a post-Soviet context in which this was no longer the case. Those countries most reliant on imports during the Soviet era – Uzbekistan and particularly Tajikistan - were least well placed to provide for their population. They saw the most severe declines in nutrition (Table 1) and the most significant declines in nuptiality. In contrast, Kazakhstan and Kyrgyzstan, which had been less reliant on imports during the Soviet era and which did not experience the 2000-2001 drought, were – after the shock of the first few years of independence – better able to provide for the population. From the mid-1990s, the level of undernourishment stayed low in Kazakhstan and decreased in Kyrgyzstan (Table 1), and the declines in first union formation in these two countries have been relatively small (Figure 1).

The rise of labour migration

The post-communist period has seen the emergence of new and significant patterns of international labour migration (see Rios 2006). These movements should be distinguished from the ethnic repatriation of the non-titular population (for example, of Russians from the Central Asian republics to Russia) in the years immediately preceding and subsequent to independence. In the Tajik case, economically-driven labour migration started to emerge in the mid-1990s (Umarov 2006) and for many it has 'offered the only alternative to going hungry' (Olimova and Bosc 2003, p.8). Much of the movement is undocumented and so not recorded in official figures. Olimova and Bosc (2003), using survey data, estimated that in 26% of Tajik households at least one household member had worked abroad at some point between 2000 and 2003. They identified several types of movement: traders who undertake short-term shuttle tours several

times a year; seasonal workers, who return to Tajikistan each winter; and those who work abroad for several years at a time and visit their families infrequently.

Since the vast majority of migrants are men of working age who are working in Russia (Mughal 2007), the effect is to remove many eligible bachelors from the marriage market. Thus Harris (1998, p.661) reports, of the Gharmi villages in Khatlon, Tajikistan that 'the absence of young men of marriageable age has made it extremely difficult to find spouses for the girls and there are increasing numbers of unmarried girls as old as 22 or 23 [which was previously unheard of]'. Indeed, the scale of labour migration in Tajikistan is likely to be one of the key reasons for the persistence of low rates of first union formation since the mid-1990s. Given also the significant labour migration from the other Central Asian republics since the mid-1990s (see, for example, Ergeshbayev 2006; Maksakova 2006), it would be interesting for future research to examine the relationship between these movements and trends in first union formation in more detail – though this may be hampered by a lack of reliable data on migration levels over time.

The role of ideational change

This paper has highlighted the importance of economic change, and the implications for food security, to changes in the rate of first union formation in post-Soviet Central Asia. But there have also been changes in the ideational sphere. In the Tajik case, Harris (2006) observes changes, for example, in young people's attitudes to romantic friendships, and in women's clothing, since the Soviet era, particularly in the capital Dushanbe. She also notes the emergence of 'modernist' family styles, characterised by a higher degree of individualism and in which children have considerable say in the choice of their spouse. This contrasts to the 'traditionalist' model, strongly collectivist, in which marriages are arranged by family members. However, as she points out (p.152) the number of modernistic families in the republic is very small – at most

representing 1% of families in the conservative rural areas of Khatlon, and 10% in the capital Dushanbe. Overall, traditionalist values remain dominant. Indeed, the post-Soviet period has seen a revival of Islamic practices (including, for example, increased observance of Ramadan) as religion becomes a more important feature of public and cultural life (Tazmini 2001) - although it is unclear that there is a serious religious resurgence (Harris 2006) and the impact on gender roles has yet to be evaluated (Falkingham 2000). In any case, the virginity of brides remains highly valued, and the movement of unmarried women outside the home tends to be restricted by their families (Harris 2004). Thus childbearing outside marriage remains rare, explaining why there has been an equally sharp drop in the rate of first births in Tajikistan as there has been in the rate of first union formation (Clifford et al. 2008). Marriage remains highly valued, and the ceremony remains the focus of conspicuous demonstrations of wealth[10].

Meanwhile, there is no evidence that girls are staying in education for longer in the post-Soviet period in Tajikistan. In fact, there is evidence of a decrease in educational enrolment after age 12, mainly among girls (Baschieri and Falkingham 2008). Rates in the non-compulsory upper secondary ages are especially low, with an enrolment rate of 29% in 2003 (TransMONEE 2006), half that of the late Soviet period, with a particularly low rate for girls. While rates of enrolment in tertiary education have remained steady in the post-Soviet period, with around 12% of those aged 19-24 years enrolled (TransMONEE 2006), the sex gap increased – from 58 girls per 100 boys in 1990 to just 34 in 1998 (Falkingham 2000) and 35 in 2005 (UNESCO 2007). Increasingly in the post-Soviet period, in the absence of alternative accommodation, newly married women become *kelin*, 'incomers', in the home of their husband's family. As well as

[10] Indeed, in an attempt to limit the amount of money spent on weddings - which could bankrupt a household (Gomart 2003) - the president of Tajikistan recently issued a decree limiting the number of guests at wedding celebrations.

childbearing, heavy emphasis is placed on their domestic role in the household, to such an extent that uneducated girls, less likely to pursue a job, are often preferred by their prospective mothers-in-law (Harris 2006). Indeed, as Falkingham (2000) argues, there has been a significant gender dimension to the nature of post-independence changes in Tajikistan, with women concentrated in the lowest-paid sectors, including agriculture, education and health, where wages are insufficient to live on. Overall, given the decrease in educational and employment opportunities for women, the context in Tajikistan contrasts sharply with the situation in Central Europe, where postponement of family formation has been attributed partly to women's new employment opportunities and career prospects (Sobotka 2004).

Therefore, in post-Soviet Tajikistan – at least thus far – economic factors, rather than ideational changes and the spread of new opportunities for women, are the main reasons for the decline in the rate of first union formation. Similarly, the annual pattern of change in first union formation in Uzbekistan - with major declines in the rate of union formation coinciding with periods of particular food insecurity – also points towards the importance of economic factors. Rates of enrolment in higher education decreased from 14% in 1991 to 8% in 2003 (TransMONEE 2006), while, as in Tajikistan, fewer women pursue higher education than men (UNESCO 2007). In contrast, in both Kazakhstan and Kyrgyzstan, there has been a significant expansion of the tertiary sector, with enrolment rates more than doubling between 1996 and 2003 (TransMONEE 2006; Figure 5). Given that in both countries the sex gap in higher education is in the other direction – with an estimated 142 women enrolled for every 100 men in Kazakhstan, and 125 women per 100 men in Kyrgyzstan in 2005 (UNESCO 2007), this represents a considerable increase in female higher education. Thus ideational change, and the spread of new opportunities for women, is likely to have played a more significant role in influencing trends in union formation in Kazakhstan and Kyrgyzstan than in Tajikistan and in Uzbekistan, especially since the mid-1990s. Indeed, declines in first union formation in Kazakhstan and Kyrgyzstan

over this period have been concentrated at the younger ages, consistent with the influence of increased female participation in higher education, while the rate at older ages has remained stable (Figure 2 and Table 3).

[Figure 5 about here]

Relating Central Asia to post-communist Europe

The principles which are helpful in understanding changes in union formation in post-communist Europe are also helpful in Central Asia. Just as in post-communist Europe, there is considerable cultural diversity – with a particular cleavage between Tajikistan and Uzbekistan, where female roles have traditionally been more conservative, and Kazakhstan and Kyrgyzstan, where gender roles have traditionally been more egalitarian (Jones and Grupp 1987). As in post-communist Europe, there have also been big differences in the economic performance of the former Communist states: Uzbekistan and, in particular, Tajikistan have experienced greater problems with food insecurity than Kazakhstan and Kyrgyzstan. It is interesting that Tajikistan, which has experienced the most severe economic problems of all, has maintained a similar distribution of age at first union, with declines in the rate of first union formation in all age groups – in contrast with Kazakhstan and Kyrgyzstan, where declines since the mid-1990s have been specifically at the younger ages. This resonates with the pattern described by Sobotka (2004), in which those countries that had experienced a more successful transition showed the most significant increase in the mean age at first birth.

As in post-communist Europe (Frejka 2008), the underlying root cause of the changes in first union formation in Central Asia has been the shift from state socialist regimes to market economies. This perspective accommodates both the importance of economic change across the

region and the possibility that the capitalist restructuring has started to foster ideational change and greater individual autonomy (Lesthaeghe and Surkyn 2002), reflected in the spread of female higher education, in Kyrgyzstan and Kazakhstan. It also provides a framework for considering economic influences on union formation which cannot be simply reduced to 'crisis' explanations. Thus in Tajikistan and Uzbekistan it has been the longer-term change from reliance on centrally-planned food imports to increased self-sufficiency, and from subsidised to free-market pricing, which has effected a one-off transition to a context in which minimum consumption levels are no longer guarenteed. This, as the paper has illustrated, has led to periods of acute food crisis. However, these crises are symptoms of a population which is now, unlike the past, vulnerable to short-term changes in food supply, either from reductions in import levels (as in 1995) or, as reliance on local crops increased, on adverse local climatic conditions (as in 2000-2001). Even outside these crisis periods, basic foodstuffs now demand a significant share of the household budget – a feature of market conditions which can be expected to continue to have an important influence on union formation even as nutrition levels start to improve. Likewise, the increasing dependence on income from international labour migration[11] is a form of economic change which, given the absence of males for extended periods, may have a long-lasting influence on patterns of first union formation.

[11] To illustrate, Mughal (2007, p.30) estimates that remittances sent by absent international migrants to families represented over a quarter of Tajikistan's Gross Domestic Product in 2004; globally, only in Tonga and Moldova do remittances make up a bigger share.

Conclusions and directions for future research

This paper extends previous research on first union formation in post-Soviet Central Asia (Dommaraju and Agadjanian 2008) by extending the period of analysis to the mid-2000s and, in including Tajikistan, extending the cross-country comparison to four of the five Central Asian republics. It finds that, while rates of first union formation peaked in the early 1990s, there was a sharp decrease in subsequent years – such that rates are considerably lower than in the 1980s. It also finds clear differences between the republics in terms of the extent of the decline. Tajikistan and Uzbekistan, which experienced the most severe declines in food security, have also seen the sharpest declines in first union formation. Indeed, Tajikistan, which had the highest rate in the late-Soviet period, had the lowest rate by the turn of the millennium, reflecting a collapse in rates of first union formation across age groups.

There are a number of interesting avenues for future research. First, while this paper has focused mainly on the importance of changes in food security for understanding changes in first union formation in Central Asia, the potential importance of ideational change and the spread of new opportunities for women could be explored in more detail, particularly for Kazakhstan and Kyrgyzstan. Second, as mentioned earlier, our understanding of trends in union formation would improve through research into the relationship with trends in international labour migration. Third, trends in first union formation for four of the five ex-Soviet Central Asian republics have been presented, but the picture would be completed by a study which examines recent changes in Turkmenistan. Fourth, the problem of food insecurity persists in Tajikistan, which has been identified by the United Nations as one of the 12 countries most severely affected by the recent increase in food prices (OCHA 2008). It will be interesting to see if this most recent period of food crisis has led to further declines in the rate of union formation.

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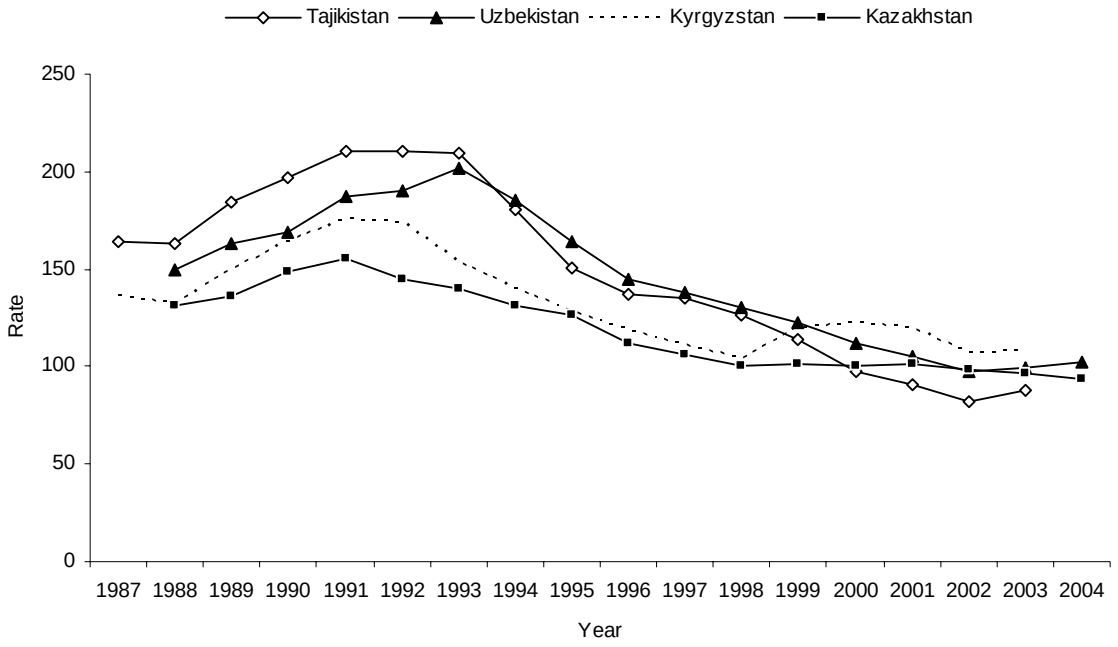
Table 1 Prevalence of undernourishment[1] in the total population of four Central Asian republics (%)

	1993-1995	2001-03
Kazakhstan	3	8
Kyrgyzstan	21	4
Tajikistan	22	61
Uzbekistan	8	26

1 A measure of food deprivation based on three parameters: food availability, equality of access to food, and minimum required average human calorific intake. See endnote 4.
Source: FAO (2008a)

Figure 1 Rate of first union formation[1] in Central Asia (three-year moving average)



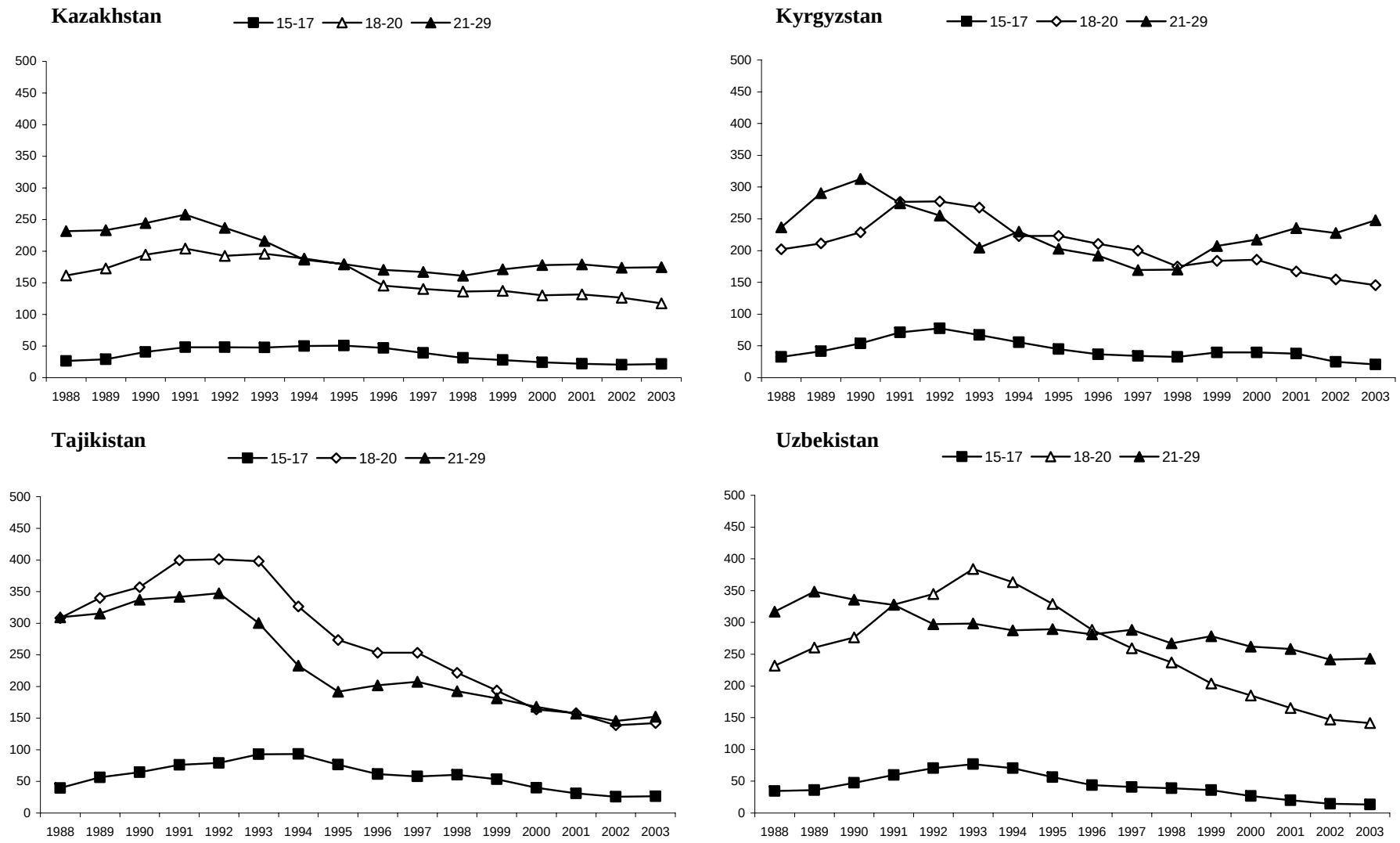
1 Rates per 1,000 years of exposure for unmarried women aged 15-29 years inclusive.
Source: author's analysis of MICS3 surveys.

Table 2 Relative risks[1] of union formation in Central Asia, compared to 1988 rate[2]

	Kazakhstan	Kyrgyzstan	Tajikistan	Uzbekistan
1987		1.03	1.01	
1988	**(131) -**	**(132) -**	**(163) -**	**(150) -**
1989	1.04	1.13	1.13	1.09
1990	1.13	1.24	1.20	1.13
1991	1.18	1.33	1.29	1.25
1992	1.10	1.32	1.29	1.27
1993	1.06	1.16	1.28	1.35
1994	1.00	1.06	1.11	1.24
1995	0.96	0.97	0.92	1.10
1996	0.85	0.90	0.84	0.97
1997	0.81	0.84	0.83	0.92
1998	0.76	0.79	0.77	0.87
1999	0.77	0.91	0.70	0.82
2000	0.77	0.93	0.60	0.75
2001	0.77	0.90	0.56	0.70
2002	0.75	0.81	0.51	0.65
2003	0.73	0.82	0.54	0.66
2004	0.71			0.69
N_u	*6,473*	*3,429*	*4,506*	*6,691*
N_{wy}	*56,953*	*25,727*	*38,098*	*50,617*

1 Relative risks based on the 3-year moving average of the rate of first union formation.
2 1988 rate shown in brackets in bold; per 1,000 years of exposure for unmarried women aged 15-29 years inclusive.
N_u and N_{wy}: number of unions, and number of years of exposure, in total analysis period for sampled women.
Source: author's analysis of MICS3 surveys.

Figure 2 Rate of first union formation[1] for different age groups in Central Asia (three-year moving average)



1 Rate (y-axis) per 1,000 years of exposure for unmarried women in age group.

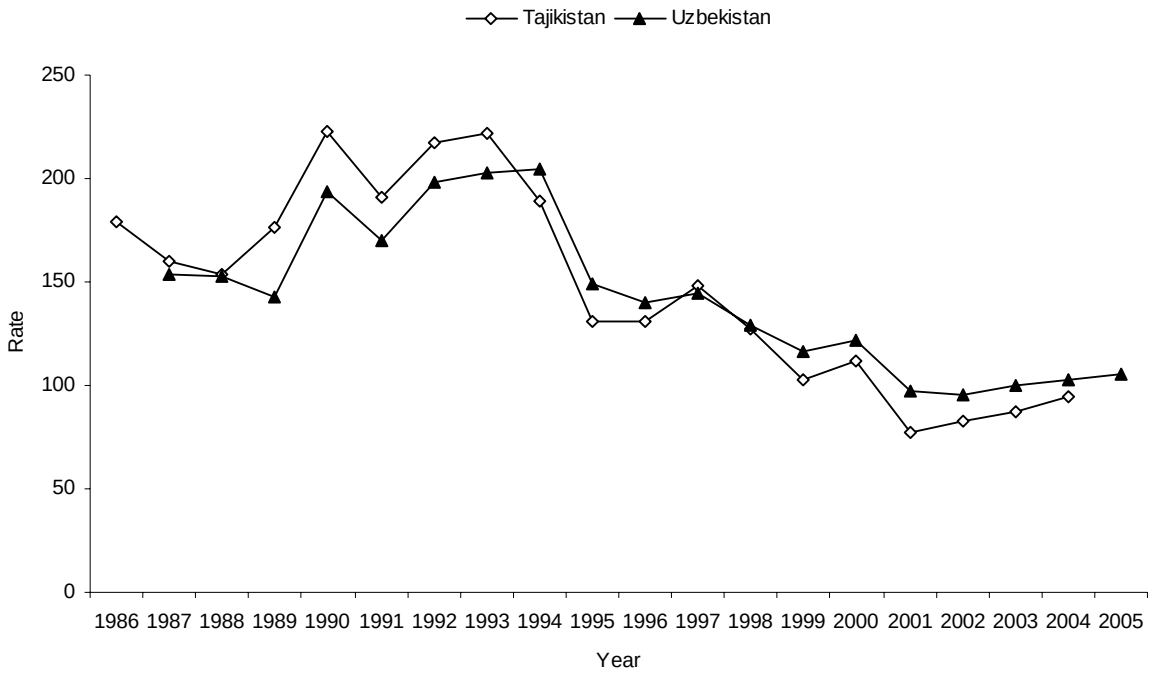
Source: author’s analysis of MICS3 surveys.

Table 3 Relative risks[1] of union formation for different age groups in Central Asia, compared to 1988 rate[2]

	Kazakhstan			Kyrgyzstan			Tajikistan			Uzbekistan		
	15-17	18-20	21-29	15-17	18-20	21-29	15-17	18-20	21-29	15-17	18-20	21-29
1987				1.10	1.00	1.06	0.98	1.06	0.97			
1988	**(26) -**	**(162) -**	**(232) -**	**(32) -**	**(202) -**	**(236) -**	**(40) -**	**(308) -**	**(309) -**	**(34) -**	**(232) -**	**(317) -**
1989	1.10	1.07	1.01	1.28	1.05	1.23	1.42	1.10	1.02	1.04	1.12	1.10
1990	1.54	1.20	1.05	1.66	1.13	1.32	1.63	1.16	1.09	1.37	1.19	1.06
1991	1.82	1.26	1.11	2.19	1.37	1.16	1.92	1.30	1.11	1.73	1.41	1.03
1992	1.82	1.19	1.02	2.39	1.37	1.08	2.00	1.30	1.12	2.04	1.49	0.94
1993	1.81	1.21	0.93	2.06	1.33	0.87	2.35	1.29	0.97	2.21	1.66	0.94
1994	1.90	1.16	0.80	1.72	1.10	0.97	2.36	1.06	0.75	2.03	1.57	0.91
1995	1.92	1.11	0.77	1.38	1.11	0.86	1.93	0.89	0.62	1.63	1.42	0.91
1996	1.77	0.90	0.74	1.13	1.04	0.81	1.55	0.82	0.65	1.26	1.24	0.89
1997	1.48	0.87	0.72	1.05	0.99	0.72	1.46	0.82	0.67	1.17	1.12	0.91
1998	1.19	0.84	0.70	1.01	0.87	0.72	1.52	0.72	0.62	1.13	1.02	0.84
1999	1.06	0.85	0.74	1.22	0.91	0.88	1.34	0.63	0.59	1.03	0.88	0.88
2000	0.92	0.81	0.77	1.22	0.92	0.92	1.01	0.53	0.54	0.77	0.80	0.83
2001	0.83	0.81	0.77	1.16	0.83	1.00	0.78	0.51	0.51	0.58	0.71	0.82
2002	0.78	0.78	0.75	0.77	0.76	0.96	0.65	0.45	0.47	0.42	0.64	0.76
2003	0.82	0.73	0.75	0.63	0.72	1.05	0.67	0.46	0.49	0.38	0.61	0.77
2004	0.78	0.69	0.76							0.33	0.55	0.75
N_u	*704*	*2,493*	*3,276*	*533*	*1,582*	*1,314*	*834*	*2,266*	*1,406*	*909*	*3,363*	*2,419*
N_{wy}	*22,961*	*16,981*	*17,012*	*12,519*	*7,755*	*5,453*	*19,052*	*11,325*	*7,720*	*25,381*	*15,910*	*9,326*

1 Relative risks based on the 3-year moving average of the rate of first union formation for a given age group.
2 1988 rate shown in brackets in bold; per 1,000 years of exposure for unmarried women in age group.
N_u and N_{wy}: number of unions, and number of years of exposure, in total analysis period in age group for sampled women.
Source: author's analysis of MICS3 surveys.

Figure 3 Rate of first union formation[1] in Tajikistan and Uzbekistan (annual rates; no smoothing)



1 Rates per 1,000 years of exposure for unmarried women aged 15-29 years inclusive.
Source: author's analysis of MICS3 surveys.

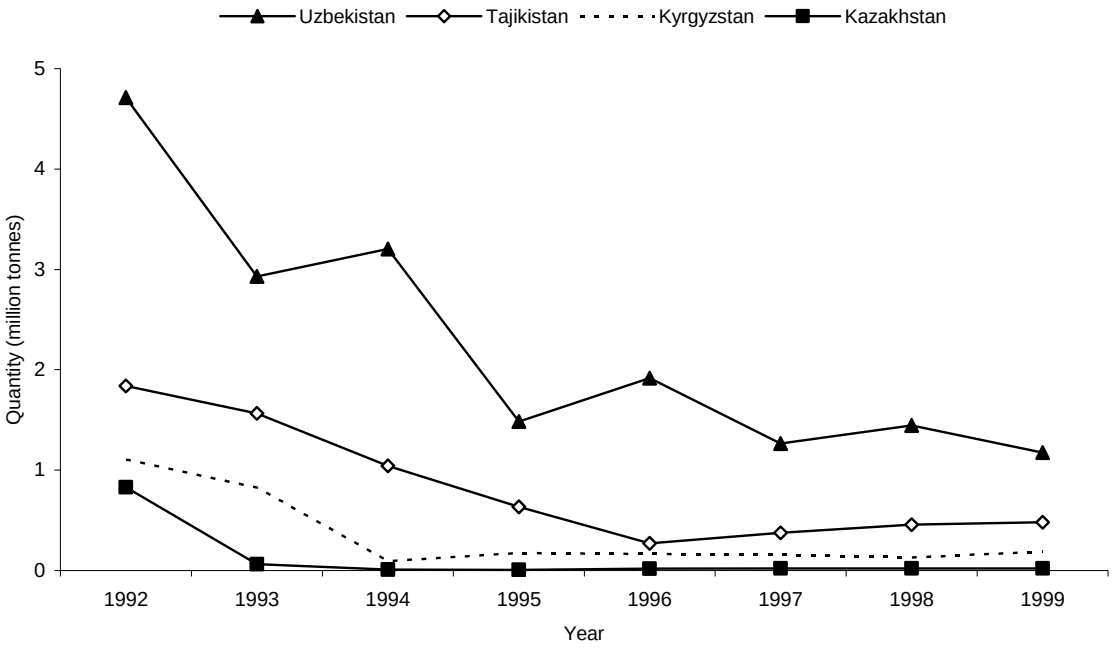
Table 4 Relative risks[1] of union formation in Tajikistan and Uzbekistan, compared to 1988 rate[2]

	Tajikistan	Uzbekistan
1986	1.17	
1987	1.04	1.01
1988	**(153)** -	**(153)** -
1989	1.15	0.93
1990	1.45	1.27
1991	1.24	1.11
1992	1.42	1.30
1993	1.45	1.33
1994	1.23	1.34
1995	0.85	0.97
1996	0.85	0.92
1997	0.97	0.95
1998	0.83	0.84
1999	0.67	0.76
2000	0.73	0.80
2001	0.50	0.64
2002	0.54	0.63
2003	0.57	0.65
2004	0.61	0.67
2005		0.69
N_u	*4,506*	*6,691*
N_{wy}	*38,098*	*50,617*

1 Relative risks based on the annual rate of first union formation (no smoothing).
2 1988 rate shown in brackets in bold; per 1,000 years of exposure for unmarried women aged 15-29 years inclusive.
N_u and N_{wy}: number of unions, and number of years of exposure, in total analysis period for sampled women.

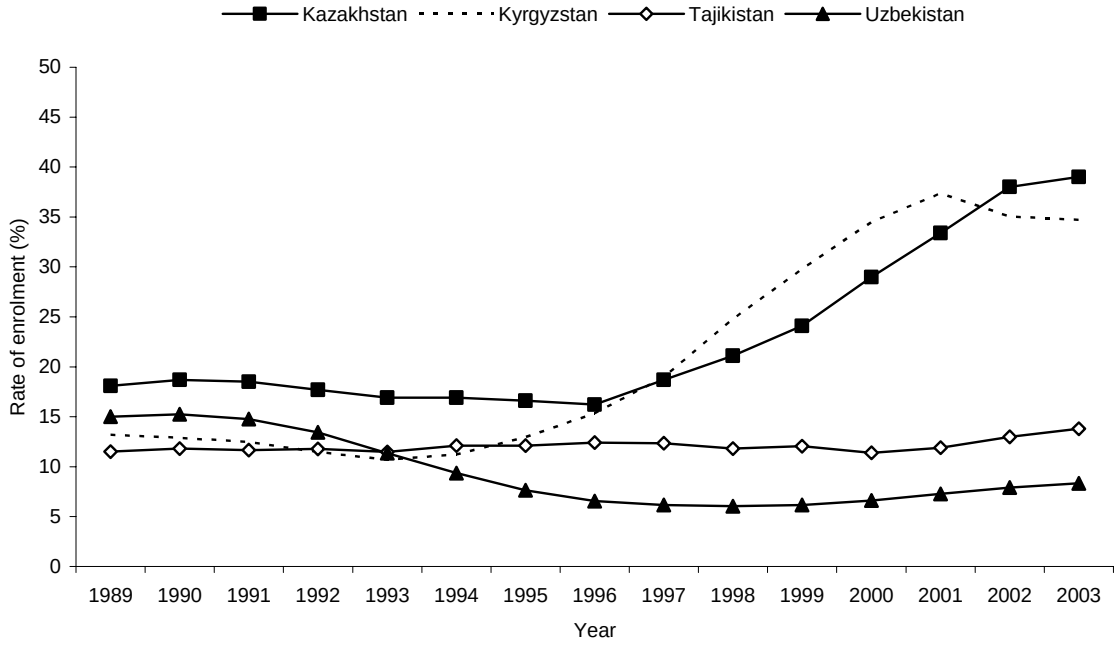
Source: author's analysis of MICS3 surveys.

Figure 4 Quantity of cereal imports in four Central Asian republics, 1992-1999



Note: The populations for the different republics, according to the 1989 Soviet census, were: Uzbekistan – 19.9m; Tajikistan – 5.1m; Kyrgyzstan – 4.3m; Kazakhstan – 16.7m.
Source: FAO (2008c).

Figure 5 Higher education enrolment[1] in four Central Asian republics, 1989-2003



1 As percentage of population aged 19-24 years.
Source: TransMONEE (2006).