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Applications and Policy

Trends In First Union Formation In Post-Soviet Central Asia

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Abstract

This study used recently available survey data to examine trends in the rate of first union formation in the post-Soviet Central Asian republics of Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. For the first time, it shows that the rate of first union formation in each republic is much lower than the Soviet-era level at the end of the 1980s. These results have three implications. First, they complement the literature on Central and Eastern Europe by illustrating the scale of post-socialist demographic change in very different cultural and demographic context. Second, post-Soviet Tajikistan and Uzbekistan here provide interesting examples of countries experiencing dramatic declines in first union formation in a conservative Moslem setting and at the same time as an increase in religiosity and a decrease in female higher education enrolment. Third, more generally, they serve to illustrate profound changes in demographic behaviour during dramatic social and economic change.

Keywords: post-Soviet, Central Asia, Tajikistan, union formation, economic crisis, food crisis, labour migration, civil war, Islam.

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 changes in union formation after communism in Central and Eastern Europe are well documented, there is not a comparable literature on post-Soviet Central Asia. Therefore, by using survey data to describe recent trends in union formation in Central Asia, this paper contributes to our understanding of human response to dramatic social and economic change.

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 and cultural change, new opportunities and the 'Westernisation' of behaviour, or of both. Frejka (2008, p.160-1) links these two explanations to one underlying root cause: the replacement of the state socialist regimes by the economic and political infrastructure of contemporary capitalism. Thus the change of economic systems led to severe economic crises in the early 1990s, in turn constraining family formation, while the

overhaul of the economic and political infrastructure was also the 'basis for emerging changes in the value systems, norms and attitudes regarding family formation'.

This 'root cause' 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 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 competition in the labour market — 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.

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 builds 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, it provides a clearer assessment of the nature of post-Soviet changes in union formation. Second, by including Tajikistan as well as Uzbekistan, Kazakhstan and Kyrgyzstan in the analysis, it extends the potential for cross-country comparison to four of the five Central Asian Republics (survey data for Turkmenistan are restricted). 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), 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 — and yet is, with Uzbekistan, the most socially conservative republic in which Islam has the strongest tradition. Tajikistan therefore offers the opportunity to examine the effects of particularly acute economic decline on union formation in a conservative Moslem setting. Unlike the other republics, it also experienced a civil war and so offers an opportunity to contribute to the literature on the demography of conflict. Given these points, this paper places particular emphasis on investigating the nature of changes in Tajikistan — while also maintaining a wider regional, and cross-country comparative, focus. Third, the paper explicitly relates the trends in rates of union formation to the nature of post-Soviet change in the republics — and, in particular, to ideational changes, economic changes associated with the shift to a market economy, and periods of economic crisis. In order to inform research hypotheses, the nature of these sets of changes will now be discussed.

Post-Soviet change in Central Asia

Ideational and cultural changes

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 (Pascall and Manning 2000; Tazmini 2001).

Particularly in Uzbekistan and Tajikistan, where Islam perhaps has the strongest tradition, and where in pre-Soviet times female roles were more restrictive (Jones and Grupp 1987), attitudes regarding women's roles have tended to become more conservative since the end of the Soviet Union. Citing these two republics as particular examples, Silova and Magno (2004, p.434) speak of a 'reassertion of a more traditional role of caring for the family and rearing children, which undoubtedly affects girls' education opportunities'.

Indeed, in Tajikistan 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). In Uzbekistan 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 (Silova and Magno 2004; 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). 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.

Economic change associated with the development of a market economy

The transition from socialism and central planning to market economy conditions included an increase in the responsibility for child costs. Indeed, while the general picture across the post-Soviet context was of reduced state support for families in a range of areas — including family allowance, nursery provision, sick child leave and parental benefits — women in Central Asia experienced a particularly dramatic collapse of services (Pascall and Manning 2000), including the most significant declines in kindergarten enrolment (Silova and Magno 2004). This was part of a more general shift in which families, and women in particular, were faced with an increased share in the responsibility for the care, health and education of dependents, as state provision declined. The reduced availability, and increased cost, of housing is another feature of the shift to the market economy of potential importance to union formation in the post-Soviet context.

The post-communist period has also 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. Much of the labour migration is undocumented and so not recorded in official figures. For the case of Tajikistan, Olimova and Bosc (2003) used survey data to estimate that in 26% of households at least one household member had worked abroad at some point between 2000 and 2003. Since the vast majority of migrants are men of working age who are working in Russia (Mughal 2007), this migration may have an important influence on

post-Soviet trends in union formation if the effect is to remove eligible bachelors from the marriage market. There have also been significant labour migration movements from other Central Asian republics (see, for example, Ergeshbayev 2006; Maksakova 2006). A lack of reliable data on the movements themselves precludes easy comparisons of the relative importance of labour migration in the different republics. However, data on remittances sent by absent labour migrants do suggest that Tajikistan has been the most significantly affected. Mughal (2007, p.xvii) estimates that Tajikistan was the second largest recipient of remittances from Russia in 2006, only slightly behind Uzbekistan (a country four times the size in terms of population). Indeed, according to a recent estimate, remittances made up 46% of GDP in Tajikistan in 2008, a higher figure than for any other country in the world (Ratha et al. 2008).

Periods of economic crisis and food scarcity

Following the end of the Soviet Union, the withdrawal of subsidies from Moscow, the disruption of trading relationships, together with the transition to a free-market economy, led to dramatic economic declines in all of the Central Asian republics (Green and Bauer 1998; Falkingham 2005; TransMONEE 2006). Figure 1 illustrates the scale of the crisis, both in terms of depth and the length of time at which GDP remained below 1989 levels. While all republics experienced a shrinkage of their economy, Tajikistan fared worst, while Uzbekistan experienced a still severe but more moderate decline. The shrinkage of the economy was accompanied by the removal of the 'three pillars' of the former Soviet system — guaranteed employment, subsidised and stable pricing, and social benefits and services (Standing 1996, p.230) —

effecting an increase in unemployment, rapid inflation, a decline in real wages and a collapse in social welfare provision (De Soto et al. 2001; TransMONEE 2006).

[Figure 1 about here]

One of the key implications of these changes for the Central Asian population was a decrease in food security at the household level (Rhoe et al. 2008). During the Soviet period, Central Asia was not self-sufficient in basic agricultural foodstuffs and 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. 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; 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). 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) and the liberalisation of previously subsidised food prices — particularly of bread, the base of the region's diet — had a significant impact on affordability.

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. The differences in food security are reflected in the estimated prevalence of undernourishment in the different countries (FAO 2008a; Table 1). In Uzbekistan and Tajikistan, in contrast to Kazakhstan and Kyrgyzstan, the prevalence of undernourishment significantly increased from 1993–95 to 2001–03, in part reflecting the drought in these countries in 2000–01. Indeed, as FAO (2006) conclude, of the post-communist countries in Europe, the Caucasus and Central Asia, the most serious declines in food security were in Tajikistan and Uzbekistan. As the data show, Tajikistan was worst affected of all.

[Table 1 about here]

Hypotheses

There are reasons to expect a significant decrease in first union formation in post-Soviet Central Asia. Abbasi et al. (2002) argue that economic hardship was a major factor behind the postponement of marriage in Iran between 1986 and 1996. More generally, Caldwell (2004, p.383), reviewing the demographic response to a range of social upheavals in different contexts, identifies the postponing or forgoing a marriage as a 'rational response to huge changes in material circumstances' (*ibid.*, p.398). This may be particularly applicable in the Central Asian context when the ceremony and

associated gift exchanges are traditionally very expensive and a focus for conspicuous demonstrations of wealth (Tett 1996; Agadjanian and Makarova 2003; Kuehnast and Dudwick 2004). More specifically, one of the key implications for the Central Asian population was a decrease in food security at the household level, manifested in periods of particular food scarcity. 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 (Lee 1981; Galloway 1988).

In addition, as well as particular periods of economic and food crisis, the longer term economic changes associated with the transition to a market economy may have encouraged decreases in the rate of first union formation. Reduced state support for families and children, and the more general increase in the burden on the family for the care, health and education of dependents, may have raised concerns about couples' ability to support a family. Given not only the particularly dramatic collapse in family services in Central Asia (Pascall and Manning 2000), but also the strong cultural expectation of a swift progression from marriage to childbearing (Tabyshalieva 1997), an inability to support children may have translated to a decision to postpone or forgo marriage. A further change associated with the transition to a market economy and prompted by economic need, international labour migration, may also have encouraged a decline in first union formation by reducing the supply of eligible men.

On the other hand, it is unclear that there has been a widespread change in underlying values or attitudes towards marriage and childbearing in the region. The concomitants of a decline in the rate of first union formation driven by ideational

factors — including a decline in the importance of marriage, more egalitarian perceptions of gender roles within the family, and an expansion of tertiary education — do not apply universally here. On the contrary, for Uzbekistan and Tajikistan at least, there has been a tendency towards more conservative gender attitudes in the post-Soviet period, and there is evidence for a decrease in female enrolment in tertiary education. This might be expected to mitigate against significant declines in rates of union formation, despite the economic pressures for decline.

These conflicting expectations for the overall change in rates of first union formation in the region also translate into conflicting expectations for cross-country differences in trends. On the one hand, Tajikistan was worst affected by the economic crisis, showing the biggest declines in GDP and real wages (TransMONEE 2006). It has also been the republic most affected by international labour emigration, and the country, followed by Uzbekistan, which faced the most acute declines in food security. These factors might point towards a more significant decline in the rate of first union formation than in the other Central Asian republics. On the other hand, Tajikistan and Uzbekistan are also the most traditional republics, in which gender roles are most conservative and in which Islam has the strongest tradition. Tajikistan and Uzbekistan have also seen declines in female tertiary enrolment, compared to the increases in Kazakhstan and Kyrgyzstan. These factors might point towards a less significant decline in first union formation in Tajikistan and Uzbekistan than in Kyrgyzstan and Kazakhstan.

Data and Method

Given these conflicting expectations, interest centred on examining trends in first union formation in each of the Central Asian republics since independence. However, official registration data are inadequate for a reliable assessment of temporal trends. 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 were 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 first 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.

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

$$\log \lambda_i = \log \lambda + \mathbf{x}_i' \beta \quad (1)$$

In this model (Model 1), 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 $\mathbf{x}_i$.

To ensure comparability across time, rates were 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. 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.

A piecewise exponential model was also specified where the process time *t*, time since 15th birthday, is split into age intervals *j*, assuming a constant hazard within these intervals:

$$\log \lambda_{ij} = \log \lambda_j + \mathbf{x}_i' \beta \quad (2)$$

where λ_j is the baseline hazard for age interval *j* (Model 2). 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 was extended to allow for the relaxation of this assumption. Specifically, an interaction

between the age intervals and calendar year was included in the model to allow for differences in trends in first union formation for different age groups of unmarried women:

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

where β_j represents the effect of calendar period for age interval *j* (Model 3).

Model 4 is similar to Model 2 (equation 2) but with an extra covariate, the mother tongue of the household head, included as a measure of ethnicity. This controls for any changes in the ethnic composition of the population at risk over time. Finally, Model 5 is similar to Model 2 but only a specific subpopulation, the titular nationality in each republic, was considered: Kazakhs in Kazakhstan, Kyrgyz in Kyrgyzstan, Tajiks in Tajikistan and Uzbeks in Uzbekistan. This is helpful when assessing whether or not differences in the overall nature of trends across republics are simply a reflection of differences in the relative size of ethnic minority populations. There is a more significant minority population in Kazakhstan than elsewhere: using the mother tongue of the household head as a measure, 59% of women interviewed in Kazakhstan were Kazakhs; corresponding figures for the proportion of titular nationalities in Kyrgyzstan, Tajikistan and Uzbekistan were 62%, 73% and 84%.

Results

Trends in overall rate of first union formation

Figure 2 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. These differences may in part reflect differences in economic development and levels of urbanisation. However, they also might reflect longer-standing differences in gender and familial systems: traditionally female roles have been more restrictive, and women have married at an earlier age, in the oasis cultures of the Uzbeks and Tajiks (Jones and Grupp 1987). 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.

[Figure 2 and Table 2 about 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 (Table 2). 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.

Figure 3 (Model 2, in panel 2) presents the trends in first union formation after controlling for any changes in the age distribution of the population at risk. After standardising, the increase in the rate of first union formation in Uzbekistan in the early 1990s is even more marked. Further controlling for changes in ethnic composition over time makes little impact on the trends (Figure 3, Model 4). Importantly, it is clear that the cross-republic differences in the nature of the temporal trend are not simply a reflection of differences in the relative size of ethnic minority populations. On the contrary, considering only the titular populations in each of the republics slightly increases the differences between the republics (Figure 3, Model 5). Thus by 2003 Tajiks in Tajikistan had experienced a 53% decline in the rate of first union formation compared to 1988 (and 64% decline from the early post-

independence peak), compared to 37% (59%) in Uzbekistan, 27% (39%) in Kazakhstan and 22% (44%) in Kyrgyzstan (Table 3, Model 5).

[Figure 3 and Table 3 about here]

Trends in rate of first union formation for different age groups

In all four republics, the increase in rates of first union formation in the early 1990s was most marked at younger ages (Figure 4; Table 4). 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 fell 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.

[Figure 4 and Table 4 about here]

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 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.

Discussion

This study has presented trends in first union formation in post-Soviet Central Asia. It extends previous research by, using more recently available survey data, illustrating the scale of decline in first unions across the region. For the first time, it is clear that the rate of first union formation is now not only much lower than the early post-independence peak, but also much lower than the Soviet-era level at the end of the 1980s. The paper also extends previous research by including Tajikistan, as well as Kazakhstan, Kyrgyzstan and Uzbekistan, in cross-national comparative analysis. This is a country of particular interest since it experienced the most significant economic decline of any post-Soviet republic and yet is, with Uzbekistan, the most socially conservative republic in which Islam has the strongest tradition.

Ideational and cultural changes

In Central and Eastern Europe, changes in family formation associated with the second demographic transition — including a decline in marriage rates and increases in cohabitation, non-marital childbearing, and divorce — were noted to spread more quickly in the most secularised regions (Sobotka 2008). This study only considered one aspect of demographic behaviour, but any declines in the rate of first union formation might still be expected to be less marked in republics with a stronger religious identity. On the contrary, post-Soviet Tajikistan and Uzbekistan here provide interesting examples of countries experiencing significant declines in first union formation (the most significant in the region) at the same time as an increase in religiosity, manifested in increased observance of Islamic rituals, a significant increase in mosque construction and a 'desire to connect more fully with the traditional practices and culture of the Islamic past' (Tazmini 2001, p.67).

A few caveats should be addressed. First, while Tajikistan and Uzbekistan have traditionally the strongest Islamic identity in the region, overall within the Soviet Union anti-religious policies had managed to curb much official religious activity. Nevertheless, Islam never died out, with a deeply rooted 'folk Islam' persisting (Atkin 1989b), such that Atkin's (1989a, p.28) judgement for Tajikistan is that Islam retained a 'significant following among a broad spectrum of the population'. Second, while in the post-Soviet period there has been a more public display of religion, in part this may be because it no longer has to be practiced in secret; thus for Harris (2006, p.159), 'it is unclear that there is a serious religious resurgence'. Third, religiosity does not necessarily equate to 'conservative' attitudes towards demographic change.

Nevertheless, in this case Tajikistan and Uzbekistan are indeed more socially conservative than Kyrgyzstan and Kazakhstan.

Fourth, despite conservative attitudes, more modern attitudes to family formation have also emerged. In the Tajik case, Harris (2006) 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 important. The virginity of brides remains important, and the movement of unmarried women outside the home tends to be restricted by their families (Harris 2004). Marriage remains highly valued, and the ceremony remains the focus of conspicuous demonstrations of wealth. Mensch et al (2005) report a theory that delays in marriage, which would be manifested in a decrease in period rates of marriage, may in some parts of Asia reflect changes in the marriage process and a shift away from arranged marriages — generally considered less time consuming — towards children choosing their own spouse. Given that arranged marriage remains the norm in Tajikistan, this is not the case here.

Traditionalist values are reflected in attitudes to gender roles. 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 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. The gendered nature of change is also reflected in the decrease in female enrolment in upper secondary and tertiary education.

The situation is different in Kazakhstan and Kyrgyzstan, where there have been significant increases in enrolment in tertiary education (Figure 5), in which females outnumber males. Declines in first union formation in the two republics over this period have been concentrated at younger ages, which is at least consistent with the influence of increased female participation in higher education, while the rate at older ages has remained stable (Figure 4 and Table 4). Enrolment in education has been cited as a major factor behind the delay of marriages in other contexts (for example, Malhotra and Tsui 1996) and it is possible that it explains part of the recent decline in first union formation in Kazakhstan and Kyrgyzstan. Overall, however, cultural and ideational changes — which would have pointed towards a less, rather than more, significant decrease in union formation in Tajikistan and Uzbekistan than elsewhere — do not on their own provide sufficient explanation for the trends in first union formation in post-Soviet Central Asia.

[Figure 5 about here]

Economic change associated with the development of a market economy

The longer-term economic changes associated with the transition to a market economy are likely to have played an important role in the decline in first union formation across the region. The Soviet system had, in many ways, represented an artificial 'greenhouse' environment, in which state population policy was important in shaping family decisions and, even amongst the urban population, reproduction was not impacted by career choices (Sobotka 2002). In particular, as Harris (2002, p.218) summarises, 'benefits paid to mothers of large families, cheap housing, free education and health care, free plots of land for members of communal and state farms, and the low costs of essential food stuffs' all made it possible for most families to afford the economic costs of family life without too much hardship. The absence of such state support, together with reduced job security in the market environment, helped to undermine the pattern of universal and early family formation — hence contributing to the decrease in the rate of first union formation. Economic concerns are given extra significance given the significant costs associated with the wedding ceremony and the associated gift exchanges. Olimova and Bosc (2003, p.111) report that young people in Tajikistan are 'forced to postpone marriage until they have enough money for a wedding'.

There is evidence that some of the increased burden associated with the withdrawal of family benefits in Central Asia, particularly in the area of childcare, has been taken on by the extended family (Pascall and Manning 2000). Further, the patrilocal tradition might be expected to reduce the extent to which difficulty in finding housing discourages first union formation. Indeed, more generally it has been argued that economic pressure for a decline in union formation is reduced in a context

in which the extended, rather than nuclear, family is the norm (Dixon 1971). But the declines in rates of first union formation shown here, and particularly in Tajikistan, show that such were the changes in material circumstances that they necessitated changes in family formation behaviour even with the availability of family support.

The economic changes associated with the transition to a market economy prompted new and significant movements of labour migrants from Central Asia, largely to Russia, in the post-Soviet period. The effect has been to remove eligible bachelors from the marriage market, a further negative influence on trends in union formation. 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]'. Given the scale of remittances to Tajikistan in 2008 (Ratha et al. 2008), it is likely that Tajikistan has been most severely affected by labour migration. However, recorded remittance flows from Tajikistan have only increased significantly in the last few years. Given the lack of reliable data, there is no clear quantitative evidence that migration flows at the turn of the millennium were more significant, for example, from Tajikistan than Kyrgyzstan, despite the clear differences in the relative decline in first union formation by this time.

Periods of economic crisis and food scarcity

After the peak in the early post-independence years, rates of first union formation started to decline across the region. This may in large part reflect a rational response to a change in material circumstances (Caldwell 2004) associated with the period of dramatic post-Soviet economic crisis. Indeed, the later decline in first union formation in Uzbekistan — in comparison to the other republics — apparent after controlling for changes in the age distribution of unmarried women (Figure 3, Model 2), and particularly apparent when comparing declines amongst the titular populations only (Figure 3, Model 4), is consistent with this explanation. The Uzbek government, compared to other republics in the region, pursued a more gradual market reform strategy. In the first few years of independence, it experienced the smallest decline in GDP of any former Soviet republic, such that initially its population experienced a less dramatic change in material circumstances than in Tajikistan, Kyrgyzstan and Kazakhstan (Pomfret and Anderson 1997; Pomfret 2000). In this context, it is perhaps not surprising that first union formation started to decline at least one year later than in the other republics.

But while rates of first union formation in Kazakhstan and Kyrgyzstan started to stabilise by the end of the 1990s, rates in Uzbekistan — paralleling those in Tajikistan — continued to decline. 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) — reflected in periods of particular food crisis — in the post-Soviet period. Clifford et al. (2008) describe the food crisis in Tajikistan in 1995, where the scarcity of flour and bread and simultaneous price liberalisation, such

that open market bread increased sixfold in the first six months of the year (Grand et al. 2001), had an acute impact on the welfare of the population. As Harris (2004, p.29) describes, 'many people suffered significant hunger over a period of many months' and it was only aid from international agencies that prevented famine. Uzbekistan faced similar pressures: 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, as imports declined (to less than half of 1994 levels in Uzbekistan: FAO 2008b), accompanied by the liberalisation of bread prices (Economist Intelligence Unit 1994, p.70).

From the mid-1990s onwards, Tajikistan and Uzbekistan became increasingly reliant on locally produced grain as imports remained well below Soviet levels (Figure 6). In 2000 and 2001, both countries were affected by a severe drought, estimated to be the worst for 70 years (IRI 2001), which did not affect 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). These declines had a serious effect on food security. As many as one million people in Tajikistan faced malnutrition and potential starvation (Economist Intelligence Unit 2001) and were dependent on international aid. About 40% of Uzbekistan's population lived in the affected areas (WHO 2000). 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.

Given past studies of the relationship between periods of food scarcity and nuptiality (Lee 1981; Galloway 1988), we would expect a decline in the rate of union formation during these periods of food crisis. Indeed, the remarkable consistency in the annual (non-smoothed) fluctuations in rates of first union formation (Figure 7, showing Model 5 results for the titular ethnic group only) help to not only illustrate the parallels between Tajikistan and Uzbekistan but also the particularly sharp declines in union formation in both countries in 1995 and 2001. In 1995, the rate of first union formation decreased by 33% in Tajikistan (p=0.005) and by 27% in Uzbekistan (p=0.001) (Table 5). While there is no evidence for a change in the rate of first union formation during the first year of drought, the rate during the second year of the drought was just 76% (p=0.062) of pre-drought (1999) levels in Tajikistan, and 75% (p=0.003) of pre-drought levels in Uzbekistan (Figure 7; Table 5). Overall, rates of union formation in Tajikistan and Uzbekistan declined dramatically during these periods of crisis and failed to recover in subsequent years.

[Figure 6 about here]

[Figure 7 and Table 5 about here]

Therefore, while longer-term economic changes were also important influences on the decline in first union formation across the region, periods of food crisis may help to explain why the declines in first union formation were particularly significant in Tajikistan and Uzbekistan. Key to the sustained impact of these periods of crisis on union formation may have been their role in prompting labour migration. In the Tajik case, Harris (1998, p.661) points to the mid-1990s, the time of the food

crisis, as a time in which men in the Gharmi villages of Khatlon decided to become migrant workers in other parts of the Soviet Union, and Olimova and Bosc (2003 p.8, 21) also point to 1995 as a time when labour migration 'increased dramatically', for many offering the 'only alternative to going hungry'. Similarly, reports at the time suggest that the drought in Tajikistan in 2000–01 prompted many men to leave the country to find work (OCHA 2000; World Food Programme 2001). These movements may have a lasting impact on union formation even as the food crisis eases. This is because migrants may stay abroad for several years, with some not returning at all (Mughal 2007), and because migration flows may gain momentum as networks develop and individuals follow others within their community in leaving to work abroad. Thus if differences between republics in the relative importance of labour migration do exist, with Uzbekistan and especially Tajikistan most acutely affected, then periods of food crisis may be an important factor in helping to explain the differing intensity of migration flows. In turn, this may help to explain cross-country differences in the extent of decline in first union formation. Further research developing or challenging these ideas would be welcome.

Evaluating the demographic impact of conflict in Tajikistan

Comparing the trends in first union formation in Tajikistan, which experienced a civil war, with those in Uzbekistan, a neighbouring country sharing similar demographic characteristics but which didn't experience war, offers an interesting opportunity to contribute to the literature on the demographic effects of conflict. Figures for the number of casualties in the Tajik civil war, between supporters of the Communist party government and a coalition of groups in 'opposition', are very hard to establish;

the International Crisis Group (2001) estimate that 60,000 to 100,000 people were killed between 1992 and 1997, from a total population of 5.1 million (at the time of the 1989 census). The most severe fighting, and therefore the majority of deaths, was concentrated in the last six months of 1992.

One interpretation of the earlier decline in first union formation in Tajikistan compared to Uzbekistan, and indeed the subsequent sustained difference in the rates between the different countries (Figure 7 and Table 5), is that this reflects the effect of war-related mortality on the availability of eligible males. Indeed, Shemyakina (2007) shows that unmarried women of marriageable age in conflict-affected areas in Tajikistan were significantly less likely to marry than those from lesser affected regions. However, over and above the effect on local marriage markets, the effect on aggregate trends in first union formation is less clear. Indeed, trends in union formation in Tajikistan at this time are similar to those in Kazakhstan and Kyrgyzstan (Figure 3; Models 2, 4 and 5); in fact, as discussed earlier, in the early post-independence years it is not Tajikistan but Uzbekistan — possibly because of its more gradual reform in the early independence years — which stands out. Further, it is unclear that war-related mortality in 1992, presumably disproportionately affecting males who were already adults, would continue to explain the significantly lower rate of first union formation in Tajikistan more than 10 years later. Overall, the absence of reliable and detailed mortality information precludes more definite conclusions. Nevertheless, the very close correspondence between the annual patterns of first union formation in Tajikistan and Uzbekistan — and the scale of decline in Uzbekistan in the absence of any conflict — shows that the civil war is by no means the main reason for the decline in union formation in Tajikistan. On the contrary, both longer-term

economic factors, and periods of economic crisis and food scarcity, are likely to have been far more important. Even the lower rate of union formation in Tajikistan compared to Uzbekistan probably more reflects the especially acute nature of the economic problems that it has experienced than the impact of war-related mortality.

Overall

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 provides a framework for considering economic influences on union formation which cannot be simply reduced to 'crisis' explanations. Even the periods of food crisis are symptomatic of a 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 guaranteed. Further, the increasing dependence on income from international labour migration 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. Indeed, it will be interesting to note the extent to which traditional expectations for demographic behaviour, specifically early and universal marriage, change as a result of the significant declines in first union formation. Given the close link between demographic behaviour and attitudes, any changes in norms may serve to reinforce behaviour such that rates of first union formation remain low, relative to the Soviet period, even as the changes which prompted the decline become less influential.

Conclusions and directions for future research

This paper, for the first time, shows that there were significant declines in the rate of first union formation in post-Soviet Central Asia. In so doing, it serves to complement existing work on post-communist trends in first union formation — which has tended to focus on Central and Eastern Europe (for example, Sobotka 2004; Sobotka and Toulemon 2008) by illustrating the scale of post-Soviet demographic change in a very different cultural and demographic context, in which fertility levels were much higher at the time of independence. More widely, given that the most significant declines of all were in Tajikistan and Uzbekistan, it has shown the potential for rates of first union formation to decline rapidly in a conservative Moslem setting. Perhaps most importantly, it contributes to our understanding of human behaviour during a period of dramatic social and economic change.

Future work is required not only to develop the themes discussed here, and to explore other demographic changes in this under-researched region, but also to consider the social consequences of demographic change. For example, the post-Soviet transition has had the effect of 'familializing women, intensifying their need for family connections to survive the loss of social support' (Pascall and Manning 2000, p.257) — yet, as this paper shows, there has been a simultaneous and significant decrease in the rate of first union formation, such that a much greater proportion of young women than before are not in a union. There are potential implications for the welfare of women which should be explored.

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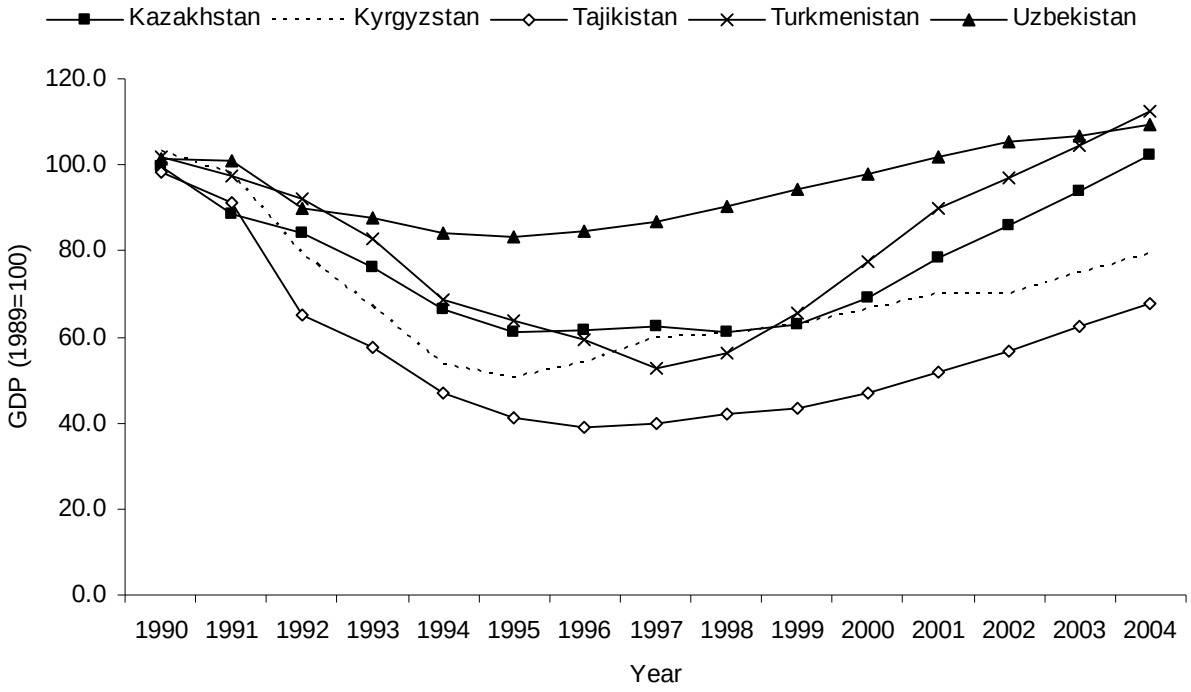

Figure 1 Trends in real GDP in Central Asia (index, 1989=100)
Source: TransMONEE (2006)

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 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. These are the only years for which estimates are available.
Source: FAO (2008a)

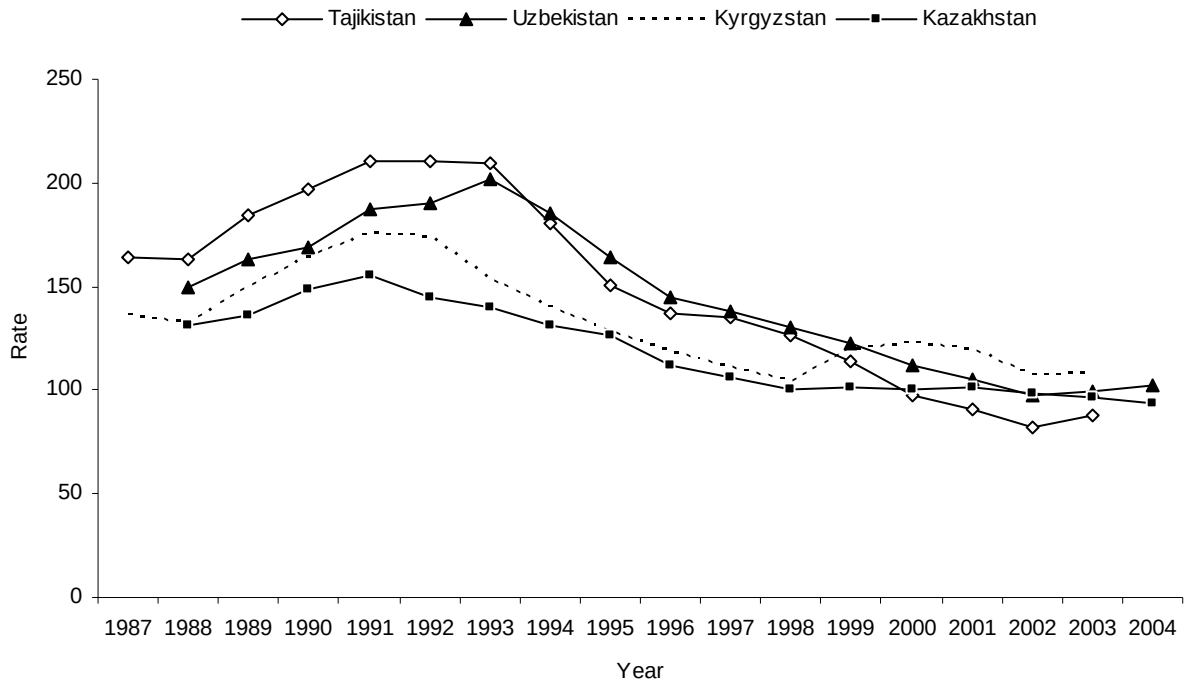

Figure 2 Rate of first union formation[1] in Central Asia (three-year moving average)
1 Rates per 1,000 years of exposure for unmarried women aged 15-29 years inclusive.
Source: author's analysis of MICS3 surveys. Results of Model 1.

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: As for Figure 2.

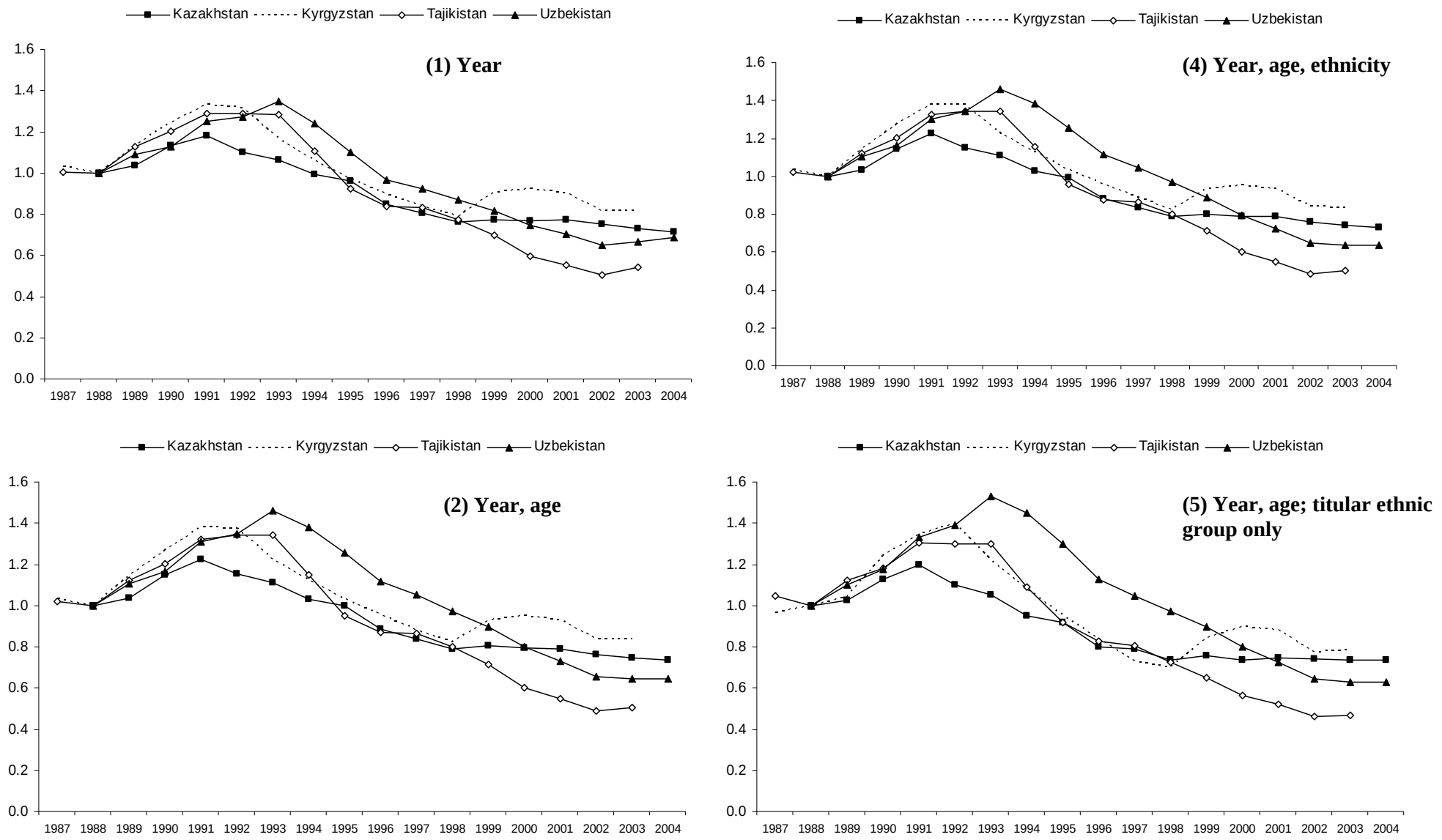

Figure 3 Trends in union formation in Central Asia: relative risks[1], compared to 1988 rate. Results for Models (1), (2), (4) and (5) — covariates in bold.
1 Relative risks based on the 3-year moving average of the rate of first union formation.
Source: author's analysis of MICS3 surveys. Results of Models 1, 2, 4 and 5.

Table 3 Relative risks[1] of union formation in Central Asia, compared to 1988 rate. Results for Models (1), (2), (4) and (5) — covariates in bold.

(1) Year

	Kazakhstan	Kyrgyzstan	Tajikistan	Uzbekistan
1987		1.03	1.01	
1988	1	1	1	1
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

(2) Year, age

	Kazakhstan	Kyrgyzstan	Tajikistan	Uzbekistan
1987		1.03	1.02	
1988	1.00	1.00	1.00	1.00
1989	1.04	1.15	1.12	1.10
1990	1.15	1.27	1.20	1.16
1991	1.23	1.38	1.32	1.31
1992	1.15	1.37	1.34	1.35
1993	1.11	1.23	1.34	1.46
1994	1.03	1.12	1.15	1.38
1995	1.00	1.03	0.95	1.26
1996	0.89	0.96	0.87	1.12
1997	0.84	0.88	0.86	1.05
1998	0.79	0.82	0.80	0.97
1999	0.80	0.93	0.71	0.89
2000	0.79	0.95	0.60	0.80
2001	0.79	0.93	0.55	0.73
2002	0.76	0.84	0.49	0.66
2003	0.75	0.84	0.50	0.65
2004	0.74			0.64

(4) Year, age, ethnicity

	Kazakhstan	Kyrgyzstan	Tajikistan	Uzbekistan
1987		1.03	1.02	
1988	1.00	1.00	1.00	1.00
1989	1.04	1.15	1.12	1.10
1990	1.15	1.27	1.20	1.16
1991	1.22	1.38	1.32	1.30
1992	1.15	1.38	1.34	1.34
1993	1.11	1.23	1.34	1.46
1994	1.03	1.12	1.15	1.38
1995	0.99	1.03	0.96	1.26
1996	0.88	0.96	0.88	1.11
1997	0.84	0.89	0.87	1.05
1998	0.79	0.82	0.80	0.97
1999	0.80	0.93	0.72	0.89
2000	0.79	0.95	0.60	0.79
2001	0.79	0.93	0.55	0.72
2002	0.76	0.84	0.48	0.65
2003	0.74	0.84	0.50	0.64
2004	0.73			0.64

(5) Year, age; titular ethnic group only

	Kazakhstan	Kyrgyzstan	Tajikistan	Uzbekistan
1987		0.97	1.04	
1988	1.00	1.00	1.00	1.00
1989	1.03	1.04	1.12	1.10
1990	1.13	1.24	1.18	1.18
1991	1.20	1.35	1.31	1.33
1992	1.10	1.40	1.30	1.39
1993	1.05	1.22	1.30	1.53
1994	0.95	1.08	1.09	1.45
1995	0.92	0.95	0.92	1.30
1996	0.80	0.84	0.83	1.13
1997	0.79	0.73	0.81	1.05
1998	0.74	0.70	0.72	0.97
1999	0.76	0.84	0.65	0.90
2000	0.74	0.90	0.57	0.80
2001	0.75	0.88	0.52	0.72
2002	0.74	0.77	0.46	0.64
2003	0.73	0.78	0.47	0.63
2004	0.74			0.63

1 Relative risks based on the 3-year moving average of the rate of first union formation.
Source: As for Figure 3.

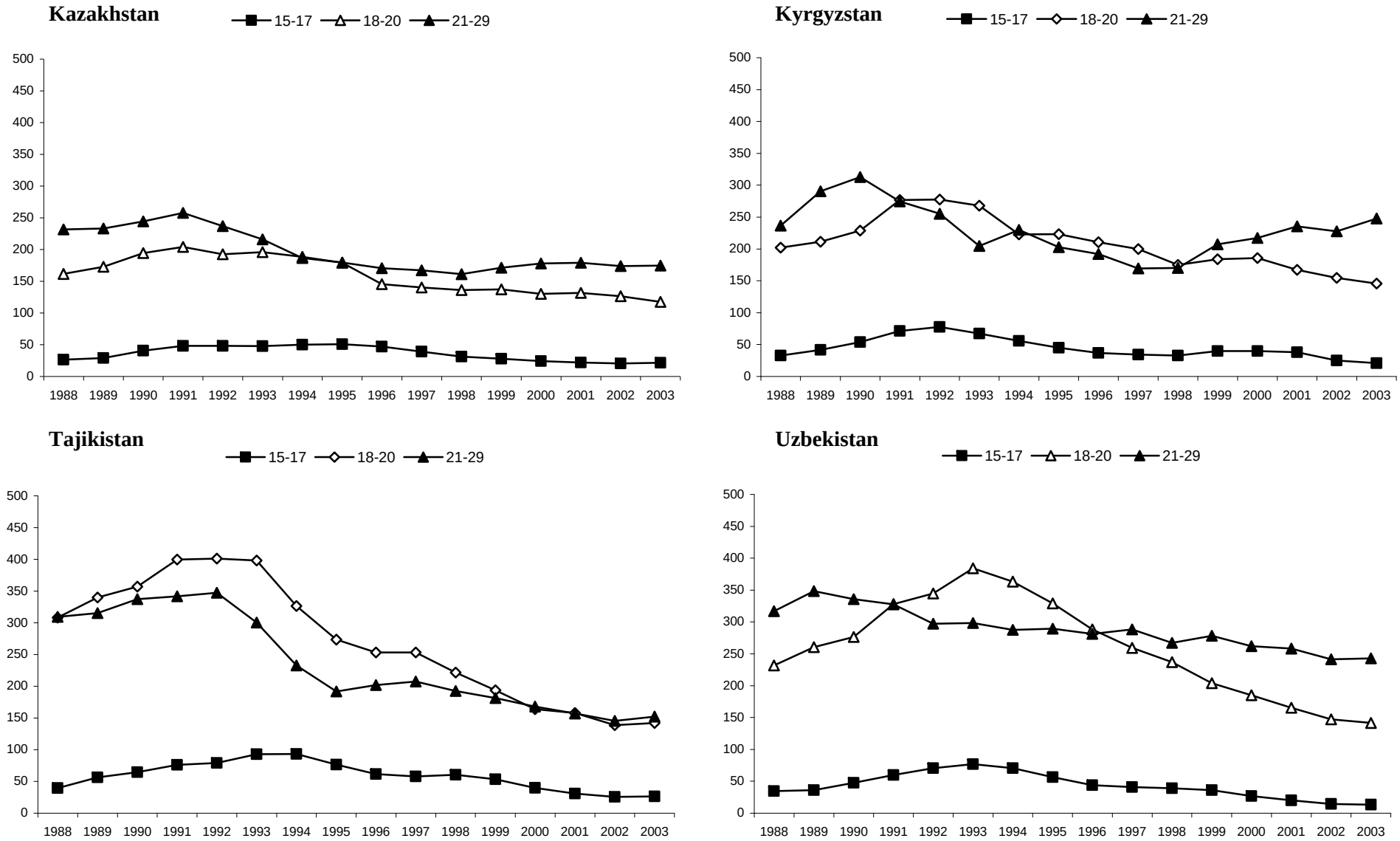

Figure 4 Rate of union formation for different age groups in Central Asia (three-year moving average)

1 Rate (y-axis) per 1,000 years of exposure for unmarried women in age group. *Source*: author's analysis of MICS3 surveys. Results of Model 3.

Table 4 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: As for Figure 4.

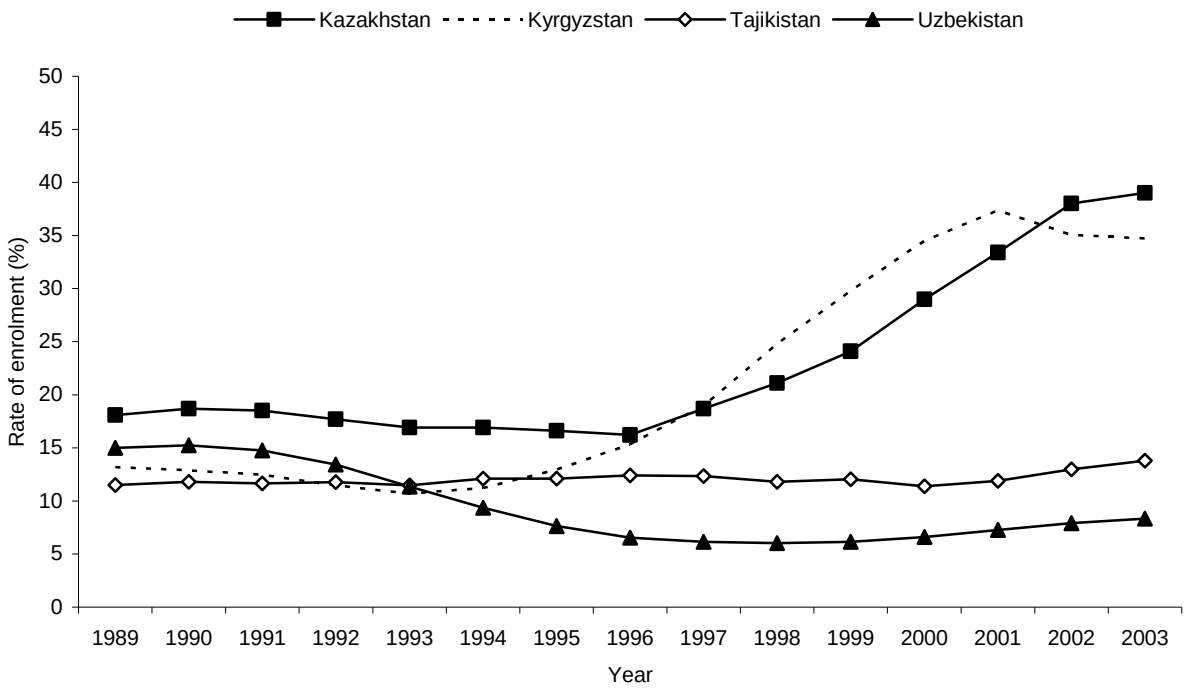

Figure 5 Higher education enrolment[1] in four Central Asian republics, 1989-2003
1 As percentage of population aged 19-24 years.
Source: As for Figure 1.

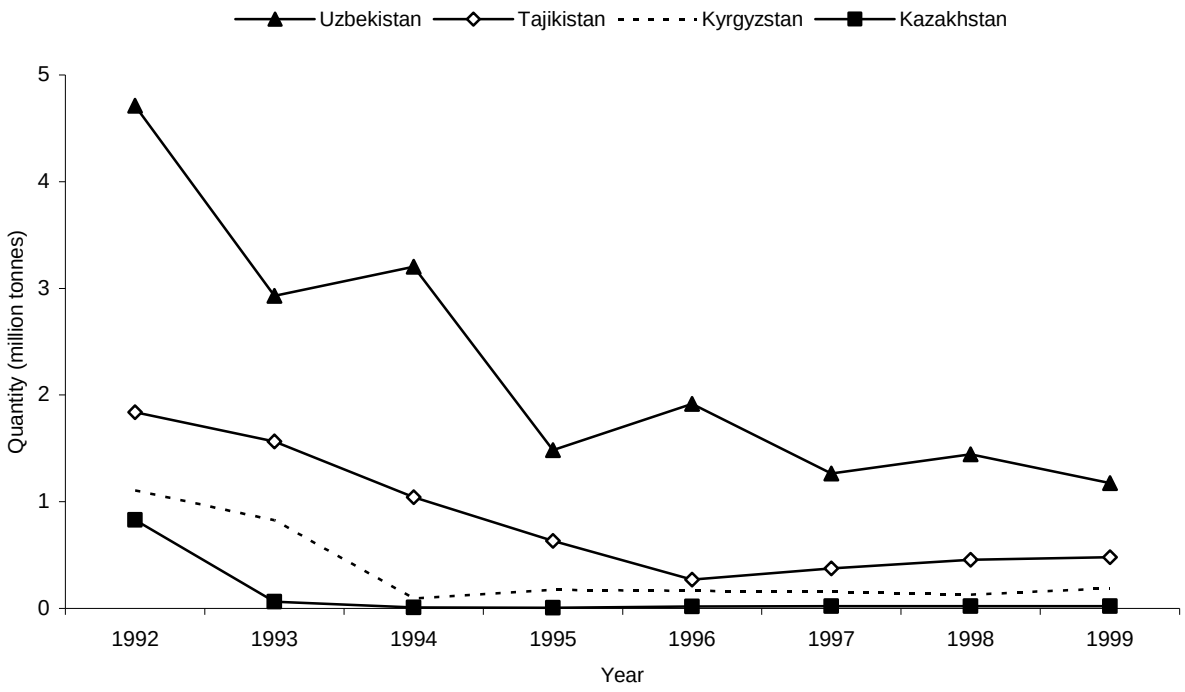

Figure 6 Quantity of cereal imports in four Central Asian republics, 1992-1999
Note: The populations for the different republics, according to the 1989 Soviet census, were: Uzbekistan – 19.9m; Tajikistan – 5.1m; Kyrgyzstan – 4.3m; Kazakhstan – 16.7m.
Source: FAO (2008b).

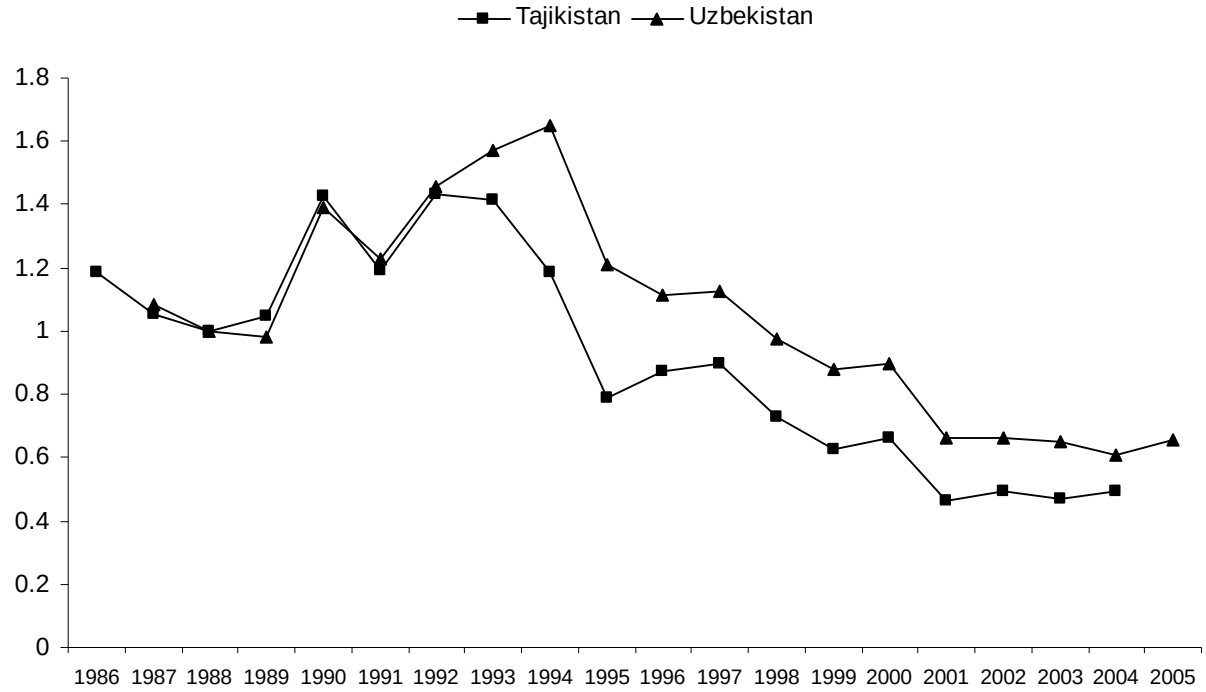

Figure 7 Trends in union formation in Tajikistan and Uzbekistan: relative risks[1], compared to 1988 rate (controlling for age; titular ethnic group only).
1 Relative risk based on the annual rate of union formation (no smoothing).
Source: author's analysis of MICS3 surveys. Results of Model 5.

Table 5 Relative risks[1] of union formation in Tajikistan and Uzbekistan, compared to 1988 rate
(controlling for age; titular ethnic group only).

	Tajikistan	Uzbekistan
1986	1.19	
1987	1.05	1.08
1988	1.00	1.00
1989	1.05	0.98
1990	1.43	1.39
1991	1.19	1.23
1992	1.43	1.46
1993	1.41	1.57
1994	1.18	1.65
1995	0.79	1.21
1996	0.87	1.12
1997	0.90	1.12
1998	0.73	0.97
1999	0.62	0.88
2000	0.66	0.90
2001	0.47	0.66
2002	0.49	0.66
2003	0.47	0.65
2004	0.49	0.61
2005		0.66
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).
N_u and N_{wy}: number of unions, and number of years of exposure, in total analysis period for sampled women.
Source: As for Figure 7.