H i C N **H**ouseholds **i**n **C**onflict **N**etwork

The Institute of Development Studies - at the University of Sussex - Falmer - Brighton - BN1 9RE

www.hicn.org

The Marriage Market and Tajik Armed Conflict

Olga Shemyakina

olga.shemyakina@econ.gatech.edu

HiCN Working Paper 66

October 2009

Abstract: This paper explores the relationship between the 1992-1998 armed conflict in Tajikistan, sex ratios and the age at first marriage for women. The findings suggest that there is substantial and robust negative effect of temporal and regional exposure to armed conflict on entry into their first marriages by females in Tajikistan. Women born in 1975-1983, who lived in the conflict affected areas were about 30 percent less likely to enter marriage than women of the same age from the lesser affected regions. The period and region specific sex ratio has little effect on the age when women first marry. This limited effect of sex ratios in Tajikistan could be explained by the adherence to traditional marriage practices when grooms and brides are often related by a common ancestor and arranged marriage is a norm.

Keywords: Marriage age, civil war, sex ratio, household, Tajikistan

Acknowledgements: I would like to thank Tilman Brueck, Christine Binzel, Lynne Casper, Richard A. Easterlin, Harikumar V. Iyer, Jeffrey B. Nugent, Kati Schindler, John Strauss and Anke Plagnol for valuable comments. Financial support was provided by the University of Southern California (USC), the USC Urban Initiative, the Institute for Social Research/William Davidson Institute at the University of Michigan and the Georgia Institute of Technology. The views expressed in this paper are those of the author alone and do not necessarily reflect those of granting and funding agencies.

1. Introduction

Crises and civil wars inflict large burdens on country's population. War-related mortality and morbidity patterns (Hoeffler and Reynal-Querol 2003; Ghobarah, Huth, Russett 2003) and the relationship between violent conflict, child mortality and female reproductive behavior (Lindstrom and Berhanu 1999; McGinn 2000; Agadjanian and Prata, 2002; Hill 2004; Hoeffler and Reynal-Querol; Verwimp and van Bavel 2005) have been addressed by researchers. This study adds another dimension to the literature by exploring the link between violent conflict and the marriage market for women in the post-conflict Tajikistan.

This paper combines a new dataset on the events during the 1992-1998 armed conflict in Tajikistan with individual and household data from the 2003 Tajik Living Standards Measurement Survey (TLSS) conducted by the World Bank. The conflict data were collected from the centrally published Tajik daily and weekly newspapers, reports on the status of human rights in Tajikistan and studies of the post-independence period by academics and non-governmental organizations (Human Rights Watch 1993; U.S. Department of State 1994, 1996, 1997; Brzezinski and Sullivan 1997; Djalili, Grare and Akiner 1997; McLean and Greene 1998; Gomart 2003; Nourzhanov 2004, and others). Demographic and regional data from the State Statistical Agency of Tajikistan are also extensively used in this paper.

Tajikistan makes an interesting setting for such an investigation as it is possible to exploit the difference in the regional and temporal impact of the 1992-1998 conflict as an identification strategy. While the southern and central regions of Tajikistan were affected significantly by the war (Khatlon and Raions of Republican Subordination), the northern region of Sugd and the eastern region of Tajikistan, Gorno-Badakshon, were relatively isolated from the war.

The human costs of the conflict were substantial for the 6.4 million inhabitants of Tajikistan. Approximately 40 percent of population was affected directly during the conflict. The conflict displaced at least 600,000 people internally. In addition, about 60,000 found temporary refuge in the neighboring states and 500,000 left the country for good. The conflict claimed the lives of at least 50,000 men, orphaned 55,000 children and widowed 20,000 women (Falkingham 2000). During the first years of war, the mortality rate due to injuries among young adults, ages 15-19, increased by 225 percent compared to the 1989 levels (Figure 1). The mortality among boys in the age group 5-14 increased substantially during the same period and was higher than that of females of the same age.

To investigate the impact of the civil war in Tajikistan on the age at first marriage by women I estimate a set of descriptive multiple regressions with dependent variable being married by age 18, 20 and 23 and the Cox proportional hazard models evaluating the duration between age of exposure and age when first married as a function of individual and regional characteristics.

The findings suggest that there are substantial, significant and robust negative effects of temporal and regional exposure to armed conflict on entry into their first marriages by females in Tajikistan. Women born in 1975-1983, who also lived in the conflict affected areas were about 30 percent less likely to enter marriage than women of the same age from the lesser affected regions. Further, the findings suggest that the period and region specific sex ratio has little effect on age when women first marry. This limited effect of sex ratios in Tajikistan may be explained by the traditional marriage practices where grooms and brides are often related by a common ancestor and arranged marriage is a norm (Bushkov and Mikulskii 1997). Since the number of

women who remained unmarried past age 18-23 has increased after the war, the Tajik government should improve access to education and employment for such women. Such policies may deter young unmarried women from entering into less desirable polygamous or informal marriages to remove the burden from their families and from dropping out of school at an early age.

The rest of the paper is organized as follows. Section 2 discusses lessons from other countries and the social and economic background on the marriage market in Tajikistan. Section 3 describes the data. Section 4 discusses the conflict in Tajikistan, identification and empirical estimation. Section 5 summarizes findings and Section 6 concludes.

2. Lessons from other countries and background

2.1 Prior research

This section explores several competing but not unrelated theories that may illustrate the potential impact of civil wars and the related to them economic, social and demographic changes on the marriage market for women.

Economic shocks and the marriage market: Armed conflicts inevitably lead to a decrease in the resources available to many households for consumption. The effect of decrease in household resources on entry into marriage is not clear-cut. There are multiple factors that may contribute to increased or decreased entry into marriage during the hard economic times.

First, if economic crises occur periodically, households may devise ex-ante strategies that would help them to smooth consumption over the time. Benefits to marriage due to specialization in labor and household production that were highlighted by Becker (1973) may become particularly valuable if these benefits allow households to smooth consumption when

there is insufficient or non-existent access to credit (Kotlikoff and Spivak 1981; Rosenzweig and Stark 1989). Marriage may be used to secure access to networks of well-to-do relatives who can provide assistance in the hard times. In some developing countries, poor families use unmarried daughters as assets and "cash" them in during the crisis (Hoogeveen et al. 2004). Hoogeveen et al. study the impact of shocks to household income on entry into marriage in Zimbabwe. They find that the marriage rate was higher for girls from poorer households. In Zimbabwe, where the bride-wealth for the wife is paid over many years, during the difficult times poorer families chose to receive a significantly higher amount of bride-wealth upfront at the time of daughter's marriage. However, such ex-ante arrangements may not be available for unexpected shocks such as wars and armed conflicts.

Second, if real wages or labor opportunities for women decrease to a larger extent than those for men, labor specialization in home and market production may become increasingly important. Rukumnuaykit (2003) finds an increased entry into marriage by females in Indonesia where the economic crisis led to drastic decline in female wages relative to males. Nobles and Buttenheim (2006) further pinpoint that an increased entry into marriage by women occurred primarily in the communities that were especially hard hit by the economic crisis in Indonesia.

Entry into marriage may be also delayed during the crisis. The circumstances leading to delayed marriages are similar to those described above. For example, fewer economic opportunities and tight labor market may make marriages costlier, as families may not be able to afford costs of ceremonies and dowries. Caldwell, Reddy and Caldwell (1986) estimate that in South India during the drought of 1980-1983 the number of marriages declined by approximately 15%. They report that the proportion of marriages deferred was positively related to the amount

of land owned by households. While wealthier households postponed the marriages to defer the payment of large dowries and wedding expenses, families of the lower castes accelerated marriages of their daughters to reduce number of mouths to feed. Palloni, Hill and Aguirre (1996) also observed postponement of marriages in Latin America, during and immediately after the economic crisis. However, after the recovery, the marriage rates started to rise.

Physical security concerns and marriage: Societal conflict and instability may increase real or perceived threats of assault or ill-treatment of young women. The threat could be associated with a potential rape, abduction, harassment or other form of dishonor or physical harm. Tadjbakhsh (1994) reports that "the rape of unmarried women in villages was a devastating blow to the 'Nomusi Tojik,' the chastity of the Tajiks, their principles for law and order...". In the traditional societies virgin brides are highly valued by potential marriage partners and family's honor is very important. Thus, at the time of political and social uncertainty during an extended civil strife, parents may expedite marriages of their eligible adult and adolescent daughters, in an attempt to shift their responsibility for maintaining family honor to sons-in-law and their families. Further, families in the conflict affected areas may attempt to find grooms for their daughters far away from the conflict zone (as daughters usually move-in with their in-laws in traditional societies), thus possibly trading off their preference to live close by for a better survival chances in the far-away land.

Marriage squeeze: It is well known that armed conflicts take a heavy toll on the population of men (Newth 1964; Das Gupta and Shuzhuo 1999; Roberts et al. 2004; Burnham et al. 2006). Newth estimates that, while the Soviet Union lost one out of five citizens during the World War II (WWII), about 30 percent of the Soviet men aged 15-59 perished during the WWII

as compared to six percent of women aged 15-55. Thus, during or following a war, young and able-bodied men disproportionately "disappear" from country's population. Men can be drafted or forced to join military forces by the official government or opposition groups. Even after peace is reached, young men who were associated with insurgent or losing groups may be placed in prison or mass executed as they may be perceived as a potential security threat by the winning forces. For example, during the conflict of 1992-1998, the Tajik government forces often targeted young Pamiri men who were associated with opposition forces as potentially dangerous militants. Multiple cases of mass execution and forced "disappearance" of men in and around Dushanbe were reported during the war. Several mass graves containing bodies with gunshot wounds were found near Dushanbe soon after the war ended (U.S. Department of State 1996, 1997; Human Rights Watch 1993).

Marriage market equilibrium and sex ratios: The marriage market for women is defined by the quality and quantity of men eligible to serve as partners and spouses. The deficit of desirable marriage partners for men or women in the relevant age, ethnicity and locality groups may motivate changes in the societal family practices and marriage institutions. Such changes may increase the number of female-headed and polygamous households and informal unions, have a negative effect on the stability of unions (Becker 1973; Greene and Rao 1994; Olimova and Bosc 2003; Harris 2006), and reallocate relative gains from marriage between brides and grooms (Rao 1993). Labor force participation by women and distribution of income in divorce settlements may be also affected by changes in sex ratios (Angrist 2002; Chiappori, Fortin and Lacroix 2002).

Age of entry into marriage and sex ratios: Following a large scale armed conflict, an age of entry into marriage may be affected in either direction. Many women may not be able to get married as early as prior to the war as fewer men are available and women (or their families) have to spend more time searching for a suitable candidate or wait until the war gets over. The prolonged time spent searching and waiting will lead to an increase in the average age at marriage for the cohort of women exposed to war. At the same time, if there are more available women for each available man, this may lead to a decrease in the average age at marriage as younger and younger women enter the marriage market intending to capitalize on the value of their youth. Such increase in the supply of younger brides may crowd out marriage opportunities for slightly older women who reached the peak of their marriage age and leave a higher proportion of such women unmarried.

A change in the sex ratio may influence customary marriage gift-giving practices and affect sizes of dowries or bride-prices. A relative scarcity of grooms in South India, allowed grooms to demand higher dowry payments and increased the average age at marriage for brides (Caldwell et al. 1983; Rao 1993).

Further, a decrease in sex ratios may lead to a change in the acceptable marriage practices that are determined by the cultural settings. In societies where polygamy is or was common in the past, such as Sub-Saharan Africa and Central Asia, a marriage squeeze may lead to an increase in the number of polygamous marriages. In societies where informal unions are fairly common such as Latin America, we may observe an increase in the number of consensual unions as compared to formal marriages (Greene and Rao).

Thus, changes in sex ratios may affect many factors that contribute to the quality of

marriage. These factors, as described above, can be adjusted either ex-ante or ex-post. The ex-post changes in the sex ratios may affect already existing marriages, while ex-ante arrangements may change the pre-marriage expectations, spouse search strategies and negotiations. However, the overall effect of sex ratios may be ambiguous if the relevant marriage pool is traditionally very narrow and marriage outside of the caste, social strata, region or age group is deemed inappropriate.

Summary. The theories reviewed above suggest that there are multiple ways in which the exposure to violent conflict and a decrease in the number of available marriage partners combined with economic and social instability may affect the marriage market for women. In this paper I focus on the changes in age at first marriage for women. The following section discusses the traditions of Tajik marriage and recent changes in marriage practices.

2.2 Family and Marriage in Tajikistan

Marriage remains a central part of Tajik culture and majority of population enter marriage by age 30. Tajik women tend to marry at a younger age than Tajik men, succumbing to pressure from their families and the society which looks down upon families who have unmarried but eligible daughters. Most men wait until they can accumulate enough money for the marriage expenses and new family. These traditions are reflected in the age at which most Tajiks marry, creating on average three to four years age gap between brides and grooms (Olimova and Bosc, 2003). The Tajik Census data for 1989 (Goskomstat 1990) and the 2003 TLSS data indicate that the median age at marriage is 19 years for women and 22 years for men.

Traditionally, in Tajik families, a mother of a young man who has reached the

marriageable age and who is ready to get married financially, sets out to search for a *kelin* (daughter-in-law) to suit her needs and preferences. The Tajik families for a long time preferred to marry children to their cousins (Kuz'menko 1991, Harris 2004: 105). It is also common to marry someone from the same large extended family - *avlod* - especially if the *avlod* has a high social standing in the society (Bushkov and Mikulskii 1997).[1] However, a marriage proposal may be extended to a bride from a less important *avlod* if a groom is not attractive for marriage, for example, suffers from chronic health problems. Further, if the pool of eligible cousins and other distant relatives is exhausted and or if a family does not want to have a son married to someone in the extended family, the search for a suitable marriage partner is conducted among family friends and acquaintances (Bushkov and Mikulskii). At least 58.3% of marriages are determined by parents (Bushkov and Mikulskii 1997).

At the time of engagement and marriage families exchange a large number of gifts. Traditionally, the groom's family transfers a larger amount of wealth, or *kalym* (bride price), to the bride's family. Both, the amount and quality of *kalym* are carefully scrutinized. An insufficient amount of *kalym* or gifts of poor quality may be used as an excuse to break the engagement.

The marriage ceremony is usually conducted by a civil servant at the local civil office (ZAGS)[2] that registers births, deaths and marriages. Tajik family law defines the age of consent

[1] In Tajik society, an *avlod* is a patriarchal community of blood relatives who have a common ancestor and common interests. Members of *avlod* can also have shared property, land and means of production. Often in extended families household budgets are consolidated or shared among members of an avlod (Bushkov and Mikulskii 1997; Abdullaev [n.d.], Olimova and Bosc 2003: 56).

[2] ZAGS - Zapis Aktov Grazhdanskogo Sostoyaniya - registry office.

as 17 years old for both men and women. The court can reduce the age at marriage by maximum one year at the written request of persons entering marriage.[3]

Since Tajikistan's independence in 1991 and the following it civil war, one can observe an emergence of new Islamic trends and weakening of women's social and economic positions. Informal and polygamous marriage unions are becoming more common in Tajikistan as women face a shortage of men due to civil war and labor migration of men to the more affluent countries in the Former Soviet Union region (Olimova and Bosc 2003). Further, the proportion of *nikoh* (religious marriages) has been increasing in Tajikistan since 1991. The *nikoh* ceremony, while not official and does not provide spouses with legal and property rights in a case of divorce, is often chosen for religious, economic and social reasons. *Nikoh* marriage allows for an easy divorce by a husband who only needs to say "Talak" three times. Underage and polygamous marriages can only be "officiated" by *nikoh*. Such marriages are more prevalent in the rural areas of Tajikistan. The 2000 WHO pilot survey on violence against women in Tajikistan reports that 21% of married women in a sample of 840 had polygamous husbands.[4]

[3] Semein'i'i kodeks: Chapter 3. Article 13. Dushanbe, November 13, 1998. # 683.

[4] Among women aged 15-49 surveyed for the TLSS 2003 less than one percent reported that they were in polygamous marriages. The difference across surveys in the proportion of women in polygamous marriages may be attributed to differences in the methodologies and the sampling frames of those surveys. The 2003 TLSS used a two-stage random sampling process to draw the sample surveyed in each region (see Section 3 for more details). The questions about current marital status of the household members are answered by household's head or a person who is most knowledgeable about the household affairs. The 2000 WHO's pilot survey data is based on the detailed interviews of individual women. The WHO's 2000 survey used two methods of selecting observations. The first method was to randomly select households (and one woman within a household) in various neighborhoods of towns and villages that were considered representative of the geographical areas selected for sampling. The second method was to interview women in academic and medical institutions, factories and farms.

The war has significantly increased women's exposure to violence. During the civil war in Tajikistan, rape was commonly used by both sides to the conflict. For example, refugee women who returned to Kabodien and Shaartuz areas of Khatlon from Afghanistan were captured and raped by pro-government militias (U.S. Department of State 1994). Many women were scared to leave their houses and collective farms and this immobility restricted their access to jobs and education. In 1996-1997 the reports of bride abductions increased significantly in Tajikistan (U.S. Department of State 1997).[5] During the war many young girls were kidnapped and raped (Harris 2006: p. 83). One of the outcomes of the general feeling of insecurity due to war and extended period of violence in Tajikistan was a spike in early marriages, where parents transferred the responsibility for the safety of young girls to their new families (Falkingham and ADB 2000). 36.0 percent of women born in 1975-1977 were married by age 18 as compared to 29.6 percent of women born in 1972-1974 (Table 2).

3. Data

This study employs the household and individual data from the 2003 Tajik Living Standards Survey (TLSS 2003), conducted by the World Bank and the State Statistical Committee of Tajikistan. The survey contains data on 4,160 households with a total of 26,141 individuals in three *oblasts* (regions), Khatlon, Sugd and Raions of Republican Subordination (RRS) that include capital city Dushanbe, and one autonomous region – the Gorno-Badakshon Autonomous Oblast (GBAO). A two-stage random sampling process was used to draw the sample surveyed in each *oblast*. The sample was stratified according to *oblast* and urban/rural settlements.

[5] In Central Asia, young girls are often kidnapped as potential brides. Such girls are then perceived dishonored if not promptly married to the kidnapper.

The data on age at first marriage comes from the female questionnaire of the survey, that was completed by women aged 15 to 49 as of 2003. The data on education, age and other socio-demographic characteristics of all married and unmarried women were obtained from the main 2003 TLSS questionnaire that contains extensive information on all household members who are eating and living under the same roof and who were not absent for more than 12 months from the household (Table 1). The analysis of entry in marriage is focused on the transition from the never married into married state.

There are two main independent variables of interest in this study. Both measures are region and period specific. The first variable measures exposure to the Tajik armed conflict of 1992-1998 and proxies for two types of shocks such as i) an economic shock to income and assets as information on income and assets for the household of origin is not available for married women who typically reside with their in-laws; and ii) shock to an individual security. The second variable is a period and region specific sex-ratio that serves as a proxy for marriage squeeze and the availability of marriage partners. Both variables are described in detail below.

3.1 Residence in the conflict affected region (RCA)

The residence in the conflict affected regions – the RCA variable - stands for regional exposure to the economic and security shocks during the 1992-1998 Tajik armed conflict. It is a dummy variable, where "1" indicates residence in the conflict affected raion and "0" stands for individual's residence in the lesser conflict-affected region.

The construction of RCA variable is based on the chronological events of the 1992-1998 Tajik armed conflict, their geographical location and impact. Using references to fighting in literature, I collected names raions, villages, towns and cities where fighting or other conflict

related event occurred from two central newspapers published in Dushanbe, Tajikistan between 1991 and 1999. I also added to this list names of the communities mentioned as affected by the armed conflict from the reports by human rights organizations, international not-for profit organizations that involved in the monitoring of armed conflicts around the world and publications on the Tajik civil war.[6] Using this information, I constructed a geographic mapping of the conflict and matched the names of villages, towns and cities in Tajikistan, which were reported to have a significant level of conflict exposure, to raion data in the TLSS 2003. For that I used two maps of Tajikistan: the detailed map of the deployment of the United Nations Mission of Observers in Tajikistan (UNMOT)[7] and the map of Tajikistan prepared by the mapping agency "Tochikkoinot" (2004).

Further, to control for possible migration during the war, I matched the raion level data on the residence of individuals during the conflict to the data on the local exposure to the conflict. Certain difficulties arose in this process as the 2003 TLSS data have information on the district of origin only for those individuals who moved between 1990 and 2003. For such individuals, the *raion* (district) of residence at age 11 (age when a woman was exposed to the hazard of marriage) is established from the individual's migration data. For those who reported to moved earlier than 1990, or never moved - the current district of residence as of 2003 is recorded as a district of residence at age 11.

[6] The RCA measure does not includes the attack by Colonel Makhmud Khudoberdiyev in Leninabad region in November of 1998. This attack was an individual conflict event reported for Leninabad (Sugd) region over the 1991-1998 period. The attack lasted for less than a month as compared to the minimum of several months of conflict exposure in the RRS, Dushanbe and Khatlon regions.

[7] Available at http://www.un.org/Depts/DPKO/Missions/unmot/Unmot.htm. Accessed 03/30/2005. (United Nations 2005).

3.2 Sex ratio calculation - Measuring the marriage squeeze

A ratio of males to females in the prime marriage age groups was used by Akers (1967), Keeley (1979) and Greene and Rao (1995) to measure a disproportion between sexes. I follow this practice in my study and use this ratio to control for the availability of men as compared to women of marriageable age. I use the ratio of men aged 20-25 to women aged 15-25 in 1989 and 2000. These age groups were chosen on the basis of ages of brides and grooms in 1989 reported by Goskomstat (1990) and the reports of age at first marriage by females in the 2003 TLSS (World Bank and Goskomstat).

To calculate raion level sex ratios I use the 1989 and 2000 State Statistical Committee of Tajikistan population data by raion, sex and age group. The population data are reported by five-year age categories for the population ages 10 to 84, such as, 10 to 14, 15 to 19 and so forth. Thus, although the prime marriage age groups in Tajikistan appear to be women ages 17-22 and men ages 18-27, the above mentioned five-year age intervals in Census data restrict me to using either five- or ten-year age groups for the construction of the sex ratios.[8] Thus, the sex ratios used in this paper are based on the ten-year age groups such as men ages 20-29 and women ages 15-24 in 1989 and 2003. The use of 10-year age groups allows for a better coverage of the potential marriage age partners, as compared to using five-year age groups.

[8] 88.92 percent of women ages 15-49 (a sample of 4,084 of married women) reported that they were married between age 17 and 22. Only 2.17 percent indicated to be married prior to reaching age 17 and 8.22% were married between age 23 and 29. The male age at marriage was calculated from the age at first marriage reported by ever married women. In the 2002 survey, I was able to link to each other spouses in 3,328 couples. 88.55% of husbands (a sample of 3,328) were married between age 18 and 27. Only 1.53% was married before reaching age 18; 6.46 percent of men were married between age 28 and 31.

I assign the 1989 and 2003 sex ratios to the corresponding birth cohort as defined in Appendix Table 1. For each point in time when a woman was at risk of being married, starting at age 11, she was assigned the closest period-specific sex ratio, in her respective raion of residence.

The sex ratios are calculated for each raion and major city for 1989 and 2000. The comparison of sex ratios between 1989 and 2003 indicates that the sex ratios decreased between 1989 and 2000 in 51 out of the 66 regional units. To determine whether the declines in the district level sex ratios between 1989 and 2000 were explained by conflict activity in those regions, I estimate two OLS regressions. In these regressions, the raion-level sex ratios for 1989 and 2000 are used as two separate dependent variables and the regional conflict exposure is used as the independent variable. The regression results (reported in Appendix Table 2) do not support the hypothesis of the significant and negative impact of the 1992-1998 conflict on the sex ratio for 2000.

In contrast to research on India (Rao 1993), in Tajikistan district level sex ratios based on the population data may not be crucial in determining the marriage market conditions, as many Tajik families prefer to marry their children to someone of their own kin. Thus, broad sex ratios that include all men and women available for marriage in the region of their current or even past residence may not measure the marriage squeeze phenomena adequately. Some regional groups and members of various clans who live in different regions may marry each other according to tradition. For example, some inhabitants of village Galadzor in Vose raion originated from Khovaling - a city to the north. Their ancestors moved from there to Vose several generations ago. Many of their descendants still marry people from Khovaling and thus do not have strong

extended family ties in Vose, where they currently reside (Gomart 2003: p. 63).[9]

4. Estimation

4.1 Identification

To identify an individual's exposure to the war, I explore two sources of variation in the exposure to the armed conflict of 1992-1998.

The first source of variation comes from the regional differences in the extent and intensity of war-related events, such as the destruction of infrastructure and industries, the degree of fighting and displacement during the conflict. Although the Tajik armed conflict lasted for a relatively long period of time, 1992-1998, the regional intensity of fighting varied over this time.[10] The first two years of the war, 1992-1993, were the most severe. Most of the population displacement and death toll due to the fighting occurred during this period. The intensity of fighting became much lower and more localized after the post-Communist Tajik government managed to take back power in late 1993. In the southern regions of Tajikistan, especially eastern Khatlon, RRS and Dushanbe, the impacts of war were particularly strong. The violent events of 1992-1993 were concentrated in Khatlon and RRS regions, including the capital of

[9] The history of forced resettlement during the Soviet times makes tracking family ties and relations more complex as one cannot assume that a group living in a particular geographical area of Tajikistan has long-standing traditional and recognized rights to the land and ties to the region of current residence. Many rural settlements, kolkhozes, in Khatlon consist of smaller ethnic groups. These groups were forcefully resettled to Khatlon area from other regions of Tajikistan, such as Pamir (Gorno-Badakshon), Gharm and Kulob to cultivate the land for cotton (Bushkov and Mikulskii 1997; Gomart 2003). Unfortunately, it is not possible to identify the appropriate marriage pool for each regional group from the quantitative data such as TLSS 2003 as there is no information on where the ancestors of each family came from.

[10] Some sources date the end of hostilities to as late as 2000 (Rashid 2003). I use 1998 as the end of the civil war in Tajikistan based on the records of major battles and loss of life in violent conflicts by Uppsala University Conflict database (2005).

Tajikistan, Dushanbe. Parts of the GBAO that border Afghanistan experienced frequent attacks of insurgents who tried multiple times to cross the border. Other areas of the country, such as the northern region of Sugd and most of the Gorno-Badakhshon territory, remained relatively unaffected by the major fighting.

The second source of variation in the conflict exposure is determined by the timing of the individual's exposure to the civil war. I assume that women who attained the prime marriage age before the conflict were affected by the war differently than the cohort of women who reached the prime marriage age during the conflict. The marriage prospects of the younger women may have been compromised by their exposure to the armed conflict and by the deficit of men in the relevant marriage age group.

Table 2 presents data on the proportion of 12 three-year birth cohorts of women born between 1954 and 1988 who were married by the end of 1991. Among the younger cohorts, 79.67 per cent of women born in 1969-1971 and less than 26 per cent of those born in 1972-1974 were married by 1992. Further, less than one per cent of women born in 1975-1977 and 1978-1980 were married at the start of 1992. Thus the majority of women who were aged 12-20 at the start of the war in 1992 were not married. These women were of prime marriage age by 1992 or reached it between 1992 and 1998. Therefore, their marriage decisions and prospects may have been affected by the armed conflict of 1992-1998 and associated with this conflict economic and social change.

4.2 Methods

To examine the association between age at first marriage and exposure to the 1992-1998 Tajik armed conflict, I estimate a Cox proportional hazards (CPH) regression model. In this model, duration time between the date of exposure to marriage and age at first marriage is measured in years. I follow Rukumnuaykit (2003), and specify the time of entry into the analysis or time of exposure to being married at age 11. For each year between age 11 and the reported age at first marriage, women contribute one observation to the analysis. Ever-married women exit the analysis when they enter their first marriages. For women who were never married at the time of the 2003 survey, the data is censored at the time of their interview. I assume such censoring to be exogenous. Woman's residence when she was 12 years old is used as a location of her exposure to the armed conflict.

The hypothesis that is being tested is the significance of the coefficients estimated on the conflict and sex ratio variables and the effect of those variables on entry into first marriage once other individual and regional characteristics are accounted for.

Assuming that residence in the conflict affected area proxies for an economic hardship, it can have a two-fold effect on entry into marriage. First, if grooms postpone marriages because of high costs, the effects of conflict on entry into marriage for women is expected to be negative. Second, families of brides may be willing to accept lower bride-prices and settle for modest weddings. If so, the effect of the conflict on entry into marriage may be very small with the second factor offsetting the delayed entry into marriage due to high marriage costs. Alternatively, women who live in a region that is not safe for young unmarried women should be married earlier than women from more stable locations.

Theoretically, the coefficient on the sex ratio variable should have a positive sign suggesting that high sex ratios, and thus availability of marriage partners, increases women's entry into marriage.

The difference-in-differences approach (Duflo 2001) is used to compare the odds of being married or having a first child for women who entered marriageable age during the period of the conflict with this of women who were either already married by 1992 or who reached marriageable age after the end of the conflict in 1998. Equation 1 below presents a basic statistical framework for the empirical analysis.

$$\ln \lambda_{ijk}(t) = \ln \lambda_0(t) + \alpha_{1j} + \beta_{1k} + \eta P_j + (P_j \; war\; cohort)\gamma + \delta X_i + \mu C_{jk} + \nu_j + \varepsilon_{ijk} \qquad (1)$$

where λ_{ijk} is a hazard rate. Subscripts on the dependent variable denote individual *i* residing in the district *j* at her time of exposure to conflict and who was born in year *k.* α_{1j} is a fixed effect for the individual's district of residence at the time of exposure. β_{1k} is a cohort of birth fixed effect. P_j is the intensity of the conflict in the raion of residence at the time of exposure to marriage. *'war cohort'* is a dummy variable indicating whether individual *i* belongs to one of the three-year birth cohorts exposed to the conflict, such as born in 1975-1977, 1978-1980 or 1981-1983 (i.e. born between 1975 and 1983). X_i is a set of individual characteristics, e.g. education level. C_{jk} is a set of regional characteristics that are specific to a birth cohort. v_j is a district specific random effect.[11]

[11] The district specific random effects do not correct for any possible correlation between the error term and the right-hand side variables. The random effects are assumed to follow gamma distribution. The variance θ is estimated from the data and measures variability of the random effects among groups of observations (Cleves, Gould and Gutierrez, 2004).

The main hypothesis that is being tested is whether the estimated coefficient γ is equal to zero, thus suggesting that the exposure to conflict during the marriageable age did not have a significant impact on age at marriage.

To estimate parameters in equation (1), I use the sample of women, born between 1966 and 1986 (ages 17 to 37 in 2003). This sample is divided into two groups - the treatment and comparison groups.

The individuals who turned 17 years old between 1992 and 2000 and who lived in the conflict-affected areas comprise the treatment group. Based on their year of birth, those women reached an age when they could officially marry during or immediately after the Tajik civil war. Thus those women were significantly exposed to the economic and demographic shocks associated with the conflict.

The comparison group consists of individuals whose marriage prospects should not have been significantly affected by the conflict. The control group includes two subgroups. The first subgroup is matched by age to the treatment group. It contains individuals born between 1975 and 1986 who lived in the regions lesser affected by conflict. The second subgroup includes individuals who were born between 1966 and 1974. This older cohort was likely to be married before the start of the conflict in 1992 and their marriage prospects should not have been affected by the conflict.

In the regression analysis that follows in Section 5, I also control for woman's education, her cohort of birth and characteristics of her district (raion) of residence at the time of exposure to marriage. The education level is potentially endogenous to marriage as the marriage hazard increases significantly upon completion of education, especially for younger people (Winship

1986; Brien and Lillard 1994). To tackle this potential endogeneity of education to marriage, I use completion of mandatory nine grades of schooling as an indicator for the education level. Assuming an individual does not repeat grades and enters school at age 7, nine grades of education should be completed the latest by age 16 or prior to the official marriage age of 17 years. The district level variables include number of doctors, number of reported crimes per 1,000 of population, and percentage of population employed in the district. All district-level variables are region and period specific. These variables are used to control for the economic and safety conditions in the district where a woman resided prior to her marriage.

Although the marriage age data is available on women ages 15-49 in 2003, the analysis is focuses on women born in 1966-1986, i.e. women who were age 17 to 37 in 2003. Women ages 15 and 16 in 2003 are excluded from the analysis as they were too young to be married at this time. The data also shows that two out of 533 women in this birth cohort were married in 2003. Women born in 1954-1965 or ages 38-45 in 2003 are also excluded as they are less comparable to the cohorts of interest.[12]

The empirical analysis that follows is focused on the transition from unmarried into married state. The estimation does not consider competing risks, such as entering informal or polygamous relationship as there are very few women in the analytical sample (less than 0.1%) who reported to be in such relationships.

[12] I estimated regressions that included omitted groups and the results (size, sign and significance of the estimated coefficients) are not very different from the regression results for the 1966-1986 sample reported in section 5.

5. Results

5.1 Descriptive analysis of entry into first marriages

Table 3 presents the cumulative probability of being married by age 18, 20 and 23 by three-year birth cohort for women born in 1954-1983. Note that younger women, born in 1981-1983 would not have been exposed to the possibility of being married by age 23 in 2003. The proportion of women married by age 18 increased by more than six percentage points for the cohort born in 1975-1977 as compared to women in the preceding and following birth cohorts. The cohort born in 1975-1977 reached age 18 between 1993 and 1995, or during the first harsh years of the Tajik civil war. Thus, a relatively large increase in the proportion of women married by age 18 for this cohort may indicate that some families rushed to marry their daughters early at the start of the war. Further, starting with the cohorts born in 1972-1974 we can observe a significant decline in the proportion of women married by age 20 as compared to the older cohorts. Next, the proportion of women not married by age 23, the age at which an unmarried girl is considered a spinster in Tajikistan, has significantly increased among those born in 1972-1980.

To test whether there are significant differences in age at first marriage among women living in the regions severely affected by the conflict and the lesser affected regions while controlling for other factors, I estimate a set of linear probability models. In these models a dependent variable is a dummy variable defined as one if a woman was married by age 18, 20 and 23 and the main independent variable of interest is an individual's residence in the conflict affected area (RCA) interacted with a dummy variable indicating whether a woman was born between 1975 and 1983, i.e. was of marriageable age during the war. One can then test the null hypothesis that the estimated coefficient on this interaction term (treatment effect) is not

statistically different from zero. If this hypothesis is true, then the coefficients on the birth cohorts do not vary by women's residence in the conflict affected area. I perform a set of F-tests, testing whether the estimated coefficient for the interactive term is equal to zero in all specifications. The tests indicate that the treatment effect: being born in 1975-1983 and residing in the conflict affected region before age 12, has a negative and statistically significant effect on the probability of being married by age 18 and age 20 (6.7 and 10.2 per cent respectively). The estimation results are reported in Appendix Tables 3, 4, and 5.[13]

5.2 Marriage hazard analysis

I continue with the semi-parametric analysis and estimate seven Cox survival models to examine how the estimated association between exposure to conflict and age at first marriage is affected when other confounding factors are introduced to the analysis. The hazard analysis is suitable for the duration data, such as time to marriage, as it accounts for censoring of the observations and exit of individuals from the analysis upon marriage at different age.[14]

The results are presented in Table 4. The main variable of interest is again the interaction between being of the prime marriage age (born in 1975-1983) during the war and living in the conflict affected region. All regressions starting with Column 1 include birth cohort dummies and the interactive term. Column 2 adjusts for the completion of nine grades of education plus

[13] All regressions are estimated with clustering of standard errors at the raion (district level). This procedure assumes that instead of N independent observations located in M regions, we have "M" independent groups of observations. Robust standard errors are estimated with the White-Huber sandwich estimator of variance and appear in brackets.

[14] All regressions are specified with random effects (frailty) at the raion level to control for unobserved heterogeneity. All tables report estimated regression coefficients in the exponential form (hazard rates). Standard errors are in brackets. The standard errors are conditional on the estimated intra-group variance θ. The standard errors are treated as conditional on θ fixed at its optimal value, as estimated from the data.

the Column 1 variables; Column 3 adjusts for the cohort and period specific measure of marriage squeeze in the region of residence, in addition to the Column 1 variables; Column 4 adjusts for the proportion of population in the raion of residence employed plus the Column 1 variables; Column 5 adjusts for the availability of doctors in the raion of residence plus the Column 4 variables; Column 6 adjusts for the number of reported crimes per 1,000 population in addition to the Column 4 variables; Column 7 controls for the region of residence and all covariates included in Column 6. Such a design enables me to examine how each covariate modifies the estimates of the effects of the being exposed to the armed conflict during the marriageable years and thus enables me to test the robustness of the estimates found in Column 1 when other relevant covariates are introduced in the analysis.

Interaction terms. Column 1 of Table 4 reports regressions results that include an interaction term, that is constructed by multiplying the dummy variable for being born in 1975-1983 by the dummy indicating that an individual lived in the region affected by the conflict (RCA) ((Born in 1975-1983)* RCA). The estimated coefficient indicates that being of marriageable age and living in the conflict affected region (interaction term) reduces the hazard of being married by about 29% (significant at 1% level). The coefficients on the interaction terms remain statistically robust and stable once other individual and regional controls are added to the regressions. The results of several joint-χ^2 tests are reported in Columns 2-7.

Residence in the conflict affected area. Woman's residence in the conflict affected area (Column 1, Table 4) has a negative effect on the hazard of marriage. The hazard of marriage for women in the conflict affected areas is about six percent less than the hazard rate for women in the lesser affected areas. The estimated coefficient is not statistically significant in any of the

regressions, indicating that residence in the conflict affected area by itself does not have a strong effect on the hazard of being married.

Birth cohort effects. The estimated effect of the time trend on entry into marriage is significant assuming either linear (including a control for the birth year only, results not reported) or non-linear (cohort dummies) effects (Column 1). Further, the estimated coefficients on birth cohort dummies are significantly different from each other for the cohorts born in 1975-1986. As expected, the coefficients follow a downward pattern where the older birth cohorts are more likely to be married as compared to the younger birth cohorts in this analysis.

Education. The estimated hazard rate for "completed nine grades of education" dummy variable indicates a negative effect of education on entry into marriage (not significant) (Column 3). This relatively weak result can be explained by the fact that the majority of women (88.2%) in the analytical sample have completed this level of education.

Sex Ratio. The estimated hazard rate associated with the Sex Ratio variable suggests that an increase in the sex ratio decreases entry into marriage (Column 4). The result is not statistically significant. The negative effect of the sex ratio variable on marriage hazard is surprising because the literature suggests that high sex ratios increase entry in marriage due to the increased pool of marriage age partners. This unexpected and weak result is likely to be related to the Tajik marriage practices, where people marry a member of an extended family or a member of a larger group that shares similar ancestral roots. Thus, as the sex ratio variable based on the Tajik Census data and relatively broad regional and age groups, it may not adequately measure the relevant pool of marriageable partners for many individuals.

Regional Controls. Models 5-7 in Table 4 include a set of regional controls to test for the

robustness of the treatment effect (i.e. 'Born in 1975-1983'*RCA). None of the estimated coefficients on the regional controls is statistically significant. However, all of them have expected signs. For example, an increase in number of doctors in the region and employment, both used as a proxy for access to social services and overall development lead to an increase in the age at first marriage while an increase in the number of reported crimes decreases it.

6. Concluding remarks

This paper explored the effect of the temporal and spatial exposure to the 1992-1998 armed conflict in Tajikistan and the period and region specific sex ratios on the age at first marriage for women.

I find substantial, highly significant and robust negative impact of temporal and regional exposure to armed conflict on entry into their first marriages by females in Tajikistan. Women born in 1975-1983, who also lived in the conflict affected areas were about 29 percent less likely to enter marriage than women who were not exposed to the conflict. Those results are robust to inclusion of birth cohort and regional controls, and raion-level characteristics, such as employment level, crime rate and number of doctors per 1,000 residents. One of the explanations for the delay of marriages for younger cohorts in the conflict affected regions is that households affected by civil war and economic crisis were conserving their scarce resources by postponing marriages and celebrations.

Assuming that exposure to armed conflict measures the economic hardship of the families, the estimated effects of war on the marriage market for women in Tajikistan are similar to those in other countries affected by economic crises, for example, see Palloni, Hill and

Aguirre (1996).

The effect of the sex ratio of men to women, a variable that was shown to have a significant impact on the marriage market for women in India, U.S.A., China and Malaysia, does not appear to have a significant effect on the age of entry into first marriage by women. This difference is explained by traditional marriage market institutions in Tajikistan where people often aim to find marriage partners who belong to the same clan or extended family. In such circumstances the sex ratio that is based on the broad census population data may have limited applicability.

In Tajikistan women have their first child very soon after marriage (Shemyakina 2007). Therefore, delaying marriage by a few years may lead to a decrease in infant mortality and total fertility rates – a positive outcome for Tajikistan which has high rates of both. However, the observed increase in age at first marriage for women also points towards a longer period of time women now have to rely on resources of their natal families or on their own ability to provide for themselves. While the Tajik or any other government is limited in its ability to influence family practices, import marriage age men or provide funds for establishment of new households and subsidize wedding expenses, the government can focus on policies that promote education of and employment for women. These strategies will help young women to reduce their dependence on the income of their parents, husbands or brothers and thus improve their status in society.

References

Agadjanian, Victor and Ndola Prata**.** "War, Peace, and Fertility in Angola." *Demography*, 2002, *39*(2), pp. 215-31.

Akers, Donald S. "On Measuring the Marriage Squeeze." *Demography*, 1967, 4, pp. 907-24.

Angrist, Joshua. "How Do Sex Ratios Affect Marriage and Labor Markets? Evidence from America's Second Generation." *Quarterly Journal of Economics*, August 2002, pp. 997-1038.

Becker, Gary. "A Theory of Marriage: Part I." *Journal of Political Economy*, 1973, Vol. 81 (4), pp. 813-846.

Brien, Michael J.; Lee A. Lillard. "Education, Marriage and First Conception in Malaysia", *Journal of Human Resources*, Vol. 29, No. 4 (Autumn, 1994), pp. 1167-1204.

Brzezinski, Zbigniew, and Paige Sullivan. Russia and the Commonwealth of Independent States: documents, data, and analysis. Armonk, N.Y.: M.E. Sharpe. 1997.

Burnham, Gilbert, Riyadh Lafta, Shannon Doocy, Les Roberts. "Mortality after the 2003 Invasion of Iraq: A Cross-Sectional Cluster Sample Survey " *Lancet*, 2006, 368(9545), pp. 1421-29.

Bushkov, V.I. and D.V. Mikulskii. *Anatomiia Grazhdanskoi Voiny V Tadzhikistane: Etno-Sotsial'nye Protsessy I Politicheskaia Bor'ba, 1992-1996.* [The Anatomy of the Civil War in Tajikistan: Ethnic and Social Processes and Political Struggle, 1992-1996]. Moscow: Institut etnologii i antropologii im. Miklukho-Maklaia RAN [Institute of ethnic studies and anthropology named after Mikluho-Maklai. Russian Academy of Sciences]. 1997.

Caldwell, John C.; Reddy, Palli Hanumantha and Caldwell, Pat. "The Causes of Marriage Change in South India." *Population Studies*, 1983, 37(3): 343-361.

Caldwell, John C.; P.H. Reddy; Pat Caldwell. "Periodic High Risk as a Cause of Fertility Decline in a Changing Rural Environment: Survival Strategies in the 1980-1983 South Indian Drought." *Economic Development and Cultural Change*, 1986, 34(4), pp. 677-701.

Chiappori, Pierre-Andre; Bernard Fortin and Guy Lacroix. "Marriage Market, Divorce Legislation, and Household Labor Supply." *Journal of Political Economy*, 2002, Vol. 110(11).

Cleves, Mario, William Gould, and Roberto Gutierrez. *An Introduction to Survival Analysis Using Stata*. College Station, Texas: Stata Press, 2004.

Das Gupta, Monica and Li Shuzhuo. Gender Bias in China, the Republic of Korea, and India 1920-90: Effects of War, Famine, and Fertility Decline. SSRN, 1999.

Djalili, Mohammad Reza, Frédéric Grare and Shirin Akiner. *Tajikistan: the trials of independence.* New York: St. Martin's Press. 1997

Duflo, Esther. "Schooling and labor market consequences of school construction in Indonesia: evidence from an unusual policy experiment." *American Economic Review*, 2001, 91, pp. 795-813.

Falkingham, Jane. Women and gender relations in Tajikistan. [Manila]: Asian Development Bank Programs Dept. East and Office of Environment and Social Development. 2000.

Gomart, Elizabeth. "Between Civil War and Land Reform: Among the Poorest of the Poor in Tajikistan." in *When things fall apart: qualitative studies of poverty in the former Soviet Union*, edited by Nora Dudwick, Elizabeth Gomart, and Alexandre Marc. Washington, D.C.: World Bank. 2003.

Goskomstat Tajik SSR [State Statistical Committee of the Tajik Soviet Socialist Republic]. Naselenie Tajik SSR. [Population of the Tajik SSR.] Dushanbe. 1990.

Greene, Margaret E,; Rao, Vijayendra. "The Marriage Squeeze and the Rise of Informal Marriage in Brazil." *Social Biology,* 1995, 42(1-2), pp. 65.

Harris, Colette. *Control and Subversion: Gender Relations in Tajikistan*. London: Pluto Press, 2004.

Harris, Colette. *Muslim Youth: Tensions and Transitions in Tajikistan*. Boulder: Westview Press, 2006.

Hill, Kenneth. *War, Humanitarian Crises, Population Displacement, and Fertility: A Review of Evidence*. Roundtable on the Demography of Forced Migration, Program on Forced Migration and Health at the Mailman School of Public Health Columbia University, National Research Council, 2004.

Hoeffler, Anke, and Martha Reynal-Querol. "Measuring the Cost of Conflict." Unpublished manuscript, Centre for the Study of African Economies, Oxford University, Oxford, U.K. 2003.

Hoogeveen, J.G.M. (Hans), van der Klaauw, Bas and van Lomwel, A. Gijsbert C. "On the Timing of Marriage, Cattle and Weather Shocks," Tinbergen Institute Discussion Papers. June 2004.

Human Rights Watch. Human Rights in Tajikistan. Helsinki, Finland: Helsinki Watch: a Division of Human Rights Watch. 1993.

Kamp, Marianne. *The New Woman in Uzbekistan: Islam, Modernity, and Unveiling under Communism.* Seattle: University of Washington Press, 2006.

Keeley, Michael C. “An Analysis of the Age Pattern of First Marriage.” *International Economic Review*, 1979, 20 (2): 527-544

Kotlikoff, Laurence and A. Spivak. “The Family as an Incomplete Annuities Market.” *Journal of Political Economy*, 1981, 89 (2): 372 – 391.

Kuz’menko, T. “E net spaseniya dushe…” *Narodnaya Gazeta*, Dushanbe: December 13, 1991, p.6.

Lindstrom, D. P. and B. Berhanu. “The Impact of War, Famine, and Economic Decline on Marital Fertility in Ethiopia.” *Demography*, 1999, 36: 247-261.

McGinn, Therese. “Reproductive Health of War-Affected Populations: What do we know?” *International Family Planning Perspectives*, 2000, 26(4): 174-180.

McLean, Jennifer, and Thomas Greene. "Turmoil in Tajikistan: addressing the crisis of internal displacement." in *The Forsaken People: Case Studies of the Internally Displaced*, edited by Roberta Cohen and Francis Mading Deng. Washington, D.C.: Brookings Institution Press. 1998.

Newth, J.A. "The Soviet Population: Wartime Loses and the Postwar Recovery." *Soviet Studies*, 1964, 15(3), pp. 345-51.

Nobles, Jenna and Alison Buttenheim. "Marriage in Periods of Crisis: Evidence from Indonesia," California Center for Population Research On-Line Working Paper Series. Los Angeles: University of California, Los Angeles, 2006.

Nourzhanov, Kirill. "Saviours of the nation or robber barons? Warlord politics in Tajikistan." *Central Asia Survey*, 2005, 24 (2):109-130.

Olimova, Saodat and Igor Bosc. "Labour Migration from Tajikistan." International Organization for Migration in Cooperation with the Sharq Scientific Research Center. 2003.

Palloni, A., Hill, K., and Aguirre, G. P. . "Economic Swings and Demographic Changes in the

History of Latin America" *Population Studies*, 1996, 50: 105-32.

Rao, Vijayendra. "The Rising Price of Husbands: A Hedonic Analysis of Dowry Increases in Rural India." *Journal of Political Economy*, 1993, 101(4).

Roberts, Les; Riyadh Lafta; Richard Garfield; Jamal Khudhari; Gilbert Burnham. "Mortality before and after the 2003 Invasion of Iraq: Cluster Sample Survey." *Lancet*, 2004, 364: 1857-64.

Rosenzweig, Mark R. and Oded Stark. "Consumption Smoothing, Migration and Marriage: Evidence from rural India." *Journal of Political Economy*, Vol. 97, No. 4 (Aug., 1989), pp. 905-926.

Rukumnuaykit, Pungpond. "Economic Crisis and Demographic Outcomes: Evidence from Indonesia." Ph.D. Dissertation. Michigan State University. 2003.

Schoen, Robert. "Measuring the Tightness of a Marriage Squeeze." *Demography*, 1983, 20, pp. 61-78.

Semein'i'i kodeks Respubliki Tajkistan. [Family Law of the Republic of Tajikistan]. Dushanbe, November 13, 1998. # 683.

Shemyakina, Olga. "Armed Conflict, Education and the Marriage Market: Evidence from Tajikistan." Ph.D. Dissertation. University of Southern California. 2007.

State Statistical Committee of Republic of Tajikistan. Regioni Respubliki Tajikistan 2001. [Regions of Republic of Tajikistan 2001.] Dushanbe: State Statistical Committee of Tajikistan. 2001.

- . Regioni Respubliki Tajikistan 2003. [Regions of Republic of Tajikistan 2003.] Dushanbe: State Statistical Committee of Tajikistan. 2004.

State Statistical Committee of Republic of Tajikistan. "Vozrastnoi Sostav Naseleniya Respubliki Tajikistan: Po Dannum Vseobshei Perepisi Naseleniya 2000 Goda. [Age Structure of the Population of the Republic of Tajikistan: According to the 2000 Census Data.] " Edited by O. A. Djabbarov, Dushanbe: State Statistical Committee of Republic of Tajikistan, 2002.

Tadjbakhsh, Shahrbanou. "Women and War in Tajikistan", *The Central Asian Monitor,* No. 1, January 1994.

United Nations. Map of United Nations Mission of Observers in Tajikistan. (http://www.un.org/Depts/DPKO/Missions/unmot/Unmot.htm. Accessed: March 30, 2005). 2005.

UNDP. Human Development Report 2003. New York: Human Development Report Office, United Nations Development Programme. 2003.

UNDP. "Central Asia Development Report." Bratislava, Slovak Republic. UNDP Regional Bureau for Europe and the Commonwealth of Independent States. 2005.

UNICEF, Innocenti Research Center. "Transmonee 2007", Statistical Tables. UNICEF Regional Office for Central and Eastern Europe and the Commonwealth of Independent States, 2007.

UNICEF. "The Status of Women and Children: Tajikistan, 2000. Multiple Cluster Indicator Survey". Regional Office for Central and Eastern Europe and the Commonwealth of Independent States. 2001.

U.S. Department of State. Tajikistan Human Rights Practices, 1993. 1994. (http://dosfan.lib.uic.edu/ERC/democracy/1993_hrp_report/93hrp_report_eur/Tajikistan.html (Accessed: February 15, 2007.)

----------. "Tajikistan Report on Human Rights Practices for 1996," The Bureau

of Democracy, Human Rights, and Labor, 1996.

----------. "Tajikistan Report on Human Rights Practices for 1997," The Bureau of Democracy, Human Rights, and Labor. 1997.

Uppsala Universitet, Department of Peace and Conflict Research. "Conflict Database: Tajikistan," (http://www.pcr.uu.se/ Accessed: May 20th 2005). 2005.

Verwimp, Philip and Jan van Bavel. “Child Survival and Fertility of Refugees in Rwanda.” *European Journal of Population*, 2005, 21: 271-290

Walsh, Brendan M.. "Trends in Age at Marriage in Postwar Ireland." *Demography*, 1972, 9(2).

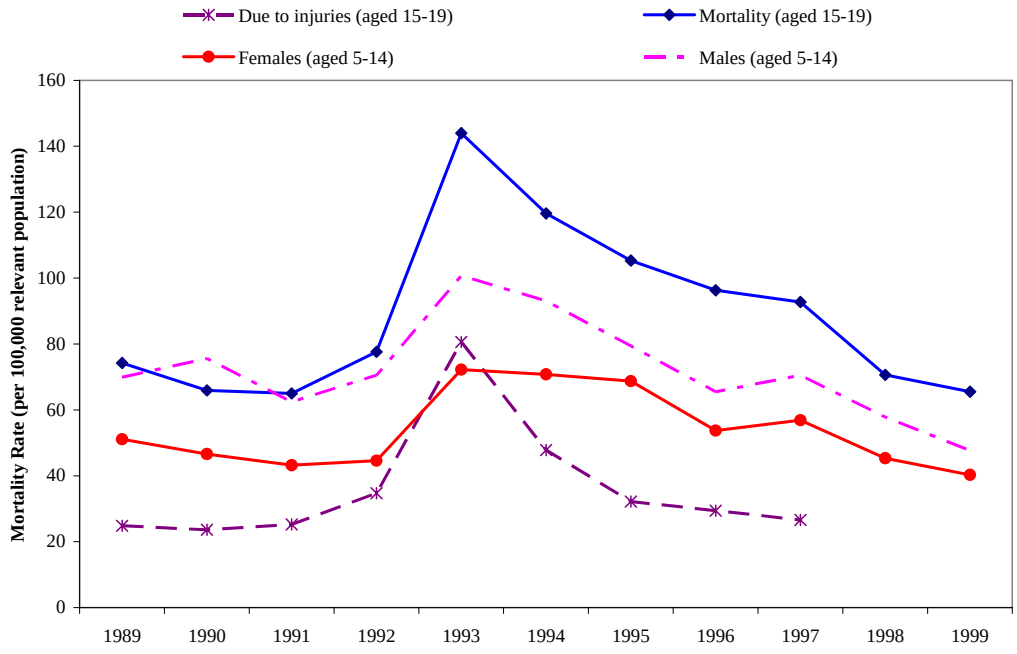
Winship, Christopher. “Heterogeneity and Interdependence: A Test Using Survival Models”, *Sociological Methodology*, 1986, Vol. 16, pp. 250-282.

World Health Organization. "Violence against Women: Report on the 1999 WHO Pilot Survey in Tajikistan," Copenhagen: WHO Regional Office for Europe, 2000.

World Bank. Tajikistan Living Standards Measurement Survey 2003. (www.worldbank.org/lsms). 2003.

----------. Republic of Tajikistan: Poverty Assessment Update. Report No.30853. Washington, D.C.: World Bank. 2005.

Figure 1 - Tajikistan: mortality trends among children and young adults, 1989-1999



Source: Based on data from UNICEF (2005). Ages 5-19.

Table 1 - Descriptive statistics. *Sample of all surveyed women, ages 15-49.*

Variable	N	Mean	Std. Dev.	Min	Max
Personal characteristics					
Age	6182	28.56	9.62	15	49
Year of birth	6182	1974.4	9.6	1954	1988
Age at first marriage	4084	19.56	2.32	9	42
Indicator for marital status					
Married	6182	0.59			
In a polygamous union	6182	0.00			
Divorced	6182	0.02			
In informal union	6182	0.00			
Widowed	6182	0.04			
Single	6182	0.33			
Indicator for community characteristics					
Rural	6182	0.70			
Reports of conflict activity (RCA)	6167	0.69			

Source: Tajik Living Standards Survey (2003). Author's calculations.

Table 2 - Three year birth cohorts: selected demographic data.

3-year birth cohort	Age in 1992	Age in 1998	Age in 2003	% of the cohort married by 1991 (inclusive of 1991)	% of the cohort who had first child by 1991	N
1954-1956	36-38	42-44	47-49	97.20	94.76	191
1957-1959	33-35	39-41	44-46	96.78	92.69	342
1960-1962	30-32	36-38	41-43	97.12	93.73	415
1963-1965	27-29	33-35	38-40	93.99	85.08	449
1966-1968	24-26	30-32	35-37	92.52	80.18	439
1969-1971	21-23	27-29	32-34	79.67	52.81	481
1972-1974	18-20	24-26	29-31	25.78	8.61	511
1975-1977	15-17	21-23	26-28	0.18	1.10	545
1978-1980	12-14	18-20	23-25	0.00	0.15	656
1981-1983	9-11	15-17	20-22	0.00	0.00	774
Total:	9-38	15-44	20-49			4,803

Note: This table allows us to identify birth cohorts whose decisions about the first marriage and first birth may have been influenced by the exposure to the Tajik armed conflict of 1992-1998 during their prime marriageable years (ages 17-22).
Source: Tajik Living Standards Survey (2003). Author's calculations.

Table 3 – Age at first marriage by 3-year birth cohort. Women born in 1954-1983.

3 year birth cohort	Median marriage age	Age first married (%)			Not married by 23	N observations
		18 and below	20 and below	23 and below		
1954-1956	19	36.5	76.6	91.1	8.8	192
1957-1959	19	32.5	71.4	91.2	8.8	342
1960-1962	20	29.7	74.9	91.8	8.2	415
1963-1965	19	27.9	70.7	87.3	12.7	448
1966-1968	19	28.9	73.6	90.0	10.0	440
1969-1971	20	26.9	72.0	87.9	12.1	479
1972-1974	19	29.7	68.6	83.0	17.0	512
1975-1977	19	36.0	64.9	80.3	19.7	542
1978-1980	19	29.3	55.1	68.2	31.7	655
1981-1983	18	21.9	42.2	-	-	775
Total	19	29.0	64.1	-	-	4,800

Source: Tajik Living Standards Survey (2003). Author's calculations.

Table 4 – Semi-parametric marriage hazard regressions (Cox proportional hazard model). Women born in 1966-1986 (ages 17-37 in 2003). Tajikistan (TLSS 2003).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Born in 1975-1983)*RCA	0.709***	0.713***	0.708***	0.693***	0.664***	0.682***	0.671***
	[0.059]	[0.059]	[0.059]	[0.063]	[0.060]	[0.061]	[0.060]
RCA	0.940	0.933	0.941	0.943	0.983	0.957	1.063
	[0.102]	[0.102]	[0.102]	[0.104]	[0.110]	[0.105]	[0.131]
Birth cohort							
1969-1971	0.978	0.980	0.978	0.979	0.970	0.977	0.972
	[0.067]	[0.067]	[0.067]	[0.067]	[0.066]	[0.067]	[0.066]
1972-1974	0.905	0.903	0.905	0.897	0.899	0.897	0.899
	[0.062]	[0.062]	[0.062]	[0.062]	[0.062]	[0.063]	[0.063]
1975-1977	1.117	1.115	1.105	1.136	1.150	1.142	1.136
	[0.097]	[0.098]	[0.098]	[0.101]	[0.102]	[0.101]	[0.101]
1978-1980	0.836**	0.822**	0.826**	0.838**	0.863*	0.854*	0.846*
	[0.072]	[0.072]	[0.073]	[0.074]	[0.076]	[0.076]	[0.075]
1981-1983	0.566***	0.566***	0.559***	0.564***	0.567***	0.562***	0.558***
	[0.052]	[0.052]	[0.052]	[0.052]	[0.052]	[0.052]	[0.051]
1984-1986	0.323***	0.308***	0.319***	0.299***	0.308***	0.309***	0.306***
	[0.037]	[0.036]	[0.037]	[0.036]	[0.037]	[0.037]	[0.036]
Sex ratio			0.788				
			[0.273]				
Completed 9 grades		0.907		0.911			
		[0.058]		[0.059]			
Regional controls							
% raion population employed				0.664	0.590	0.597	0.666
				[0.208]	[0.213]	[0.202]	[0.215]
N doctors per 1,000 raion population					1.002		
					[0.026]		
N crimes per 1,000 raion population						1.000	0.997
						[0.011]	[0.013]
Region of residence controls	no	no	no	No	no	no	yes
Observations	4223	4153	4223	4153	4223	4223	4223
Number of groups	67	67	67	67	67	67	67
Log likelihood	-20488.4	-20185.6	-20488.2	-20184.7	-20485.1	-20487	-20470.2
Chi2-tests, p-values							
(1975-1983)*RCA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(1975-1983)*RCA, RCA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residence controls							0.00

Notes: "RCA" – dummy variable that stands for residence in a community highly affected by the conflict. Women born in 1966-1986 (ages 17-37 in 2003). Columns represent hazard ratios. Standard errors are in brackets. All regressions include controls for heterogeneity at the raion level (frailty effects) specified with gamma distribution. Reference categories: born in 1966-1968, "Resident of Sugd". Subjects enter analysis at age 11. Sample: born in 1966-1986. Regressions also include dummy variable controls for missing information on the regional control variable (when included). All regressions include a dummy variable controlling for residence in the rural area.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Appendix Table 1 – Assignment of sex ratios by birth cohort.

Birth cohort	Age in 1989	Age in 2000	Age in 2003	Sex Ratio=(men age 20-29)/ (women aged 15-24)
1966-1974	15-23	26-33	29-37	1989
1975-1986	3-14	14-25	17-28	2000

Appendix Table 2 - Effect of regional conflict variable on sex ratio.

	Dependent variable: sex ratio	
	Men ages 20-29 to women ages 15-24 in 1989	Men ages 20-29 to women ages 15-24 in 2000
	(1)	(2)
RCA	-0.009	0.021
	[0.032]	[0.021]
Constant	0.889***	0.810***
	[0.026]	[0.017]
Observations	69	69
R-squared	0.00	0.01

Notes: OLS regressions. Standard errors in brackets.
Source: population data – State Statistical Committee of Tajikistan (2002), conflict data – author's calculations.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Appendix Table 3 - Linear Probability Regressions. Dependent variable: Married by 18. Sample: Ages 18-37 in 2003.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Born in 1975-1983)* RCA		-0.067*	-0.075**	-0.068**	-0.082**	-0.072*	-0.077**	-0.081**
		[0.034]	[0.034]	[0.033]	[0.035]	[0.037]	[0.037]	[0.035]
RCA	-0.027	0.008	0.008	0.008	0.006	0.000	0.000	-0.010
	[0.038]	[0.032]	[0.032]	[0.032]	[0.032]	[0.031]	[0.032]	[0.051]
Birth Cohort								
1969-1971	-0.018	-0.019	-0.016	-0.019	-0.015	-0.016	-0.018	-0.016
	[0.031]	[0.031]	[0.032]	[0.031]	[0.031]	[0.031]	[0.031]	[0.032]
1972-1974	0.006	0.005	0.011	0.005	0.009	0.002	-0.004	0.003
	[0.030]	[0.030]	[0.031]	[0.030]	[0.031]	[0.030]	[0.030]	[0.028]
1975-1977	0.069**	0.115***	0.116***	0.114***	0.128***	0.126***	0.120***	0.116***
	[0.033]	[0.038]	[0.040]	[0.040]	[0.040]	[0.041]	[0.039]	[0.038]
1978-1980	0.000	0.046	0.044	0.045	0.059	0.061	0.068	0.061
	[0.037]	[0.041]	[0.043]	[0.043]	[0.042]	[0.043]	[0.043]	[0.041]
1981-1983	-0.073**	-0.027	-0.027	-0.027	-0.031	-0.035	-0.030	-0.031
	[0.030]	[0.038]	[0.040]	[0.041]	[0.042]	[0.041]	[0.042]	[0.040]
1984-1986	-0.167***	-0.168***	-0.178***	-0.169***	-0.191***	-0.184***	-0.185***	-0.182***
	[0.027]	[0.027]	[0.029]	[0.029]	[0.036]	[0.032]	[0.035]	[0.031]
Sex ratio				-0.017				
				[0.126]				
Completed 9 grades			-0.105***		-0.098***			
			[0.023]		[0.022]			
Regional controls								
% raion population employed					-0.284**	-0.353**	-0.401***	-0.228**
					[0.137]	[0.138]	[0.137]	[0.107]
N doctors per 1,000 raion population						0.003		
						[0.009]		
N crimes per 1,000 raion population							0.006*	0.006
							[0.003]	[0.005]
Region of residence controls	no	no	no	no	no	no	no	yes
Constant	0.285***	0.262***	0.359***	0.278**	0.445***	0.365***	0.358***	0.318***
	[0.039]	[0.037]	[0.043]	[0.123]	[0.067]	[0.066]	[0.062]	[0.057]
Observations	3959	3959	3895	3959	3895	3959	3959	3959
R-squared	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05
F-tests, p-values								
(Born in 1975-1983) *RCA		0.05	0.032	0.045	0.024	0.055	0.038	0.023
(Born in 1975-1983)*RCA, RCA		0.131	0.094	0.119	0.075	0.156	0.114	0.073
Residence controls								0.000

Notes: Columns represent OLS coefficients. Standard errors (in brackets) are corrected for heteroscedasticity and are robust to clustered residuals across individuals who resided in the same raion at age 11. Reference categories: born in 1966-1968, "Resident of Sugd". Sample: born in 1966-1986 (age 18 to 37 in 2003). "Married by 18" – is an indicator variable equal to one if a woman was married at age 18 or earlier, the variable is equal to zero otherwise. Regressions also include dummy variable controls for missing information on the regional control variable (when included). All regressions include a dummy variable controlling for residence in the rural area. *significant at 10%; ** significant at 5%; *** significant at 1%.

Appendix Table 4 – Linear Probability Regressions. Dependent variable: Married by age 20. Sample: Ages 20-37 in 2003.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Born in 1975-1983)*RCA		-0.102**	-0.109**	-0.104**	-0.146***	-0.129**	-0.145**	-0.132***
		[0.044]	[0.044]	[0.043]	[0.052]	[0.054]	[0.056]	[0.047]
RCA	-0.112**	-0.051	-0.052	-0.051	-0.029	-0.038	-0.031	0.013
	[0.051]	[0.047]	[0.047]	[0.047]	[0.056]	[0.052]	[0.055]	[0.071]
Birth Cohort								
1969-1971	-0.01	-0.013	-0.012	-0.013	-0.012	-0.01	-0.012	-0.012
	[0.031]	[0.031]	[0.033]	[0.031]	[0.032]	[0.031]	[0.031]	[0.033]
1972-1974	-0.056*	-0.057*	-0.050*	-0.056*	-0.055*	-0.061**	-0.067**	-0.054**
	[0.029]	[0.029]	[0.030]	[0.029]	[0.030]	[0.028]	[0.030]	[0.026]
1975-1977	-0.092***	-0.022	-0.017	-0.025	0.004	-0.007	-0.004	-0.008
	[0.034]	[0.043]	[0.044]	[0.046]	[0.048]	[0.051]	[0.048]	[0.045]
1978-1980	-0.195***	-0.126***	-0.126***	-0.129***	-0.100**	-0.108**	-0.093*	-0.102**
	[0.036]	[0.044]	[0.045]	[0.046]	[0.047]	[0.049]	[0.049]	[0.045]
1981-1983	-0.321***	-0.251***	-0.249***	-0.254***	-0.253***	-0.261***	-0.256***	-0.257***
	[0.029]	[0.040]	[0.040]	[0.042]	[0.045]	[0.046]	[0.047]	[0.042]
Completed 9 grades			-0.085**		-0.076**			
			[0.035]		[0.034]			
Sex ratio				-0.075				
				[0.165]				
Regional controls								
% raion population employed					-0.443**	-0.384**	-0.530**	-0.253*
					[0.220]	[0.161]	[0.246]	[0.139]
N doctors per 1,000 raion population						-0.006		
						[0.014]		
N crimes per 1,000 raion population							0.004	0.003
							[0.005]	[0.005]
Region of residence controls	no	no	no	no	no	no	no	yes
Constant	0.767***	0.725***	0.805***	0.795***	0.938***	0.884***	0.876***	0.817***
	[0.049]	[0.047]	[0.053]	[0.156]	[0.083]	[0.077]	[0.072]	[0.054]
Observations	3403	3403	3346	3403	3346	3403	3403	3403
R-squared	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.13
F-tests, p-values								
(Born in 1975-1983)*RCA		0.023	0.015	0.018	0.007	0.02	0.011	0.006
(Born in 1975-1983)*RCA, RCA		0.033	0.019	0.026	0.006	0.017	0.013	0.023
Residence controls								0.000

Notes: Columns represent OLS coefficients. Standard errors (in brackets) are corrected for heteroscedasticity and are robust to clustered residuals across individuals who resided in the same raion at age 11. Reference categories: born in 1966-1968, "Resident of Sugd". Sample: born in 1966-1983 (age 20 to 37 in 2003). "Married by 20" – is an indicator variable equal to one if a woman was married at age 20 or earlier, the variable is equal to zero otherwise. Regressions also include dummy variable controls for missing information on the regional control variable (when included). All regressions include a dummy variable controlling for residence in the rural area.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Appendix Table 5 – Linear Probability Regressions. Dependent variable: Married by age 23. Sample: Ages 23-37 in 2003.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Born in 1975-1980)*RCA		-0.076	-0.078*	-0.078*	-0.108**	-0.099**	-0.111**	-0.082*
		[0.046]	[0.044]	[0.045]	[0.050]	[0.049]	[0.054]	[0.048]
RCA	-0.092**	-0.057*	-0.060*	-0.056*	-0.039	-0.039	-0.035	0.03
	[0.044]	[0.031]	[0.031]	[0.032]	[0.039]	[0.039]	[0.040]	[0.045]
Birth Cohort								
1969-1971	-0.016	-0.018	-0.017	-0.018	-0.018	-0.018	-0.018	-0.020
	[0.018]	[0.018]	[0.018]	[0.018]	[0.018]	[0.018]	[0.018]	[0.020]
1972-1974	-0.074***	-0.075***	-0.071**	-0.074***	-0.075***	-0.077***	-0.083***	-0.064***
	[0.027]	[0.027]	[0.027]	[0.027]	[0.028]	[0.025]	[0.028]	[0.022]
1975-1977	-0.101***	-0.05	-0.052	-0.054	-0.035	-0.039	-0.035	-0.033
	[0.032]	[0.048]	[0.046]	[0.049]	[0.048]	[0.050]	[0.050]	[0.043]
1978-1980	-0.225***	-0.174***	-0.185***	-0.178***	-0.163***	-0.160***	-0.149***	-0.163***
	[0.034]	[0.046]	[0.045]	[0.048]	[0.045]	[0.048]	[0.048]	[0.046]
Completed 9 grades			-0.098***		-0.088***			
			[0.032]		[0.029]			
Sex ratio				-0.097				
				[0.141]				
Regional controls								
% raion population employed					-0.425**	-0.317*	-0.499**	-0.109
					[0.203]	[0.174]	[0.233]	[0.118]
N doctors per 1,000 raion population						-0.009		
						[0.016]		
N crimes per 1,000 raion population							0.003	-0.004
							[0.004]	[0.004]
Region of residence controls	no	no	no	no	no	no	no	yes
Constant	0.926***	0.901***	0.998***	0.992***	1.129***	1.054***	1.050***	0.970***
	[0.039]	[0.036]	[0.040]	[0.136]	[0.067]	[0.055]	[0.055]	[0.034]
Observations	2628	2628	2589	2628	2589	2628	2628	2628
R-squared	0.06	0.06	0.07	0.06	0.08	0.07	0.07	0.15
F-tests, p-values								
(Born in 1975-1980)*RCA		0.106	0.083	0.086	0.034	0.046	0.045	0.091
(Born in 1975-1980)*RCA, RCA		0.120	0.090	0.116	0.060	0.082	0.083	0.169
Residence controls								0.000

Notes: Columns represent OLS coefficients. Standard errors (in brackets) are corrected for heteroscedasticity and are robust to clustered residuals across individuals who resided in the same raion at age 11. Reference categories: born in 1966-1968, "Resident of Sugd". Sample: born in 1966-1980 (age 23 to 37 in 2003). "Married by 23" – is an indicator variable equal to one if a woman was married at age 23 or earlier, the variable is equal to zero otherwise. Regressions also include dummy variable controls for missing information on the regional control variable (when included). All regressions include a dummy variable controlling for residence in the rural area.
* significant at 10%; ** significant at 5%; *** significant at 1%.