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タジキスタン内戦の長期的帰結：就学と国際移民への影響

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【要旨】

本論文は、武力衝突に晒された程度の違いを利用して、タジキスタン内戦終戦後20年経過した時点での長期的帰結について定量的な評価を行った。まず、義務教育年齢で武力衝突に晒された女性は義務教育を修了する割合が有意に低いと同時に、大学まで進学した女性の割合が有意に高いことがわかった。さらに、小学生の時に武力衝突に晒された男性の雇用には負の影響がみられるとともに、こうした男性は海外移民に行く割合も有意に低いことが明らかになった。

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**Long-term Consequences of Civil War in Tajikistan:
Schooling and International Migration Outcomes**

by

Satoshi Shimizutani and Eiji Yamada*

Abstract

This study utilizes variations in exposure to the armed conflict to examine the long-term consequences of civil war in Tajikistan on a variety of outcomes twenty years after the end of the civil war. We confirm a negative and significant effect on completing basic education for girls exposed to the war during their school ages while other girls were able to attain higher education levels than previously. Moreover, we see adverse effects on employment status for males exposed to armed conflicts in their primary school ages and long-term effects in international migration status for those males.

Key words: Tajikistan; civil war; long-term consequences; schooling; labor market outcome; international migration.

JEL Classification Codes: D1, I2, O1, P2.

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1. Introduction

Tajikistan experienced a violent internal conflict called the *Tajik Civil War* between 1992 and 1997, right after gaining its independence. The civil war dragged on for five years and ended in the complete devastation of many areas, with widespread human casualties and physical damage. This study utilizes variations in regional and temporal exposure to the armed conflict in Tajikistan to uncover the long-term consequences of the civil war on a variety of outcomes twenty years after the end of the war.

A large volume of literature has empirically examined both short-run and long-term consequences of human-made catastrophes, including civil wars, on various outcomes. At the micro-level, this type of investigation is known as the “microeconomics of violent conflict.” This literature has emerged particularly over the last decade as a sub-field of empirical development economics (Verwimp et al., 2019). These papers can be categorized depending on the outcomes that are examined.¹ The first group investigated educational attainment, with the literature observing the adverse effects of armed conflict on schooling through a variety of paths, including damage to school infrastructure and psychological distress to teachers and students (Buckland, 2005; Brück et al., 2019) as well as the impoverishment caused by conflict (Justino et al., 2013). Negative effects have

¹ Stewart et al. (2001) summarize the literature on economic and social consequences of internal wars in developing countries up to around 2000.

been found to result from World War Two in Austria and Germany (Ichino and Winter-Ebmer, 2004), child soldiering in Uganda by the Lord's Resistance Army (LRA) in the 1990s (Blattman and Annan, 2010), the Rwandan genocide against the Tutsis in 1994 (Akresh and de Walque, 2016), the Tajik Civil War in the 1990s (Shemyakina, 2011), and civil conflict with the Shining Path during the 1980s to the mid-1990s in Peru (Leon, 2012). Other studies reporting negative effects are related to the Cambodian genocide by the Khmer Rouge in the second half of the 1970s (Islam et al., 2017), landmine contamination from Cambodia's 30 years of war (1970 to 1998) (Merrouche, 2011), the 1969-1973 US bombing of Cambodia (Saing and Kazianga, 2020), the Boko Haram conflict in Nigeria in 2009-2016 (Bertoni et al., 2019), long-lasting civil conflicts in Myanmar (Yamada and Matsushima, 2020), the Israeli–Palestinian conflict during the Second Intifada (Brück, et al., 2019) and violence in Timor Leste in 1999 (Justino et al., 2013).

The second group examined labor market outcomes. Most of the literature found long-term loss of earnings. Negative effects were found 40 years later due to early life exposure to WWII in Austria and Germany (Ichino and Winter-Ebmer, 2004). Effects were also found following the civil war in Peru (Galdo, 2013) and political violence by terrorist groups in the same country (Leon, 2012). Blattman and Annan (2010) also

reported negative impacts from child soldiering in Uganda. In contrast, other studies found little effect on earnings from landmine contamination in Cambodia (Merrouche, 2011), the US bombing of Cambodia (Saing and Kazianga, 2020), and Hezbollah rocket attacks on Israel during the 2006 Lebanon War (Elster et al., 2017).

The third group examined economic outputs. The literature revealed a long-term negative effect on GDP 40 years after the end of WWII in Austria and Germany (Ichino and Winter-Ebmer, 2004), ETA (Euskadi Ta Askatasuna) terrorist activities in the Basque Country between 1968 and 1997 (Abadie and Gardeazabal, 2003), and 40 years after the US bombing of northern Laos during the Vietnam War (Yamada and Yamada, 2021).²

This study utilizes variations in regional and temporal exposure to the civil war in Tajikistan in the 1990s to reveal the long-term effects on a variety of outcomes twenty years after the end of the war. Among the large volume of related literature, we start with confirming Shemyakina (2011), who examined the immediate educational outcomes of

² Elster et al. (2017) found a decline in housing prices caused by Hezbollah rocket attacks in Israel. While beyond the scope of this paper, a large body of literature also examined health outcomes. Most of the papers found negative effects on population height resulting from conflict, such as the civil war in Burundi in the second half of the 1990s (Bundervoet, et al., 2009), the 1998-2000 Eritrean–Ethiopian war (Akresh et al., 2012), the 1967-1970 Nigerian Civil War (Akresh et al., 2012), the 2002-2007 armed conflict in Côte d'Ivoire (Minoiu and Shemyakina, 2012), and Cambodian genocide by the Khmer Rouge in the 1960s (Islam et al., 2017). An exception is Saing and Kazianga (2020), which found no adverse effects from the US bombing in Cambodia. Other papers examined health outcomes on birth weight due to violent crimes under the escalation of the Mexican Drug War since the late 2000s (Brown, 2018), fertility rates following the 1994 Rwandan genocide (Kraehnert et al., 2019), the U.S. bombing in Cambodia (Saing and Kazianga, 2020), psychological distress among child soldiers in Uganda (Blattman and Annan, 2010), and mental health resulting from early exposure to the Vietnam War (Singhal, 2019). In addition, Rohner et al. (2013) found a negative impact from civil conflict on social capital in Uganda.

the civil war in Tajikistan using the Tajik Living Standards Survey (TLSS) conducted right after the end of civil war in 1999 and 2003. Shemyakina showed that girls of school age during the conflict were more negatively affected in completing their mandatory schooling and school enrollment, while no effect was found for boys.

In order to contribute to the broader literature, we advance Shemyakina (2011) to uncover the long-term consequences on educational attainment resulting from exposure to conflict. We use a rich nationally representative household-level panel dataset collected in 2018 in Tajikistan, twenty years after the end of the civil war, which is merged with geographic information on the armed conflict. Moreover, we expand the analysis to outcomes other than educational attainment related to the labor market. In particular, we examine the effect of the civil war on international migration decisions, an area not well investigated in other publications but relevant to the country. Tajikistan is, to date, one of the most heavily remittance-dependent countries in the world (JICA-RI, 2020) and international migration started to expand after the end of the war.

We provide several new findings. First, we confirm a negative and significant effect on completing basic education for girls exposed to conflict in their school days, consistent with Shemyakina (2011). However, girls also attained a significantly higher educational level, resulting in a wider inequality of educational attainment in female students. Second,

we see adverse effects on employment status for males exposed to the conflicts in their primary school ages. Third, we also observe long-term effects in international migration status for those males under the prevalence of international migration in the country.

This paper is comprised of the following sections. Section 2 briefly describes the civil war in Tajikistan in the 1990s. Section 3 explains the dataset used in this study. Section 4 presents and discusses the estimation results. The final section provides a summary of our main findings and briefly discusses some implications.

2. Civil war in Tajikistan

Tajikistan gained its independence from the former Soviet Union on September 9, 1991, thereby becoming the *Republic of Tajikistan*.³ Prior to independence, the economy of the Tajik Soviet Socialist Republic was dominated by agriculture, particularly cotton. In addition, the economy had developed light industry (cotton ginning, silk, and carpet weaving), a food industry, and heavy industry in electricity, as well as mining and non-ferrous metal (aluminum and hydrometallurgical). However, the economy suffered from severe hardship in the 1980s and Tajikistan was the poorest among the former Soviet Union republics (Falkingham, 2000).

³ The Tajikistan Soviet Socialist Republic was renamed the Republic of Tajikistan on August 31, 1991 and was among the last republics of the Soviet Union to declare its independence.

After independence, for five years between 1992 and 1997, Tajikistan endured a violent internal war known as the *Tajik Civil War*. Fighting broke out on May 5, 1992 between the proponents of the new government and opposition forces. The new government supporters were led by President Rahmon Nabyev, elected in 1991 with the support of Russian border guards. The country was now dominated by two regional groupings. The Leninabadi region was a historical power during Soviet times that had provided many of the ruling elites, and those from the Khujand and Kulob regions occupied high posts in the Ministry of Internal Affairs. In contrast, the opposition forces consisted of regional groups from the Garm and Gorno-Badakhshan (Pamiris) regions and were led by liberal democratic reformers and Islamists (Nourzhanov, 2005).⁴

After many clashes, a compromise was made between the Leninabadi and the opposing forces to form a new coalition government in the capital. However, fighting continued to occur outside of the capital, and the Leninabadi-Kulobi Popular Front Forces gained power with the support of the Russian military and Uzbekistan. Finally, the coalition government in the capital collapsed and the Supreme Soviet (parliament), dominated by the Leninabadi-Kulobi faction, elected a new government under Emomali Rahmonov in December 1992.⁵ The Kulobi militias soundly defeated opposition forces.

⁴ Garm is located in the Rasht Valley area of central Tajikistan.

⁵ Rahmonov came from Kulob, not from the Leninabadi, and his power was military-based. He

The campaign against Garmis and Pamiris was concentrated in areas south of the capital and many Garmis and Pamiris were killed or fled to Afghanistan, where the opposition was reorganized under an umbrella group called the United Tajik Opposition (UTO).⁶

While the armed conflict peaked between 1992 and 1993, the civil war dragged for a further five years, finally ending on June 27, 1997, when the “Moscow Protocol” was signed by the warring parties. During the civil war, at least 50,000 men were killed, 20,000 women were widowed, and 55,000 children were orphaned (Falkingham 2000). While the majority of displaced people had settled back to their communities by 1995, at least 600,000 people remained internally displaced at the end of the war (Falkingham 2000).⁷

At the end of the civil war, Tajikistan was in a state of complete devastation, with huge human and structural damage – particularly in the southern part of the country where the main battlefields were located. In 1992, 80% of the country’s industry was destroyed, including 100% of industry in the south (Shemyakina, 2011). At the end of the war, most survivors lived at a subsistence level, and the resulting economic hardship motivated people to migrate abroad from the beginning of the 2000s.

became the 3rd president of Tajikistan in November 1994.

⁶ The violence was particularly concentrated in Qurghonteppa, home to many Garmis.

⁷ 1.2 million people were refugees inside and outside the country (United Nations, “Tajikistan: rising from the ashes of civil war”).

Given this development of the conflict, we focus on the long-term consequences of the civil war on education and labor market outcomes, including international migration. We provide new evidence on those outcomes so that policy makers in the affected countries are better informed regarding planning for conflict recovery.

3. Data description

We use two datasets in this study, which are merged using geographical information, household-level data and conflict data.

(1) Household-level data

We use a nationally representative survey conducted in 2018. The base of the survey is the “Tajikistan Labor, Skills and Migration Survey,” which is the Tajikistan part of “the Central Asia Longitudinal Inclusive Society Survey (CALISS).” The survey was conducted between June and April 2013 by the World Bank and the German Federal Enterprise for International Cooperation (GIZ).⁸ The households in the sample are derived from households surveyed in the 2009 Tajikistan Living Standard Survey (TLSS), which was stratified based on oblasts (regions) and urban/rural areas in each oblast.⁹ A

⁸ The CALISS survey in 2013 was conducted in Uzbekistan, Kyrgyzstan and Tajikistan.

⁹ There are nine strata: Dushanbe Urban, GBAO (urban and rural), Sughd (urban and rural), Khalton (urban and rural) and RRS (urban and rural). The urban RRS (Districts of Republican Subordination) was oversampled to ensure a sufficient number of observations to compare results across regions.

hundred primary sampling units (PSU) were selected with a probability proportional to the number of households using the census of 2011, and 20 households in each of the PSUs were selected at the second stage. The most knowledgeable person responded to the questionnaire covering a wide variety of variables: household members with their demographics and educational attainment, information on migration and remittances, household financial resources including assets and housing.¹⁰ The sample size of the baseline survey is 2,000 households with 13,437 individuals that are representative at the oblast and urban/rural level.

In this study, we use the survey conducted in 2018 to track the Tajikistan sample of the CALISS from 2013, since we can investigate the consequences of the civil conflicts over the longer run. The 2018 survey was implemented by the Japan International Cooperation Agency (JICA). A major part of the questionnaire consisted of the replication of CALISS in 2013, with some additions specifically focused on migration and remittances. Among the 2,000 households surveyed in 2013, 1,716 households (86%) responded to the 2018 survey, and thus the attrition rate is 14%. In addition, 284 households from the sample of the 2013 survey were replaced with new ones.¹¹ The

¹⁰ In addition, 1,300 households residing in Dushanbe (Dushanbe booster) were surveyed. The total sample size of the CALISS 2013 survey is 3,300 households with 20,142 individuals.

¹¹ Most of the households that were replaced were urban households that had moved.

sample size of the 2018 survey is therefore 2,000 households with 14,940 individuals.

Among these, we will use a sample comprising two groups for this study. The first is the “Born 1976-86” cohort consisting of those aged 7 to 15 years during the civil war (we call this cohort the “Born 1976-86” cohort or “war exposed cohort”), while the other consists of individuals born between 1966 and 1975 who were supposed to complete their basic education by the beginning of the conflict. Note that there has been no institutional change in the nine years of basic education for all cohorts born since 1966.¹²

(2) Conflict data

The conflict data in this study comes from the “UCDP Georeferenced Event Dataset (UCDP GED),” which is made available by the Uppsala Conflict Data Program, Department of Peace and Conflict Research, Uppsala University (Sundberg and Melander, 2013).¹³ The dataset provides comprehensive data on organized violence in the post-1989 period at a geographically and temporally disaggregated level in a consistent way. The dataset focuses on the effect of armed violence on deaths across time and space. The

¹² There may be a systematic difference in higher educational attainment between cohorts born before 1973 who reached the age required to enter university before the collapse of the former Soviet Union. We examined this group to detect any differences in our analyses between cohorts born before and after 1973 but we did not find any significant difference.

¹³ We use GED 20.1, which covers the period between 1989 and 2019. The code book is available at <https://ucdp.uu.se/downloads/ged/ged201.pdf>. The sources of the UCDP GED data contain (1) global newswire reporting, (2) global monitoring and translation of local news performed by the BBC and (3) secondary sources such as local media, NGO and IGO reports, field reports, books etc.

basic unit of analysis for the dataset is the “event,” which is defined as an individual incident (phenomenon) of lethal violence occurring at a given time (the most detailed unit is a day) and place (the most detailed unit is an individual village/town).¹⁴ The dataset is fully geocoded, enabling us to merge it with the household data containing information on PSU.¹⁵

Our measure of “exposure to conflicts” is based on the locations reported to have experienced casualties during the civil war. In this study, an individual was exposed to conflict if any casualties due to the civil war were reported within five kilometers from the centroid of a PSU where he or she resided in a year.¹⁶ Since armed conflict was mainly concentrated in 1992 and 1993, we define exposure to conflict in each year for each conflict, not throughout the whole five-year civil war period. In other words, if a conflict is recognized, exposure to the event is limited to the year in which it was recorded.

¹⁴ The strict definition of an event is an incident where armed force was used by an organized actor against another organized actor, or against civilians, resulting in at least 1 direct death at a specific location and a specific date.

¹⁵ Shemyakina (2011) used three sets of conflict data; (1) household reports of damage to their own dwellings available only in the 1999 survey, (2) regional level (PSU or raion) data in which any household reported damages to their dwelling and (3) raion-level data indicating high levels of conflict and insurgent activities, violence, and atrocities using a variety of sources. Since we cannot identify PSU in the 1999 survey, we cannot link the information to our household survey and therefore use the first and second conflict data. Conceptually, our measure is similar to the third one.

¹⁶ We defined an exposure to conflicts in different distances from the centroid of a PSU (e.g., 3 kilometers, 5 kilometers and 10 kilometers) and found that our results for basic education were the closest to the findings of Shemyakina (2011) if we define the exposure to conflicts within 5 kilometers from the centroid of a PSU. We also defined other measures of exposure such as the number of deaths and the number of conflicts. However, the information on the numbers is based on newspapers and reports including speculation, and thus may be incorrect or suffer from measurement errors.

For example, an individual aged six in 1992 lived in a place where any casualties were reported within five kilometers from the centroid of his/her PSU in 1992 and 1993. In this case, the individual was exposed to conflict when he/she was six and seven old but not exposed at other ages (years).

Figure 1 illustrates the geographical relationship between the location of the armed conflict and our survey sample. The pink dots show the centroids of the PSUs of the survey sampling, while the blue diamonds represent the whereabouts of the armed conflicts during the Tajik Civil War. Among the five regions in Tajikistan, most of the violent events took place in Dushanbe, Districts of Republican Subordination, and Khatlon Region. Another two regions, the Soghd Region and Gorno-Badakhshan Autonomous Region (GBAO), were less affected by the armed conflict. However, even within each region, the proximity to the location of armed conflict varies across the PSUs of the survey.

Table 1 reports the summary statistics of the variables used in this study. We present these statistics by sex. The proportion of individuals exposed to casualties within five kilometers is 28% for females and 26% for males, while for individuals in the “Born 1976-86” cohort, the proportion is about 62%. Turning to the covariates in the regression, the share of Uzbek ethnicity is less than 20%, while other ethnicities are negligible. The

average years of education of the head of household are 5.8 years for females and 5.5 years for males. The proportion of heads of households who were born before 1966 exceeds half.

The remaining rows report the summary statistics of the outcome variables we investigate. Looking at educational attainment, the share of individuals who completed basic education is more than 90% for both sexes, with more than 60% of individuals completing secondary education. We define the completion of secondary education as those whose highest diploma is secondary general (grades 9 to 11), secondary special or secondary technical. The share of individuals who completed tertiary education is about 10% for females and 19% for males. The completion of tertiary education is defined as obtaining a bachelor, master, or Ph.D. degree. In terms of employment status, the proportion of individuals without a job in the past twelve months is 4% for females and 9% for males. The share of those receiving a cash wage is 23% for females and 40% for males. By sector, the share of the agricultural sector is less than 10% for both sexes while that of the construction sector is negligible for females and a quarter for males.

Lastly, we see that the proportion of current international migrants is only 5% for females but 28% for males, demonstrating that international migration is common in the country. The remaining two variables are related to past migration experiences. The

average number of experiences of international migration since 1998 is 0.1 for females and 0.9 for males, suggesting that most males have experienced international migration since the war's end. The migrations per year figure, which divides number of experiences of migration by year to adjust for age differences in the cohort and average migrations per year, is ten times larger for males than females, showing that international migration is very prevalent for males.

Before commencing the empirical estimation, we make two remarks on the possibility that selection into violence or displacement may drive our results in a biased way and is a concern in the estimation. More specifically, some household characteristics prior to the civil war might be correlated with both exposure (proximity) to violent conflict during the civil war and the outcomes after the war. This endogeneity will bias the results. Furthermore, since the civil war caused a scale of domestic displacement, estimating the impact of the armed conflict based on the current (2018) residence may bias the distribution of the households in the sample because more resilient households are more likely to continue staying in the affected area.

First, we examine selection into violence: specific groups of households were more likely to be targeted and damaged by attacks. We address this issue by examining the relationship between “exposure to conflict” and two variables that were predetermined

before the civil war: educational attainment by head of household and ethnicity.¹⁷ We regress an indicator to take one for households that were exposed to the conflict (they lived in a PSU where civil war casualties were reported within 5km of the PSU centroid) and zero otherwise. Column (1) of Table 2 confirms that exposure to conflict is not significantly associated with predetermined variables prior to the civil war if we control for district fixed effect, suggesting that households in our data are exempt from selection into violence.

Second, regarding displacement, we confirm that 82.8% of households have no members who moved during or after the civil war and 17.7% of households have some members who have moved, either voluntarily or involuntarily, since the war started, based on the 2018 survey.¹⁸ In order to detect whether the armed conflict affected displacement after the civil war, we regress an indicator to take 1 for domestically displaced households (“movers”) and 0 otherwise on exposure to conflict conditional on variables used for selection into violence. Column (2) of Table 2 shows that displacement of households is not significantly associated with exposure to the conflict, suggesting that households in our data are exempt from selection into displacement. However, we see some coefficients

¹⁷ Shemyakina (2011) argued that there is no such selection into violence during the civil war in Tajikistan by confirming that damage to household dwellings was not associated with any pre-war household characteristics or post-war socio-demographic characteristics.

¹⁸ At the individual level, 94.3% of the total individuals in the 2018 survey were not displaced from their original places during or after the civil war.

on the covariates are statistically significant. Thus, we provide our results using those covariates in the estimation.

4. Estimation results

In the estimation results, we look first at the long-term consequences on educational attainment of the civil war. During the civil war, Tajikistan mandated nine required grades of schooling for children 7 to 15 years old as a basic nine-year education and provided schooling up to grade eleven free of charge. As discussed in the introduction, previous studies reached a consensus on the negative effects of civil wars on educational attainment through reduction of financial resources, need to attend a different school or interruptions to education, targets of attacks by terrorists, and death of parents. Shemyakina (2011) found that girls in Tajikistan who were of school age for basic education and exposed to conflict were less likely to complete their mandatory schooling or to be enrolled than girls at the same age but less exposed.

We start with replication of the results by Shemyakina (2011) to examine the effect of the armed conflict on completion of basic education by comparing individuals who should have completed their mandatory schooling before the war and individuals who were of school age during the war. We estimate the difference-in-difference specification.

$$y_{ijt} = \alpha_j + Exposure_i + \beta(War_j * Exposure_i) + \gamma X_{ijt} + \epsilon_{ijt} \quad (1)$$

where, y_{ijt} is an indicator to take 1 if individual i born in year t in location j has completed nine grades of basic education and 0 otherwise. α_j is a fixed effect for location j (district) during schooling. $Exposure_i$ is an indicator to take 1 if individual i was in the cohort exposed to conflict in their school ages of basic education – in other words, they were 7 – 15 years old when the war started in 1992 and completion of their basic education was affected by the war. War_j indicates whether any casualties by civil war were reported within 5km of the PSU centroid in location j .¹⁹ X_{ijt} is a vector of covariates predetermined prior to the conflict. ϵ_{ijt} is a well-behaved error term.

Following Shemyakina (2011), we set up the treatment group and the control group as follows. The treatment group consists of individuals born between 1976 and 1986 who lived in the regions affected by conflict, and the effect of the conflict on the group is captured by the term $War_j * Exposure_i$ in the equation above. The control group consists of two groups. One is a group of individuals born between 1976 and 1986 and

¹⁹ Some papers that treat armed conflict as endogenous and address it by using instrumental variables. Galdo (2013) instruments a conflict with the incidence of conflict in nearby districts. Rohner et al. (2013) instrument the violence in Ugandan county by the county's distance from Sudan.

not affected by the conflict, and the other comprises those born between 1966 and 1975 who were supposed to complete their nine grades by the beginning of the conflict and thus were not exposed to the conflict during their mandatory schooling years.²⁰

Table 3 reports the estimation results. Column (1) shows the coefficient on the interaction term between the “Born 1976-86” cohort and exposure to conflict is not statistically significant for males, while Column (2) reports that the coefficient is negative and significant for females, suggesting that girls who were living in affected areas during their school ages are less likely to complete the mandatory nine grades by 5.5%. The size of the magnitude is comparable with the negative 7.3% reported by Shemyakina (2011), despite the use of different household and conflict data. The results are not altered if we conduct the same regression on the sub-sample by removing households who changed their residential location after the civil war (Columns (3) and (4)).

Now, we turn to examine the impact of higher education on higher education, which has not been addressed. We employ the same specification to examine the impact at higher education levels. Table 4 shows the results when we take the completion of secondary and tertiary education as y_{ijt} in the estimation equation (1). Column (1) reports that the

²⁰ Individuals born before 1966 were not included, since they were not required to complete nine grades of education. Shemyakina (2011) also excludes individuals born in 1974 and 1975 who can belong to either treatment or control groups. We cannot replicate the results on school enrollment since the 2018 survey does not contain information on current school enrollment for individuals affected by the conflict but on their final educational attainment.

coefficient on the “Born 1976-86” cohort and exposure to conflict are positive but not statistically significant for males, suggesting that males who were exposed to the war in their basic education ages were not significantly disadvantaged in completing secondary education. Column (2) shows the same result for females exposed to the war in their basic education ages – they were not significantly disadvantaged in completing secondary education. Turning to tertiary education, Column (3) shows that the coefficient on the war-exposed cohort and exposure to conflict is positive but not significant, indicating that males who were exposed to the war in their basic education ages were not significantly disadvantaged in completing tertiary education. In contrast, Column (4) reports that the coefficient on the interaction term is positive and significant. The result shows that females in the war-exposed cohort who lived in affected areas are more likely to complete tertiary education.

This may be counterintuitive since they are also significantly less likely to complete basic education. Figure 2 illustrates the distribution of years of schooling for the “Born 1976-86” cohort separately by sex. The upper panel shows that the distribution for females has fatter right and left tails (thicker lowest and highest attainments), but this is not the case with the distribution for males. A potential mechanism that drives this result is the improved accessibility to universities in urban areas after the civil war. Out of 38

universities in Tajikistan, 13 universities were established after the end of the Civil war.²¹

Most of these new universities are located in urban areas such as Dushanbe, Khujand, and Kulob. If proximity to universities is more strongly associated with attaining tertiary education for women, enhanced university provision in war-affected urban areas after the end of the war may explain the result.

Now, we move to examine labor market outcomes of the civil war. Table 5 reports the coefficient on the interaction terms between the “Born 1976-86” cohort and exposure to casualties within five kilometers. For males, the coefficient is negative and significant in receiving cash wages and construction workers, showing that males exposed to the conflict in their basic education age are less likely to have a waged job and work in the construction sector. However, the latter coefficient becomes insignificant when we exclude movers from the sample. The coefficient is not significant in unemployment or working in the agricultural sector. For females, we see a negative and significant coefficient on working in the agricultural sector, suggesting that exposure to the war reduces the chance to work in agriculture for women born in the 1976-86 cohort.

Lastly, we examine the impact of the civil war on international migration decisions.

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https://tg.wikipedia.org/wiki/%D0%A4%D0%B5%D2%B3%D1%80%D0%B8%D1%81%D1%82%D0%B8_%D0%B4%D0%BE%D0%BD%D0%B8%D1%88%D0%B3%D0%BE%D2%B3%D2%B3%D0%BE_%D0%B4%D0%B0%D1%80_%D0%A2%D0%BE%D2%B7%D0%B8%D0%BA%D0%B8%D1%81%D1%82%D0%BE%D0%BD

Table 6 reports that the coefficient on the interaction term of our interest is negative and significant in current international migration, indicating that males affected by the conflict in their basic education age are less likely to migrate internationally. The coefficient is not significant for females. This pattern of the coefficients is not altered if we confine the sample excluding movers. In addition, we investigate the impact of international migration experiences in the past due to the civil war. We measure the migration experience by the number of times of international migration since 1998 and migration per year. We see that the coefficient of our interest is negative and statistically significant in the number of times of international migration, showing that males exposed to the conflict in their basic education age are less likely to migrate. These results show that affected males are less likely to migrate internationally, not only currently but also cumulatively under the prevalence of international migration in the country.

5. Conclusion

This study utilizes variations in regional and temporal exposure to armed conflict to examine long-term consequences on a variety of outcomes twenty years after the end of the Tajikistan civil war. We provide several new findings. First, we confirm a negative and significant effect on completing basic education for girls exposed to the war in their

school ages. They also attained a significantly higher educational level, resulting in a wider inequality of educational attainment for females affected by the conflict. Second, we see adverse effects on employment status for males exposed to armed conflicts during their primary school ages. Third, we also observe long-term effects in international migration status for those males within the prevalence of international migration for the country.

This study reveals that, in several aspects, the impact of the armed conflict has lasted for twenty years after the end of the war. In particular, we show an impact of the civil war on international migration, an area that has not been well addressed by previous literature. We report that the effect is observed in international migration, which is very common in Tajikistan and provides a significant alternative livelihood option for males. Future studies should address the transmission mechanism of the impact in a more nuanced way.

References

- Abadie, A., Gardeazabal, J., 2003. The economic costs of conflict: A case study of the Basque Country. *American Economic Review* 93(1), 113-132.
- Akresh, R., Bhalotra, S., Leone, M., Osili, U., 2012. War and stature: Growing up during the Nigerian Civil War. *American Economic Review* 102(3), 273-77.
- Akresh, R., de Walque, D., 2016. Armed conflict and schooling: Evidence from the 1994 Rwandan Genocide. World Bank Policy Research Working Paper No. 4606.
- Akresh, R., Lucchetti, L., Thirumurthy, H., 2012. Wars and child health: Evidence from the Eritrean–Ethiopian conflict. *Journal of Development Economics* 99(2), 330-340.
- Bertoni, Eleonora, Maio, M., Molini, V., Nisticò, R., 2019. Education is forbidden: The effect of the Boko Haram conflict on education in North-East Nigeria. *Journal of Development Economics* 141, 102249.
- Blattman, C., Annan, J., 2010, The consequences of child soldiering. *Review of Economics and Statistics* 92(4), 882–898.
- Brown, R. 2018., The Mexican drug war and early-life health: The impact of violent crime on birth outcomes. *Demography* 55 (1), 319–40.
- Brück, T., Maio, M., Miaari, S., 2019. Learning the hard way: The effect of violent

- conflict on student academic achievement. *Journal of the European Economic Association* 17(5), 1502–1537.
- Buckland, P., 2005. *Reshaping the future: Education and post-conflict reconstruction*. World Bank, Washington, DC.
- Bundervoet, T., Verwimp, P., Akresh, R., 2009. Health and civil war in rural Burundi. *Journal of Human Resources* 44(2), 536-563.
- Elster, Y., Zussman, A., Zussman, N., 2017. Rockets: The housing market effects of a credible terrorist threat. *Journal of Urban Economics* 99, 136–47.
- Falkingham, J., 2000. *Women and gender relations in Tajikistan*. Country Briefing Paper. Asian Development Bank Programs.
- Galdo, J., 2013. The long-run labor-market consequences of civil war: Evidence from the Shining Path in Peru. *Economic Development and Cultural Change* 61(4), 789-823.
- Ichino, A., Winter-Ebmer, R., 2004. The long-run educational cost of World War II. *Journal of Labor Economics* 22(1), 57-86.
- Islam, A., Ouch, C., Smyth, R., Wang, L., 2017. The intergenerational effect of Cambodia's genocide on children's education and health. *Population and Development Review* 43(2), 331–53.
- JICA Ogata Sadako Research Institute for Peace and Development (JICA-RI), 2020.

Migration, living conditions, and skills: A panel study - Tajikistan, 2018

https://www.jica.go.jp/jica-ri/ja/publication/booksandreports/175nbg000019cex3-att/report_20200604.pdf

Justino, P., Leone, M., Salardi, P., 2013. Short- and long-term impact of violence on education: The case of Timor Leste. *The World Bank Economic Review* 28(2), 320–353.

Kraehnert, K., Brück, T., Di Maio, M., Nisticò, R., 2019. The effects of conflict on fertility: Evidence from the genocide in Rwanda. *Demography* 56(3), 935–68.

Leon, G., 2012. Civil conflict and human capital accumulation: The long-term effects of political violence in Perú. *Journal of Human Resources* 47(4), 991-1022.

Merrouche, O., 2011. The long term educational cost of war: Evidence from landmine contamination in Cambodia. *Journal of Development Studies* 47(3), 399-416.

Minoiu, C., Shemyakina, O., 2012. Child health and conflict in Côte d'Ivoire. *American Economic Review* 102(3), 294-299.

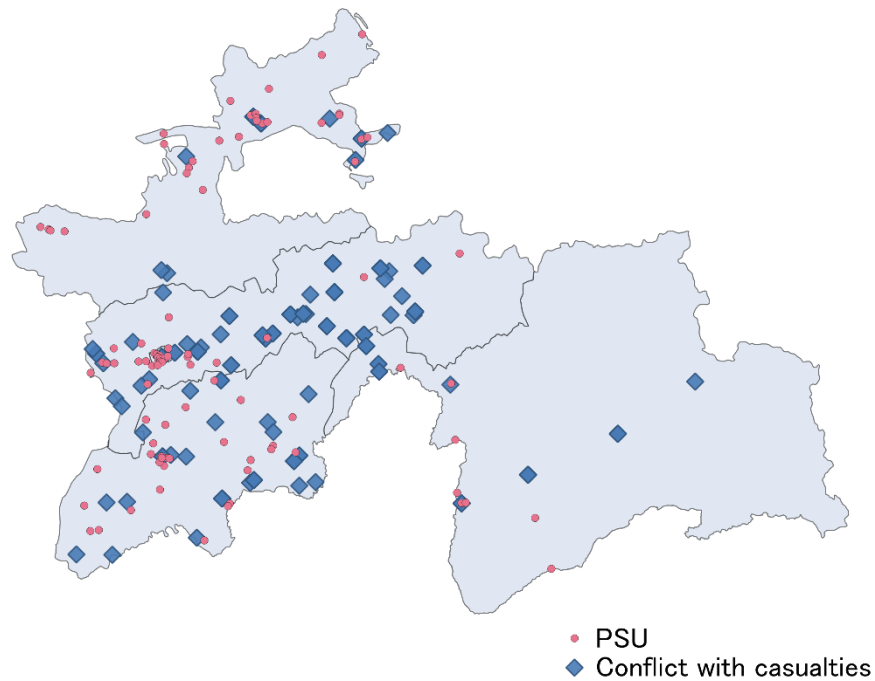
Nourzhanov, K., 2005. Saviours of the nation or robber barons? Warlord politics in Tajikistan. *Central Asian Survey* 24(2), 109-130.

Rohner, D., Thoenig, M., Zilibotti, F., 2013. Seeds of distrust: Conflict in Uganda, *Journal of Economic Growth* 18(3), 217–52.

- Saing, C., Kazianga, H., 2020. The long-term impacts of violent conflicts on human capital: US bombing and, education, earnings, health, fertility and marriage in Cambodia. *Journal of Development Studies* 56(5), 874–89.
- Shemyakina, O., 2011. The effect of armed conflict on accumulation of schooling: Results from Tajikistan. *Journal of Development Economics* 95(2), 186-200.
- Singhal, Saurabh, 2019. Early life shocks and mental health: The long-term effect of war in Vietnam. *Journal of Development Economics* 141, 102244.
- Stewart, F., Huang, C., Wang, M., 2001. Internal wars in developing countries: an empirical overview of economic and social consequences. In: Stewart, F., Fitzgerald, V. (Eds.), *War and Underdevelopment*. Oxford University Press, Oxford.
- Sundberg, R., Melander, E. 2013. Introducing the UCDP georeferenced event dataset. *Journal of Peace Research* 50(4), 523-532.
- Verwimp, P., Justino, P., Brück, T., 2019. The microeconomics of violent conflict. *Journal of Development Economics* 141, 102297.
- Yamada, Hiroyuki, Matsushima, Midori, 2020. Impacts of long-lasting civil conflicts on education: Evidence from the 2014 Census of Myanmar. *Journal of Asian Economics* 71, 101250.

Yamada, Takahiro, Yamada, Hiroyuki, 2021. The long-term causal effect of U.S. bombing missions on economic development: Evidence from the Ho Chi Minh Trail and Xieng Khouang Province in Lao P.D.R. *Journal of Development Economics* 150, 102611.

Figure 1 Map of Tajikistan and the conflict areas



(Note) The base map is obtained from DIVA-GIS, an open-source GIS data distribution for administrative boundaries (URL: <http://www.diva-gis.org/gdata>). The pink dots show the centroids of the PSUs of the survey sampling, while the blue diamonds represent the whereabouts of the conflict-related violence during the Tajikistan Civil War.

Figure 2 Distribution of educational attainment

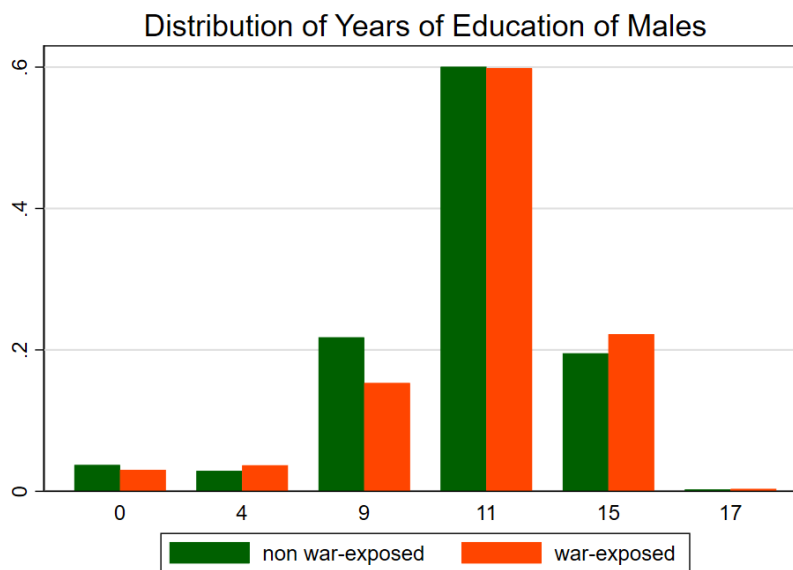
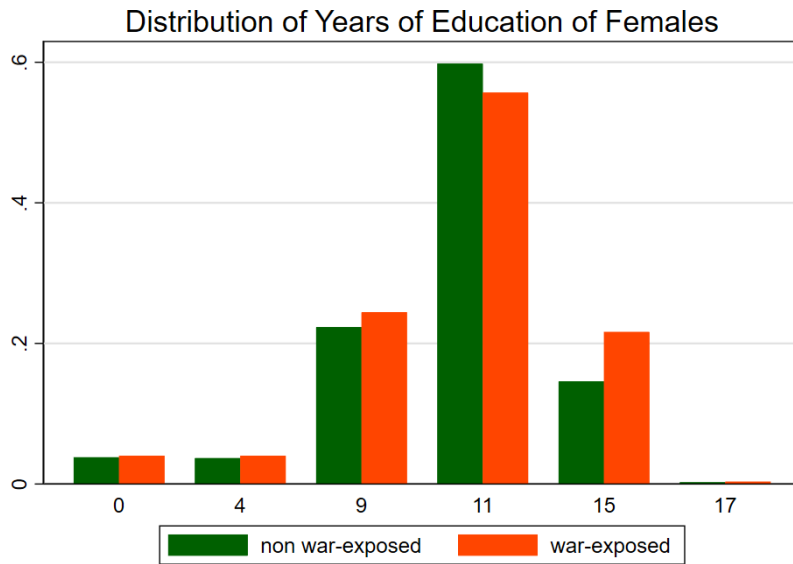


Table 1 Summary statistics

VARIABLES	Male (N=1378)		Female (N=1455)	
	(1)	(2)	(3)	(4)
	mean	sd	mean	sd
Conflict within 5km	0.255	0.436	0.282	0.450
“Born 1976-86” cohort (7 to 15 years old during the war)	0.622	0.485	0.623	0.485
<Covariates>				
Uzbek ethnicity	0.189	0.391	0.199	0.399
Other ethnicity	0.0218	0.146	0.0227	0.149
Head's years of education	5.490	5.720	5.757	5.771
Head was born before 1966	0.530	0.499	0.546	0.498
<Outcome Variables>				
(1) Education level				
Completed basic education	0.950	0.218	0.927	0.260
Completed secondary education	0.657	0.475	0.608	0.488
Completed tertiary education	0.190	0.393	0.0997	0.300
(2) Employment status				
Did not work in past 12 months	0.0864	0.281	0.0364	0.187
Receive cash wage	0.403	0.491	0.228	0.420
Work in agricultural sector	0.0951	0.293	0.0845	0.278
Work in construction sector	0.252	0.434	0.00137	0.0371
(3) Migration status				
Current international Migrant	0.282	0.450	0.0481	0.214
Times of migration after 1998	0.873	1.529	0.0984	0.472
Migration per year	0.0243	0.0412	0.00248	0.0116

Table 2 Selection into violence and migration

VARIABLES	(1) Casualties within 5km	(2) Domestic displacement
Casualties within 5km		0.0616 (0.0580)
Uzbek ethnicity	-0.0230 (0.0912)	-0.116*** (0.0400)
Other ethnicity	-0.0418 (0.0923)	-0.202* (0.102)
Head's years of education	0.000395 (0.00399)	0.00356 (0.00507)
Constant	0.468*** (0.0969)	0.284*** (0.0804)
Observations	1,179	1,179
R-squared	0.639	0.144
District fixed effect	yes	yes

(Note) Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3 Effect on completion of basic education

Variables	(1)	(2)	(3)	(4)
	All Sample		Movers excluded	
	Male	Female	Male	Female
	Completion of basic education			
Born1976-86 X Conflict in 5km	0.00919 (0.0207)	-0.0549** (0.0254)	-0.0110 (0.0220)	-0.0557* (0.0286)
Uzbek ethnicity (dummy)	0.0263 (0.0262)	0.0608** (0.0286)	0.0427 (0.0299)	0.0760** (0.0359)
Other ethnicity (dummy)	-0.275 (0.167)	0.126*** (0.0442)	-0.344* (0.195)	0.151** (0.0605)
Head's years of education	0.0115*** (0.00359)	0.0141*** (0.00475)	0.0117*** (0.00387)	0.0169*** (0.00521)
Head was born before 1966 (dummy)	-0.131*** (0.0465)	-0.181*** (0.0548)	-0.122** (0.0469)	-0.215*** (0.0600)
Constant	0.972*** (0.0160)	1.027*** (0.0136)	0.970*** (0.0191)	1.018*** (0.0161)
Observations	1,378	1,455	1,070	1,159
R-squared	0.166	0.172	0.203	0.194
District fixed effect	yes	yes	yes	yes
Cohort fixed effect	yes	yes	yes	yes

(Note) Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4 Effect on completion of secondary and tertiary education

VARIABLES	(1) All Sample		(2) All Sample		(3) Sample excluding movers		(4) Sample excluding movers	
	Male	Female	Male	Female	Male	Female	Male	Female
	Completion of Secondary Education		Completion of Tertiary Education		Completion of Secondary Education		Completion of Tertiary Education	
Born1976-86 X Conflict in 5km	0.0342 (0.0425)	0.0440 (0.0506)	0.0757 (0.0579)	0.0633* (0.0326)	0.0210 (0.0512)	0.0685 (0.0574)	0.111* (0.0665)	0.0953** (0.0438)
Uzbek ethnicity (dummy)	0.0544 (0.0513)	0.107** (0.0412)	-0.0342 (0.0408)	0.0137 (0.0229)	0.0576 (0.0617)	0.101** (0.0485)	0.00129 (0.0496)	-0.00799 (0.0260)
Other ethnicity (dummy)	-0.320** (0.149)	-0.0597 (0.122)	-0.130 (0.106)	0.0474 (0.102)	-0.411*** (0.154)	0.00752 (0.160)	-0.102 (0.118)	0.0402 (0.114)
Head's years of education	0.0261*** (0.00453)	0.0236*** (0.00565)	0.0300*** (0.00543)	0.0109*** (0.00385)	0.0250*** (0.00507)	0.0276*** (0.00579)	0.0308*** (0.00626)	0.0132*** (0.00417)
Head was born before 1966 (dummy)	-0.282*** (0.0538)	-0.212*** (0.0688)	-0.276*** (0.0621)	-0.111*** (0.0392)	-0.262*** (0.0580)	-0.258*** (0.0704)	-0.269*** (0.0694)	-0.128*** (0.0419)
Constant	0.918*** (0.0337)	0.834*** (0.0479)	0.243*** (0.0428)	0.0994*** (0.0212)	0.924*** (0.0371)	0.846*** (0.0492)	0.226*** (0.0507)	0.0760** (0.0300)
Observations	1,378	1,455	1,378	1,455	1,070	1,159	1,070	1,159
R-squared	0.181	0.198	0.137	0.185	0.216	0.213	0.140	0.221
District fixed effect	yes	yes	yes	yes	yes	yes	yes	yes
Cohort fixed effect	yes	yes	yes	yes	yes	yes	yes	yes

(Note) Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5 Effect on labor market outcomes

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Male	Female	Male	Female	Male	Female	Male	Female
	Did not work in		Receiving cash wage		Work in		Work in	
	past 12 months				Agricultural Sector		Construction Sector	
All Sample								
Born1976-86 X Conflict in 5km	0.0141	-0.00151	-0.0937**	-0.0480	0.0337	-0.0472*	-0.0794*	-0.00133
	(0.0359)	(0.0189)	(0.0468)	(0.0384)	(0.0395)	(0.0283)	(0.0433)	(0.000829)
Sample excluding movers								
Born1976-86 X Conflict in 5km	-0.0243	0.00867	-0.0855*	-0.0556	0.0344	-0.0540	-0.0655	-0.00155
	(0.0426)	(0.0228)	(0.0512)	(0.0562)	(0.0424)	(0.0368)	(0.0461)	(0.000964)

(Note) Standard errors in parentheses are clustered at the level of PSU. *** p<0.01, ** p<0.05, * p<0.1

All regressions include the district fixed effect and the cohort fixed effect and control for the covariates (Uzbek ethnicity dummy, other ethnicity dummy, head's years of education and dummy for head who was born before 1966.

The sample size is 1,378 observations for males and 1,455 observations for females in all sample and 1,070 observations for males and 1,159 observations for females in the sample excluding movers.

Table 6 Effect on international migration

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Male	Female	Male	Female	Male	Female
	Current international Migrant		Times of international migration since 1998		International migration per year	
All Sample						
Born1976-86 X Conflict in 5km	-0.113*	0.0134	-0.425**	-0.0581	-0.0106*	-0.00125
	(0.0577)	(0.0259)	(0.208)	(0.0611)	(0.00617)	(0.00148)
Sample excluding movers						
Born1976-86 X Conflict in 5km	-0.117*	-0.0117	-0.502**	-0.108	-0.0117	-0.00252
	(0.0682)	(0.0312)	(0.249)	(0.0755)	(0.00726)	(0.00188)

(Note) Standard errors in parentheses are clustered at the level of PSU. *** p<0.01, ** p<0.05, * p<0.1

All regressions include the district fixed effect and the cohort fixed effect and control for the covariates (Uzbek ethnicity dummy, other ethnicity dummy, head's years of education and dummy for head who was born before 1966.

In all sample analysis, the male regressions use 1,378 observations and the female regressions use 1,455 observations.