The Legacies of war for Ukraine

SUMMARY

This article reviews the literature on the multifaceted consequences of historical conflict. We revisit three key topics, which are especially relevant for the current Ukrainian context. (1) The negative long-term impact of bombing campaigns and political repression against civilians. (2) The interplay between forced migration, refugees and war. (3) The role of gender and war, with a special focus on sex ratios and conflict-related sexual violence. We conclude with an empirical investigation of the Russian war against Ukraine, including aforementioned historical determinants such as ethnic populations, historical political repression and voting outcomes.

JEL codes: D74, N10, O10

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1. INTRODUCTION

Given the current geopolitical and security situation in Ukraine, in this article, we revisit the evidence on the legacies of historical conflict. It is an attempt to gather lessons from history that can help for a post-war scenario. We focus on three broad topics which are both relevant in the academic literature and for the current Russian war against Ukraine. First, we look at the aftereffects of bombing campaigns and political violence against civilians. We then analyse the interplay between forced migration and war.

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Next, we examine the role of gender, and in particular sex ratios and war, concluding with an inquiry of conflict-related sexual violence. We draw parallels from this academic literature to the Ukrainian context and proceed with an empirical analysis of the current war, starting with some stylized facts. We examine both modern conflict dynamics, as well as historical determinants highlighted in the current conflict literature. First, we document an overall decline of attacks and describe regional patterns of violence. In our empirical analysis, we find a negative correlation between recent political participation and modern attacks. We also find a strong positive correlation between the historical presence of ethnic Russians and current violent events in the war, as well as a negative one between modern violence and Holodomor famine deaths (an extreme form of repression), both within Ukraine. We conclude the piece with some policy lessons that could inform the conflict resolution process. Since our focus is on empirical papers, we direct the interested reader to other recent theoretical surveys such as Kimbrough et al. (2020), Kimbrough and Sheremeta (2019) and Verwimp et al. (2019).

2. LONG-TERM IMPACT OF BOMBING CAMPAIGNS AND POLITICAL VIOLENCE

2.1. Bombing campaigns and economic development

The evidence on the destructive nature of war in the short run is hard to overemphasize (Blattman and Miguel, 2010; Bauer et al., 2016; Ray and Esteban, 2017), especially when it involves military operations and bombing campaigns by international actors (Kocher et al., 2011). Yet, the economic consequences of these wars in the long-run have proven more elusive to assess empirically. A recent paper by the European Bank for Reconstruction and Development (EBRD) shows the large negative economic costs of war using a synthetic control method, in a panel of countries (Chupilkin and Zsoka, 2022). Several studies, stressing postwar recovery, have found no long-lasting economic impacts after the bombings in Japan, Germany and Vietnam (Davis and Weinstein, 2002; Brakman et al., 2004; Miguel and Roland, 2011; Vonyó, 2018). Perhaps one way to understand these results is that physical capital can be rebuilt, while human capital might take longer to replendish (Waldinger, 2010), as examined later. In the very long term, historian Charles Tilly postulated that war made the state, and that states made war, by fostering fiscal capacity (see Gennaioli and Voth, 2015; Dincecco and Onorato, 2018).

A series of papers have recently revisited the existing evidence on the long-term impacts of bombing campaigns with new data, econometric tools and in different contexts. We acknowledge that not all of the studies would apply to Ukraine directly, but we first provide an overview of a well-developed literature in economics, to then discuss more directly the role of Unexploded Ordnance (UXO) contamination in Ukraine. For Vietnam, Dell and Querubin (2018) show that US bombing reduced the collection of local taxes, led to more anti-American sentiment and hindered access to primary schools, using both an instrumental variables (IVs) strategy and a spatial regression discontinuity

design (RDD) based on military strategies. Redding and Sturm (2016) and Dericks and Koster (2018) use the blitz of London during World War II to study spatial sorting, neighbourhood effects and agglomeration which are all key to understand urban economic growth. Similarly, Adena et al. (2020) find that allied bombing and propaganda undermined German morale during Second World War (WWII), exploiting exogenous variation in weather conditions. For that same conflict, Harada et al. (2020) show that neighbourhoods in Tokyo more affected by the air raids have lower social capital today. Bombing appears a first-order topic in the conflict literature as well as a relevant element for the Ukrainian context, especially as Russia has increased the use of missiles and precision bombings, while Ukraine gains access to the Patriot missile system (Courtney McBride, 2022).[1]

Building on this literature, Riaño and Valencia-Caicedo (2020) evaluate the enduring effects of the US government's 'Secret War' in Laos (1964–75). As a result of one of the most intensive aerial bombing campaigns in human history, Laos is now severely contaminated with UXO, which has impaired Laotians' health, education and migration choices. These factors have in turn hindered the structural transformation and economic growth of the country, which remains one of the world's poorest.[2] These findings for Laos – especially with regards to the role of UXO contamination after bombing – extend to other war-torn countries. For example, Lin (2020) studies the problem of UXOs in Cambodia, finding that agricultural land has become less productive due to UXO contamination. It appears that the negative effects of bombing on modern growth are particularly salient in more rural environments. As a flipside, Chiovelli et al. (2018) stress the large economic benefits of clearing the landmines – another UXO type war legacy – left after the Mozambican Civil War (1977–92) through the subsequent impact of this on increasing market access of impacted communities. Similarly, Prem et al. (2021) show that demining campaigns in Colombia was also key for economic development. However, they show that these campaigns work better if conducted after conflict ends as demining campaigns during military operations could exacerbate extractive activities, such as mining. These papers are relevant to inform an eventual demining process in Ukraine.

In terms of policy implications, we believe that the demining agenda should take a centre stage in a post-war Ukraine. The empirical evidence on the negative long-term impacts of UXO contamination is clear, and so are the key benefits of demining after the war. However, the effects of the short-term clearance are still hard to assess. As Karen Chandler from the US Bureau of Political–Military affairs recently explains (United States Department of State, 2022):

1 The Patriot stands for Phased Array Tracking Radar for Intercept on Target, is a theater-wide surface-to-air missile defense system and considered one of the most advanced air defense systems in the United States (Reuters, 2022a).

2 See also Fergusson et al. (2020) for this channel in Colombia.

> Unexploded ordnance, landmines, and other explosive remnants of war will exacerbate global food insecurity by impacting Ukraine's food production and supply chain, block humanitarian aid workers from accessing Ukraine's hardest hit areas, and hinder the restoration of critical civilian infrastructure. Additionally, returning refugees will stream back into communities contaminated by explosive remnants of war. [They] and many returning civilians may feel compelled to clear explosive remnants of war themselves, causing casualties from these dangerous items to spike.

According to Ukraine's Ministry of Foreign Affairs and Agriculture, as of April 2022, approximately 80,0000 km^2 of land – 13% of Ukraine's territory – was suspected to be contaminated by landmines and UXOs, while 10% of the country's farmland is tainted by some form of explosive hazard. Before Russia's invasion of Ukraine in February 2022, only 3.4 km^2 of contaminated land in the Donbas region had been cleared of landmines. This is less than 1% of the current estimate of suspected hazardous areas in the region (United States Department of State, 2022). There is a tension here with regard to potential demining operations. Ideally, one would want to wait to start clearing operations. Yet, given the current contamination involved and the possibility of tracking the bombing operations in real time, there is a pressing need to assess the risk of clearance of the most contaminated areas. Overall, one would not want to wait until the situation resembles the Cambodian or Laotian one, entering a Conflict Trap (Collier et al., 2003), further hampering the health and human capital of the Ukrainian population in the long run. The distant lesson from Laos is relevant for Ukraine today.

2.2. Cultural and political legacies of political repression against civilians

The issue of violent repression against civilians during war is particularly relevant to the current context. Existing work in political science and economics has already examined the long-lasting impact of Soviet repression. Lupu and Peisakhin (2017) find that political violence shapes political identities among Crimean Tatars. Descendants from those that suffered the most during Soviet times identify more strongly with their ethnic group and hold more hostile views towards Russia today. Rozenas et al. (2017) also stress the inter-generational impact of indiscriminate violence on political behaviour. In a tragically relevant case – involving deportations to Siberia – they document that where Stalinist repression was strongest in western Ukraine, people are less likely to vote for 'pro-Russian' parties later on. For identification, they use both an IV strategy (based on railway networks) and a fuzzy RDD across Soviet rayons. In a follow-up paper, Rozenas and Zhukov (2019) show that indiscriminate and 'credible' repression can induce political obedience. Namely, they show that Ukrainian communities that were more exposed to Stalin's 'terror by hunger' behaved more loyally towards Moscow later on. Their identification strategy exploits exogenous variation in local famine mortality due to weather shocks. In a very recent contribution, Yaremko (2022) looks at the long-term negative impact of the blacklisting or targeting of the 'kulak' entrepreneurial peasantry

by Stalin. All of these papers show the negative impact of historical political repression in Ukraine.

Unfortunately, there are already reports of civilian repression including deliberate missile attacks on Ukrainian power stations and even mass graves in the current Russian war against Ukraine. The missile attack on Ukrainian power stations during the months of October and November of the year 2022 left many people without electricity, water and heat. Missile attacks on 23 October destabilized all four nuclear power stations in Ukraine leaving people without power for hours and in some cases days. To this day, Ukraine's nuclear power generation capacity has decreased substantially, and can only operate at 50% capacity. For this reason, Ukrainian residents are subjected to unscheduled power blackouts (Human Rights Watch, 2022; Reuters, 2022*b*). Additionally, the news stories of civilian massacres received from Bucha and the mass graves exhumations in Izyum – both Ukrainian cities occupied by the Russian army during the first months of the Russian invasion – depict a tragic scenario.[3] If the results from other major confrontations are any guide, the impact of these wounds could be felt for generations to come.

The findings for Soviet repression extend to other contexts as well. Fontana et al. (2018) study the impact of the Nazi occupation of Italy at the end of WWII. They find that where this occupation was stronger, the Communist party – which was active in the resistance movement – gained more votes during the postwar period. These long-term effects are at the expense of centrist parties. For identification, the authors use a RDD along the Gothic Line, an important defensive line that crossed northern Italy. Cannella et al. (2021) reach similar conclusions for northern Italy, along with lower political participation. Bühler and Madestam (2022) examine the long-term political effects of the Khmer Rouge in Cambodia. They find that in places closer to the Killing Fields people vote more and do so for the opposition party. For identification, they use exogenous shocks to rice productivity, a keystone of the authoritarian regime. Bautista et al. (2021) show that in places closer to military bases people voted against Pinochet's dictatorship in Chile. For more recent conflicts, Bellows and Miguel (2009) find that exposure to conflict during Sierra Leone's Civil War led to more political participation, while in Uganda it led to increased voting (Blattman, 2009). Later, we examine empirically political participation in the current context.

Tur-Prats and Valencia Caicedo (2020) examine the political and cultural legacies of the Spanish Civil War, focusing on civilian repression. They find long-lasting results on voting during the democratic period from 1977 to 2019, corresponding to the sided political repression carried out in the Aragon region, consistent with the results above on credible repression and targeted political violence. Areas that were occupied by Republican troops now vote for the centre left, while areas occupied by Nationalist

3 See, for instance, https://foreignpolicy.com/2022/04/19/bucha-ukraine-russia-war-crimes-collective-memory/ or https://www.bbc.com/news/world-europe-62922674.

troops do so for the centre right. They also find a significant and negative relationship between political violence and generalized trust, which extends to trust in institutions associated with the Civil War. For identification, the authors exploit deviations from the initial military plans of attack in an IV framework and a geographical RDD along the battlefront of Aragon. In terms of mechanisms of persistence, the authors find lower levels of political engagement and differential patterns of pro-Franco attitudes and collective memory about this traumatic historical event, using observational data and a survey conducted in the Aragon region.[4]

The results on trust echo those found in other settings, or for shorter time periods. Rohner et al. (2013*a*) find that conflict in Uganda decreased generalized trust and increased ethnic identity. Using experimental evidence from Tajikistan, Cassar et al. (2013) show that exposure to violence undermined trust and participation in market transactions. Alacevich and Zejcirovic (2020) also find that individuals living in more violent areas during the Yugoslavian War in Bosnia and Herzegovina are less trusting and politically active today. On the surveillance side, Lichter et al. (2021) find that the Stasi spying network in Germany eroded trust. At a broader scale, Grosjean (2014) also finds an erosion of trust. These results are at odds with the war fosters cooperation literature summarized in Bauer et al. (2016).

In the Ukrainian case, we observe an erosion of support for pro-Russian parties that started already before the Russian invasion in February 2022. We also look at political polarization using the RQ index. Although Montalvo and Reynal-Querol (2005) developed this index to capture ethnic polarization, we use it to approximate political polarization with electoral data from the 2010 Ukrainian presidential election, distinguishing between votes for the pro-Russian candidate and votes for the more pro-west candidate.[5] Figure A1 shows that Ukraine in 2010 was more polarized in the central regions and less polarized in the east. This is likely a result of the east having more pro-Russian votes whereas votes in the central regions are more split. Figure 1 shows the share of votes for pro-Russian parties, which varies widely across regions but had remained relatively stable for the period 2002–12. Oblasts that voted pro-Russian were located mostly in the eastern region including Donetsk, Dnipropetrovsk and Odessa. However, we observe a dramatic drop in pro-Russian votes in 2014 which can be associated with the Revolution of Dignity and the annexation of the Crimea region. This sharp decline has been even more significant in the eastern oblasts of Donetsk, Dnipropetrovsk and Odessa, which had traditionally been pro-Russian. In April–May 2014, referendums were held by the pro-Russian leaders and the self-proclaimed regions of Donetsk People's Republic (DNR) and Luhansk People's Republic (LNR) were established. As

4 Francisco Franco was the leader of the Nationalist forces when they won the war, and ruled over Spain from 1939 to 1975 as a dictator.

5 For a further discussion on how the index was computed, see the Appendix. For instance, we cannot incorporate measures of ideological distance under this formulation.

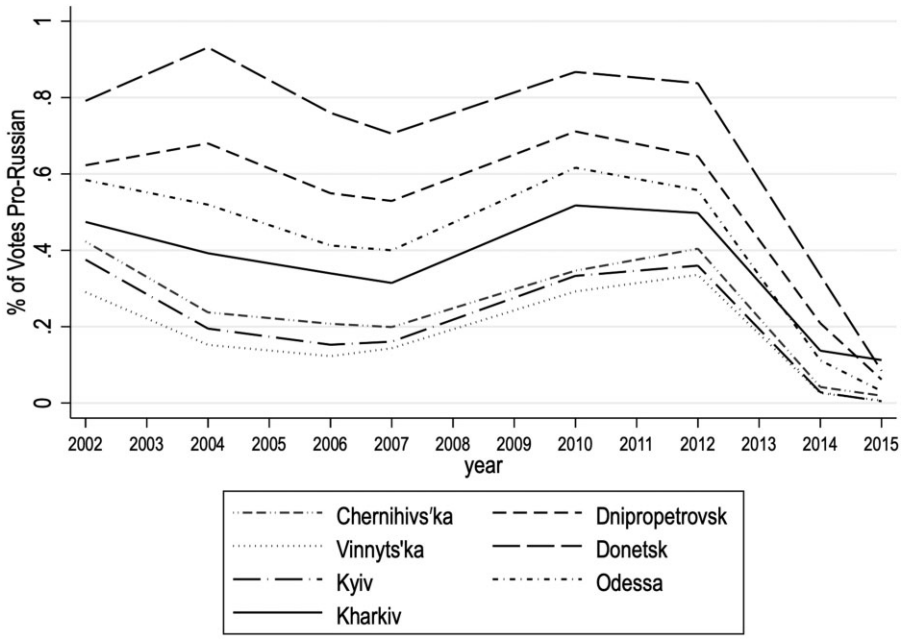

Figure 1. Pro-Russian votes over time.

Source: Data from Rozenas and Zhukov (2019).

reflected in Figure 1, voters including Ukrainian-controlled eastern region voters started to lose their trust in pro-Russian opposition leaders.[6] We examine later the potentially relevant role of political propaganda. These political realities are relevant for the current Russian War against Ukraine, as examined next.

Figure 2 shows a negative relationship between 2022 violence and 2014 voter turnout. That is, higher voter turnout in 2014 elections is correlated with lower war violence in 2022. Additionally, the eastern regions including Donetsk, Luhansk and Odessa had the lowest 2014 voter participation in the country (Central Election Commission of Ukraine, 2014), which is consistent with our findings about higher 2022 violence in the eastern oblasts of Ukraine, shown later in Section 5.1. Existing literature has found that violence fosters political participation in the aftermath of conflict (Bellows and Miguel, 2009), while here we see that lower political participation in the earlier period is correlated with increased conflict later on. We acknowledge, however, that the results could be driven by third factors.[7]

6 The support for pro-Russian parties continued decreasing in the 2015 elections. The 2019 election further divided people into three main camps: pro-Poroshenko, pro-Zelensky and pro-Boyko voters. Figure A2 shows that the Ukrainian western region had the majority of Poroshenko supporters. On the contrary, eastern regions including Luhansk, Donetsk and Dnipropetrovsk supported a pro-Russian presidential candidate Yuriy Boyko.

7 We also assess the relationship between trust and present-day violence in Ukraine. We only find a positive correlation between conflict and trust in the armed forces, not reported.

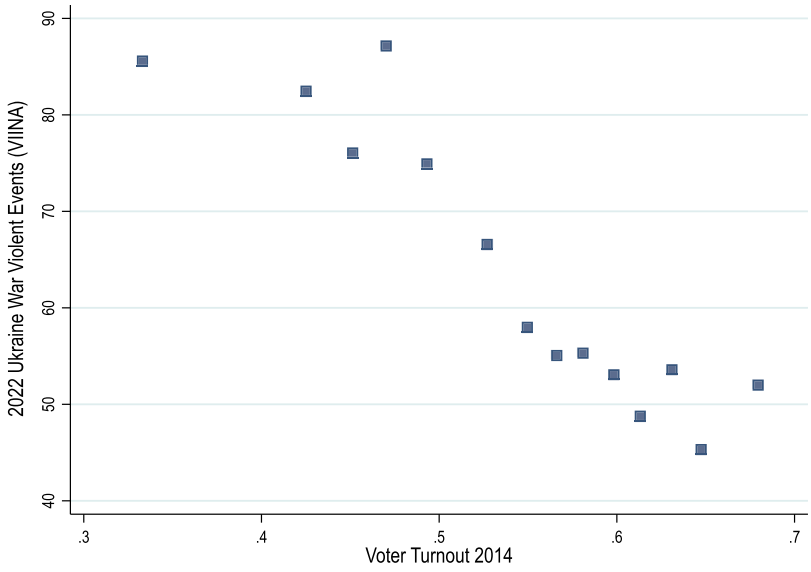

Figure 2. Political participation and conflict.

Notes: Binsreg of 2022 Ukraine War events regressed % voter turnout in 2014, geographic controls, distance to Russia (quadratic) and region fixed effects ($N = 380$). Violence data up to 30 August 2022.

Source: Data from Rozenas and Zhukov (2019) and Zhukov (2022).

The main lesson from the studies analysed in this section is that political repression can have long-lasting consequences that go well beyond the conflict years. Work conducted on this topic stresses the key role of collective memory as a mechanism of transmission of these legacies. A nuanced and balanced construction of the events is fundamental for victims from all sides. Avoiding in-depth research such as the one conducted by truth and reconciliation commissions in the short term could bring social problems in the long run. Two policy lessons that we draw from our reading of the literature are the importance of encouraging citizens to vote and be part of the democratic process, as well as working on the healing of the social fabric. Regaining citizens' trust is fundamental for long-term social cohesion and economic prosperity, to end the cycles of war and mistrust (Rohner et al., 2013*b*).

3. WAR AND MIGRATION

As of 16 October 2022, it is estimated that nearly 14 million Ukrainians are currently displaced due to the Russian invasion. Of these, approximately 6.2 million are thought to be internally displaced, while nearly 7.7 million are in other European countries.[8]

8 UNHCR https://data.unhcr.org/en/situations/ukraine and International Organization for Migration https://displacement.iom.int/ukraine. Accessed 16 October 2022.

Historically, high risk of and exposure to violence has forced people to migrate to safer regions. For instance, the Mexican Revolution caused a large increase on border crossings to the United States (Escamilla-Guerrero et al., 2022). We divide our summary into five parts: factors in the decision to migrate, refugee selection, the effect of forced migration on migrants, the effect on sending regions and the effect on receiving regions.[9] Becker and Ferrara (2019) define forcibly displaced individuals as people who moved due to threats of violence, psychological distress or extreme economic conditions.

3.1. Factors in the decision to flee conflict

Research has shown that a confluence of factors can impact a person's decision to migrate in the face of conflict. For example, Boustan (2007) finds that conflict and violence alone do not explain patterns of the Jewish exodus out of Russia in the late nineteenth and early twentieth centuries, but how increased urbanization and promising economic prospects in the United States were also determinants of emigration. Assessing the same mass migration event, Spitzer (2021) finds that the first wave of pogroms in Russia (violent large-scale anti-Jewish attacks) did not significantly affect migration, but the second wave did. This, the author posits, is because after the first wave Jews had bigger migration networks, which indicates that network effects can be important 'pull' factors in the decision to flee violence. Becker et al. (2021) show similar results for academic networks. They find that Jewish academics in Nazi Germany were significantly more likely to leave if they had ties to academic colleagues who had already emigrated. Buggle et al. (2020) also document that social networks affected Jews choices to migrate out of Germany during the Nazi Party's rise to power. They show that social 'push' factors, such as experiencing more threats of persecution within the social network, impact a person's choice to move. This choice to move in the face of conflict is also determined by 'pull' factors, such as a larger social and ethno-cultural group in a destination country.

3.2. Refugee selection

Research shows that forced migrants' earnings are consistently lower than those of people native to receiving regions (Peters, 2017; Brell et al., 2020). However, the economic outcomes of refugees relative to voluntary migrants or economic migrants are a priori ambiguous. On the one hand, refugees typically experience a more abrupt and traumatic removal from their homeland. Refugees may have lower levels of education and access to capital if they were targets of violence due to their socioeconomic status (Ibáñez and Vélez, 2008). Using data from 2008, Dustmann et al. (2017) find that refugees who migrated to the EU had worse employment outcomes than economic

9 For comprehensive analyses of this literature refer to Becker (2022), Verme and Schuettler (2021), Becker and Ferrara (2019) and Chin and Cortes (2015).

migrants, even if they arrived from the same country and had similar levels of education. Brell et al. (2020) show that in Scandinavian countries, Canada, Australia, the United States and the United Kingdom, refugees have on average lower wages and employment rates than voluntary migrants. Moreover, they show that female refugees are particularly adversely impacted, with a lower female-to-male employment ratio compared with other migrants. However, because Ukrainian women have relatively high education on average compared with other refugee women, these gender gaps seen in other migrant groups may be less pronounced in the current context. We further examine the relationship between conflict and gender in Section 4.

On the other hand, refugees may have higher education and skills than other types of migrants if they fled when there were high barriers to leaving, so only the wealthiest or most connected could leave (Abramitzky et al., 2022). Moreover, Aksoy and Poutvaara (2021) show that refugees fleeing violence may have higher levels of education compared with their home population if the risk of violence in their home country sufficiently reduces the returns from human capital. They find that if women face high gender discrimination in their home country, their returns to education will be lower than for men, which explains why female migrants from these countries might also be on average more educated than women in their home country. Similarly, Abramitzky et al. (2022) find that migrants fleeing persecution from the Soviet Bloc were positively selected in terms of education. These findings point to the theory that persecution can disproportionately induce highly educated people to leave even if the returns to their human capital are higher in their home country in the absence of persecution. These factors might play an important role for return migration, discussed later.

3.3. Consequences for forced migrants

Forced migration can have detrimental effects on migrants, yet it can also improve economic outcomes of individuals under certain conditions. These conditions are related to the migrant's pre-existing income and to the investment in human capital brought upon by the migrant's relocation. These potentially counterintuitive findings deserve further explanation. Bauer et al. (2017) find positive effects of forced migration with respect to overall mortality rates for people leaving for West Germany after WWII when the German borders were redrawn, but only for those in the top income quintile. Becker et al. (2020) find that forced migrants can also be more likely to invest in education if forced migration generates a higher preference for mobile human capital relative to stationary physical capital. They show the migration of Poles from the Kresy Territory after WWII had persistent positive impacts on education levels for several generations as a result of shifting preferences to invest in human rather than physical capital. In more modern times, after WWII, migrants expelled into West Germany fared worse than the

native population with the exception of people who worked in the agricultural sector and re-educated to work in new sectors (Bauer et al., 2013).[10]

How forced migrants are integrated into a new region affects their socioeconomic outcomes too. High concentrations of refugees give rise to worse integration outcomes and refugees are best integrated when they are relocated to urban centres, as Braun and Dwenger (2017) show in the context of West Germany post-WWII. Moreover, Black et al. (2022) show that government aid to refugees positively impacted education for all eligible young adults. However, for eligible children, benefits were only seen for males and not females, which stresses the importance of considering differential treatments for women and girls when designing refugee aid programmes.

In the context of the current crisis, it is specifically important to assess research pertaining to refugees returning home. Beaman et al. (2022) study what drives refugees to return in the context of the Syrian War. Using data for 2 million refugees, this paper finds that refugees are more likely to return when conflict intensity falls in their home region. They empirically show refugees with better housing and food security in the destination countries are more likely to return home. Moreover, vignette survey results from this research show that refugees are more likely to indicate their intention to return if their house has not been destroyed and schools are still in good condition. Other research in economics has studied return migration, but there is currently a gap in the literature on return migration in the context of war. Some notable work on return migration that can be applied to the context of refugees comes from Bijwaard and Wahba (2014), who find that the probability of return migration has a U-shape distribution over migrant income in the Netherlands. In a related paper, Bijwaard et al. (2014) find that employment delays an immigrant's return while unemployment enhances their probability of returning quickly.[11] Return migration should be at the centre of the discussions for a post-war Ukraine.

3.4. Impacts on sending regions

The impact of forced migration on sending regions is less well understood than the impact of forced migration on receiving regions (Becker and Ferrara, 2019) and the effects of forced migration can be difficult to disentangle from the effects of the conflict or unrest that caused people to flee. However, the literature is nearly unanimous in its findings that forced migration is detrimental for sending regions. We categorize the causal channels of these detrimental effects into two groups. First, forcing swaths of a population to

10 In the context of a natural disaster, forced migration due to a volcanic eruption in Iceland positively impacted the educational and earnings outcomes for people younger than 25 but had a negative impact on earnings for those who were older than 25 (Nakamura et al., 2021).

11 Gibson and McKenzie (2011) empirically study top academic performers and find that their decisions to return to their home countries are mostly driven by family ties and preference for the lifestyle of their home, rather than income opportunities.

leave can dramatically erode trust and institutions. Second, when populations flee they take their human capital and skills with them, which can leave a vacuum that may not be able to be replaced by the remaining population.

In the context of institutions and trust, the conditions that precede forcible migration events can degenerate inter- and intra-group trust. From a historical perspective, Nunn (2008) shows that slave trades in Africa significantly decreased sending countries' present-day economic output. One of the mechanisms for this result is likely the degradation of trust generated by the slave raids (Nunn and Wantchekon, 2011). This also holds in the context of post-WWII, where areas with higher historical forced migration in Hungary have lower levels of trust that have persisted to the present-day (Borbely and Mckenzie, 2022).

Expelling populations changes the human capital composition of a region. When highly educated people are expulsed, the following generations of people who remain can have significantly lower educational outcomes, as Yuksel and Yuksel (2013) show in the context of post-war Germany. Regions that experienced a greater outflow of migrants in the partitioning of India and Pakistan saw literacy rates fall due to migrants having on-average higher levels of education (Bharadwaj and Ali Mirza, 2019). German expulsion of Jews from academia, specifically in the context of mathematicians, resulted in lower outcomes for PhD students remaining in Germany (Waldinger, 2010). For Laos, Riaño and Valencia-Caicedo (2020) find that those who move internally can overcome some of the negative human capital legacies of conflict. Another effect of the human capital deficit left by forced migration is the effect of firms losing workers. Huber et al. (2021) show that firms that had Jewish managers in Germany suffered significantly due to the loss of their managers during the Nazi Regime.

3.5. Effects of forced migration on receiving regions

The most populated migration literature in economics pertains to the impacts of migration on receiving populations. Whether an influx of forced migrants generates positive or negative impacts on receiving population is highly context-specific (Becker and Ferrara, 2019).[12] If refugees have relatively high levels of human capital, there can be positive effects on human capital, skill and knowledge transfer for a receiving region (Hornung, 2014; Moser et al., 2014; Toews and Vézina, 2021; Mirza, 2022). The presence of refugees can also stimulate economic activity by creating new jobs and increasing demand for local goods. In Kenya, increased numbers of refugees are associated with higher economic activity and increased consumption for locals living near refugee camps (Alix-Garcia et al., 2018). On the other hand, refugees can draw resources away

12 In a meta-analysis, Verme and Schuettler (2021) find that often the literature on forced migration shows no significant effect on the labour market outcomes. Becker and Ferrara (2019) describe the literature as providing mixed results.

from the native population. For example, Baez (2011) found that exposure to refugees had negative impacts on Tanzanian children's health and educational outcomes during the influx of refugees from Rwanda and Burundi in 1994.

One of the major concerns about receiving forced migrants voiced in media and politics is the impact on the labour market. If new forced migrants compete directly with the native population for jobs, they can have negative impacts on native labour market outcomes (Braun and Mahmoud, 2014; Morales, 2018; Black et al., 2022). However, if the new migrants do not compete directly with the native population or step into jobs that are complements to existing native jobs then there can be negligible (Card, 1990) or even positive (Peters, 2017, 2022; Black et al., 2022) impacts on native employment. For example, after WWII, the population of Germany increased by nearly 20% when ethnic Germans were forcibly displaced from Eastern Europe. Peters (2022) finds that this influx of refugees had positive long-term effects on income per capita and manufacturing employment in Germany. In some cases, firm productivity in receiving regions can increase if forced migrants have skill matches to existing firms. In these circumstances, there can be wage increases for employees in these firms. Positive firm-level productivity impacts are documented by Altindag et al. (2020), Hornung (2014) and Braun and Kvasnicka (2014). Moreover, forced migrants can have positive impacts on receiving regions by transferring skills and knowledge to locals (Murard and Sakalli, 2018; Toews and Vézina, 2021).

One concern for policy-makers is civilian sentiment about how influxes of refugees may impact demand for housing. If forced migrants have sufficient capital, a large enough flow of migrants into one area could raise the price of housing rental units in both high- and low-income areas. If forced migrants are capital constrained, it is possible that rental prices increase in low-income but not high-income areas (Balkan et al., 2018). However, negative attitudes to refugees can increase demand for high-quality housing for the native population while not significantly changing low-quality house prices, as Depetris-Chauvin and Santos (2018) show for internally displaced persons in Colombia.

Inflows of forced migrants can also change a region's political outcomes. Dustmann et al. (2018) find that refugees change voter behaviour of the native population. They show that in the most rural areas, increased presence of refugees decreases vote shares for right-wing politicians, whereas in all other areas increased refugee populations coincide with higher right party vote shares. Steinmayr (2021) found similar effects in Upper Austria. Initial influxes of refugees increased far-right votes in the region, but when native people interacted with refugees the far-right vote share fell. Assessing the 2015 mass migration of refugees into Europe, findings show that more exposure to migrants increases anti-immigrant sentiment and reduces trust in government (Ajzenman et al., 2022). However, other research shows that the large influx of refugees into Germany in 2014 and 2015 did not substantially change support for anti-immigrant politicians (Gehrsitz and Ungerer, 2022). For voluntary migrants, Giuliano and Tabellini (2020) show that European migrants led to more liberal political views in the United States.

From the literature, we garner three policy lessons. First, the literature shows that refugees do better if they are able to invest in education or skill training (Bauer et al., 2013; Becker et al., 2020). But policies themselves, for instance with regards to residence requirements, could also have major effects (Adda et al., 2021). Nations receiving refugees from Ukraine should focus their efforts on providing language courses, education and labour training (see Lochmann et al., 2019). Moreover, female and older refugees of working age typically have worse employment outcomes than male and young refugees (Brell et al., 2020). Successful refugee integration programmes need to focus on improving access to education for these groups.[13] Second, research has shown that refugees do better when they are integrated into urban centres (Braun and Dwenger, 2017; Abramitzky and Boustan, 2022). Refugees should be integrated into areas with bigger job markets, and more options for education and transportation. This is something that is often avoided for political reasons, such as backlash from urban electorates. Third, mass forced migration creates a human capital deficit in the sending regions (Yuksel and Yuksel, 2013; Bharadwaj and Ali Mirza, 2019). Therefore, bringing Ukrainian refugees home after the war is a critical part for rebuilding Ukraine and should be a major focus of policy-making.

4. CONFLICT AND GENDER

Wars and civil conflicts often generate sex ratio imbalances among the nations involved in the struggles. In an extreme example, the War of the Triple Alliance (1864–70) killed around 75% of Paraguayan men (Alix-Garcia et al., 2022). These imbalances, even when less extreme, impact economic variables through different mechanisms. In the last years, the number of studies focusing on this subject has increased, focusing on different outcome variables that can give us some lessons for the Ukrainian case.[14]

4.1. Labour market participation and gender norms

Wars mobilize men to the armed forces, independently of their labour status – although some exceptions are made regarding age, farmers, ethnicity or disabilities. Thus, in periods of conflict, the number of men in the labour market drops. One of the conflicts that has generated more research on this topic is the WWII, which mobilized 16 million men to serve in the US Military and caused the male labour-force participation in the country to drop from 84.2% in 1940 to 67.7% in 1945. The decline in male labour-force participation may generate an increase in the number of women in the labour market.

13 Again, we note that the high level of human capital of Ukrainian migrants makes this less of a problem.

14 See Bochenkova et al. (2022), Dube and Harish (2020) and Eslava (2020) for a detailed discussion on the impact of women as leaders on conflict.

In fact, between 1940 and 1945, female labour-force participation (FLFP) increased from 27.8% to 33.8% (Acemoglu et al., 2004). Moreover, FLFP rates decreased after 1945 but did not go back to prewar levels, suggesting hysteresis. These labour shifts can generate both short- and longer-term effects in employment and beyond.

One of the first attempts to evaluate the causal effect of WWII on FLFP was Goldin (1991), who finds a positive effect, though modest. In particular, the author shows that about half of the women that enter the labour-force during WWII left again after the struggle. Acemoglu et al. (2004) also find a positive association between conflict and FLFP in the United States, but find a more permanent effect. The authors argue that, after the war, FLFP increased permanently because women's preferences changed as a result of their experiences working during the war. This is a good example of how, even though the economic shock might be short-lived, its cultural and socioeconomic impact might be long-lasting, permanently affecting gender norms. Other papers that analyse the effects of WWII using US data offer more nuanced results. Goldin and Olivetti (2013) find that the shift in labour supply appears to have occurred for women who entered white-collar positions during the war. Moreover, they discuss that the persistent impact loads on higher-educated women. Fernández et al. (2004) find that wives of men who grew up with a working mother were more likely to work. The authors argue that a new family model developed: one in which children, especially male children, see their mother going to work. This new type of family positively influenced men's preferences towards a working wife or improved their abilities as a companion for working women. The family transformed gradually and changed women's role through generations. These findings hold in other settings as well. Using WWI as an exogenous event, Boehnke and Gay (2022) find that FLFP increased in France, and that this effect persisted during the interwar period. The authors claim that this might have occurred as a consequence of the negative income shock that households and widows experienced. They also find that single women were more likely to delay marriage which, in turn, induced them to enter the labour-force. Gay (2021) documents a persistent change of attitudes and beliefs towards FLFP generated by WWI in France.

The potential longer-term implications of war on FLFP through imbalanced sex ratios can be analysed in the context of the Triple Alliance War in Paraguay (1864–70), in a developing country context. Using modern census data, Alix-Garcia et al. (2022) find that, within Paraguay, the probability of being employed today is higher for women living up to 30 km away from battles or marches than those living farther. They also find that war areas are more associated with female-headed households and women being unmarried and living with a child, and point to gender norms as the mechanism behind this persistence. They find a positive effect on both men's and women's attitudes towards female employment which, in turn, can potentially lead to a higher FLFP. These gender-equal norms are related to the war: the positive perception towards women's participation is higher the closer the individual is to march lines. Boggiano (2021) also exploits the Triple Alliance War and finds similar results to Alix-Garcia et al. (2022). Although the main focus of Boggiano (2021) is on intimate-partner violence (IPV), the

results on FLFP echo those previously found in the literature. Despite the positive effect of employment on empowerment (independence and income), Boggiano (2021) notices that it can also have negative and unintended consequences on IPV, pointing out another dimension of the war's consequences. The author argues the dominance of a backlash norm: women's labour participation and income might threaten males' bread-winning role, to which men might respond with violence against their partners.

The implications of conflict for female empowerment are also studied by Rogall and Zárate-Barrera (2020) in the context of the Rwandan Genocide (1994). The authors find that women living in villages that faced high-intensive violence experience better living conditions 15–20 years after the genocide. In particular, they find that women are wealthier, healthier, better educated, less likely to accept and be victims of domestic violence, have better jobs, experience more decision power in their households and enjoy more financial and sexual autonomy. The authors claim that the militia's strategy of targeting adult men allowed women to take crucial positions in both the household and the government. Some of these results are at odds with the papers examined in Section 4.4 and might not be fully applicable to the Ukrainian context.

4.2. Marriage and out-of-wedlock births

In addition to the consequences in the labour market, wars have an effect in the marriage market too. Recently, numerous papers have empirically studied the effects of sex ratios imbalances, on both marriage and out-of-wedlock childbearing, using conflicts as an exogenous shock. Abramitzky et al. (2011), using WWI as a source of exogenous variation, analyse the effects of male scarcity on the marriage market in France. The authors find that, after the war, a larger fraction of men married women of higher social class, thus improving men's status. Moreover, they find that the age gap within newlywed couples decreased after the war. According to the authors, this is a consequence of women delaying marriage after the war, similar to the results discussed in Boehnke and Gay (2022). Furthermore, Abramitzky et al. (2011) show that women were less likely to marry, but men were more likely to do so.

Bethmann and Kvasnicka (2013) analyse the effects of WWII in Bavaria, Germany. They find that the scarcity of men in the aftermath of WWII led to an increase in out-of-wedlock childbearing. According to the authors, this might be a consequence of excess supply of women in the marriage market, leading to a higher bargaining power of men. Another explanation could be that women went to the labour-force during the war, increased their income and worried less about the cost of bearing a child on their own. Bethmann and Kvasnicka (2013) also focus on women's expectations. In particular, they use prisoners of war (POW) information to evaluate women's expectation about the marriage market. Their argument is that the probability of returning home for soldiers who go missing in action (who are severely injured or are killed) is almost zero. But, as the authors claim, POWs have a high positive probability of return. Hence, the

number of men per woman is likely to increase in the near future in counties with a high proportion of POW and the marriage market for women is likely to be better. In line with this prediction, Bethmann and Kvasnicka (2013) find that, in counties with a higher proportion of POW, the effect of sex ratio imbalances on out-of-wedlock childbearing was attenuated. They state that the effect might be driven by women's prospects on the marriage market: if women expect that in the near future the supply of men will increase, they might wait for the market to 'get better'. Brainerd (2017) uses the same event but focuses on Russia. The author shows that the war, by generating sex ratios imbalances, reduced marriages for both women and men (cf. Abramitzky et al., 2011). While out-of-wedlock births increased after the war, marital fertility rates declined, which might be explained by preferences for children, female participation in the labour-force, unstable marriages and men's higher bargaining power.

4.3. Lessons from history

The short-term sex ratio shocks can have longer-term economic impacts, especially if they change gender norms in a society. Current FLFP in former Soviet countries, including Ukraine, might be influenced by Communist legacies (see Campa and Serafinelli, 2019; Boelmann et al., 2022). Though the imbalances estimated for Ukraine by the beginning of 2022 (before the Russian war against Ukraine started) were not as extreme as for the wars described before, they may be exacerbated by male-biased migration shocks (see Donato et al., 2008; Nobles and McKelvey, 2015).

The demographic information from the Ukrainian population and labour market allows us to tie this reality to the surveyed literature. In Ukraine, the estimated sex ratio is 116 women per 100 men, but it differs by age group.[15] The Martial Law in Ukraine prohibits men aged 18–60 to leave the country (Deutsche Welle, 2022). Hence, this group might be the most affected by the conflict. The sex ratio in this group is close to unity (104 women per 100 men). Next, we divide this group into two categories: those affected by the Martial Law still in reproductive years (18–49, World Health Organization, 2006) and older individuals affected by the Law but not in reproductive years (50–60). The sex ratio for the former is 99 women per 100 men. For the latter, 120 per 100. In the oldest cohort, it is 180–100 (Figure 3a). Right before the war started, in 2021, FLFP in Ukraine was 68% for working-age women (between 15 and 59 years old), according to the 2021 Labor Force Survey in Ukraine. FLFP differed significantly by age group, being the highest for women aged 40–49 (83%) and the lowest for young women between 15 and 24 (28%). These rates are lower than those observed for men for all age groups (Figure 3b).

History shows us that women took men's place in the labour market as men went to the armed forces. We might expect higher participation of women in the labour market;

15 This estimation is as of 1 January 2022. The estimation is retrieved from State Statistics Service of Ukraine.

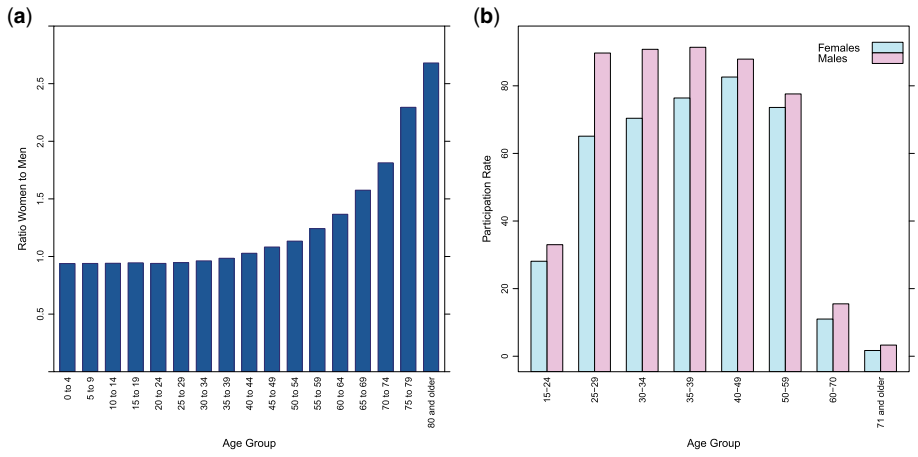

Figure 3. Estimated sex ratio and labour-force participation.

Notes: Panel (**a**) shows the women-to-men ratio by age group. Data from State Statistics Service of Ukraine (2022). Estimates as of January 1, 2022. Panel (**b**) shows female and male labour-force participation by age group.

Source: Data from State Statistics Service of Ukraine, Labor Force Survey 2021.

in particular, for younger women. In addition, as we have seen in previous research, this may reshape gender norms for younger individuals, both females and males. The effect on the marriage market might be harder to predict. If the sex ratio in the aftermath of the war is biased towards women, we could expect to see more out-of-wedlock births, lower marriage rates and higher female headed households. As women participate more in the labour-force, marrying age will be delayed and financial independence will increase. Despite these positive impacts on women's employment and income, the overall impact on female well-being – in terms of their physical and mental health, and their education – might be negative, as we show in the next section.[16] Moreover, Ukrainian policy-makers should promote policies that foster the long-term consequences of the war – for instance, encouraging the positive effects on labour-force participation through training or improving job market conditions and reducing barriers for women, as discussed previously. In addition, they should also mitigate the negative consequences of conflict. In particular, by focusing on their education, physical and mental health, and promoting childcare for newborns. Sexual violence against women is a fundamental aspect, which we focus on next.

4.4. Conflict-related sexual violence

Conflict-related sexual violence is a pervasive phenomenon, whose intensity can vary from isolated events to widespread and systematic use. Rape and gang rape are the

16 See Ramos-Toro (2019) for a discussion on the impact of conflict on other dimensions of female well-being.

most common forms, but it can also include sexual torture, sexual mutilation, sexual slavery, forced prostitution, forced pregnancy, forced sterilization and forced abortion. The brutality and scale of these incidents, observed in conflicts fought all around the world, has pushed this issue into the public agenda. In 2018, the Nobel Peace Prize went to Doctor Denis Mukwege and activist Nadia Murad for their 'contribution to focusing attention on, and combating, such war crimes'.

Since the Russian invasion in February 2022, there have been multiple allegations of sexual violence. Although the actual numbers are still unclear, by early June 2022 the United Nations (UN) High Commissioner for Human Rights had received 124 reports of sexual violence committed in the Ukrainian war zone. The Armed Conflict Location and Event Data (ACLED) Project reported 22 conflict-related sexual violence events between February 2022 and January 2023. As described in Figure 4, these acts were mostly perpetrated by Russian soldiers against Ukrainian civilians, predominantly women and girls, and against Ukrainian female soldiers.

Why do soldiers rape? The literature highlights two main motivations: strategic and expressive. Sexual violence can be used strategically to achieve military or organizational goals; for instance, as an effective weapon to terrorize or punish the targeted group (Wood, 2006). Sexual violence can also be used expressively to satisfy soldiers' private motivations, such as their sexual desire or their wish for power or dominance over other individuals (Goldstein, 2003). A recent paper by Guarnieri and Tur-Prats (2022) sheds new light on the fundamental determinants of conflict-related sexual violence, focusing on the role of deep-rooted gender norms. Guided by the anthropological literature, the authors construct an index capturing armed actors' degree of male dominance based on information on ethnic groups' ancestral family arrangements and subsistence activities. The study finds that actors with male-dominant norms (as opposed to those with more gender-equal norms) are more likely to perpetrate sexual violence. Moreover, the cultural distance between the gender norms of the combatants matters: sexual violence increases when the perpetrator has relatively more male-dominant norms than the opponent.

These results can be extrapolated to the current Russian war against Ukraine. Guarnieri and Tur-Prats (2022)'s male dominance index, whose distribution is displayed in Figure 5, ranges between 0 and 1, with one denoting the maximum degree of male-dominant constructs of gender. Based on their ancestral characteristics, ethnic Russians would be classified as a group with a degree of male dominance of 0.89.[17] Only 2% of

17 To our knowledge, there is no publicly available data on the ethnic composition of the Armed Forces of the Russian Federation. Our discussion assumes that ethnic Russians constitute the majority, but we acknowledge that ethnic minorities may have been disproportionately involved in the most recent recruitment campaign, especially for the rank-and-file section of the army. Therefore, compared with their share in the Russian population, ethnic minorities such as the Buryat might be overrepresented in the state military (unfortunately, the ethnographic information on the Buryat ethnic group is not sufficiently rich for computing the male dominance index). Moreover, according to the ACLED project, members of the Chechen Battalion of Ramzan Kadyrov have been alleged to have committed sexual abuses against Ukrainian civilians alongside Russian soldiers. The Chechen ethnic group male dominance index is 0.83.

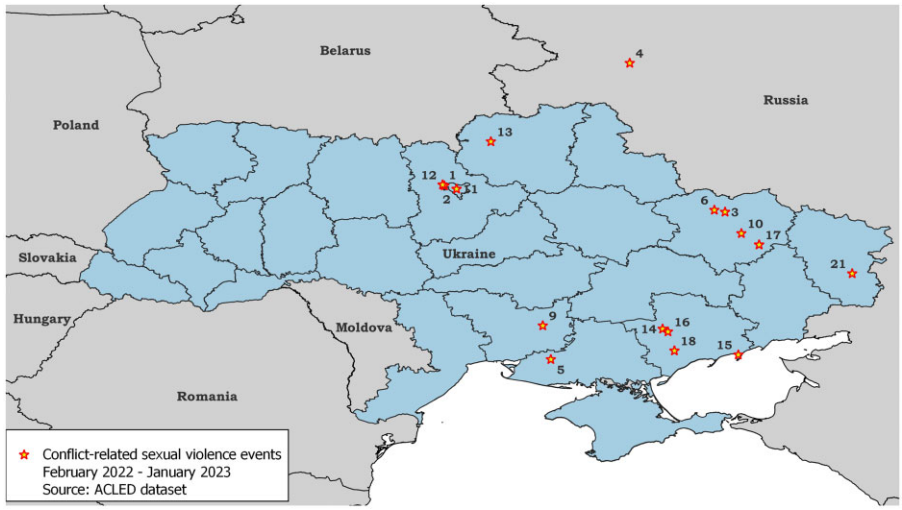

Figure 4. Conflict-related sexual violence events (February 2022–January 2023).

Notes: Events description: 1, On 28 February 2022, a Russian soldier raped a 28-year-old woman in Bucha, Kyiv. 2, On 7 March 2022, Russian soldiers, including Russian Chechen fighters, raped a woman in Kyiv region and killed her husband. 3, On 13 March 2022, a Russian soldier beat, tortured and repeatedly raped 31-year-old woman in Mala Rohan, Kharkiv. 4, Around 15 March 2022, Ukrainian female soldiers taken as prisoners by Russian forces to Bryansk were stripped naked in the presence of men, forced to squat, had their hair cut off and were constantly interrogated in an attempt to break their morale. 5, Around 15 March 2022, Russian forces raped a 16-year-old girl and a 78-year-old woman in the Kherson region. 6, Around 15 March 2022, a Russian soldier repeatedly raped a 29-year-old woman in Kharkiv region, and killed her old mother, when the daughter refused to go to Russia with the soldier. 7, Around 15 March 2022, five Russian soldiers raped a 20-year-old woman in Irpin, Kyiv. 8, Around 15 March 2022, Russian forces, including Russian Chechen fighters, systematically raped around 25 women and girls aged 14–24 in the basement of one house Bucha, Kyiv, while the town was under Russian occupation. Nine of the women got pregnant. 9, Around 15 March 2022, Russian soldiers raped a woman in Bashtanka district, Mykolaiv. 10, Around 15 March 2022, Russian forces captured and abducted a woman and her daughter in Balakliia, Kharkiv region. The daughter was raped while the woman was abused by Russian forces. 11, Around 15 March 2022, a Russian soldier raped a pregnant woman in the Kyiv region (coded to Kyiv, Kyiv). As a result, the woman lost her child. 12, Around 17 March 2022, a Ukrainian woman disappeared in Bucha, Kyiv region, during the occupation of the settlement by Russian forces. She was found dead, shot in the head by Russian soldiers. She has also been raped. 13, Around 20 March 2022, Russian soldiers were residing in a civilian house in a village in Chernihiv region for 3 weeks, while one of the soldiers was sexually assaulting a 16-year-old girl in that household. Her relatives were also threatened and physically assaulted. 14, Around 25 April 2022, Russian forces raped a woman in Orlianske, Zaporizhia. 15, On 6 June 2022, a Russian serviceman raped a Ukrainian woman in Berdiansk, Zaporizhia region. 16, On 15 June 2022, Russian soldier raped a woman in occupied Mykhailivka, Zaporizhia. 17, Around 10 July 2022, Russian soldiers abducted a woman in Izium, Kharkiv region, tortured her with electric current and repeatedly raped her, while holding in captivity for 10 days. 18, Around 13 July 2022, a 13-year-old girl was raped and killed in Melitopol, Zaporizhia region. The body was found on 27 July. The victim's family suspects Russian soldiers. 19, Around 15 July 2022, Russian forces illegally detained, tortured, orally raped and sexually assaulted a female resident of Izium, Kharkiv region. Her husband was also detained and tortured. 20, Around 15 July 2022, Russian forces illegally detained, tortured and raped for 10 days a female civilian in Izium, Kharkiv region. She was later released. 21, Around 20 July 2022, a Russian soldier or a group of soldiers raped and killed 8 civilian women in Luhansk, Luhansk region. 22, Around 9 January 2023, a Russian soldier raped an underage girl in Melitopol, Zaporizhia region. There is no indication that he was held responsible for the offence.

Source: Data from ACLED Project (Raleigh et al., 2010).

ethnicities in the global sample display more male-dominant cultural norms than ethnic Russians. The latter are also relatively more male-dominant than the ethnic Ukrainians, whose index, based on the same ancestral traits, is 0.78 (at the 88th percentile of the global distribution of ethnic groups).

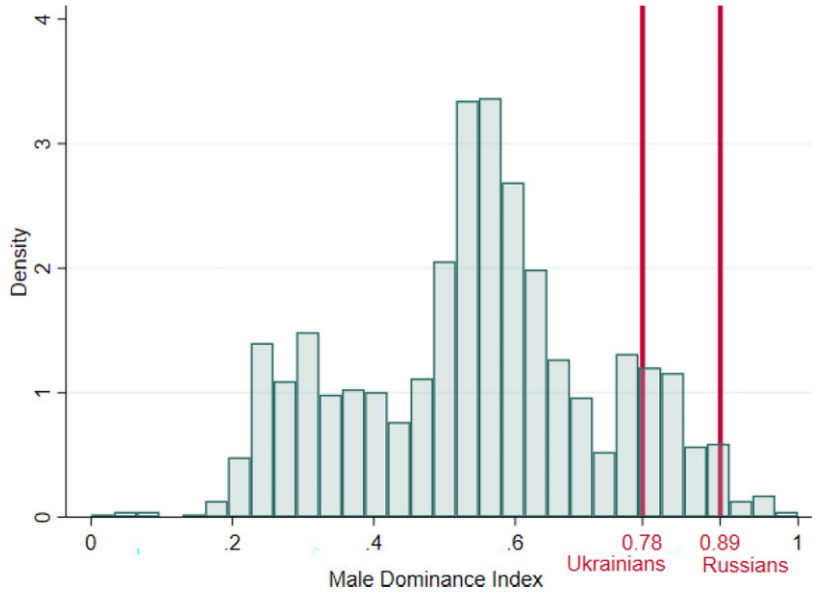

Figure 5. Global distribution of the male dominance index.

Note: Distribution of the male dominance index across ethnic groups around the world.

Source: Data from Murdock Ethnographic Atlas and Guarnieri and Tur-Prats (2022).

Why do male dominance and the cultural distance in gender norms between warring parties matter in explaining the emergence of sexual violence? On the one hand, more male dominant soldiers and commanders face lower costs of exerting sexual violence, both in terms of the psychological toll and the legal or social punishment of committing those acts. On the other hand, the benefits of sexually assaulting women might be higher when the opponent is gender equal. When sexual violence is used strategically, it can be a more effective weapon if directed against women who are the backbone of their communities. Cultural distance in gender norms might matter also when sexual violence is used expressively, for private purposes. If soldiers with male dominant constructs disapprove of the relatively more prominent position of women in the enemy's society, they might resort to sexual violence to alleviate the discomfort of what they perceive as an insult to their ideals.[18]

The consequences of wartime sexual violence are long-lasting and detrimental not only for the victims – who might face trauma and permanent damages to their reproductive capacity, among other physical and psychological aftereffects – but also to their families and communities (Ba and Bhopal, 2017). Especially when committed in public, sexual violence can deeply affect the collective memory of the victim's community and undermine solidarity, particularly in contexts where rape is highly stigmatized

18 For a detailed exploration of these mechanisms, refer to Guarnieri and Tur-Prats (2022).

(Mukwege and Nangini, 2009). Viktoriya, one of the few Ukrainian sexual violence survivors who talked publicly, expressed her enduring pain stemming from the stigma and judgement of neighbours and acquaintances.[19] From a policy perspective, urgent priority should be given to providing immediate medical care – both physical and psychological – to survivors of sexual violence to mitigate as much as possible the lingering negative consequences.

The UN has declared that all forms of sexual violence 'can constitute war crimes, crimes against humanity or a constitutive act with respect to genocide' (United Nations Security Council, 2008). To increase armed actors' costs of committing these abuses, these crimes should be thoroughly investigated and severely prosecuted. Up to January 2023, Ukrainian authorities had initiated investigations on more than 150 cases of conflict-related sexual violence.[20] While this suggests a remarkable effort to prosecute sexual violence and seek justice for victims, a too-large fraction of cases remain uninvestigated or even undetected, as pointed out by Iryna Didenko, who leads the prosecutor's department investigating such crimes.

Crucial to enforcing punishment and providing timely support is the development of tools to collect accurate information on the perpetrators and survivors of sexual violence in war. Given the importance of gender norms in explaining the pattern of sexual violence, observers should carefully monitor the situation of women and girls exposed to wars where one of the sides involved is highly male dominant, and even more if there is a difference in gender norms between the two belligerents, as in the current Russian war against Ukraine. Sexual violence remains an underreported phenomenon: only a few of the multiple allegations received by the UN since the Russian invasion have been recorded in the ACLED database, one of the most reliable sources of real-time information on violent events. Oleksandra Kvitko, a psychologist and psychotherapist managing a help hotline, reported having received 1,500 calls from people seeking assistance to cope with sexual crimes, torture and abuse, between 1 April and 15 May 2022.[21] Any data collection effort on sexual violence should be guided by ethical practices to guarantee confidentiality and protect survivors' safety, as highlighted in the Murad Code project, a code of conduct for documenting and investigating conflict-related sexual violence.[22] Further research should focus on how to design effective interventions to *prevent* conflict-related sexual violence and to revert those societal conceptions about gender that support it.

5. EMPIRICAL ANALYSIS OF THE RUSSIAN WAR AGAINST UKRAINE

Having covered the literature on post-war scenarios in economics and related social sciences, we now provide an empirical analysis of the Russian war against Ukraine.

19 https://www.nytimes.com/2023/01/05/world/europe/ukraine-sexual-violence-russia.html
20 https://www.nytimes.com/2023/01/05/world/europe/ukraine-sexual-violence-russia.html
21 https://www.nytimes.com/2022/06/29/world/europe/ukraine-russia-rape.html
22 https://www.muradcode.com.

This war is part of an ongoing military conflict between these two countries, which can be dated to February 2014, with the annexation of Crimea and the war in Donbas after the Euromaidan protests and the Revolution of Dignity, in Kyiv. The Russian occupation of the Donetsk and Luhansk oblasts in May 2014, in Eastern Ukraine, was followed by an all-scale invasion of the country by Russian military forces in February 2022, including bombings of military and civilian targets. According to the Office of the UN High Commissioner for Human Rights (OHCHR), as of 9 January 2023 it is estimated that almost 6,952 civilians have died (431 of them were children) and 11,144 have been injured (810 of them were children). However, those numbers provided by OHCHR could be well underestimated since Ukrainian officials have not officially disclosed the number of casualties. Ukrainian President Volodymyr Zelensky has reported that in Mariupol alone tens of thousands of civilians were killed (France24, 2022). Also, the Adviser to the Head of the President's Office announced that approximately 13,000 Ukrainian soldiers and almost 99,000 Russian soldiers have died (BBC, 2022).[23] Both bombings (UXOs specifically) and civilian repression (including mass graves) have been important features of the struggle.

We first start by showing some trends in the current Russian war against Ukraine, regarding the evolution of violence over time and by regions, and the presence of Russian forces. Next, we move to analyse the correlation of current violent events with some historical factors, such as the presence of ethnic Russians in Ukraine in 1926, the use of Russian language by regions and the severity of the Holodomor famine (1932–3), following the historical literature described before. Holodomor was a man-made famine that killed approximately 13% of the Ukrainian population caused by the collectivization programme. The collectivization programme was implemented among rural areas and was further imposed by the Soviet NKVD.[24] Food production was strictly controlled by the government and no private trade was allowed. The government itself collected food from the villages and redistributed it to the cities. As a result, collective farming was responsible for 52% of excess death in 1933 (Overy, 1997; Applebaum, 2017; Naumenko, 2021). Thus, the collectivization programme turned the Soviet state once known as a 'bread-basket' into a hungry society in a matter of few years.

For our empirical analysis, we use geo-localized data from the ACLED project, geolocated data from Zhukov (2022) on the ongoing war[25] and data from Rozenas et al. (2017) on historical ethnicities and modern voter participation originally from the 1926

23 For estimates on civilian casualties from the UN, see Office of the High Commissioner for Human Rights, UN (2023).

24 The People's Commissariat for Internal Affairs was established to protect the security of the USSR.

25 In the context of this paper, a violent event refers to a war/military operation from data publicly provided by Zhukov (2022). Zhukov (2022) collects data on these war/military operation events by web scraping a variety of news sources and compiling them using machine learning. These war/military operations can include events initiated by Russia, Ukraine or civilians, and carried out with a variety of weapons. We do not restrict the data to only include events where at least one person died, as different databases/authors do.

Census and historical Soviet repression, including the Holodomor famine. We also employ a large set of potentially relevant controls such as elevation, agricultural suitabilities for wheat, potato, maize, flax and barley, forest cover and distance to the Russian border from FAO and the aforementioned sources. Results are updated daily, so we report here regressions for data up to 30 August 2022.

5.1. Trends in the current Russian War against Ukraine

In Figure 6, we plot the number of military-involved violent events per day from the start of the invasion on 24 February 2022 to 30 August 2022. First, we see an overall decline in violence. When we disaggregate the data into regions, we observe that the majority of the violence is in the eastern region. We also notice that violence started out high in the northern region but decreased by the late spring of 2022 (Figure 7). These empirical observations are in line with news reporting on the war. Second, we observe a discontinuity of the region Russia controlled when the frontier of the war shifted from the north to the east on 29 March 2022, the day that Putin announced a change in Russian strategy (Figure 8). Russian attacks in the north substantially decreased after this announcement. Although we do observe a spike in violent events in the eastern region after this date, this spike in violence did not persist, and we see an overall downwards trend in violence in the eastern region too. The only region for which we observe an upwards trend in violence is the southern region, which includes the oblast of Crimea.

We also looked at violence initiated by civilians. Although violence initiated by civilians constitutes a small fraction of the total number of violent events, we still see that almost all of the civilian-initiated violence takes place in the Eastern oblasts (see Figure A3). Although we do not know the causes of the civilian-initiated violence, it is possible that civilians are defending their homeland, or that some who are aligned with Russian forces are launching their own anti-Ukrainian attacks. In this vein, Rogall (2021) found that armed groups mobilized civilians to commit violence in the context of the Rwandan genocide. Although identifying the causes of civilian-initiated violence beyond the scope of this paper, this is an important area of further research in the context of this war.

5.2. Correlations with historical variables

Guided by the literature, we also look at correlations with historical variables. Important determinants of the current war could be ethnic identity and the use of Russian language. In line with this hypothesis, as shown in Figure 9, we find a positive, significant and robust correlation between ethnic Russians in Ukraine in 1926 and current attacks. This relationship is also visible in the map on the right panel, where areas with more attacks and higher historical Russian ethnic populations appear in purple. Similarly, Figure 10 shows a positive relationship between the use of Russian language by regions

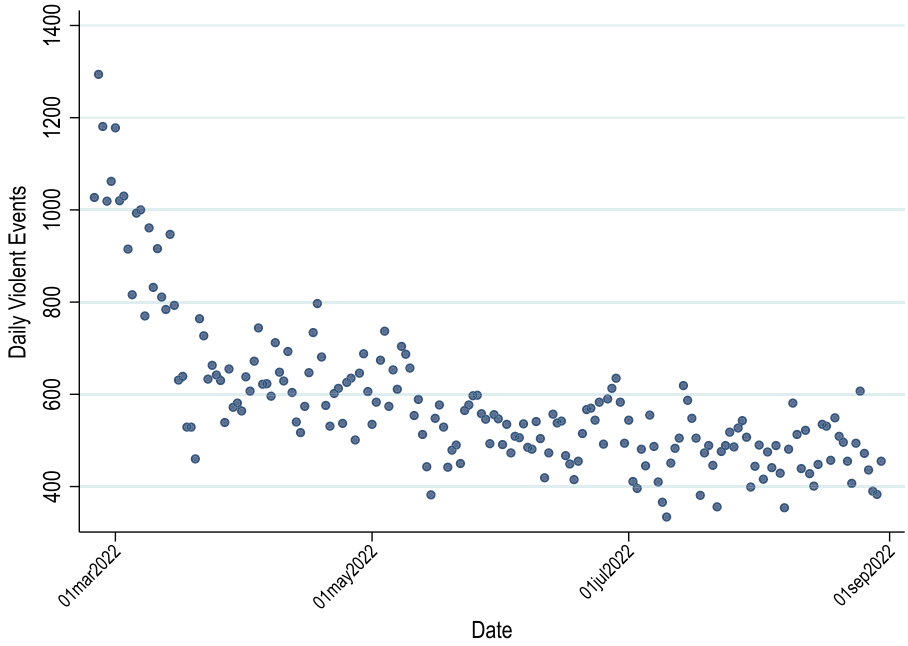

Figure 6. Daily violence over time in Ukraine war.

Source: Data from 23 February to 30 August 2022. VIINA database (Zhukov, 2022).

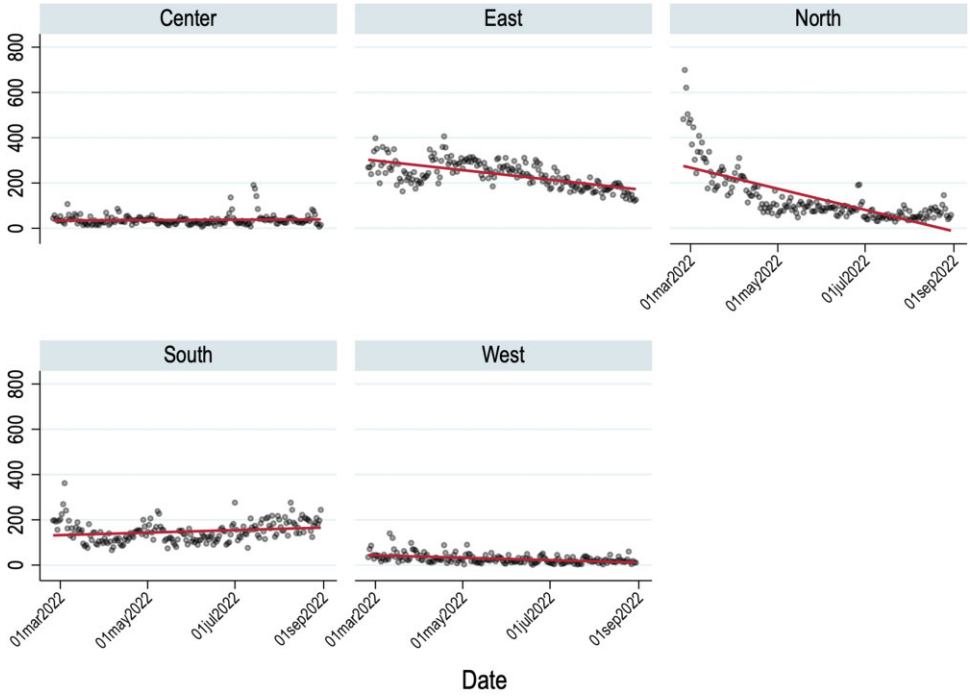

Figure 7. Ukraine daily violence over time by region.

Source: Data from 23 February to 30 August 2022. VIINA database (Zhukov, 2022).

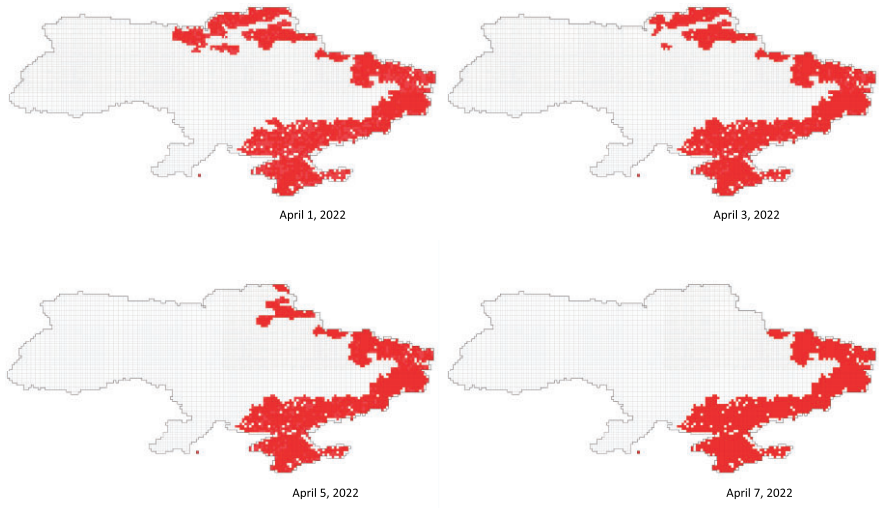

Figure 8. Russia controlled areas.

Source: Data from VIINA database (Zhukov, 2022).

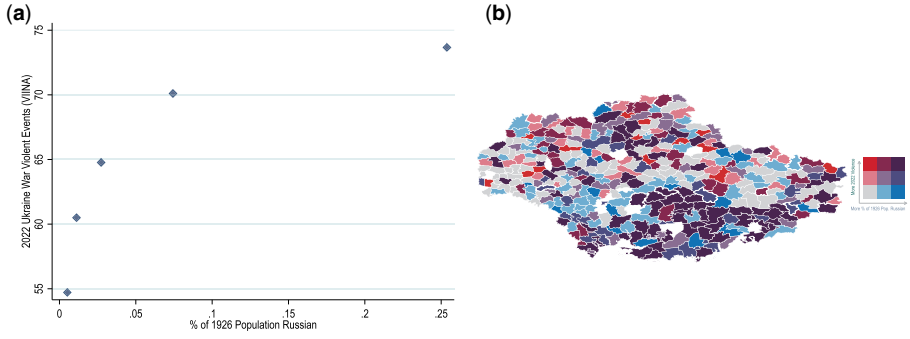

Figure 9. Ukraine violence and 1926 Russian population.

Notes: Panel (a) shows a binsreg plot ($N = 380$), with controls for historical Soviet violence, crop suitability (from UNFAO), elevation, forest coverage (from Zhukov, 2022), distance to Russia (quadratic) and region fixed effects. Panel (b) is a bivariate map of Ukraine rayons in 1933, with purple regions depicting areas with more 2022 Ukrainian violence and a higher proportion of Russians historically. Ukraine conflict data until 30 August 2022.

Source: Historical Russian population data from Rozenas and Zhukov (2019) and present-day violence data are from Zhukov (2022).

and modern-day attacks. This suggests that language could be a driving mechanism of the ethnicity effect. These include border areas, such as Donbas and Luhansk, as well as districts in the South (Mariupol and Odessa) and the centre of the country.

The relationship with these historical correlates is striking, but we recognize that other omitted factors could be driving the result. Politically, invading territories with a larger

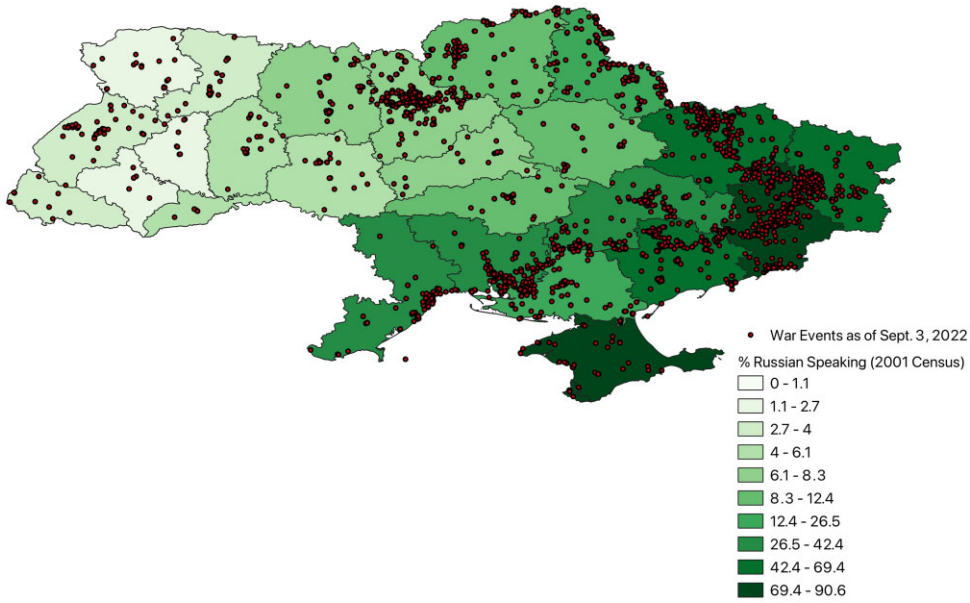

Figure 10. Russian speaking population and the current war.

Source: War data from 23 February to 3 September 2022, VIINA database (Zhukov, 2022). Language data from 2001 Ukraine Census.

Russian-speaking population has been used as motivation by Russian propaganda. The new propaganda includes spreading disinformation on social media and TV channels about the false Ukrainian fascist movement and accusing Ukraine of planning an all-scale invasion of Russia (The New York Times, 2022). As already mentioned, years of Russian disinformation in the eastern regions weakened people's trust in the Ukrainian government by making them more compliant with the Russian war on Ukraine. Targeting places where ethnic Russians reside could be a tactical strategy to garner support and eventual territorial control.[26] Lastly, the findings are consistent with a Russian nationalist doctrine of irredentism.[27] Namely, the Russian government targets and attacks areas with ethnic nationals, perhaps hoping to garner local support to their invasion.

Second, we examine the correlation between the Holodomor famine, a measure of historical repression, and modern conflict. The Great Famine or Holodomor occurred between 1932 and 1933, and killed approximately 3.9 million people (see Naumenko, 2021). Results are reported in Figure 11. Areas where famine severity was higher correspond with those that have had less confrontations in the modern struggle and where opposition to the invasion has been stronger. As noted before, this could be related to a

26 We thank Dominic Rohner for this point.
27 We thank Shanker Satyanath for guiding us towards this interpretation.

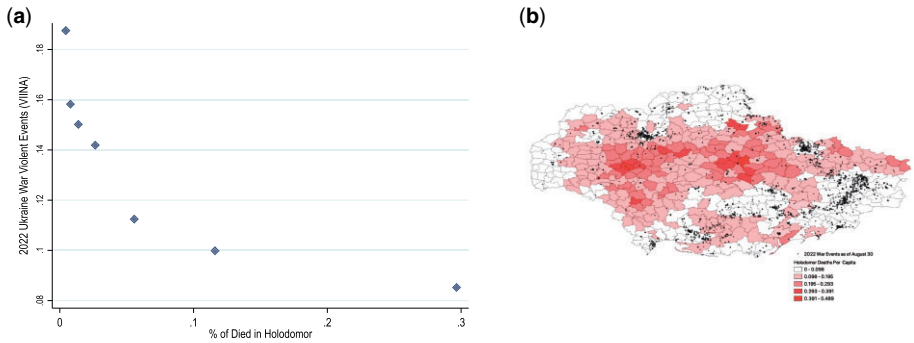

Figure 11. Violent events and Holodomor severity.

Notes: Panel (**a**) is binsreg of 2022 violent events in the Russian war against Ukraine, regressed on the percent of the rayon's population that died in the Holodomor famine, crop suitability (from UNFAO), elevation, forest coverage (from Zhukov, 2022), distance to Russia (quadratic) and region fixed effects ($N = 380$). Panel (**b**) is a heatmap of Ukraine in 1933, with darker red rayons signifying a higher proportion of famine deaths and the black dots represent Ukraine war events in 2022. Ukraine conflict data are from 30 August 2022.

Source: Data from Rozenas and Zhukov (2019) and Zhukov (2022).

higher historical presence of ethnic Ukrainians in these areas, in line with the findings of Markevich et al. (2021). These are also places where resistance has been stronger, perhaps given this history of repression.

We acknowledge the lack of a proper identification strategy, though several have been suggested in the literature (Rozenas and Zhukov, 2019). We note, however, that our empirical results are robust to controlling for the large set of controls described above, including distance to Russia, hold for areas at 200 km from the Ukrainian border, and for different types of violence classified in the modern data, such as airstrikes, anti-air defense, tank battles, arrests and Russian-initiated attacks. Notably, the correlations do not hold for other ethnic minorities, such as the Germans, in a placebo-type exercise. In a horserace with the two historical covariates, we find that both coefficients are of similar magnitude, but are marginally stronger for the Russian ethnicity results.

6. DISCUSSION AND POLICY LESSONS

Naturally, not enough time has passed for a long-term analysis of the current struggle, but the findings from the historical bombing and political repression literatures surveyed above suggest a bleak future for the affected areas, beyond the current humanitarian catastrophe. Ukrainian postwar recovery should remain in the global policy agenda for the years to come. We focus here on bombing and civilian repression, migration and gender, but acknowledge that there are other elements at play in the current war, such as cyber-attacks and financial sanctions.[28]

28 See https://cepr.org/themes/ukraine-initiative

Related to the above, and without aiming to be comprehensive, we highlight recent research related to the ongoing war with respect to trade disruptions, international sanctions and nuclear war.[29] Korovkin and Makarin (2021) show how the 2014 Russian–Ukrainian War led to a decrease in trade between these two countries. This decline was concentrated in Ukrainian areas with fewer ethnic Russians, and can be explained by an erosion of inter-group trust. Korovkin and Makarin (2022) document propagation effects of conflict using railway shipments data. Both papers document how conflict can affect non-conflict areas, speaking to the negative externalities of conflict. On the other hand, the war also opens up a possible trade reorientation towards the EU, which could more than compensate the disruptions just described (see Glick and Taylor, 2010). On the sanctions side, Nigmatulina (2021) documents how these restrictions distorted the Russian economy. The author documents a misallocation between state- and private-owned firms that prevented labour and capital input to flow towards the more productive firms. Counterintuitively, sanctioned firms gained capital inputs, as the government moved to protect targeted firms. Since the threat of nuclear war has been used in the current war, we briefly note some of the academic literature on this topic. We already mentioned (Davis and Weinstein, 2002) on the bombing of Hiroshima and Nagasaki. The lack of impact from a long-run population structure perspective contrasts with the findings for the Chernobyl disaster for pre-natal exposure in Sweden (Almond et al., 2009). Given the magnitude or the topic, this area of research deserves more academic attention, though nuclear incidents should be avoided at all costs.

There are other broader discussions that are beyond the scope of this piece. Though we point towards the importance of human over physical capital damages, we did not delve into other broad topics such as regime change and economic inequality. As hinted above, the political consequences of an economic shift towards Europe can be immense, with an eventual accession of Ukraine to the EU. However, political polarization might increase. Historian Walter Scheidel argues that only massive catastrophes such as war can reduce inequality (Scheidel, 2017), a lesson echoed in economics (Piketty and Saez, 2014). The empirical evidence is scant, but Heldring et al. (2022) provide a lead for Britain. They show that WWII bombing led to falls in inequality and an increase in the vote share for labour, especially in the north of the country. The issue of mobilization and the social contract is a core one during wartime. How do governments compensate their serving citizens and war veterans? This interplay of nation-building, state capacity and civic reciprocity is fertile ground for future research.

Having covered the relevant conflict literatures we close with five policy lessons from the three main topics analysed. From the long-term consequences of bombing, the demining agenda should become a priority postwar, to avoid a Conflict Trap situation where human capital and other key investments are halted. With regard to political

29 For a discussion on another topic relevant to the current situation, but with a focus on health and children see, 'Unaccounted long-term health cost of wars on wartime children'.

repression, we learn that the consequences can be long-lasting, as the social cohesion and trust between the citizenry and the state can be deeply eroded. The collective memory of historical events is also a powerful mechanism that could end up providing the necessary closure after a traumatic occurrence. With respect to migration and conflict, refugees should be integrated into regions with more promising labour market outcomes, something which is sometimes not possible or desirable due to more political considerations. Historically wealthier and younger people might have an easier time integrating, while women have a harder time, on average. Human capital and training programmes could take into account these realities to maximize their impact and minimize socioeconomic vulnerabilities. Return migration should take centre stage. Gender emerges as an important component in conflict literature. Sex ratio imbalances can have a long-term effect if they change the cultural norms with respect to work and leisure. Conflict can impact FLFP and marriage patterns, not only in the short run, but also in longer-term horizons and in developing countries. Though the sex ratio imbalances in Ukraine are not as extreme as in other conflicts, policy-makers can help mitigate their negative consequences while encouraging the positive ones. Perhaps the most important one to avoid is the plight of conflict-related sexual violence, a war crime that should be prosecuted in local and international courts, while bringing full assistance and support to the affected victims. Though the current realities of war in Ukraine are devastating, we hope that the lessons provided from history could inform policy-makers in an eventual postwar scenario.

APPENDIX

For a detailed discussion on the Reynal-Querol (RQ) Index, see Montalvo and Reynal-Querol (2005) and Esteban and Schneider (2008). According to the index, when a 'large majority' meets a 'large minority' there is a higher probability of social conflict.

The equation characterizing the RQ index is

$$\mathrm{RQ} = 1 - \sum_{i=1}^{N} \left(\frac{1/2 - \pi_i}{1/2} \right)^2 \pi_i. \tag{1}$$

When $\pi_i \to 1/2$, then $\mathrm{RQ} \to 1$.

Where π_i is the share of votes for candidate i in the second-round ballot of the 2010 Ukrainian presidential election. The nominated candidates were Viktor Yanukovych, a member of the Party of Regions (a pro-Russian political party), and Yulia Tymoshenko, a member of the All-Ukrainian Union 'Fatherland' (a pro-west political party). Data on the share of votes for each candidate, their respective

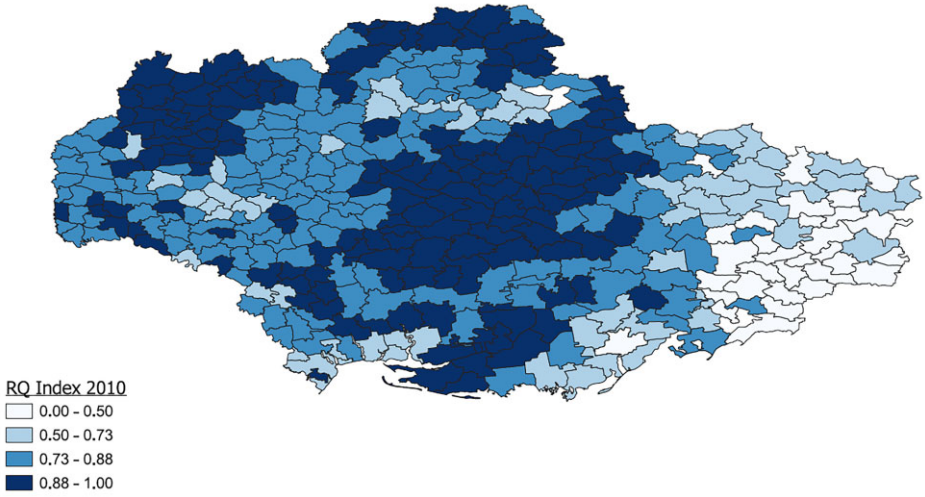

Figure A1. Political polarization in Ukraine.

Note: Reynal–Querol (RQ) index using 2010 Electoral information.

Source: Data from Rozenas and Zhukov (2019). Map uses the 1933 borders of Ukraine.

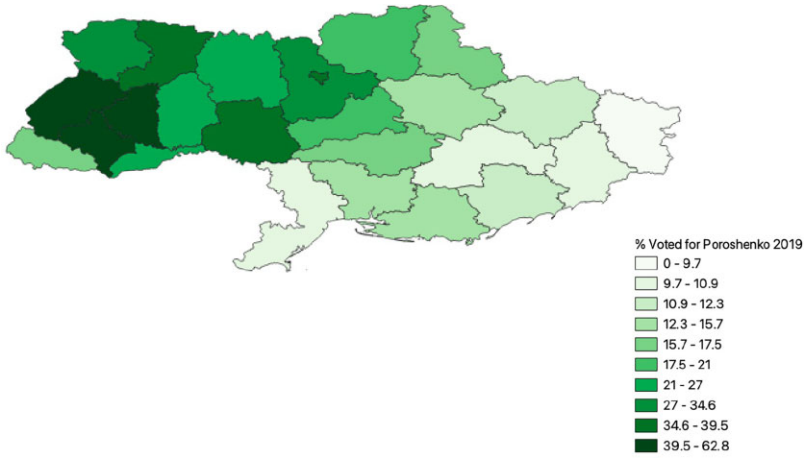

Figure A2. Votes for Poroshenko, 2019.

Source: Data from Ukrainska Pravda (2019). Accessed December 2022. No data for Crimea.

classification (pro-Russian or pro-west) and the geographical location, are from Rozenas and Zhukov (2019).

The RQ index was initially developed to capture ethnic polarization – however, here, we use it to approximate political polarization. In particular, we approximate it considering π_i as a measure of the proportion of individuals belonging to a specific group: pro-Russian or pro-west.

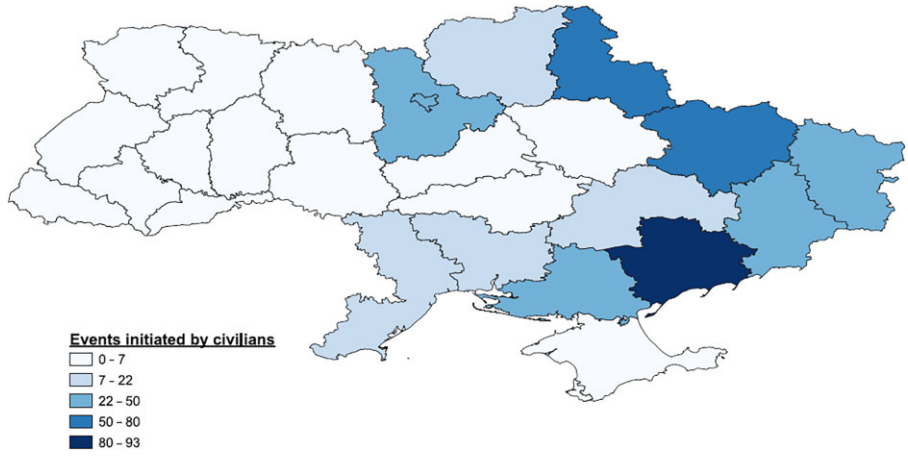

Figure A3. Violent events initiated by civilians.

Source: Violent events data from 23 February to 30 August 2022, VIINA database (Zhukov, 2022) at the first administrative geographic level.

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