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Economic Challenges and Costs of Reintegrating the Donbas Region in Ukraine

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The conclusions and recommendations developed in this report represent a compromise formulation on which the research team could agree. As such, they should not be directly attributed to individual authors of the report.

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Abstract

This study provides a systematic assessment of the costs of the ongoing armed conflict in the Donbas region of Ukraine. By combining the pre-war geographical distribution of fixed capital with data on battle intensity, survey evidence on household damage in the conflict-affected areas and novel data on the macroeconomy of certain areas of the Donetsk and Luhansk regions, the report estimates the minimum reconstruction costs of the region at USD 21.7 billion. On the basis of the composition of the costs, the study argues that the government's main focus should be on restoring the basic institutions that are usually taken for granted in most economies: the markets and state capacity. The study proposes the key features of a reconstruction plan to help achieve this goal.

This plan – assuming a lasting ceasefire is being observed – involves a continuation of the reform path in order to achieve sustainable and inclusive economic growth, to attract both foreign and domestic investments, improve the well-being of Ukrainian citizens and increase the opportunity costs of conflict. The systematic collection and dissemination of data on the Donbas region is essential. Ukraine should strive for balanced trade with the rest of the world. Last but not least, ensure that the peace settlement is durable. In the case of the Donbas this would mean an additional agreement that would not substitute the Minsk II Agreement but would both help to implement and complement it.

Keywords: conflict economics, political economy, international conflict, Ukraine, restoration, Donbas

JEL classification: F50, F51, H12, H56, O52, I38, Q34

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ABBREVIATIONS

BMEIA	Austrian Ministry of Foreign Affairs
CADLRs	Certain areas of Donetsk and Luhansk regions
CESEE	Central, Eastern, and Southeast Europe
CPI	Consumer price index
DCFTA	Deep and Comprehensive Free Trade Area
DNR	Donetsk People's Republic
LNR	Luhansk People's Republic
EBRD	European Bank for Reconstruction and Development
EDA	Swiss Federal Department of Foreign Affairs
EFF	Extended fund facility
EIB	European Investment Bank
ERW	Explosive remnants of war
EU	European Union
FARC	Revolutionary Armed Forces of Colombia
FDI	Foreign direct investment
FX	Foreign exchange
GAR15	Global Assessment Report on Disaster Risk Reduction 2015
GDP	Gross domestic product
IDP	Internally displaced persons
GCT	Government-controlled territory
IMF	International Monetary Fund
LFS	Labour force survey
NPL	Non-performing loans
NEK Ukrenergo	National Power Company Ukrenergo
ODA	Official development assistance
OHCHR	Office of the United Nations High Commissioner for Human Rights
OSCE	Organisation for Security and Co-operation in Europe
PPP	Purchasing power parity
SAGSUR	Strategic Advisory Group for Supporting Ukrainian Reform
SBA	Stand-by arrangement
SMM	Special Monitoring Mission of OSCE in Ukraine
UAF	Ukrainian armed forces
UAH	Ukrainian Hryvnia
UN	United Nations
UNOCHA	United Nations Office for Coordination of Humanitarian Affairs
URA	Ukraine Reform Architecture programme
USA	United States of America
USD	United States Dollar
USSR	Union of Soviet Socialist Republics
VIIRS	Visible Infrared Imaging Radiometer Suite
wiiw	Vienna Institute for International Economic Studies
xSub	Cross-sub repository of event data on armed conflict

The implications of COVID-19 for this study

This study was prepared before the COVID-19 outbreak plunged the global economy into crisis. Although the crisis will have a significant impact on Ukraine and the Donbas region, incorporating the changes and impact analysis in the present study is problematic for at least two reasons.

First, there is lack of credible and comprehensive data on the impact of the global pandemic on the war-affected population. This makes it hard for us to provide an up-to-date reassessment of the reconstruction costs of the region given the virus outbreak. The OSCE Monitoring Mission continues to report ceasefire violations and is facing restrictions on movement in both Donetsk and Luhansk regions[1].

Second, the COVID-19 crisis is still unfolding. The uncertainty regarding the magnitude and length of the economic downturn makes it hard to separate the short-term fluctuations and the long-lasting effect.

For these reasons, we have decided to provide this short introductory text instead of altering the whole report. Contrary to the core of report, this note is based largely on episodic and anecdotal evidence. We therefore emphasise that the following discussion is based on our conjectures rather than on thorough investigation. Nevertheless, however incomplete, we think it is necessary to provide an updated outlook for our readers and point out the additional conflict dimensions, which might be affected by the crisis.

In the short-term, the economy of Donbas is going to be less affected by the contraction of international trade than almost anywhere else in Europe, including the rest of Ukraine. However, the larger share of the informal economy and the poor capacity of the healthcare services in the Donbas (Reach-initiative.org, 2020) are likely to amplify the potential negative effects of the crisis on the region.[2] As everywhere, the sick, the old and the poor are going to be affected the most. However, there are increased risks for the following population groups in Certain Areas of the Donbas and Lugansk Regions (CADLRs):

› Internally displaced people who live in conditions with bad sanitation;

› Those residing close to the contact line with a limited access to healthcare services;

› The elderly population in CADLRs.

The latter group is likely to be affected particularly badly. The closure of the checkpoints across the line of contact since 21st March 2020 effectively prevents the elderly population of the CADLRs from collecting their pensions, which are a critical source of income. Apart from that, the poor state of the

1 https://www.osce.org/special-monitoring-mission-to-ukraine/449656

2 According to the survey of hospitals located in the government-controlled territories, the major problem is low capacity of the local medical facilities to provide an adequate emergency response. The deficiencies were most pronounced in lack of necessary equipment for personal protection, insufficient capacities to collect samples, poor logistics for suspicious cases, and infrastructure issues (access to clean water and waste disposal of infectious waste). (Reach-initiative.org, 2020; p. 1).

healthcare services – staffed at 60 to 70% of the required capacity[3] – raise doubts regarding the ability of the CADLRs' authorities to properly handle the consequences of the virus outbreak.

Therefore, we recommend that the Ukrainian government and the authorities in charge in the CADLRs:

a) Provide intensive randomised testing for internally displaced people living in temporary housing; b) Strengthen healthcare service capacity for the population residing close to the contact line;
b) Develop a solution for transferring social service payments for the CADLRs population – an issue that should have been solved long ago anyway.

In terms of estimations provided for the costs of reconstruction in the main report, one has to bear in mind three points. First, the virus outbreak will eventually increase the human capital expenditures needed for future reintegration. The negative effects will materialise in the form of a higher death toll and adverse long-term health consequences (e.g. higher rate of chronical diseases) that result in a lower productivity of the labour force.

Second, the quarantine measures increase the chance of technological disasters due to lower on-site presence of workers at the critical enterprises of the Donbas region. The reconstruction costs of securing the environment and fixed capital will rise should this risk materialise.

Third, financing of the reconstruction will become more costly in the short term and more difficult in the medium term. Global macroeconomic uncertainty will increase borrowing costs on the capital markets for emerging economies and overstretch the capacities of the international financial institutions. As of April 5th 2020, 85 countries have already approached the IMF with requests for financial assistance to mitigate the crisis. The IMF made clear that the funds are limited and prioritise the poorest countries (IMF, 2020). Should this environment prevail in the longer run, the Ukrainian government will necessarily need to expand the horizon of the restoration program and/or mobilise other resources.

All these arguments reinforce a central point, which we have emphasised elsewhere in the text: our estimation is the lower bound for the reconstruction costs of Donbas. The global recession will make these costs even greater.

However, the global recession also creates some grounds for optimism in the peace settlement process. However counterintuitive and uncharacteristic for economists it might sound, there is a straightforward logic behind it: in times of an economic crisis, the opportunity costs of an armed conflict rise. Fighting two wars – with both the epidemic and political opponents – is expensive. We do not expect these effects to take place immediately after the recession starts. Instead, we are likely to observe them with a significant lag following the deterioration of the fiscal positions of the conflict parties.

Since the economic activity of CADLRs critically depends on the financing from the Russian Federation, the Kremlin's expectations regarding its fiscal position become of critical importance. Like most emerging markets, Russia will have to apply a massive fiscal stimulus to avoid economic collapse, but the conditions under which it is facing the crisis are unfavourable. Unlike the developed countries of Western Europe, the Kremlin cannot finance the spike in public expenditures through quantitative

[3] DNR-live.ru, 2020

easing. Meanwhile, unlike some other developing countries, the size of the Russian economy is too big to be supported exclusively through the IMF lending. The Russian financial vulnerability is compounded by a simultaneous collapse of energy prices. Russian foreign exchange reserves (more than USD 550 billion as of end-March 2020) can mitigate the most critical adverse effects, but not finance a huge stimulus programme. Nonetheless, strategic considerations may ease some purely financial considerations related to COVID-19 crisis.

If the current crisis develops into a prolonged recession, Russian fiscal stability could be called into question. If the global economic downturn lasts longer than a year, the Kremlin will have to decide whether the expensive support of the satellite states is worth the political gains. As the rapid dissolution of the Eastern bloc in the late 1980s showed, changes in that respect might occur quickly and previous commitment is a poor signal for assessing the future actions of the parties. Given the long production cycle for a vaccine and unresolved structural imbalances in the world economy, a double dip recession with a wave of corporate and state defaults is not an alarmist conjecture. This scenario is already being explored in academia (Baldwin, 2020; Jenny, 2020). Therefore, there appears to be a higher chance than previously that the Kremlin will adopt a more accommodative foreign policy in the coming years.

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Executive summary

The landslide victory of Volodymyr Zelensky in the 2019 presidential election marked a radical change of elites in Ukraine and turned a fresh page in the government's attempts to end the war in Donbas. The strong commitment of the new president to resolving the conflict sparked hopes for restoration of the war-torn region; but the exact plans of the government for the future post-conflict stage remain largely unclear. This is not surprising. A reconstruction plan requires careful analysis of the whole Donbas economy; but a complete picture is not readily available, because the state of the economy in those areas outside government control remains unknown. This study addresses this gap by providing a systematic account of the economic state of the Donbas region, including certain areas of the Donetsk and Luhansk regions (CADLRs). Using the pre-war geographical distribution of fixed capital, along with data on battle intensity, survey evidence concerning household damage in the conflict-affected areas and novel macroeconomic data in the CADLRs, the report estimates the reconstruction costs of the Donbas region.

The study puts the minimum costs of reconstruction at USD 21.7 billion. This includes damage to physical capital (44%), human capital expenditure (40%) and the mitigation of environmental threats (16%). The research team emphasises that the costs represent the lower bound, as the analysis has left out cost components that are hard to assess due to lack of credible and systematic evidence for the whole region. These include the reallocation costs of the internally displaced population, greater health spending due to decay in the capacity of the state healthcare services, and the costs of environmental rehabilitation.

The volume and composition of the costs lead us to two major conclusions. First, the conflict has reached a stage where armed skirmishes themselves are not the biggest contributors to the economic problems of the region. A large proportion of the costs (42%) is attributed to the disruption of business continuity processes and state capacity, capital depreciation and the liquidation costs of mines. Simply ejecting bullets from the magazines of guns will not be enough to reboot the economy of Donbas – the government needs to develop a full-scale programme to restore the basic economic institutions: markets and state capacity. The study outlines a plan that should achieve the following goals:

a. Ensure security by demining the region and eliminating environmental threats
b. Return the displaced population and refugees by rebuilding infrastructure and employing cash assistance programmes
c. Promote long-term sustainable economic growth by attracting domestic and foreign investors using preferential investment schemes and by clearly resolving property-rights issues within the framework of transitional justice
d. Support post-war resilience by supporting administrative capacities and the political engagement of the CADLRs.

Our second conclusion is that the amounts involved are too great to be covered by Ukrainian taxpayers. The minimum estimated costs amount to one third of the annual revenues of Ukraine's state budget, or 16% of GDP in 2018. Although the study highlights how Ukraine can use both legal enforcement and cooperation with Russia to finance some of the restoration activities, we believe that external finance is the most viable option for the government. Should the international financial markets regain full confidence in the coming years, the government of Ukraine should take the opportunity to issue long-term bonds.

Although these suggestions are based on evidence, there is no guarantee that the plan outlined above – even if followed completely – will lead to lasting peace. As experience of other war-torn countries shows, one should constantly expect slip-ups and tension during conflict resolution. Yet the chances of a positive outcome would be increased if the government were to provide credible evidence for the local population of its long-term commitment to the pursuit of inclusive policies. There are several ways to achieve this: by promoting the political participation of the regions, by providing self-governance tools and by adopting binding long-term guarantees at the highest legal level to prevent discriminatory policies against ex-combatants. Yet a prosperous state with a solid economy would be the best proof of concept. For that, Ukraine should solve the long-standing problems by overcoming vested interests, fighting corruption and continuing the path of reform.

Introduction

In 2020, the military conflict in eastern Ukraine ('Donbas') will mark its sixth 'anniversary'. The conflict started in March 2014, when, in the wake of the annexation of Crimea by the Russian Federation, protests by Russian-backed anti-government groups in the Donetsk and Luhansk oblasts (regions) of Ukraine escalated into an armed conflict with the Ukrainian government. An 'anti-terrorist operation' was launched by the Ukrainian authorities in reaction to the seizure by local insurgents of administrative buildings in Kharkiv, Donetsk and Luhansk in April 2014. With so far over 13,000 dead (more than 3,000 of them civilians) and up to 30,000 wounded (more than 7,000 of them civilians), this is the bloodiest conflict in Europe since the end of the war in former Yugoslavia. The Organization for Security and Co-operation in Europe's (OSCE) Special Monitoring Mission (SMM) to Ukraine continues to report violations of the ceasefire and minor skirmishes across the contact line almost every day. Despite some progress having been made in resolving the conflict, especially after the recent change of political leadership in Ukraine, military actions continue, along with a deterioration in daily life, social services, infrastructure, economic activity and the environment in this densely urbanised and industrialised parts of the Donetsk and Luhansk regions.

The fresh peace agenda promoted by the new Ukrainian government marks an improvement and revives interest in reintegration of the 'certain areas of Donetsk and Luhansk regions' (CADLRs) controlled by separatists. Nonetheless, the factual basis for the reintegration plans remains unclear, because information on the economies of the separatist 'republics' is incomplete and unsystematic. More often than not, the discussion surrounding the economic state of the CADLRs is based on speculation, rather than solid analysis. We believe, however, that policy decisions of such importance require a sound foundation. This study attempts to establish it by providing a systematic account of the economics of CADLRs and the economic costs required to restore the Donbas region.

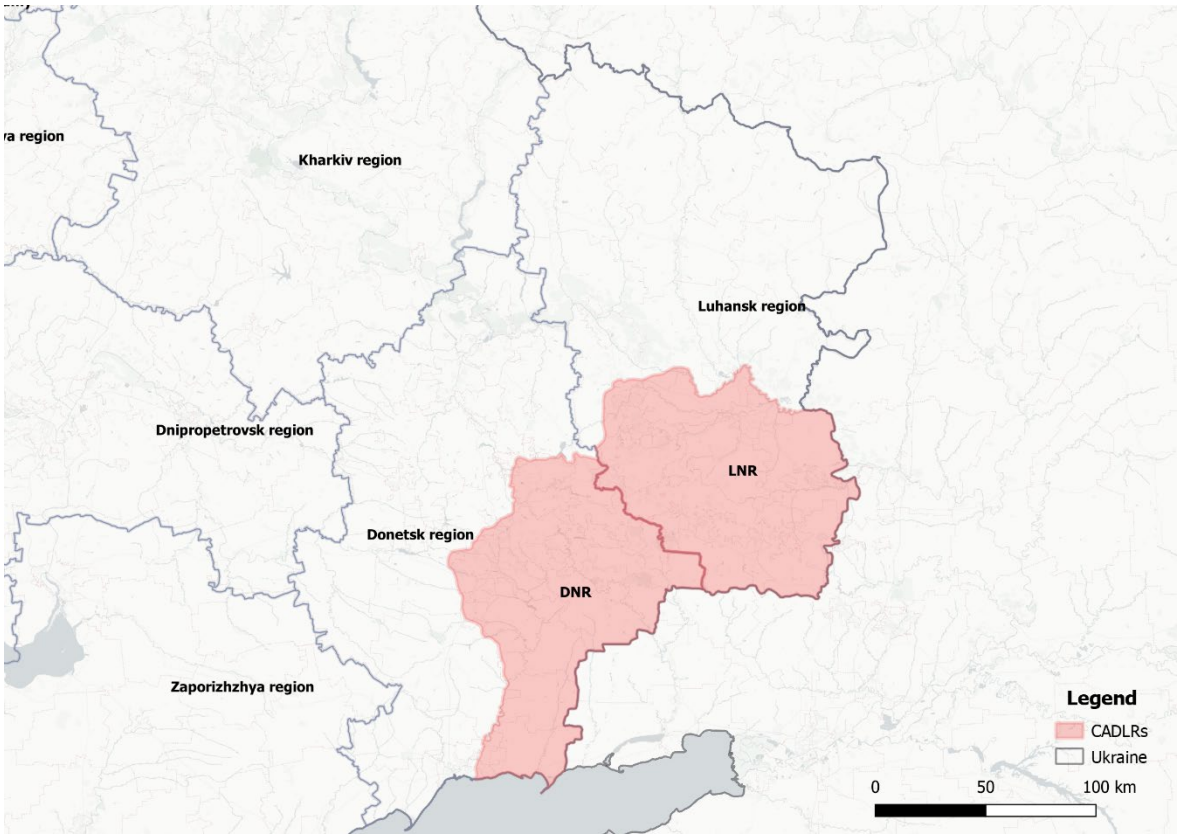
Our contribution is threefold. First, we provide the most up-to-date overview of the separatist macroeconomy. We confront the labour market evidence collected from open access separatist websites with comparable statistics from the government-controlled territory (GCT) and examine the estimations in the light of the findings of other researchers.

Second, we transparently evaluate and present the restoration costs for Donbas, based on comprehensive evidence from field surveys, open access sources, satellite imagery, news, and insight documents. Unlike other studies, we clearly report the methodology and the sources employed in the estimation, in order to assure transparency and replicability of our results. Additionally, we carefully discuss the critical assumptions of the calculations and show the direction for future improvement of the estimations.

Finally, we provide recommendations based on the calculation results and the conflict and post-conflict experiences of the Ukraine's peer countries. We hope that international experience of post-war conflict resolution will provide theoretically sound and practically feasible advice for policymakers.

Overview of the Donbas conflict

Figure 1 / Areas of Ukraine not under government control

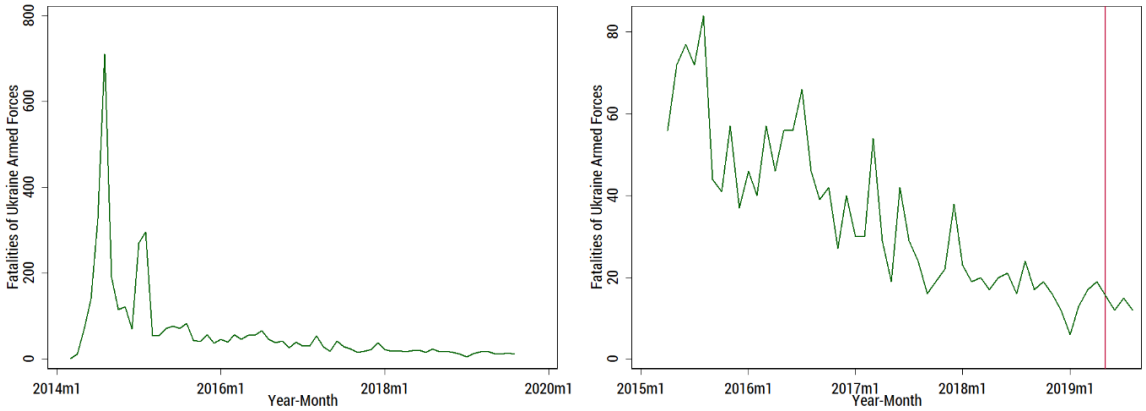


Note: Gauss-Krueger 7 Projection.
Source: OpenStreetMap, Kochnev (2019a).

THE WAR IN DONBAS: A LONG VIEW

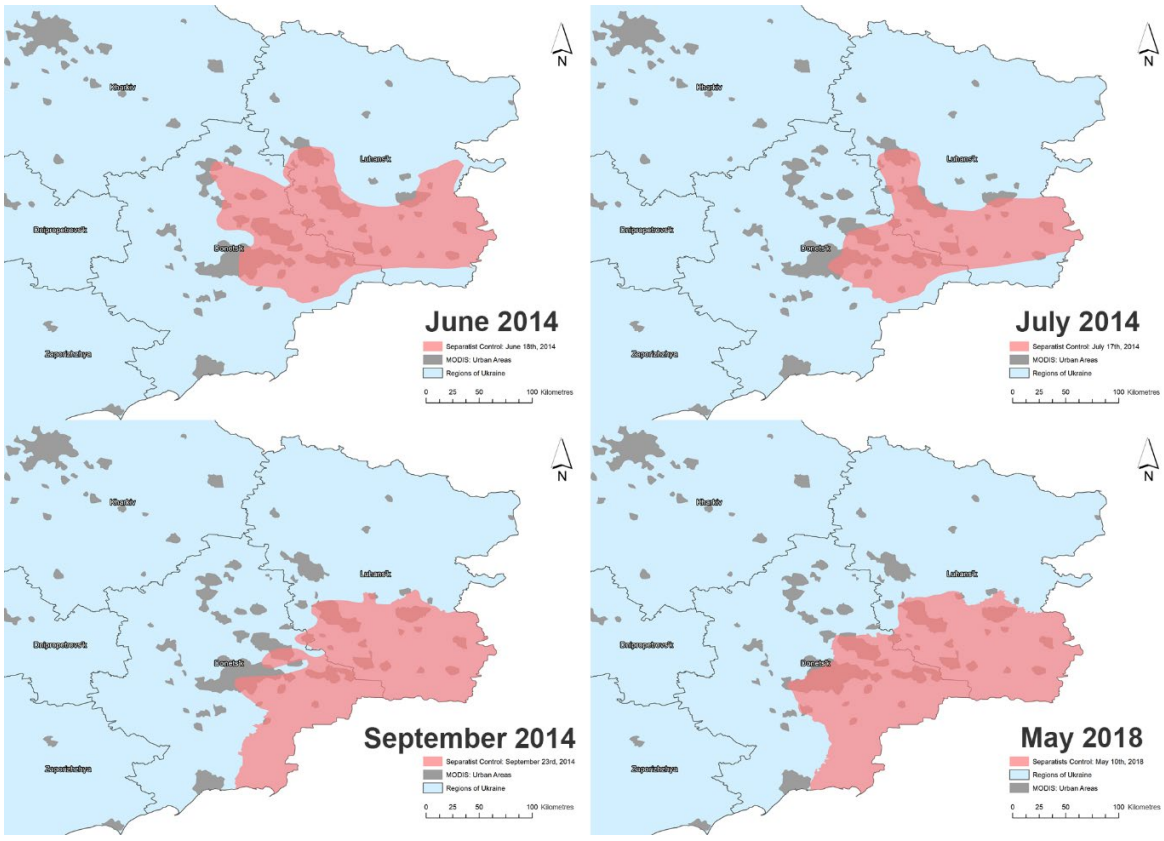
The war in Donbas can be crudely split in two major parts: before the Minsk II agreement and after. This becomes evident if one looks at the time series of the fatalities of the Ukrainian armed forces (UAF) according to the collaborative project 'Memory book'. The figure below shows that the battle intensity had two peaks: in August 2014 (the Ilovaisk battle) and January 2015 (the Debaltsevo battle).

Figure 2 / Number of fatalities of the UAF during the conflict. Left panel: complete sample; Right panel: sample since March 2015



Source: Memorybook.org.ua (2020), collected and processed by wiiw.

Figure 3 / Evolution of the 'uncontrolled' territories



Source: Mediarnbo.org, digitised by A. Kochnev.

The initial stage of the conflict was characterised by an unstable territorial control and wide presence of semi-autonomous paramilitary groups on both sides.[4] The poor military organisation of the UAF allowed the rapid expansion of the separatist forces, which continuously extended their territorial control until May 2014.[5]

The separatists started to systematically confront the UAF forces from June 2014, and almost immediately began to lose their positions. Figure 3 shows that the geography of insurgency rapidly shrank in the course of July 2014. As Igor Girkin – in August 2014, the commander in chief of the separatist armed forces – recalled, the separatists were able to withstand the offensive only thanks to military support from Russia (Zavtra.ru, 2014).[6]

The Minsk agreements that followed heavy fighting in August 2014 and January 2015 have been heavily criticised for not being able to set up a framework that would ensure a stable ceasefire (Euromaidanpress, 2020; Pifer, 2016). Yet as Figure 2 shows, both of them were followed by a rapid decline in conflict intensity. Despite considerable variation in the post-Minsk II period, the number of fatalities declined from ca. 70 per month at the beginning of 2015 to 20 a month by 2018.

This change reflects the post-Minsk II nature of the skirmishes: entrenched warfare superseded the open large-scale confrontation characteristic of the early stage of the conflict. This brought both positive and negative effects. On the one hand, this transition was associated with a reduction in civilian casualties, which dropped rapidly from 733 in November 2014 – February 2015 to 30 in the period November 2016 to February 2017 (OHCHR, 2019). On the other hand, armed troops used this opportunity to set up defensive positions and expand minefields along the line of contact. As a result, Donbas became one of the most landmine-contaminated regions in the world.

CURRENT STATE

Since 2018, however, little progress has been observable. Despite the change in executive power in Ukraine and some progress in peacebuilding activities in 2019 – exchange of captives and withdrawal of armed forces from several locations – the intensity of the armed conflict has not declined significantly. The change in the Ukrainian leadership in 2019 brought a positive impulse. Yet, it was primarily limited to trust-building measures involving an exchange of prisoners, the withdrawal of forces from Pitrivske and Zolote, and a ‘Normandy’ meeting in December 2019.

The count of ceasefire violations[7] before and after recommitment to the latest ceasefire in July 2019 provides no grounds for optimism: although a July ceasefire took immediate effect, it lasted no longer than a week. Figure 4 shows that since early August 2019, the number of ceasefire violations has bounced to 300-400 cases per day.

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4 Zhukov (2015, Online Appendix, p. 8) distinguishes 41 pro-government and 13 separatist groups.

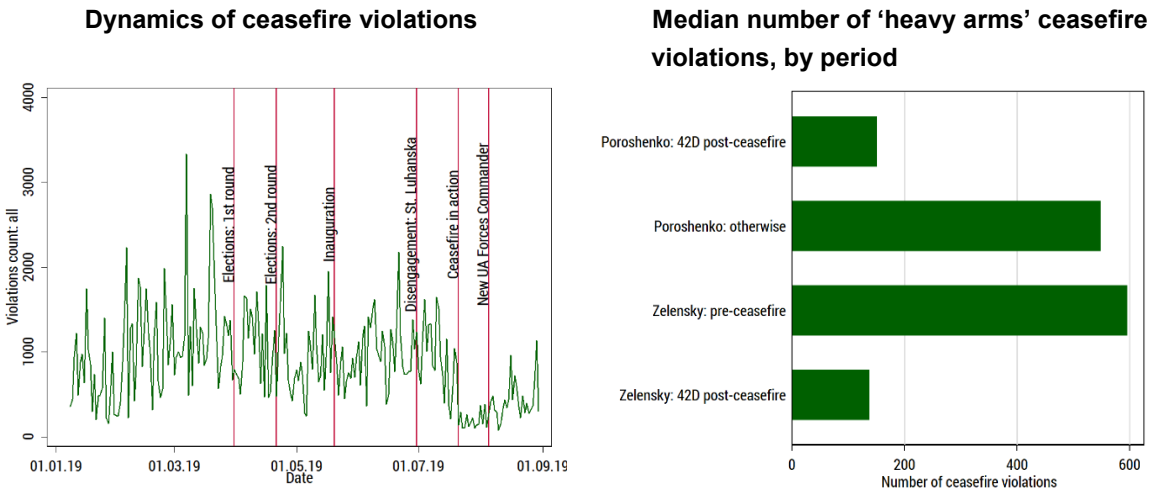
5 Oleg Tenukh, the acting minister of defence said in a parliamentary speech on March 2014: ‘[O]nce I give an order, 20,000 [soldiers – A.K.] must be ready. The actual state is that only 6,000 are ready’ (Rada.gov.ua, 2014).

6 For journalistic evidence, see Tsvetkova (2015, 2018), Kostjuchenko (2015), Memorialmap.org (2020) and Informnapalm.org (2020).

7 Technically the whole post Minsk II period is subject to a ceasefire agreement. Yet, as the Minsk II ceasefire is constantly violated, sides occasionally agree to recommit to the ceasefire. Since the Minsk II ceasefire is not fulfilled, we use the word “ceasefire” and “ceasefire recommitment” interchangeably.

The July ceasefire brokered under Zelensky also shows no improvement over the last ceasefire attempt, when Poroshenko was still in power. The right panel of Figure 4 shows that the median number of violations during the first post-ceasefire days under Zelensky – performed presumably by heavy arms – was close to 200 per day and did not differ much under a comparable period under Poroshenko.

Figure 4 / Number of ceasefire violations under Poroshenko and Zelensky



Note: Left panel: Stanytsia Luhanska (St. Luhanska) is a settlement close to the line of contact and features the only checkpoint from CADLRs to GCT in the Luhansk region. The checkpoint is characterised by regular shelling and armed fighting. Right panel: counts violations recorded by the OSCE as 'explosion', 'projectile', 'muzzle flash', 'airburst' or 'missile'. 42D stands for 42 'days'
Source: Kochnev (2019b).

The subsequent withdrawal of weapons in Pitrivske and Zolote did not have a lasting effect either. As the OSCE SMM report of 22 February 2020 shows, the monthly average of ceasefire violations has returned to its 'standard' level of more than 500 cases per day.[8]

POLICIES OF UKRAINE AROUND THE CONFLICT

After the failure of the offensive in summer 2014, the government of Ukraine started to implement a set of policies to regulate economic relations between the GCT and the CADLRs. The CADLRs were defined as *'temporarily occupied and uncontrolled territories of Ukraine'*. According to the policies effectively introduced in November 2014 and January 2015, the state restricted access to the areas and withdrew all services from the uncontrolled territories. That is, the government created massive pressure for enterprises and people to relocate to the GCT. This decision triggered a 'commuting' style of migration from the CADLRs to the GCT, as people went to avail themselves of social services; this remains a characteristic feature of local migration between the territories.

Although most enterprises had to relocate to the GCT to comply with Ukrainian law, the largest industrial enterprises were granted exemptions. The government of Ukraine allowed the largest industry producers to trade in goods and services across the line of contact, conditional on registration in the GCT. This situation changed in January 2017, when civil activists – composed mainly of war veterans who were

[8] See OSCE SMM Daily Report 43/2020 (https://www.osce.org/special-monitoring-mission-to-ukraine/446905).

motivated to stop the trade, which they perceived as morally indefensible – blockaded the railway connection between the CADLRs and the GCT. As a reaction to that, the 'authorities' of the Donetsk People's Republic (DNR) and the Luhansk People's Republic (LNR) seized control of 46 enterprises that enjoyed special trading privileges. Following this move, Ukraine's government introduced a complete ban on trade with the separatist economies.

Most of the affected enterprises were major regional industrial plants (steel, coke, chemical plants), coal mines and energy companies that were of strategic importance for the region and were especially important in terms of local employment. Before the conflict, the CADLRs represented important regional clusters and contributed significantly to Ukrainian GDP and exports (Figures 5 and 6 below, see also Annex 1).

MEDIATION EFFORTS

Since 2014, the political representatives of EU countries have undertaken efforts to mediate between the warring parties, in order to achieve a peaceful settlement to the conflict.[9] The most prominent result was the **Minsk Agreement of 12 February 2015,** negotiated by German Chancellor Merkel, French President Hollande, Ukrainian President Poroshenko and Russian President Putin after 17 hours of difficult talks.[10] Since then, the peace dialogue has continued at different levels in the Normandy Format and the Trilateral Contact Group (OSCE, Ukraine, Russia). A fresh impetus in peace negotiations occurred after the March 2019 Ukrainian presidential election and the formation of a new government in the country that September. Having campaigned successfully on the peace programme to win with more than 70% approval in the second round of the election, the new President Volodymyr Zelensky launched fresh peace initiatives immediately following his inauguration in May 2019 – in particular a ceasefire and the exchange of prisoners. The issue of lifting the economic blockade of CADLRs was discussed as well.

BOX 1 / THE DECENTRALISATION ISSUE

A large part of the disagreement surrounding the implementation of the Minsk II agreement relates to the proper sequencing of elections, border control and the legal implementation of the special regime in certain districts of Donetsk and Luhansk regions (presumably those that are defined as CADLRs now). The Ukrainian government insists that the special regime should not be part of the constitutional change and must fit the framework of the decentralisation reform that was started in April 2014 and should finish in autumn 2020 (Sologub, 2020). The Russian authorities, however, insist that the special regime and its characteristics must be set out explicitly in the constitutional amendments.

Source: adapted from Romanova and Umland (2019); Sologub (2020).

On 1 October 2019, again after protracted negotiations, a breakthrough occurred as the representatives of Ukraine, Russia, the OSCE and the CADLRs signed a letter containing a commitment to implement

[9] For various peace settlement proposals and negotiations, see, for example, UP Foundation (2019).

[10] However, the Minsk II agreements were signed not by the above heads of state, but by representatives of Ukraine, Russia and the OSCE, as well as by the leaders of the DNR and the LNR, A. Zakharchenko and I. Plotnitsky. The Minsk Agreement has not been implemented.

the so-called '*Steinmeier Formula'*, which calls inter alia for elections to be run in the separatist-held territories according to Ukrainian legislation and under OSCE supervision.[11] If the OSCE judges the ballot to be free and fair, then the territories will be awarded 'special self-governing' status and Ukraine will regain control of its eastern border with Russia.

The Ukrainian president maintained that implementation of the 'Steinmeier Formula' for holding local government elections in the occupied parts of the Donbas would be conditional on the complete withdrawal of all troops and on Ukraine retaking control of the Russian-Ukrainian border. Without this precondition, the full implementation of the Minsk II agreements would be seen by the Ukrainian public as a betrayal of the national interest to protect Ukrainian sovereignty. However, so far there have been no indications that the Russian side is willing to fulfil this condition (Rbc.ru, 2019). In Ukraine, there have been numerous protests against Zelensky's peace initiative by Ukrainian nationalists and opposition activists in both Kyiv and Lviv, and at the Donbas ceasefire line.

The *Normandy Meeting* in Paris on 9 December 2019 did not result in any real breakthrough, but at least the ceasefire was prolonged, and there was another exchange of prisoners later that month. The memorandum signed at the Normandy Summit in Paris includes essentially three points (see Box 2).

BOX 2 / KEY CONCLUSIONS OF NORMANDY PARIS SUMMIT OF 9 DECEMBER 2019

1. Stabilise the situation in Donbas

- conclude a ceasefire by the end of 2019;
- update and implement the existing plan to remove landmines from Donbas;
- open new crossing points for civilians along the front line within 30 days;
- give the OSCE special monitoring mission full access to Donbas and allow it to work 24 hours a day, rather than the current 12;
- pull back troops at three more sites on the front line by the end of March 2020, with the areas to be identified soon (President Zelensky has promised that this will not jeopardise Ukraine's defence interests);
- hold a prisoner swap by the end of the year to launch an 'all for all' series of prisoner exchanges.

2. Start implementing the Minsk protocols

- grant the occupied Donbas special status on a permanent basis (the law granting the region a degree of self-governance will only come into effect on the day of local elections in the region);
- incorporate the 'Steinmeier Formula' into Ukrainian legislation, if necessary.

3. Continue negotiating

- the countries' foreign ministers and political advisers will continue meeting;
- the Normandy four will meet again in four months' time to discuss 'the political and security conditions, inter alia for the organization of the local elections'.

Source: https://www.kyivpost.com/ukraine-politics/what-ukraine-achieved-in-paris.html

[11] See, for example, UP Foundation (2019). Elections conducted on the CADLRs on 11 November 2018 were recognised neither by Ukraine nor by its Western partners.

Personnel changes that occurred in Moscow at the end of January 2020 may indicate a shift in Russian policies towards Ukraine: V. Surkov, who had previously been in charge, was replaced by Deputy Prime Minister V. Kozak, who has a positive track record in Ukraine-Russia negotiations, such as an exchange of captives in 2019 (Antonova et al., 2020). In Ukraine, A. Yermak, President Zelensky's newly appointed chief of staff, said in February 2020 that reaching peace with Russia would be his main priority in his new role.[12]

SUMMARY

The findings of this section provide good and bad news. The good news is that despite repeated ceasefire violations, fatalities in Donbas are currently at their lowest level since the beginning of the conflict. Moreover, the new Ukrainian leadership has shown commitment to the peace process and readiness for compromise. This has allowed some progress to be made in diplomatic negotiations and a number of trust-building measures to be initiated.

The bad news is that the mode of interaction between the government forces and separatists limits the potential for further improvement at the contact line. We do not see how one can further reduce warfare along the line of contact without introducing additional mechanisms to control and prosecute ceasefire violations. A similar conclusion follows the diplomatic negotiations. Although the new Ukrainian team has been able to score tactical successes, the fundamental problems of implementing the Minsk agreements – the legal implementation of the 'special regime' for the CADLRs and lack of consensus on establishing border control and local elections – remain unresolved.

[12] See *Kommersant*, 25 January 2020; Aslund (2020); Kyiv Post, 12 February 2020.

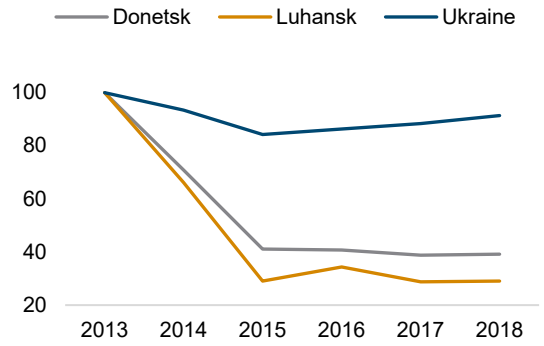
The war in Donbas and the economy

THE MACROECONOMY OF UKRAINE

Immediate effects

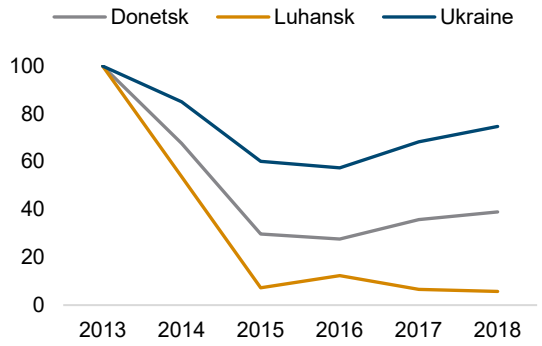
The armed conflict in Donbas has had a significant impact on the economy of the country. In 2014 and 2015, the Ukrainian economy contracted by 6.6% and 9.8%, respectively, with Donbas region undergoing even more severe economic decline (Figure 5, Annex 1, Annex 2). According to official statistics, in 2014 industrial production dropped by more than 30% in Donetsk and by more than 40% in Luhansk, accounting for most of the 10% decline in Ukraine as a whole. Coal mining and the metals industry – both heavily concentrated in war-torn areas – were particularly hard hit: those industries dropped by 30% and 15%, respectively, while machine-building, whose main export market was Russia, also reported a strong decline (-20%).

Figure 5 / Index of GDP growth, 2013=100



Note: Data starting from 2014 exclude the occupied territories of Crimea and Sevastopol and temporarily occupied territories in the Donetsk and Luhansk regions.
Source: State Statistics Service of Ukraine.

Figure 6 / Index of goods exports, 2013=100



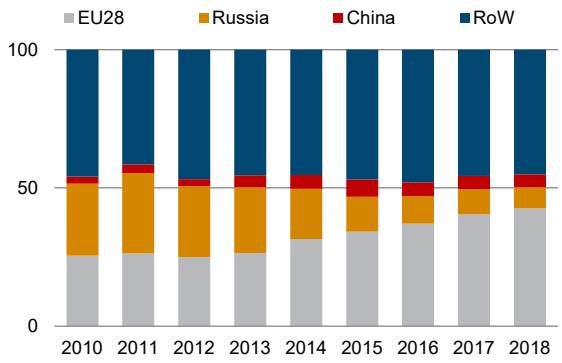
Note: Data starting from 2014 exclude the occupied territories of Crimea and Sevastopol and temporarily occupied territories in the Donetsk and Luhansk regions.
Source: State Statistics Service of Ukraine.

Exports to Russia, which used to account for a quarter of Ukraine's exports, plummeted by 35% in US dollar terms in 2014. Exports to the European Union increased by 12%, but that could not offset the decline in exports to Russia and the rest of the world. In 2015, the exports decrease continued, and over 2014-2015 the value of Ukraine's merchandise exports decreased cumulatively by about 40%. Yet export dynamics turned positive from 2017, as some exporters gradually reoriented themselves to different markets (Figure 7, see also Annex 1, Annex 2).

Painful transition

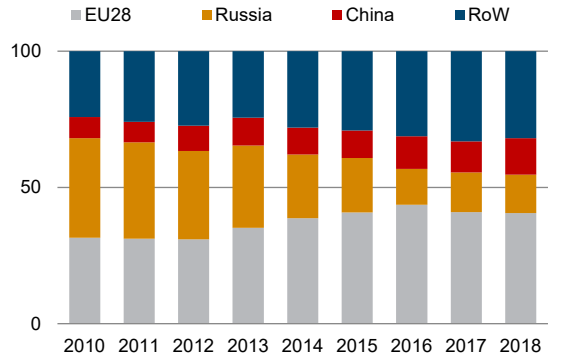
By 2018, the EU was taking more than 42% of Ukrainian exports, while Russia accounted for less than 8%, according to UN Comtrade data. In terms of imports, the shift in regional trading partners was also spectacular, with a severe decline in war-affected Donetsk and Luhansk.

Figure 7 / Ukraine's export partners



Source: wiiw calculations based on UN Comtrade Database.

Figure 8 / Ukraine's import partners



Source: wiiw calculations based on UN Comtrade Database.

Official exports from Donetsk and Luhansk regions – which accounted for nearly a third of total Ukrainian exports before the conflict – dropped by 70% and 95%, respectively, over the same period (see Annex 2).[13] By 2017, exports from Donetsk and Luhansk (only the government-controlled territories) accounted for just 10% of the total. Even in the case of the GCT in Donetsk and Luhansk, the share of exports to the EU increased between 2012 and 2017. A few regions did increase their overall exports over the same period, with the most spectacular growth recorded in Vinnitsya (+86%) and Ternopyl (+60%) regions (see Annex 1).

International assistance and foreign direct investment

The macroeconomic instability of Ukraine led to a deterioration in the balance of payments, and the government had to apply for international assistance. The largest financing partners of Ukraine were the International Monetary Fund (IMF), the EU and the USA, yet the focus of the aid was different depending on the donor.

As an individual country, the USA is the largest aid provider, with a USD 2.8 billion project portfolio.[14] US assistance has been provided as a technical assistance programme that concentrates on developing state capacity. By contrast, the scope of EU assistance is broad and targets both capacity development and macroeconomic stabilisation. The volume of EU aid is several times greater than the US assistance, and by the end of 2019 had exceeded EUR 15 billion (European Commission, 2019a). Besides, in 2016 the EU and the European Bank for Reconstruction and Development (EBRD) launched the Ukraine

[13] In 2017, the data covered only the GCT of Donetsk and Luhansk (exports amounting to USD 4,400 million and USD 240 million, respectively) according to the State Statistics Service of Ukraine.

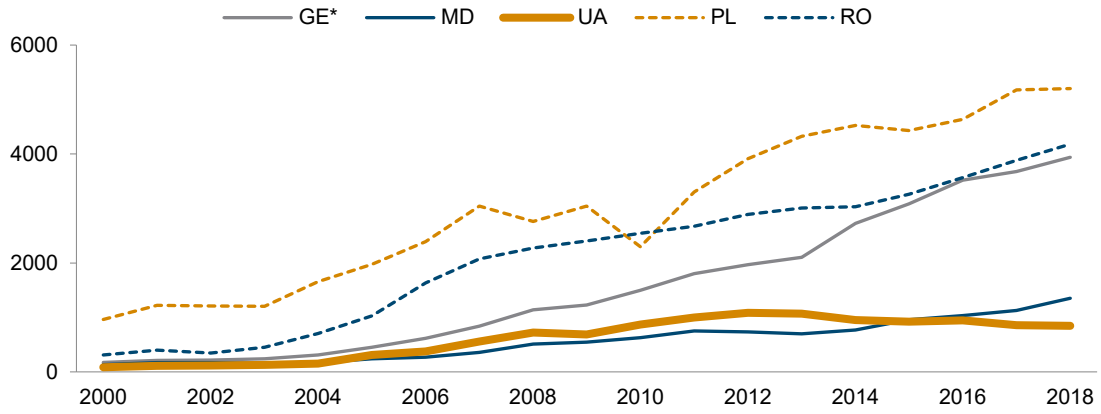
[14] This does not probably include the USD 390 million of military assistance from July 2019 that became the contentious issue in the Trump impeachment hearings in the USA (see (Kramer, 2019).

Reform Architecture (URA) programme, which aims at boosting the general capacity to implement reforms (EBRD, 2019b, pp. 26-27).[15]

The financial assistance of the IMF, however, appears to have been instrumental during the early stages of the evolving macroeconomic crisis. In April 2014, the IMF approved a **stand-by agreement** (**SBA) for Ukraine, amounting to USD 16.5 billion,**[16] which was later replaced by a larger **USD 17.5 billion extended fund facility (EFF)**. The EFF loan disbursements were tightly linked to long-term implementation of a four-year reform programme, which was subject to intense political debate within Ukraine. The EFF was never fully implemented, and the Executive Board of the IMF approved another 14-month SBA for Ukraine on 18 December 2018. The arrangement amounted to the equivalent of 2.8 billion special drawing rights (about USD 3.9 billion, 139% of quota).

Despite Ukraine's cooperation with the IMF, which usually provides a boost to investors' confidence, foreign investors have remained too cautious to increase their investment in the country. With respect to foreign direct investment (FDI), the Ukrainian record is the worst of the peer transition countries (see Balas et al., 2018): FDI stocks per capita are lower in Ukraine than in any of its regional peers (Figure 9), while FDI inflows into Ukraine after the outbreak of the war have also been meagre (Figure 10).[17] The share of gross fixed capital formation in the country's GDP remains the lowest of all the Central, Eastern and Southeast European (CESEE) transition countries – just 17.2% in 2018 (up from only 13.5% in 2015).[18]

Figure 9 / FDI inward stock per capita, EUR



Note: *) Georgia: without Abkhazia and South Ossetia after 2008.
Source: wiiw FDI database.

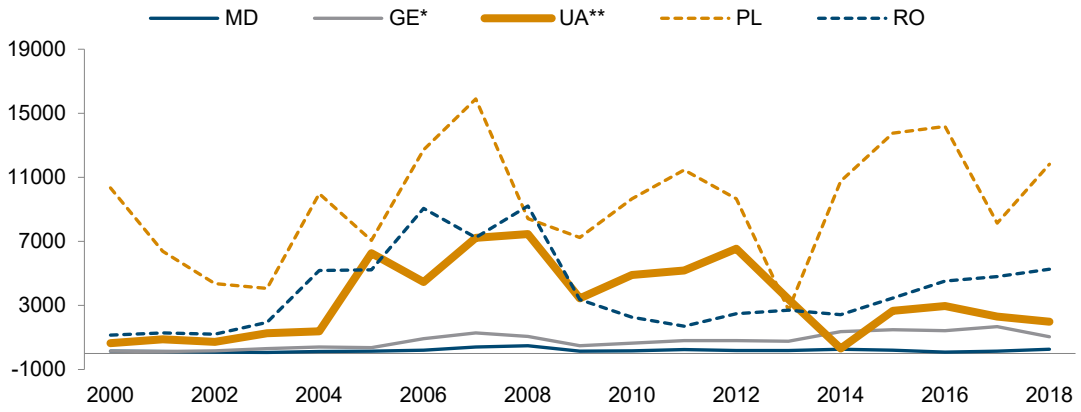
[15] Nearly 200 locally recruited Ukrainian reformers are embedded in eight ministries and public agencies as part of the URA initiative (EBRD, 2019b, Box 1.2).

[16] The volume of the IMF's lending was 'exceptional' as it significantly exceeded the Ukraine's allowed quota. An ex-post evaluation of the 2014 SBA concluded that 'while the program faced substantial risks from the outset and did not achieve many of its goals, it served as an important policy anchor in an uncertain environment' (IMF, 2016).

[17] Were it not for the EBRD, which has invested more than EUR 14.5 billion in more than 400 projects in Ukraine, the FDI record would be even more depressing. The current EBRD project portfolio in Ukraine amounts to EUR 4.4 billion. See Annex 3 for more details.

[18] A lower investment ratio was recorded only for Greece (11.1% in 2018) and the United Kingdom (17%) – see wiiw, (2019, p. 12).

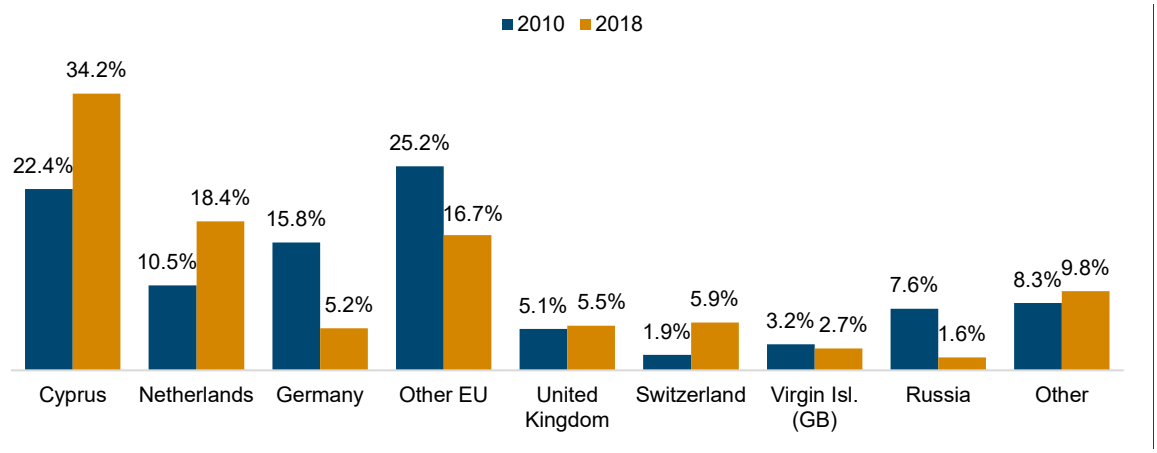
Figure 10 / FDI inflows, EUR million



Note: *) Georgia: without Abkhazia and South Ossetia after 2008, **) Ukraine: without Crimea and CADLRs.
Source: wiiw FDI database

The country origin of the FDI inflows additionally highlights the fact that a large share still comes from countries with particularly favourable tax regimes and points to the round-tripping of capital. Overall, according to the National Bank data, in 2010-2018 residents' funds that were siphoned off abroad and then returned to Ukraine amounted to USD 8.4 billion, or 22% of total FDI. The largest round-tripping investments were recorded in 2010-2013, accounting for roughly one third of the total FDI. In 2018, FDI in funds of domestic origin amounted to USD 500 million or 20.6% of total FDI that year. Such transactions of Ukrainian businesses were mostly executed through Cyprus, the Netherlands, Switzerland and Austria (Figure 11).

Figure 11 / Share of Ukraine's inward FDI stock by country in % of total



Source: wiiw FDI database.

Post-war growth

Positive economic growth was restored in 2016 and continues uninterrupted (as of 2019 – see Annex 1). In 2019, economic growth exceeded expectations, having achieved about 3.3% year on year in 2019, on the back of very strong private consumption bolstered by fast-growing wages and robust accumulation of

gross fixed capital formation. Although the insurgent-held areas used to supply significant volumes of intermediate goods to the rest of Ukraine, these were highly commodified and therefore could be relatively easily replaced by imports – albeit frequently at higher cost. Inflation decreased in 2019 to single-digit figures.

Ukraine has significantly changed its geographic and sector structure of exports as the economy has adjusted to the shock of the war. As exports to Russia plummeted, Ukrainian producers have reoriented to other markets in Europe and Asia: in 2018, Russia's share in the country's merchandise trade was 7.1%, 16 p.p. lower than in 2013; the EU's share in Ukraine's exports during that period increased by 12.5 p.p. to 34.5%; and the share of Asian countries rose by 6 p.p. to 22.5% (Figures 7 and 8 above). In terms of the commodity structure, Ukraine has positioned itself as a leading exporter of agricultural and food products globally. In 2019, it became the third-largest exporter of agri-food products to the European Union.

Prudent monetary and fiscal policies have resulted in rapid macroeconomic stabilisation – by the end of 2019, inflation had fallen below 5%, and the exchange rate strengthened in the latter half of 2019 to 23.6 Ukrainian hryvnia (UAH) to the USD. This made UAH the best-performing currency in the world in 2019. Under these circumstances, the National Bank could continue removing capital controls, which it had imposed at the peak of the currency crisis in spring 2015, and cutting its policy rate (from 18% at the beginning of 2019 to 11% in January 2020). The yield on government bonds has declined markedly, allowing the government to return to international capital markets: in January 2020, Ukraine raised EUR 1.1 billion issuing eurobonds yielding 4.375% interest over 10 years.[19]

In September 2019, Prime Minister O. Honcharuk announced an ambitious five-year action plan that should result in the economy expanding by 40% over that same period; this implies GDP growth of 5% in 2020, and of at least 7% per year in 2021-2024. To achieve this, the government would need to attract significant volumes of FDI – USD 50 billion are set as a target for that period.[20] Achieving this goal would require a concerted effort by the authorities, civil society and other stakeholders to improve the investment climate.[21] In particular, the government should continue structural reforms, including lifting the ban on farmland sales, resuming the large-scale privatisation of state assets,[22] restarting judicial reform, and decentralisation.

The major internal negative risk to the forecast is the inability of the government to shake off the influence of oligarchs and to deliver on its promised judicial and anti-corruption reforms.[23] Backsliding on Privatbank's nationalisation, as demanded by its former owner, the oligarch I. Kolomoysky, would

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19 See *Kyiv Post*, 24 January 2020.

20 In order to reach the same FDI penetration level as, for example, Romania (EUR 4,200 FDI stocks per capita in 2018) or Poland (EUR 5,200), Ukraine would need to attract EUR 150 billion in FDI or EUR 180 billion, respectively.

21 According to the World Bank Survey, Ukraine's Ease of Doing Business ranking was 64 in 2019, climbing 7 spots compared to the previous year. It was the country's largest annual leap since 2014, when Ukraine climbed 25 places. (For comparison, Ukraine's peers had the following rankings: Romania: 55, Belarus: 49, Poland: 40, Russia: 28, Kazakhstan: 25, Georgia: 7). See https://www.doingbusiness.org/en/rankings

22 Both the agricultural reforms (farmland sales) and the privatisation of state assets are highly controversial and have encountered opposition (see also Sologub, 2020). The parliamentary vote on agricultural land sales was postponed in February 2020.

23 In 2019, Ukraine fell in the Transparency International Corruption Perception Index from 120th to 126th place (out of 180) – see www.ti-ukraine.org

jeopardise cooperation with the IMF and further discourage investors. In December 2019, the Cabinet of Ministers submitted a bill to parliament that makes it impossible – by either legislative or judicial means – to return a bank recognised as insolvent to its former owners. However, in the current version the bill allows for the former owners of a failed bank to receive compensation, which is strongly disapproved of by the IMF.

THE ECONOMY OF 'CERTAIN AREAS OF DONETSK AND LUHANSK REGIONS'

The economy of the CADLRs that are currently not controlled by the government can be succinctly described as an economy of restrictions. The everyday economic processes of the CADLRs – trade, investment, finance – are constrained either by the sanctions imposed by Ukraine's government or by the economic policies of the separatists. As a consequence, a large part of the economic activities of the CADLRs is directed at circumventing the restrictions. Bigger industrial producers establish foreign trade through shell companies in South Ossetia, while small financial intermediaries travel back and forth across the line of contact to transfer money to and from Ukraine. Similarly, CADLR residents move across the contact line once in a while to prolong registration in the GCT, receive social security payments and withdraw cash. Then they return home.

Despite the large costs of doing business and rigid economic policies that favour monopolies, the economies of the CADLRs have been growing since the end of 2017 and are likely to continue to do so in the near future. This offers a slight hope that the severity of the humanitarian crisis – which currently affects 3.5 million Ukrainians in the GCT and CADLR areas (UNOCHA, 2018) – will decrease. Yet, so long as economic restrictions remain in force, growth of the local economies will be constrained by their pre-war levels in the long term, with little chance of resolving the humanitarian crisis.

Economic growth and the labour market

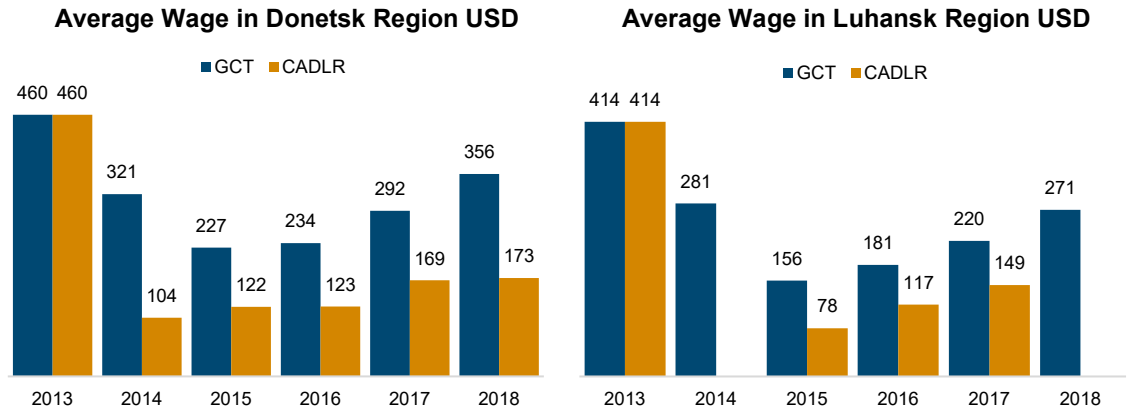
The magnitude of the economic downturn of the separatist economies in 2014 and 2015 was comparable to the fall of the centrally planned economies shortly after the collapse of the USSR. Indirect estimates show that the economies of the breakaway 'republics' contracted by 50% within a year of the outbreak of conflict, with the Luhansk region experiencing a sharper decline (Bluscz and Valente, 2019). Wage data publicly stated by the separatist 'authorities' suggest, however, that the downturn was actually sharper. In 2015, the average wage in the CADLRs fell by 77% in Donetsk region and by 82% in Luhansk region. The mass contraction was followed by subsequent growth: since 2016, wages have been growing at 6% per year in Donetsk region and 37% in Luhansk region.

One has to interpret the results cautiously. In the case of wartime Luhansk region, the numbers include only the city of Luhansk and are not representative of the whole region. Additionally, the high growth rates are partly a consequence of the extremely low base in 2015: the average salary in Luhansk in 2015 was around a fifth of the pre-war level (see Figure 12).

In Donetsk region, the numbers do not reflect the economic downturn of 2017, when the government of Ukraine introduced a total ban on trade with CADLR enterprises. The reason why we believe the effect to have been sizeable stems from the almost twofold jump in the number of CADLR to GCT crossings in March 2017 (see Figure 14) and indirect assessment of economic activity using satellite imagery

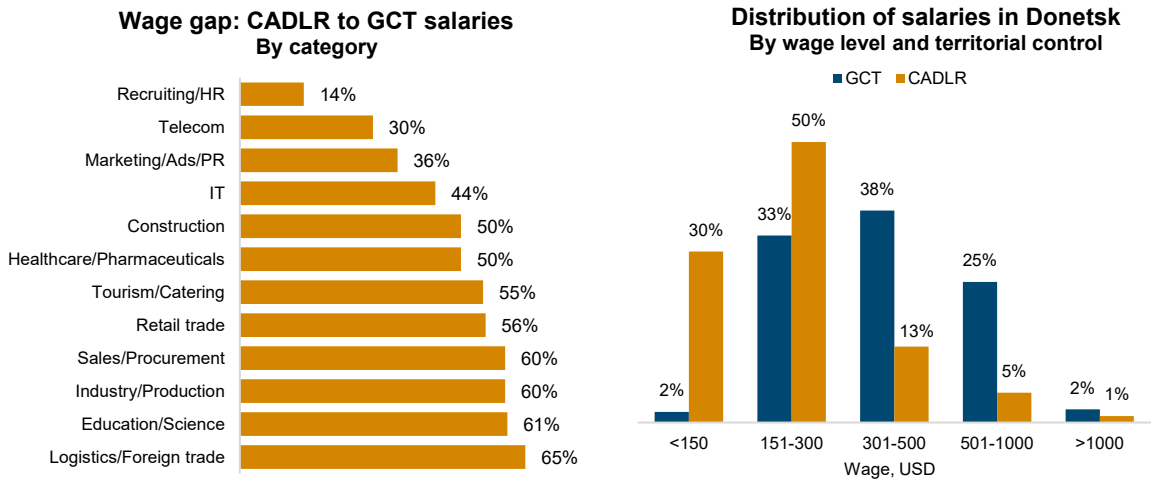
(Kochnev, 2019a). According to the assessment, the economic activity of districts located close to those enterprises affected by the trade ban declined by 20%. Since ban-affected enterprises, however, were never registered in the CADLRs and reported to the authorities in Ukraine, the unemployment caused by de-facto closure of the affected enterprises did not enter the publicly reported statistics of the separatists.

Figure 12 / Wages in Donetsk and Luhansk regions by control of territory



Note: All data in current USD. Data for the CADLRs of Luhansk region for 2015-2017 include Luhansk city only. Data for the CADLRs of Donetsk region for 2014-2017 cover only selected months: 2014: December; 2015: October-December; 2016: April; 2017: June-October. The average wage for 2013 is assumed to be equal across the territories.
Source: DNR-Live (2019), Novorosinform.org (2016, 2018), Ukrstat (2019).

Figure 13 / Wages in Donetsk region



Note: All data in current USD. Data for the CADLRs from http://workdnr.ru/ as of 02.01.2020. Data for the GCT from https://www.work.ua/ru/ as of 03.01.2020. Industry-wise comparisons are done for industries with at least 10 observations per industry.
Source: own estimations based on Work.ua and Workdnr.ru

Despite being imprecise for certain years, the long-term trend in the wage data is consistent with indirect estimates. The CADLR economies reached their lowest point in 2015, and since then have been recovering – at different paces. This growth has been partly supported by the free supply of utilities from

Russia, which helps to keep the variable costs of production significantly below the GCT areas (Golovatiuk, 2017).

Average income levels, however, have not reached the GCT and historical pre-war levels. The data of recruiting websites in Donetsk region show that the monthly median wage of the job positions on offer in the CADLRs was USD 158, which is roughly half the median wage offer in the GCT (USD 316) and only a third of the pre-war level. As the right panel of the figure above shows, this result reflects the overall pattern in the CADLRs and is not driven by the outliers.

The negative effect of the war was heterogeneous across industries. The wage gap between salaries in the CADLRs and GCT varies from 14% to 65%. Judging by the available data, export-oriented companies, public institutions and industrial enterprises are those most negatively affected by the economic restrictions.[24]

Humanitarian crisis and migration

The economy of the CADLRs is that of an economy in the midst of a humanitarian crisis. Recurrent damage to critical civilian infrastructure, inability to receive Ukrainian public services and social security payments, and restrictions on freedom of movement across the line of contact severely constrain the access of the local population to basic goods and services.

According to UNOCHA (2018), 3.5 million people are currently in need in Ukraine. Of those, UNOCHA planned to reach 1.3 million who are residing permanently in the CADLRs. Many of those people lack access to the most basic services and goods: all 1.3 million lack access to safe water and sanitation; 600,000 have no access to healthcare services; and 300,000 have no recourse to legal assistance.

The humanitarian crisis is typically assumed to be more severe in the CADLRs than the GCT (UNOCHA, 2019). This is likely to be the case, although one should not completely downplay the role of assistance that the CADLRs receive from Russia. Ukrainian authorities estimated the volume of financial support of Russia to CADLR at USD 6 billion (Interfax Ukraine, 2016). Half of the amount was estimated to support military forces, while the other one presumably financed public expenditures and purchase of energy goods.[25]

The pessimistic expectations that followed the intense skirmishes of 2014 triggered mass internal displacement of the most productive labour force. Those who were less mobile continued to reside in the CADLRs. As a result, the age distribution of the economic labour force within the CADLRs became more skewed towards the elderly population, which is the most vulnerable demographic group. Since

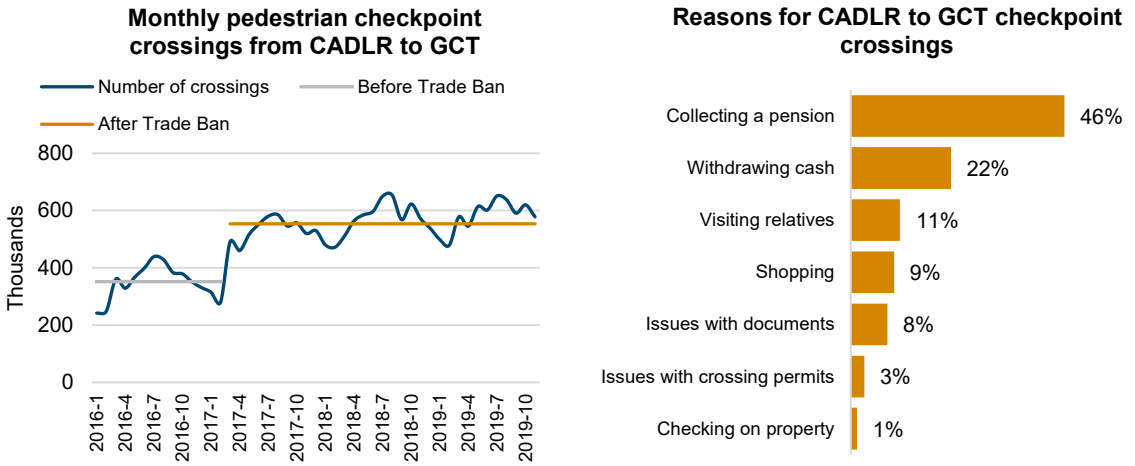
[24] The list contains only a selection of industries, because a) only a subset of them was directly comparable between the recruiting websites, and b) some industries are either small or absent in the CALDRs. For instance, the demand for positions in financial industries of the CADLRs is too small to allow for a meaningful comparison of them with the GCT offers.

[25] Russia supplies gas and electricity to the CADLRs for free. Furthermore, Russia provides a simplified procedure to apply for Russian citizenship for Ukrainian citizens living in Donetsk and Luhansk regions. Although this procedure is typically regarded as a political move to strengthen Russia's diplomatic position in its negotiations with Ukraine, it contains a humanitarian component as well. Russian citizenship makes the CADLR civilians potentially eligible for pensions, unemployment benefits and healthcare services provided by Russia.

pensions remain the primary income of the elderly, most of them cross the contact line to pick up their pensions in the GCT.

This pattern is visible from the checkpoint surveys. According to these, the two most common reasons for CADLR residents to cross the line of contact on foot are to pick up their pensions (46%) and to withdraw cash (22%).[26] In other words, most of the CADLR residents come to GCT areas only temporarily: they fulfil the eligibility criteria for social security payments, withdraw cash and return to the CADLRs.

Figure 14 / Dynamics and reasons for crossing the line of contact



Note: The survey results on reasons include only the population that crossed the checkpoints on foot.
Source: State Border Guard Service of Ukraine, UNOCHA (2018).

Movement across the line of contact is associated with costs, especially for the elderly. The 427 km long line of contact features only five checkpoints where one can move between the CADLRs and the GCT. These checkpoints have neither the capacity nor the infrastructure required to allow the smooth movement of the half a million people who travel between the territories each month.[27] Consequently, those people who cross on foot – and half of them live at least 20 km from the contact line – have to wait in long queues, where they are exposed to the risk of shelling, landmine explosions and health complications while waiting in extreme temperatures.

Table 1 / Estimated humanitarian needs and funding for Ukraine, 2015-2020

	2015	2016	2017	2018	2019	2020
People in need, million persons	1.4	3.1	3.8	3.4	3.5	3.4
Funding requirements, USD million	316	297.9	203.6	186.9	164.4	157.8
Funding received, USD million	148.5	88.3	56.9	66.6	81.1	…

Source: UNOCHA (2018).

[26] Note that the survey results include only those people who crossed the checkpoints on foot.

[27] Except for localities that are ‘crossed’ by the line of contact. They feature smaller inter-city checkpoints.

The overall trend of yearly funding required for humanitarian assistance in Donetsk is decreasing and reflects the declining fighting intensity, gradual improvement in public services, and mild economic recovery. The pace of the decline in the last year has, however, slowed compared to previous years. We believe that this reflects the limits to which humanitarian needs can be reduced without resolving the underlying problems of the Donbas economy: the trade ban between the two economies, restricted freedom of movement and continuing violence at the line of contact.

Economic policies, financial sector and foreign trade

The economic policy of the separatist leaders is largely inspired by the example of countries that have followed state capitalism. The consequences of this approach are most strongly highlighted in the banking and industry sectors.

After the withdrawal of operations by Ukrainian banks in 2014, the banking system of the CADLRs became very rudimentary. Currently, the banking sector of each region consists of a single state-owned bank, which provides financial services and is responsible for financial regulation together with the separatists' 'ministries of finance'. The banking sector offered no credit products to either individuals or enterprises until early 2019, when the first steps were taken: the Luhansk People's Republic 'authorities' launched a credit programme for agricultural enterprises in March, while the Donetsk People's Republic established a basic framework for credit regulation in November. As a consequence, local business and individuals are severely constrained in their credit opportunities, as the CADLRs' banking products are primarily limited to cash and settlement services.[28]

The largest enterprises are also controlled either directly by the separatist 'authorities' or by a single monopoly enterprise that is closely related to them. This approach has resulted in reduced competition and increased mismanagement in the export sectors. In July 2019, the delay in paying the employees of Vneshtorgservis – an enterprise registered in South Ossetia that manages the largest industrial plants in the CADLRs – triggered discontent in the mining industry (Burmistrova and Dergachev, 2019). Threatened by rallies, the 'governments' of the unrecognised republics granted coal export rights to independent coal traders as well.

Russia remains the main trading partner of the CADLR economies. According to public statements by the leaders of the DNR, trade with Russia comprised 74% of its total foreign trade turnover in 2017 (Regnum, 2017). The CADLR economies run a sizeable trade deficit and are therefore financed by the Russian economy. According to an investigation by Golovatiuk (2017) based on customs data and accounting documents of the railway operators in Russia, the import of goods from the breakaway republics was equal to USD 1.2 billion and exceeded the export volume in bilateral trade with Russia by a factor of 6.[29] Natural gas (41%), food (22%) and other fossil fuels (11%) comprised the largest share of CADLR imports.

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[28] It is worth mentioning that certain forms of credit finance were available to private individuals from the non-banking finance sector (e.g. by pawnbrokers). The size of the industry is, however, unknown.

[29] According to data from the 'Ministry of Economic Development' of DNR, the import/export ratio in 2016 was 4.65. Yet it is unclear whether or not these figures include imports of natural gas – which back then was formally booked by the Russian customs as exports to Ukraine. Nonetheless, both numbers confirm a wide trade deficit of the CADLR economies.

Although the CADLRs' exports of goods have to move across the Russian border, the real geography of export destinations is broader. Separatist leaders use shell companies in South Ossetia and Russia to bypass trade restrictions. According to DNR claims, the number of countries trading with the unrecognised republic increased from 53 to 64 in 2018. Although this appears highly questionable, the media have repeatedly reported that CADLR goods have reached non-Russian markets: Belarus, Estonia, Georgia, Italy, Poland and Turkey (Golovatiuk, 2017; Regnum, 2017; Potocki and Baca-Pogorzelska, 2017). The volume of exports to third countries is unknown, but judging by DNR claims, it does not exceed 25% of the volume of foreign trade.

Summary

The economies of the CADLRs have largely adapted to the economic restrictions imposed by the government of Ukraine. The economies bottomed out in 2015 and have gradually been recovering. Although they are likely to continue to grow in the coming year – assuming that the economy of Russia grows as well – the pace of recovery will be weak owing to military insecurity, a negative demographic outlook, lack of investment and severe limitations on either restoring the old value chains or joining new ones. As a consequence, the humanitarian crisis is going to continue, although its severity might decline slightly in the coming years.

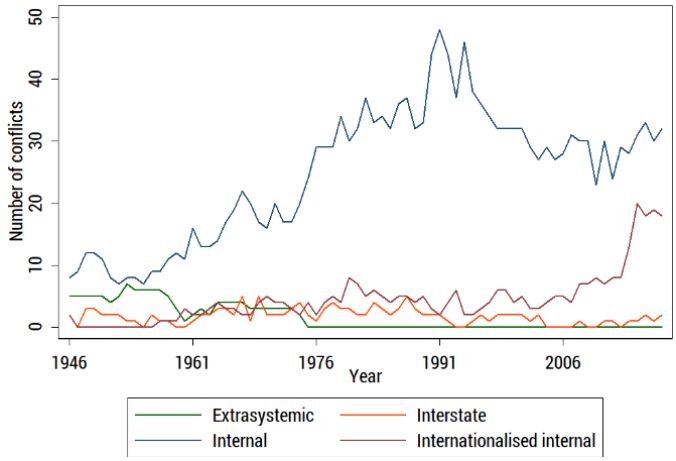
Lessons from other conflict regions

The inception of each conflict is unique, yet the consequences are similar. Armed conflicts are a common phenomenon, and despite their complexity, social scientists have identified some similarities among conflict-afflicted states. This chapter does not seek to provide a profound overview of conflict-related issues: there are reports that better serve this purpose (see UN and World Bank, 2018; World Bank, 2011; Brauer and Dunne, 2012). The purpose of this chapter is to provide a high-level overview of the most characteristic phenomena that usually go hand in hand with armed violence, and to examine the implications they usually have for post-war reconstruction.

CONFLICT TRENDS AND CONFLICT EFFECTS

After the end of the Second World War, wars in Europe became exceptional events. Unfortunately, it is not like that in the rest of the world. From 2013 to 2018, every fourth country 'hosted' at least one conflict episode that cumulatively caused at least 25 fatalities. The long-term trend is increasing (see Figure 15).

Figure 15 / Evolution of conflict types around the world



Source: Sundberg and Melander (2013).

A sceptic might argue that the tools of external military involvement by Russia in Ukraine make the conflict unique, and the experience of other countries does not closely resemble the issues arising in Ukraine. This is not the case for two reasons. First, although the scale of Kremlin's support through biased media reporting, supply of arms, and military manpower was instrumental to transform public discontent into an armed insurgency in Donbas, external support of insurgents is a widespread feature of contemporary conflicts.[30] This is reflected in a growing number of internationalised internal conflicts –

[30] There is growing evidence of Russia's active participation in the military conflict in Donbas. As Brzezinski et al. (2020) point out in their article on the Atlantic Council website: 'Moscow … launched its hybrid war in Donbas and used its massive disinformation apparatus to present this as a Ukrainian civil conflict. Without Kremlin leadership, financing,

that is, initially internal conflicts that become interstate wars (see Figure 15). In fact, they are the second most prevalent type of conflict today.[31] This trend reflects that the neighbour countries rarely stay uninvolved in internal affairs and try to use the internal struggles of each other to obtain political or economic benefits. Notable examples include the civil war in Colombia, where the Revolutionary Armed Forces of Colombia (FARC) was allegedly supported by Cuban and Venezuelan governments (IISS, 2011), the Israeli-Palestine conflict, where Hezbollah and Hamas movements are supported by Arab states (Gleis and Berti, 2012), and the Libyan intervention in Chad during the civil war (Joffe, 1981).

Second, most conflicts exhibit similar dynamics. Heavy casualties usually come in bursts, at specific periods of the conflict – e.g. during a large-scale military operation – and are followed by low-intensity fighting most of the time. Table 2 shows that the distribution of conflict episodes is close to exponential: low-intensity fighting accounted for 89% of all conflict episodes until 2018.

Table 2 / Distribution of recorded conflict episodes, by number of fatalities

Fatalities per 10,000 population	1	10	100	1,000
Number of episodes	1,245	138	15	1

Source: Sundberg and Melander (2013).

World experience also shows that the main negative effect of armed conflict is not driven by immediate destruction and mass displacement. The greatest negative effect accumulates over the long term. Wars destroy the future by undermining the social contract – an implicit agreement among the citizens to cooperate for the collective benefit. The grief caused by losses on opposing sides entrenches the divisions between the fighters and their supporters, sets the stage for future insurgencies and undermines the peace process, leading to a protracted confrontation. Breaking the vicious circle of conflict requires concerted efforts. We would like to highlight three factors that play a fundamental role in conflict resolution: the commitment problem, institutions and state capacity, and vested interests.

PATHS TO CONFLICT RESOLUTION

Although peaceful conflict resolutions are intuitively more appealing, this view is not supported by observational statistics. The figure below highlights that the chances of conflict resuming after a peace settlement are no different from the situation in the event of outright state victory.[32] A small difference in conflict recurrence across the conflict outcomes underscores the fact that neither a 'declaration' of peace

weapons (including heavy arms), ammunition, and – in some cases – regular units of the Russian Army, there would be no 'conflict in and around Ukraine'.' See https://ilovaisk.forensic-architecture.org/ for evidence of Russian involvement in the Ilovaisk battle.

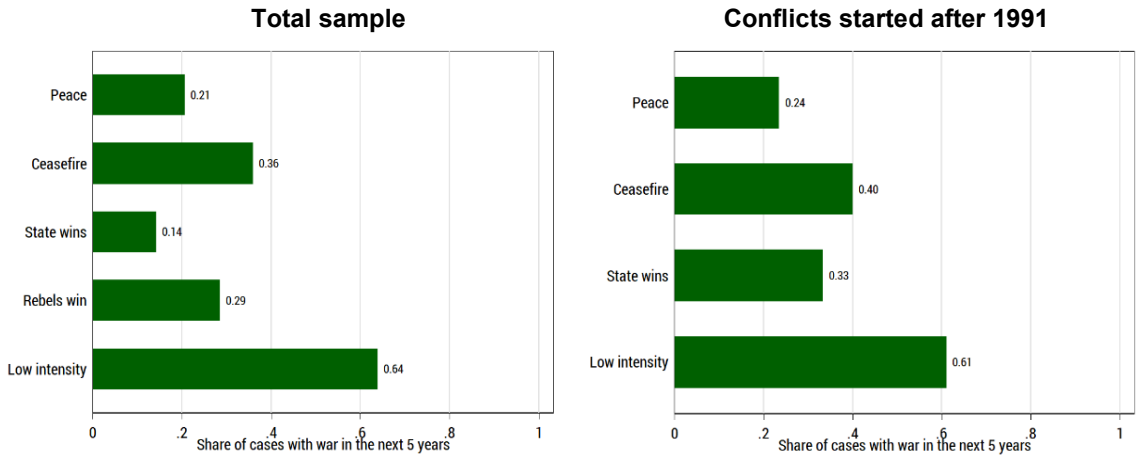
[31] Together, internal and internationalised internal conflicts account for 98% of all ongoing conflicts in the world. The reasons for that development deserve a standalone study. Two facts, however, are worth noting. First, most of the fatalities are concentrated in the post-colonial countries (see Annex 2). Second, post-Second World War world governance institutions were primarily created to resolve issues between nations and were not designed to resolve internal disputes.

[32] This finding applies especially to the state victories in the post-Cold War settings. These results are partly driven by a small sample size for certain categories: for all conflicts that started in 1991 and ended by 2013, the dataset of Sundberg and Melander (2013) contains only six cases of state victories in internal conflicts. Yet even with such a limited sample size, leaving conflict unresolved ('low intensity' category) indicates the highest chance of a conflict recurrence in the future.

nor a military victory is any guarantee of uncontested government leadership in the long term. The figure shows that it is not the final score between opposing parties, but the nature of the outcome that defines whether or not the conflict is going to reoccur in the future. To prevent insurgency, the state and insurgents must agree on the terms of a new 'contract', which would consider the interests of both groups. This contract cannot be agreed upon if it does not address two aspects: the post-war distribution of public good and the commitment problem.

Although the particular mechanisms responsible for the onset of violence are the subject of wide discussion, this debate centres on the ability of the state to resolve tensions triggered by contested material or political assets. Social scientists typically agree that 'good' institutions are those that help to overcome the collective action problem – i.e. when it is more attractive to pursue self-interest than to engage in cooperation. From the economic standpoint, the goal of a state is to develop mechanisms that solve such problems. A peace agreement needs to reach the same goal with the armed opposition. In practice, it implies that the state and the insurgents should agree on a mutually acceptable way of public goods provision and political participation in the post-war period.[33]

Figure 16 / Probability of a conflict episode in the five years following the end of a conflict, by type



Note: Only internal and internationalised internal conflicts are considered. Graphs do not include cases with undetermined outcomes. The sample does not include conflicts that started after 2013.
Source: Sundberg and Melander (2013).

Additionally, a peace agreement should establish mechanisms that overcome the commitment problem – i.e. when one side or the other has an incentive to deviate from an agreement once it is reached.[34]

[33] Whether institutions that emphasise punishment are more effective than those that encourage cooperation is still an open question. History shows that developed nations usually excel in both: they provide tools for local and countrywide collective decision-making (inclusive institutions) and possess well-organised enforcement mechanisms – police and armed forces – that provide proper functioning of the collective decisions (state capacity). The proper implementation of the mechanisms is the subject of intense academic discussion (Acemoglu and Robinson, 2012; Besley and Persson, 2011).

[34] To be more complete, the mainstream rationalist theory of war by Fearon (1995) proposes that the war can also be explained by imperfect information and the indivisibility of the contested resource. These mechanisms, however, are not likely to be decisive in protracted territorial conflicts, where both sides are likely to reveal the true military power of each other and can potentially divide the territory as a continuous space. For these reasons, we emphasise the commitment

The major difficulty in peace negotiations in intrastate conflicts is the asymmetry of coercive power in favour of the state after the war ends. Armed insurgents realise that by laying down their arms, they are giving up the very tool that assures their protection, thus enabling the government to apply coercive policy against them, in contravention of the agreements previously reached. Therefore, a peace agreement should contain clearly defined mechanisms that keep the opposing sides committed to peace (Sundberg and Melander, 2013). Usually, this implies binding long-term government guarantees to ensure the fair distribution (or fair rules for the distribution) of public goods, and a supervisory mechanism to hold all sides accountable for deviations from the agreements.

Post-war guarantees of this sort are politically costly, as they offer preferential treatment for insurgents. Yet one has to take into account the following: first, this treatment should be transitory, not permanent. Second, the immediate political costs should be compared with the opportunity costs of a continuing conflict. As we have noted above, conflicts tend to stay unresolved and to place a long-term burden on social life, even if active warfare is over. See the box below on how these effects are reflected in the cases of Moldova and Georgia.

BOX 3 / 'FROZEN' CONFLICTS IN MOLDOVA AND GEORGIA

The weakened central power of the Communist party in the last years of the USSR sparked a full-scale state disintegration in the early 1990s. Frequently, the disintegration and territorial disputes were framed along the administrative divisions defined in the USSR. Nominally, the USSR was composed of 15 socialist republics, several of them including 'autonomous' regions and territories. These autonomous regions were frequently, but not always, formed along ethnic lines. In a number of cases, the leaders of some 'autonomous' regions tried to use the momentum of the power vacuum and embraced the nationalist agenda, in order to gain greater autonomy, more power or even full independence from the former titular Soviet republic that they used to be part of under the previous regime. The authorities of those republics, however, frequently opposed the separatist tendencies, and the conflict often turned violent. In both Georgia and Moldova, as well as in Armenia and Azerbaijan (and later Chechnya), the political confrontation between the newly established regional authorities (often represented by the old 'nomenklatura') and the separatist leaders led to armed violence and ethnic cleansing. Russia was actively involved in the intrastate conflicts, backing separatist regions as well as directly taking part in the military actions.

Compared to other post-Soviet conflicts, the armed conflict in Transdniestria – the breakaway republic in Moldova – was mostly restricted to several short episodes during the early 1990s. The lack of intense fighting is usually perceived as a reason for the comparatively successful post-war relations between the national government and separatist authorities. Despite differences in political positions, the authorities were able to find a series of mutually acceptable solutions, which helped to overcome humanitarian issues, despite the political differences. Many Transdniestrians have taken Moldovan foreign passports, allowing them to travel more freely to the EU.[35] Similarly, the two sides were able to reach a compromise on trade relations in the process of the implementation of a Deep and Comprehensive Free Trade Area (DCFTA) with the EU in Moldova. Although Russia is the largest trade partner of the Transdniestrian economy, local businesses currently rely heavily on exports to the European Union.[36] The Transdniestrian economy benefits from exports

problem mechanism, as it helps to explain why conflicts tend to last long without a resolution. See Levy (2011) for a more detailed account on the causes of war.

[35] Similarly, many Moldovans have taken Romanian passports after the accession to the EU.

[36] The Transdniestrian economy relies on four main sources (de Waal, 2019b, p. 12): remittances; direct Russian aid; indirect Russian aid in the form of free gas; exports from factories that can benefit from EU-Moldova DCFTA. Remittances come largely from Russia, and Russian direct aid comes in the form of pension top-ups (currently less than

to Moldova, Romania and the rest of the EU – two thirds of exports from Transdniestria go west, according to de Waal (2019b, pp. 11-12) – and enjoys preferential treatment on the EU market, implied by the EU-Moldova Association Agreement/DCFTA since the beginning of 2016. This DCFTA participation has caused some controversy, as details of Transdniestria's participation in the DCFTA have not been published: 'Brussels admits fairly openly that the DCFTA has political benefits, and have been prepared thus far to overlook lack of implementation by the Transdniestrian side' (de Waal, 2019b, p. 12). Anecdotal evidence suggests that 'Transdniestrian businessmen reap the benefit of the DCFTA without having to undergo the difficult regulatory approximation' required by the EU (de Waal, 2019b, p. 12).

The post-war experience in Georgia followed a different scenario. Abkhazia and South Ossetia – two unrecognised territories of Georgia – both declared independence in the early 1990s. After a war in 1992-1993 and subsequent ethnic cleansing, Abkhazian and Georgian leaders reached a ceasefire agreement under the patronage of Russia. The tensions erupted in 2008, when artillery attacks by pro-Russian separatists in South Ossetia broke the ceasefire agreement and the Georgian Army moved to the South Ossetian conflict zone. Russia accused Georgia of aggression against South Ossetia, and on 8 August launched a large-scale land and air invasion of Georgia that was framed as a peace enforcement operation. In a few days, the Russo-Georgian War spread to Abkhazia. On 26 August, the Russian Federation officially recognised both South Ossetia and Abkhazia as independent states. Georgia has moved to increase isolation of the breakaway regions by restricting free movement and economic activity in the territories. Since then, the economy of the region has been nearly totally dependent on Russia (de Waal, 2019a). Though there has been no fighting on the Abkhaz-Georgian and South Ossetian border since 2008, economic contacts with Georgia are limited, despite the increasing attempts by the Georgian authorities to re-establish economic ties. Theoretically, Abkhazia could follow the example of Transdniestria and get the trade preferences available under Georgia's DCFTA with the EU; but these attempts have found no positive response (de Waal, 2019a, p. 11) – not least because of the common border with Russia, the more toxic nature of the conflict with Georgia, and the low sophistication of the Abkhaz economy, which is heavily dependent on agriculture and tourism.

The post-conflict relations between national governments and separatists highlight the fragility of ceasefire arrangements and the lack of trust. The Transdniestrian example shows that, once broken, it might take decades to establish a mutually productive dialogue between the leaders of opposing sides.

Source: adapted from de Waal (2019b, 2019c), Astrov and Havlik (2008), Adarov and Havlik (2016), wiiw (2016), Akhveldiani and Havlik (2019).

Finally, the policymakers should address the problem of vested interests during negotiation of the peace agreements. Although wars are detrimental to an aggregate economy, they can bring benefits for individual companies.[37] The market distortions brought by the warfare create a supply shortage of goods

USD 10 per person and month). The number of Transdniestrian pensioners still receiving a pension from Russia was reported as 146,000 in 2019; Russia would thus pay more than USD 7.5 million in pensions to Transdniestria. During 2012-2017, Russian development assistance was reported to amount to USD 70 million for the construction of schools, kindergartens and hospitals in Transdniestria. Yet the main form of Russian assistance is free gas for Transdniestria, provided indirectly by Gazprom via the Moldovan utility Moldovagaz, a company in which Gazprom has a 50% stake. According to de Waal, over the past decade the unpaid gas debt for Transdniestria has built up to an estimated USD 6-7.5 billion.

[37] There is growing evidence that the effect is widespread across countries and, therefore, is not driven by the individual characteristics of a particular country. Recent stock market studies (Guidolin and La Ferrara, 2010; Brune et al., 2015) found that the majority of wars that broke out between 1974 and 2004 were associated with rising stock prices. Journalists and scholars documented evidence of how conflicts support rent-extraction in a variety of conflicts and contexts: the war in Chechnya (Aliev, 2004; Klebnikov, 1999), the FARC insurgency in Colombia (Fergusson, 2019), and the civil war in Angola (Guidolin and La Ferrara, 2007).

and services, which individual companies and politicians can benefit from.[38] Those firms and politicians who benefit from the war would have a natural incentive to undermine the peace process and prolong the armed violence. The state should readily identify these groups and prevent them from forming coalitions that would back continued warfare.

SUMMARY

The history of previous conflicts offers three main lessons on how to break the conflict trap. First, long-lasting peace does not depend on the immediate outcome of the war. Peace does not depend on the score: it depends on the motives to cooperate. And these appear to be the same as for the long-term development of nations: sound institutions, state capacity and good governance.[39] In other words, the state should clearly show the value of its functions – typically through the provision of public goods – and provide tools for participation and control by the citizens.

Second, all peace settlement negotiations face lack of trust driven by the commitment problem. Overcoming it is a major obstacle on the way to stopping warfare. Therefore, the peace agreement should include mechanisms that support a lasting adherence to peace. These mechanisms may be achieved by introducing explicit guarantees of minority rights in the constitution during the post-war transition period; an amnesty for, or the free exit of, insurgents; and third-party supervision to monitor and punish/sanction deviations from the agreement.

Finally, the state should oppose groups with vested interests, who benefit from the war. These groups naturally oppose conflict resolution to secure their privileged position either on the market or in the post-conflict political competition. Policymakers should be able to identify the groups and undermine – whenever feasible – the sources of their rents to prevent deterioration of the peace process. As recent history shows, the task is more challenging in the case of conflicts initiated/backed by Russia, and the right methods of solving such conflicts have yet to be found.

[38] Increased insecurity costs can be viewed as an additional barrier to entry to a market.

[39] See EBRD (2019b) for more detailed evidence.

Estimates of conflict and reconstruction costs

EXISTING ESTIMATES

Assessment of the economic situation in Donbas, and particularly in the CADLRs, is difficult owing to the almost total lack of reliable data. The existing reconstruction cost estimates are therefore mostly crude approximations or informed guesses characterised by wide ranges. Frequently, the methodological assumptions and data sources remain undisclosed, limiting the ability to make a qualified judgement of the validity of the estimates.

There are several estimates that deserve special attention, on account of either wide circulation in the media or their solid foundations. From our perspective, the joint study by the UN, EU and the World Bank (UNEUWB, 2015b) appears to be the most reliable estimate, judging by the data sources and the methodology employed. That study relied on administrative data received from the Ukrainian authorities. Its authors estimated aggregate recovery needs at **USD 1.5 billion**. Yet the study was concluded at the beginning of 2015 and could not take account of losses incurred by later fighting and the continuously deteriorating environment and state capacity in the CADLRs.[40]

Adarov et al. (2015) took into account the subsequent intense battles in the first half of 2015, and estimated the total war-related damage to infrastructure in Donbas at in excess of **USD 10 billion**, or about 8% of Ukraine's GDP in 2014. Yet, like the UNEUWB study, the estimation could not account for losses incurred later.

Another figure with a solid basis to it was calculated by the Ukrainian Ministry of Temporarily Occupied Territories and Internally Displaced Persons. According to it, the reconstruction of Donbas will cost **USD 20-30 billion and will take at least 10 years**.[41] This figure, however, covers only the GCT and deals solely with the reconstruction of physical capital.

Another estimation widely circulated in the media belongs to A. Aslund, who assessed the Donbas reconstruction costs at **USD 20 billion**.[42] The validity of this estimate remains uncertain, however, as we were not able to uncover and assess the underlying methodology.[43]

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[40] Currently, the World Bank is conducting a major study on 'Economic Recovery in Eastern Ukraine' that will be ready later in 2020. This study, supported by the Ukraine Multi-Partner Trust Fund on Peacebuilding and Recovery (MPTF), aims to inform national authorities and the international community regarding potential drivers of future economic recovery in conflict-affected areas of Ukraine. The consultations started at a workshop in Kyiv, 1 November 2019.

[41] See https://glavcom.ua/economics/finances/rujini-ta-groshi-skilki-koshtuvatime-velikiy-remont-donbasu-dokumenti-547636.html

[42] See https://zn.ua/UKRAINE/stoimost-vosstanovleniya-donbassa-mozhet-dostigat-20-mlrd-aslund-204628_.html; https://www.atlanticcouncil.org/blogs/ukrainealert/who-should-pay-for-the-restoration-of-the-donbas/.

[43] Another study conducted under Aslund's supervision for the Atlantic Council reports capital damage of USD 9.5 billion. The volume seems to be indirectly estimated by extrapolating Piketty's asset-to-GDP ratio on the latest pre-war GDP volumes of Donetsk and Luhansk regions. Yet the exact calculation of the figure in the report remains undisclosed. See https://www.atlanticcouncil.org/in-depth-research-reports/report/kremlin-aggression-in-ukraine-the-price-tag/

The latest – and largest – estimate was recently provided by the Ukrainian minister of economic development, who put Ukraine's total losses due to Russian aggression in the Donbas and the annexation of the Crimea at between USD 50 billion and USD 150 billion.[44] This figure, however, was only reported as a public statement, without presenting a proper estimation methodology. The public statement refers to the pre-war real estate value of Crimea and the CADLRs, and apparently uses that as a basis for the calculations.

As the overview makes clear, the estimates are inconsistent in their goals, methods and coverage. Most of the studies tend to combine losses from the annexation of Crimea with the wartime losses in Donbas, which have a different structure, as Crimea never experienced intense warfare. Apart from the UNEUWB (2015b), none of the studies covers the cost dimensions comprehensively – especially with regard to the CADLRs. The majority of the estimations concentrate on capital costs and neglect other components. Yet, as we make clear in the following sections, the costs of human capital and environmental restoration together exceed the volume of physical capital losses. Finally, except for the UNEUWB (2015b), most of the reports estimate incurred *losses* (which are backward looking), rather than post-conflict restoration costs. Restoration, however, is forward looking: it is concerned with costs to revive the region and is, therefore, more relevant for policymakers. The goal of the next subsections is to address these gaps.

EFFECTS OF THE ARMED CONFLICT ON CAPITAL STOCKS

Machinery and buildings are not the most valuable asset of an economy: humans are. Nonetheless, we believe that estimating the losses of fixed capital is a meaningful exercise. The history of other war-damaged regions shows that building a sustainable post-war economy is a hard task: most post-war regions fail to start the engine of long-term economic growth for decades afterward.

The rich coal and iron reserves defined the comparative advantage of Donbas before the war, and are likely to continue to do so in the initial phase of the post-war reconstruction period. Yet mining and manufacturing are capital-intensive industries. Therefore, the recovery of fixed capital is critical for exploiting the comparative advantage of the region and for establishing the foundations for sustainable post-war economic growth.

This section evaluates the volume of the **post-war fixed capital investments in Donbas**. Its objective, however, is not to present a 'true' number. That task is rendered impossible by the inability to use standard measurement techniques in CADLR separatist-controlled areas. One should view the findings of this section as an attempt to comprehend the magnitude of the losses and as a starting point for more elaborate and precise investigations. We **evaluate fixed capital losses** indirectly, by combining recent survey evidence on household damage with data on battle intensity. The estimation process consists of four major steps (see Annex 3 for details). First, we calculate the share of housing value lost due to hostilities for a subset of the government-controlled areas. In step two, we estimate the linear relationship between the district-level battle intensity and the share of capital lost for the same districts. In step three, we use the relationship obtained to predict the share of capital lost for all districts of Donbas – both government and separatist controlled. Finally, we multiply the shares of capital lost by the district-level estimates of the pre-war capital stock.

[44] See https://vchasnoua.com/donbass/63296-u-minekonomiky-ozvuchyly-sumy-vtrat-cherez-rosiisku-ahresiiu-na-donbasi

The accuracy of our estimates depends largely on quality of data and methodological assumptions. First, we assume a perfect external validity for a linear relationship between the volume of hostilities and the damage to housing. That is, hostilities in government-controlled areas on average caused the same damage to housing as that caused in separatist-controlled areas. Second, we assume that damage to civilian housing in government-controlled areas is a good proxy for damage to all fixed assets. Finally, we assume that the capital depreciation in separatist-controlled areas was not covered by investment throughout the period. There is good reason to believe that the first assumption holds. This is driven by the fact that the exact form of the contact line separating Donbas was not anticipated at the beginning of the conflict. The inability of the Ukrainian army to rapidly deploy armed forces, active participation of semi-autonomous paramilitary groups on both sides, and external intervention by the Russian armed forces in the pivotal events of the war resulted in a chaotic evolution of the conflict, with a territorial division that was barely predictable at the very beginning (see Chapter 1).

Reversed causality is, however, a potential caveat, because insurgents could have specifically initiated military operations in capital-abundant locations.[45] This could have happened for a variety of reasons: rent extraction (coal mines), important strategic position (Debaltsevo railway hub) or symbolic value (Donetsk airport). This concern, however, is mitigated by two factors. First, OSCE (2017) mentions that that there is no evidence of long-lasting targeted assault of the enterprises.[46] Second, even if it is true, the largest enterprises of the region are mostly located either within or in close proximity to urban areas. It is thus likely that military action caused measurable 'spillover' damage to residential areas, which is captured in the REACH household survey (see Annex 4).

In addition to the direct capital damage caused by fighting, we assess the amount of capital depreciation. Since the exact value of capital investment in separatist-controlled areas is unknown, we adopt a conservative approach. That is, we assume that the volume of capital investment in separatist-controlled areas is negligible and the value of fixed assets depreciates at a full rate. For the government-controlled areas, we assume that local investment covers the volume of depreciated capital.[47] We make this second assumption, since we are not aware of any alternative source that comprehensively assesses district-level fixed capital losses in Donbas. The assumption may be wrong if the impact of war actions on the value is not the same across the different types of fixed capital.[48] The available sources, however, do not allow us to differentiate the different types of damaged property, and constrain our ability to make a more precise estimation.

According to our estimates, **the total capital losses incurred over the period 2014-2019 in Donbas amount to USD 9.5 billion**, which is equivalent to 14% of the pre-war capital stock in the region (see the figure below).[49] Of this value, the share of damage caused by the hostilities amounts to 40%, while the remaining 60% is caused by depreciation. Considering the hostilities-induced damage alone, two

[45] As argued by Zhukov (2015), the separatists' 'success' in seizing territory was related to the industry structure and trade exposure to Russia of Donbas localities.

[46] '[T]he general history of the conflict testifies to the absence of a sustained, targeted assault on industrial facilities' (OSCE, 2017, p. 40).

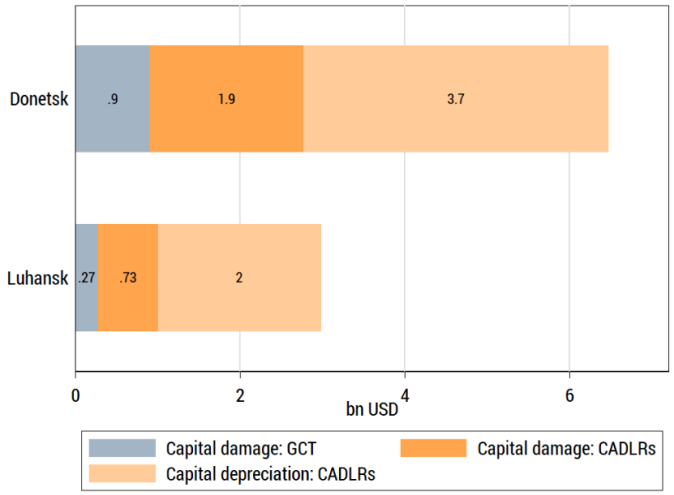
[47] The depreciation rate we use for the calculations is the five-year average value reported for Ukraine in the Penn World Tables 9.1 – the most authoritative source on comparative long-term macroeconomic data.

[48] Unlike in the case of a residential building, a projectile can severely damage a complex industrial plant by interrupting critical industrial processes, leading to the strong devaluation of an asset.

[49] All values are reported in current 2018 USD values.

thirds of it is borne by the separatist-controlled areas. This is not surprising, as the separatists control the regional capital cities of Donetsk and Luhansk, which had the largest concentration of pre-war fixed capital and which experienced intense fighting in the early stages of the conflict.

Figure 17 / Total capital losses by region and control, USD billion



Source: own estimations.

The pattern of damage is highlighted in the table below. Damage to capital in Donetsk and Luhansk districts amount to USD 1.7 billion or 44% of the total value. The figure rises to **USD 2.8 billion (73% of the total)** if one considers the top five districts damaged in each region of Donbas (Table 3).

Table 3 / Estimated direct damage to capital stocks, USD billion, 2018 prices

Rank	Donetsk Region		Luhansk Region	
	District/City	Damage, bn USD	District/City	Damage, bn USD
1	Donetsk	1.30	Luhansk	0.43
2	Mariupol	0.36	Popasnyanskyi	0.14
3	Horlivka	0.19	Antratsytovskyi	0.09
4	Novoazovskyi	0.11	Perevalskyi	0.04
5	Volnovaskyi	0.09	Stanichno-Luhansky	0.04
-	Total	2.05	Total	0.74

Source: wiiw estimations.

Although the amount of estimated **direct damage is substantial – about 3% of annual Ukrainian GDP** – the estimated volume of capital depreciation exceeds that. This result – while seemingly surprising – is easily explained. The pre-war economy of Ukraine and Donbas was characterised by a comparatively high concentration of fixed capital assets in the economy: the capital-output ratio in Ukraine was 1.9 times greater than the world average. Therefore, when the normal business environment was disrupted by war, the depreciation losses started to accumulate very quickly.

The above estimates have **three major implications. First**, although the direct damage caused by the hostilities has had a detrimental effect on the economy of Donbas, it is the **disruption to business continuity processes** that now accounts for the largest share of capital losses. This implies that the **restoration activities should aim to restore markets**.

Second, restoration activities should prioritise the **largest urban areas** of the separatist-controlled territories. Although the rural areas were subject to damage as well, a positive economic effect is more likely to be observed in densely populated areas with a greater pre-war concentration of capital.

Third, the amount of the capital losses alone raises a question regarding the **financing of a restoration programme**. The reconstruction programme targeting the recovery of capital losses is unlikely to be financed by Ukraine's economy alone. For comparison, the **total estimated capital stocks damage (USD 9.5 billion)** comprises nearly 10% of the annual GDP of Ukraine and is double the country's annual military expenditure. Given the precarious finances of the country, the government will not be able to finance the restoration programme in the near future. Therefore, external support will be instrumental in restoring Donbas's fixed capital to pre-war levels.

EFFECTS OF THE ARMED CONFLICT ON HUMAN CAPITAL

The conflict in Donbas has taken a big toll on the lives of people in the country. During the entire conflict period, more than 13,000 people have been killed (more than 3,000 of them civilians), and as many as 30,000 wounded (more than 7,000 of them civilians). Yet aside from the direct injuries, the local population suffers from a humanitarian crisis that is still unresolved. UNEUWB (2015a) has estimated that 'of some 5.2 million people in the Donbas, **at least 3.9 million** have been directly affected'.[50]

In our estimations, we explicitly highlight two components of the costs, which will remain of particular importance for the post-war recovery. First is the social support that is going to be required for the post-war period.[51] State budget expenditure related to the conflict in eastern Ukraine amounted to UAH 4.2 billion in 2018 (USD 154 million).[52] We extrapolate these costs over the remaining lifetime of the median Ukrainian, adjusted by a linear dropout rate of 1.67% of the initial amount per annum.[53]

High levels of psychological trauma among the population have been reported across the conflict-affected areas, due to people living in constant fear of being killed or injured. Mental health problems are

[50] Parts of the costs generated are borne by internally displaced persons (IDPs). The war in Donbas caused the biggest displacement crisis in Europe since the Balkan Wars (Jaroszewicz, 2019). According to the data of Ukraine's Ministry of Temporarily Occupied Territories and Internally Displaced Persons, as of 14.11.2019 there were 1.4 million registered IDPs from Donetsk and Luhansk region, who required significant state expenditure on accommodation, social services and rehabilitation.

[51] Annual expenditure during the years of conflict and once the conflict is resolved includes the following components: humanitarian assistance to the population living in the conflict zone; medical, psychological, professional and social assistance to civilians injured by explosive objects; assistance to IDPs; financial support for veterans and their families; treatment, physical and psychological rehabilitation, social and professional adaptation for veterans, compensation for prisoners of war and assistance to their families.

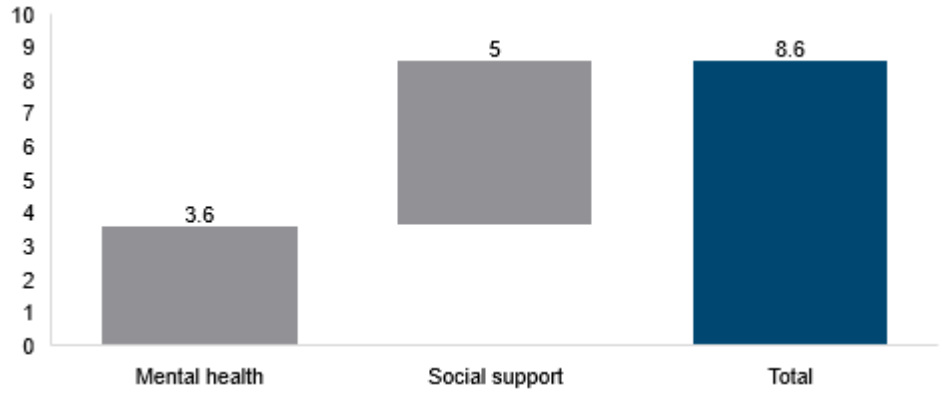
[52] According to the latest information (from December 2019), there are about 500,000 pensioners living in CADLRs that are registered as IDPs and receive pensions; but another 700,000 are not registered and receive no pension. A new bipartisan pension reform project submitted to the Rada stipulates obligatory registration in order to receive a pension. As of June 2018, there was a backlog in unpaid pensions in CADLRs of UAH 62 billion (EUR 2.4 billion), and the cumulated pension arrears will have reached UAH 85 billion by the end of 2019 (about EUR 3.3 billion). This should be disbursed in monthly instalments over the next five years, under a proposed Draft Pensions Law from November 2019 (See Delovaya Stolitsa, No. 48/966, 2 December 2019, p. 4)

[53] We define the dropout rate of the population by calculating the implied annual rate of decline of the median-age Ukrainian stratum (40-45 years) to the oldest age stratum (100+ years). According to our calculations, the value is equal to 1.67% per year. That is, the '40-45' stratum should linearly decline by 1.67% per annum from the base value to achieve the population amount of 100+ years.

rarely aired in public, but represent a significant burden on the well-being of the persons affected. According to UNOCHA (2018), 75% of families living close to the contact line in the GCT report either that psychosocial support services are unavailable or that they do not know where to access such services. We estimated the burden of mental health issues, drawing on the results of the stratified internally displaced persons (IDP) survey conducted by Roberts et al. (2017). According to it, 42% of the IDPs surveyed suffered from mental illnesses in 2016, with average treatment costing USD 54 at 2018 prices. We assume that the costs are yearly expenditure and extrapolate this value – adjusted by the annual dropout rate and the incidence rate – to the conflict-affected population of 5.2 million.

According to our calculations, **total transfers to support the war-affected population in the post-war period amount to USD 8.6 billion**. Most of this stems from the present-value social support and the mental health treatment of the population (see Annex 5 for the detailed description of the methodology).

Figure 18 / Components of human capital costs, USD billion



Source: own estimation.

As the figure above highlights, mental health problems, which are currently untreated, present a serious issue for the affected population. Roberts et al. (2017) highlight a big policy gap in the treatment of mental health problems. The majority of respondents reported that the lack of qualified specialists and high treatment costs are the greatest impediments to receiving treatment. This implies that future restoration activities require a separate programme to mitigate the negative psychological impact of war on mental health.

Aside from the aforementioned factors, we would point out that the estimations are still incomplete. First, the required rates of social support and mental health problems in the CADLRs are likely to be greater, implying that the costs are likely to exceed the reported amount. Second, certain aspects are definitely not covered in full. The effect of landmine casualties is one such. Currently, Ukraine is the third most **landmine-contaminated** place in the world. Over 1,000 casualties have been recorded as a result of landmines and other explosive remnants of war (ERWs) since 2014, as landmines continue to be planted in the ongoing conflict.

Another aspect that is left out relates to the spread of otherwise contained diseases. The disruption of sanitation and vaccination activities in the Donbas has caused outbreaks of infectious diseases.

Although we have not been able to quantify the related costs, the restoration programme should address this issue by providing increased efforts to prevent the outbreak of epidemics.

EFFECTS OF THE ARMED CONFLICT ON THE ENVIRONMENT

Military action can lead not only to directly observed losses of infrastructure and buildings, but also to damage to the environment. Environmental hazards can spread beyond the area of conflict and can be very costly to eliminate. Some environmental damage may even turn out to be irreversible. Limited access to the relevant information means that it is impossible to conduct a full assessment either of the effects of the armed conflict on the environment or of the environmental hazards in the Donbas area, in particular in the CADLRs. It would be even more challenging to attempt to put a price on the environmental damage (potential or actual).

We were, however, able to quantify costs for *certain* components of the environmental pollution. We provide accounts for two of them. First, these are the costs of coal mine liquidation. Prior to the war, Donbas was characterised by a largely unprofitable coal industry. Most of the coal mines fell under the control of the separatists. Yet most of them are believed to be unprofitable and must be liquidated to avoid environmental pollution. According to the OSCE's 2017 report, more than 35 mines in the region are either in the process of flooding or have already totally flooded. Since 2014, average water drainage has dropped from 800 million to 400-450 million cubic metres per year (Sokolova, 2019). The conflict is also having an impact on the operations of pumping stations in at least 28 mines in Donetsk and 18 in Luhansk. The flooding of mines and their adjacent territories caused by power outages and damaged equipment is a prime factor in the potential pollution of ground and surface waters that may come into contact with mine waters that are contaminated with iron, chlorides, sulphites and other mineral salts and heavy metals. An especially acute danger is posed by the flooding of mines that had been purposed as waste storage facilities.

To assess the liquidation costs, we use the figures attributed to the draft report by the Ministry of Energy of Russia on the state of the energy sector of the CADLRs (Informnapalm.org, 2016).[54] In 2016, the ministry assessed the number of unprofitable mines at 120 units, with a liquidation cost of closure of USD 24.5 million per mine,[55] using the so-called 'wet' method.[56] Scaling the costs for each mine yields a total cost of mine closure of **USD 2.9 billion**.

Second, there are costs of landmine clearance. As mentioned above, Ukraine is the third most landmine-contaminated region in the world. Clearing the ERWs is a necessary activity to avoid human casualties and allow the seamless movement of population and goods within the region. The cost of clearing just one anti-personnel mine varies from EUR 300 to EUR 1,000 depending on the terrain, accessibility and industrial waste in the ground (Ostanina, 2018). The Ukrainian Defence Ministry estimates the costs **of mine clearance at EUR 650 million**.

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[54] We believe that the news provided refers to the draft of a real document. The style – both verbal and visual – closely resembles other reports from Russian ministries we have previously worked with.

[55] We adjust the reported values of 2015 by yearly inflation rates of the RUB and the USD/RUB exchange rate as of end 2018.

[56] The method is based on controlled flooding of the mines and does not require regular water drainage. The method is the least expensive, but carries significant environmental risks.

Our estimates, however, do not incorporate a number of risks, which may easily materialise in the region. First, existing information shows that the conflict has exacerbated existing pollution in the Donbas region and has caused further environmental damage and loss (UNEUWB, 2015a, 2015b). Zwijnenburg (2017) calls Donbas a 'ticking toxic time bomb', as the military action has damaged several environmentally hazardous sites and a relatively large number of industrial installations and mining sites. According to Obikhod and Omelchenko (2018), the damage caused to the Donbas environment during the years of military conflict could be irreversible. The primary threat of significant episodes of environmental pollution stems from operational disruption and incidents at industrial facilities. As stated in the OSCE (2017) report, prior to the onset of hostilities the Donetsk and Luhansk regions were home to some 4,500 potentially hazardous businesses. Between 2014 and 2017, regional companies experienced over 500 cases of operational disruption and related incidents at various chemical, metallurgical and power plants and oil refineries. According to OSCE expert evaluation, if unfavourable scenarios materialise, the potential risk of incidents with grave environmental consequences remains significant. More than 70 enterprises and 10 public utilities require particular attention. Additionally, the fighting has continued to disrupt electricity and gas supplies, with knock-on effects on industrial production. This brings with it the risk of environmental emergencies triggered by emergency shutdowns. For example, there has been a series of explosions at the Donetsk State Factory of Chemical Products (including one in February 2017). Recent attacks have again highlighted the risk that waste chemicals stored in numerous ponds along the line of contact may find their way into the surrounding soil and rivers. In the case of the Dzerzhinsk phenol plant, this could amount to some 400,000 cubic metres of waste chemicals, sulphuric acid and formaldehyde.

Second, a potential cost of mines flooding is the weakening of the geological stability of the land, resulting in land subsidence. According to the Space Research Institute of the National Academy of Sciences of Ukraine, in some areas around Makeevka land subsidence had already reached 20 cm in December 2018 (Durnev, 2019). Scientists found areas with soil subsidence of up to 80 cm – but fortunately, this was in the steppe and other uninhabited places. With subsidence of more than 20 cm, building foundations begin to crack and municipal infrastructure is damaged. No reliable quantitative predictions of this impact have yet become available.

Third, aside from the landmine contamination, armed hostilities have contributed to human-based pollution, by introducing into the environment munitions fragments and combustion products, damaged bits of civil and military equipment, wrecked infrastructure and other industrial elements, e.g. petroleum products, oil and lubricants (OSCE, 2017). The effects of pollutants that end up in the natural environment may persist for an extended period. The pollutants have also been shown to be mobile, working their way through the food chain, and often posing an immediate toxic, carcinogenic and mutagenic threat to the population.[57]

Finally, there has been other extensive damage to natural resources – namely, local water basins, forests and protected areas, steppe grasslands and cultivated fields. In 2014 alone, over 3,000 forest fires were reported in the conflict zone – 15 times more than in 2013 (UNEUWB, 2015a). The region has been experiencing changes in biological diversity, including the disappearance of some species and the

[57] Currently available data on the increase in pollution during the conflict years vary across different reports: while the OSCE project found only a marginal increase in soil pollution, compared to the background level, according to reports by other organisations the increase in pollution could be up to 12 times. In several water reservoirs, significant pollution with non-radioactive strontium and barium has been discovered.

uncontrolled dispersion and growth in population of other species, including some that threaten the sanitary and epidemiological conditions of the territory and its agriculture (OSCE, 2017). However, the experience from other polluted areas (e.g. Chernobyl) shows that the environment eventually recovers, while people continue to suffer.

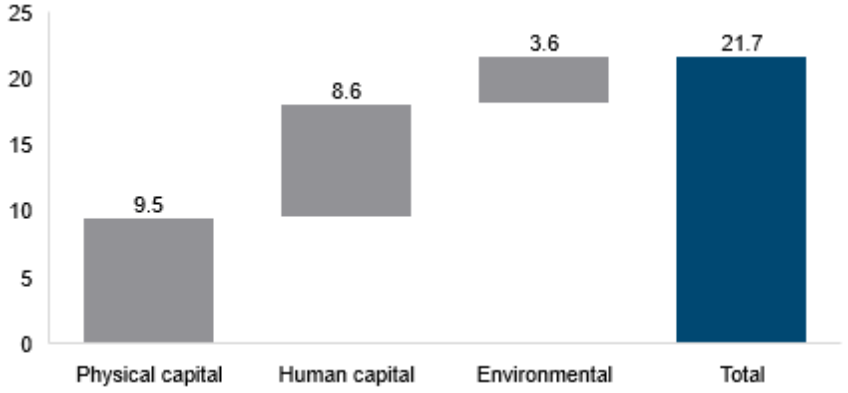
We would like, therefore, to emphasise that the full account of the risks and their probability requires constant monitoring on the ground, and we would encourage stakeholders to increase cooperation to allow proactive preventive measures. Otherwise – as the example of Chernobyl has clearly shown – the price tag of environmental problems can easily skyrocket.

Conclusions

Conflict researchers continuously emphasise that despite all progress made in recent decades, we still have a poor understanding of the pathways to post-war stabilisation. The war in Donbas is no exception. Despite six years of continuous fighting, public discussion is still based on anecdotes, fragmented evidence and outdated figures. By combining evidence from the ground and transparent modelling techniques, the present report aims to provide a sound basis – and hopefully guidance – for discussion on how to reconstruct and restore the economy of Donbas.

According to our estimates, the **lower bound of Donbas reconstruction costs amounts to USD 21.7 billion**. The report has focused on estimating three dimensions of the restoration costs: physical capital, human capital and the environment. The figure below shows that the components of the costs are not evenly split. Physical capital contributes the largest share with USD 9.5 billion (44%), followed by the costs of human capital (USD 8.6 billion - 40%) and environmental restoration (USD 3.6 billion - 17%).

Figure 19 / Reconstruction costs of Donbas, USD billion



Source: wiiw estimations.

The estimation results allow us to draw several conclusions about the nature and consequences of the war in Donbas. First, the destruction of assets caused by violent actions is not the most significant cost contributor in the long run. In the case of Donbas, 42% of the restoration costs can be directly attributed to the disruption of business continuity processes and degradation of state capacity that accumulated over years of inaction.[58] Therefore, lack of skirmishes at the contact line is not a sufficient condition for the revival of the region. One needs a set of measures that would restore those aspects of the economy that are usually taken as given in non-war environments: markets and state services.

Second, the restoration is too costly to be covered by the Ukrainian taxpayers on the spot. The costs of USD 21.7 billion are greater than the annual GDP of Bosnia and Herzegovina, and are equivalent to 16% of the GDP of Ukraine in 2018. Since the ability to cover the expenses through lawsuits against the

[58] The figure is a sum of fixed capital depreciation (USD 5.7 billion) and costs of liquidation of coal mines (USD 2.9 billion).

Russian Federation – the preferable option for the government of Ukraine – appears elusive, the Ukrainian government should seek more feasible alternatives. We propose our vision in the next section, but what is clear is that Ukraine will require access to external long-term finance and the participation of private investors – both domestic and foreign – to address the needs of the region.

Finally, we would like to underline the opportunities for future research on the Donbas economic reconstruction. As we highlighted previously in the report, the depth and detail of the underlying sources were not equal across the components investigated. As a consequence, the reliability of our evaluations is uneven. The fact that the physical capital costs dominate in the overall cost structure partly reflects the degree of ignorance about the other dimensions. For instance, the assessment of human capital costs does not embed the effects of outbreaks of disease caused by disrupted prevention and treatment of otherwise contained infectious illnesses: measles, tuberculosis and HIV. A similar criticism is valid for the environmental cost assessments. For example, areas close to the contact line are highly industrialised. The close proximity of potentially hazardous enterprises to the active warfare zones poses a risk of long-term environmental pollution. Yet lack of knowledge about the distribution of the toxic leaks and the likely cost makes the assessment unfeasible. Therefore, we would like to emphasise that our results should be perceived as the lower bound, as they reflect only the *confirmed* costs of restoration. We would expect the magnitude of the costs of human capital and environmental pollution to be greater than we report, and recommend that future researchers investigate these components more thoroughly.

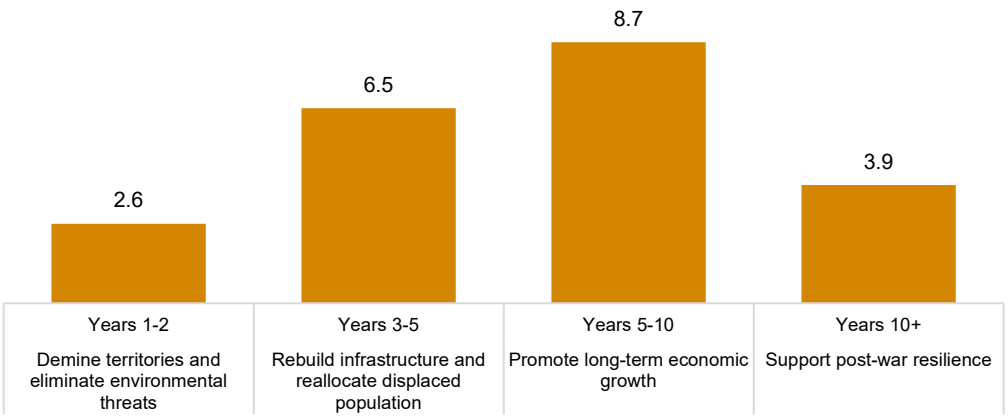
Despite the limitations, we believe that the present study provides a rich insight into the restoration costs and related re-integration challenges facing Donbas. The renewed diplomatic negotiations provide modest hope for a resolution to the conflict. Yet as the experience of other war-torn countries shows, peace should be carefully planned for decades ahead, not just for a couple of weeks. We hope that our study can contribute to an understanding of the magnitude of the challenges and can shed light on the truth hidden behind the fog of war.

Policy recommendations

We view the new political leadership in Ukraine as an opportunity to launch a new initiative for peace, democracy, rehabilitation and economic reconstruction of the Donbas region. The renewed peace negotiations, coupled with the ongoing economic recovery in Ukraine – all remaining obstacles notwithstanding – create a favourable economic environment for starting a new reintegration initiative in Donbas. Based on the findings of our report, and in this climate of moderate optimism, we propose a restoration plan and policy recommendations for a post-war Donbas reconstruction, should the peace negotiations be successful and last.

We want to emphasise three points, however, before we present our recommendations. First, the proposed reconstruction spending we provide below is purely indicative. The sequencing of **the spending** is based on the experience of post-war reconstruction of Bosnia and Herzegovina. Although we believe the war in Bosnia and Herzegovina may provide a useful case for Donbas, because both territories are of comparable size and population, and have suffered massive wartime destruction, the validity of extrapolation cannot be taken at face value (see Annex 7 for methodology of the estimates). The exact timing and sequence of reconstruction activities depends on conditions of the peace settlement and the state capacity of Ukraine to finance, execute and monitor the restoration projects. Since both factors are currently unknown, precise elaboration is not really possible.

Figure 20 / Stages of Donbas reconstruction efforts, USD billion



Source: wiiw estimations.

Second, the split of activities we show in Figure 20 above indicates the primary goals that the government should achieve by the end of the period, and does not imply that other activities should not be undertaken. That is, we do not advise the government to completely postpone the rebuilding of critical infrastructure during the initial stage of demining. The proposed stages emphasise the focus of activities, not the fixed time constraints. Likely, the **execution of measures will overlap**.

Third, the effectiveness of the post-conflict recovery is **closely tied to the ongoing reform process in Ukraine.** The revolution of 2014 had its roots in rent-seeking elites, which opposed inclusive political

processes and efficient public goods provision. Yet protest alone does not change elites' incentives. That is why the government should keep its focus on the reform process. We emphasise this point in the final subsection of this chapter.

OUTLINE OF THE RECONSTRUCTION PLAN

Stage 1: Demine territories and eliminate environmental threats.

Lack of security is the primary reason for internal displacement. A credible ceasefire and disarmament ensure there is no warfare, but do not address the side-effects that continue to threaten the everyday **security of the population**: landmines and environmental issues. Eliminating both threats at the initial stage of restoration is crucial to avoid health damage after the mass reallocation of the displaced population.

Stage 2: Rebuild infrastructure and reallocate the displaced population.

To get the economy of the Donbas back up and running, the reconstruction should **restore markets** and attract population. It requires the restoration of critical infrastructure and transition of property rights from the CADLRs 'legal system' to the Ukrainian one at a micro-level.

The **restoration of infrastructure** is critical in order to overcome the humanitarian crisis and address the urgent needs of the region. Since Donbas is a highly urbanised region, the restoration should prioritise projects in the largest urban areas. Economies of scale mean that these projects will have a greater chance of addressing the humanitarian crisis and of establishing local support.

At the same time, the transition process should define a clear framework – preferably as a separate part of the peace agreement – that clarifies the process of revising contractual relations concluded among agents under separatist rule. This step is necessary to minimise the costs of the post-war transition of local business and to lay the foundations for long-term investment.

The economy of Donbas will also not revive without a qualified labour force. Yet early resettlement to a post-war region will not be an attractive proposition, due to the initially poor state of critical infrastructure, weak labour markets and a hostile environment. Therefore, we advocate developing a cash **assistance programme for refugees and internally displaced persons** contingent on their long-term relocation to Donbas. The specific targeting of the potential beneficiary groups should be based on detailed individual (e.g. household) evidence, which would feature information on the household background: income levels, employment status, urgent needs, willingness to come back and responsiveness to the cash incentives.

Stage 3: Promote long-term sustainable economic growth and create favourable conditions for both domestic and foreign investors in the region.

Although improvements in the investment climate are obviously linked to the progress in the Ukrainian reform process, the fragile post-war environment might scare investors off investing specifically in the Donbas region. This perception will, in turn, result in low growth, discontent and greater fragility, which will

drive away more investors. To avoid the vicious circle, the state should consider providing **preferential investment conditions** for the Donbas region at an early stage of the post-war reconstruction.

Specific investment incentives will have to be designed as to limit the negative effects of moral hazard and asymmetric information, that might result in corruption or misuse of allocated funds. The concrete design of the incentives will require a deep understanding of the current business practices and Ukrainian law that would allow implementing the desired mechanisms into the existing legal frameworks.

An improvement of the investment climate will likely have to involve also a process of property rights transition. However, this process should be based on a mutually acceptable solution and might inter alia involve compensations of more recent investments by the 'new owners'. The substance of the deal will be largely based on both economic and non-economic motives like feeling of fairness and rightfulness.

Stage 4: Support post-war resilience.

The reconstruction efforts do not end once the pre-war GDP levels are reached. Post-war security is fragile, and only a broad legitimation of the government in power can ensure that the local population does not follow another call to rebellion. It might be tempting to focus on the supply side of an insurgency through counter-insurgency measures, law enforcement and monitoring of the post-war incidences. These actions are necessary, but not sufficient to guarantee a lasting peace, as they do not address the demand side. This is the goal of inclusive institutions: mechanisms of collective decision-making that guarantee political participation, minority rights and public goods provision. Yet setting 'better' rules alone is not enough to make a difference. Experience of the decentralisation reform in Ukraine and Germany shows that the newly established governing bodies may lack the skills to effectively use the existing tools, and run the risk of excessive centralisation of public goods provision in the centres of the amalgamated territorial units (Dudley, 2019; Roesel, 2019). Therefore, the state should support administrative capacity and political engagement of the CADLRs in the long term, to avoid dissatisfaction and ensure fair representation of local interests at the state level.

FINANCING AND COORDINATION

As we emphasised in the conclusions above, the reconstruction programme will require long-term financing, as the costs are too great to be covered by the Ukrainian budget alone on the spot. Furthermore, we expect that Ukraine might not possess enough skills and expertise in reconstruction activities to execute a project of such magnitude on its own. We believe that the government can address both issues by establishing a temporary financial infrastructure for rebuilding activities. Since the exact design of the infrastructure is a topic for a standalone study, we would like to emphasise only four points here.

First, issuing long-term 'reconstruction' bonds on the international market appears to be the most viable solution.[59] Yet financing through international credit markets will only be reasonable on two conditions: a low interest rate environment and a stable exchange rate. And there is no guarantee that the current interest rate environment will remain in the future or that the aggregate economy of Ukraine will be stable in times of global economic slowdown. Therefore, the government should carefully track global

[59] Although the World Bank is likely to participate in providing finance, we do not expect that its management can approve project finance in a single country equal to the bank's total portfolio in Middle East and North Africa.

and domestic macroeconomic risks, in order to avoid unfavourable timing of bonds' placement and a sudden spike in financial leverage due to currency depreciation.

Second, restoration activities on such a scale require a body to coordinate projects and provide funds on the ground. The Ministry of Temporarily Occupied Territories and Internally Displaced Persons can naturally take on these functions. We recommend that the ministry should use existing institutional arrangements of technical assistance to Ukraine – such as the Strategic Advisory Group for Supporting Ukrainian Reform (SAGSUR) or the Ukraine Reform Architecture (URA) programme – embedded with the National Reforms Council to implement Donbas reconstruction and reintegration efforts (EBRD, 2019b, Box 1.2). An expanded and adjusted URA programme should establish a small high-level expert supervisory body - composed of the main stakeholders involved in providing finance - and coordinating reconstruction activities. Apart from members of the Ukrainian government, we would expect the supervisory body to contain representatives of the World Bank, the EBRD and the EU. Thus, we believe that coordination should be left to the Ukrainian ministries to assure responsibility and process ownership. The supervisory functions of the foreign members should provide a sound basis for monitoring the quality of the reconstruction activities.

Third, use courts to provide compensation for the costs of conflict. Ukrainian activists and authorities collected rich evidence that confirms damage caused by Russian military forces in Donbas. This evidence can serve as a basis for lawsuits against the Russian Federation, which could provide further finance to cover the reconstruction costs. There have been some successful developments on this front, both in the case against Russia filed in the International Court of Justice and in corporate arbitrations (see Annex 6 for a more detailed account).

Fourth, Ukraine should welcome contributions from the Russian Federation to support economic restoration of the region foreseen by the Minsk Agreement of February 12, 2015 in general terms.[60] The cross-border cooperation in this field would undoubtedly benefit from international support of the economic reconstruction of the Donbas region. A sizeable contribution to reconstruction efforts of the Donbas region and a readiness by Russia to coordinate on this with international donors and financial institutions would certainly resonate well with investors. To assure that the active participation of Russia will not give the Kremlin the space for opportunistic behaviour, we encourage to steer these contributions through the multilateral institutions where Russia participates on equal rights.

GENERAL RECOMMENDATIONS

Continue the reform path. The experience of post-war countries shows that the chances of a durable peace are greater when the well-being of post-war regions improves. Recruiting people for an insurgency is easy if the population has little to lose. Although direct transfers are instrumental in building confidence and achieving short-term political stabilisation, this approach would not be a durable solution, as transfers cannot take the place of a productive environment and depend heavily on a stable macroeconomic environment. Adhering to the reform path is essential to launching an engine of

[60] "…the assistance of the central executive bodies for cross-border cooperation by the CALDRs with regions of the Russian Federation" (United Nations, 2015; sub note 6 to Art.11)

sustainable and inclusive economic growth: attract foreign investments, improve the well-being of Ukrainian citizens and increase the opportunity costs of conflict.[61]

Establish the systematic collection and dissemination of data on GCT and CADLRs. This report has highlighted that the sources on losses in the CADLRs remain extremely limited. The estimations provided still rely heavily on proxy variables collected from the web and methodological assumptions. To provide a more detailed and fair account of losses, the GCT and CADLRs should start exchanging more information in terms of losses incurred, based on evidence from the field. This would help to understand the restoration needs more clearly, factor in the currently unquantified risks, and prioritise the post-war government actions.

Strive for balanced trade with the rest of the world. Trade economics consistently confirms that countries tend to trade with proximate locations (Yotov et al., 2016). Although trade restrictions have become a commonly used tool in foreign relations between Ukraine and Russia they produce more harm to the Ukrainian economy than benefits. First, trade war is a negative sum game: the more one restricts trade, the more one loses oneself. Second, the Ukrainian economy is not big enough to impose high costs on the Russian economy and influence Kremlin's politics from within. In the post-conflict environment, it could be beneficial for Ukraine to aim for a diversified basket of import and export markets, including Russia (Adarov et al., 2015). This approach would mitigate the costs of unfavourable decisions by a single policymaker and ensure the greater stability of foreign trade in the long run. If in the future geopolitical reality changes in a way that makes the idea of a free trade area with the Eurasian space possible, it would make sense for Ukraine to participate in it on terms, which would not lead to exclusion from other trade agreements.

Ensure that the peace settlement is durable. The peace agreement is not likely to be effective if any of the negotiating sides can easily deviate from the settlement. Since accords establishing peace between a central government, separatists and possible outside actors typically assume restoration of control and coercive power by the central authorities they should achieve two outcomes. First, it should bind the government with long-term guarantees that would effectively prevent the state from pursuing post-war discriminatory policies against the former opponents. Second, the agreement should establish a supervisory mechanism that would ensure that both parties adhere to the settlement procedure. Practically, one can address the first goal by adopting a constitutional change, as for instance foreseen in the Minsk II Agreement, that would explicitly embed the guarantees offered to the CADLRs' 'citizens' and ex-combatants, together with the post-war transition rules.[62] The second goal can be addressed by signing an agreement that would establish an international monitoring mission on the ground and an enforcement mechanism that would punish deviations from the peace agreement by either side. In the case of the Donbas this would mean an additional agreement that would not substitute the Minsk II Agreement but would both help to implement and complement it.

[61] See Adarov et al. (2015), Miklos and Kukhta (2019) and EBRD (2019b) for detailed discussions on the reform recommendations in Ukraine.

[62] We emphasise that this proposal does not support an unconditional amnesty for all ex-combatants. War crimes and crimes against humanity should be prosecuted.

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Annexes

ANNEX 1: STATISTICAL DATA

Table A.1 / Ukraine: selected macroeconomic indicators

	2012	2013	2014	2015	2016	2017	2018	2019
Population, th pers., average	45,593	45,490	43,001	42,845	42,673	42,485	42,270	42,030
Gross domestic product, UAH bn, nom.	1,459	1,523	1,587	1,989	2,385	2,984	3,559	3,970
annual change in % (real)	0.2	0.0	-6.6	-9.8	2.4	2.5	3.3	3.3
GDP/capita (EUR at PPP)	6,700	6,600	6,400	6,000	5,900	6,100	6,400	6,800
Consumption of households, UAH bn, nom.	1,002	1,099	1,121	1,332	1,570	1,978	2,431	2,850
annual change in % (real)	8.4	6.5	-8.3	-19.8	2.7	9.5	8.9	8.5
Gross fixed capital form., UAH bn, nom.	283	264	224	269	369	470	611	690
annual change in % (real)	3.3	-8.0	-24.0	-9.2	20.4	16.1	14.3	9.0
Gross industrial production								
annual change in % (real)	-0.7	-4.3	-10.1	-13.0	2.8	0.4	1.6	-1.8
Gross agricultural production								
annual change in % (real)	-4.5	13.3	2.2	-4.8	6.3	-2.2	7.8	1.1
Construction output								
annual change in % (real)	-8.3	-11.0	-20.4	-12.3	17.4	26.3	8.5	20.0
Employed persons, LFS, th, average	20,354	20,404	18,073	16,443	16,277	16,156	16,361	16,500
annual change in %	0.1	0.2	-6.4	-0.4	-1.0	-0.7	1.3	0.9
Unemployed persons, LFS, th, average	1,657	1,577	1,848	1,655	1,678	1,698	1,579	1,460
Unemployment rate, LFS, in %, average	7.5	7.2	9.3	9.1	9.3	9.5	8.8	8.4
Reg. unemployment rate, in %, eop [2)]	1.8	1.8	1.7	1.6	1.5	1.4	1.3	.
Average monthly gross wages, UAH [3)]	3,026	3,265	3,480	4,195	5,183	7,104	8,865	10,497
annual change in % (real, net)	14.4	8.2	-6.5	-20.2	9.0	19.0	12.5	9.8
Consumer prices, % p.a.	0.6	-0.3	12.1	48.7	13.9	14.4	10.9	7.9
Producer prices in industry, % p.a. [4)]	3.7	-0.1	17.1	36.0	20.5	26.4	17.4	4.1
Central bank policy rate, % p.a., eop [7)]	7.50	6.50	14.00	22.00	14.00	14.50	18.00	13.50
Current account, EUR mn [8)]	-11,153	-12,441	-3,476	1,457	-1,210	-2,165	-3,696	-957
Current account, % of GDP	-7.9	-8.7	-3.4	1.8	-1.4	-2.2	-3.3	-0.7
FDI liabilities, EUR mn [8)]	6,360	3,396	641	2,750	3,108	2,506	2,095	2,891
FDI assets, EUR mn [8)]	762	324	414	34	156	207	98	655
Gross reserves of NB excl. gold, EUR mn [8)]	17,186	13,592	5,429	11,320	13,965	14,872	15,955	21,590
Gross external debt, EUR mn [8)]	102,120	102,852	102,728	107,695	107,648	96,741	92,352	109,870
Gross external debt, % of GDP	71.9	71.7	101.7	131.2	127.7	97.3	83.4	80.1
Average exchange rate UAH/EUR	10.27	10.61	15.72	24.23	28.29	30.00	32.14	28.95

Note: Excluding the occupied territories of Crimea, Sevastopol and CADLR starting from 2014.
1) Preliminary and wiiw estimates. - 2) In % of working age population. - 3) Enterprises with 10 and more employees. - 4) Domestic output prices. - 5) Without transfers to Naftohaz and other bail-out costs. - 6) From 2017 including NPLs of the nationalised Privatbank and changes in rules of credit risk assessment. - 7) Discount rate of NB. - 8) Converted from USD.
Source: wiiw Databases incorporating national statistics.

Table A.2 / Contribution of Donetsk and Luhansk regions to key sectors

Share in respective indicator	Donetsk region	Luhansk region	Together
Population	9.6%	5.0%	14.6%
Employed population	7.5%	5.0%	12.5%
GDP	11.7%	4.0%	15.7%
Industry	18.5%	6.1%	24.6%
Construction	9.5%	1.9%	11.4%
Trade	7.4%	2.9%	10.3%
Agriculture	4.9%	2.8%	7.7%
Export of goods	19.6%	5.6%	25.2%
Export of metals	50.3%	9.5%	59.8%
Export of services	4.3%	1.1%	5.4%
State budget revenues	4.6%	1.7%	6.3%
Pension fund	10.7%	4.7%	15.4%

Source: adapted from UNEUWB (2015b, Table 13, p. 55).

Table A.3 / Selected indicators for the Donetsk region

	2000	2005	2010	2013	2014*
Population, thousands	4923.9	4647.2	4449.9	4359.7	4320.4
Real Economy					
GDP, mln. UAH	17278.0	58044.0	128986.0	164926.0	119983.0
GDP growth, real	-	14%	13%	-5%	-40%
GDP, mln. USD at FX Prices	3170.3	11336.7	16245.1	20641.6	10133.7
GDP per capita, USD at FX Prices	643.9	2439.5	3650.6	4734.7	2345.5
Economic Activity					
Gross Industry Output, % of GDP	-	-	158%	134%	148%
Gross Agriculture Output, % of GDP	46%	17%	7%	7%	9%
Fixed Capital Investment, % of GDP	-	-	12%	17%	11%
Retail Trade Turnover, % of GDP	-	28%	43%	55%	54%
External Sector					
External Trade Turnover, % GDP	122%	96%	100%	80%	105%
Export, % GDP	93%	75%	84%	63%	88%
Import, % GDP	28%	22%	16%	17%	17%
Net Export, % GDP	65%	53%	68%	47%	70%
Labour Market					
Economically Active Population, thousands	2383.5	2265.1	2166.6	2133.7	1968.8
Monthly Average Employed Population, thousands	2153.2	2124.9	1983.7	1968.1	1752.4
Unemployed, thousands**	230.3	140.2	182.9	165.6	216.4
Unemployment Rate, %	9.7%	6.2%	8.4%	7.8%	11.0%
Average Monthly Wage, UAH	383.0	962.0	2549.0	3755.0	3858.1
Average Monthly Wage, USD at FX Prices	70.3	187.9	321.0	470.0	325.9
Financial Sector					
Inflation Rate (CPI based)	-	11.9%	10.3%	1.3%	22.0%
Official Exchange Rate, UAH/USD	5.45	5.12	7.94	7.99	11.84

* Values for 2014 do not account for the separatist-controlled areas and migration flows.
** According to the methodology of the International Labour Organization.
Sources: State Statistical Service of Ukraine, National Bank of Ukraine.

Table A.4 / Selected indicators for Luhansk region

	2000	2005	2010	2013	2014*
Population, thousands	2625.3	2424.8	2301.4	2248.0	2229.8
Real Economy					
GDP, mln. UAH	6403.0	19716.0	45541.0	55108.0	31393.0
GDP growth, real	-	20%	7%	-7%	-54%
GDP, mln. USD at FX Prices	1174.9	3850.8	5735.6	6897.1	2651.4
GDP per capita, USD at FX Prices	447.5	1588.1	2492.2	3068.1	1189.1
Economic Activity					
Gross Industry Output, % of GDP	-	-	162%	132%	107%
Gross Agriculture Output, % of GDP	62%	30%	11%	12%	17%
Fixed Capital Investment, % of GDP	-	-	12%	21%	17%
Retail Trade Turnover, % of GDP	-	37%	51%	72%	63%
External Sector					
External Trade Turnover, % GDP	272%	228%	247%	207%	355%
Export, % GDP	252%	214%	230%	182%	322%
Import, % GDP	20%	13%	17%	25%	33%
Net Export, % GDP	232%	201%	213%	158%	289%
Labour Market					
Economically Active Population, thousands	1135.3	1143.2	1094.1	1078.0	990.3
Monthly Average Employed Population, thousands	1008.3	1054.4	1015.4	1011.7	877.6
Unemployed, thousands**	127.0	88.8	78.7	66.3	112.7
Unemployment Rate, %	11%	8%	7%	6%	11%
Average Monthly Wage, UAH	232	805	2271	3337	3377.1
Average Monthly Wage, USD at FX Prices	42.6	157.2	286.0	417.6	285.2
Financial Sector					
Inflation Rate (CPI based)	-	12.0%	10.5%	1.3%	25.2%
Official Exchange Rate, USD/UAH	5.45	5.12	7.94	7.99	11.84

* Values for 2014 do not account for the separatist-controlled areas and migration flows.
** According to the methodology of the International Labour Organization.
Sources: State Statistical Service of Ukraine, National Bank of Ukraine; Workshop Economic connectivity in European conflict regions, Vienna, July 2016. The Workshop was organised by: The Vienna Institute for International Economic Studies (wiiw) in collaboration with the Austrian Ministry of Foreign Affairs (BMEIA), and the Swiss Federal Department of Foreign Affairs (EDA).

Table A.5 / Insurance premium collected, thousand UAH and shares of Donbas

Year	Casco (voluntary insurance)		Property (voluntary insurance)		MTPL (compulsory insurance)		Other		USD/UAH
	Total	Share of Donbas	Total	Share of Donbas	Total	Share of Donbas	Total	Share of Donbas	
2018	6,972,432.2	0.296%	10,937,239.5	0.040%	6,002,664.9	1.03%	18,474,607.6	0.33%	31.7
2017	5,570,077.9	0.322%	8,696,961.9	0.040%	5,042,941.8	0.98%	18,671,428.6	0.29%	33.5
2016	4,603,990.7	0.364%	6,694,284.2	0.038%	4,673,520.3	0.98%	14,266,092.0	0.34%	28.42
2015	3,827,337.4	0.832%	5,463,817.0	0.291%	4,044,242.2	1.45%	12,320,168.1	0.69%	26.22
2012	3,499,293.1	8.574%	4,760,653.3	10.535%	2,752,659.6	6.12%	7,550,461.3	3.70%	10.54
2011	3,543,203.8	7.368%	5,737,933.8	11.769%	2,609,851.7	6.39%	8,466,024.5	4.29%	10.30

Note: For 2013-2014 there are no official data due to hostilities in the country. Share of Donbas is calculated as share of Donetsk and Luhansk regions in the Ukraine's total. USD/UAH is the official exchange rate as of 31.12 of the corresponding year.
Source: extracted from https://forinsurer.com/insurancetop_67, courtesy of O. Kovshik, Knyazha Kyiv.

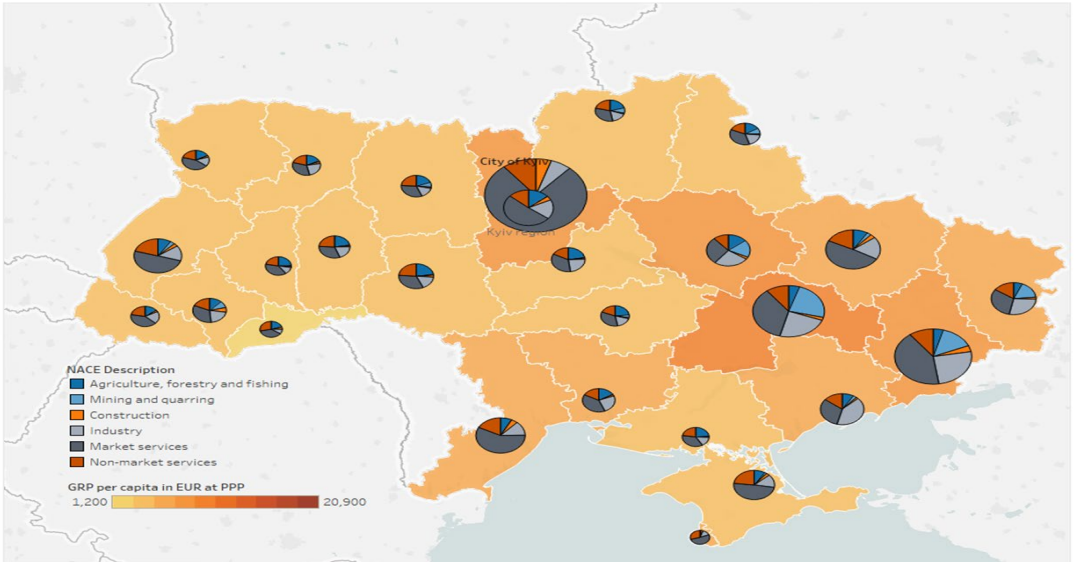
Table A.6 / Regional composition of exports by destination

	2012				2017				2012	2017	Growth, %
Region	EU27	Russia	CIS excl. Russia	RoW	EU27	Russia	CIS excl. Russia	RoW	Total	Total	2017/2012
City of Kyiv	3598	1508	972	6693	3586	304	644	5204	12770	9738	76
Kyiv	454	651	352	525	645	116	222	766	1983	1748	88
Chernivtsi	48	31	21	25	100	7	22	21	125	150	120
Ivano-Frankivsk	287	383	77	75	412	48	54	152	822	665	81
Khmelnytskiy	144	185	68	63	229	39	62	137	460	468	102
Lviv	748	176	147	273	1223	38	88	237	1344	1585	118
Rivne	206	127	57	113	277	12	42	52	504	383	76
Ternopil	140	52	12	33	262	3	37	77	237	380	161
Vinnytsya	202	142	140	169	445	39	119	615	652	1218	187
Volyn	361	142	92	11	536	23	68	62	606	689	114
Zakarpattya	1127	197	7	54	1347	8	4	88	1385	1446	104
Zhytomyr	173	194	83	100	344	37	78	131	550	590	107
Chernihiv	147	142	129	124	220	75	94	236	542	625	115
Donetsk	**3025**	**3089**	**1648**	**6365**	**2161**	**717**	**162**	**1393**	**14127**	**4433**	**31**
Kharkiv	265	925	395	437	234	307	178	473	2022	1192	59
Luhansk	**1049**	**1804**	**330**	**1009**	**118**	**57**	**22**	**37**	**4193**	**234**	**6**
Poltava	760	1029	734	882	854	95	152	764	3404	1865	55
Sumy	118	591	213	201	186	184	77	225	1122	673	60
Cherkasy	287	197	93	431	211	20	123	264	1008	618	61
Dnipropetrovsk	1705	2791	1198	4436	2335	654	279	3785	10130	7053	70
Kherson	85	81	69	94	153	20	35	81	328	289	88
Kirovohrad	131	114	89	297	96	49	31	239	631	416	66
Mykolayiv	224	759	58	1329	320	474	42	1065	2371	1901	80
Odesa	308	239	157	1081	445	106	165	1098	1785	1814	102
Zaporizhzhya	715	1705	323	1261	866	506	178	1430	4005	2981	74
Autonomous Rep. of Crimea	155	262	100	371	-	-	-	-	889	-	-.
Sevastopol	16	40	5	98	-	-	-	-	159	-	-
Total	16478	17556	7568	26551	17606	3936	2978	18632	68153	43152	63

Note: Excluding the occupied territories of Crimea, Sevastopol and CADLR in 2017.
Source: own calculations based on data from the State Statistics Service of Ukraine.

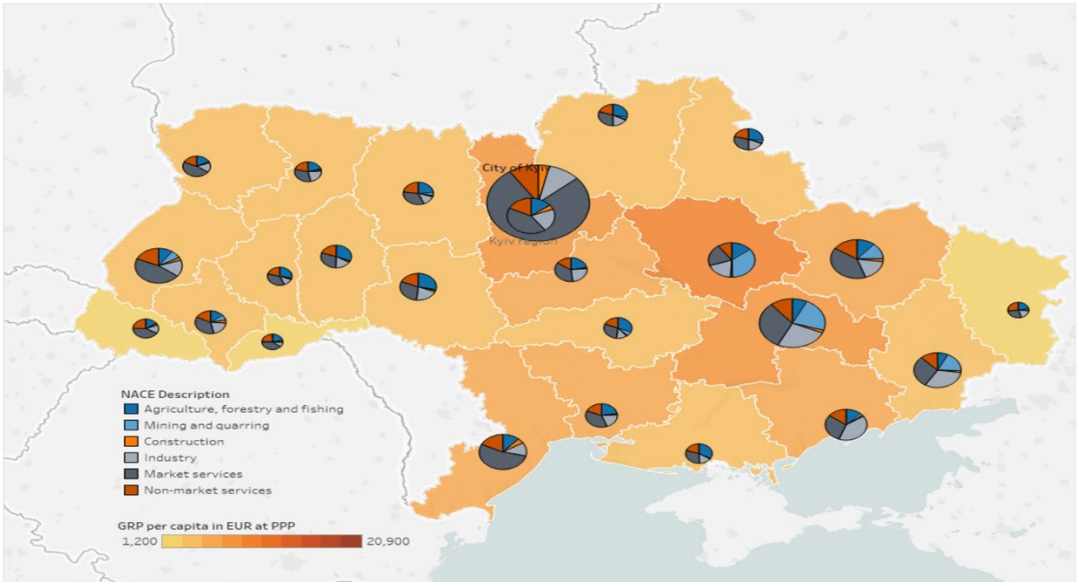
ANNEX 2: SUPPORTING GRAPHS

Figure A.1 / Gross regional product per capita in 2012, in EUR at PPP



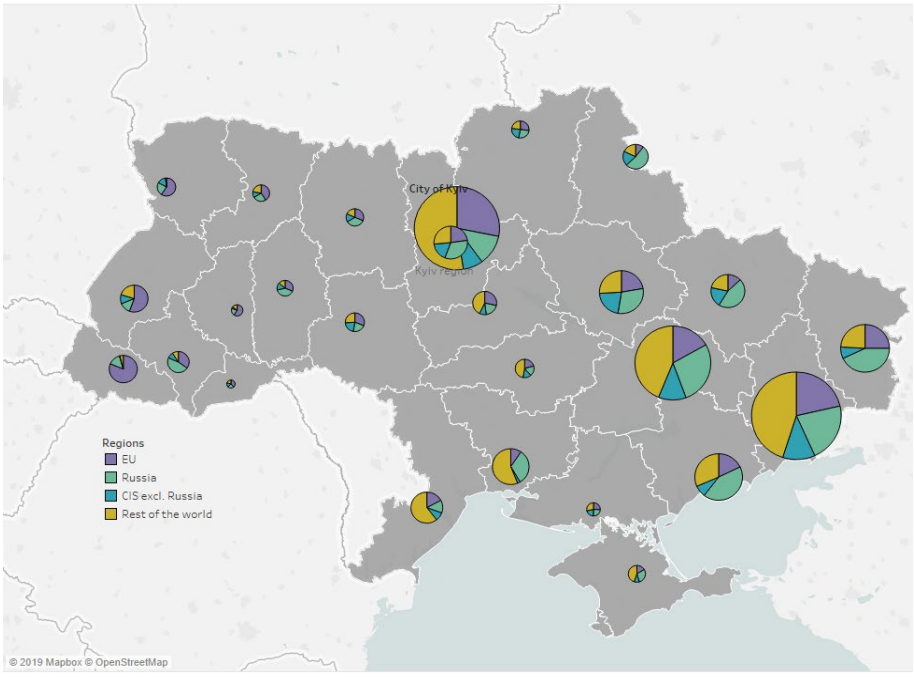
Note: Purchasing power parity (PPP) is a wiiw estimate based on the 2011 International Comparison Project benchmark, and is assumed to be the same across regions.
Source: own calculations based on data from the State Statistics Service of Ukraine.

Figure A.2 / Gross regional product per capita in 2017, in EUR at PPP



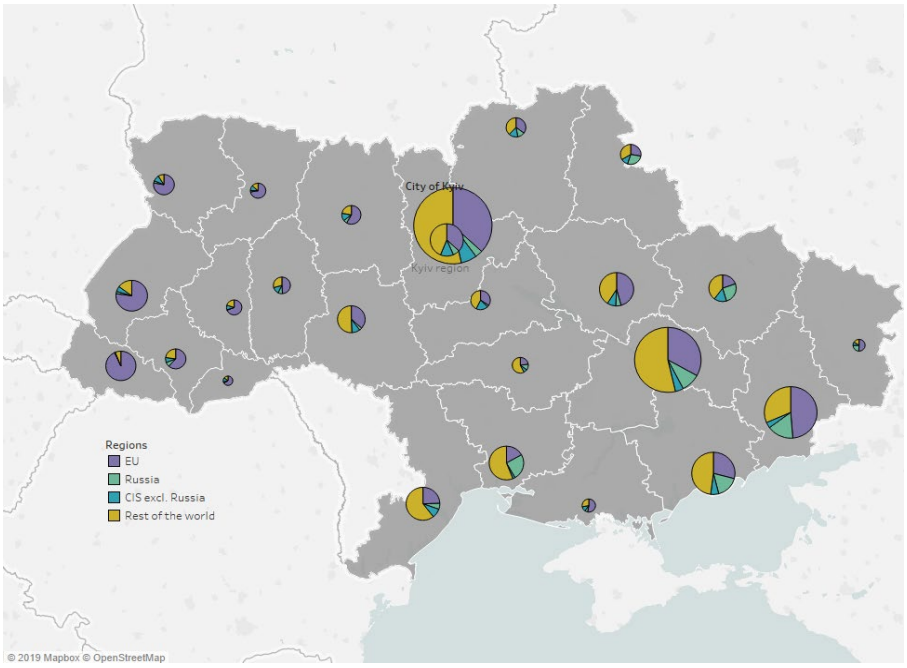
Note: Purchasing power parity (PPP) is a wiiw estimate based on the 2011 International Comparison Project benchmark, and is assumed to be the same across regions. Data starting from 2014 exclude the occupied territories of Crimea and Sevastopol and temporarily occupied territories in the Donetsk and Luhansk regions.
Source: own calculations based on data from the State Statistics Service of Ukraine.

Figure A.3 / Regional composition of exports by destination, 2012



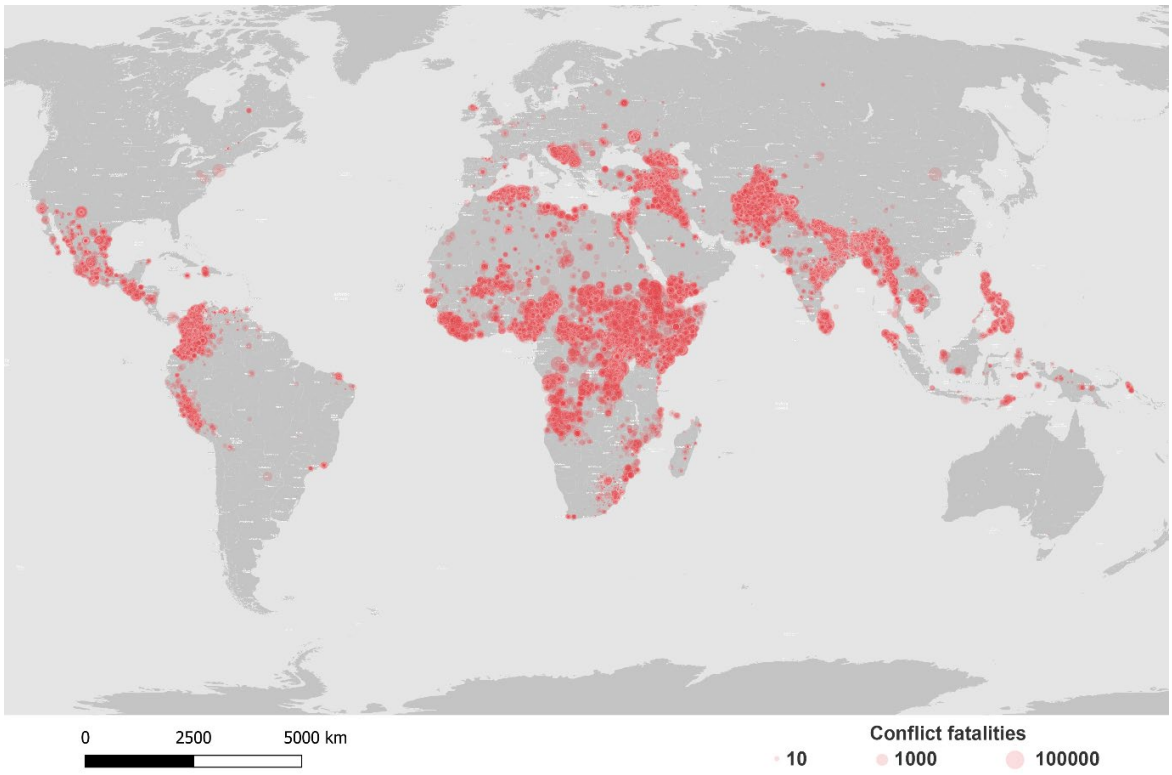
Note: Size of the pie corresponds to the value of a region's exports in USD million.
Source: wiiw calculations based on data from State Statistics Service of Ukraine.

Figure A.4 / Regional composition of exports by destination, 2017



Note: Size of the pie corresponds to the value of a region's exports in USD million.
Source: wiiw calculations based on data from State Statistics Service of Ukraine.

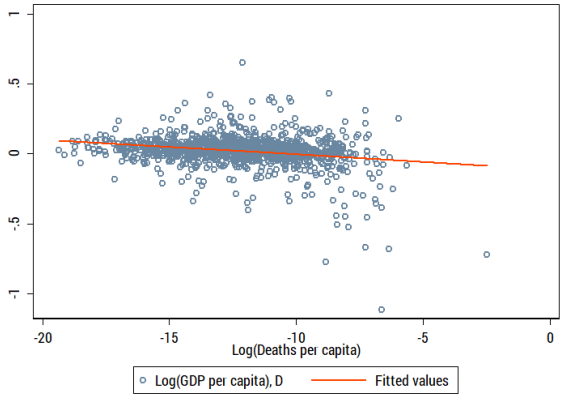
Figure A.5 / Distribution of fatalities around the world: 1946-2018



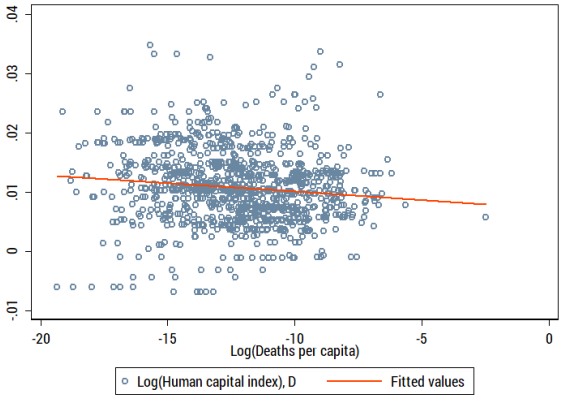
Source: Sundberg and Melander (2013).

Figure A.6 / Correlations between dynamics of conflict intensity and economic development

Left panel: change in conflict fatalities per capita and GDP per capita growth



Right panel: change in conflict fatalities per capita and human capital growth



Note: Only internal and internationalised internal conflicts are considered.
Source: Sundberg and Melander (2013), Feenstra et al. (2015).

ANNEX 3: INTERNATIONAL ASSISTANCE

Table A.7 / Overview and a brief description of the financial assistance to Ukraine

Donor	Receiver	Program	Focus	Volume, bn	Currency	Period
EU+	Ukraine	Total assistance	Macroeconomic stabilisation, governance, reforms, regional development	15	EUR	2014 - 2019
EU	Ukraine	Macrofinancial assistance I-IV	Macroeconomic stabilisation, governance, reforms	3.8	EUR	2014 - present
EU	Ukraine	European Neighbourhood Instrument, European Commission's Support Group for Ukraine	Governance, structural reforms, regional development, judicial independence	0.2	EUR	2014 - present
EU	Ukraine	Neighbourhood Investment Platform	Infrastructure, local currency lending	0.18	EUR	2014 - present
EU	Ukraine	Humanitarian Assistance	Protection, food security & livelihoods, water and sanitation, health and nutrition, shelter, education, services and support, cash assistance	0.4	EUR	2014 - present
EU	Ukraine GCT	Comprehensive support programme	Governance, regional development	0.06	EUR	2017 - present
EIB	Ukraine	Loans	Infrastructure, reforms	4.6	EUR	2014 - present
EBRD	Ukraine	Cumulative investment	Governance, regional development	14.69	EUR	1992 - 2019
IMF	Ukraine	Stand-by arrangement	Macroeconomic stabilisation, structural reforms, financial sector	16.5	USD	2014 - 2015
IMF	Ukraine	Extended Fund Facility	Macroeconomic stabilisation, structural reforms, financial sector	17.5	USD	2015 - 2018
IMF	Ukraine	Stand-by arrangement	Macroeconomic stabilisation, structural reforms, financial sector	3.9	USD	2018 - 2019
World Bank	Ukraine	Cumulative investment	Infrastructure, structural reforms	12	USD	1992 - 2019
USAID	Ukraine	Cumulative investment	Governance, economic development, state capacity, democracy	3	USD	1992 - 2019
USA	Ukraine	Sovereign loan guarantee	Macroeconomic stabilisation	1	USD	2014 - 2016
OCHA	GCT, CADLR	Humanitarian Assistance	Protection, food security & livelihoods, water and sanitation, health and nutrition, shelter, education, services and support, cash assistance	0.44	USD	2014 - 2019
Various	Ukraine	International technical assistance	National security, nuclear safety, governance, civil society, IDP, regional development, energy, public services	6.6	USD	2018
Russia	CADLR	Financial support of CADLRs	Energy, public services, environment, shelter	3	USD	2016
Russia	CADLR	Military support of CADLRs	Arms, manpower, military training	3	USD	2016

Note 1: EU+ refers to the EU bodies and other European financial institutions.
Note 2: Listed sources of assistance are not comprehensive and overlap with each other.
Note 3: All volumes listed in current values of the respective years.
Source: European Commission, (2019a, 2019b, 2019c), IMF (2016), UNOCHA (2019), Interfax Ukraine (2016), EBRD, Cabinet of Ministers of Ukraine (2019).

ANNEX 4: METHODOLOGY OF CAPITAL STOCK LOSSES ESTIMATES

To assess the impact of fighting on damage to capital stock, we estimate the following model using the ordinary least squares technique:

$$d_i = \alpha + \beta_h \times h_i + \varepsilon_i \quad \text{A.1}$$

Where d_i stands for an average share of value that residential buildings lost due to damage in a district i, h_i stands for a number of hostilities in a district i times 1000, ε_i is an iid error term which is not correlated with h_i, α is a constant and β_h is the parameter that represents the impact of hostilities on the share of households' value of residential buildings lost. The box below shows the sources we used to estimate the equation.

BOX A.1 / DESCRIPTION OF DATASETS

GAR15: Global Assessment of Risk Exposure

Description: The GAR15 global exposure database is based on a top-down approach where statistical information including socio-economic, building type and capital stock at a national level are transposed onto 5x5 or 1x1 grids using geographic distribution of population data and gross domestic product (GDP) as proxies.

Mode of data collection: The value of capital stock based on perpetual inventory method and historical gross capital formation data from World Bank (2011) is distributed using the Visible Infrared Imaging Radiometer Suite (VIIRS) night-time lights imagery.

Sampling: 152 countries
Time frame: 2010

REACH: Household survey dataset

Description: A survey dataset containing information on multi-sectoral humanitarian needs of populations living in conflict-affected government-controlled areas of Ukraine.

Mode of data collection: Face-to-face interviews with head of household or household representative.

Sampling: Stratified sampling with stratification for four areas: 5km/20km; Rural/Urban. Confidence level – 95%. Margin of error – 5%. Survey contains settlements only in government-controlled areas.
Time frame: Data collection took place between 23 July and 16 August 2019.

xSub: Conflict event dataset

Description: xSub (cross-sub.org) is a repository of micro-level, subnational event data on armed conflict and contention around the world.

Mode of data collection: Automatic news classification based on a supervised machine learning model (support vector machines).

Sampling: The whole sample of war-related news collected by five Ukrainian sources (Channel 5, Espresso.tv, Information Resistance, Interfax-Ukraine and Ukrinform),four Russian sources (Gazeta.ru, Lenta.ru, BFM.ru, Interfax-Russia), one pro-rebel source (Rusvesna.su), and two international sources (the Russian-language edition of Wikipedia, daily briefings from the OSCE Special Monitoring Mission to Ukraine).
Time frame: April 2014 to April 2016

Shelter Cluster: Cluster guidelines on structural repairs and reconstruction

Description: The guidelines promote good practices in providing durable shelter solutions for permanent stay by exploring existing practices in Ukraine to provide partners with guidance for structural repairs and reconstruction. The guidance includes selection of the most appropriate methodologies, construction details and level of finishing, financing and scale for interventions.

Mode of data collection: expert judgement based on legal housing standards of Ukraine.

Sampling: N/A
Time frame: 2016

The share of value that residential buildings lost was approximated using a) the REACH survey of households located in the government-controlled areas within 5 to 20 km from the contact line, b) the costs of repair and reconstruction works estimated by the UNHCR Shelter Cluster by major element types of a three-person house.[63] The breakdown of costs by the UNHCR Shelter Cluster was more detailed than in the REACH questionnaire, therefore we frequently added up different cost types for certain damage types reported by REACH. For instance, for each positive answer for roof/ceiling damage, we include roof and upper ring beam repair costs, as suggested in the Shelter Cluster recommendations. Table A.5 shows the mapping used between the two datasets. According to it, damage to roofs/ceilings and walls accounted for the largest share of repair costs of buildings (22% and 6%, respectively).

Table A.8 / Mapping of REACH questionnaire to cost assessment of UNHCR Shelter Cluster

Position	Costs of structural repairs	Reconstruction costs	Ratio: structural repair/total reconstruction	REACH code question
Foundation/wall + floor basement	234	797	2.22%	e11_what_damaged/floors
Opening window	265	0	2.51%	e11_what_damaged/windows
Doors	265	0	2.51%	e11_what_damaged/doors
Walls + Insulation	672	5370	6.36%	e11_what_damaged/walls
Upper ring beam + Roofing + Ceiling	2310	1853	21.88%	e11_what_damaged/roof_ceilings
Heating system/Gas pipes	240	240	2.27%	e11_what_damaged/gas_pipes
Plumbing	250	500	2.37%	e11_what_damaged/water_pipes
Sewerage system	250	500	2.37%	e11_what_damaged/sewerage_system
Electrical system	180	300	1.70%	e11_what_damaged/electrical_wiring

Note: Estimation is done for a three-person household. Data for reconstruction costs are estimated by interpolating UNHCR data for a two-person household.
Source: UNHCR Shelter Cluster Ukraine (2016), REACH (2019).

The mapping was applied to each household surveyed in the REACH dataset and averaged by each district. This dataset was combined with the conflict-event dataset of Zhukov et al. (2019), which is currently the most detailed source of battle events at the initial stage of the war in Donbas. The final dataset contained 28 districts of Donetsk and Luhansk. This sample was used to estimate equation (A.1) using ordinary least squares.

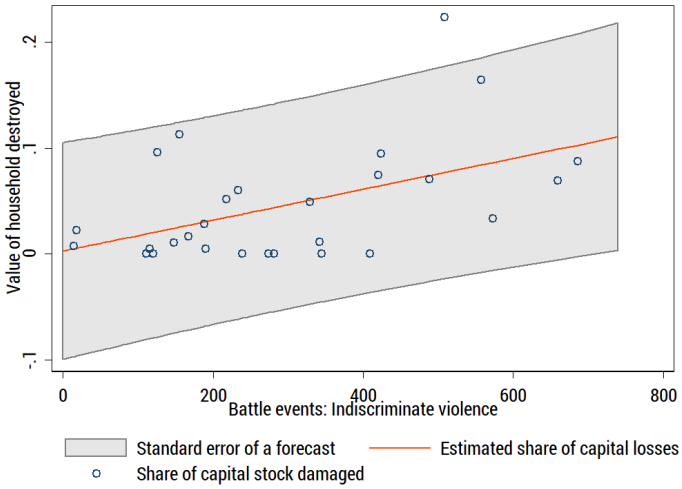
[63] Since we are interested in the share of household value damaged, the size of the representative household we assume in the calculations does not have a big impact on calculations, so long as the household size is fixed for repair and reconstruction costs.

Table A.9 / Estimations of impact of hostilities on damage to households

	(1)	(2)	(3)	(4)
Battle events: all	0.075**			
	[0.000]			
Battle events: Indiscriminate weapon		0.146***		
		[0.000]		
Log(Battle events: All)			21.813*	
			[0.012]	
Log(Battle events: Indiscriminate weapon)				22.822**
				[0.011]
Observations	28	28	28	28
Adjusted R^2	0.154	0.212	0.081	0.114
Constant	Yes	Yes	Yes	Yes

Note: Standard errors in brackets; * for p < 0.05, ** for p < 0.01, *** for p < 0.001. Battle events are measured in thousand media reports. Unit of observation is a district. Models (2) and (4) use only those battle events for which use of indiscriminate weapons was reported by Zhukov et al. (2019).
Sources: Battle events by Zhukov et al. (2019), household damage estimations based on REACH (2019) and UNHCR Shelter Cluster (2016).

Table A.10 / Share of value of residential building lost and the number of battle events



Source: own estimations based on REACH (2019), UNHCR (2016) and Zhukov et al. (2019).

Table A.11 shows estimations of the model based on different model specifications. In all of them, the relationship is statistically significant at the 1% level. The correlation between two variables is clearly represented at the scatterplot on Figure A.10.

Since all coefficients for battle events in Table A.11 are statistically significant, we select the model that gives the highest explanatory power measured by R-squared (model 2). This model counts only those battle events that featured weapons that cause indiscriminate violence: the violence that affects both armed forces of opponents and civilians. According to it, each 1,000 indiscriminate battle events per district on average diminish the value of a residential building by 14.6 percentage points. The full parametrisation of the model is shown by equation (A.2).

$$\widehat{d_i} = 0.0028 + 0.146 \times h_i \quad \text{(A.2)}$$

The model is used to predict the share of fixed capital lost by each district based on the conflict event dataset of Zhukov et al. (2019). The values we present in the study are predicted values of this model. Table A.11 shows the distribution of capital damage losses generated by the model.

Table A.11 / Estimated capital losses of Donetsk and Luhansk regions by district, type of loss and territorial control

Region	District/City	Capital stock, mn USD	Estimated Capital Losses, mn USD		
			Capital damage GCT	Capital damage CADLR	Capital depreciation CADLR
Donetsk	Amvrosiivskyi	478	24	0	71
Donetsk	Yasynuvatskyi	866	29	43	50
Donetsk	Yenakiyeve	1747	18	0	271
Donetsk	Kostyantynivka	629	0	3	0
Donetsk	Kostyantynivskyi	708	0	14	3
Donetsk	Kramatorsk	2166	0	58	0
Donetsk	Pokrovsk (Krasnoarmiisk)	1050	0	7	0
Donetsk	Krasnoarmeyskyi-D	1034	0	45	0
Donetsk	Krasnolymanskyi	126	0	1	0
Donetsk	Mikolaivka	799	0	24	0
Donetsk	Krasnolymanskyi	495	0	20	0
Donetsk	Makiivka	3793	77	0	582
Donetsk	Mariinskyi	1352	17	33	70
Donetsk	Mariupol	4122	1	354	2
Donetsk	Olkhovakta	13	0	0	2
Donetsk	Chasiv Yar	110	0	0	0
Donetsk	Petropavlivka	12	0	0	2
Donetsk	Bakhmut/Artemivskyi	728	2	45	5
Donetsk	Novoazovskyi	1129	40	71	57
Donetsk	Novohrodivka	304	0	1	0
Donetsk	Oleksandrivskyi	197	0	3	0
Donetsk	Pershotravnevyi	245	0	2	0
Donetsk	Selydove	24	0	0	0
Donetsk	Shahtarsk-Don	658	2	0	103
Donetsk	Shahtarskyi-Don	1885	71	0	284
Donetsk	Sloviansk	1220	0	36	0
Donetsk	Slovyanskyi-Don	490	0	12	0
Donetsk	Dobropillia	172	0	1	0
Donetsk	Snezhnoye	750	18	0	115
Donetsk	Starobeshevskyi	515	21	0	77
Donetsk	Telmanivskyi-Don	319	16	17	22
Donetsk	Torez-Don	838	9	0	130
Donetsk	Velykonovoselivsk	412	0	12	0
Donetsk	Volnovaskyi	1670	18	70	51
Donetsk	Volodarskyi	280	0	8	0
Donetsk	Vuhledar	299	12	0	45
Donetsk	Dobropolskyi	712	0	13	0
Donetsk	Donetsk	9849	1302	0	1338
Donetsk	Dzerzhinsk-Don	325	0	11	0
Donetsk	Gorlivka	3082	179	13	421
Donetsk	Iasynuvats'ka	450	6	5	38
Luhansk	Alchevsk	903	11	0	140
Luhansk	Krasnolusk	470	3	0	73

ctd.

Table A.11 / contd.

Region	District/City	Capital stock, mn USD	Estimated Capital Losses, mn USD		
			Capital damage GCT	Capital damage CADLR	Capital depreciation CADLR
Luhansk	Kreminskyi	684	0	17	0
Luhansk	Lugansk	3875	429	0	539
Luhansk	Lutuginskyi	629	27	0	94
Luhansk	Lisychansk	1135	0	15	0
Luhansk	Markivskyi-Lug	142	0	1	0
Luhansk	Milovskyi	118	0	2	0
Luhansk	Girske, Zolote, Nizhne, Toshkivka, Chikhirove, Svetlichne	316	1	7	4
Luhansk	Novoaydarskyi	222	0	6	0
Luhansk	Novopskovskyi	284	0	9	0
Luhansk	Antratsyt	245	2	0	38
Luhansk	Perevalskyi	822	44	0	122
Luhansk	Popasnyanskyi	2199	38	104	86
Luhansk	Rovenki	224	1	0	35
Luhansk	Rubizhne	207	0	1	0
Luhansk	Severodonetsk	505	0	6	0
Luhansk	Slovyanoserbskyi	345	24	2	45
Luhansk	Stahanov	260	2	0	40
Luhansk	StanichnoLugansky	588	2	42	4
Luhansk	Starobilskyi	449	0	15	0
Luhansk	Svatovskyi	331	0	15	0
Luhansk	Antratsytovskyi	1228	90	0	178
Luhansk	Sverdlovs'ka	426	6	0	66
Luhansk	Sverdlovskyi-Lug	718	11	0	111
Luhansk	Troitskyi-Lug	191	0	4	0
Luhansk	Bilokurakinskyi	181	0	7	0
Luhansk	Bilovodskyi	218	0	7	0
Luhansk	Brianka	1151	8	0	179
Luhansk	Kirovsk	338	5	0	51
Luhansk	Krasnodons'ka	702	10	0	108
Luhansk	Krasnodonskyi	540	18	0	82

Source: Capital stock by De Bono and Chatenoux (2015), adjusted to current 2018 USD prices by Penn World Tables 9.1.

ANNEX 5: METHODOLOGY OF HUMAN CAPITAL LOSSES ESTIMATES

The calculations of both social support and mental health expenditures over time are calculated according to the following formula:

$$\bar{E}_i = \sum_{t=0}^{T} (1 - d \times t) E_i \tag{A.3}$$

Where $\bar{E}$ is the sum of expenditures, i is a type of expenditures (social transfer/mental health), E_i are the current annual cost of expenditures of type i, d is the yearly dropout rate – the rate at which the population of interest declines – , t is the year after the start of the conflict, and T is the final year of the support program.

In our calculations we assume that the dropout rate and the final year of the support program (d, T) are equal across the types of expenditures. We calculate d based on the ratio of the size of the oldest reported stratum of the Ukraine's population over the size of the median-age Ukrainian. According to UN (2019), the age of a median Ukrainian is 41.2, which belongs to the 40-44 population stratum. The latest reported stratum in the population pyramid is 100+. We assume thus, that T is the difference between the lowest bounds of the ages for two categories: 100 – 40 = 60 years.

The yearly dropout ratio is then defined as follows:

$$d = \frac{1}{60}\left(1 - \frac{S_o}{S_m}\right) \tag{A.4}$$

Where S_o is the size of population in the oldest stratum, S_m is the size of population in the median-age stratum. Thus, the dropout rate shows the rate, at which the size of the median-aged stratum should linearly decline to reach the size of the oldest-age stratum in 60 years. PopulationPyramid.com (2019) reports $(S_o, S_m) = (3'293'121, 1'897)$. Imputing the numbers in A.4 yields the annual dropout rate of 1.67%.

To estimate E_s – the yearly expenditures on social support – we use the volume of annual expenditures of the Ukrainian budget on the support of veterans and IDP: USD 164 million. For E_m – expenditures on mental health – we multiply the size of the conflict-affected population (5'200'000) with the share of persons with symptoms of psychological disorders (42%) and average treatment costs (USD 54) reported in Roberts et.al (2017). The annual mental health expenditures are thus equal to USD 118 million. Substituting E_s, E_m, d, T in A.3 yields results reported in Section 4: $\overline{E_s}$ = USD 5 million; $\overline{E_m}$ = USD 3.6 million.

ANNEX 6: RESULTS OF THE LAWSUITS BETWEEN UKRAINE AND THE RUSSIAN FEDERATION

A major win for Ukraine was the ruling of the **International Court of Justice** on 8 November 2019, in which the Court rejected Russia's jurisdictional objections and agreed with Ukraine that its claims were properly before the Court. All of Ukraine's claims concerning the financing of terrorism in Ukraine and racial discrimination in Crimea will now move forward to a full hearing on their merits. The Ukrainian government has not compiled a unified inventory of all the damage for which it would demand compensation, and so the value of the potential compensation is unknown at this stage.

Ukrainian companies have managed to win several **arbitration lawsuits** against Russia:

› In 2019, Ukrnafta won a USD 44.5 million arbitration ruling and Gazprom agreed to pay USD 2.9 billion to Naftogaz to settle a long-running dispute over transit fees for gas transported to Europe.

› In January 2020, a Swiss court obliged Russia to pay USD 81.1 million compensation to 12 Ukrainian firms due to loss of assets in Crimea.

There was progress in other cases in 2019:

› The Permanent Court of Arbitration in the Hague refused Russia's demand to review the issue of jurisdiction on PrivatBank's lawsuit for the expropriation of its assets in Crimea.

› A Paris Court of Appeal dismissed Russia's attempts to suspend the execution of the International Court of Arbitration's decision to award USD 1.3 billion in compensation to Ukraine's Oschadbank for the expropriation of the bank's assets in Crimea.

New claims against Russia

› Naftogaz has filed a claim over a 10-year deal, seeking USD 12 billion in compensation from Gazprom for its refusal to accept market-based gas transit tariffs in 2018 and 2019, and a USD 5.2 billion claim over assets that Russia seized during its annexation of Crimea in March 2014.

› The Ukrainian state-owned electricity company NEK Ukrenergo commenced proceedings against Russia in August 2019 over the alleged expropriation of assets in Crimea.

› Potential pending actions include the Ukrainian Sea Ports Authority, which is said to be preparing an investment treaty claim against Russia over the seizure of its assets in Crimea with an estimated value of around USD 50 million.

The State Hydrographic Service of Ukraine announced in July 2019 that it plans soon to begin the process for filing a claim against the expropriation of its assets in Crimea.

ANNEX 7: ESTIMATION OF DISBURSEMENT OF FUNDS FOR THE RESTORATION

We estimate the approximate pace of reconstruction spending for Donbas by drawing on experience from Bosnia and Herzegovina. We select this case because several features of the Bosnian war correspond to the ongoing warfare in Ukraine. Both wars affected similarly sized populations and territories, involved the extensive use of heavy arms and had a devastating effect on the economy.

Moreover, the restoration projects in Bosnia appear to be well executed. Although several projects experienced risks that placed the result in doubt, all of them were eventually finished. The overall evaluation of the programme by the World Bank staff was 'satisfactory' (World Bank, 2004).

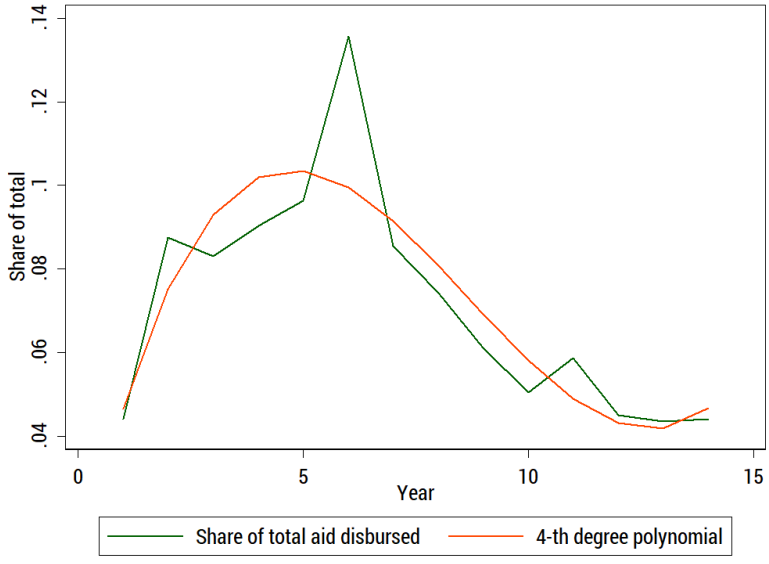
We used the history of the net official development assistance provided to Bosnia and Herzegovina. We limited the period analysed to between 1995 (the year the war ended) and 2007 (when the last post-war reconstruction project was finished by the World Bank).

Using the data, we calculated the share of official development assistance (ODA) in the overall total for each year and fitted a fourth-degree polynomial to approximate the underlying disbursement of funds (see equation A.5).

$$s_t = \alpha + \sum_{i=1}^{4} \beta_i \times t^i + \varepsilon_t \qquad \text{(A.5)}$$

Where s_i stands for the share of ODA disbursed in year t, α stands for a constant, β_i is coefficient of the i-th polynomial, t is a post-war year, and ε_t is an error term.

Figure A.7 / Disbursement of the net development aid in post-war Bosnia and Herzegovina



Note: Horizontal axis shows post-war years. Time frame comprises the period from 1995 to 2007.
Source: own estimations based on World Bank (2020).

As Figure A.7 shows, the model provides a comparatively good approximation of the underlying data (R-squared = 0.78).

We used the predicted value of shares, normalised them so that values sum up to unity, and multiplied the share at each point in time by the total estimated reconstruction costs of the Donbas region.

Table A.12 / Estimation of the post-war reconstruction

Year	Share of ODA disbursed*	Normalised predicted ODA**
1	4.41%	4.66%
2	8.76%	7.51%
3	8.31%	9.30%
4	9.03%	10.19%
5	9.63%	10.35%
6	13.56%	9.95%
7	8.55%	9.14%
8	7.42%	8.08%
9	6.11%	6.93%
10	5.05%	5.82%
11	5.87%	4.90%
12	4.51%	4.31%
13	4.36%	4.19%
14	4.41%	4.67%

* Volume of yearly net ODA divided by total net ODA disbursed to Bosnia and Herzegovina from 1995 to 2007.
** Predicted with a fourth-degree polynomial and normalised to sum up to unity.
Sources: Own calculations based on World Development Indicators.

IMPRESSUM

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