econPOL FORUM

2
2023
March
Vol. 24

POLICY DEBATE OF THE HOUR

How to Reconstruct Ukraine? Challenges, Plans and the Role of the EU

Anna Bjerde, Romina Bandura, Anders Åslund, Marek Dabrowski, Christopher A. Hartwell and *Dmytro Boyarchuk, Barry Eichengreen, Stephan von Cramon-Taubadel* and *Oleg Nivievskyi, Joop Adema, Yvonne Giesing, Tetyana Panchenko* and *Panu Poutvaara*

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EconPol Forum
ISSN 2752-1176 (print version)
ISSN 2752-1184 (electronic version)

A bi-monthly journal on European economic issues
Publisher and distributor: CESifo GmbH, Poschingerstr. 5, 81679 Munich, Germany
Telephone +49 89 9224-0, telefax +49 89 9224-1409, email office@cesifo.de
Annual subscription rate: €50.00
Single subscription rate: €15.00
Shipping not included
Director EconPol Europe: Florian Dorn
Editor of this issue: Chang Woon Nam

EconPol Europe: www.econpol.eu

2/2023 econPOL FORUM

The war in Ukraine is not over yet. Nevertheless, a possible roadmap and proposals for post-war reconstruction strategies are currently being discussed. They should be accompanied by economic and political reforms in the country. To finance this project, Ukraine will need to tap a variety of sources and institutions. This is because it will require investments in the hundreds of billions – perhaps even trillions – of US dollars. The EU, the US and other Western countries have signaled their willingness to provide further financial support for post-war reconstruction. Also potentially involved could be bilateral donors, multilateral banks, private investors, and the Russian state with reparations.

The articles in the "Policy Debate of the Hour" section address the question of how to rebuild and modernize Ukraine after the war. They shed light on the major challenges facing the country and the EU, critically assess the reform strategies under discussion. The authors propose short- and long-term measures necessary for the successful implementation of economic, political, and infrastructural reconstruction – also with a perspective of Ukraine's future admission to the EU.

In our "Economic Policy and its Impact" section, the authors show how the closure of police stations affects theft crime. "Institutions Across the World" looks at regional income inequality in Germany in this issue. Finally, in "Big-Data-Based Economic Insights," we examine how the need for data skills in German companies is reflected in online job ads.

POLICY DEBATE OF THE HOUR

How to Reconstruct Ukraine? Challenges, Plans and the Role of the EU

ECONOMIC POLICY AND ITS IMPACT

INSTITUTIONS ACROSS THE WORLD

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Introduction to the Issue on

How to Reconstruct Ukraine? Challenges, Plans and the Role of the EU

Chang Woon Nam

Although the war in Ukraine is still ongoing, international development institutions and various teams of experts have already developed proposals for post-war reconstruction and modernization, as well as accompanying economic and political reforms in the country. The EU, the US, and other Western countries have also signaled their firm solidarity and willingness to provide further financial support for the recovery when the war is over. The scale of the war's destruction (particularly in the areas of critical and network infrastructure, housing, and agriculture) is so vast that reconstruction will require investments in the hundreds of billions of US dollars – perhaps even trillions, by some estimates. To finance this undertaking, Ukraine will need to tap a variety of sources and institutions: bilateral donors, multilateral banks, private investors, and the Russian state in the form of reparations. On the other hand, this also points to the need to integrate and coordinate the efforts of aid donors – not only governments, but also NGOs, philanthropists, and others. The EU accession process and its conditionality attached to the post-war reconstruction aid will further play the role of solid pro-reform and pro-modernization incentives, particularly in the fields of institutional reforms of a judicial system, strengthening anti-corruption bodies, fighting organized crime, further reform of public administration as well as de-oligarchization.

The articles in this issue of EconPol Forum address the question of how to rebuild and modernize Ukraine after the war. They shed light on the major and immediate challenges facing the country and the EU in this context, critically assess the reform strategies under discussion, and propose new short- to long-term measures needed for the successful implementation of the planned economic, political, and infrastructural reconstruction, also with a view to Ukraine's future admission to the EU.

While formulating a roadmap for reconstruction is important, *Anna Bjerde* argues from the World Bank's perspective that Ukraine should first lift restrictions on the private sector and donors; strengthen the rule of law, incentivize and catalyze external support, and increase the effectiveness of implementation; and maintain macroeconomic stability while prioritizing the well-being of the population.

In her eight recommendations, *Romina Bandura* emphasizes, among other things, that massive foreign direct investment endowed with technological spin-offs are also needed in the medium term to modernize the industrial structure, create a national innovation system, and achieve sustainable economic growth in Ukraine.

According to *Anders Åslund*, the cost of the damage Russia has inflicted on Ukraine is enormous. Russia must be forced to pay war reparations, and the currency reserves of the Russian Central Bank, which have been frozen in Western central banks, should be used for Ukrainian reconstruction.

With regard to the massive reform challenges facing Ukraine, *Marek Dabrowski* critically notes that economic and political reforms in the prewar period were rather slow and less successful. In particular, areas such as the judicial system, law enforcement agencies, and the large share of state ownership in the economy remained unreformed or insufficiently reformed.

According to *Christopher A. Hartwell* and *Dmytro Boyarchuk*, EU accession is still a long-term goal for Ukraine. The EU's institutional and political reform conditions for this country's accession (as outlined above) are actually all issues that Ukraine should push forward even without EU accession, and that is where the focus should be: becoming a European state, with emphasis on core European values related to the rule of law and free trade, even if the accession process takes years.

Drawing on the experience of the Marshall Plan in West Germany after World War II, *Barry Eichengreen* suggests how to effectively rebuild the network infrastructure (e.g., power grids, roads, and rail system) and housing in postwar Ukraine, and urges that steps be taken now to coordinate relief efforts through the creation of an independent administrator and a multi-donor fund.

Given its national and global importance, *Stephan von Cramon-Taubadel* and *Oleg Nivievskyi* stress that agriculture in Ukraine is a key sector to consider when assessing the postwar reconstruction needs and challenges. Key priorities include demining and re-cultivating agricultural land, rebuilding on-farm and local storage facilities, and repairing export infrastructure.

Last but not least, *Joop Adema, Yvonne Giesing, Tetyana Panchenko*, and *Panu Poutvaara* explore the potential role of the diaspora in postwar economic and political development in Ukraine in terms of financial remittances and return migration, which also foster the transfer of knowledge, innovative ideas, and democratic values. In addition, the Ukrainian government should make better use of the diaspora network to build more solid bridges between Ukraine and the West.

We hope you enjoy this Policy Debate of the Hour!

Anna Bjerde

"Laying Foundations for Building Back Better in Ukraine" – Policy Actions and Principles for a Strong Transition and Recovery Process*

KEY MESSAGES

- **Russia's invasion of Ukraine is causing massive social and economic repercussions with a devastating loss of human lives, millions of displaced people, and a sharp increase of poverty**
- **Ukraine will need to balance the need to sustain the war economy today and create the necessary conditions for a sustainable economic recovery in future**
- **Ukraine's reconstruction and progress toward EU standards will demand more from its institutions and will be a key driver for reforms and plans to build back better**
- **External support, especially from the private sector, remains key to expand the available and necessary pool of resources exponentially**
- **Ukraine would need to build a strong foundation to accelerate reconstruction by focusing on a set of policies that catalyze external financing, enhance implementation capacity, and ensure recovery actions do not impede progress on long term commitments and accession requirements (including the green transition)**

Russia's invasion of Ukraine is causing massive economic and social repercussions in Ukraine, including a sharp increase in poverty.[1] Ukraine's GDP is estimated to have contracted by about 30 percent in 2022, due to the reduction in economic activity caused by the destruction of productive capacity, damage to arable land, and reduced labor supply. Poverty is estimated to have increased from 5.5 percent in 2021 to 25 percent in 2022 with income below US$6.5 per day[2] and headline inflation hit 26.6 percent in December 2022, with food price inflation hurting the poor. As of January 3, 2023, 17,994 civilian casualties were recorded. The invasion of Ukraine has also triggered the largest human displacement crisis in the world at present: since the onset of the war, approximately 5.4 million people have been displaced within Ukraine and over 8.1 million have moved to neighboring countries (UNHCR).

Damages to infrastructure and services are mounting daily with persisting and intensified attacks. The recovery and reconstruction needs are immense, estimated at approximately US$349 billion—more than 1.6 times Ukraine's 2021 GDP—as of June 2022. The ensuing destruction over the following months has pushed up this already high estimate. The scale of the damage is best exemplified by the energy sector where targeted attacks on energy infrastructure had damaged over 60 percent of Ukraine's power infrastructure by the end of December 2022—causing destruction estimated at over US$10 billion. Similarly, damage to housing increased 35 percent between June 1, 2022[3] and the end of 2022 to reach an estimated US$54 billion.

EU candidacy is a key driver for reconstruction efforts. After Ukraine was granted candidate status in June 2022, the country's future is expected to involve eventual membership of the European Union. This means that the process of reconstruction will need to be closely aligned with EU accession process requirements. Despite the war, Ukraine has continued to advance toward gradual alignment with the EU acquis—a process that began in 2014—and to implement its economic reform agenda aimed at addressing structural impediments to (i) attract greater investment, (ii) better allocate capital, and (iii) take full advantage of the opportunities offered by its agriculture sector. Alignment with the EU also entails improving institutional governance, integrating climate change mitigation and adaptation in recovery and reconstruction efforts, and reconfiguring the country's development objectives towards carbon neutrality.

Ukraine's reconstruction and progress toward EU standards will demand more from its institutions. The country's remarkable capacity to carry out basic governmental functions during the terrible events of the past 12 months can be attributed in large part to the extensive reforms implemented in public administration, financial, healthcare, and agriculture sectors over the past

* This article benefited from contributions of a World Bank expert team consisting of Arup Banerji, Caryn Bredenkamp, Charles Joseph Cormier, Christoph Pusch, Debashree Poddar, Ellen Hamilton, Erik Johnson, Iryna Shcherbyna, Jordan Schwartz, Karlis Smits, Laura Pop, Sameh Naquib Wahba, Sergiy Zorya, Silvia Martinez Romero, Sudeshna Ghosh Banerjee, Florian Blum, and Trang Van Nguyen.

[1] All statistics in this and subsequent sections are estimates by World Bank Staff based on official statistics of Ukraine's public authorities and do not reflect the status at the time of publication.

[2] In 2017 PPP.

[3] Based on the ongoing damages assessment under second Rapid Damage and Needs Assessment. Final results are expected in April and may differ from the current estimations presented.

Anna Bjerde

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half-decade, along with the establishment of anti-corruption institutions. Ukraine provided a convincing roadmap to meet the EU accession criteria in 2022, following the start of the war. However, the momentum on many reforms has stalled during the war, due to weakened institutional capacities and a shift in priorities to cater to wartime needs.

While the Government of Ukraine (GoU) is expected to lead recovery and reconstruction efforts, the country cannot finance the magnitude of the needs by itself. Efforts to contain the high fiscal financing requirements—consisting of the deficit (excluding grants) and debt repayments—are ongoing. Donor support has somewhat alleviated the severe fiscal strain,4 with an estimated US$3 billion to US$4 billion per month required in 2023 to maintain essential services, including government operations, health, education, and social protection.5 Additionally, Ukraine's capital absorption capacity, at around US$8 billion in 2023,6 is limited in relation to its needs—only amounting to less than one tenth of the direct damages as of June 1, 2022. To enhance the pool of resources available for both short-term needs and long-term focused investments, the Government needs to foster private sector financing and bolster donor support.

KEY CHALLENGES: BALANCING PRESENT NEEDS WITH BUILDING FOR A SUSTAINABLE FUTURE

Ukraine will need to balance the need (i) to sustain the war economy today, and (ii) to create the necessary conditions for a sustainable economic recovery in the future. The authorities have deployed resources to sustain essential public services (including social transfers) while maintaining broadly sound macroeconomic policies to avert the most immediate fiscal, monetary, and financial sector risks of the wartime economy. Yet, the Government is faced with difficult decisions on how to fund other activities (including emergency restoration of critical infrastructure) given the cost of the war and of providing essential social services, wages and pensions. Additional compression of social expenditures could risk breaking the social contract, already stretched to the limit amidst rising poverty and joblessness. At the same time, a successful transition towards a sustainable economic recovery will hinge on a combination of targeted public investments to restore critical assets and policy interventions that control wartime rent seeking and reduce risks so that the private sector can invest. If Ukraine's productive capacity cannot be sustained or even boosted during the war, it risks settling into a situation of low or no growth and facing huge social challenges once the war ends.

Maintaining a broadly adequate macroeconomic policy framework during a protracted conflict is another key challenge. Specifically, adequate policies are needed to maintain macroeconomic stability and limit adverse distributional impacts for households and damage to productive sectors of the economy while the war is ongoing. A return to less trying conditions after the war will mark a divergence between current and anticipated future income streams, accompanied by a revival of domestic demand, including for reconstruction, that exceeds output capacity. In practice, this translates into tightening budget constraints on public spending and limited resources to support economic recovery. Management of these policy tensions requires a strong macroeconomic framework that encourages private investment and maintains overall market confidence.

Thus far, large donor inflows have helped to mitigate macroeconomic risks by helping the Government to mobilize much-needed financial resources. Most of these inflows have been used to honor bare-bones social expenditures, limit irrevocable damage to Ukrainians' living standards, and rehabilitate personal incomes. Donor inflows, however, could be limited in the medium term. If Ukraine's imbalances persistently exceed external support, deficits will need to be increasingly offset by domestic resources through increased monetization and financial repression, and further compression of private investment and consumption through borrowing or taxation.

Experience from other post-conflict situations highlights the central role of Government and its institutions in managing resource allocation and ensuring vertical and horizontal coordination among different levels of government during the reconstruction process. The public sector, and its key institutions, will likely play an important role in providing guarantees and other de-risking instruments (particularly insurance) to enable private sector participation. Public intervention may also be needed to restore private assets, including housing. Productive sectors such as agriculture may require additional public financing for recovery and the banking and financial sector may need capitalization to offset losses incurred during the war.

However, Ukraine's track record has also shown that the Government's strong role may overburden state capacity, exacerbate existing problems (rent-seeking), and encourage (untaxed) informal market activities. Centralization and the introduction of Martial Law during the war have given the central Government unparalleled powers to mobilize

[4] Since February 2022, tax revenue collection has plummeted due to the GoU's strategic decision to reduce the tax burden on the population and, particularly because of a war-related decline in economic activity (including due to out-migration) and the inability to collect taxes in conflict. On the other hand, public expenditure has increased sharply to maintain key public services during wartime.

[5] The World Bank Group has been working with international partners to mobilize fast-disbursing funds that help the GoU sustain essential public service delivery under the "Public Expenditures for Administrative Capacity Endurance (PEACE)" project. Government programs supported through PEACE-mobilized financing include wages for hospital workers, pensions for the elderly, social programs for the vulnerable, social assistance for utility bill payments, grants to internally displaced persons and wages to State Emergency Service staff.

[6] Based on extrapolations of the 2021 budget plan and considering inflation for 2022 and 2023.

resources and manage the wartime economy. A post-war Government may face different challenges that require a more decentralized approach to decision making. Hence, it may have neither the resources nor the capacity to rebuild the economy, and this may become a key binding constraint.

By contrast, the domestic and external private sector has both the resources and the ability to act as a permanent engine of growth in the aftermath of the war. The role of public policy – in particular, ensuring fair competition and regulatory policies that limit market concentration and capture – will be to ensure that the private sector has the incentives and environment needed to grow. These market conditions will be facilitated by rapid trade, fiscal, and regulatory integration with the EU. EU integration also offers an opportunity to access global markets.

BUILDING STRONG FOUNDATIONS TO CATALYZE TRANSITION AND ACCELERATE THE RECONSTRUCTION OF UKRAINE

Given the scope and range of needs and the limited resources, the GoU needs to carefully prioritize its recovery agenda, focusing first on building strong foundations. The evolution of the war cannot be predicted, and this uncertainty makes precise assessments and long-term planning difficult. Urgent repair projects must be implemented simultaneously with continued support for basic services, but this too is affected by evolving conditions on the frontline. Given ongoing efforts to balance short-term needs with long-term goals, Ukraine must focus first on policies that catalyze external financing, enhance internal implementation capacity, and ensure that short-term emergency and recovery actions do not impede progress on long term commitments and accession requirements—including the green transition. For Ukraine, this would entail focusing on key actions centered around three pillars.

Building Trust, Accountability, and Implementation Capacity

a. *Rebuilding with integrity in a competitive environment.* Ukraine's anticorruption architecture is beginning to demonstrate its capacity to uphold accountability. This architecture needs to be strengthened further to support reconstruction. Justice reform is on track, but not finalized, and should therefore remain a priority to ensure the rule of law and independence of the judiciary system. Law enforcement alone cannot safeguard the integrity of the massive reconstruction process to come. Preventive measures will be key. Finally, without implementing robust anti-trust measures, reconstruction might benefit only a few in the private sector, with negative impact on Ukrainian consumers and the broader economy. Potential post-war privatization processes should be closely monitored.

b. *Reforming public institutions for greater accountability, transparency, and efficiency.* For the private sector and donors to play a prominent role in the recovery and reconstruction, governance systems need to be transparent and accountable to all stakeholders, including to the people of Ukraine. This requires concerted efforts to strengthen overall public investment management systems by embedding reliable checks and balances and fast-tracking essential institutional and regulatory reforms in line with international good practice—including for procurement, public financial management, and state-owned enterprise (SOE) reforms—and enhancing processes for regular performance monitoring and strengthening parliamentary oversight.

c. *Building strong institutions and modalities focused on facilitating effective and efficient reconstruction planning and works.* Global experience suggests the success of large-scale recovery and reconstruction efforts, like those needed in Ukraine, relies on leadership from a legally empowered agency, set up under a central authority to coordinate all stakeholders, mobilize resources and set up monitoring systems. Recently the State Agency for Reconstruction and Development of Ukraine was set up under the Ministry of Communities, Territories and Infrastructure Development for driving recovery and reconstruction. To meet its mandate, the agency would need to optimize processes including coordination and planning, absorption of funds, and facilitation of streamlined and agile implementation — all of which are key factors underpinning effective reconstruction. Additionally, the agency would not only need to be responsible for the formulation of regulations vital to recovery and reconstruction and for strategic planning for long-term reconstruction and rehabilitation, but it would also need to establish the necessary architecture for financial devolution and implementation independence.

d. *Enhancing the agency and capacity of local governments through the completion of decentralization reforms.* Decentralization reforms were ongoing at the war onset and critical areas remained contentious, such as demarcation of administrative boundaries and mechanisms to help local governments implement regional development strategies. Progress has stalled with the war and the burden on local governments has grown exponentially as they are expected to implement emergency recovery works, create conditions for resilience, and develop urban recovery plans for coordinated recovery at the local level. Given current capacity and the lack of clarity on administrative boundaries, roles and responsibilities, transfer mechanisms and local finance regulations, local governments will be hard-pressed to deliver. Without an integrated place-based approach and implementation capacity at the local level, much needed recovery and reconstruction efforts in urban areas will stall.

e. *Strengthening land and property rights and registration to enable the private sector and residential (re)construction*. With recovery, new businesses will need to find premises and established businesses may need to scale up, scale down or move to a different location, reflecting market changes caused by the war. Similarly, households will need to repair, rebuild or move, depending on multiple factors including the changing location of jobs and opportunities. Prior to the war, the cadaster was comparatively underdeveloped. Deficiencies were especially acute in urban areas where coverage was low and accuracy was uncertain. Typically, in Fragile, Conflict and Violence contexts confiscations, expropriations, fraudulent transactions, transactions conducted under duress, land grabbing and land speculation during war further weaken property rights and limit reconstruction and recovery for both households and businesses by making legitimate ownership more difficult to determine. Strengthening land/property rights would include comprehensive registration, including apartments, and a dispute resolution process. Cadasters depend on local government boundaries, which have not yet been legally agreed due to recent local government reforms. Boundary delimitation is another priority area, required for both cadaster and master plans.

Ensuring Macro Stability Supported by the Rehabilitation and Rethinking of Key Sectors

f. *Restoring macro stability and mobilizing private finance.* Stable exchange and interest rates, overall price stability and a conducive risk-return ratio for investments are key to any private sector-led economic growth strategy. Authorities are committed to maintaining sound macroeconomic policies to avert the most immediate fiscal, monetary, and financial sector risks. At the start of the war, the authorities managed to preserve financial and exchange rate stability and fiscal policy was swiftly adjusted to maintain spending on critical social needs and increase defense expenditures. More recently, the authorities have made progress in *reducing sizable drains on foreign currency assets*. Just as a full restoration of macroeconomic stability would require cessation of military activity, the mobilization of private finance will require progress in addressing long-lasting structural impediments. Specifically, an *improvement in conditions for private sector investment* would require further deregulating the business environment, improving government effectiveness, and strengthening connectivity and trade to support integration with the EU and reducing state capture through SOEs. In addition, policy actions are needed to *improve allocation of capital* and increase access to finance, such as enhancing the financial sector's contribution to addressing private sector needs including through provision of credit guarantees, export financing and credit insurance mechanisms, measures to stimulate bank lending and diversification of the financial system as well as strengthening of digital financial services. During the war, a significant share of banking system liquidity remains frozen in non-performing loans or idling in Central Bank deposits.

g. *Reforming, rehabilitating, rebuilding, and modernizing infrastructure sectors and services, with a focus on energy.* The energy sector will play a pivotal role in the recovery and reconstruction phases. Energy policy decisions made during recovery could impact long-term economic and climate objectives. Before the war, reforms were initiated in the energy sector to improve efficiencies, establish a wholesale electricity market, and introduce private sector participation in generation and distribution, although challenges remained on underpricing and robust governance. The post-war context will present an opportunity to rethink energy sector priorities in Ukraine. Physical and market integration with the European energy system should be a key priority to ensure energy security. However, emergency measures such as the introduction of public service obligations (PSOs) and other legal changes under martial law could delay compliance with European energy commitments and hinder the economic integration process. During reconstruction, Ukraine will need to adopt a building back better approach with policies to align its energy model with the European energy strategy.[7] These policies will also help attract support from donors, financiers, and investors to accelerate the restoration and reconstruction. In the transport sector, improved multi-modal planning will be needed to optimize the logistics network, which will be important to enhance connectivity, and for territorial cohesion and economic activity after the war. Finally, reconstruction should take advantage of opportunities and synergies to decarbonize and digitalize the energy and transport sectors, building on significant advances in digital development before and during the war.[8]

[7] (i) Transposition of the Clean Energy Package with support from the Energy Community Secretariat, correcting institutional and market-related breaches; (ii) diversification of gas supply and promotion of green gases and promoting electrification when economically feasible; (iii) Acceleration of decarbonization of the power sector and implementation of a just transition roadmap out of coal and toward renewable energy generation; (iv) boosting energy efficiency in demand sectors (housing, industrial, transport).

[8] The comprehensive legislative framework in cybersecurity and its implementation strategy helped protect Ukrainian systems during the war. Ukrainian energy facilities suffer continuous cyberattacks.

h. *Rebuilding the agri-food sector for accelerated climate resilience, diversified growth and enhanced global food and nutrition security.* In 2021, the agri-food sector, with input supply and agricultural trade, generated 20 percent of GDP – making the sector a backbone of the Ukrainian economy. In addition to direct war damage, the sector has lost billions of dollars due to depressed farmgate prices, reduced exports, and decreased agricultural production. Rebuilding the agri-food sector is a daunting task, made more difficult by landmines and ordnance on agricultural land and inland waterways. In the short run, the agri-food sector will require much liquidity in the form of credit softening, credit lines, and grants for smaller farms and food processors to recover agricultural production. Public support will also be required to demine agricultural fields and recover damaged assets. Lack of support to this sector would have severe negative implications for Ukraine's economy and global food and nutrition security. In the medium term, the completion of land and irrigation reforms is essential. Attention must also be paid to building institutions and programs that accelerate climate resilience through climate smart agriculture adaptation, incentivize the diversification of agricultural production and food processing, and support improvements in food safety, phytosanitary and sanitary measures, digitalization and agri-logistics to reduce the cost of private sector investments.

Adopting a People-centered Approach with Careful Sequencing

i. *Investing in recovery of social infrastructure and services, especially at the local level, as well as real sectors.* By the end of January 2023, 6 percent of health facilities and 10 percent of schools had been damaged or destroyed. Bomb shelters are required for schools to re-open. Restoring access to safe and modern health and education services is essential for the well-being of the Ukrainian people and their potential to contribute productively to the recovery. As territories become safe, the provision of key social services will encourage Ukrainian refugees and internally displaced people (IDPs) to return to home communities.

j. *Addressing new needs that have arisen directly as a consequence of the war.* These include an increased need for mental health services, physical rehabilitation of the injured, and services for veterans, among others. With 2.4 million jobs lost by October 31, 2022, equal to 15.5 percent of pre-war employment,[9] job creation will be important and opportunities to match the need for investment in recovery with job needs could be explored through the introduction of public works programs or better labor market activation services. Such programs are also likely to hasten integration of IDPs in host communities and the reintegration of returnees in home communities.

k. *Sequencing and phasing designed around evolving demographic profile and needs.* The war has resulted in large scale displacement. As the country transitions to the recovery and reconstruction phases, Ukraine's population and its spatial distribution is unlikely to resemble its pre-war status. While some territorial communities have retained only a fraction of their population, other cities have become IDP hubs and increased in size. The war has also altered the age and gender aspects of the demographic profile. Considering limited resources, the planning, sequencing and phasing of investments for short, medium and long timeframes at both local and national levels must be based on a realistic outlook of population flows and their associated needs. "Reconstruction" should therefore not aim to actually reconstruct all damaged assets and replicate pre-war status, but rather reflect the current context and anticipate future needs with investments that are both justified and feasible.[10]

POLICY CONCLUSION

Although the path to recovery and reconstruction for Ukraine is challenging, it presents an opportunity for building a modernized, better Ukraine. At present, Ukraine is at an important juncture: on the one hand, the country is grappling with continued attacks and aggression while catering to the wartime economy; on the other hand, driven by EU candidacy, it is actively planning for recovery and reconstruction based on building back better principles. Given financing limitations, this entails balancing short-term needs and securing future sustainability and productivity. External support, especially from the private sector, remains key to exponentially expand the available and necessary pool of resources. While articulating a roadmap for reconstruction is important, Ukraine must first focus on key actions that (i) resolve constraints for private sector and donors; (ii) strengthen the rule of law, incentivize and catalyze external support, and bolster implementation efficacy; and (iii) maintain macro-stability while continuing to prioritize the well-being of people. Ultimately, the pace and trajectory toward EU accession and modernization will be determined by actions rooted in strong foundations.

[9] https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/briefingnote/wcms_859255.pdf.

[10] This could play out in various ways such as focusing on the expansion of transport and energy networks and services to some cities while in others downsizing and leveraging more compact planning; ceasing all recovery and reconstruction work and planning in certain areas due to the presence of explosive hazards; building communal and social infrastructure for an ageing populous and reducing assets catering to children due to significant current and anticipated changes in age profile.

Romina Bandura

Eight Recommendations to Reconstruct and Modernize Ukraine

KEY MESSAGES

- **After victory, Ukraine should not simply rebuild old infrastructure and institutions but become a modern economy**
- **Ukraine deserves to be sent the weapons it needs to win the war with a realistic timeline towards NATO membership in sight**
- **Reconstruction should be human-centered, focusing on policies that will create jobs and make investments in social infrastructure**
- **Donors are central in accompanying this effort though technical assistance, project preparation, financing and oversight**
- **Financing can come in different forms: use of risk mitigation tools, seeding investment funds, possible EU solidarity tax, and seizing frozen Russian central bank assets**

Although Russia continues to callously target civilians and infrastructure facilities in Ukraine, strategic planning for reconstruction is already underway. In July 2022, during the international donors' conference in Lugano, Switzerland, the Ukrainian government unveiled its reconstruction vision through the National Recovery Plan.[1] Yet Ukraine should not simply rebuild its old infrastructure and institutions: it deserves something new. Ukraine has a chance to break away from 350 years of Russian domination with an economy and society connected to and firmly embedded in the Euro-Atlantic community. In fact, the more fitting term to describe Ukraine's goal is "modernize" rather than "reconstruct." According to Merriam-Webster's Dictionary to "reconstruct" is to "to build or assemble (something) again" while the term "modern" means "involving recent techniques, methods, or ideas."[2]

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A modern, democratic, and secure Ukraine that upholds the Charter of the United Nations is the foundation for security and wellbeing of Europe and for defending democratic principles globally. In that regard, the EU and G7 nations have a historical opportunity to help the country win the war and modernize after victory. Ukraine's leadership, its military and citizens have demonstrated to the world that the country deserves to join the EU and NATO. Ukrainian citizens also want to align with the West, according to a recent poll commissioned by the Transatlantic Dialogue Center,[3] a Ukrainian think tank. The majority of Ukrainians have a positive view of G7 countries with 81-90 percent of respondents supporting the participation of these nations in reconstruction efforts.

Ukraine will emerge victorious from this war and international donors will have a historic opportunity to accompany rebuilding efforts, applying the lessons learned from past reconstruction experiences. Ukraine's reconstruction and modernization will be a generational undertaking, with investment estimates ranging from $350 billion to $1 trillion. How should donors approach this challenge? What should Ukraine focus on? Drawing on the work conducted by the CSIS Ukraine Economic Reconstruction Commission,[4] this brief provides eight broad recommendations to reconstruct and modernize Ukraine.

HELP UKRAINE WIN THE WAR AND PROVIDE LONG-TERM SECURITY ASSURANCES BY ADMITTING IT TO NATO

Ever since Ukraine declared independence from the former USSR on August 24, 1991, Russia has sought to retain Ukraine under its sphere of influence and control. This culminated in Russia's illegal annexation of Crimea in 2014 and occupations of eastern regions of Ukraine. Ukraine used diplomatic means and tried to negotiate with Russia in good faith to end the conflict. Since President Volodymyr Zelensky was elected in 2019, Ukraine sat at the table to negotiate with Russia 88 times.[5] Ukraine abided by the Minsk I and II agreements, but Russia instead chose to invade the country on February 24, 2022, to realize Vladimir Putin's "Russkiy mir," that is, his imperial ambitions for Russia. Russia has also exported corruption and spread misinformation in Ukraine, to impose its values and a kleptocratic society.

At the time of the breakup of the USSR, Ukraine held the third-largest arsenal of nuclear weapons in the world. In 1994, Ukraine signed the Budapest

[1] https://www.urc2022.com/urc2022-recovery-plan.
[2] https://www.merriam-webster.com/dictionary.
[3] https://tdcenter.org/2022/12/13/survey-reconstruction-of-ukraine-and-international-aid/.
[4] https://www.csis.org/programs/project-prosperity-and-development/projects/ukraine-economic-reconstruction-commission.
[5] https://www.politico.com/news/magazine/2023/01/24/russia-ukraine-war-peace-talks-00079042.

Memorandum on Security Assurances, giving up this arsenal in exchange for security and sovereignty guarantees from Russia, United States, and the United Kingdom. It goes without saying that those guarantees have not been met.

Ukraine deserves to remain independent, sovereign, and secure from Russia. The only way to achieve this goal is for the West to provide Ukraine the weapons it needs to win the war and work with Ukraine on a realistic timeline towards NATO membership. Ukraine will be victorious, but without strong security guarantees it will not remain immune from potential Russian attacks.

Even if Putin is deposed, there is a cadre of Russian oligarchs and autocrats that support the Russkiy mir vision. Moreover, although it has been more than 30 years since the breakup of the Soviet Union, Russian society still lament the dissolution of the USSR according to Levada Center polls.[6] In the short term, Russia is unlikely to see any regime change, and Ukraine will be in constant danger of Russian aggression. Joining NATO[7] is the best security guarantee for Ukrainians and is likely the most credible deterrent against any future Russian aggression.

ACCELERATE PRE-WAR AGENDA OF REFORMS

The West can provide security guarantees for Ukraine to remain independent and deter future Russian attacks. But Ukraine needs to help itself by undertaking governance, social, and economic reforms – including combatting corruption and improving the rule of law – to attract foreign investment and to become a modern economy.

Since 2014, Ukraine has made significant progress in carrying out important reforms, including decentralization, e-government, and improving the business enabling environment. Although Ukraine is a unitary state, it has decentralized government functions and resources by empowering regional and local governments. The following need to be included among the main areas that require further reform:

- Civil service modernization
- An independent, fair, and transparent judiciary system
- Financial autonomy and quality assurance in higher education institutions
- Digitalizing customs systems
- Simplification of taxation regimes
- Implementing anti-corruption legislation
- Digitalization of SMEs
- Restructuring and privatization of state-owned enterprises
- Break up of media conglomerates.

Ukraine needs to continue this reform process and "turbocharge" its efforts. Even during war times, President Zelensky has shown the highest level of political commitment to combatting corruption by instituting a zero-tolerance approach.[8] Recently, he fired a range of senior level public officials that were implicated in opaque practices.[9]

ALIGN REFORMS TO THE EU ACCESSION PROCESS AND SET A DEFINED MEMBERSHIP TIMELINE

At the same time, Ukraine's reform agenda needs to be aligned and anchored to the EU accession process. Ukraine has a large consumer market, a strong industrial base, and a skilled population that has the potential to be internationally competitive and complement markets in the European Union. However, to be admitted to the EU, a country has to fulfill a series of steps:[10]

- comply with all the EU's standards and rules
- obtain the consent of the EU institutions and EU member states
- obtain the consent of their citizens through approval in their national parliaments or by referendum.

On June 23, 2022, the European Council granted candidate status to Ukraine (and Moldova).[11] But to start EU accession negotiations, Ukraine has to first meet seven mandatory requirements that are related to specific reforms that include judiciary, selection of judges and courts, anticorruption, anti-money laundering, oligarchs, media, and minorities.[12]

Ukraine will then have to negotiate reforms across more than 30 chapters or areas.[13] In return, the EU will help the country with political support, financial assistance, and technical advice. But this process can potentially take decades to materialize. For example, it took the Central and Eastern European countries approximately 10 years to complete the EU process while North Macedonia and Turkey have been candidate countries for 18 years now.

While the EU does not have a set time frame for accession, in the unique case of Ukraine, it would be beneficial to mutually agree on an expedited and clear timeline, probably less than 10 years. My CSIS colleagues (Runde et al. 2023)[14] have argued that a time-

[6] https://www.levada.ru/en/2019/01/14/the-collapse-of-the-ussr/.
[7] https://www.cer.eu/insights/first-help-ukraine-win-war-then-help-it-win-peace.

[8] https://www.kmu.gov.ua/en/reformi/verhovenstvo-prava-ta-borotba-z-korupciyeyu/borotba-z-korupciyeyu.
[9] https://www.businessinsider.com/zelenskyy-fires-top-officials-corruption-scandal-vacation-war-2023-1.
[10] https://neighbourhood-enlargement.ec.europa.eu/enlargement-policy/conditions-membership_en; https://neighbourhood-enlargement.ec.europa.eu/opinion-ukraines-application-membership-european-union_en.
[11] https://www.consilium.europa.eu/en/policies/enlargement/ukraine/.
[12] https://www.eeas.europa.eu/delegations/ukraine/eu-commissions-recommendations-ukraines-eu-candidate-status_en?s=232
[13] https://www.eeas.europa.eu/sites/default/files/071215_eu-ukraine_association_agreement.pdf; https://www.globalpolicywatch.com/2022/07/ukraines-eu-accession-process/.
[14] https://www.csis.org/analysis/enabling-economic-transformation-ukraine.

line of 10 years with set benchmarks of progress will provide clarity, funding, and the needed confidence for businesses to invest in Ukraine. An ambiguous and long accession process would not give the right incentives for Ukraine to reform. Moreover, donors should be aligning their policy conditionality with EU standards and rules to avoid multiple and conflicting requests on the Ukrainian government. This would be a step in the right direction to simplify and harmonize conditions among donors.

UKRAINE TO LEAD THE MODERNIZATION EFFORT

Hand in hand with reforms, the process of reconstruction and modernization of Ukraine will entail massive investments in physical infrastructure: housing, schools, hospitals, transport and logistics corridors, communications, and the energy sector. The scale of destruction from the war is so immense that rebuilding will require investments in the hundreds of billions of dollars – and even trillions, according to some estimates.[15] To finance such endeavor, Ukraine will need to tap into a variety of sources and institutions: bilateral donors, multilateral banks, private investors, and the Russian state in the form of reparations.

As discussed in the previous point, Ukraine will also need to invest in building modern institutions and reforming legal and regulatory frameworks. In comparison to physical infrastructure investments, these reforms are cheaper to undertake (i.e., in the range of $1-2 billion[16]) but nevertheless complex to implement because of political pushback and vested interests.

International donors and Ukraine partners have put forward proposals on how the reconstruction and modernization architecture should be designed, governed, and funded (RISE 2022; Becker et al. 2022; Gorodnichenko et al. 2022; Kirkegaard et al. 2022). Among the different proposals, there is consensus that Ukraine should own and lead the effort. The Ukrainian national government is the most suitable stakeholder to make decisions on reconstruction and to develop a strategic modernization plan, making a list of priority projects with a phased approach.

As Eichengreen and Rashkovan (2022) suggest, this plan should also involve consultations and active participation of subnational governments, civil society, and business groups. If this process is overcentralized within the national government, there is a risk of weakening local governments and all the progress achieved so far towards decentralization and democratization. The national government must work with subnational governments and allow them to present their own plans and projects and should coordinate these efforts across levels of government and ministries. Large projects such as rebuilding transport and logistics and energy infrastructure will probably be centralized at the national level. However, social infrastructure – schools, parks, hospitals, and housing – and smaller projects will have to be led and managed by local governments.

TAKE A HUMAN-CENTERED APPROACH TO RECONSTRUCTION AND MODERNIZATION

Although rebuilding physical infrastructure has a high price tag, a more important task is to support and involve Ukrainians in the reconstruction process. Buildings can be repaired, and new ones can be erected. However, the human element of reconstruction needs more focused attention. There is a large talent pool of Ukrainians, in whose hands rebuilding the future Ukraine should lie.

When the war ends, there will be 10–15 million Ukrainians who might want to come back to live in Ukraine. There will also be more than 5 million Ukrainian veterans and people with disabilities who will need jobs and health services, including mental health support. Therefore, it will be important to focus on policies that will create jobs for Ukrainians and those investments that will recover the basic infrastructure for people to lead dignified lives.

Ukraine will not be able to implement all reforms and projects at once, so it will be important to prioritize and select quality projects that can generate economic opportunities for Ukrainians. Reconstruction and modernization should, therefore, take a human-centered approach, focused initiatives that encourage Ukrainians to come back and projects that maximize the employment of Ukrainians so they can continue to take ownership of their country and rebuild their lives.

DONORS CAN PROVIDE TECHNICAL ASSISTANCE, OFFER PROJECT PREPARATION, LEVERAGE PRIVATE CAPITAL, AND OVERSEE THE PROCESS

On the donor side, there are many institutions that will be involved in the reconstruction process, among them the European Bank for Reconstruction and Development (EBRD), the Bretton Woods institutions (World Bank and the International Monetary Fund), the Organization for Economic Cooperation and Development (OECD), the EU, and bilateral donor agencies. What is important to note is that each institution brings a unique set of technical knowledge, expertise in specific sectors, and financial firepower. However, no institution has it all or can do it all. The comparative advantage of these institutions vis-a-vis the Ukrainian government or private investors is providing technical assistance, project preparation activities, leveraging private capital, and overseeing funding and projects. As argued by Bandura et al. (2022), there are several areas that donors should prioritize:

First, donors need to clarify their roles, assess their strengths, and have a division of labor in terms

[15] Ukraine Reconstruction May Cost $1.1 Trillion, EIB Head Says - Bloomberg.
[16] https://cepr.org/publications/books-and-reports/rebuilding-ukraine-principles-and-policies.

of supported projects so that they are leveraging their strengths and not overlapping. As a first step, on January 26, 2023 the EU launched the Multi-Agency Donor Coordination Platform[17] to increase coordination among institutions that are providing financial assistance to Ukraine.

Second, donors can support the Ukrainian government by putting together a strong pipeline of bankable projects. Not all the projects laid out in Ukraine's National Recovery Plan will be able to attract funding. These projects need to be well-prepared, meet high standards, and demonstrate economic, social, and environmental benefits. Donors can also help Ukraine prioritize projects and select those that will have the most impact.

Third, donors can help the Ukrainian government with the procurement process and screen contractors and investors to prevent malign influence and ensure a new class of oligarchs does not emerge from the reconstruction process. Donors can start this process now by vetting and prequalifying companies and contractors.

Fourth, for Ukraine to modernize, it will have to be able to attract financing, technology transfers, and technical know-how from private sector firms. The TDC poll shows that Ukrainians welcome the contribution of foreign companies in reconstruction: 55 percent of those polled want firms to be actively involved, not only to provide finances but to supervise Ukrainian companies as well, and another 29 percent polled want foreign companies to be directly involved in the reconstruction.[18] In this regard, bilateral donors and specialized institutions such as development finance institutions (DFIs) and multilateral development banks have a vital role to play in leveraging private sector investments into Ukraine. These organizations possess expertise in developing public-private partnerships (PPPs), structuring complex transactions and undertaking large infrastructure projects. They also have at their disposal a set of financial instruments that precisely foster private sector development in countries, including directly investing in firms or equity portfolios, structuring political risk insurance and guarantees to mitigate risks for investors, and using blended finance approaches.

Finally, working with Ukrainian civil society, donors should provide oversight of the process and set up an independent monitoring and evaluation (M&E) system so that funds are tracked properly and projects are delivering their intended goals. Ukraine has a very strong network of NGOs, including the RISE UA coalition, which promote integrity, accountability, and citizen participation for reconstruction, which includes tools such as timely disclosure of data, development of monitoring, and oversight of the process. Ukraine's digital sophistication is also an important asset to help to reduce corruption and increase transparency in procurement, for example, through the use of the digital public procurement system, ProZorro[19] and other tools.

GIVE PRIORITY TO COMPANIES AND CONTRACTORS FROM ALLIED NATIONS

In addition, the reconstruction and modernization of Ukraine should reflect current geopolitical realities. As such, when attracting investments and partnering on projects, Ukraine should prioritize companies and contractors from countries that are supporting Ukraine politically, militarily, economically, and through humanitarian aid (e.g., welcoming refugees).

During 2022, there are many countries that have abstained or voted in favor of Russia in UN General Assembly special sessions. A significant number of countries that abstained were African nations, alongside China and India. Moreover, there are counties that decided not to participate in economic sanctions placed on Russia, including China, India, and Mexico.[20] In contrast, since the war began, G7 countries including the United States, Canada, United Kingdom, Japan, and Germany have been strong partners of Ukraine, providing military and economic support. Neighboring countries such as Poland, Moldova, and others have opened their borders and welcomed more than 7 million Ukrainian refugees. The EU, its Member States, and European financial institutions have committed 49 billion euros in financial, budget support, emergency, humanitarian, and military assistance to Ukraine.[21] These are the countries that should be given priority for contracts and investment opportunities in the reconstruction process.

Specifically, the US has been Ukraine's number one donor, contributing more than 60% of all aid to Ukraine. US aid to Ukraine totals $68 billion,[22] with an additional recent package of $45 billion.[23] The US private sector also has a significant country presence, including more than 200 member companies in the American Chamber of Commerce in Ukraine. Before the war, the United States was also a top source of FDI in Ukraine. US companies also have significant experience in supporting large-scale reconstruction

[17] https://eu-solidarity-ukraine.ec.europa.eu/index_en.
[18] https://tdcenter.org/2022/12/13/survey-reconstruction-of-ukraine-and-international-aid/.
[19] https://voxukraine.org/longreads/three-years-of-reforms/index-en.html#openModal4.
[20] On March 2, 2022, the United Nations General Assembly adopted Resolution ES-11/1 deploring Russia's invasion of Ukraine, demanding a full withdrawal of Russian forces and a reversal of its decision to recognize the self-declared People's Republics of Donetsk and Luhansk. The resolution passed with 141 countries voting in favor, 5 against, and 35 abstentions. On April 7, 2022, the UN General Assembly held a special session to suspend Russia's membership in the UN Human Rights Council Resolution ES-11/3: 93 countries voted in favor, 24 voted against, and 58 countries abstained. On October 12, the UN General Assembly passed resolution ES-11/4, calling on countries not to recognize the four regions of Ukraine which Russia has illegally claimed: 43 countries voted in favor, five voted against, and 35 abstained.
[21] https://ec.europa.eu/commission/presscorner/detail/en/read_23_383.
[22] https://www.csis.org/analysis/aid-ukraine-explained-six-charts.
[23] https://www.cnbc.com/2022/12/24/us-house-approves-ukraine-aid-including-arms-after-zelenskyy-visit.html.

efforts in difficult environments, including conflict or war zones such as Afghanistan and Iraq.

DESIGN AND STRUCTURE FINANCING MECHANISMS FOR RECONSTRUCTION

Lastly, bilateral and international donors and DFIs can be more creative in designing innovative financing mechanisms to raise different pools of resources devoted to Ukraine's reconstruction. In the immediate term, the Ukrainian economy needs support to keep operating and in the medium run, the country needs to attract massive amounts of FDI and other financial sources to rebuild and modernize its economy.

Scale Up Risk Mitigation Tools to Help Rebuild and Lure in Private Investments in the Future

In the short run, companies and SMEs operating in Ukraine require financing and insurance to cover heightened risks due to the war. However, local banks want to protect their capital and are leery of lending to local SMEs because of the volatile situation and are already expected to lose 20 percent or more[24] of their loan portfolio due to the war. Foreign investors are also cautious about investing in Ukraine even in the regions where there is no active fighting taking place due to the risk of property and transportation damages and expropriation from Russia. In this regard, private insurers, multilateral development banks (MDBs), DFIs, and specifically the Multilateral Investment Guarantee Agency (MIGA) can employ a variety of risk-mitigation tools (i.e., guarantees, political-risk insurance, and first loss coverage) to help investors reduce exposure to political and macroeconomic hazards and attract private capital to Ukraine. Within private insurers, there are only a few companies that are ready to back Ukraine (e.g., Lloyds of London in the UK). There is an opportunity for these institutions to be more active in Ukraine and collaborate to provide risk-mitigation instruments.

There are several proposals for these instruments: i) Set up a war insurance fund: for the immediate recovery phase, Kirkegaard et al. (2022) and, Igor Liski,[25] a Ukrainian investor, proposed establishing an internationally backed insurance fund that would protect investments against military risk so investors start rebuilding now despite the ongoing conflict. In addition, MIGA's existing "war and civil disturbance" insurance could be expanded for broad usage in this context. ii) Establish a separate multi-donor fund to back MDB commitments: bilateral donors can set up a pool of funding to back MDBs' balance sheets so they can take more risk and finance projects in Ukraine.

[24] https://www.bstdb.org/BSTDB_Overview%20of%20the%20financial%20sector_UKRAINE.pdf.
[25] https://www.wsj.com/articles/ukraine-economy-stabilizes-military-gains-11663078436.

Use Seized Russian Assets Held in G7 Central Banks

The United States together with its G7 partners have frozen more than $330 billion in Russian assets.[26] These include Russian central bank assets held in G7 banks as well as those owned by sanctioned Russian individuals and companies. Among Russian frozen central bank assets, France holds the most of any country at more than $71 billion, Japan is second at $58 billion while Germany $55 billion and the United States at $48 billion.[27] These assets can provide a significant opportunity to help foot the immense bill for Ukraine's reconstruction.

However, it may be difficult to seize these assets in the short run because of various legal impediments, and lack of international standards and political will. Nevertheless, there are proposals[28] put forward to unlock these assets. For example, the US Congress[29] passed a bill to allow Ukrainians to seek and collect monetary damages from Russia or any individuals sanctioned by the US Government. Canada also passed the C-19,[30] the budget implementation bill, that grants powers to seize and sell off assets owned by Russian individuals and entities on Canada's sanctions list.

Help Set Up Enterprise Funds to Invest in SMEs

Donors and philanthropists can provide capital to set up special investment funds that would support small and medium-sized companies in Ukraine. During the 1990s, to help develop the private sector and promote a free market economy in the former Soviet states, the United States government funded and set up a series of enterprise funds that invested and provided credit to small companies. One such successful fund is the Western NIS Enterprise Fund (WNISEF) founded in 1994 as a $150 million fund in Ukraine and Moldova. Over the years, WNISEF has supported 136 companies, employing 26,000 people in Ukraine and Moldova.[31]

Introduce a Small and Short-lived EU Solidarity Tax

Finally, although it might be politically unpopular and difficult to implement, the EU could potentially design a solidarity tax where the proceeds would be directed to a fund to help Ukrainian reconstruction. There are past experiences where countries instituted a solidarity tax, during war times or to fund noble public goals.

[26] https://www.businessinsider.com/repo-global-task-force-freeze-330-billion-russia-oligarch-assets-2022-6.
[27] https://www.nbcnews.com/data-graphics/russian-bank-foreign-reserve-billions-frozen-sanctions-n1292153.
[28] https://www.lawfareblog.com/legal-approach-transfer-russian-assets-rebuild-ukraine.
[29] https://upton.house.gov/news/documentsingle.aspx?DocumentID=401934.
[30] https://www.justice.gc.ca/eng/csj-sjc/pl/charter-charte/c19_2.html.
[31] https://wnisef.org/.

For example, in 1991 Germany introduced a flat rate of 7.5% on all personal income to fund the reunification of East Germany. In the case of Ukraine's reconstruction, this tax would be temporary (i.e., 5 years), and represent a small percentage levied on sales of inelastic goods and services (e.g., luxury items) or on profits from multinational companies that chose to remain in Russia.

POLICY CONCLUSION

When the USSR collapsed in 1991, the West declared victory over the Cold War but provided Russia an outsized role in international affairs. As such, Russia was automatically admitted as a permanent member in the UN's Security Council[32] although both Ukraine and Belarus were also former USSR states and original members of the UN since 1945. Moreover, there was not a truth, reconciliation, and healing process about the legacy of communism for the citizens of the 15 former Soviet republics. There was also no justice process for the 20 million people that died due to the brutality of the Soviet regime.[33] Even today, Russia remains part of the Security Council.

Now the free world is faced with another historical challenge with an opportunity to help Ukraine continue its democratization and modernization journey. Ukrainians desire and deserve this opportunity. The Ukrainian national anthem proudly proclaims that Ukraine has not yet perished: it will not perish and will be reborn into a modern country.

International donors will have a historic opportunity to accompany rebuilding efforts, applying the lessons learned from past reconstruction experiences and help Ukraine become that modern society. In sum, the main elements for reconstruction and modernization involve the following.

After victory, Ukraine should not simply rebuild its old infrastructure and institutions: it deserves something new. Ukraine has a chance to break away from 350 years of Russian domination with an economy and society connected to and firmly embedded in the Euro-Atlantic community. This will require significant governance, social, and economic reforms that are anchored in the European Union (EU) accession process. A modern, democratic, and secure Ukraine that upholds the Charter of the United Nations is the foundation for security and well-being of Europe and for defending democratic principles globally. The EU and G7 nations have a historical opportunity to help the country win the war and win the peace.

Ukraine deserves to remain independent, sovereign, and secure from Russia. The only way to achieve this goal is for the West to provide Ukraine the weapons it needs to win the war and work with Ukraine on a realistic timeline towards NATO membership. Ukraine will be victorious, but without strong security guarantees it will not remain immune from potential Russian attacks.

The Ukrainian national government should develop a strategic modernization plan, making a list of priority projects with a phased approach to reconstruction. The human element needs added attention: when the war ends, there will be 10–15 million Ukrainians who might want to come back to live in Ukraine. There will be also more than 5 million Ukrainian veterans who will need jobs and health services, including mental health support. For Ukrainians to lead dignified lives, it will be important to focus on policies that will create jobs and make investments in social infrastructure.

The comparative advantage of development institutions vis-a-vis the Ukrainian government or private investors is providing technical assistance, project preparation activities, leveraging private capital, and overseeing funding and measuring impact. As such, when attracting investments and partnering on projects, Ukraine should prioritize companies and contractors from countries that are supporting Ukraine politically, militarily, economically, and through humanitarian aid.

In the immediate term, the Ukrainian economy needs to keep operating. In the medium run, the country needs to attract massive amounts of foreign direct investment and other financial sources to rebuild and modernize its economy. Bilateral and international donors and development financial institutions can be more creative in designing innovative financing mechanisms. These includes risk mitigation tools, seeding private equity funds, a possible EU solidarity tax, and seizing frozen Russian central bank assets.

[32] https://cepa.org/article/expelling-russia-from-the-un-security-council-a-how-to-guide/.
[33] https://www.amazon.com/Black-Book-Communism-Crimes-Repression/dp/0674076087.

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Anders Åslund

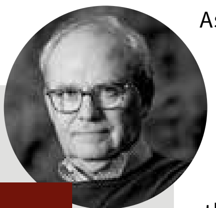
How to Reconstruct Ukraine

KEY MESSAGES

- **The Ukrainian state budget needs about $3.5 billion a month to keep afloat in 2023. The main donors must be the United States and the European Union**
- **Three key tasks need to be combined: reconstruction, EU accession, and completion of systemic reforms**
- **The collective West needs to set up a joint steering group with the Ukrainian government for the management of the reconstruction, EU accession, and completion of reform with good governance and eminent transparency**
- **The costs of the damages that Russia has incurred on Ukraine are enormous. Russia must be forced to pay war reparations. Fortunately, more than $300 billion of currency reserves of the Central Bank of Russia has been frozen in Western central banks. They should be confiscated and used for Ukrainian reconstruction**
- **Reconstruction should be based on the principles of insurance, covering the costs of each person or entity that has suffered losses from Russian aggression. At the same time, the Ukrainian government and the EU need to reorient strategic infrastructure from Russia to the EU**

On February 24, 2022, Russia launched a full-scale invasion of Ukraine. President Vladimir Putin talked about denazification, that Ukraine was about to join NATO, and the stopping of genocide of Russian speakers in Donbas, etc., but neither existed (Putin 2021 and 2022). Putin's obvious aim was to conquer as much as possible of Ukraine to re-establish part of the Soviet Union or Russian Empire.

Ukraine surprised both Russia and the world by defending itself with valor. Kyiv never fell, and Ukraine defended Kyiv, Chernihiv, and Kharkiv and even recovered Kherson in the South. As this is being written in January 2023, a slow Ukrainian offensive in the south and the east is proceeding.



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The Russian attack on Ukraine had a major impact on the world. The whole West came together as never before. The European Union, NATO, the G7, and the UN General Assembly condemned Russia's war of aggression. The collective West reacted with far-reaching financial and personal sanctions on Russia. As many as fifty countries engaged in the supply of arms to Ukraine. The West also provided financial assistance. The EU instantly opened its borders to Ukrainian refugees and allowed them residence and work permits and social benefits. Both governments and civil society provided Ukraine and Ukrainians with substantial humanitarian aid. The big future question is how to pursue Ukraine's reconstruction after the war has ended.

THE COSTS OF RUSSIA'S WAR ON UKRAINE

Ukraine has suffered tremendously from Russia's aggression and this suffering is growing. In 2014-15, Russia seized 7 percent of Ukraine's territory and caused Ukraine a loss of 17 percent of its GDP. Ukrainian private claims on Russia in international arbitration amount to more than $10 billion, while common assessments of the costs in the Donbass amount to some $20 billion (Åslund 2018).

In February 2022, Russia started a far greater military campaign. The immediate costs are material destruction, lost human lives, and reduced economic activity. The Government of Ukraine, the World Bank, and the European Commission have launched a joint Rapid Damage and Needs Assessment. The material and human losses from the Russian aggression are very substantial. As of June 1, 2022, the World Bank recorded direct damage of more than $97 billion (World Bank 2022). By November 1, the Ukrainian government and the private Kyiv School of Economics had recorded losses of more than $120 billion at original cost. With realistic assessment of the reconstruction cost, the amount is likely to nearly double to some $200 billion. Most of the losses are buildings and infrastructure.

The Russians have killed tens of thousands of civilian Ukrainians and presumably three times as many have been injured. After Libyan officers planted a bomb on an airplane that blew up over Lockerbie in Scotland in 1998, Libya eventually agreed to pay $10 million per victim.[1] If Russia has killed 50,000 Ukrainians, it would have to pay $500 billion by the same standard.

To this comes the current Russian devastation of the Ukrainian economy. The Ukrainian Ministry of Economy assesses that Ukraine's GDP fell by 30 percent in 2022. Since Ukraine's 2021 GDP was $200 billion, this means a loss of $60 billion in 2022 for Ukraine, and this cost will continue in ensuing years.

[1] "Lockerbie Compensation: Libyan officials Acquitted," BBC, June 17, 2013.

Russia has imposed severe sanctions on Ukraine and blockaded all Ukraine's Black Sea ports, which means that Ukraine needs to build a new infrastructure to redirect its trade to Europe. The World Bank assesses that "disruptions to economic flows and production, as well as additional expenses associated with the war, are collectively measured as losses and among to some $252 billion" (World Bank 2022, 2).

Moreover, Russia's aggression has caused both emigration and internal displacement. Measurement is complicated by Ukrainians both emigrating and returning. No less than 7.5 million people fled to the EU, while almost as many Ukrainians, probably 7 million, were internally displaced.

RUSSIA MUST PAY WAR REPARATIONS

Ukraine's Western allies need to force Russia to pay substantial war reparations to Ukraine. The Putin regime will not agree to pay any reparations, but the G7 froze the international currency reserves of the Central Bank of Russia held in the West immediately after its invasion of Ukraine.[2]

According to the public statistics of the Central Bank of Russia of January 1, 2022, these funds amounted to $316 billion. Germany held $96 billion, France $61 billion, Japan $57 billion, the US $39 billion, the United Kingdom $31 billion, Canada $17 billion, and Austria $15 billion (Hufbauer and Schott 2022).

The central bank reserves have many advantages. They are the indisputable property of the Russian state, which is directly responsible for the war crimes in Ukraine. They are perfectly liquid and require a minimum of administrative and legal work. The countries that hold and have frozen these funds should confiscate them through national legislation because of Putin's unprovoked war of aggression against Ukraine (International Working Group 2022).

On November 14, the UNGA adopted a strong resolution with 94 votes against 14 with 73 abstentions to hold Russia accountable and compel it to pay war reparations to Ukraine (United Nations 2022b). It "recognizes that the Russian Federation must be held to account for any violations of international law in or against Ukraine, including its aggression in violation of the Charter of the United Nations, as well as any violations of international humanitarian law and international human rights law, and that it must bear the legal consequences of all of its internationally wrongful acts, including making reparation for the injury, including any damage, caused by such acts" (United Nations 2022a). It can form the basis for an international tribunal against Russia to extract war reparations from Russia.

The principle is clear: Russia must be made to pay substantial reparations to Ukraine after the war (Åslund 2022). Sticking to international law, the G7 should confiscate Russian state funds in Western countries. The G7 should announce their intention to do so now and tell the Kremlin that it will have to pay for everything that it destroys in Ukraine. The more damage Russia inflicts on Ukraine, the larger the amount of funds that will have to be confiscated.

Canada has taken the lead, adopting a law in late June to confiscate the assets of both individuals and states that are linked to violations of international peace and security, as well as gross violations of human rights. Canadian legislation could serve as a useful model for other countries currently holding Central Bank of Russia reserves.

Another potential source of financing for Ukraine's reconstruction are assets of sanctioned Russian oligarchs that have been frozen abroad because of their assistance to Putin's criminal regime, but it is unlikely to offer much financing within a reasonable time period because of the tremendous legal obstacles. The culpability of various oligarchs will be hard to prove, and they will defend themselves vigorously in court with the best lawyers in the world. Actual ownership is often hidden in layers of 20-30 anonymous shell companies registered in a dozen secretive offshore tax havens, and the owners may transfer property. The declared frozen assets are limited, and few of these assets are liquid. The prices of superyachts and palaces are very low at executive auctions.

Instead, each country that holds Russian Central Bank reserves should adopt a special law for the confiscation of these assets and their transfer to Ukrainian reconstruction. There is no other way in which Russia can be forced to finance war reparations to Ukraine in the short term.

SHORT-TERM FINANCING, 2023

The dominant topic of financial discussion is the medium-term reconstruction, but Ukraine needs substantial support also in the short term in order to escape high inflation (Ferguson 2022). In 2022, the Western funding was unfortunately insufficient, so inflation reached 27 percent in October 2022 because of the shortage of financing caused by the sharp fall in GDP and thus in tax revenues. The international budget support stopped at $32 billion (Dragon Capital 2023). Yet, the government financial system continued functioning remarkably well.

The Ukrainian government has specified its needs for 2023, presuming that the war continues with the current somewhat lower intensity. In October, President Volodymyr Zelensky stated that Ukraine would need $55 billion of foreign support next year, including $38 billion for the budget and $17 billion for the rebuilding of critical infrastructure. He expected an IMF program of some $20 billion.[3]

[2] DiCamillo, N., "The G7 Has Frozen All of Russia's Reserve Assets in Their Countries," Quartz, February 28, 2022.

[3] Shalal, A. and D. Lawder, "Ukraine's Zelenskiy Appeals for $55 bln to Cover Budget Gap and Reconstruction," Reuters, October 12, 2022.

The two dominant donors to the Ukrainian budget are the United States and the European Union. Hopefully, each will offer $1.5 billion a month in 2023, which should suffice if their disbursements occur on time. The US Congress has adopted a program of assistance for Ukraine of $45 billion for the first nine months of 2023. Most of it goes to military assistance, but it also contains $14 billion in budget assistance, that is $1.5 billion a month. The European Union intends to match the US financial support and has adopted a package of €18 billion macro-financial assistance for the Ukrainian budget for 2023 (Dragon Capital 2023).

UKRAINE'S RECONSTRUCTION

In April 2022, eight economists from the respected Centre for Economic Policy Research (CEPR) released a substantial and useful report, "A Blueprint for the Reconstruction of Ukraine." They distinguished between three stages of reconstruction. The Ukrainian government has adopted a similar periodization, an emergency response, while the war continues, 2022-23, reconstruction for 2023-25, and development and modernization, 2026-32 (Becker et al. 2022, Ukraine's National Recovery Council 2022).

The CEPR report formulated nine pertinent principles for the international aid for the reconstruction, which have become widely accepted. The aid should be rapid but conditional. The aid should consist of grants rather than loans. Given the multitude of aid sources, close coordination between the different funding sources and the recipient is necessary. The aid should be administered by an independent EU-affiliated or authorized agency. Ukraine must "own" the reconstruction. The reconstruction should be combined with EU integration. The reconstruction must also involve modernization. The hopefully vast amounts of funding require a major role for the state in the economy. The reconstruction should be conditioned on measures to reduce corruption.

The current focus is the reconstruction phase for the three years 2023-25, for which the Ukrainian government requests $300 billion. Ideally, all of it would be covered by confiscated Russian Central Bank reserves as discussed above.

It is vital that a common coordination mechanism is being agreed upon among the Western donors. Traditionally, the international financial institutions, led by the International Monetary Fund, have played this role, but currently the main donors are the United States and the European Union. Other issues are the balance between reconstruction and EU accession, the balance of power between donors and recipient, and the seat of a secretariat (Kubilius 2022; Ganster et al 2022; Zelikow and Johnson 2022).

The driving force of the Western support for Ukraine has become the informal G7, which also includes the EU. At its virtual meeting on December 12, 2022, the G7 agreed on some principles. They stated: "we are determined that Russia will ultimately need to pay for the restoration of critical infrastructure damaged or destroyed through its brutal war." They agreed to "establish a multiagency Donor Coordination Platform" that the World Bank formed days later. Finally, they agreed to "set up a Secretariat for the Platform. We will each designate a senior government representative to oversee the set-up of the platform and ongoing coordination efforts, and ask them to convene as soon as possible in January 2023" (Gv.UK 2022). The basis for a common coordination mechanism had been formed and the emphasis on speed appears reassuring.

It is still unclear where the secretariat will be located. The European Commission has offered to host it. So has the World Bank, and the Ukrainian government wants it in Kyiv. The degree of coordination with EU accession remains moot and the very governance has not been settled.

The post-war rebuilding of Ukraine must not become mechanical reconstruction. Instead, the reconstruction funding should be an insurance covering the losses made by the owners of assets that have been destroyed by the Russian warfare, which will lead to a natural decentralization. At the same time, the Ukrainian government and the EU need to modernize and reorient strategic infrastructure from Russia to the EU.

REFORMING UKRAINE THROUGH EU ACCESSION

In June 2022, the European Union offered Ukraine the important status of EU candidate. The next step is that the EU Council decided to open accession negotiations. In can do so in early 2023 or delay it for years. The actual accession negotiations last three to four years in the best case. It involves the adoption of hundreds of new laws of a candidate country. After that, all EU members have to ratify a country's membership, which take an additional two years.

Ukraine has already adopted a substantial part of the legislation the EU requires because of having concluded an extensive Association Agreement with the EU. As the European Commission acknowledged: "Ukraine has worked since 2016 on the implementation of the EU-Ukraine Association Agreement, including a Deep and Comprehensive Free Trade Area (AA/DFCTA). These agreements already capture an unprecedented amount of the EU acquis. Ukraine has gradually approximated to substantial elements of the EU acquis across many chapters. It has an overall satisfactory track record of implementation, while in some sectors the country is more advanced than in others" (European Commission 2022a).

While the EU accepted Ukraine as an EU candidate, it did so with seven conditions, and the Commission will monitor Ukraine's progress in fulfilling these steps. The first four conditions are legal, while the three others are democratic principles. They concern somewhat abridged selection procedure for judges of the Constitutional Court; the integrity vetting of the candidates for the High Council of Justice members; further strengthening of anti-corruption investigations, prosecutions and convictions; appoint a new head of the Specialized Anti-Corruption Prosecutor's Office and a new Director of the National Anti-Corruption Bureau of Ukraine; implement the Anti-Oligarch law; tackle the influence of vested interests in media; finalize the reform of the legal framework for national minorities (European Commission 2022a).

STRUCTURAL REFORMS

Many, but not all, new EU members have excelled with eminent growth rates soon after they became members. In the 1990s, Ireland and Poland, and in the 2000s, Estonia, Latvia, and Lithuania excelled with sustained growth rates of 7-8 percent a year. But success or failure depends on reforms.

A broad and clear understanding has arisen about what major reforms Ukraine requires (European Commission 2022b; Åslund 2015). Ukraine has already come far in its reforms, especially in macroeconomics. The EU has rightly focused on the rule of law and anticorruption, but economic freedom remains insufficient. Four areas requiring significant reforms should be pinpointed, namely reform of the state administration, completion of market reforms, speeding up of privatization, and improvement of corporate governance of state-owned enterprises.

Interestingly, in July 2022, First Deputy Prime Minister and Minister of Economy Yuliya Svyrydenko (2023) published an article sensibly calling for 7 percent growth a year for the next decade by cutting the tax burden from 45 percent of GDP to 30 percent of GDP, by radically liberalizing the economy, and by imposing the rule of law. This was a clear policy advice in line with what has worked in the recent winners in the EU, but it remains to be seen what policy will win.

POLICY CONCLUSIONS

This study highlights the following three important points related to how to reconstruct Ukraine. First, in the short term, it is vital that the Ukrainian state budget receives about $3.5 billion a month to keep afloat in 2023, essentially from the United States and the European Union. Second, the three key tasks for the country after the war are reconstruction, EU accession, and completion of systemic reforms. They should preferably be combined, and the collective West needs to set up a joint steering group with the Ukrainian government for the management of these three processes with good governance, efficacy, and eminent transparency. Third, the costs Russia has incurred on Ukraine are enormous and Russia must be forced to pay war reparations. The only good way of doing so is to confiscate the more than $300 billion of currency reserves of the Central Bank of Russia that Western central banks have frozen.

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Marek Dabrowski

Reforming the Ukrainian Economy and State: The Unfinished Business

KEY MESSAGES

- **Until 2013, Ukraine's record in reforming its economy and state was not impressive. The late start of reforms in the 1990s and their chaotic implementation led to macroeconomic and financial crises in 1993, 1998-99, 2008-09, and 2014-15, and the building of powerful oligarchic groups**
- **The Euromaidan protest movement in 2013-14 marked a turning point in Ukrainian history, which also opened a new window of political opportunity for reforming the Ukrainian state and economy**
- **Since 2014, reforms have accelerated, but their pace has been uneven. Several areas including the judicial system, law enforcement agencies, large share of state ownership in the economy have remained unreformed or underreformed**
- **The Russian invasion in February 2022 is causing severe material, economic, and human losses, which is increasing daily. Furthermore, martial law has meant the necessity to subordinate the entire economy and its management to military and security needs. International financial aid helps to partially close a sizeable fiscal gap resulting from the war**
- **Ukraine will need additional international aid to rebuild its economy and infrastructure when the war ends. A strict reform conditionality should accompany this aid. Incentives for reforms will also be created by the European Union's accession process**

Until 2013, Ukraine's record in reforming its economy and state was not impressive. As a result, the income per capita level in 2021 in purchasing power parity terms did not differ from that in 1992 when the Soviet Union collapsed (Figure 1).

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The late start of macroeconomic stabilization and liberalization (end of 1994) and slow and chaotic reforms in the 1990s and 2000s led to macroeconomic and financial crises in 1993, 1998-1999, 2008-2009, and 2014-2015 (Dabrowski 2007 and 2017a). The slow pace of reforms helped build powerful oligarchic groups that benefited from macroeconomic imbalances, structural distortions, and opaque legislation. They parasitized numerous state-owned enterprises (SOEs) and captured national and local politics.

The Orange Revolution in 2004 seemed to bring new opportunities and hopes for democratic and market transition. However, they were lost due to personal rivalries between the Revolution leaders and a lack of coherent and consequent reform vision of the subsequent governments. Eventually, the victory of Viktor Yanukovych in the presidential election in January 2010 led to the reversal of the post-Orange Revolution democratization gains. Government policy was captured by the oligarchic clan around the President and his family.

The Euromaidan protest movement, which started in November 2013 and culminated with the fall of President Yanukovych in February 2014, marked a turning point in contemporary Ukrainian history. It signified a shift towards a clear West-facing orientation of politics and the economy. Although it provoked Russian intervention, the annexation of Crimea, and the war in Donbas, it also opened a new window of political opportunity for reforming the Ukrainian state and economy.

Since 2014, Ukraine has had two presidents and four prime ministers. The activity of each government followed a typical political economy cycle: attempts at reforms at the beginning of their terms followed by their gradual deceleration, stagnation, and, sometimes, even partial reversal. As a result, the periods of the most intensive and comprehensive reforms fell for the periods 2014-15 (after the election of President Petro Poroshenko and the formation of the Cabinet of Ministers of Arseniy Yatsenyuk), 2016 (after the nomination of Volodymyr Groysman for the position of the Prime Minister), and mid-2019–early-2020 (after election victories of the President Volodymyr Zelensky and his "Servant of the Peoples" party when a short-lived Cabinet of Ministers of Oleksiy Honcharuk was in office). The reform effort concerned both the economic and political systems. The progress in both spheres was closely interrelated.

ECONOMIC REFORMS 2014-2021

In the economic sphere, the Yatsenyuk's government (2014-2016) and the new leadership of the National Bank of Ukraine (NBU) concentrated on macroeconomic stabilization that was seriously damaged between the end of 2013 and February 2015 and the banking sector restructuring. Four IMF programs supported this effort – the Stand-by Arrangement (SBA) approved in 2014, replaced by the Extended Fund Facility (EFF) in 2015, and two subsequent SBAs in 2018 and 2020. The EFF involved partial debt reduction negotiated with private foreign investors in 2015-2016. No program was fully disbursed due to problems with meeting conditionality.

Nevertheless, Ukraine managed to avoid the danger of debt, the balance of payments, and banking crises that could happen in 2014 and early 2015. It returned to moderate growth between 2016 and 2019 and 2021 (interrupted by a Covid-19-related output decline in 2021). During the same period, the general government (GG) deficit and gross debt to GDP were reduced, NBU gross international reserves increased (Figure 2), and the hryvnia's exchange rate stabilized. Inflation went down. However, it started growing again in 2021, on top of global inflationary pressure – see Table 1).

The Groysman government (2016-2019) continued reforms. It eliminated subsidies for natural gas and district heating and initiated the restructuring of the Naftogas (2016). It helped to reduce excessive natural gas consumption and dependence on gas imports from Russia. The government also started the reform of the electricity market. In 2017, it managed to get parliamentary approval for pension reform, which helped partly reduce the liabilities of the public pension system in the subsequent years. It also initiated the reform of the healthcare sector.

The years of Groysman's cabinet were marked by the beginning of the implementation of the Association Agreement between the European Union (EU), including a Deep and Comprehensive Free Trade Area (DCFTA), which entered into force on January 1, 2016. Together with the unilateral revoking of the previous bilateral free trade agreement by Russia, it led to the radical reorientation of Ukrainian trade from Russia to the EU (Dabrowski et al. 2020).

Unfortunately, the governments of Yatsenyuk and Groysman did practically nothing to privatize SOEs, accounting for a large share of the Ukrainian economy. Only Honcharuk's government (2019-2020) tried to relaunch a privatization process. It initiated small privatization via the electronic public procurement platform, Prozorro. The parliament elected in 2019 replaced the old long list of companies for which privatization was prohibited with the new, much shorter list in 2020. In March 2020, it also partially lifted the moratorium on the sale of agricultural land, which had been in place since 2001 (the new law entered into force in July 2021).

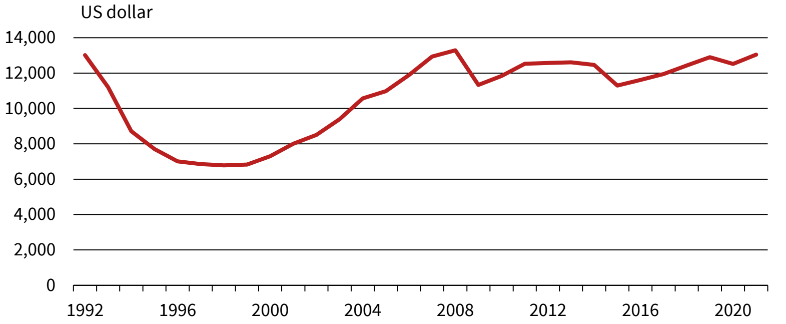
The Honcharuk government also started preparations for privatizing several big companies. However, a replacement of the Honcharuk's cabinet with the new one led by Prime Minister Denys Shmyhal in March 2020 and the Covid-19 pandemic stopped implementing these plans. Nevertheless, small privatization has been further continued.

Generally speaking, the pace of reforms has slowed down substantially since March 2020. The macroeconomic situation also deteriorated in 2020 due to the Covid-19 pandemic and related lockdown

Figure 1

Gross Domestic Product per Capita

Constant prices, purchasing power parity, 2017 international dollar, 1992–2021

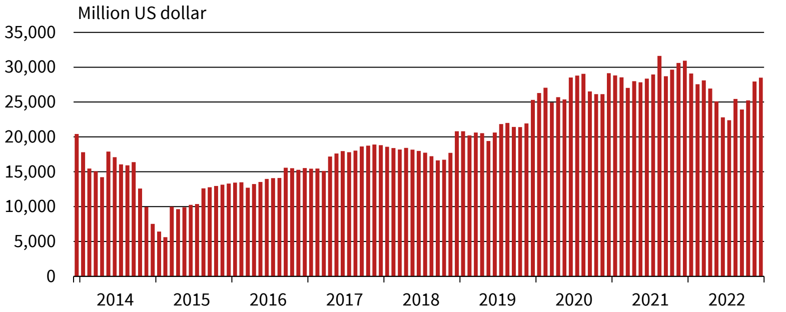


Source: IMF World Economic Outlook database, October 2022. © ifo Institute

Figure 2

NBU Official Reserve Assets

December 2013–December 2022



Source: National Bank of Ukraine (NBU), https://bank.gov.ua/files/SDDS/IREZ_en.xlsx. © ifo Institute

Table 1

Ukraine: Fundamental Macroeconomic Indicators, 2013-2021

Variable	2013	2014	2015	2016	2017	2018	2019	2020	2021
GDP, constant prices, % change	0.0	−6.6	−9.8	2.4	2.4	3.5	3.2	−3.8	3.4[(a)]
Inflation, end of period, %	0.5	24.9	43.3	12.4	13.7	9.8	4.1	5.0	10.0
GG net lending/borrowing, % of GDP	−4.8	−4.5	−1.2	−2.2	−2.3	−1.9	−1.9	−5.9	−3.3
GG gross debt, % of GDP	40.5	70.3	79.5	79.5	71.6	60.4	50.5	60.6	47.6
Current account balance, % of GDP	−9.2	−3.9	1.7	−1.5	−2.2	−3.3	−2.7	3.3	−1.6[(a)]

Note: GG = general government; [(a)] IMF staff estimates.

Source: IMF World Economic Outlook database, October 2022.

measures. In 2021, the economy recovered partly from the pandemic shock (see Table 1).

The continuous perception of the unfavorable business and investment climate reflected the uneven and incomplete reform process before the pandemic and war. The World Bank *Doing Business Survey 2020* placed Ukraine sixty-fourth among 190 countries, scoring 70.2 out of 100. In *Doing Business 2014*, Ukraine ranked 112 out of 189. An even less favorable assessment came from the Heritage Foundation Index of Economic Freedom 2020, in which Ukraine was ranked 134 out of 180 countries evaluated in the category of "mostly unfree" economies. However, there has been a systematic improvement in Ukraine's position in this ranking since 2014.

THE POLITICAL AND GOVERNANCE REFORMS 2014-2021

In 2014, just after the Euromaidan, the 2004 constitutional amendments were reinstated. They moved part of the President's power to the parliament by granting the latter the authority to appoint and control the government (previously subordinated to the President).

In 2016, a package of constitutional and legislative changes initiated the reform of the judicial branch of government, with the ultimate goal of strengthening the rule of law and radically improving contract enforcement and the protection of property rights. The structure of the Ukrainian court system was simplified (moving from four to three tiers), and merit-based recruitment of supreme court judges was initiated. However, this reform has been progressing slowly with many zigzags, and Ukraine is still only at the beginning of building an independent and professionally credible judiciary.

The same relates to various law-enforcement agencies, many of them being from the Soviet-era legacy and a source of harassment of the business community and ordinary citizens. Again, reforms in this sphere have been only partial. They concentrated on the formation of the new patrol police and reform of tax enforcement, and the tax and customs administration (still unfinished). Reform of other police formations and the Security Service of Ukraine (*Sluzhba Bezpeki Ukrainy*, SBU) is less advanced. Reform of the General Prosecutor's Office has been tried a few times but never completed.

However, since 2014, Ukraine has managed to successfully reform its armed forces, which has been able to resist Russian aggression in 2022-23. Between 2014 and 2019, in response to the donor-imposed conditionality, Ukraine created a system of anti-corruption institutions. It includes the National Agency for Prevention of Corruption (NAPC), the National Anti-Corruption Bureau (NABU), the Special Anti-Corruption Prosecutor's Office (SAPO), and the High Anti-Corruption Court (HACC). The NAPC collects e-declarations of civil servants and inspects correspondence of declared funds and assets with the lifestyle of public officials and members of their families. The NABU investigates top-level corruption cases and submits them under the supervision of SAPO, an independent unit of the General Prosecutors Office. The HACC litigates the indictments filed by the NABU. However, establishing these institutions did not diminish corruption in Ukraine and its international perception in a meaningful way. For example, the Transparency International Corruption Perception Index 2021 placed Ukraine at 122 out of the 180 countries assessed (with a grant score of 32 out of 100), with the only marginal improvement since 2013.

Worse, in 2019-2020, the Constitutional Court of Ukraine issued several rulings concerning the unconstitutionality of the NABU Law and its Head's appointment. These rulings paralyzed the work of this institution for a certain period.

After years of political fighting, the parliament adopted a new election code in December 2019, which reintroduced the proportional system (which existed before 2012) based on partly open lists and multi-seat constituencies. The mixed electoral system that governed parliamentary elections in 2012, 2014, and 2019 weakened political parties, helped oligarchs and other interest groups to elect their representatives, and encouraged political corruption. However, there is still a long list of election-related issues requiring further legislative action, including rules on financing election campaigns, use of the media, including social media in election campaigns, and strengthening the independence of the Central Election Commission.

The long-awaited decentralization of the Ukrainian state has only been partly implemented. The drafting of constitutional changes intended to open the way for genuine local and regional self-government were blocked by parliament in 2015, primarily because of opposition to the special status of Eastern Donbas, which was part of the same legislative package. However, some essential decentralization reforms have been conducted, such as the voluntary amalgamation of the lowest territorial units, *hromadas*, into the United Territorial Communities (UTC) and some degree of fiscal decentralization, mainly related to education and healthcare. This partial decentralization has been considered successful and has strengthened the resilience of local communities during the Russian aggression.

THE DEVASTATING IMPACT OF THE WAR

The Russian invasion of Ukraine, which started on February 24, 2022, caused enormous human and economic losses that are difficult to assess[1] at the moment of writing this paper (late January 2023). Furthermore, the war continues, and the damage toll

[1] According to IMF (2022) forecast, Ukraine's GDP will decline by 33 percent in 2022.

increases every day. However, beyond human and material losses, the logic of the war economy and martial law led to command management and administrative restrictions in many policy areas.

The NBU introduced numerous foreign exchange restrictions and tight control of the hryvnia exchange rate. It also had to return to monetary financing of the budget deficit, which ballooned to more than 20 percent of GDP in 2022 (IMF 2022), despite sizeable foreign grants amounting to almost 10 percent of GDP. The size of the fiscal gap and its potential inflationary consequences should serve as the argument for scaling up international financial aid to Ukraine from all possible sources (Åslund 2022).

Borrowers affected by the war can benefit from credit vacation and debt restructuring. The same relates to tax and social insurance liabilities.

Energy tariffs have remained frozen since 2021. As a result of heavy Russian attacks against energy infrastructure, the economy and population suffer from frequent electricity blackouts. In such a situation, energy supplies must be administrated and strictly regulated. Air transportation has had to be suspended and railway transportation subordinated to the priority of military needs. Infrastructure enterprises have had to deliver on public sector obligations regardless of their economic interest. The same relates to industries producing various war-related supplies, which were partly militarized.

Large-scale privatization has been placed on hold (in fact, it was not launched before the war). Furthermore, some companies belonging to Russian owners or pro-Russia oligarchs have been brought under government control. Competitive procedures of selecting SOE managers and other corporate governance rules introduced in previous years have been partly abandoned.

The Prozorro electronic procurement, the flag reform achievement of the post-Euromaidan era, has also been partially suspended. The government limited the collection and publication of economic and financial data, especially concerning the military and security sectors. The war environment has made civil society and media monitoring government activities more complex, including fighting corruption (Melkozerova 2023).

AFTER THE WAR: POLICY CONCLUSIONS

Although the war continues, international development institutions and various teams of experts work on the proposals for post-war reconstruction (see, e.g., Becker et al. 2022; CASE 2023), and accompanying economic and political reforms in Ukraine.

On June 23-24, 2022, the European Council granted the EU candidate status to Ukraine and Moldova. It also approved the opinion of the European Commission (2022), which presented recommendations for Ukrainian authorities, the fulfillment of which is a condition to start membership negotiations. They include completing institutional reforms of a judicial system, including the process of merit-based selection and vetting of judges, strengthening anti-corruption bodies and their independence, strengthening free and pluralistic media and civil society, fighting organized crime and money laundering, further reform of public administration, and de-oligarchization. And indeed, these are the most important and urgent reform steps which can strengthen the rule of law and democratic foundations of the Ukrainian state. However, adopting the above conditions in the second half of 2022 was slow and incomplete (Sydorenko 2022).

The experience of the previous European Economic Community/EU enlargement rounds since the mid-1980s has demonstrated that the accession process and its conditionality play the role of solid pro-reform and pro-modernization incentives (Roland 2002; Dabrowski and Radziwill 2007). In the case of Ukraine, it can be another potential incentive, namely the conditionality attached to the post-war reconstruction aid.

Beyond the recent European Commission's recommendations, there is a long list of reforms in various areas which should be completed or undertaken to ensure a better investment climate, lower business costs, macroeconomic and financial stability, the rule of law, more transparency, and less corruption.

Once the war ends, martial law regulations and other war-related restrictions and administrative-control measures should expire. Some rules, especially those related to economic management, can be lifted even earlier.

The list of needed reforms remains long in the political and institutional sphere. It includes transitioning from a presidential-parliamentary to a parliamentary-cabinet regime, legislation on political parties and election campaigns, completing an overhaul of the judiciary and law-enforcement agencies, and building apolitical and merit-based civil service. The respective constitutional guarantees must back the decentralization reform. The role of oblasts and rayons should be determined and supported by revenue sources.

The list of most needed actions in the socio-economic sphere is also substantial. It consists of large-scale privatization of SOEs and banks, returning to corporate governance reform in both private and public sectors, further liberalization of the agriculture land turnover, including legal persons and non-residents, liberalization of the energy market, completing the implementation of the Association Agreement with the EU, simplification of the tax system and tax administration, better targeting of social assistance, further increase in effective retirement age, and continuation of healthcare and education reforms.

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Christopher A. Hartwell and *Dmytro Boyarchuk*

What Should Be the Economic Priorities in Post-war Ukraine?

KEY MESSAGES

- **Ukraine must first win the war. But if it can successfully expel Russia from all of its territories, it needs to accelerate its post-Maidan, pre-war tempo of reforms**
- **Ukraine must build what it has long been lacking: the rule of law. In order to do this, it must build the rule of law from scratch, reforming its judiciary, unabashedly protecting property rights, and continuing its highly successful decentralization reforms**
- **During the transition from war economy to market economy, simplification of nearly every facet of interaction with the government should be undertaken – and kept in place. This will encourage not just hanging on to foreign charity, but also encourage investments needed for growth**
- **These steps will help Ukraine move towards Europe and continue its march towards Euro-integration even if (and especially if) accession to the European Union is a longer-term goal**
- **Ukraine's survival after the war is dependent on making policy reversals incredibly difficult to implement. This requires substantial political will**

It has been one year since Russia launched an unprovoked and brutal assault on the independent sovereign nation of Ukraine. During this time, the hollowness of Russia's great power pretensions has been exposed, with its military performing in away which vindicates late US Senator John McCain's assertion that Russia is a "gas station masquerading as a country." More interestingly, the war has also shown the resilience of Ukraine and Ukrainian society (Alshamy et al. 2023), an almost-unthinkable outcome when seen from the vantage point of the first Russian invasion of Ukraine in 2014. The reforms undertaken since the protests on Maidan ousted Russian-backed Viktor Yanukovych have paid off handsomely in enabling Ukraine to resist the Russian war machine.

However, there is much to be done if Ukraine is to win the peace in a post-war era, no matter what shape it takes. Maidan represented a long-delayed starting point for a country which had fallen far behind its western neighbors in transitioning to a market economy (Åslund 2009), retaining too many institutions from its communist past and standing in the way of the fundamental economic institutions required of free markets, including rule of law and protection of private property (Hartwell 2016). The actions of the Ukrainian government post-2014, catalyzed by the existential threat from a Russia which had already seized Crimea and was occupying portions of the country's east, finally put an end to much of the start-stop reforms which characterized the 1990s. But they did not go far enough.

The purpose of this policy brief is to outline the crucial priorities for Ukraine in any post-war reconstruction, focusing on the needed economic institutions first and foremost. Coming out of a joint Ukrainian-Polish-Swiss project, our efforts have been directed to highlight the most important reforms for the Ukrainian government, so as to have a blueprint ready to go when the Russians retreat. Unlike the 1990s and 2000s, Ukraine does not have the luxury of giving in to corruption, an intrusive state, and a Russian-inspired economic system. If the country is to truly break away from any form of Russian influence, it needs to accelerate and deepen its reforms, and this brief gives a sense of where its efforts should be targeted. In particular, we emphasize the areas of building fundamental economic institutions on the path to Euro-integration. These will be taken in turn.

BUILDING FUNDAMENTAL INSTITUTIONS

Within the myriad of economic institutions which will require attention in the post-war world, rule of law stands heads and shoulders above the rest. However, "rule of law" is a concept rather than a policy goal (Krygier 2016). Substantively building the rule of law in Ukraine in the post-war environment will require a complex set of actions focused on the judiciary and reducing the power of the state. In the first

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instance, Zelenskyy's government will need to be serious about the rule of law and especially the fight against corruption. Decades of shelving the issue of rule of law (De Waal 2016) translated into a decision to create a proxy system of anti-corruption bodies (thus acknowledging the inability of existing institutions to wipe away the scourge of corruption). However, the prescriptions for reform of the judicial and law enforcement systems have already been drawn up by international financial institutions (IFIs) in collaboration with Ukrainian civil society, and should be seriously considered:

- The Constitutional Court of Ukraine (CCU) should be rebooted without political influence under the supervision of independent international experts and representatives of civil society.
- The High Council of Justice (HCJ) and the High Qualification Commission of Justice (HQCJ) should be restarted under the supervision of international experts and civil society (implementation in progress), and as soon as the bodies are staffed, they should revise the entire judicial system (courts of first instance and appeal courts).
- Similarly, the Security Service of Ukraine (Sluzhba Bezpeki Ukrainy or SBU) should be stripped of its power to investigate economic and corruption crimes.
- Finally, the overhaul of operative and detective units of the police (which remained untouched in 2015), as well as the prosecutor's office (suspended in 2020) are also critical for the reform of the law enforcement system.

The abovementioned measures remain necessary but are not sufficient conditions in themselves for the successful establishment of rule of law, as rule of law is not just the passing of better legislation or even tweaking existing institutions (Krygier 2016). Indeed, in the broken atmosphere of Ukraine, which has neglected rule of law for too long, better laws will have little impact. Against this backdrop, there is a need for more sophisticated digitized metrics for measuring the progress of changes in the area of law enforcement and the judicial system, providing evidence for the (lack of) progress in the post-war era. Some basic monitoring already exists, such as the tracking of changes to court decisions in courts of appeal and the Supreme Court. Also, civil activists can analyze court decisions via an electronic judiciary system. However, further development of both data collection and the system of indicators is needed. With a system of quantitative metrics, based on sound methodologies (Skaaning 2010), Ukraine could evaluate progress in establishing rule of law.[1] Progress in establishing rule of law should also be directly linked to financing the post-war recovery. International partners need to make it absolutely clear that rule of law will be required and there will be no flexibility enabling the bypassing of this requirement.

Judicial institutions are only a first step, and corruption has flourished in Ukraine namely because the state has far too much power with which to demand rents. With fewer interactions between the state and citizen, there are less opportunities for corruption to arise.[2] Moreover, lack of rule of law has a domino effect with other institutional mechanisms: Because of the dysfunctional law enforcement system in Ukraine, it was impossible for the authorities to effectively collect taxes, as law enforcement bodies were unlikely to trace and punish evaders. As a workaround, the Ministry of Finance and tax authorities developed a tax collection system based on the presumption of taxpayer (tax agents) guilt, making businesses responsible for proving their innocence on a daily basis. Presuming taxpayers (tax agents) to be guilty is perhaps a helpful tool (in the short term) for fiscal consolidation but constitutes a very counterproductive instrument for generating economic growth in the country.

A state which a) has too much power and b) presumes that every transaction is illicit is also a state which has no love for property rights protection. This has been demonstrated through the aggregation of land rights to the government and away from individuals. Since 2001, a "temporary" moratorium on the sale of agricultural land was in place (Kostyashkin et al. 2020), finally lifted only in July 2021. Due to fierce political resistance, the reform was far less comprehensive than it could have been and was passed with multiple limitations: for example, until 2024, only individuals are allowed to buy land plots, with a cap of 100 hectares for any individual. Legal entities will be allowed to buy land from 2024, subject to a cap of 10,000 hectares for any one entity. State-owned and community land will not be for sale at all at present, while foreigners will be able to buy land only after a national referendum, which should be arranged (theoretically) in the not-too-distant future. Despite many fears connected with land reform, the first year of land market operations passed smoothly, with only technical difficulties reported (such as the need to streamline certain procedures for the easier closing of deals). Most importantly, banks have already started treating land plots as a source of collateral for new loans. In the post-war realm, Ukraine will have to go even farther with its land reforms, opening its market to non-residents to speed up the modernization and business of agriculture and its integration with international markets. As a more important objective, state and municipal land should be the subject

[1] For instance, the fraction of supportive decisions in favor of the state in litigations between tax authorities and taxpayers, comparative statistics on judges whose decisions were canceled by a court of appeal or the Supreme Court, and a more sophisticated (digitalized) monitoring system for the actions of law enforcement bodies at the stage of pre-trial investigation and litigations, etc.

[2] One of the authors made this point while serving on a USAID-funded project in Armenia in the early 2000s, only to have this assertion waved away as wishful thinking. It was decided it was better to spend more on anti-corruption campaigns than do something as fanciful as reduce the opportunities for corruption.

of sale and privatization according to a transparent procedure, developing alongside the procedures for rule of law.

Last but not least, Ukraine needs to not only address some of the gaps in its institutional framework but also build on the successes which it has had. Decentralization stands paramount among these, as the resilience of local communities during the Russian aggression is partly attributable to the decentralization reforms which began in 2014. An important part of this was the creation of its best-known aspect, the Amalgamated Territorial Communities (ATCs) or *hromadas* (1,469 ATCs were created by 2021). Some degree of fiscal decentralization, mainly related to education and health care, has also been implemented. However, this reform can still go farther, and will complement the withdrawal of the state from every facet of economic life. After the way, policymakers need to expand the fiscal autonomy of lower-level governments, while re-opening the draft constitutional changes intended for opening the way to genuine local and regional self-government but which were blocked by parliament in 2015. As with many Eastern European countries, Ukraine faces a challenge in understanding how funding between the center and the regions can be shared, and a key challenge will be understanding the mismatch between available funding and responsibilities allocated to local communities. A renewed decentralization effort, acknowledging the role that the regions played in keeping Ukraine alive, would be a welcome policy course.

EURO-INTEGRATION, WITH OR WITHOUT THE EU

These institutional reforms are a crucial step on the way towards accession to the European Union but are also independent of the often-belabored accession process. The process of European integration in Ukraine started in 1994, when the country signed a Partnership and Cooperation Agreement with the EU and established a special European integration department within the Cabinet of Ministers. Cooperation with the EU accelerated after 2009, when Ukraine became one of the EU's geopolitical partners under the Eastern Partnership Initiative. The signing of an Association Agreement (AA) in the spring of 2014 further deepened cooperation, bringing it to the level of strategic partnership and potentially opened the prospect of EU membership for the country.

However, from a political point of view, the EU did not even dare, at the time, to bring up official prospects of membership despite the unprecedented commitments taken by Ukraine under the AA to approximate the regulatory environment of the European Union. A poorly attended advisory Dutch Referendum on the EU-Ukraine Association Agreement was held in April 2016, showing that Dutch voters were not quite ready to give Ukraine the prospect of EU membership (Jacobs 2018). Despite ratification of the Association Agreement by EU Member States, the referendum made any promise of EU accession to Ukraine at that juncture politically impossible.

In reality, the EU–Ukraine Association Agreement had a significant impact on government policy, as key reforms began to set in motion the gradual modernization of the country (Králiková 2022). Certain fundamental changes – such as decentralization, reform of the civil service, and judiciary reform – were expected from Ukraine under the terms of the AA, and they were to serve as the basis for broader reforms and the further implementation of broad, sector-based transformations. In fact, Ukraine's greatest successes post-2014 were achieved in the "trade sections" of the Agreement, which aimed at reducing customs duties and removing non-tariff barriers to Ukrainian exports to EU markets. Changes in the "sector-based" part of the Agreement, which involved steps in specific areas from energy to education, reached varying degrees of progress, from "ready-to-be-integrated into the EU Single Market" sectors like public procurement or technical regulation, to "unpopular sectors" like education or postal services. A government assessment[3] of the implementation of the AA Action Plan for 2014-2024 arrived at an implementation rate of 66 percent as of November 2022, while an independent assessment[4] by the Ukrainian Centre for European Policy was less optimistic, showing that overall progress stood at 49 percent as of the first half of 2021, which included both fully completed commitments and interim results.

In June 2022, Ukraine was granted candidate status for EU membership through an extraordinarily quick decision of the European Council, taken when the country was resisting Russia's full-scale invasion. An unprecedented decision (the EU had never granted candidate status to a country at war before), Ukraine skipped several steps of the accession process as mandated by the Treaty on the European Union. Under normal conditions, Ukraine would have had to fully implement all the commitments under the Association Agreement, demonstrate and convince EU members that the country had fully implemented them, and only then submit a membership application: the base scenario for tendering an application was originally scheduled for 2035. Therefore, preserving the progress within the framework of AA implementation has become an important prerequisite for accession negotiations.

While much has been achieved since 2014, obstacles remain that hold the country back. "Frozen" progress – in particular in establishing rule of law, the continuing weakness of the civil service and extensive reach of the state and, in particular, the political interference that this allows – remains the most significant

[3] See the Ukrainian Government website, "Pulse of the Agreement," available at https://pulse.kmu.gov.ua/ua/a/year/all.

[4] Shown on the website of "Europaiska Pravda" (a project of newspaper Ukrainskaya Pravda) at https://navigator.eurointegration.com.ua/.

of these issues. This reality means that some commitments made by Ukraine during this process will have to be resolved, including the complex set of political and regulatory decisions (covering anti-oligarch legislation, the implementation of anti-monopoly rules, and a better investment climate and access to finance for reconstruction). For example, the harmonization of European environmental law concerning GHG emissions (e.g., requirements of the Large Combustion Plant Directive for air pollution limits by large power plants)[5] will require substantial investment and, in fact, a complete overhaul of the country's old and badly deteriorated domestic power generation system. Such issues also clash with the interests of the business groups that own the power plants responsible for the greatest pollution and are opposed to such restrictions.

Not all issues come from the Ukrainian side, however, and the EU also has policy avenues that it needs to explore to hasten the process of accession. First, an accelerated and complete elimination of customs duties, tariff quotas and other pricing restrictions for Ukrainian agricultural goods would function as a measure to support the country's economy and is a political measure that the EU could (in theory) do quickly. Second, signing the Agreement on Conformity Assessment and Acceptance of Industrial Products (ACAA), which allows the EU to recognize Ukraine's National Quality Infrastructure and conformity assessment to ensure supplies of industrial goods to the EU internal market without additional certification. These issues are currently in the verification phase, and fast-tracked signing of the three agreements in the first three industrial sectors (electrical equipment, pressurized vessels, electromagnetic compatibility) would be a major step of support on the part of the EU.

POLICY CONCLUSIONS

As this brief shows, opportunities abound for Ukraine in a post-war scenario to continue the reforms begun in earnest in 2014 after years of neglect. However, the chance must be seized and the reforms instituted rapidly; as former Polish Deputy Prime Minister/Central Bank Governor/Finance Minister Leszek Balcerowicz (1995) noted, after a great victory (over communism or Russia) there is a period of "extraordinary politics" where radical and necessary reforms can be implemented. This window of opportunity closes fast, however, and so must be used to its maximum. The immediate post-war period would be such a time.

In reality, EU accession is still a long-term goal for Ukraine and, as the accession of Central European states such as Poland and Hungary showed, attaining EU Member State status is not a panacea for all institutional woes. Indeed, as one of us have argued elsewhere (Hartwell, 2013), the EU actually froze in place the institutional experimentation that was underway after the end of communism, a stasis which has led to some of the issues seen today in backsliding countries such as Poland (e.g., with regard to the judiciary). With Ukraine attempting to approximate EU legislation, it should take advantage of being outside of the EU formally to push for innovative and extensive institutional reforms, implemented quickly. For example, in light of the multiple institutional problems within the country, the European Commission also outlined seven post-candidacy conditions for Ukraine which should be implemented before the accession negotiation process starts, including requirements on reforming the Constitutional Court, judicial reform, combatting corruption, combating money-laundering, implementing anti-oligarch legislation, harmonizing legislation on media, and amending legislation on national minorities. These are all issues which Ukraine should be moving on even without EU accession, and this should be the emphasis: becoming a European state, with an emphasis on core European values related to rule of law and free trade, even if the process of accession takes years.

The reality, however, which may trip up such a plan, is that Zelenskyy is not and was not a natural reformer. His movements regarding anti-corruption before the war were not encouraging, and his pre-war association with oligarchs was troubling. It remains to be seen if his wartime resolve translates into a desire to push the reforms that he was reluctant to tackle previously, although the extensive anti-corruption investigations and firings occurring in January 2023 are a good signal.

Finally, when discussing the myriad of reforms that Ukraine needs in the post-war world, it is crucial to remember that Ukraine needs to win the war first. Inordinate amounts of effort, borne by the Ukrainian people but with the support of NATO and the West, need to be expended to uphold the liberal international order and repel Russian aggression. Anything short of forcing Russia to retreat will leave a continuing potential threat to the country's souvereignity. For our purposes, anything less than unqualified victory will also have negative consequences for the country's reform path, as current leaders will be seen as ineffective and other avenues may be sought. It is thus imperative that Ukraine wins the war first. Only then can it work on post-war reconstruction – but this reconstruction, as we have shown, will be just as crucial for breaking out of *Russkiy Mir*.

[5] Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants.

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Barry Eichengreen

Economic Recovery in Post-World War II West Germany and Ukraine Today*

KEY MESSAGES

- **Historical experience suggests that network infrastructure can be reoriented and reconstructed relatively quickly in postwar Ukraine, with the central government playing a coordinating role**
- **Repair of the housing stock may take longer, and chronic housing shortages leading to inadequate labor supply in some locations may handicap recovery and growth**
- **A voucher program would enable households to choose where to live on the basis of economic opportunity and cost, and provide incentives for residential construction**
- **Postwar Ukraine is likely to run very large current account deficits. Foreign direct investment and portfolio capital inflows will not provide the necessary finance. In addition, substantial foreign aid will be required**
- **Steps should be taken now to coordinate the provision of aid through the creation of an independent administrator and multi-donor fund**

Post-World War II economic reconstruction in Western Europe, and in West Germany in particular, is widely cited a template for getting postwar Ukraine back on its feet. The Marshall Plan is an example of how to organize aid to Ukraine, both in form, which is to say as grants rather than loans, and structure, with a head office in a national capital but also program officers on the ground and ownership on the part of the recipients (Conley 2022). The European Payments Union and European Coal and Steel Community illustrate how economic integration can support reconstruction; they are consistent with the presumption that integration with the European Union, culminating in EU membership, should be integral to Ukraine's reconstruction. The rapid recovery of the West German economy during the Marshall Plan years and then the *Wirtschaftswunder* in the third quarter of the 20th century demonstrate what is possible (Economist 2022).

This is stylized history, designed to inspire. Providing inspiration for a positive public-policy response is certainly a valid use of history. But it is the historian's task to be true to the facts. In this note, I review some facts about West Germany's economic recovery and reconstruction in the Marshall Plan years, with the goal of providing additional perspectives on the challenges and opportunities confronting Ukraine.

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* I am grateful to my collaborators in the CEPR report "Rebuilding Ukraine: Principles and Policies." My intellectual debt to them will be clear from the references. I also thank Albrecht Ritschl and Tamás Vonyó for helpful comments.

NETWORK INFRASTRUCTURE

For better or worse, Allied bombing attacks on Nazi Germany and Russian missile attacks on Ukraine share features in common. Attacks on German cities were intended to demoralize the civilian population. Increasingly from mid-1944, the Allied bombing campaign focused on knocking out key German infrastructure, such as the electric power grid and railway system (Mierzejewski 1988). Even the notorious firebombing of Dresden in February 1945 was motivated by the fact that the city was a major center for Nazi Germany's rail and road network. More than 40 percent of the urban housing stock was destroyed in the course of bombing attacks (more on this below). But this was largely corollary damage of attempts to disable key war industries and critical infrastructure.

Postwar reconstruction of network infrastructure was relatively quick. Already in the summer of 1946, less than a year following Germany's surrender, all bridges and railway lines in the American and British zones of occupation were rebuilt (Vonyó 2012). By late 1947, prior to initiation of the Marshall Plan, the number of locomotives was back up to its prewar peak, and across Continental Western Europe railway freight haulage had recovered to 1938 levels (DeLong and Eichengreen 1993).

A difference between Ukraine and post-World War II Germany was the presence of occupation forces in the earlier war, and the fact that the occupiers needed bridges, rails and roads for their own immediate purposes. Postwar Ukraine may see competing priorities. Still, historical experience suggests that damage to network infrastructure is unlikely to be a lasting constraint on Ukraine's economic recovery. The speed with which Ukraine has succeeded in restoring electricity to its cities and key industrial facilities following Russian missile attacks is consistent with this history. To be sure, Ukraine's task is complicated by the need to reorient rail and power networks away from Russia and toward Europe, requiring among other things integrating its gas pipeline network with European LNG terminals (Deryuqina et al. 2022) and changing its railway gauge (Bilotkach and Ivaldi 2022). It is reassuring that after World War II a similar reorientation of West German infrastructure away from what had become the Soviet zone of occupation in favor of a North-South orientation did not derail, as it were, the process.

Local governments have the best understanding of local conditions, so decisions regarding postwar reconstruction should devolve to state and local governments wherever possible. But where power and transport are delivered by networks, investments must be planned and coordinated. This unavoidably creates a leading role for the central government in this sphere.

HOUSING

Housing, on the other hand, is a sector where specific responsibilities for design and construction can be delegated. In West Germany after World War II, the process of repairing the housing stock was largely delegated to state and local authorities. But the process was laborious and time consuming. Some 2.3 million dwelling units in what became West Germany were destroyed between 1939 and 1945, and equal number suffered significant damage (Wandersleb 1953). More than 2 million units were needed for the inflow of evacuees and expellees from Eastern Europe, and another million were needed to meet the needs of newly formed families. Yet in the first five postwar years, only 1 million additional dwelling units became available, chiefly through repairs. The 1950 West German housing census recorded 2 million individuals as living in shelters or make-shift hovels and many others doubling up. Only 40 percent of households had a dwelling unit for themselves.

As a result, the number of residents of the largest cities, which suffered the most destruction, fell significantly, while the population of small towns and villages increased. Industrial agglomerations being urban, there was a mismatch between labor supply and labor demand. Low unemployment in urban areas coexisted with unemployment rates as high as 15 and 20 percent in agrarian states.

As Vonyó (2018) shows, this mismatch was a problem for economic recovery. Supplies financed by the Marshall Plan and the recovery of domestic production largely eliminated raw material and energy shortages by 1950. The stock of capital equipment, valued at constant prices, was back up to 1938 levels (see Table 1). Yet industrial production on the territory of what was now West Germany was still 12 percent lower than in 1939 (Ritschl and Vonyo 2014) – 1950 being two full years after the famous currency and economic reforms in the three western zones (Schnabl 2019). Labor shortages in the cities, in or near to which the most efficient large industrial plants were located, accounted for the difference.

Ukraine will face similar, if not identical problems. As one set of authors (Green et al. 2022) puts it, “refugees are where housing is not, and housing is where people are not.” However much one hopes that Ukraine regains its entire prewar territory, Donetsk and Luhansk may remain under Russian control, and there may be a continued flow of Ukrainians westward from those regions. Firms may relocate to western Ukraine in order to be closer to the EU market but be unable to find workers in the absence of an adequate housing stock. These problems will be compounded if Ukraine fails to re-attract residents who fled the country during the war.

The prospects are complicated by the fact that not just the location but also the composition of employment is likely to change. Ukraine was already undergoing a transition from industry to services, which will now accelerate as a result of the decline of Russian-facing industries. It may be that employment in high-tech services can be disbursed; the rise of work-from-home points to this possibility. But the history of high tech suggests that agglomeration economies are important for innovation (think Silicon Valley), and that tech workers value urban amenities (think San Francisco).

In 1950, the new West German government finally began systematically addressing the housing problem. The First Housing Act set a goal of 300,000 new dwellings a year and was extended through 1962. It provided low-cost public loans for constructing rental units for low-income earners. Starting in 1950, federal finance included Marshall Plan funds targeted at low-cost housing units in locales with the most urgent

Table 1

Capital Stock at Constant 1936 Prices, Postwar West German Territory (1936 = 100)

Year	Mining and manufacturing	Aggregate economy		
	Capital stock	Equipment	Structures	Aggregate
1938		107	103	102
1944	136			
1946	116			
1948	113			
1950	122	107	92	95

Source: Eichengreen and Ritschl (2009).

needs, and for persons working in critical industries and export trades (Kassouha 2020). But two-thirds of public funds were provided by state and local authorities, which raised them by issuing housing bonds. Interest on the bonds was tax exempt, and purchases could be deducted from taxable income within limits. Lenders were induced to provide capital for residential construction by income tax reductions or deferrals. Local tax reductions encouraged additional construction, while accelerated depreciation was permitted for the first two years, at 10 percent per annum, as opposed to the conventional 3 percent.

The result, according to Wertheimer (1958) was a housing "miracle," in the form of additions to the housing stock at an annual rate of 5 percent, five times the historical pace. Without this, the implication follows, the *Wirtschaftswunder* would not have been possible.

The fact that the occupation authorities after World War II did not prioritize rubble removal or housing reconstruction, where the Ukrainian government presumably will, suggests that Ukraine may be able to reconstruct its housing stock faster. Rubble removal has been mechanized in the course of the last 75 years. Recourse today to modular and prefab housing points in the same direction. Finally, there is the fact that Ukraine's population has declined considerably over the last three decades, from some 51 million in 1991 to 42 million in 2021, suggesting the preexistence of surplus housing.

That said, there is no question that significant investment in housing construction and repair will be required. Damaged dwellings will have to be repaired, and the energy efficiency of the housing stock will have to be enhanced.

Green et al. (2022) suggest providing vouchers for housing purchases by households whose single-family dwelling units have been destroyed. Vouchers would be proportional to the prewar value of property, with an adjustment for increased construction costs, and supplemented with government-subsidized affordable mortgage loans, resembling West German practice in the 1950s. While the public authorities might take the lead in constructing multi-family units where the city owns the land, it would be preferable for residents to receive vouchers rather than having flats allocated on the basis of prewar occupancy. This would give households more freedom to decide where to live, while also incentivizing construction in desirable areas. Reconstruction of the housing stock is also an opportunity to sell off public land to individuals and development companies, and in the course of so doing to shift the composition of the housing stock from Soviet-style multi-unit flats to single-family homes. It provides an opportunity for upgrading energy efficiency.

BALANCE OF PAYMENTS CONSTRAINT

The exact nature of the problems that the Marshall Plan was intended to solve, and how it solved them, continue to be debated. The traditional view (e.g., Borchardt and Buchheim 1991) is that economic recovery was held back by shortages of coal and key industrial materials. Post-World War II Europe had no way of financing imports of energy and materials from the dollar area. Marshall Plan aid relaxed this constraint and, by making intermediate inputs available, enabled Europe to export. Its conditionality required the recipients to eliminate the price controls that had discouraged firms and farmers from producing for the market.

A revisionist view, associated with Milward (1984), argues that industrial activity in Western Europe, aside from West Germany where the occupying powers continued to limit production in heavy industry, had in fact more than fully recovered to 1938 levels before the Marshall Plan came on stream. In other words, intermediate inputs were not the binding constraint. Europe's balance of payments crisis reflected not an inability to produce and export but, rather, governments' overly ambitious reconstruction plans. Investment rates that exceeded the available savings translated into current account deficits that could be financed by limited foreign exchange reserves only for a finite period, and private capital inflows were prominent by their absence.

In principle, this constraint might have been relaxed by reducing food imports and subsidies, effectively requiring additional forced saving by households. But doing so would have risked political unrest.

The Marshall Plan provided resources for financing current account deficits and politically vital food supplies. By conditioning US aid on European integration and locking Germany peacefully into Europe, it allowed ceilings on West German industrial production to be lifted, loosening remaining supply bottlenecks (Berger and Ritschl 1995). Its conditionality required governments to set exchange rates at realistic levels, helping to correct the imbalance between imports and exports. It required them to balance budgets, closing the gap between investment and saving. It provided funding for the European Payments Union (EPU) to extend financial assistance to countries, including West Germany, with temporary payments problems (Eichengreen 1993).

West Germany is widely cited as a case where exports surged as a result of currency reform, price decontrol and economic liberalization during the Marshall Plan years (see e.g., Wallich 1955). But, in fact, the value of imports of goods and services was still almost twice the value of exports of goods and services in 1949 (see Table 2). In 1950, imports again exceeded exports, this time by 30 percent, and the German government was forced to appeal to the EPU for emergency credit. In return it agreed to increase taxes, limit private spending, and restrict the extension of credit by banks to industry (a measure effected by raising bank reserve requirements). With these measures, investment growth slowed. There was then a fortuitous improvement in the terms of trade as European demand for German capital goods ramped up, and the current account of the balance of payments finally swung into surplus in 1952.

Ukraine will be similarly prone to run current account deficits or else face a binding external constraint on investment. It has the advantage, in contrast to post-World War II Germany, of not having to import food, even if agricultural production is depressed for a period by the presence of Russian mines, given its massive grain surplus. De-mining was also a major problem after World War II but could be accelerated by employing the same German engineers who had laid the mines in the first place, and hence knew where to find them, and in the notorious Danish case by deploying German prisoners of war. Such options are either unavailable or unacceptable today.

Gorodnichenko et al. (2022) foresee the need to raise the share of investment in Ukraine's postwar GDP to at least 30 percent, up from 15-18 percent previously. Meanwhile, private-sector savings capacity is likely to be depressed. Private finance for ongoing current account deficits of, say, 15 percent of GDP would essentially be unprecedented. Like West Germany in 1950, Ukraine will have to rely on official credits, in its case from the International Monetary Fund, other multilaterals, and bilateral donors.

Unlike West Germany in 1950, however, Ukraine has the advantage of a flexible exchange rate, which it can adjust to boost export supplies and limit import demands. Reconstruction will take place in an environment of active international financial markets, which should enable Ukraine to attract foreign direct investment (FDI), and portfolio capital flows once inherited debt is restructured (Obstfeld et al. 2022). But there is also the danger that FDI will be deterred by war risk in the absence of a definitive resolution to the conflict with Russia. To overcome these security concerns, Movchan and Rogoff (2022) recommend multilateral provision of insurance against military risks, similar to multilateral Investment Guarantees managed by the World Bank. Ukraine and the Multilateral Investment Guarantee Agency in fact announced a pilot project along these lines in September 2022. One is reminded of the security guarantee provided to West Germany by the United States, France and Britain and, starting in 1955, by NATO.

Portfolio capital inflows have the disadvantage of creating additional debt-service obligations for the government, corporations and banks, and they command premium interest rates. There is also the risk of disruptions in the event of a sudden stop. Private capital is part of the solution to the financing problem, but only part. This suggests the need for continued foreign aid, pointing in turn to the question of how aid should be organized.

ORGANIZING AID

The Marshall Plan consisted of one donor, the United States, and 16 national recipients. Aid for Ukrainian reconstruction, in contrast, will involve one national recipient and donors from at least 16 countries. This points to the need to integrate and coordinate the efforts of the donors, not just governments but also NGOs, philanthropists and others.

Integration and coordination imply the need for a clearly-defined, hierarchically-organized administrative structure overseen by a managing director and experienced management team, reporting to a supervisory board made up of representatives of the principal donors. Eichengreen and Rashovan (2022) argue that this agency should be led by a director experienced in dealing with the European Commission and that it should draw on the Commission's expertise and resources, since EU membership is the economic and political endgame for Ukraine, requiring that reconstruction should proceed in a manner consistent with EU norms and standards. At the same time, the reconstruction agency should be independent of the Commission, just as the Marshall Plan had significant independence from US State and Treasury Departments. This will enable the agency to ramp up quickly, display flexibility in hiring, and avoid political interference.

The agency should have its main office in Kyiv, just as the Economic Cooperation Administration based the office of its Special Representative (Averell Harriman) in Paris, and foreign and Ukrainian staff in the field. (The Office of the Special Representative oversaw the work of 600 Americans and 800 Europeans.) But local knowledge resides with Ukrainians on the ground, and ownership of reconstruction implies the need for input and guidance from Ukraine when it comes to project selection and execution.

Table 2

German Balance of Payments on Current Account (Millions of US Dollars)

Year	Exports of goods and services	Imports of goods and services	Current account balance
1949	1,283	2,304	–1,022
1950	2,199	2,823	–625
1951	3,896	3,753	144
1952	4,814	4,253	561
1953	5,316	4,380	937

Source: Dernburg (1954).

The Office of the Special Representative recognized national units that made recommendations regarding aid disbursements. But whereas the Office of the Special Representative liaised with 16 separate national units, the Ukrainian reconstruction agency will want to distinguish a set of distinct operational (energy, telecommunications, transportation) and possibly also regional divisions (Mylovanov and Roland 2022). Alternatively, each operational division could have separate regional subdivisions.

Requests for project funding would come from the Ukrainian side and be reviewed, approved or vetoed by the agency. The central government should coordinate with regional and municipal authorities, who have the best sense of the facts and opportunities on the ground. The creation of regional divisions would encourage this by giving regional authorities a separate channel through which to make their recommendations. The agency should be able to halt disbursements for projects that go awry. A special commission or court, made up of members of the reformed Ukrainian judiciary and foreign magistrates, could hear appeals of decisions to veto and halt projects.

To facilitate integration and coordination, it will be important for bilateral and other donors to funnel their contributions through this agency. Some donors may nonetheless wish to proceed separately, just as various NGOs proceeded outside the Marshall Plan after World War II. Because adequate funding may be slow to materialize, it would be desirable to create an arrangement similar to the International Finance Facility for Immunization, whereby donors pledge to provide money over a period of time and the facility immediately issues bonds against these donations.

Donors to Ukraine, like donors everywhere, will want reassurance regarding control of corruption. Corruption was a problem in a number of Marshall Plan countries. C. A. Munkman, a US State Department official, in a retrospective review of experience in Greece (Munkman 1958), concluded that of aid targeted at economic development (as distinguished from the significant share of US aid directed toward strengthening the Greek military), only 10 percent achieved its goal. He colorfully described how Marshall Aid intended for obtaining horses for use in agriculture bought horses bred for racing that were useless in the field. Marshall Planners reduced aid disbursements in 1951-52 owing to the inability of the Greek government to allocate them efficiently (Vetsopoulos 2009).

Transparency is the best disinfectant for corruption. Ukraine operates a digital platform, ProZorro, where bids and contracts for public procurement are available for all to see. But problems can also occur after the procurement stage. Data and information should be assembled in timely fashion, audited by international accounting firms, and made available publicly in order for donors and civil society to monitor the reconstruction process. A comprehensive digital platform – and expanded version of ProZorro – could be created for this purpose.

POLICY IMPLICATIONS

Successful reconstruction of Ukraine will have to surmount further challenges in addition to those analyzed here. These include reforming health, education and judicial systems, improving the business environment, and above all strengthening economic and political governance. In building institutions for economic and political governance, West Germany was able to look back at institutions that had operated reasonably successfully prior to the 1930s. Eichengreen and Ritschl (2009) argue that there was continuity between these earlier institutions and the governance arrangements put back in place after World War II. In particular, collective bargaining and workplace codetermination as developed in the 1920s were restored after 1945. Acts passed starting in the 1950s, drawing on earlier legislation, cemented Germany's system of industrial cooperation.

Ukraine lacks a similar inheritance of successful institutions of economic and political governance. It will want to import knowledge about their structure from the EU and specifically from EU members formerly known as transition economies. This is yet another reason why Ukrainian institutions and policies should be harmonized with those of the EU, and why EU membership should be the ultimate economic and political objective of reconstruction.

West Germany's experience after World War II similarly demonstrates the benefits of economic integration. European integration facilitated export-led growth and specialization along lines of comparative advantage, which would similarly benefit Ukraine. Beyond that, West German experience has a number of implications for Ukrainian reconstruction. It suggests an important role for the central government in coordinating reconstruction of the country's network infrastructure, including roads, railways and energy networks, which will have to be reoriented away from now hostile powers and toward Europe. In contrast, responsibility for housing can be delegated to regional and municipal governments, and a program of housing vouchers can give households agency over where and how to live.

Post-World War II experience suggests that Ukraine will need security guarantees in order to attract foreign direct investment. It will need foreign aid to finance the high levels of investment required for repair and reconstruction, and to close the balance-of-payments gap while it struggles to replace its former exports to Russia. Foreign aid does not administer itself. The experience of the Marshall Plan, in West Germany and elsewhere, provides some guidance about how an effective aid agency might be organized.

But it is important to recognize that the circumstances of Ukrainian reconstruction are different and that there will be differences in administration. The role of historical comparisons, after all, is not just to emphasize similarities but also to highlight differences.

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Rebuilding Ukraine – the Agricultural Perspective

KEY MESSAGES

- **Given its national and global importance, agriculture in Ukraine is a key sector to consider when assessing both the damages and losses caused by Russia's attempted invasion and the associated post-war reconstruction needs and challenges**
- **As of September 2022, total war damages and losses for Ukrainian agriculture were estimated to be US$ 40.9 billion**
- **Using the Post Disaster Need Assessment methodology, KSE Agrocenter (2023) estimates that reconstruction and recovery of Ukrainian agriculture will cost at least US$ 23.5 billion**
- **Key priorities include demining and re-cultivating agricultural land, rebuilding on-farm and local storage facilities, and repairing export infrastructure**
- **Policy makers should focus on eliminating bottlenecks for private investments to drive sectoral growth, not selecting specific products or value chains for support**
- **Investments in agriculture and public administrative capacity in agriculture should be carried out with a view to compatibility with EU regulation in agriculture and supporting Ukraine's EU accession perspective**

Agriculture is a key sector of the Ukrainian economy. In 2020, the farm sector accounted for roughly 10 percent of Ukrainian GDP. If upstream (e.g., agricultural machinery) and downstream (e.g., food processing) industries are factored in, the entire agri-food sector's share of Ukrainian GDP amounts to roughly 20 percent. In addition, agriculture accounted for 45 percent of Ukraine's exports in 2020 (Gagalyuk et al. 2022).

Ukrainian agriculture is also of vital global importance. After a difficult initial decade of transformation from a planned to market economy environment, Ukrainian agriculture has since the turn of the century become an increasingly important source of staple food exports. On average over the 2018-20 period, Ukraine accounted for 10 percent of global wheat exports, 16 percent of global maize exports, and 50 percent of global sunflower oil exports (Glauber and Laborde 2022). Ukraine has roughly one-third of the world's most fertile so-called chernozem (black) soils, and year-round access to ice-free harbors in relative proximity to major markets in Africa and the Middle East. Per hectare yields and total production of grains and oilseeds in Ukraine have increased considerably over the last two decades but still fall short of potential. Hence, Ukraine has an essential role to play in addressing the challenge of sustainably feeding a growing global population (von Cramon-Taubadel 2022).

Given its national and global importance, agriculture in Ukraine is a key sector to consider when assessing both the damages and losses caused by Russia's attempted invasion and the associated post-war reconstruction needs and challenges. Russia's war has caused massive damage and losses to Ukrainian agriculture, which has halted and reversed the positive trends and contributions outlined above. It will require resources and careful planning to recover lost ground, both figuratively and literally, and set Ukrainian agriculture back on a path to increased sustainable productivity growth.

DAMAGES AND LOSSES

The price of Russia's aggression is immense for Ukraine and increasing daily. Beyond the terrible human toll, the most recent estimate of total economic war damages to Ukraine, dating from September 2022, is US$ 136 billion or almost 64 percent of the country's 2021 GDP (KSE 2022).[1] This estimate does not include damages caused by Russia's stepped-up missiles attacks on critical infrastructure since October 2022. Total war damages and losses for Ukrain-

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[1] Damage and losses calculated using the Post Disaster Need Assessment methodology developed by the Global Facility for Disaster Reduction and Recovery (GFDRR), the World Bank, the EU, and the United Nations (GFDRR 2017). War damages are calculated as the monetary value of physical assets that were destroyed (or stolen) or partially damaged (but still suitable for repair/recovery). War losses are calculated as the foregone revenues or additional costs caused by the war. Updated estimates through the end of February 2023 (after one year of war) are in preparation.

ian agriculture were estimated to be US$ 40.9 billion as of September 2022 (Nivievskyi et al. 2023). This estimate includes US$ 6.6 billion in damages and US$ 34.3 billion in losses.

Not surprisingly, the damages have been heaviest in the Ukrainian oblasts in the east and south that have seen the most fighting, i.e., in Luhansk (US$ 1.8 billion), Donetsk (US$ 1.1 billion), Kharkiv (US$ 992 million), Kherson (US$ 976 million), and Zaporizhya oblasts (US$ 759 million). The two largest categories of losses are agricultural machinery (84,200 thousand units of machinery valued at US$ 2.9 billion) and stored products (US$ 1.9 billion including 2.8 and 1.2 million t of grains and oilseeds, respectively). The remaining categories include damage to storage facilities (9.4 million t of storage capacity valued at US$ 1.1 billion), reductions in livestock numbers (95,000 sheep and goats, 212,000 head of cattle, 507,000 pigs, and almost 11.7 million chickens, valued together at US$ 362 million), 14,300 hectares of damaged perennial crops such as fruit orchards (US$ 346 million), and finally destroyed and stolen inputs (600,000 t of agricultural chemicals such as pesticides, 124,000 t of fertilizers, and 11.5 million t of fuel, valued together at US$ 95 million).

The losses in Ukrainian agriculture are due first to lower yields as farmers were unable to adequately care for their crops (reduced applications of fertilizer and agricultural chemical) and, in some cases, harvest or properly store them (the latter leading to quality losses). Second, disruptions in export flows due to the destruction of transportation infrastructure and harbor facilities led to a large backlog of grains and oilseeds and reduced domestic prices in Ukraine. Where exports were possible (for example, via the land route through the EU to ports in Germany, Poland, and Romania), high transport costs increased the margin between world market and domestic Ukrainian prices. While world market prices for wheat exceeded 300 US$/t for much of 2022, farmers in Ukraine generally received less than half that amount.

The negotiation of the Black Sea Grain Initiative in late July 2022 (United Nations 2023) increased export flows considerably, but trade costs remained high and domestic prices in Ukraine correspondingly low. Grain that leaves the remaining Ukrainian ports in and near Odesa under this initiative is subject to inspection by joint teams. The Russian members of these teams work unreliably and slowly, which leads to large backlogs of ships in the Bosporus, lengthy delays, and inflated shipping costs.[2] Altogether, the war-related losses of US$ 34.3 billion through September are equivalent to roughly 75 percent of the previous year' gross agricultural output, and it is estimated that slightly over one-half of these losses were due to reduced domestic prices.

POST-WAR NEEDS ASSESSMENTS

Estimates of damages and losses to date would provide a basis for an assessment of needs if the war had just ended and reconstruction could begin immediately. However, there is little indication that Russia will end its hostilities and withdraw from Ukrainian territory in the near future. Hence, damages and losses can be expected to accumulate further before sustained reconstruction, as opposed to temporary repair and improvisation, can begin.

As the 2023 harvest approaches, there are signs that especially losses will continue to grow. While Ukrainian farmers typically planted over 9 million hectares of planted winter crops (especially wheat and barley) in the years prior to the invasion, statistics on the planting campaign released by the Ukrainian Ministry of Agrarian Policy and Food indicate that only 4.5 million hectares of winter crops were planted in 2022. This reduction is partly due to the fact that some Ukrainian farmland is currently occupied or cannot be farmed because it is damaged or mined. However, the seeded area has also been reduced in regions that are far from the fighting. When winter crops were being planted in August and September of 2022, many farmers were suffering from a lack of liquidity due to the revenue losses described above. They were therefore unable to purchase inputs such as seed and fuel that are required for planting. Some farmers who might have been able to plant winter crops in 2022 have chosen instead to wait until April-May of 2023 and plant more summer crops (especially maize and sunflower), which could compensate to some extent for the reduction in winter crops.

In any event, the total harvest of all crops in 2023 will likely be substantially smaller than the harvest in 2022, which was itself roughly one-third smaller than expected in mid-February 2022 prior to Russia' attack. As a result, losses will continue to accumulate, the farms' financial situation will deteriorate further, and Ukraine's contribution to global food supplies will fall further below potential. Hence, the assessment of needs presented below, which is based on current estimates of damages and losses, represents a lower bound that will increasingly underestimate true needs with every additional day of destruction and loss caused by Russian military aggression.
Post-war needs can be broken down into three broad categories:

- Reconstruction – the replacement and repair of destroyed and damaged assets.
- Recovery – the provision of resources, including public services that will enable farmers to restart agricultural production.

[2] On October 31, 2022, Russia announced that it was withdrawing from the Initiative, but two days later on November 1, 2022, it rejoined. In the two days without Russian participation, 85 ships were inspected; since Russia has re-joined the average daily rate of inspection has been roughly 10 ships per day.

– Modernization – taking advantage of the opportunity to not just return Ukrainian agriculture to its pre-war state but, where appropriate, to "build back better" (Hallegatte et al. 2018) to increase the sector's economic and environmental efficiency.

Based on the current damages and losses estimates and the Post Disaster Need Assessment methodology (see Footnote 1), KSE Agrocenter (2023) projects that Ukrainian agriculture would need US$ 23.5 billion. This estimate includes US$ 7 billion for reconstruction and US$ 16.5 billion for recovery.

Reconstruction (and Modernization)

The estimated costs of reconstruction in KSE Agrocenter (2023) are based on the damage estimates presented above. A 20 percent premium to account for modernization has been added to each of the individual damage categories (e.g., replacement and repair of storage facilities, replanting perennial crops, and restocking farm animal herds) except agricultural machinery. Since damages to agricultural machinery are estimated using new equipment prices rather than depreciated current value, the damage values already include a modernization component.

These reconstruction needs do not include an estimate of the costs of demining or re-cultivating agricultural land that has otherwise been damaged by the military conflict (i.e., removal of unexploded ordnance, pollution, destroyed military equipment, craters, trenches and other fortifications). It is estimated that 5 million plots of land (13.5 million hectares) could suffer from mining and pollution, and that of these 1.3 million plots will require technical inspection and re-cultivation before they can be safely used (Nizalov et al. 2022). Meeting these needs and processing the presumably millions of compensation claims will be a difficult task. The Ukrainian State Land Cadastre records land ownership and rental data, but it is incomplete. Documents have been lost due to the destruction and looting of public and private offices and archives. Property belonging to thousands of Ukrainians who have lost their lives will need to be transferred; many of the millions of displaced Ukrainians have lost documents and will have a difficult time establishing their claims to damaged land and other property. These problems will be especially acute in the occupied and de-occupied regions of Ukraine.

Recovery

Replacing damaged and lost productive assets is important but not sufficient for recovery in Ukrainian agriculture. Farmers need working capital to purchase seed, fuel, and fertilizer, and to pay workers and landowners. Due to the losses that they have sustained since the war began, most farms are heavily indebted to the suppliers of these inputs, and many are effectively bankrupt. KSE Agrocenter (2023) estimates that of the US$ 34.3 billion in total losses suffered by Ukrainian agriculture, farms would require US$ 12.6 billion to restart production, i.e., to purchase necessary inputs, and pay suppliers of land and labor. In addition, US$ 0.9 billion would be required to cover non-performing loans and enable banks to issue new short- and medium-term loan to farms.

Finally, to support the provision of public services that are essential for a resumption of production and exports, KSE Agrocenter (2023) estimates that roughly US$ 300 million per year will be required. This amount is equal to 120 percent of the 2021 aggregate budget of several important public institutions, including the Ukrainian Ministry of Agrarian Policy and Food, the State Service of Ukraine for Food Safety and Consumer Protection, the various institutions involved in the land cadastre and registration system, and the National Academy of Agrarian Science.

POLICY CONCLUSION

The reconstruction and recovery needs outlined above may be lower-bound estimates, but they nevertheless add up to substantial sums of money. Ukrainian agriculture will be competing with other important sectors such as electricity and other utilities, housing, health care, transportation, and the military for funding. It is therefore safe to assume that Ukrainian agriculture will ultimately have to work with less than estimated above. It is therefore important to ensure the most efficient use of whatever funds are available by focusing especially on the elimination of bottlenecks that threaten reconstruction and recovery.

As discussed above, demining and re-cultivating agricultural land is an obvious priority. Repairing on-farm and local storage facilities is also important. Of Ukraine's estimated 75 million tons of crop storage capacity, 14 percent were listed as damaged or destroyed and 10 percent were located in Russian-occupied territories as of August 2022 (FAO 2022). The lack of storage facilities was a major concern in mid-2022 as the 2022 harvest approached. Looking forward, if Ukraine's 2023 harvest turns out as low as some expect, and as long as the Black Sea Grain Initiative continues to operate, rebuilding storage facilities may be less urgent in the short run. Nevertheless, in the medium term, storage capacities will have to grow in line with the recovery in crop production.

Repairing export infrastructure to ensure that farmers get the highest possible share of world market prices for their crops will also be crucial. The infrastructure in question (railways and harbor facilities) is also important for other sectors that depend on trade, so this is a priority not only for agriculture but for the economy as a whole.

An important related issue is what role to assign to the land route for future agricultural exports from

Ukraine. Under normal circumstances, transporting bulk agricultural commodities by ship is much less costly than by land. Hence, Ukrainian farmers are assured a higher share of the world market prices for their products if export takes place via the Black Sea rather than by land via the EU. In the years before Russia's attempted invasion, Ukraine exported an average 5 to 6 million tons of grain and oilseeds per month, almost exclusively via its Black Sea ports. Following the occupation and destruction of many of these ports, however, exporters have been forced to turn to the land route. Even after the Black Sea Grain Initiative began to operate and exceed expectations, traders continued to move Ukrainian grain and oilseeds to world markets overland to the Romanian port Constanta or to Baltic ports in Poland (e.g., Gdansk) and Germany (e.g., Rostock). A French shipping company has even suggested developing an "Adriatic Land Bridge" from Odesa in Ukraine via Slovakia and Austria to the Italian port Trieste (CSIS 2022).

It is difficult to assess the merits of investing in land route alternatives. On the one hand, investing in such routes could act as an insurance policy, making Ukrainian agriculture less vulnerable to interruptions of the sea route. This could prove extremely valuable if the war with Russia develops into a protracted, frozen conflict with constant threats to the openness and safety of maritime traffic. Furthermore, with a view to Ukraine's goal of EU membership, some investments into improving westward road and rail connections (e.g., reducing the difficulties caused by the use of different rail gauges on either side of Ukraine's western border) appear inevitable, not only with a view to agricultural trade. On the other hand, if it is possible to reach a stable post-war situation in which Ukraine once more controls its Black Sea ports, specific infrastructure for moving grains and oilseeds westward by rail could end up as a white elephant. It is unlikely that private investors will be willing to assume the associated risks, so this will ultimately be a policy decision.

Another priority will be facilitating access to finance. Private sector investments are essential not just for reconstruction, but also for the long-term development of a sector (Wessel and Asdourian 2022). As outlined above, Ukrainian farms face severe liquidity problems as a result of the war. This is especially true for many small farms that lack a credit history and only keep simplified and incomplete accounting records. In many industrialized countries farmland serves as collateral and improves farmers' access to credit, but most farming in Ukraine takes place on leased land. A partial credit guarantee system that has been developing in Ukraine (World Bank 2022) can encourage commercial lenders to engage in agriculture despite the lack of collateral, while ensuring that decisions to lend are still based on sound investment criteria. Matching public grants from the state or donors could also be incorporated into such a scheme.

All of the priorities listed above are general in the sense that they eliminate bottlenecks and provide benefits to the sector as a whole rather than focusing on specific product markets, value chains, or farm types. Policy makers should avoid the temptation to pick winners and leave the selection of specific investment priorities to commercial decision makers. For example, a perennial theme in agricultural policy debates in Ukraine has been the call for public investments to support increased value added in Ukrainian agricultural production and exports, for example by expanding livestock production.[3] Proponents argue that rather than exporting raw products such as grains and oilseeds, it would be better for Ukraine to feed these raw products to livestock and export value-added dairy and meat products instead. There are risks involved in such a strategy, however. When Ukraine becomes an EU member it will become subject to EU regulation in the areas of animal welfare, the transport of live animals, standards for slaughterhouses, food safety regulations, etc. This would increase production costs in Ukraine and might reduce or eliminate some of Ukraine's apparent comparative advantage. Moreover, as the example of African Swine Fever has shown, animal production can be extremely vulnerable to outbreaks of disease. This is not to say that investing in animal production is necessarily a bad idea for Ukraine. However, the decisions to do so should be taken, and the resulting risks borne by private investors, while the state focuses on providing generic export infrastructure and necessary inspection and certification services.

Post-war reconstruction and recovery in Ukraine will be coupled with EU integration and Ukraine's EU accession perspective. Agriculture is one of the most integrated sectors in the EU, with extensive EU-wide regulation of markets and standards in the areas of farming practices, food safety, environmental protection, and animal welfare. The EU will be a major source of donor funding for reconstruction and recovery, and other donors such as the World Bank and the EBRD will presumably coordinate their assistance with the EU. Hence, much assistance will be targeted at rebuilding Ukrainian agriculture in a manner that is compatible with the EU's comprehensive agricultural acquis communautaire. An important task will be developing the regional administrative capacity in Ukraine that is required to implement the Integrated Administration and Control System (IACS) that is the basis for the provision of the various form of support to farms in the EU, e.g., that controls whether farms are fulfilling criteria such as sufficiently diversified crop rotations that are a condition for receiving per hectare support payments. Launching the State Agrarian Registry in August 2022 (which is essentially a prototype of the IACS) (World Bank 2022) was a good first

[3] See, for example, the current blueprint National Recovery Plan that was presented in Lugano in July 2022 (NCR 2022).

step towards this goal in Ukraine.[4] The prospect of EU accession will foster reconstruction and recovery by making Ukraine attractive for foreign investment, but it will also restrict the agricultural policy options available in Ukraine to those that are compatible with accession.

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[4] https://www.dar.gov.ua/about-dar.

Joop Adema, Yvonne Giesing, Tetyana Panchenko and *Panu Poutvaara*

The Role of the Diaspora for the Recovery of Ukraine

KEY MESSAGES

- **Ukraine has a long history of emigration and a large diaspora in high-income countries**
- **This diaspora has supported democratic and economic development before and during the war**
- **Remittances corresponded to 7 percent of Ukraine's GDP in 2021**
- **Return migration will be an essential factor for the reconstruction of Ukraine**
- **Well-integrated Ukrainian emigrants can help to integrate Ukraine into the European Union**

Diasporas can play a critical role in the development of their countries of origin, especially in the reconstruction after emergency situations and wars (Shain 2002). A large body of literature discusses the financial contribution of diasporas to their origin countries. Yang and Choi (2007) and Frankel (2011) have found that the remittances from the diaspora help smoothen recipient households' income. Furthermore, remittances can increase investments in education (Ashraf et al. 2015) and foster more capital-intensive entrepreneurship (Yang 2008). In addition to financial remittances, diasporas interact with their family and friends back home and transfer knowledge and social norms to their home country. Fackler et al. (2020) found that emigrants from Eastern Europe increased knowledge transfer to their home countries, which caused a growth in innovation. In addition, Bahar et al. (2022) provide evidence on how the return of refugees to their respective countries of origin boosted exports (from former Yugoslavia to Germany). Barsbai et al. (2017) show that Moldovan emigrants transferred democratic values from Western European destinations back to Moldova.

This article first provides an overview of the size and activities of the Ukrainian diaspora before the war. Next, it outlines the needs of Ukraine for its reconstruction and how these needs can be supported by the diaspora through remittances, return migration, and other activities. Lastly, it concludes with policy implications that outline how governments can leverage the diaspora to build bridges between Ukraine and the West.

THE UKRAINIAN DIASPORA BEFORE 2022

Ukraine has a long history of emigration and therefore a large diaspora. The first wave of Ukrainian emigration began in the last quarter of the 19th century and lasted until the beginning of the First World War. At that time, hundreds of thousands of Ukrainians left their homeland in search of a better life and settled in North and South America, where there was a demand for skilled farmers. The second wave of Ukrainian emigration took place between World War I and World War II. Among them were the Ukrainians who fought against the Soviet regime, as well as prominent Ukrainian writers and scientists. The third wave of the Ukrainian emigration began during World War II, which spanned over the postwar period, and lasted until the 1980s. This wave consisted of separate groups that differed widely in their reasons to emigrate. It included forced migration by prisoners of war and those deported to Germany for forced labor who could not return home after the war for various reasons like risk of persecution by Soviet authorities. The third wave also included people with anti-Soviet sentiments, who fled Ukraine during or after the World War II for political reasons. People fleeing the repression of the Soviet Union also emigrated to Europe, Canada, the US, Australia, and South America. The fourth wave of migration started during Gorbachev's "perestroika" (since 1986) and gained momentum due to economic difficulties after the collapse of the Soviet Union. Due to the relatively low level of harmonization of the Ukrainian and destination countries' educational systems, and employment restrictions in destination countries, Ukrainian migrants who arrived at that time were mainly employed in jobs which required low level of qualifications. Therefore, the Ukrainian labor migration in the 1990s and early 2000s is mainly described as "unskilled labor migration". Some scholars (Musiyezdov 2019; Panchenko 2019; Prus 2018) identify a

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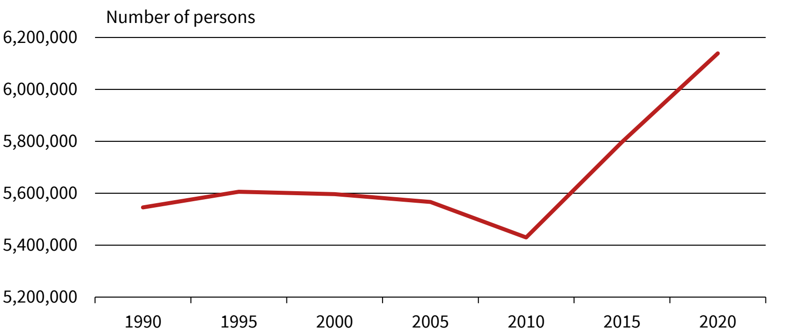
Figure 1
Ukrainian-Born Population Living Abroad between 1990 and 2020



Note: The data is available at 5-year frequency.
Source: UN (2020). © ifo Institute

fifth wave of migration from Ukraine that began in 2010 – under the influence of many factors such as the global financial and economic crisis, globalization of the world economy, and political events in Ukraine. Since then, higher educated emigrants have arrived in Europe and America. Consequently, the "brain drain" alarm was raised in Ukraine (Albrecht and Panchenko 2022; Reshetchenko 2014).

Until 2022, the countries with the largest Ukrainian diaspora were Russia, Canada, the United States, Brazil, Moldova, and Argentina (MFA 2019). The number of Ukrainian immigrants in the EU countries increased sharply after the annexation of Crimea by Russia and the armed conflict in Donbass in 2014. According to the European Commission, the number of Ukrainian immigrants in 2019 was more than four times the number in 2014. In 2020, over 1.3 million Ukrainians were legally residing in the 27 EU Member States (European Commission 2022). Germany, Italy, and Poland each hosted more than 250,000 Ukrainians and Spain and the Czech Republic each more than 100,000 (UN 2020). These five states together hosted over 80 percent of the Ukrainian citizens living in the EU. Geographical proximity to Ukraine and similarities in language and culture made Poland the most attractive destination for Ukrainian labor migrants.

Figure 1 shows that the number of Ukrainian-born individuals living abroad increased by about 700 thousand between 2010 and 2020 and that in 2020 more than 6.1 million people born in Ukraine lived outside of Ukraine (UN 2020). Accounting for the descendants of the earlier Ukrainian emigrants, the diaspora consists of more than 20 million people in more than 60 countries globally (UWC 2021), which is about half the size of the population of Ukraine in 2021.

Representatives of the early emigration wave and their descendants supported democratic transformations in the USSR and the struggle for Ukraine's independence (Oleinikova 2020). Later, the Ukrainian diaspora supported the Orange Revolution of 2004, the Revolution of Dignity in 2013, and the struggle for returning lost Ukrainian territories after 2014. They also actively supported the Euromaidan movement financially and now extend the same for the Ukrainian army. Most importantly, the representatives of the global Ukrainian diaspora are credited for carrying out information campaigns in mass media and other communication platforms about the events unfolding following the war (Reshetchenko 2014).

PLANS TO REBUILD UKRAINE

The ongoing war has caused catastrophic destruction with relentless damage to properties. Ukraine presented its first plan for reconstruction at the Ukraine Recovery Conference in July 2022. The plan is spread over 10 years starting from 2022 and (estimated) costs about USD 750 billion. Of this amount, USD 250-300 billion are expected to be attracted through partnership grants, USD 200-300 billion through loans or equity capital, and USD 250 billion through private investments (Lugano Declaration 2022).

The timeline of the plan is divided into three stages. The first stage started in 2022 and focuses on providing support to SMEs and restoration of the critical infrastructure such as energy infrastructure, communication networks, and housing. The next stage lasts from 2023 to 2025 and involves rebuilding of schools, hospitals, and other civilian infrastructure, as well as housing. The final stage, which is from 2026 to 2032, will concentrate on modernization of the economy and measures for Ukraine's accession to the European Union. Demand for physical labor and capital will be relatively greater in the first stage, compared to the subsequent stages where the role of intellectual resources will dominate.

REMITTANCES FROM THE DIASPORA

An important source of financial assistance are remittances sent by Ukrainians abroad to their friends and families. Before the Russian invasion, Ukraine was the largest recipient of remittances in Europe and Central Asia, with record-high inflows of more than USD 14 billion in 2021 (National Bank of Ukraine 2022). Figure 2 shows that total remittances have steadily increased in the recent past:

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from almost 6 billion (4.3 percent of GDP) in 2010 to 14 billion (7 percent of GDP) in 2021. In the first few months of war, the National Bank of Ukraine recorded a 10 percent decrease in the volume of private remittances sent to Ukraine (IOM 2022), which could be explained by an increase in informal transfers and redirection of the funds to support family members who left Ukraine. However, in line with Yang and Choi (2007), one can argue that the large negative impact of the Russian invasion on earning opportunities in Ukraine may provide an additional motive to remit to those living in safety. The scope for higher remittances to Ukraine is widening further as Ukrainian refugees are finding employment in high-income destination countries and therefore will be increasingly able to remit in the coming years.

RETURN INTENTIONS OF REFUGEES

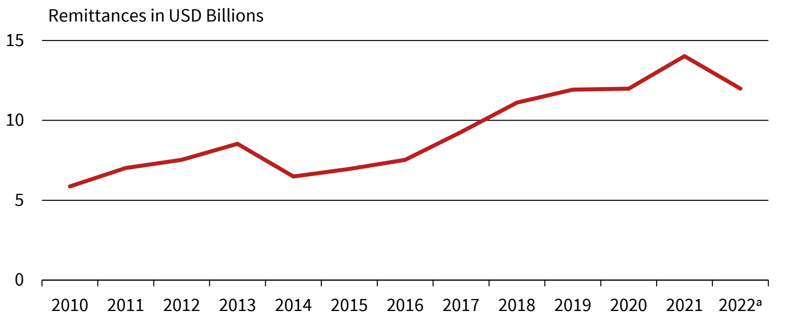
After Russia's invasion of Ukraine in February 2022, more than seven million people fled Ukraine to seek protection in other European countries. More than 11 percent of the Ukrainian population (about 5 million) have filed for a temporary protection status in the EU (UNHCR 2022). Most went to countries where their friends and relatives had previously settled.[1] Therefore, there is a clear correlation between the size of the existing Ukrainian diaspora in a certain country and the inflow of new Ukrainian immigrants to the same country.

The results from the ifo surveys[2] in Germany show that the refugees from Ukraine are mostly women with children whose partners stayed in Ukraine. They are usually well-educated, were employed in Ukraine, and had a relatively stable financial situation, as well as their own home to which they can still return to. (Panchenko and Poutvaara 2022). We asked about the respondents' plans for the next two years in both surveys. Questions to understand their intentions to return to Ukraine without specifying the time were also asked, but only in the second survey wave.

Figure 3A shows that the majority of refugees plan to either "stay in Germany" or "return to Ukraine": among the rest, only very few of them intend to move to other countries. The share of those who plan to stay has increased over time and reached 63 percent in October 2022.

Figure 2

Yearly Personal Remittances to Ukraine on the Rise between 2014 and 2021



ᵃ For the years 2010–2021, the data is annual and obtained from the yearly database. Annual data for 2022 was unavailable, hence monthly data from the National Bank of Ukraine was summed up manually for representation purposes. The data for 2022 is from January to November. For the year 2022, information on remittances in February until April 2022 was not collected and an estimate was made. Kane et al. (2023) suggest that a significant part of the remittances went unrecorded in 2022 due to increased informal transfers.

Source: National Bank of Ukraine (2022). © ifo Institute

Figure 3

Ukrainian Refugees' Stay and Return Plans: Survey Data

Note: The options for some answers differed: in the ifo survey, the following wording was used: »I plan to return soon«, in IAB-BiB-FReDA-BAMF-SOEP: »I plan to return within a year«; in the ifo survey: »I plan to return when I feel safe«, in IAB-BiB-FReDA-BAMF-SOEP: »I want to wait until the end of the war« and »I want to wait for several years later«.

Source: ifo Survey 2022; IAB-BiB-FReDA-BAMF-SOEP 2022. © ifo Institute

Figure 3B demonstrates the results of an alternative question which was additionally included in the ifo survey in October as well as in the IAB-BiB/FReDA-BAMF-SOEP survey.[3] In both the surveys, about half of the respondents expressed their intention to return to Ukraine soon or when it is safe. The total number of respondents from the IAB-BiB/FReDA-BAMF-SOEP who want to wait until the end of the war (34 percent) and who want to wait for several years later (11 percent) is similar to the share of respondents who want to return when they feel safe (45 percent) in the ifo survey. 22 (28) percent of respondents in the ifo survey and 26 (27) percent in the IAB-BiB/FReDA-BAMF-SOEP

[1] According to the Kantar Public pan-European survey, 38 percent of respondents chose their destination country due to the presence of family and friends (Kantar Public 2022). In Germany, the corresponding indicator ranged between 57-60 percent (Panchenko 2022; IAB-BiB/FReDA-BAMF-SOEP 2022).

[2] The first survey was conducted in June 2022, and the second in October 2022. The invitations to take part in the surveys were posted in various Ukrainian and Russian-speaking Facebook groups of Ukrainians in Germany. 936 people participated in the first survey and 1,461 in the second survey. Since the participants of the study filled out the questionnaire online with the option of not answering, the number of answers received to different questions vary (the figures indicate the number of respondents who answered each question). An important caveat is that the sample is not statistically representative, as respondents have been recruited as a convenience sample using snowball methods.

[3] The IAB-BiB/FReDA-BAMF-SOEP survey consisted of 11,225 Ukrainian refugees in Germany. The survey was conducted between August and October 2022. The results are summarized in Brücker et al. (2022).

survey answered that they do not intend to return to Ukraine (have not yet decided). According to the ifo survey, married women whose partners stayed in Ukraine are more likely to return, as well as people over 60 years.

THE ROLE OF DIASPORA IN THE WAR AND BEYOND

The Ukrainian diaspora's response to the 2022 large-scale Russian invasion has been strong and fierce. They have become a reliable medium who "speaks the language of help and need" (ICMPD 2022) between Ukraine and the rest of the world. In the first weeks of the war, more than 320,000 Ukrainians returned to the country to take up arms and fight against the Russian invasion according to the State Border Guard Service of Ukraine.[4] Many of those who remain outside are fighting on the information front, using social media to counter Russian misinformation, and organizing political protests against the Russian invasion. The Ukrainian diaspora has also helped with the integration of Ukrainian refugees.

POLICY IMPLICATIONS AND RECOMMENDATIONS

Surveys on return intentions have shown that a large share of Ukrainian refugees intend to return once it is safe. This will be a critical human capital contribution to the reconstruction of Ukraine. However, until their return, it is important to integrate Ukrainian refugees as well as possible into their host countries. It is also crucial to provide opportunities for refugees to send remittances, transmit knowledge, and make investments in Ukraine, as they can serve as a bridge between host countries and Ukraine. The diaspora can also contribute to the success of Ukraine by pushing for high standards in Ukraine, especially in terms of fighting corruption.

Good Integration Is Important – Both in the Case of Return and Non-return

Successful integration into the labor market is important not just for refugees and their host countries, but also to boost the scope for remittances, as well as investments in post-war Ukraine. One central requirement for a successful labor market integration is language. Investing in learning the language of destination countries is vital to be able to work in immigrants' field of expertise (Imai et al. 2019). This often provides better returns and labor market opportunities in the long term than immediately taking up a low-skilled job irrelevant to one's qualification. Policymakers should therefore provide language courses, trainings, internship opportunities, and direct job search support to avoid highly qualified refugees ending up in dead-end low-skilled jobs. Battisti et al. (2019) show that the employment rate of refugees in Germany can be improved though direct job search support.

Another important requirement to be successful on the labor market is the recognition of professional qualifications obtained in migrants' (origin) countries (Brücker et al. 2021). This is often a time-consuming and expensive process, which might not be worthwhile in situations where it is unclear about how long refugees stay. Host countries should improve recognition offices to provide speedy processes and allow specialists, for example in the medical field, to work as assistants under the supervision of experienced staff in the meantime. By implementing policies such as these, new human capital can be accumulated instead of existing human capital lying idle.

Aksoy et al. (2021) illustrate that the economic and social integration of refugees who arrived in Germany between 2013 and 2016 depended on initial conditions in the county they were exogenously assigned to. Those assigned to high-unemployment locations with unwelcoming attitudes are less likely to be subsequently employed or socially integrated. As Ukrainian refugees are free to choose where to live, they can avoid locations with unpromising labor market prospects. Furthermore, public attitude towards Ukrainian refugees is overwhelmingly positive, promoting their integration in Germany.

Build Global Networks through the Ukrainian Diaspora

Attracting foreign investments in Ukraine has already been a priority among the Ukrainian diaspora in recent years. For example, the Ukrainian World Congress (UWC) announced plans to promote Ukraine-oriented business associations globally to strengthen their economic development. The plan intends on using the global Ukrainian diaspora network to foster international relations for economic development (UWC 2021). Furthermore, the UWC's Economic Prosperity and Investment Committee (EPIC) has been supporting the Ukrainian diaspora, which includes entrepreneurs, investors, and political advocates, for many years. EPIC aims to strengthen the position of diaspora Ukrainians as strategic agents of transformation and change for Ukraine (UWC 2022).

Policymakers can maximize knowledge transfers by actively engaging the diaspora and by encouraging and facilitating the return migration post-war. Return migrants bring back newly gained knowledge and many times create their own start-ups that foster development in the countries of origin. By successfully engaging the diaspora, western countries and Ukraine can build bridges that can ultimately pave Ukraine's way into the European Union.

[4] This was reported on March 16, 2022 by Ukrainian Pravda, quoting the spokesman of the State Border Service of Ukraine, Andrii Demchenko, see https://edition.cnn.com/europe/live-news/ukraine-russia-putin-news-03-17-22/h_a612ed70f58aa1b85583da9cdf4e9ebf, and https://www.pravda.com.ua/news/2022/03/17/7332269/ (Ukrainian).

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Sebastian Blesse and *André Diegmann*

The Closure of Police Stations Leads to an Increase in Theft Crime

KEY MESSAGES

- **Regional access to local police infrastructure matters for crime outcomes**
- **Exploiting a police reform, we show that closing police stations increases car theft and residential burglary**
- **Our findings are consistent with lower deterrence due to a lower visibility of the local police**
- **Police closures lead local private security firms to exit the market, which exacerbates local crime**
- **Fewer visible local police stations have severe and unintended consequences which need to be considered by bureaucrats and policy makers pushing for more efficiency in providing public safety**

Maintaining efficient municipal services of general interest is a central challenge in many advanced countries. In recent years, there have often been efforts to increase the centrality of municipal provision of public services, for example, by merging municipalities or through inter-municipal cooperation. The aim of such mergers and cooperation is to make municipal services more efficient and professional (Blesse and Rösel 2017). However, centralization in the provision of public goods can have far-reaching consequences for regional access to these goods and exacerbate regional disparities in municipal services.

This paper considers one form of centralization from the field of public safety: the closure and subsequent mergers of police stations. Within the last two decades, many developed economies have seen a centralization of police organizations through substantial reductions in the number of local law enforcement agencies. The impact of this reorganization on local crime patterns is yet not comprehensively comprehensively understood despite a vivid international debate on how (salient) police forces deter criminal activity. Based on a study by the authors published in the *Journal of Public Economics* (Blesse and Diegmann 2022), this paper provides first causal evidence from Germany by comparing crime patterns in regions where police stations were closed with similar regions that were not affected by such closures. We focus on police closures in the context of a large-scale police reform in the German state of Baden-Württemberg. The present article also places the results in the current literature and discusses the relevance of the results in the political debate on how to organize municipal services at the local level.

INSTITUTIONAL FRAMEWORK AND DATA AVAILABILITY

Apart from federally organized border controls, asylum legislation, and aviation security, police organization in Germany is regulated at the state level. To analyze the effect of police stations and their closure, data from a comprehensive reform of police organization in Baden-Württemberg are used. On a nationwide scale, as well as in comparison with other European countries, Baden-Württemberg is characterized by a relatively low number of crimes per capita. Until the reform year 2004, local police units – with more than 570 police stations – in the southwestern German state were organized in a highly decentralized manner. On average, there was one police station for every two municipalities. With the goal of closing 100 police station, in October 2003 the state government called on police headquarters to optimize police stations as local organizational units of police departments and to present corresponding candidates for closures and mergers. Motivated by efficiency arguments and taking into account criteria such as the capacity utilization of police units and a predefined availability of police officers per inhabitant, it was publicly announced in March 2004 that instead of the 100 stations, more than 200 police stations were to be closed *without* detriment to public safety.

Figure 1 shows the number of closures and the remaining number of police stations

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over time between 1995 and 2012. Although there were individual closures in the run-up to the reform, in the years from 2004 onward there was a systematic reduction in the number of available stations due to the gradual reorganization reform.

Since this reform was not associated with a reduction in the number of operational forces, the reorganization resulted in a significant increase in the number of police officers per station from about 4 to 5.5. The absence of layoffs allows us to analyze the local availability and visibility of stations. The corresponding effects are thus not compromised by possible changes in the number and quality of officers.

Figure 2 exemplarily shows for the Ostalbkreis (blue frame) municipalities with a station closure; marked with a red cross. Typically, stations were closed within the precinct affiliation and the police forces were integrated into other stations and precincts. No change occurred at the precinct level, which is typically organized within individual counties, as part of the reform. Accordingly, the relocated police units continued to be responsible for the old municipalities; however, for patrolling purposes, they had a further journey to the respective municipalities of their (old and also new) area of responsibility.

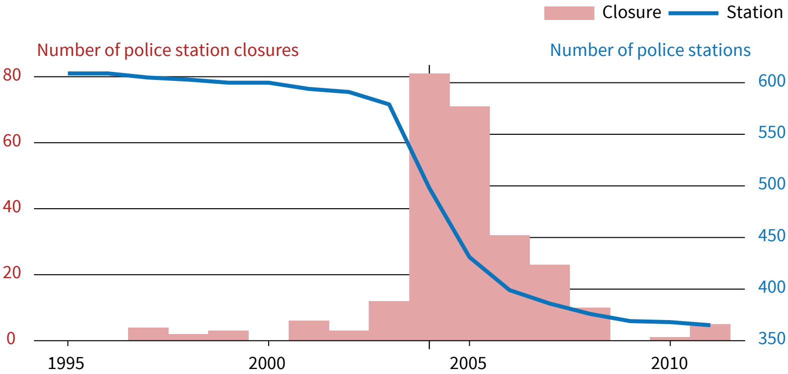
We supplement the police structural reform data aggregated at the regional community level with police crime statistics (number of cases, clearance rates, characteristics of suspects) provided to the authors by the State Office of Criminal Investigation in Baden-Württemberg. These data contain detailed information on local theft crime as part of the police crime statistics. To ensure the robustness of the results and to test for local spillover effects in neighboring communities, we also use corresponding crime statistics from the State Criminal Police Office in Hesse.

INCREASE IN CRIME AS A RESULT OF POLICY STATION CLOSURES

The analysis of the causal effect of police station closures on local crime is based on a difference-in-differences approach combined with a matching procedure to identify control municipalities with similar characteristics (population density, age, education, and migration structure, as well as labor market structure in the year before the reform). Thus, for each reform municipality (treatment group), a municipality without station closure is included that does not differ with respect to the observed variables (control group). Moreover, the respective control municipality must not be a direct neighbor of the municipality with a station closure. Treatment and control groups are subsequently compared in terms of the number of theft cases over time (i.e., before and after the respective station closure). Based on the aggregation of station closures at the municipality level between the years 2004 to 2008, we observe 166 municipalities without

Figure 1

Police Station Closures over Time



Source: Blesse and Diegmann (2022).

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Figure 2

Station Closures in the Local Context

Source: Blesse and Diegmann (2022).

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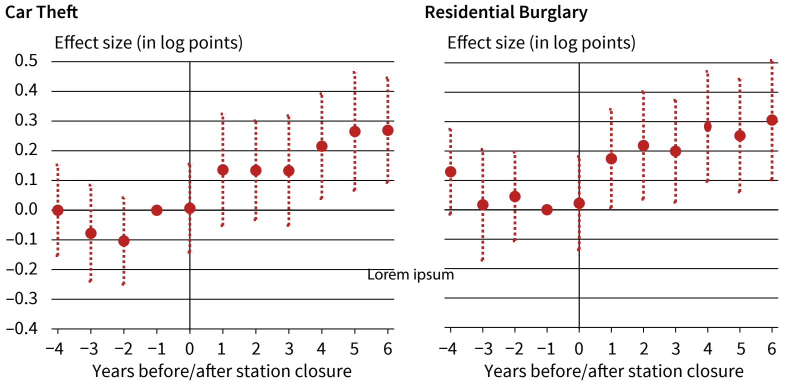
post-reform police stations that lost their last station in the context of 180 closures. Within the context of this comparison of municipalities that no longer had a police station after the reform and other statistically comparable municipalities, we can now empirically examine the causal effect of the loss of police infrastructure on local crime patterns.

Figure 3 shows for the years before and after the reform the relative change in the number of car thefts and residential burglaries in the municipalities affected by station closures compared to the control group. First, the figure shows that the trend in the number of cases does not differ between municipalities that either have lost their last police station and those that have not, respectively. After the reform, however, the reported number of theft crimes increase significantly in municipalities with police station closures compared to similar municipalities without such closures. On average, there is an increase of about 18 percent in reported car thefts and about 12 percent in reported residential burglaries.

At the same time, with the additional use of data from the neighboring state of Hesse, the results show that crime has not decreased in communities adjacent to reform communities. This suggests that theft crime has increased overall as a result of the station closure, or has at least decreased at a lower rate in

Figure 3

Crime Changes as a Result of Police Station Closures



Source: Blesse and Diegmann (2022). © ifo Institute

light of declining property crime rates in recent years. In contrast, no effects are observed regarding other categories of theft, such as theft of two-wheelers, robbery, or burglary of stores/businesses.

The evaluation of the crime suspect statistics shows that the reported suspects in the reform-related additional crimes are, in particular, men of German nationality. This is a first indication that the perpetrators are not part of organized gangs, but rather are familiar with the local police structure and have closely followed the station closures. Since the closures were picked up by local newspapers and national newspapers mainly in Baden-Württemberg, it is not surprising that especially German suspects can be observed for the increased number of property crimes in the context of the station closures.

LOCAL DIFFERENCES

Interestingly, the effects of police station closures differ according to how effectively a police station was functioning before its closure and where the station was located in the community. To analyze such local effects, we first divide stations into high/low effectiveness as measured by pre-reform clearance rates. If relatively effective stations are closed, there is a subsequent increase in auto thefts of more than 30 percent. While car thefts also increase by about 16 percent in regions with less effective police stations (compared to about 30 percent when effective stations are closed), the results suggest that the effectiveness of local police units in fighting crime is of particular importance. For residential burglaries, there is no significant difference with respect to the effectiveness of closed police stations. This could be related to the fact that for this property crime, clearance rates are relatively low anyway, at around 15 percent. In comparison, the average clearance rates for car theft are around 40 percent.

As a further subdivision, we exploit the regional environment of the local police infrastructure facilities. Here, we can distinguish between closures in (i) residential areas and (ii) the community center. If stations located in a residential area are closed, there is subsequently a significant increase in residential burglary. On the other hand, if the stations were located in the community center – for example, in the town hall or the local marketplace – the closure does not result in an increase in residential burglaries.

The stated goal of the reform was to achieve efficiency gains by professionalizing the police. However, the data show that local clearance rates have not changed in the course of the reform. Thus, the reform has not resulted in taking more criminals "off the street". On the contrary, the results show that the reform has been more likely to encourage individuals to steal, and that these individuals also potentially have a good understanding of local conditions. Accordingly, the subjectively perceived probability of being convicted and punished by police forces for criminal acts has likely decreased as a result of the reform and may depend strongly on the local context.

THE INTERACTION OF POLICE AND PRIVATE SECURITY COMPANIES

In principle, it is also possible for municipalities to increase spending on public order (e.g., employees in the public order office). This part of public spending is independent of the state budget for security through police units and has the potential to increase the visibility of the state. However, there was no increase in spending on public order as a result of the reform. Contrarily, results provide evidence that fewer private security companies are observed in closure communities after the reform. While private security firms are not a substitute for the police, station closures could nevertheless increase local demand for private security and mitigate potential negative effects. Although the number of private security firms is an incomplete proxy for private security demand, the results show that private security firms indeed benefit from proximity to official police units. This may have practical reasons, for example, in convicting crime suspects. Overall, this trend could exacerbate the negative effects caused by police station closures.

WHAT DOES THIS MEAN FOR POLICY?

The recent literature on law enforcement activities and police presence shows that the intensity of crime can be influenced by police availability and visibility. This study is one of the first to analyze the effects of police infrastructure on crime occurrence. A similar framework was recently used to show an increase in crime as a result of less police infrastructure in London (Faccetti 2021). Also documented for London is a reduction in crime rates due to the first creation of a professional police force in the 19th century (Bindler and Hjalmarsson 2021). Descriptive results for Buenos Aires confirm the deterrent effect of police stations on local crime occurrence (Fondevila et al. 2021). Since these findings come from different countries (both advanced and emerging economies as well as rural and metropolitan areas) and exhibit similar results, they illustrate a certain generalizability of the value of visible police infrastructure across different contexts. A literature analyzing disruptive shifts in response forces, for example, due to terror alerts or the management of police operations through computerized predictions of criminal cases ("predictive policing"), similarly finds visible police forces to be effective in reducing criminal activity (Klick and Tabarrok 2011; Jabri 2021). The present article also shows the importance of municipal services in the field of public safety. Attempts to cut back on police infrastructures in the area in favor of supposed efficiency gains can therefore be accompanied by considerable side effects – in the form of an increase in reported property crimes. Thus, the present results can inform policymakers and practitioners about possible unintended side effects of efficiency-oriented restructuring of administrative infrastructures. These should be considered for future plans of an efficient and future-proof reorganization of police structures.

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Regional Income Inequality in Germany

KEY MESSAGES

- **We characterize regional inequality in gross incomes at the municipality level in Germany using data from administrative tax returns for the period 1998-2016**
- **More unequal municipalities are more likely to be urban and located in West Germany**
- **Decomposing the increase in inequality in the last two decades into a between and within municipality component, we find that the increase was entirely driven by growing inequality within municipalities**
- **Thirty years after reunification, Germany is a country with rather modest interregional inequalities but a growing level of intraregional inequality**

Allocating incomes fairly within a society is currently one of the key economic challenges in developed countries. What a "fair" income distribution looks like is, of course, a matter of public discourse. In recent years, the spatial component of inequality has received growing attention in this debate. While income differences between countries are declining since decades in Europe, income differences between the regions of a given country are growing since 1990 (Rosés and Wolf 2018). Many are concerned that these growing gaps signal that regions and people are being left behind, undermining inclusive growth in the countries and leading to political backlash. Furthermore, if people have a preference to stay in their home regions, they may rather be concerned about their position in the regional – rather than national – income distribution.

In this article, we provide new evidence on regional income inequality in Germany, using tabulated income tax statistics for the period 1998-2016. Other than related work on regional income inequality in Germany which analyzes income (e.g., Bartels 2019; Bartels et al. 2020; Immel and Peichl 2020; Immel 2021) or wages (e.g., Dauth et al. 2014 and 2021) at the county level, we can characterize inequality at the municipality level. As there currently exist 401 counties in Germany, but more than 10,000 municipalities, our analysis is conducted at a much more fine-grained level.

Our findings can be summarized as follows. First, there are persistent differences in the level of regional inequality across Germany. Inequality in West Germany is higher than in East Germany, highly populated municipalities are found to be more unequal, and urban locations are more unequal than their rural counterparts, even conditional on population size. Second, by decomposing overall inequality into a within and between municipality component, we show that income disparities within municipalities account for over 95 percent percent of national inequality. These results mirror the findings in Schluter and Trede (2021), who also decomposed regional inequality in Germany, but for the much more aggregated commuting zones and using wage earnings. Third, we document that the national increase in income inequality in the late 1990s and early 2000s was again mainly driven by growth in within – rather than between – municipality inequality. Overall, Germany is currently a country with rather modest interregional inequalities but a growing level of intraregional inequality.

* All views expressed in this article are those of the author and do not necessarily reflect those of the European Central Bank.

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DATA

We use income data from tabulated tax records at the municipality level for the years 1998, 2001, 2004, 2015, and 2016, which we obtained by filing individual requests to the Statistical Offices of the German federal states. We thus have a panel with five data points, spanning a range of 18 years. For 10 of the 16 German states, we have data for each of these years, while for 4 states information for the year 1998 is missing. Statistics for Saxony and Schleswig-Holstein are available only in the years 2015 and 2016. Appendix Table A1 provides a detailed description of the available data by state.

These high-quality administrative data provide a reliable source of information of the local income distributions in all German municipalities and are also accurate for high-income individuals. In contrast, low-income individuals are covered less reliably, as not all adult individuals in Germany file a tax return (Drechsel-Grau et al. 2022). The tabulated data contain information on the sum of gross pre-tax income for all taxpayers within two income thresholds. Thus, average incomes per income bracket and per municipality can be determined. Gross pre-tax income includes seven income categories: agriculture and forestry, business, self-employment, employment, capital income, renting and leasing, and other potential income sources. For privacy reasons, gross income and the number of taxpayers are not reported for all income brackets in some municipalities. We impute these missing values using polynomial or exponential approximations. Whenever the amount of missing tax units was higher than five percent, the corresponding municipality was dropped.

We then use generalized Pareto interpolation to estimate the full income distribution in percentiles (Blanchet et al. 2022). Based on these data, we compute different inequality measures: the Theil index, the Gini coefficient, and top income shares. In our baseline analysis, we focus on the Theil index because it can be additively decomposed into a within-municipality and a between-municipality component of inequality. The Theil index (GE(1)) belongs to the class of generalized entropy indices (GE(α)), where α is a parameter for the sensitivity towards higher incomes. A high Theil index implies high inequality, while GE(1)=0 implies total equality in incomes.

REGIONAL INEQUALITY STATISTICS

Figure 1 shows a heat map of the Theil Index for the year 2016 at the municipality level. The median Theil index value is 0.41, which corresponds to a top 10 percent income share of 32.7 percent and a Gini coefficient of 0.47. Income inequality levels across municipalities vary extensively, and we observe extreme values on both ends of the distribution. While those outliers are mostly municipalities characterized by a small population size, the variation also remains large when abstracting from extreme values: the municipality at the 90th percentile of the distribution of the Theil index is, for example, 87 percent more unequal than the municipality at the 10th percentile. By construction, variation in the top 10 percent income share and the Gini coefficient is somewhat less pronounced, but still substantial.

A consistent finding in our data is that income inequality increases in the population size of the municipality. Hamburg, for example, has a high top 10 percent income share (43.2 percent in 2016) and ranges among the top 5 percent of the most unequal municipalities in Germany. On the other hand, the 5 percent most equal municipalities mostly consist of small municipalities. In terms of our preferred inequality measure, the Theil index, Hamburg is at least two times more unequal than these municipalities. This city-size penalty has been previously documented in various contexts (Schluter and Trede 2021; Dauth et al. 2022).

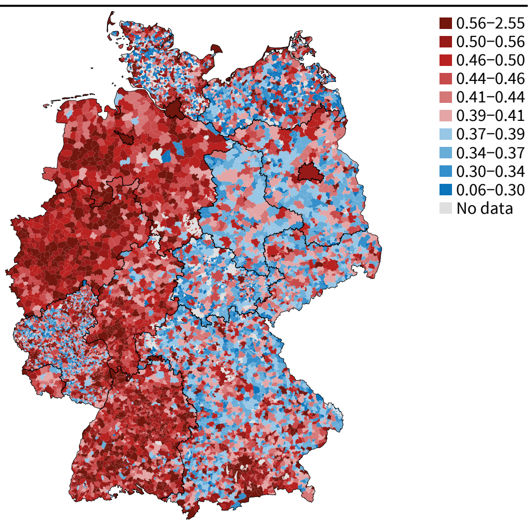
A second stable pattern in our data is that municipalities in Western Germany are on average more unequal than their counterparts in the East. Municipalities in Baden-Württemberg exhibit on average the highest levels of inequality. The most equal municipalities are located in Thuringia. In Erfurt, the capital of Thuringia, the Theil index amounts to 0.45, and the Top 10 income share to 35 percent. In the slightly smaller city of Heilbronn in Baden-Württemberg, the Theil index is as high as 1.54, and the 10 percent highest-income households receive almost 60 percent of total income.

National Trends

We next investigate changes over time at the national level. Figure 2, Panel (a), shows trends in the income shares of the top 1, top 10, and bottom 50 percent

Figure 1

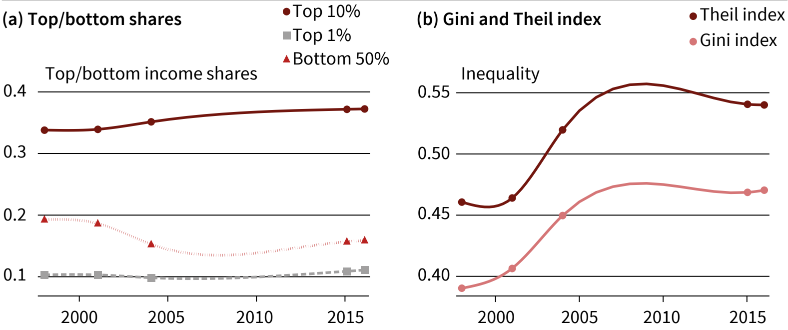
Inequality in German Municipalities in 2016



Note: This map shows municipality-level Theil indices in 2016. For Lower Saxony, small municipalities are aggregated to larger units (Samtgemeinden) due to data availability. The class breaks are defined by assigning municipalities into deciles.
Source: Authors' calculations. © ifo Institute

Figure 2

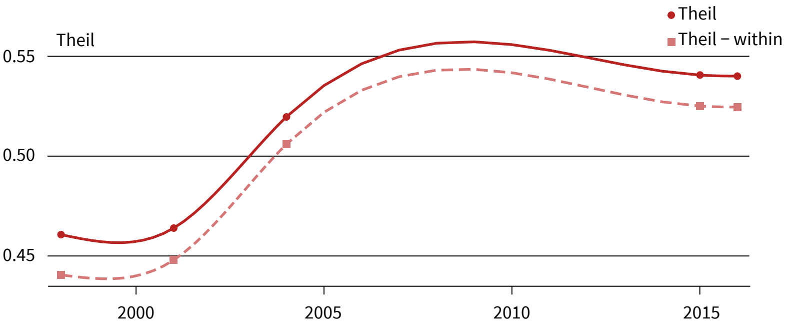
National Inequality Trends



Note: The figures show national income inequality trends. Figure (a) shows the evolution of different income shares over time. Figure (b) shows the evolution of the Theil index and of the Gini index over time. The lines show a smoothed median spline.
Source: Authors' calculations. © ifo Institute

Figure 3

Decomposition of the Theil Index in Within- and Between-Municipality Inequality



Note: The figure shows national income inequality in Germany for the period 1998–2016 as measured by the Theil index, and the within-municipality component of the Theil index for each point in time. The lines are fitted using a median spline.
Source: Authors' calculations. © ifo Institute

of the income distribution for the period from 1998 to 2016. The top 10 percent income share, that is the share in total income that is earned by the richest 10 percent of taxpayers, increased steadily during the last two decades and ultimately rose by roughly ten percent from 33.8 percent in 1998 to 37.2 percent in 2016. Additionally, the top 1 percent income share rose from 10.3 percent to 11.1 percent in the same time span. The temporary drop in 2004 is potentially explained by the gradual exclusion of capital income from personal income taxation, as explained below. As capital income accounts for a larger share in total earnings at the top of the distribution, true income growth among the top 10 percent and top 1 percent income earners might have been even higher, and our estimates can be interpreted as lower bounds. In contrast, the income share earned by the bottom 50 percent decreased by more than fifteen percent since 1998, decreasing from 19.3 percent to 15.9 percent.

As top earners have gained during this period while taxpayers in the bottom half of the distribution have lost in relative terms, it is no surprise that aggregate inequality as measured by the Theil index and the Gini coefficient increased. Panel (b) of Figure 2 shows that the Gini coefficient increased by more than 20 percent from a value of 0.39 in 1998 to 0.47 in 2016. The Theil index rose in accordance. These results confirm the finding of an increase in national income inequality during this period, especially in the years 2000-2005, as documented, for example, in Bartels (2019), Biewen et al. (2018), Drechsel-Grau et al. (2022), and Fuchs-Schündeln et al. (2010).

DECOMPOSING INEQUALITY TRENDS IN GERMANY

To better understand the regional component of this increase in income inequality, we investigate if inequality arises mainly due to income differences between or within regions. A distinct feature of all generalized entropy indices is their additive decomposability.

(1) $GE(\alpha) = GE(\alpha)_{within} + GE(\alpha)_{between}$

We can thus compute the share of national level inequality in the Theil index arising from income differences within municipalities and the share of inequality which arises because average incomes differ between municipalities.

Within- and Between-municipality Inequality

In Figure 3, we decompose national income inequality in Germany in a within- and between-municipality component and plot the composition over time. The within-municipality component accounts for the lion's share of inequality in Germany: between 95.6 and 97.4 percent of inequality in gross income can be described by the income differences within the municipalities, depending on the year under consideration. Furthermore, the increase in within-municipality inequality (19 percent between 1998 and 2016) was more pronounced than the respective increase in overall inequality (17 percent). This implies that regional differences in income levels have actually declined in the past decades and cannot explain the increase in national inequality. The high share of within-municipality inequality is also visible for other general entropy indices like the mean log deviation (GE(0)). By construction, the share of interregional inequality is even lower at higher levels of spatial aggregation, such as counties and states (compare Appendix Figure A2).

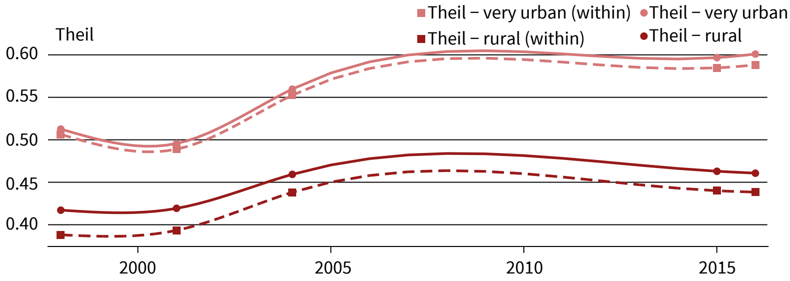
Urban versus Rural: Comparing Municipality Characteristics

The share of within-municipality inequality is even higher among the subset of urban municipalities. To capture the degree of urbanization, we first follow a five-category classification provided by the Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR) on the basis of population size, importance for the surrounding areas, and the urban infrastructure. In Figure 4, we compare the difference in overall and within inequality between rural municipalities and metropolitan cities. In line with the results for population size, inequality in metropolitan municipalities is on average around 25 percent higher than in very rural municipalities. Interestingly, the within-municipality inequality share is also increasing in urbanization. Differences in income inequality between rural municipalities are therefore more marked than differences between metropolitan cities.

Another proxy for urbanization is population density. In line with the aforementioned results, income inequality increases in population density as well, even when conditioning on population size. Hence, urbanization in itself constitutes an important predictor of intra-regional inequality.

Figure 4

Decomposition of the Theil Index in Within- and Between-Municipality Inequality, comparing Metropolitan and Rural Municipalities



Note: The figure compares income inequality trends in Germany for the period 1998–2016 between rural and metropolitan municipalities. Municipalities are classified as rural and metropolitan according to definitions of the Bundesinstitut für Bau-, Stadt-, und Raumforschung (BBSR). Dashed lines show within-municipality inequality in those municipality groups. The lines are fitted using a median spline.
Source: Authors' calculations.

Sensitivity Analysis

Our results are robust to several alternative definitions of our sample and the income concepts used. For example, we investigate the sensitivity of our results with respect to a change in the German capital income taxation. As pointed out in Bartels and Jenderny (2015), capital income taxation was gradually excluded from the personal income tax in two subsequent steps which both fall in our observation period. Hence, our latest three income tax records only partly include capital income. To address this and ensure that we can compare incomes over time, we approximate capital income by assuming a constant capital income share for the top 1 percent income earners after 2001.[1] Adding to the income of high-income earners naturally results in higher inequality in all years after 2001. However, the trends in overall as well as in within-municipality inequality are basically unaffected by this procedure (compare Appendix Figure A3b).

As described above, for reasons of data protection some municipalities did not report gross income and the number of tax units for all tax brackets. So far, we have imputed these missing values. To validate the outcome of this procedure, we compare our baseline results with a "balanced" sample and a sample without any interpolated values. While the "balanced" sample excludes all municipalities for which we had to drop any of the given observations over time, the second case is even more restrictive by excluding all municipalities for which gross income and the number of tax units had to be interpolated in any income bracket at any time. Even though summary statistics of the different subsets indicate sample selection towards larger and more urban municipalities after removing municipalities with imputed values, the levels and trends of income inequality hardly change after constraining the data (compare Appendix Figure A3).

POLICY CONCLUSIONS

Our results show that inequality in Germany is mainly a phenomenon within regions rather than between regions. Thirty years after the reunification, Germany is a country with rather modest interregional inequalities but a growing level of intra-regional inequality.

As most inequality arises within municipalities, it will not be very effective to focus on regional income differences, like the still substantial earnings and employment gaps between East and West Germany. Given the descriptive evidence presented here, place-based policies and interregional transfers are unlikely to substantially impact income inequality. To ensure that the distribution of gross income in Germany does not grow further apart, policymakers will have to consider different instruments. For example, if extreme skill complementarity is responsible for higher income inequality in metropolitan areas (Schluter and Trede 2021; Eeckhout et al. 2014), education policies might be a promising approach to reduce inequality.

Besides these aspects, our data also show a positive relationship between average income in a municipality and measures of income inequality. Municipalities where incomes are distributed very equally tend to be relatively poor. When only focusing on (relative) inequality, one runs the risk of forgetting that absolute incomes matter for welfare as well. In that sense, policies which strengthen inclusive and broad-based economic growth should be the way forward.

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APPENDIX

Table A1

Data Availability and Imputation Method by State

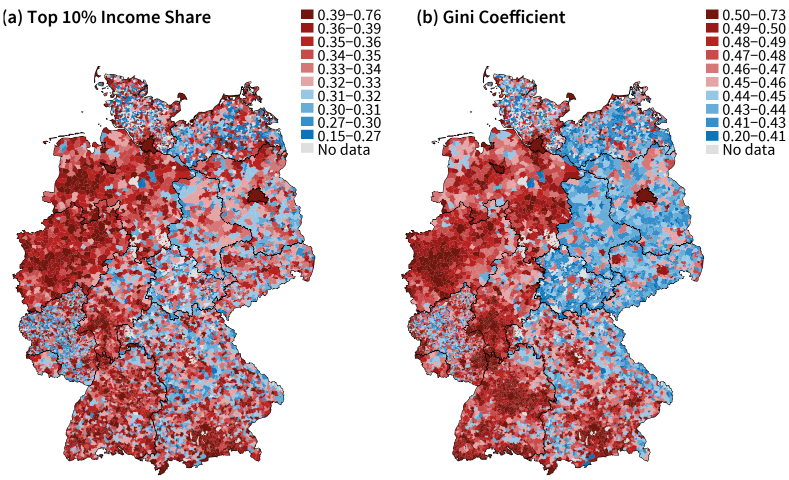
State	Years available	Interpolation method
Baden-Württemberg	2001, 2004, 2015 & 2016	polynomial
Bavaria	1998, 2001, 2004, 2015 & 2016	linear
Berlin	1998, 2001, 2004, 2015 & 2016	no missing values
Brandenburg	2001, 2004, 2015 & 2016	polynomial
Bremen	2001, 2004, 2015 & 2016	no missing values
Hamburg	1998, 2001, 2004, 2015 & 2016	no missing values
Hesse	1998, 2001, 2004, 2015 & 2016	polynomial
Mecklenburg-Western Pomerania	1998, 2001, 2004, 2015 & 2016	polynomial
Lower Saxony	1998, 2001, 2004, 2015 & 2016	linear
North Rhine-Westphalia	2001, 2004, 2015 & 2016	no missing values
Rhineland-Palatinate	1998, 2001, 2004, 2015 & 2016	polynomial
Saarland	1998, 2001, 2004, 2015 & 2016	no missing values
Saxony	2015 & 2016	polynomial
Saxony-Anhalt	1998, 2001, 2004, 2015 & 2016	polynomial
Schleswig-Holstein	2015 & 2016	polynomial
Thuringia	1998, 2001, 2004, 2015 & 2016	polynomial

Note: The table shows data availability by federal state and the imputation method applied in case of missing values. In states not disclosing information on brackets with less than three tax units, we linearly interpolated the values from the bordering brackets. In states where missing values occurred also in brackets with three or more taxpayers, we instead used polynomial or exponential approximations to impute the missing values.

Source: Authors' compilation.

Figure A1

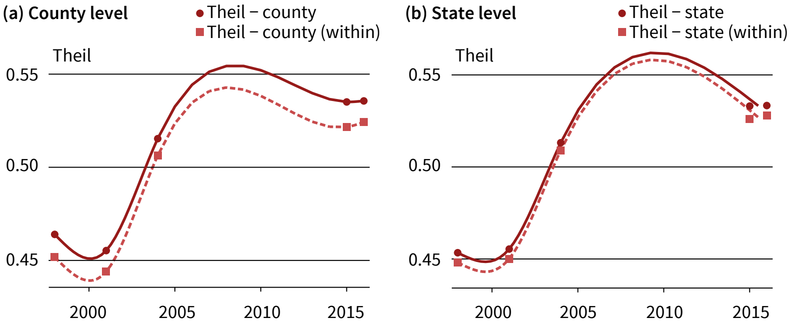
Top Income Shares and Gini Coefficient in German Municipalities



Note: This heat map shows municipality-level top 10% income shares (Figure a) and of the Gini coefficient (Figure b) for the year 2016. For Lower Saxony, small municipalities are aggregated to larger units (Samtgemeinden) due to data availability. The class breaks are defined by assigning municipalities into deciles of the respective inequality statistic.
Source: Authors' calculations.

Figure A2

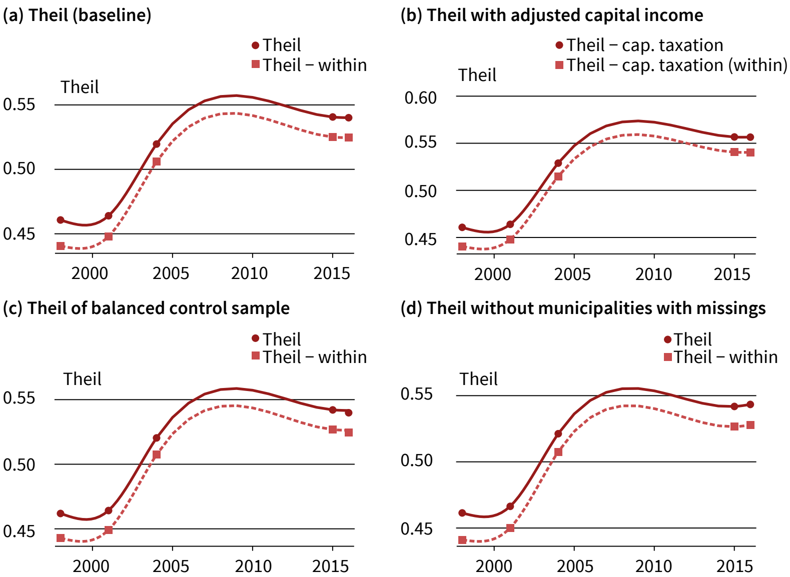
Decomposition of Theil Index for Other Regional Levels



Note: The figures compare within-region decomposition on other regional levels. Figure (a) shows the overall as well as the within-county inequality trend calculated from county-level data. Figure (b) shows the overall as well as the within-state inequality trend calculated from state-level data. The lines are fitted using a median spline.
Source: Authors' calculations.

Figure A3

Inequality Trends According to Theil Index with Sensitivity Check Specifications



Note: The figures analyse the sensitivity of the baseline results to different data specifications. Figure (a) is the baseline within-municipality decomposition. Figure (b) accounts for changes in capital taxation within the observational window. Figures (c) and (d) prove the liability of the used interpolation techniques and, thus, of the data. The lines are fitted using a median spline.
Source: Authors' calculations.

Jan Büchel, Jan Engler and *Armin Mertens*

The Demand for Data Skills in German Companies: Evidence from Online Job Advertisements

KEY MESSAGES

- **Data skills are required in every fifth online job advertisement in Germany**
- **Demand for data skills is increasing over time and heterogenous between sectors**
- **Companies from the ICT sector demand more advanced data skills in every second job advertisement**
- **Sectors that are advanced in digitalization have a higher demand for jobs with data skills**
- **Policymakers should intensify the recruitment of foreign professionals and align curricula with growing business demand for data skills**

Data can be a strategic resource for companies, which they can benefit from in many ways. Based on data, products or services can be developed, processes can be improved, and supply chains can become more transparent if data is shared with other companies (Andres and Niebel 2022; Brynjolfsson and McElheran 2016; Kache and Seuring 2017). In addition, companies can develop data-driven business models (Gierten et al. 2021). For example, usage data of products that are already sold, such as machines, can be analyzed and used to predictively maintain machines in the future and thus reduce production downtimes. To fully exploit the potential of data, companies first and foremost have to be prepared for the data economy. For this purpose, firms have to store, manage, and use data in an efficient way. For example, different types of data – like production, financial, or personal data – should be stored digitally. Standardized quality checks and interfaces can optimize the data flow from a management perspective. Lastly, the real added value of data lies in diverse usage purposes. For example, data can be used for analysis, visualization, documentation, forecast of processes, or for sale to other firms.

Given the importance of data as an invaluable asset in modern economies, scientific research in economics and management has increasingly focused on the dynamics and repercussions of the data economy (Börner et al. 2018; Cong et al. 2021; Farboodi and Veldkamp 2021). One of the key drivers for the data economy are data-related skills, since they enable individuals and organizations to effectively collect, analyze, and utilize data to make informed decisions and create new products and services (Pappas et al. 2018). However, there is still a lack of a deeper understanding of the demand in skills and jobs that are necessary to process and strategically use the large amounts of data companies accumulate. Considering the fast pace of the advancements of the data economy and the jobs that come with it, existing research is rather sluggish in analyzing current demand in the labor market (Börner et al. 2018; European Commission 2020). In this regard, job advertisements can provide timely information on the need for specific knowledge of companies (Büchel and Mertens 2021; Pejic-Bach et al. 2020). To provide tangible and up-to-date insights into the demand for jobs related to the data economy, we leverage data from online job advertisements and use a state-of-the-art machine learning approach to accurately estimate the demand for data skills in the German labor market.

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DATA ECONOMY READINESS OF GERMAN COMPANIES

Companies can demand data skills to be able to participate in the data economy or, if they are already data economy ready, to further improve their handling of data. In 2022, only 31 percent of companies in Germany were data economy ready, as a survey of 1,051 companies from the industrial and industry-related services sectors revealed (Büchel and Engels 2022c). This share is slightly higher than the previous year (29 percent), as a comparable survey found (Büchel and Engels 2022a). Therefore, over two-thirds of the surveyed companies do not meet the requirements to participate in the data economy in an efficient way. In concrete terms, this means that on average they fulfill less than 50 percent of the relevant aspects with respect to data storage, data management, and the use of data. One reason for this could be that relevant decision-makers still have to be convinced of the potential of data or corresponding data skills are generally lacking in the firm. If employees do not have the necessary digital skills and do not know how to use corresponding applications, companies may be limited in their ability to make progress towards participating in the data economy.

To address this, there are several ways for companies to build up data skills. On the one hand, firms can offer on-the-job training to improve the data skills of their employees. Hence, employees who have received relevant on-the-job training can be enabled to conduct and support the data strategy pursued by the firm. On the other hand, firms can hire new employees who already have necessary data skills. While on-the-job training activities are internal and thus not publicly known, job advertisements are published and can therefore be analyzed.

To estimate the demand for data skills in the German labor market, we utilize large amounts of data on job advertisements. These types of data are becoming increasingly popular in economic research on the labor market (Acemoglu et al. 2022; Azar et al. 2018; Deming und Noray 2020; Hershbein and Kahn 2018). Typically, job advertisements consist of a first part where the employer presents the hiring company, the working conditions, or special offers. This part is followed by a description of the underlying job profile and the required skills of the potential employee. These are most important for the following analysis. Indeed, this part of the job advertisement can be used to identify whether the advertisement requires data skills or not. For this reason, job advertisements can be an efficient instrument to analyze the extent to which companies in Germany require new employees to have relevant skills that help them to improve their storage, management, and use of data – the three components of data economy readiness. Thus, this can function as an indicator of the demand for data skills in Germany.

The following analysis is based on a data set provided by Textkernel that contains online job advertisements in Germany from over 60,000 different sources, including the major online job portals such as Indeed, Stepstone, or the German Federal Employment Agency. The data set encompasses job advertisements from the first quarters Q1 of the years 2019, 2020, 2021, and 2022. In total, 3.2 million unique job advertisements were posted in the first quarter of 2019, 3.0 million in 2020, 3.6 million in 2021, and 4.5 million in 2022. The aim of the following analysis is to classify each individual job advertisement depending on whether data skills are required for the job or not. This is possible by first identifying required data skills in the job advertisements. For this purpose, the basic concept and theoretical background focus on the three components of data economy readiness: data storage, data management, and usage of data (Büchel and Engels 2022a). The relevant aspects of these three components are compared to the job profiles and required skills in the posted job advertisements. If the new employee is intended to support the demanding firm in one of these aspects, the job advertisement is hence classified as requiring data skills. The following explains how this is implemented methodologically at the level of individual job advertisements.

MACHINE LEARNING APPROACH FOR IDENTIFYING JOB ADVERTISEMENTS THAT REQUIRE DATA SKILLS

It would be very time-consuming and costly to analyze each job advertisement manually. Instead, a machine learning (ML) approach is used to automatically classify the job advertisements as to whether they require data skills or not. For the model to make the correct decision, it first has to be trained to a sufficient extent with domain-specific information.

To train such an ML model, a set of job advertisements was annotated manually using the open-source text annotation tool doccano (Nakayama et al. 2018). The basic idea is that the model learns the classification decision from this template to independently make further predictions on new data. Therefore, the three authors annotated a set of job descriptions and determined whether these job advertisements require data skills or not based on the relevant aspects of data economy readiness.

Such a task can be rather subjective. To increase objectiveness, the authors have created annotation guidelines that provide detailed instructions for the widest possible range of different skills and phrases related to the data economy to correctly classify individual job postings. Initially, the authors used the terms listed in Büchel and Engels (2022a) as initial annotation guidelines and annotated a separate data set containing 100 job advertisements. During this process, the annotators discussed their disagreements with the aim of refining and updating the guidelines.

The authors decided that, for example, if the description of the job profile contains at least one keyword like “database maintenance,” “programming,” or the required skillset contains knowledge of cloud technologies, the job advertisement was classified as related to the data economy. If, on the other hand, the potential employee should only have Microsoft Office skills or it was unclear whether the activities were to be performed digitally or in an analog way (i.e., like storing customer data), this was not a decisive factor for classifying a job advertisement as data economy related.

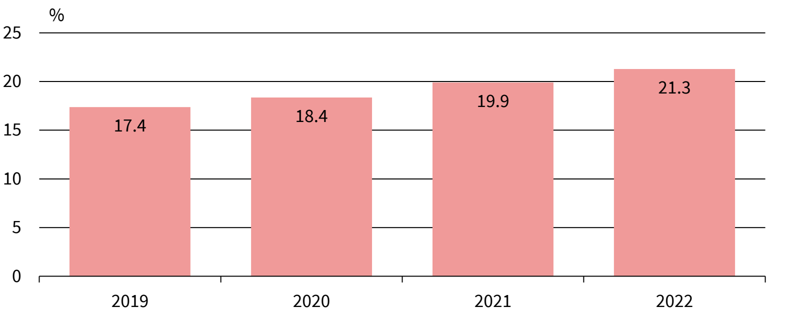
Based on the annotation guidelines, an additional 1,000 job advertisements were annotated as training data for the ML model. Overall, a very high inter-annotator-agreement (~94 percent across all annotators) was reached. This is a high-quality signal of the guidelines and the corresponding training data. Remaining disagreements were solved by majority vote by the three authors.

Modern ML model have hundreds of million trainable parameters (Devlin et al. 2018). Training those models from scratch, using only these mere 1,000 annotated advertisements, would be impossible. Consequently, an already pre-trained model was used as a basis for the analysis. The manually annotated data was then applied to fine-tune the model to the specific task of identifying job advertisements including data skills. The model used here was the so-called BERT model by Gnehm et al. (2022). Their model was pre-trained on German job advertisements as well as general German text, for example using German Wikipedia. Fine-tuning such a model means that a new neuronal network classification layer was added to the BERT model and was then trained jointly with the other layers (Devlin et al. 2018).

After fine-tuning, the BERT model was applied to all 14.3 million job advertisements from the first quarters of the years 2019 to 2022, predicting the correct classification decisions with a very high accuracy. The prediction-making of the ML model was evaluated extensively. Initially, a separate dictionary-based model was created that classifies job advertisements by searching for carefully selected domain-specific buzzphrases, as “cloud” or “analyze data”. This second model was used as a baseline for the present task. To measure the prediction accuracy, an additional, so-called “test set” of 200 manually annotated job advertisements was created. Both models were then used to predict whether data skills are required or not in these job advertisements. The predictions were compared to the manual annotations. The ML model performed very well on the test set and achieved a higher accuracy compared to the dictionary-based model (94 percent vs. 92.5 percent), f1-Score (0.914 vs. 0.892), precision (0.928 vs. 0.909), and recall (0.902 vs. 0.877).

Considering the better performance of the ML model compared to the dictionary-based model, it was used in the subsequent analysis. The results of the application of the model to the entire data set are presented below.

Figure 1
Demand for Data Skills in Germany



Note: Share of online job advertisements in Germany that require data skills; first quarter of each year; in % of all online job advertisements in Germany in the respective quarter.
Source: German Economic Institute based on Textkernel data.
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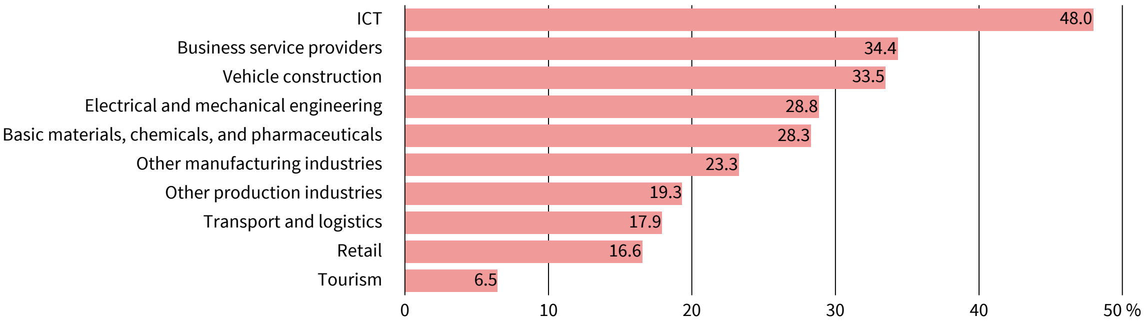
DEMAND FOR DATA SKILLS IN GERMAN COMPANIES

After applying the ML model, 21.3 percent of the 4.5 million online job advertisements in the first quarter of 2022 in Germany require data skills (Figure 1). The share has been rising steadily since 2019: In the first quarter of 2019, the share was at 17.4 percent, rising to 18.4 percent in the first quarter of 2020 and 19.9 percent in the first quarter of 2021, respectively.

The share of 21.3 percent in the first quarter of 2022 is plausible because just over 30 percent of companies in Germany currently are data economy ready (Büchel and Engels 2022c). Both aspects are closely linked since most companies in Germany are small and therefore unlikely to advertise a disproportionately high number of job advertisements on average. On the one hand, it is exactly the companies that use data efficiently that are looking for suitable employees, for example to further develop existing data-driven business models or processes. On the other hand, data skills are needed first and foremost in companies to become increasingly data economy ready. In comparison to the status quo of the data economy readiness, however, the analysis of job advervtisements is slightly more dynamic and delayed because it shows which human capital investments companies are currently making to be able to manage data more efficiently in the future.

Figure 1 illustrates that data is taking on an increasingly important role for companies in Germany. However, it should be noted that we measure only the number of new job advertisements posted by companies. The analysis does not provide any information on the level of fluctuation. If fluctuation is high, it is more likely that some of the advertised jobs cannot be filled due to the shortage of skilled workers in digitalization professions in Germany, which has become even more acute in recent years (Burstedde 2021).

Figure 2
Demand for Data Skills in Germany by Sector



Note: Share of online job advertisements in Germany that require data skills; first quarter of 2022; in % of all job advertisements in Germany; 389,748 job advertisements with data skills in total.
Source: German Economic Institute based on Textkernel data.
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To gain a better understanding of the drivers of data skill demand in Germany, the share of such job advertisements in individual sectors is analyzed. For this purpose, we focus on ten sectors[1] from the areas of industry and industry-related service providers. In comparable studies, which have representatively surveyed the status quo of data economy readiness or digitalization, the same industry focus was applied. These studies can therefore be compared with the present analysis. Furthermore, the focus allows for more targeted statements on the sectors analyzed.

Information about the sector of each tendering company is included in the Textkernel data that contains an assignment of each job posting to the German Classification of Economic Activities (WZ 2008)2. Based on these classifications, the companies can be assigned to the ten sectors and the job advertising activities of the respective sectors in the first quarter of 2022 can be analyzed (Figure 2). Generally, however, a large share of job advertisements is advertised through intermediaries. As a result, the searching company behind it and its sector cannot be identified. 38 percent of all job advertisements with data skills are advertised via intermediaries and thus cannot be assigned to any sector. The dataset also contains a few job advertisements that were not advertised through intermediaries but could not be assigned to any industry due to incomplete information, for example. Finally, there are job advertisements with data skills that do not correspond to the focus of the ten sector groups. These job advertisements are subsequently excluded from the analysis. In total, slightly less than 400,000 job advertisements with data skills can be assigned to the ten sector groups.

The ICT sector exhibits the highest demand: almost every second job advertisement in this sector requires data skills. This result is plausible, as companies in the sector offer, for example, data processing as a service to other companies or manufacture data processing equipment. Data is often a core component of their business model. Other studies also illustrate that the German ICT sector is the leader in terms of both the level of digitalization and its data economy readiness among the sectors analyzed here (Büchel and Engels 2023 and 2022b).

Besides the ICT sector, the sectors business service providers and vehicle construction also exhibit a high demand for prospective employees with data skills: about one-third of job advertisements require data skills. This is particularly astonishing in the case of business service providers: in absolute terms, there are about 90,000 job advertisements with data skills, roughly the same number as in the ICT sector. However, since the total number of job advertisements is higher in the business service providers sector, the share of job advertisements with data skills is correspondingly lower. The demand in the two sectors of business service providers and vehicle construction also coincides with good results for the level of digitalization (Büchel and Engels 2023): employees with data skills are needed to initiate and implement digitalization projects in the company. However, these companies seem to aim to improve digitalization and data management even further. After all, they are still posting job advertisements for data skills on a large scale.

The sector vehicle construction shows a development of its demand for data skills that differs from most other sectors: the latter exhibit a continuous increase of the relative share of job advertisements with data skills since 2019. In vehicle construction, however, the demand reached its peak of 37.3 percent in the first quarter of 2019, coming in second after the ICT sector (43.9 percent). In 2022, vehicle construction's demand for data skills had declined to 33.5 percent, ranking third. A comparable study on job advertisements requiring AI skills in Germany reached a similar result for vehicle construction (Büchel and Mertens 2022): since 2019, there was a similar decline in AI job advertisements in the regional clusters around Stuttgart and Wolfsburg, where large companies from the automotive and supplier sectors are located who advertise the majority of AI job advertisements in these regions. Since AI job advertisements make up a subset of job

[1] For the exact composition of the ten sectors, see Büchel and Engels (2023).
[2] The data provider Textkernel matches each company listed in each respective job advertisements to national company directories to gain information about the respective sector.

Figure 3
Data Skill Demands of the ICT Sector

Note: Word cloud of the most frequently required data skills; first quarter of 2022; in total 91,695 job advertisements with data skills in the ICT sector in Germany.
Source: German Economic Institute based on Textkernel data. © ifo Institute

Figure 4
Data Skills in the Tourism Sector

Note: Word cloud of the most frequently required data skills; first quarter of 2022; in total 4,198 job advertisements with data skills in the tourism sector in Germany.
Source: German Economic Institute based on Textkernel data. © ifo Institute

advertisements with data skills, the underlying reasons may be very similar. In view of the major challenges currently facing the automotive industry, such as the switch to electromobility and autonomous driving or the shortage of semiconductors, the decline in job advertisements with data skills could be due to the fact that companies have less financial capacity available today than in the previous years. At the same time, it is precisely new employees with AI or data skills who are part of the solution to deal with the megatrends, as they help to enable autonomous driving or connected mobility, for example. In addition, many of the job advertisements requiring data skills from previous years could have been successfully filled in the meantime, implying that a high level of data competencies has already been achieved in the companies. A decline in annual job advertisements with data skills can thus also indicate initial saturation effects. However, this implies that fluctuation in these companies would be comparatively low.

The share of job advertisements with data skills is lowest in retail (16.6 percent) and tourism (6.5 percent). Nevertheless, these shares increased in the past few years: in the first quarter of 2019, the share in retail was 14.9 percent and in tourism 5.1 percent, resulting in a relative growth rate of 11 percent for retail and even 26 percent for tourism.

A closer look at the required data skills in the ICT sector job advertisements reveals that there is demand for rather advanced data competencies in ICT companies (Figure 3): the advertisements predominately include demand for knowledge of cloud services and servers as well as programming languages. This demonstrates how advanced ICT companies are with respect to their use of data. These skills also seem to have been in demand in recent years. Interestingly, the ICT sector only shows a low relative growth rate in the share of job advertisements with data skills of around 9 percent compared to the first quarter of 2019. In contrast, the average growth rate of the ten sector groups is 22 percent. Low growth in the ICT sector can be interpreted as a first sign of saturation in the sense that the share of 48 percent could be close to an upper bound share of a company that manages and uses data in an efficient way. If this is really the case, however, remains to be proven.

A closer look at the required data skills in the tourism sector reveals the main data usage purposes in that sector (Figure 4). An ability to navigate the software "Protel" that is mainly used by hotels for processing their client data, dominates the data skill demands in the tourism sector. Other buzzwords such as "statistics" or "customer relation management (CRM)" reveal that data skills are still understood in a rather basic sense – to simplify initial process steps or to store customer data – compared to the ICT sector. Further evidence for this observation is provided by the strongly increasing growth rate of job advertisements with data skills in the tourism sector. We are therefore hopeful that companies in the tourism sector will make greater use of data in the future. This is supported by the frequently mentioned buzzword "Cloud", which, for example, appeared far less frequently in previous years and possibly points to more advanced data tasks that potential employees are expected to execute.

In general, it would not be optimal for certain sectors if data skills were required in all job advertisements. Rather, the optimal share of job advertisements with data skills is heterogenous between sectors. There are several possible explanations for these differences. First, the type of product or service that a sector offers and the resulting employee activities can make a difference. For example, services in the hospitality industry demand a different skill set than services in the ICT sector, which can result in different data skills being needed. Nevertheless, the potential for increased data management and usage can be high in both sectors. In tourism, for example, companies use data among others for advertising and marketing (Büchel and Engels 2022b) to increase the attractiveness of their offers. This also includes the continuous, data-based development of products and services as well as monitoring, for example, of the occupancy of certain offers at certain times. At the same time, there are other job activities that do not require data skills, as they focus purely on service fulfilment, for example.

POLICY CONCLUSIONS AND FURTHER RESEARCH

The analysis shows that data skills are required in many job advertisements in Germany and are becoming more relevant. This is a positive sign for the data economy in Germany, as companies increasingly realize the potential of data and try to implement it in their own operations. However, a growing demand for employees with data skills poses challenges for companies in the future in view of the existing skills gap, especially in digitalization professions (Burstedde 2021). Policymakers should intervene by, for example, taking measures that make it easier for companies to recruit foreign workers. They could, for example, create incentives for immigration via higher education, as there is still a lot of potential in this field: currently, comparatively more people only immigrate after completing their university degree (Geis-Thöne 2022). Policymakers should start with the financial resources required for the granting of residence permits for the educational immigration of third-country nationals and set up a corresponding scholarship or guarantee program.

In addition, further research could focus on the specific tasks that the job advertisements with data skills are primarily advertised for. For example, new employees could primarily help the company to improve their data storage. Alternatively, the focus could be on data management or data use. However, the categories can also overlap, such that new employees could also help the company in several categories. A corresponding analysis can reveal in which data skill category companies have particularly high demand. This in turn can provide valuable implications for the vocational training, school, and higher education sector in Germany to address the growing skills gap. If, for example, skills are required on a large scale to technically create data interfaces in companies or to develop pragmatic data-based business models, this should be found accordingly in relevant curricula to be able to meet this demand in the future. This concerns, for example, the expansion of computer science as a school subject as well as the supply of appropriate teaching staff at schools in the STEM area and their continuous further training (Anger et al. 2022).

Beyond this, it could be analyzed in more detail whether there is indeed a sustainably growing demand for data skills in companies or whether a high fluctuation hinders sustainable growth. The challenge would be to determine the degree of fluctuation in companies and to separate the effect of fluctuation from the general growth of job advertisements. Nevertheless, a better understanding of the fluctuation could help to identify appropriate measures that companies or policymaker could implement to counteract the skills gap.

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EconPol FORUM 3/2023 will be published in Mai 2023