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PARIS REPORT 1

Rebuilding Ukraine: Principles and policies

Edited by
Yuriy Gorodnichenko, Ilona Sologoub, and Beatrice Weder di Mauro



REBUILDING UKRAINE: PRINCIPLES AND POLICIES

Paris Report 1

CEPR

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Centre for Economic Policy Research
33 Great Sutton Street
London EC1V 0DX
UK

187 boulevard Saint-Germain
75007, Paris
France

Tel: +44 (20) 7183 8801
Fax: +44 (20) 7183 8820
Email: cepr@cepr.org
Web: www.cepr.org

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REBUILDING UKRAINE: PRINCIPLES AND POLICIES

Paris Report 1

Edited by

Yuriy Gorodnichenko

University of California, Berkeley and CEPR

Ilona Sologoub

VoxUkraine

Beatrice Weder di Mauro

Geneva Graduate Institute, INSEAD and CEPR

We dedicate this book to the Ukrainian people who have become the symbol of bravery and freedom for the whole world

**CENTRE FOR
ECONOMIC
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Contents

<i>Acknowledgements</i>	<i>vi</i>
<i>About the contributors</i>	<i>vii</i>
<i>Foreword</i>	<i>xix</i>
Introduction	1
Yuriy Gorodnichenko, Ilona Sologoub and Beatrice Weder di Mauro	
1 Ukraine's EU integration	15
Pavlo Klimkin and Ivan Mikloš	
2 Ukraine's post-war reconstruction and governance reforms	39
Tymofiy Mylovanov and Gerard Roland	
3 Anti-corruption policies in the reconstruction of Ukraine	71
Torbjörn Becker, Jonathan Lehne, Tymofiy Mylovanov, Giancarlo Spagnolo and Nataliia Shapoval	
4 Ukraine's business environment	97
Yegor Grygorenko and Monika Schnitzer	
5 International trade and foreign direct investment	119
Veronika Movchan and Kenneth Rogoff	
6 The reconstruction and development of Ukraine's financial sector after the war	167
Ralph De Haas and Alexander Pivovarsky	
7 Rebuilding Ukraine's energy sector: Challenges and Opportunities	193
Tatyana Deryugina, Oleksandr Kravchenko and Mar Reguant	
8 Rebuilding Ukrainian transport infrastructure	215
Volodymyr Bilotkach and Marc Ivaldi	
9 Accelerating urban economic growth in Ukraine	241
Richard K. Green, J. Vernon Henderson, Matthew E. Kahn, Alex Nikolsko-Rzhevskyy and Andrii Parkhomenko	
10 The labour market in Ukraine: Rebuild better	283
Giacomo Anastasia, Tito Boeri, Marianna Kudlyak and Oleksandr Zholud	
11 Education reforms during and after the war	323
Martin Kahanec, Snizhana Leu-Severynenko, Anna Novosad and Yegor Stadnyi	
12 The health system	361
Yuriy Dzhygyr, Kateryna Maynzyuk, Adrianna Murphy and Carol Propper	
13 Transforming Ukraine's research and development to become a driving force of reconstruction	385
Yuliia Bezvershenko and Oleksiy Kolezhuk	
14 How to organise aid	415
Barry Eichengreen and Vladyslav Rashkovan	

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About the contributors

Giacomo Anastasia is a Master's student in Economics and Social Sciences at Bocconi University, and a Research Assistant at the Ing. Rodolfo DeBenedetti Foundation. He collaborates with the Scientific Direction of the Turin International Festival of Economics. He holds a BA in Philosophy, International Studies and Economics from Ca' Foscari University of Venice. His research interests are in public, labour and political economics.

VII

Torbjörn Becker has been the Director of the Stockholm Institute of Transition Economics (SITE) at the Stockholm School of Economics in Sweden since 2006 and is a board member of several economics research institutes in Eastern Europe, including the Kyiv School of Economics. Prior to this, he worked for nine years at the IMF, where his work focused on international macro, economic crises and issues related to the international financial system. He holds a PhD from the Stockholm School of Economics and has been published in top academic journals such as *Journal of Monetary Economics*, *Journal of International Economics*, *Economics of Transition*, and *International Journal of Finance and Economics*, and has contributed to several books and policy reports focusing on Eastern Europe.

Yulia Bezvershenko is a Ukrainian policy expert who works on science and innovation (S&I) policy with a specific focus on institution building, promoting science, and creating a knowledge-based economy and society in Ukraine. During 2020-2021, she served as a Director General of the Directorate for Science and Innovation, Ministry of Education and Science of Ukraine. It is a unit responsible for national-level S&I policy development, implementation of S&I programmes, and international S&I cooperation. As a scientist and public activist, Bezvershenko has been deeply involved in the Ukrainian R&D sector reform since 2014, co-authoring a new version of the Law on Scientific and Technical Activity (2015), advocating its approval, and working on its implementation. Her particular focus was on creating the National Council on Science and Technology of Ukraine and the National Research Foundation of Ukraine and promoting Ukraine's integration into the European Research Area. In addition, she has been a co-founder and Vice-President of the NGO "Unia Scientifica" and Deputy Head of the Young Scientists Council of the National Academy of Science of Ukraine (NASU) (until 2019). Bezvershenko is a Ukrainian Emerging Leaders Program 2021-2022 Fellow at the Center of Democracy, Development, and the Rule of Law, Stanford University. In 2022, she co-founded the "Ukrainian Science Reload" initiative and project "Science at Risk". Bezvershenko holds a Master of Public Policy and Governance from the Kyiv School of Economics (2019), a PhD in Theoretical Physics from the Bogolyubov Institute for Theoretical Physics, NASU (2015), and an MSc in Physics from the National University "Kyiv-Mohyla Academy" (2010).

Volodymyr Bilotkach is an Associate Professor in the Air Transport Management Program at the Singapore Institute of Technology. Previously, Dr Bilotkach taught at the University of California, Irvine and Newcastle University Business School in the UK.

He has published a book titled *Economics of Airlines*, and around 40 papers in refereed journals. He is also an Associate Editor of the *Journal of Air Transport Management* and sits on the Editorial Board of *Research in Transportation Economics*. Since 2016 Dr Bilotkach has been an External Instructor with IATA Training, delivering intensive aviation policy, management, law, and planning courses around the world. He has advised the Netherlands Competition Authority, the European Commission, Incheon International Airport and the Malaysian Aviation Commission.

Tito Boeri is Professor of Economics at Bocconi University, Milan (where he was also Dean of Research until 2014). He was Centennial Professor at the London School of Economics, where he is currently Senior Visiting Professor. From March 2015 to February 2019, he was President of the Italian Social Security administration. His field of research is labour economics, redistributive policies and political economics. He is Scientific Advisor of the Fondazione Rodolfo De Benedetti, where he acted as Scientific Director since its inception in 1998 to 2015. He is a Research Fellow at CEPR, CEP-LSE, IZA, Netspar and IGIER-Bocconi. Before becoming president of INPS, he was columnist for *La Repubblica* and collaborated with some foreign newspapers such as the *Financial Times* and *Le Monde*. He is the founder of the economic policy watchdog website www.lavoce.info, in the editorial board of Voxeu.org, and the Scientific Director of the International Festival of Economics in Turin. After obtaining his PhD in Economics from New York University, Tito Boeri was senior economist at the OECD from 1987 to 1996. In this position, among other things, he coordinated all the work carried out by the OECD in the field of human resource policies in the central and eastern European economies in transition after 1990. He was also a consultant to the International Monetary Fund, the World Bank, the European Commission, the International Labour Office, and the Italian government.

Ralph De Haas is the Director of Research at the European Bank for Reconstruction and Development (EBRD) and a part-time Professor of Finance at KU Leuven. He is also a CEPR Research Fellow; a member of the CEPR's Research and Policy Network on Sustainable Finance; Fellow at the European Banking Center; Research Associate at the ZEW-Leibniz Centre for European Economic Research; and Practitioner Director at the Financial Management Association (FMA). He completed his PhD in Economics at Utrecht University and received the 2014 Willem F. Duisenberg Fellowship Prize. His research lies at the intersection of empirical banking and development economics. He is particularly interested in firms' and households' access to financial services; the stability aspects of global banking; finance and green growth; and the role of gender in the economy.

Tatyana Deryugina is an Associate Professor of Finance at the University of Illinois. Her work focuses on the role environmental risk plays in determining economic and health outcomes. Her research has been published in leading economics journals, including the *American Economic Review*, *American Economic Review: Insights*, *AEJ: Applied Economics*, and *AEJ: Economic Policy*, and has received widespread press coverage, including by *The Economist*, *The Wall Street Journal*, *The Washington Post*,

Bloomberg, and *The Atlantic*. Tatyana is a co-editor at the *Journal of the Association of Environmental and Resource Economists* and at *Environmental and Energy Policy and the Economy*. She also serves on the board of editors of *AEJ: Policy*. She is affiliated with the National Bureau of Economic Research, the Institute for the Study of Labor (IZA), the E2e Project, and the CESifo Research Network. Professor Deryugina holds a PhD in Economics from MIT, a BA in Applied Mathematics from UC Berkeley, and a BS in Environmental Economics and Policy from UC Berkeley.

Yuriy Dzhygyr is a graduate of the National University of “Kyiv Mohyla Academy” (1999), where he received a double Bachelor’s degree in Economics and Political Sciences. He continued his study at Syracuse University in the United States (Maxwell School of Citizenship and Public Affairs), where he gained a Master’s degree in Economics in 2001 with a specialisation in Public Finance. In 2001-2018, Yuriy worked on a number of international development projects and was responsible for the development and expert back-up of public finance reforms as well as for the funding of social sector programmes in Ukraine, Kyrgyzstan, Tajikistan, Kazakhstan, Kosovo and in the countries of Eastern Asia and Oceania. In 2015-2018 he worked as an external advisor to the Minister of Finance of Ukraine supporting the fiscal decentralization and funding for healthcare. In 2016-2018 he worked as an external advisor to the acting Minister of Healthcare of Ukraine developing and implementing the funding reform of the healthcare sector. During 2018-2020 he acted as Ukraine’s deputy Minister of Finance, covering public spending on human capital development programmes.

Barry Eichengreen is the George C. Pardee and Helen N. Pardee Professor of Economics and Professor of Political Science at the University of California, Berkeley, where he has taught since 1987. He is a CEPR Research Fellow, and a fellow of the American Academy of Arts and Sciences, and the convener of the Bellagio Group of academics and economic officials. In 1997-1998, he was Senior Policy Advisor at the International Monetary Fund. He was awarded the Economic History Association’s Jonathan R.T. Hughes Prize for Excellence in Teaching in 2002 and the University of California at Berkeley Social Science Division’s Distinguished Teaching Award in 2004. He is also the recipient of a doctor *honoris causa* from the American University in Paris. His research interests are broad-ranging, and include exchange rates and capital flows, the gold standard and the Great Depression; European economics, Asian integration and development with a focus on exchange rates and financial markets, the impact of China on the international economic and financial system, and IMF policy, past, present and future.

Yuriy Gorodnichenko, a native of Ukraine, is Quantedge Presidential Professor at the Department of Economics of the University of California, Berkeley. He received his B.A. and MA at EERC/Kyiv-Mohyla Academy (Kyiv, Ukraine) and his Ph.D. at the University of Michigan. A significant part of his research has been about monetary policy (effects, optimal design, inflation targeting), fiscal policy (countercyclical policy, government spending multipliers), taxation (tax evasion, inequality), economic growth (long-run determinants, globalization, innovation, financial frictions), and business

cycles. Yuriy serves on many editorial boards, including *Journal of Monetary Economics* and VoxUkraine (<http://voxukraine.org/>). Yuriy is a prolific researcher. His work was published in leading economics journals and was cited in policy discussions and media. Yuriy has received numerous awards for his research..

Richard K. Green is the Director of the USC Lusk Center for Real Estate. He holds the Lusk Chair in Real Estate and is Professor in the USC Sol Price School of Public Policy and the Marshall School of Business. Prior to joining the USC faculty, Dr. Green spent four years as the Oliver T. Carr, Jr., Chair of Real Estate Finance at The George Washington University School of Business. He was Director of the Center for Washington Area Studies and the Center for Real Estate and Urban Studies at that institution. Dr. Green also taught real estate finance and economics courses for 12 years at the University of Wisconsin-Madison, where he was Wangard Faculty Scholar and Chair of Real Estate and Urban Land Economics. More recently, he was a visiting Professor of Real Estate at the University of Pennsylvania's Wharton School, and he continues to retain an affiliation with Wharton. Dr. Green also is a Weimer Fellow at the Homer Hoyt Institute, and a member of the faculty of the Selden Institute for Advanced Studies in Real Estate. He was recently President of the American Real Estate and Urban Economics Association.

Yegor Grygorenko is a Partner and a Head of the Consulting Department at Deloitte Ukraine. He leads a team that provides comprehensive services in strategic and operational consulting, planning and support of transformation programmes, support for the implementation of complex IT products and risk management to Deloitte customers both in Ukraine and abroad. Prior to joining Deloitte, he was a partner at Bain & Company, with a total of almost 15 years of consulting experience. During that time Grygorenko has launched and facilitated major turnaround programmes, led strategy design projects at both the corporate and business division level, assisted clients in M&A-related projects and advised leading financial services and private equity players on governance and organization issues. Prior to that, he worked for Citigroup for seven years, doing various banking activities in Ukraine, Russia and Kazakhstan. Grygorenko received his MA summa cum laude from the Kyiv-Mohyla Academy (EERC/KSE) in 2001. He has several scientific publications, one of which was awarded a J. Michael Montias Prize by the Association for Comparative Economic Studies (United States). He also holds the Chartered Financial Analyst (CFA) designation.

J. Vernon Henderson joined the London School of Economics in 2013 as School Professor of Economic Geography. He was formerly Eastman Professor of Political Economy at Brown University. His current research concerns urbanisation in developing countries, with a particular focus on city growth and land market development in sub-Saharan Africa, climate change and land quality in developing countries, and the political economy of land and capital markets and infrastructure investments in urban China. Vernon is a Fellow of the British Academy. He has served as co-editor of the *Journal of Urban Economics* and the *Handbook of Regional and Urban Economics*. He was a founder and

President for many years of the Urban Economics Association. His recent research has been funded by the EU, IGC, and the World Bank. He has done research and advised in countries such as China, Kenya, Tanzania, Indonesia, Brazil, India, Korea, and Poland.

Marc Ivaldi is a Professor of Economics at the Toulouse School of Economics (TSE) and at the Ecole des Hautes Etudes en Sciences Sociales (EHESS), and a Research Fellow at the Centre for Economic Policy Research, CESifo and the Institute for Sustainable Aviation (ISA). He is President of the French Association of Transport Economics (AFET). He has served as President of the International Transport Economics Association (ITEA) and as a member of the Economic Advisory Group on Competition Policy at the Directorate General for Competition (European Commission). He is an expert in the use of empirical and quantitative methods for competition and regulation policy and has advised firms as well as competition and regulatory authorities on a wide range of issues in competition economics. Much of his work has been devoted to the analysis of network and transport service industries including rail, air, urban transport, energy, telecommunications, banking, and information technologies. Ivaldi is a member of the editorial boards of *Economics of Transportation* and *Review of Network Economics*. He is a frequent speaker at leading conferences and academic forums around the world. He is also the author of books and has contributed to many others. He is a referee for several of the world's most prestigious academic journals in economics and has had dozens of his own articles published. He holds a PhD in Economics from the University of Pennsylvania and a PhD in Economics from the Université des Sciences Sociales of Toulouse.

Martin Kahanec is a Professor and Head of the Department of Public Policy at the Central European University (CEU) in Vienna; he acted as the Dean of its School of Public Policy in 2017-19 and 2020-21. He is a founder and Scientific Director of the Central European Labour Studies Institute (CELSI), Bratislava, an Affiliated Researcher at the University of Economics in Bratislava, and an Affiliated Scholar and member of the Advisory Board at the Global Labor Organization. Kahanec is an elected member of Academia Europaea and serves as the chair of its Section Committee "Economics, Business and Management Sciences". Kahanec has held several leading scientific and advisory positions, including in the Council for Science, Technology, and Innovations of the Slovak Government, the Scientific Board of the Ministry of Labor and Social Affairs of the Czech Republic, and the COVID-19 Economic Crisis Management Council at the Ministry of Finance of the Slovak Republic. Kahanec has served as an editor for a number of scientific journals. He has published extensively on economic and social policy, labour and population economics, migration and EU mobility, and reforms in European labour markets.

Matthew E. Kahn is the Provost Professor of Economics at the University of Southern California. He is a Research Associate at NBER and IZA. His research areas include urban, environmental and real estate economics.

Pavlo Klimkin is co-founder of the Centre for National Resilience and Development and former Minister of Foreign Affairs of Ukraine. He holds a Master's degree in Physics and Applied Mathematics from the Moscow Institute of Physics and Technology. He worked as a researcher in the Ukrainian Academy of Sciences, before joining the Ukrainian Foreign Ministry in 1993, where his main profiles were arms control and security, nuclear safety, energy security, the EU and NATO. He was head of the negotiating team for the EU-Ukraine Association Agreement and the EU visa-free regime for Ukraine. He has been posted to Germany and the UK, including as Ambassador to Germany. Klimkin is a Member of the Board of the Come Back Alive foundation.

Oleksiy Kolezhuk received his PhD in Solid State Physics from the Institute for Metal Physics, Kyiv, Ukraine, in 1991; Dr. habil. in Physics from the University of Hannover, Germany, in 2001; and D.Sc. in Physics of Magnetism from the Institute of Magnetism, Kyiv, Ukraine, in 2004. Between 2004 and 2009, he was the Heisenberg Fellow of the DFG, conducting research at the University of Hannover, Harvard University, and RWTH Aachen. He has been a Research Fellow at the Institute of Magnetism, National Academy of Sciences of Ukraine since 1995 and a Professor at the Institute of High Technologies, Taras Shevchenko National University of Kyiv since 2010. Kolezhuk was elected a corresponding member of the National Academy of Sciences of Ukraine since 2021 and a member of the Scientific Committee of the National Council of Ukraine on Science and Technology Development since 2017, where he is also Head of the Committee since 2019.

Oleksandr Kravchenko is a Managing Partner at the McKinsey & Company office in Ukraine, a leader of the Energy and Materials Practice in Central and Eastern Europe and a core member of the firm's Metals & Mining Practice, where he focuses on steel value chain. In addition to working with private-sector clients, Oleksandr is also excited to support McKinsey public sector work in Ukraine and beyond. Outside of work, Oleksandr serves on the board of Kyiv School of Economics.

Marianna Kudlyak is an economist with research interests in the fields of macroeconomics, labour economics and consumer finance. She works as a Research Advisor at the Federal Reserve Bank of San Francisco. She is also a Visiting Fellow at the Hoover Institution at Stanford University, a Research Fellow at the Centre for Economic Policy Research (CEPR) Monetary Economics and Fluctuations Programme and at the Institute of Labor Economics (IZA), and a Senior Research Fellow at the International Center for Economic Analysis (ICEA). Dr. Kudlyak earned a PhD in Economics from the University of Rochester. Dr. Kudlyak was born in Lviv, Ukraine. She studied at the Lviv Lyceum of Physics and Mathematics, obtained the BA and Specialist degrees in Economics from the State University Lviv Polytechnic, and MA in Economics from the Economic Education and Research Consortium at the Kyiv Mohyla Academy. Dr. Kudlyak has conducted research on unemployment, wages, online job search, mortgage default, young borrowers, inequality, among other topics. She is ranked in the top 110 of female economists worldwide (over the last ten years of publications) by IDEAS/RePEc.

Jonathan Lehne is a researcher at the Stockholm Institute of Transition Economics (SITE) - Stockholm School of Economics. His research focuses on elections, bureaucracies, and governance in developing countries. He did his PhD at the Paris School of Economics. He previously worked in the Research Department of the Office of the Chief Economist at the European Bank of Reconstruction and Development.

Snizhana Leu-Severynko, PhD, has 16 years of experience in the coordination and management of projects and activities of EU and US donor organisations and more than 10 years of experience in teaching from primary to higher levels of education. Currently, Mrs. Leu-Severynko is a Senior Workforce Development Manager of the USAID Economic Resilience Activity (ERA) and collaborates with ERA partner universities to meet the needs and challenges that educational institutions are facing in the field of workforce development and the provision of better skills services. Her areas of research activity cover vocational education and training, work-based learning, comparative pedagogics, and the standardisation of education.

Kateryna Maynzyuk is a development economist with experience in assisting reforms in public financial management, social policy and fiscal decentralisation in Ukraine, the Western Balkans, Central Asia, East Asia and the Pacific. After the Revolution of Dignity in Ukraine, she has focused on providing technical support to the Ukrainian government, working with the Ministry of Health to design the country's healthcare financing reform and with the Ministry of Finance to strengthen public expenditure management and spending efficiency in human capital development programmes. She holds an MSc in Development Studies (specialising in Economics) from the London School of Economics and Political Science and a BA in Economics (minor in Sociology) from the National University of "Kyiv-Mohyla Academy", Ukraine.

Ivan Mikloš is the former Deputy Prime Minister and Minister of Finance of the Slovak Republic (2002-2006, 2010-2012), Deputy Prime Minister for Economy (1998-2002), and Minister of Privatization (1991-1992). He co-founded and led the economic think tank MESA₁₀ (1992-1998). Between 2006-2010 and 2012-2016, he was a Member of Parliament. In 2014, he was reappointed as the President of MESA₁₀ and became a Member of the International Advisory Board of the National Reform Council of Ukraine and the platform VoxUkraine. During 2015-2016 he served as a Chief Advisor to the Minister of Finance of Ukraine and as an Advisor to the Minister of Economic Development and Trade of Ukraine. Between April 2016 and August 2019, he served as a Chief Economic Advisor to the Prime Minister of Ukraine. He is a Chairman of the Strategic Advisory Group for Support of Ukrainian Reforms and Co-Founder of the Ukrainian economic think tank Centre for Economic Strategy. Mikloš was one of the leading figures of economic transformation in the Slovak Republic. He contributed significantly to the entry of the Slovak Republic into the OECD, and instigated an extensive and effective tax reform. He led the government agenda on economic restructuring and fiscal consolidation.

Veronika Movchan is a Research Director at the Institute for Economic Research and Policy Consulting (IER) in Kyiv. Her main research interests are trade policy, including WTO- and EU-related issues, regional integration, non-tariff measures, and policy modelling. From 2015, she headed the Ukrainian team in the project ‘Understanding the EU’s Association Agreements and DCFTAs with Ukraine, Moldova and Georgia’, implemented by the Centre for European Policy Studies (Belgium) consortium and funded by the Swedish government. She has been a team leader/trade expert on many international projects in Eastern Europe, South Caucasus and Central Asia. She is an associated consultant at Berlin Economics GmbH, Germany; a member of the VoxUkraine Editorial Board and IAMO’s Scientific Advisory Board. She holds an MA in Economics from the National University Kyiv-Mohyla Academy in Ukraine; and was a visiting research fellow at Stanford University.

Adrianna Murphy is an Associate Professor of Health Systems Research and Policy at the London School of Hygiene and Tropical Medicine and co-Director of the School’s Centre for Global Chronic Conditions. She currently holds a UKRI Future Research Leader Fellowship to study health systems responses to chronic diseases in low- and middle-income and crisis-affected settings. Previously, Adrianna held a Wellcome Trust Fellowship focused on improving measures of healthcare expenditure and financial protection in these contexts. She has worked with partners in Ukraine including the WHO Ukraine Country Office and V.N. Karazin Kharkiv National University on studies of the social determinants of health and healthcare expenditure. Adrianna has an SM in Global Health from Harvard University, School of Public Health and a BA in Social Psychology from the University of British Columbia.

Tymofiy Mylovanov is President of the Kyiv School of Economics (KSE) and Associate Professor of Economics at the University of Pittsburgh. He graduated from Kyiv Polytechnic Institute (Management) in 1997 and from Kyiv-Mohyla Academy majoring in Economic Theory in 1999. In 2004 he got his PhD in Economics at the University of Wisconsin-Madison (USA). During his professional career, he has been teaching for a long time at the European and American universities, including Rheinische Friedrich-Wilhelms-Universität Bonn, University of Pennsylvania and University of Pittsburgh. Tymofiy’s research interests cover such areas as theory of games and contracts, institutional design. His articles on these topics have been published in the leading international academic magazines, including *Econometrica*, *American Economic Review* and the *Review of Economic Studies*. During the Revolution of Dignity, jointly with other leading economists of Ukraine and the world, he founded the VoxUkraine platform aimed to increase the level of economic discussion in Ukraine.

Alex Nikolsko-Rzhevskyy is a Professor of Economics at Lehigh University College of Business and a research development advisor for the IMF. Alex earned his doctorate in Economics from the University of Houston and a Master’s degree in Physics from Odesa

National University in Ukraine. He does research on macroeconomics and finance. He has been the recipient of numerous research grants and his papers have been referred to the US Congress.

Anna Novosad is a Ukrainian educational activist. She served many years in various positions at the Ministry of Education and Science of Ukraine, including as a Minister in 2019-2020. Anna contributed to and led the comprehensive school reform in Ukraine, and was a leader of the higher education funding reform. In 2021/2022, she completed the Hubert Humphrey Fellowship Program at Vanderbilt University in the United States. Currently, Anna leads the charity foundation SavED, which aims at education access renewal in Ukraine following the consequences of the Russian aggression.

Andrii Parkhomenko is an Assistant Professor at the University of Southern California, Marshall School of Business. His research interests include spatial economics, urban economics, and housing. In his recent work, he explored the implications of telecommuting for the spatial distribution of economic activity, the effect of land use regulations on local and aggregate economic performance, the relationship between housing prices and job polarisation within local labour markets, etc. Andrii grew up in Kyiv, Ukraine. He graduated with a BA in Economics from Kyiv National Economics University, and obtained a PhD in Economics from Universitat Autònoma de Barcelona.

Alexander Pivovarsky is the Director of Capital Markets Development at the EBRD, which he joined in 2008 as a Principal Economist in the Office of the Chief Economist. He subsequently served as a Senior Adviser in the Bank's Corporate Strategy department and a Deputy Director in the Office of the President. Before his appointment to his current role, he led the EBRD's team in Belarus helping to scale up the Bank's policy dialogue efforts in the country. Prior to joining the Bank, he worked at the IMF where he contributed to negotiating stabilisation programmes in countries around the world. He also led a reform advisory programme for Ukraine at the Harvard Institute for International Development. Pivovarsky holds Master's and Doctoral degrees in Public Policy from Harvard University and a diploma from the University of Kyiv.

Carol Propper is Professor of Economics at Imperial College London in the Department of Economics and Public Policy and a Visiting Professor at Monash University. Her research focuses on the impact of incentives on the quality of health care delivery and health system productivity and, more widely, on the design and consequences of incentives within the public sector and the boundary between the state and private markets. She was Associate Dean for Faculty and Research at Imperial Business School 2016-19, Co-Director and Director of the Centre for Market and Public Organisation at the University of Bristol between 1998-2009 and Co-Director of the Centre for the Analysis of Social Exclusion at London School of Economics between 1997-2007. From 2016 she has been Deputy Editor of Vox EU. She is the current President of the Royal Economic Society and a member of President Macron's expert commission on major economic challenges. She has undertaken a wide range of public service activities including Chair of the ESRC

Research Grants Board (2005-09), member of the ESRC Council (2005-09) and member of the Royal Economic Society council (2000-2005). Propper was awarded a CBE for her services to social sciences in 2010, and was made a Dame in the 2021 New Year's Honours in recognition of her public services to health and economics. She was elected as a fellow of the British Academy in 2014 and an international fellow of the National Academy of Medicine in 2018.

Vladyslav Rashkovan is an Alternative Executive Director at the IMF, representing Ukraine and 14 other states on the Executive Board. Prior to joining the IMF, he served as Deputy Governor and a Member of the Board of the National Bank of Ukraine (NBU). Before joining the NBU in 2014, Mr. Rashkovan spent eight years working with the UniCredit Group, holding the position of CFO and Deputy CEO of UniCredit Bank Ukraine. In 2000, he served as a strategic consultant in the M&A field. He has been widely engaged in non-profit activities, having co-chaired the Banking and Financial Committee of the American Chamber of Commerce in Ukraine in 2010-2013, and having set on the Board of the Kyiv School of Economics in 2012-2014. He graduated from the Banking Department of the Odessa State Economic University in 2000 and later was a researcher at the University of Genova (Italy) and the Institute of the World Economics of the Hungarian Academy of Sciences.

Mar Reguant is a Professor of Economics at Northwestern University and a Research Fellow at the Barcelona School of Economics. Her work focuses on the electricity sector and climate policy. She develops models and quantitative tools to analyse the impacts of the energy transition, focusing on renewable integration and distributional issues. She has received several honours, including a Sloan Fellowship and a PECASE award. In her policy work, she has collaborated with the California Air Resources Board to study leakage mitigation in their cap-and-trade programme. She has also participated in a commission of experts to advise the French presidency on climate policy.

Kenneth Rogoff is the Maurits C. Boas Professor at Harvard University, and former Chief Economist at the IMF. His influential 2009 book with Carmen Reinhart, *This Time Is Different: Eight Centuries of Financial Folly*, shows the remarkable quantitative similarities across time and countries in the roots and aftermath of debt and financial crises. Rogoff is also known for his pioneering work on central bank independence, and on exchange rates. He is co-author of the widely-used graduate text, *Foundations of International Macroeconomics*. His 2016 book *The Curse of Cash* looks at the past, present and future of currency from standardized coinage to crypto-currencies. His monthly syndicated column on global economic issues is published in over 50 countries. Rogoff is an elected member of the National Academy of Sciences and the American Academy of Arts and Sciences. He has long ranked among the top ten most cited economists, and is an international grandmaster of chess.

Gérard Roland joined the Berkeley faculty as a professor in 2001. He received his PhD from Université Libre de Bruxelles in 1988 and taught there from 1988-2001. Professor Roland is also a Research Fellow of CEPR, where he was programme director between 1995 and 2006. He served as editor of the *Journal of Comparative Economics*, and has been associate editor for several other journals. Among his awards and honors are the Medal of the University of Helsinki, Officier de l'Ordre de Leopold II, and entries in "Who's Who in the World," "Who's Who in America," and "Who's Who in Economics since 1776." He was a fellow at the Center for Advanced Studies in Behavioral Sciences in Stanford in 1998-1999. He was program chair of the Fifth Nobel symposium in Economics devoted to the Economics of Transition in 1999. He was named Jean Monnet Professor at Université Libre de Bruxelles in 2001 and received an Honorary Professorship of Renmin University of China in 2002.

Monika Schnitzer is Professor of Economics at the University of Munich. Her current research focuses on innovation, competition policy, and multinational corporations. She has also worked on the transformation of former planned economies. She has visited at MIT, Stanford University, Yale University, the University of California, Berkeley, and Harvard University. For more than 20 years, she has been active in policy advice for the German government and the European Commission, including as Vice-Chair of the Expert Commission on Research and Innovation and as a member of the Economic Advisory Group on Competition Policy of DG Competition. She has been a member of the German Council of Economic Experts since April 2020 and was elected as its Chair in October 2022.

Nataliia Shapoval is Vice President for Policy Research at Kyiv School of Economics & Head of KSE Institute. Since the war started, Natalia and the KSE Institute team have focused on providing direct research-based analytical support on sanctions, damages, food security and recovery issues to the Presidential Office, the Cabinet of Ministers of Ukraine, and the Yermak-McFaul International Working Group on Russian Sanctions. Natalia has ten years of experience in policy research and consulting projects in public procurement, the healthcare and pharmaceutical industry, and strategic development of the private sector. Natalia advised on several governmental strategies, including economic, regional development, and investment.

Ilona Sologoub is a Scientific Editor at VoxUkraine. During 2011-2019 Ilona worked at KSE as a researcher and Director for Political and Economics research. Before joining KSE, Ilona worked in the bank sector performing market and operational risk analysis. She has experience in developing and implementing of market risk models and preparing analytics on various topics including Ukrainian and world economy, science, politics and market researches. She has also lectured in Econometrics at Kyiv-Mohyla Academy.

Giancarlo Spagnolo is Professor of Economics at Stockholm University and the University of Rome Tor Vergata, and Research Fellow at SITE, EIEF, CEPR, and MaCCI. He is an internationally recognised expert on competition policy, public procurement,

and anti-corruption. He has published many widely quoted scientific articles in leading international academic journals such as *Econometrica*, *American Economic Journal: Microeconomics*, *Economic Journal* and the *Journal of Economic Theory* and has co-edited Cambridge University Press's *Handbook of Procurement*. He has founded and directed for four years the Research Unit at the Italian Central Procurement Agency (Consip), and has advised many national and international institutions, including the World Bank, the EU Parliament, and the European Commission. In 2017 he has worked in Ukraine in collaboration with the Kyiv School of Economics to train public procurement officials and help designing transparent and effective procurement procedures.

Yegor Stadnyi is a Vice Rector at Kyiv School of Economics. He served as the Deputy Minister of Education and Science of Ukraine in 2019-2020. Before that, he worked at the Cedos think tank (Kyiv, Ukraine) and as a consultant for the World Bank dealing with public policy analysis in the education sphere.

Beatrice Weder di Mauro is Professor of International Economics at the Geneva Graduate Institute and Distinguished Fellow at the INSEAD Emerging Markets Institute, Singapore. Since July 2018, she serves as President of the Centre for Economic Policy Research. From 2001 to 2018, she held the Chair of International Macroeconomics at the University of Mainz, Germany, and from 2004 to 2012 she served on the German Council of Economic Experts. She was Assistant Professor at the University of Basel and Economist at the IMF. She held visiting positions at Harvard University, the National Bureau of Economic Research and the United Nations University in Tokyo. She has served as consultant to governments, international organizations and central banks (European Commission, IMF, World Bank, ECB, Deutsche Bundesbank, OECD, among others). She is an independent director on the board of Bombardier, UBS and Bosch. She is a senior fellow at the Asian Bureau of Finance and Economics Research (ABFER), a member of the ETH Foundation, the International Advisory Board of Bocconi and a member of the Bellagio Group.

Oleksandr Zholud has a Bachelor's degree from the National University of Kyiv-Mohyla Academy (1999) and Master's degree in Economics from the Economics Education and Research Consortium (EERC), currently Kyiv School of Economics (KSE) (2001). He worked as a reporter for an international company and economic analyst at several Ukrainian think tanks, and currently works as a chief expert in the Monetary Policy and Economic Analysis Department at the National Bank of Ukraine. His main spheres of professional interests are monetary and labour economics, macroeconomic forecasting, economic history. Zholud has taken part in creating economic and demographic growth models for regions of Ukraine, of monetary transmission, labour market dynamics and others. He is also a member of the Editorial Board of VoxUkraine and a member of the KSE Board of Directors.

Foreword

For more than three decades, CEPR's *Geneva Reports* have formed the blueprint for other reports on seminal topics in economics. As part of the expansion of CEPR's activities in Paris, we decided to launch a new series of *Paris Reports*, which are designed to be in-depth studies of very topical policy issues. It is hard to think of a subject with greater policy impact and importance for Europe than the Russian full-scale invasion of Ukraine on 24 February 2022. Death and destruction are on a scale not seen in Europe since World War II and the ripples of the war are felt everywhere. Hence it was decided that the topic for the first in this new report series should be a study of how Ukraine can be rebuilt after the destruction of the Russian invasion.

XIX

This first Paris Report offers a perspective on how the reconstruction of Ukraine can be achieved once the war is over. Specifically, it builds on *A Blueprint for the Reconstruction of Ukraine* published by CEPR in April 2022. This earlier report provided a set of principles and strategies for reconstruction, but at that point there was deep uncertainty about the future of Ukraine and hence the report provided only broad contours for policy recommendations. With a clearer outlook and major developments (for example, Ukraine is now a candidate country to join the European Union), there is an urgent need to lay the groundwork for future recovery efforts, not only to increase the chances of post-war success but also to give hope to the millions of Ukrainians who have found the courage and strength to fight in the most difficult conditions.

To this end, this report provides an in-depth, sector-by-sector analysis to inform policymakers and the public about challenges, opportunities and tools for Ukraine's reconstruction. The topics covered range from infrastructure to institutions to education to organization of aid. In the spirit of making the reconstruction a joint endeavour, each chapter is written by a team of authors from Ukraine and the West. The contributors draw on their vast experience and expertise in academia and policy to summarise pre-war trends, war damage and proposed paths forward. The recommendations have a clear leitmotif: reconstruction is not about rebuilding Ukraine to the pre-war state; it is about a deep modernisation of the country.

The report aims at providing a timely account (it was conceived in July 2022 and completed in December 2022), but the situation in Ukraine remains highly fluid. Uncertainty will not be resolved until the war is over. However, although adjustments to its recommendations may be necessary as the future unfolds, the focus on the fundamental forces that will shape the trajectory of Ukraine should mean that the report makes a long-lasting contribution.

CEPR is grateful to the editors of this eBook, and above all to Yuriy Gorodnichenko, leader of CEPR's Ukraine Initiative, for his incredibly hard work in bringing this report to fruition. Our thanks also go to Anil Shamdasani for his skilled handling of its production.

CEPR, which takes no institutional positions on economic policy matters, is delighted to provide a platform for an exchange of views on this crucially important topic..

Tessa Ogden
Chief Executive Officer, CEPR
November 2022

XX

Introduction

Yuriy Gorodnichenko,^{a,b} Ilona Sologoub^c and Beatrice Weder di Mauro^{d,e,b}

^aUniversity of California, Berkeley; ^bCEPR; ^cVoxUkraine; ^dGeneva Graduate Institute; ^eINSEAD

1

“Rebuilding Ukraine means restoring the principles of life, restoring the space of life, restoring what makes people people. ... Of course, it is not only about restoring the substance of life, but also about institutional development. Our country has become a candidate for joining the European Union. ... And the reconstruction of Ukraine will be an equally great reform for all of us, because we will unite the democratic world to the extent that everyone will see: the worldview of free people always wins. The world will see that no one can ever achieve their goals through war.”

Volodymyr Zelensky¹

On 24 February 2022, Russia started a full-scale war on Ukraine. This blatant violation of Ukraine’s territorial integrity was swiftly condemned by the General Assembly of the United Nations, but the war continues. Death and destruction are on a scale not seen in Europe since World War II and the ripples of the war are felt everywhere – from the Ukrainian families who have lost their loved ones to African countries that face the prospect of hunger.

This is a dark hour for humanity, but we have to think about how Ukraine will rebuild after the war is over. This is important for ensuring the survival of the country in the long run; advanced planning and preparations *now* will save lives and increase chances of success. Furthermore, these steps will give hope to millions of Ukrainians that after the horrors of the war there is light at the end of the tunnel.

In a report commissioned by CEPR, Becker et al. (2022) provided the first blueprint for the reconstruction of Ukraine. When it was written in March of 2022, the uncertainty was extreme. How far would Russia go in destroying Ukraine? (Russian war crimes² and open calls for genocide³ in Ukraine speak volumes.) How much resistance would Ukraine put up? (Ukrainians are nearly unanimous in their desire and commitment to defeat the Russian aggression.) What aid would the civilized world give to Ukraine? (The world is united in supporting Ukraine.) Once unthinkable, Ukraine’s victory now has increasingly clear contours. This calls for a more comprehensive analysis of what Ukraine should become after the war and what tools policymakers can use to fulfill these goals.

1 “The reconstruction of Ukraine will be the greatest contribution to the maintenance of global peace,” President’s speech at the Ukraine Recovery Conference in Lugano, July 2022 (www.president.gov.ua/en/news/vidbudova-ukrayini-bude-najbilshim-vneskom-u-pidtrimku-globa-76261).

2 See the Independent International Commission of Inquiry on Ukraine (United Nations 2022).

3 <https://euvsdisinfo.eu/into-the-heart-of-darkness-what-russia-wants-in-ukraine/>

To this end, this book offers perspectives from leading scholars and practitioners. Each chapter of the book covers a specific sector but there is a natural overlap across the chapters because Ukraine's reconstruction is a comprehensive transformation of the country, with many elements required to work in unison. With such a complex task, it is important to have a clear vision of the goals. The leitmotif of this book is clear: reconstruction is not about rebuilding Ukraine to the pre-war state, it is about a deep modernisation of the country. Infrastructure, technology, business environment, institutions, education, healthcare and other critical elements of the economy and society will have to leapfrog and undergo reforms to help Ukraine escape the post-Soviet legacy and become a full-fledged democracy with a modern economy, strong institutions, and powerful defense sector. As a part of this ambiguous agenda, Ukraine will become a full member of the European Union and NATO. To be clear, there should be no shortcuts – all the requirements to prospective members of these organisations, especially concerning democracy, robust institutions and low corruption, should be met.

The book repeatedly emphasises that allies' aid will be absolutely essential but, to make the reconstruction a true success story, Ukraine's future should be decided by the Ukrainian people. In other words, Ukrainians should own this process. For a long time (and for good reasons), Ukrainians perceived the state as some hostile and alien construct which is there to repress them. Now more and more people realise that they need to own the state, i.e. protect their rights and fulfill their responsibilities as citizens. Building on the wave of patriotism, establishing mechanisms for genuine citizen participation will help prolong national unity and volunteer enthusiasm of Ukrainians beyond the war, but more importantly, it will ensure democratic development of the country.

Ukraine's reconstruction will be a challenge not only for Ukraine but also for the world. The damage is huge and thus no one country or organisation will be able to implement the reconstruction process. It will require a lot of coordination between governments, international organisations, non-governmental organisations, businesses and other stakeholders. In the process, the mechanisms, institutions and alliances will be forged.

In the rest of these introductory remarks, we provide more background information, discuss the current situation in Ukraine and its main challenges, then give an overview of the reconstruction process as described in this book and conclude with a few tough questions that will need to be addressed to ensure sustainability of reconstruction, the prerequisite for which will be Ukraine's security.

1 PRE-WAR REFORMS AND DYNAMICS

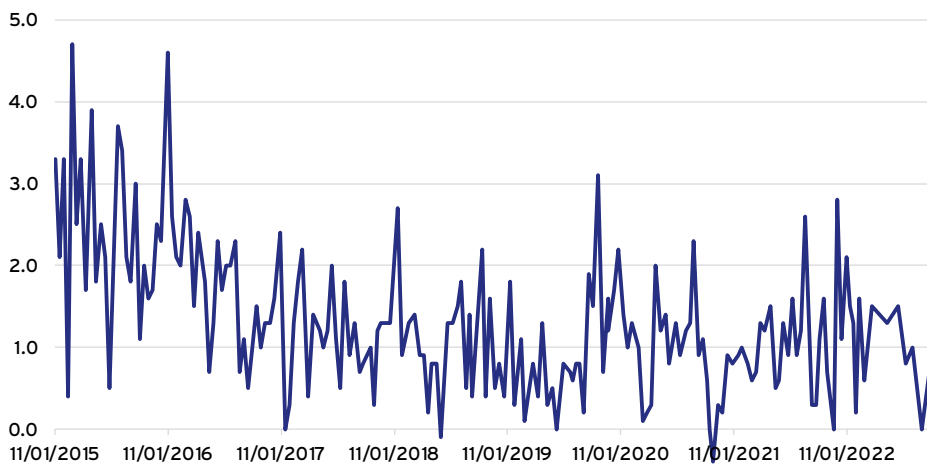
The current war is not the first time Russia has violated Ukraine's territorial integrity. After the Revolution of Dignity (also known as the Euromaidan) in 2013–2014, Russia annexed Crimea and occupied a large part of Donbas. The global community largely shrugged and let Russia get away with this crime (Germany, for example, continued to build gas pipelines from Russia to Germany bypassing Ukraine, which lowered the

cost of war for Russia), but it was a wake-up call for Ukraine. The state model based on corruption, technological degradation, disenfranchised citizens and weak armed forces threatened the very existence of the country. Reforming Ukraine became literally a matter of life or death for many Ukrainians.

After Viktor Yanukovych, the corrupt, pro-Russia president of Ukraine, fled the country, a new president (Petro Poroshenko) and a new government (with Arsenii Yatschenkyuk as the prime minister) faced extremely difficult conditions. Russia controlled 7% of the country; Ukraine lost a lot of productive capacity; propaganda from the Kremlin spread fake news about Nazis in Ukraine; the currency and banks were facing a run and the economy was in free fall. Furthermore, international aid, and especially military assistance, was limited (the United States, for example, sent only non-lethal aid such as blankets), which made the tradeoffs for the Ukrainian government particularly painful.

The International Monetary Fund provided a vital \$17 billion loan in exchange for reforms. As shown by the Reform Index,⁴ a summary indicator developed by VoxUkraine⁵ to measure the intensity of reforms, Ukraine made tremendous progress immediately after the revolution. For example, the banking system went through a thorough clean up to root out related-party lending, improve bank supervision and make the central bank independent. Transparency was also improved dramatically. For example, public contracts were awarded via ProZorro, an electronic procurement system that opened access, enhanced reporting and enabled public scrutiny. In a similar spirit, public officials were required to report income and spending not only for themselves but also for their close relatives.

FIGURE 1 TIME SERIES FOR THE REFORM INDEX



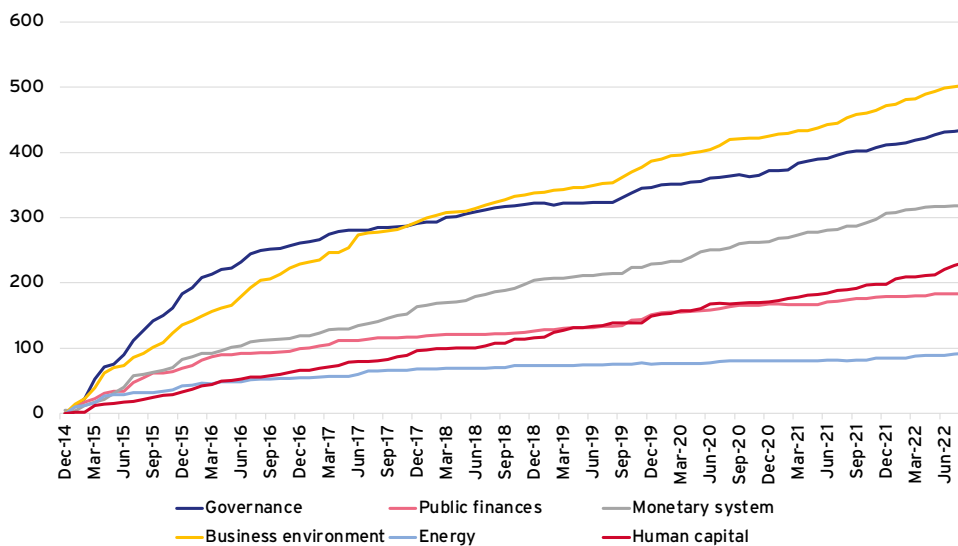
Notes: The Reform Index is an analytical instrument aimed to quantitatively evaluate economic reforms in Ukraine. It is based on expert assessments of changes in the regulatory environment which can be considered as reforms (+5 corresponds to a profound reform) or anti-reforms (-5 corresponds to a profound antireform). The Index was created in early 2015. The Index has six components: I1. Governance, I2. Public Finance, I3. Monetary System, I4. Business Environment, I5. Energy Sector, I6. Human capital. See <http://imorevox.org/about/> for more details.

4 <http://imorevox.org>

5 <https://voxukraine.org>

Unfortunately, the reforms were uneven across sectors. For example, the judicial branch was barely reformed (establishing an anti-corruption court and reloading the Supreme Court were among the few bright spots there), which hampered reforms in other spheres. Reforms of the civil service were equally incomplete and disappointing.

FIGURE 2 CUMULATIVE REFORM INDEX SCORES BY SECTOR



Notes: Each line shows cumulative scores for key reforms. See notes for Figure 1 and <http://imorevox.org/> for more details.

The Russian aggression of 2014 also had a profound effect on the economy. As discussed in the chapter on trade and FDI by Veronika Movchan and Kenneth Rogoff, Ukraine largely redirected its trade to the European Union and away from Russia. After multiple instances of Russia using energy to blackmail Ukraine, Ukraine stopped purchasing natural gas from Russia directly. Transit and other ties were cut (e.g. there are no direct air links between Russia and Ukraine since 2015) or severely curtailed. The continuous low-grade war in Eastern Ukraine was a security concern for many domestic and foreign businesses and made Ukraine less attractive for investment.

Although the post-2014 push to modernise and overcome the Soviet legacy was increasingly decelerating by the time Volodymyr Zelenskiy was elected president in 2019, Ukraine not only reconfirmed its strengths as an open, pro-democracy society but also underwent tectonic changes in its institutions, economy and society. For the first time in many years, Ukraine was set on a clear trend to lower corruption (see the chapter on anticorruption by Torbjörn Becker and co-authors). The public reached a consensus that the future of Ukraine lies with the European Union and joining the Union is the strategic goal for Ukraine. Visa-free travel to the European Union was instrumental not only in reinforcing the identity of Ukraine as a member of the European family but also in forging new alliances.

2 WAR LOSSES AND DAMAGES

The ongoing war has already resulted in massive loss of life, millions of destroyed families and homes, and enormous economic damages. We do not have the words to convey the pain inflicted by the war, but any socioeconomic indicator points to colossal costs.

After the full-scale invasion on 24 February 2022, Russia occupied over 120,000 km² at the peak of its offensive. After the counter-offensive in Kharkiv oblast in September and in Kherson in November, Ukraine regained over 12,000 km², so at the moment of writing Russia occupied about 18% of the country, although the Ukrainian forces are making some advances every day. Almost a fifth of the country (which is equal to around to a third of Germany) is certainly a lot not only in terms of land but also in terms of productive capacity and, most importantly, people. Facing abduction, deportation, torture and extrajudicial killing, millions of Ukrainians are under Russian occupation.⁶

As of September 2022, the Kyiv School of Economics estimates the damage to infrastructure at \$127 billion,⁷ with the majority of that attributable to housing (over 136,000 houses are damaged, destroyed or under occupation). The damage to industry is estimated at almost \$10 billion (412 enterprises damaged or destroyed) but indirect damage (foregone revenues) is much higher at \$30 billion. The World Bank (2022) estimates the cost of reconstruction at \$349 billion (as of 1 June 2022), noting that it will increase if the hostilities continue. Ukraine's GDP is projected to decline by 35% in 2022. The unemployment rate is over 30%.

The war has affected sectors and geographical areas very unevenly. The economy of Eastern Ukraine is largely destroyed (some of the largest steel mills were in Mariupol), while Western Ukraine is more lightly damaged. There is also major differentiation across production sectors. For example, Russian missiles destroyed all major oil refineries, but the IT sector remains strong (the number of vacancies there is similar to pre-war levels). This heterogenous impact of the war exacerbates mismatches in the labor market that existed before the war (see the chapter on the labour market by Giacomo Anastasia and co-authors).

The material estimates of damage do not take into account the enormous human cost of war. This war may have adverse demographic consequences for Ukraine comparable to the Great Famine of 1933 (Guzman 2022). There are not only more than 100,000 killed but also those injured and those whose health has because of lack of access to healthcare,

6 The exact number of people under occupation is unknown. In 2013, there were almost 2 million people in Crimea, 4.3 and 2.2 million in Donetsk and Luhansk oblasts (over 3 million lived in Donetsk and over 0.4 million in Luhansk cities respectively). At the end of 2021, Ukrainian statistical authority estimated that there were 4 million people in Donetsk oblast, 2.1 million in Luhansk oblast (including occupied territories), 1 million in Kherson oblast and 1.6 million in Zaporizhzhya oblast that are partially occupied as of September 2022. As of July, 2022 about 2 million people, of them several hundred thousand children, were deported to Russia (www.pravda.com.ua/news/2022/07/13/7357898/), with little opportunities to escape. In October Russia implemented forced "evacuation" of people from Kherson and oblast.

7 <https://kse.ua/about-the-school/news/the-total-amount-of-damage-caused-to-ukraine-s-infrastructure-is-more-than-127-billion-kse-institute-s-report-as-of-september-2022/>

basic amenities or even food and water. Psychological damage should not be neglected either; many people (and not only combatants) may have mental problems both during and after the war. Furthermore, the foregone schooling – in addition to COVID-19, when children could not receive proper education because of lockdowns – is another cost. Schools were either closed or moved to online teaching in the spring of 2022. Although offline schooling has restarted in safer regions, children need to go to bomb shelters quite often. In more dangerous regions they continue to study online (see the chapter on education by Martin Kahanec and co-authors).

Against this background of devastation, Ukrainians remain resilient if not optimistic. A recent survey⁸ shows that the share of people who would like their children to live in Ukraine has increased to 72% from 48% a year ago. Many Ukrainian refugees would like to return (81% hope to return to Ukraine some day, and 13% plan to return within the next three months, according to UNCHR 2022). Surveys of businesses (e.g. European Business Association surveys,⁹ Gradus, National Bank of Ukraine¹⁰) suggest stabilisation and even a modest recovery.

3 BASELINE SCENARIO

The Ukrainian government has stated its key objective in the war clearly: regain full control over the Ukrainian territory in the internationally recognised borders. This is the outcome supported by the vast majority of Ukrainians: 55% believe that Ukrainian victory should imply restoring Ukraine in its 1991 borders, 20% believe that the Russian army should be completely destroyed, and only about 20% consider some territorial concessions for Ukraine.¹¹ Although there is a chance of negotiated peace that delivers this result, this outcome will likely be secured by the Ukrainian armed forces with the support of Ukraine's allies. Ukraine also aspires to join the European Union and NATO to secure its democratic and peaceful future.

Consistent with these objectives, the baseline scenario for this book is as follows: the territorial integrity of Ukraine is restored, Ukraine has credible security guarantees, and Ukraine is on a path to join the European Union.

Obviously, there is significant uncertainty in the outlook and the ranges of outcomes are wide. For example, the war can result in the fragmentation of the Russian empire into several dozen states shaped by economic or ethnic factors (Kuzio 2022). It is unclear whether these states will lean towards a democratic model or an authoritarian one. On

8 https://gradus.app/documents/284/Future_Ukraine_Gradus_Research_UKR.pdf (in Ukrainian).

9 "Surveys of small businesses that participate in the Unlimit Ukraine project" second wave (<https://eba.com.ua/malyj-biznes-postupovo-povertayetsya-do-robot>), third wave (<https://eba.com.ua/vse-bilshe-msb-povertayetsya-do-roboty-na-tli-skorochnya-finansovyh-rezerviv>) and fourth wave (<https://eba.com.ua/kozhen-p-yatyj-msb-povidomlyaye-pro-vraty-vid-vijny-bilshe-100-tys-dolariv>), in Ukrainian.

10 <https://bank.gov.ua/en/statistic/nbusurvey>

11 <https://dif.org.ua/article/independence-day-of-ukraine-what-unites-ukrainians-and-how-we-see-victory-in-the-sixth-month-of-war>

the other hand, Russia may turn into ‘another North Korea’ with even more repression and state control over the economy. We do not cover these alternatives but we assume that the state(s) on the eastern border of Ukraine will remain hostile to Ukraine. In other words, future Ukraine may be similar to current Israel or South Korea security-wise. The threat of another invasion will shape a number of economic policies, ranging from the organisation of infrastructure, to rebuilding cities to the business environment to international trade. As a result of this threat, Ukraine will have to have strong armed forces and defence industry, as well as a fortified eastern border and limited movement of goods and people across it.

In any case, we are confident that Ukraine, supported by the countries that believe in the rules-based order, will win. Otherwise, we would not be writing this book.

4 RECONSTRUCTION AS A MULTI-LAYER PROCESS

As we discuss throughout this book, the reconstruction of Ukraine should be a transformation rather than rebuilding the country to its pre-war state. This deep modernisation should not only leapfrog business technologies and infrastructure but also radically upgrade institutions. This process will touch on nearly every element of the economy and society. Because the chapters of this volume will provide details for what this transformation will mean for specific sectors, we focus here on outlining the principles as well as a few tactical elements of this process.

As stated above, the ultimate goal of Ukraine’s transformation is a full EU and NATO membership. What does this imply? First of all, a **full-fledged democracy**. This is a foundation for all subsequent efforts and reforms. This principle – supported almost unanimously by Ukrainians¹² – implies continuation of empowering citizens and communities. In practical terms, this means more decentralisation, more competitive political environment, more independent media, and so on (see the chapter on governance by Tymofiy Mylovanov and Gerard Roland).

Second, **robust institutions** and low levels of corruption (see the chapter on corruption) are central to the long-term success of Ukraine. Previous accessions to the European Union provide a natural template for the many steps necessary to achieve this goal (see the chapter on EU integration by Pavlo Klimkin and Ivan Mikloš). However, the reconstruction of Ukraine offers unique opportunities to accelerate the transition from the post-Soviet legacy to a modern democracy. For example, a reconstruction agency (see the chapter on governance and the chapter on the design of aid by Barry Eichengreen and Vladyslav Rashkovan) can be the role model for good governance as well as a source

¹² According to a survey funded by the National Democratic Institute (2022), 94% of Ukrainians believe that it is important that Ukraine becomes a full-fledged democracy. A KIIS survey implemented at the end of October, showed that 86% of Ukrainians support continuation of Ukraine’s resistance to Russia (www.kiis.com.ua/?lang=ukr&cat=reports&id=1151).

of expertise and cadres for the Ukrainian public sector. Aligning Ukrainian law with that of the European Union will increase transparency and reduce corruption. Obviously, Ukraine's progress should be measured not only on how laws are passed but also on how these laws are implemented and enforced.

There are a number of reasons to be optimistic that Ukraine will succeed in reforming its institutions irreversibly. Accession to the European Union is a powerful stimulus to push through difficult trade-offs and vested interests. The 'rally around the flag' moment is strong and will likely persist. For example, the war has increased the share of people who support Ukraine's independence (now almost 100%) and reduced the number of people who speak Russian in their everyday lives (from 26% in December 2021 to 13% in August 2022).¹³ The Russian fifth column in Ukraine effectively disbanded and the Russian threat is likely to remain a consolidating factor. Millions of veterans and volunteers can inject fresh blood into Ukraine's political life, thus helping to abandon previous corrupt practices.

Third, a **strong economy** is critical not only for 'proving' that democracy can provide superior standards of living but also for supporting a large defence budget. Institutional reforms discussed above will be the prerequisite for economic development, but policies promoting international trade and foreign direct investment (see the chapter on trade and FDI), favourable business environment (see the chapter on the business environment by Yegor Grygorenko and Monika Schnitzer) and inclusive, resilient financial system (see the chapter on the financial sector by Ralph De Haas and Alexander Pivovarsky) will also be needed. For example, insurance against military risks – similar in spirit to the Multilateral Investment Guarantee Agency (MIGA) managed by the World Bank – will be essential for overcoming security concerns that domestic and foreign investors may have.

The chapters on the energy sector (by Tatyana Deryugina and co-authors), infrastructure (by Volodymyr Bilotkach and Marc Ivaldi) and urban development (by Richard Green and co-authors) discuss how Ukraine can construct a durable backbone for this new, modern economy. For example, development of renewables and introduction of energy efficient technologies (especially in residential buildings) can not only improve the environment but also reduce the dependence of Ukraine on Russia or any other supplier of energy. Building back better is the recurrent theme of reconstruction in these sectors.

Because human capital is a key asset for any modern economy, Ukraine will need to continue reforming its education system (see the respective chapter) to prioritise quality, develop skills and competencies rather than provide degrees, and compensate for lost years of schooling. The education system should become a part of a larger effort on labour reskilling (see the chapter on labour). To integrate into modern production chains and

13 https://ratinggroup.ua/research/ukraine/s_mnadcyate_zagalnonac_onalne_opituvannya_dentichn_st_patr_otizm_c_nnost_17-18_serpnia_2022.html

develop technological competitiveness, Ukraine will have to rethink the organisation and structure of its science sector so that it really becomes a source of new technologies for defense and businesses as well as data-based policies for the government (see the chapter on science and R&D by Yuliia Bezvershenko and Oleksiy Kolezhuk). Ukraine will also need to continue reform of its healthcare sector to not only improve the quality of life for millions of people but also create a stronger stimulus for investing in human capital (see the chapter on healthcare by Yuriy Dzhygyr and co-authors).

The chapters emphasise that Ukraine will have to go through a massive reallocation of resources. For example, the country's infrastructure (especially railways) will need to be adjusted to accommodate the redirection of flows of goods and people towards the European Union and away from Russia. The economic life in urban centres will likely shift towards cities closer to the European Union. Mismatch in the labour market entails large flows of workers across space, occupations and skills. To facilitate and accelerate this adjustment, Ukraine will need to liberalise economic activity further and remain open to the rest of the world. Indeed, the nascent trend for nearshoring/reshoring/friendshoring gives Ukraine an opportunity to integrate into the European Union's value chains. To fully utilise this opportunity, Ukraine (and the European Union) should reduce tariff and non-tariff barriers and streamline cross-border flows of resources and ideas (see the chapter on trade and FDI). In a similar spirit, a society open to immigration can help address problems with shortages of labor.

Fourth, a **strong defence sector** will be needed to protect Ukraine from possible Russian attacks. Recall that the security risk will likely be the main impediment to Ukraine's development and, ultimately, only Ukraine can defend itself from future aggression. Although today Ukraine largely relies on Western arms, it is capable of producing effective weaponry that already has shown impressive results during the full-scale war. Defence could also spur development of new technologies that can benefit the economy. More generally, Ukraine will need to build resilience to withstand future attacks.

These four factors are deeply intertwined. Neither democracy nor a strong economy is possible without institutions (e.g. a law enforcement system). A strong economy is needed to support a strong army so that the choice between 'guns and butter' is not as stark as it is today in Ukraine. And the army is needed to protect assets and people and thus encourage investment. This calls for a comprehensive, deep modernisation of the country.

5 THE SCARS OF THE WAR

It is clear that the Russian invasion will leave many scars on Ukraine's society and economy. While current discussions tend to focus on ruined infrastructure, the potential demographic catastrophe may be more crippling in the long run. For example, the share of people aged 65+ increased from 12% in the 1990s to 17.6% in early 2022. At the same time, the share of people younger than 18 has been about 18% for the last 15 years, down from a quarter in early 1990s. As many women and children have left Ukraine, these ratios have probably changed for the worse.

Returning to normal life will not be an easy process for millions of people. For instance, internally displaced people will need resources to find new lives or rebuild their homes if they choose to return to their original areas. Veterans and the injured will need targeted support addressing their specific needs (physical and psychological rehabilitation, reskilling). Developing inclusivity at all levels – from roads and buildings to education and media spheres – will be a part of this support. It will also help people who had disabilities before the war and generally make Ukrainian society more 'European'. Many children have lost their parents, and Ukraine will need to streamline adoption procedures and to continue the reform to replace childcare institutions with foster families. Perhaps the most complicated part of this work will be bringing back children who were illegally transferred to Russia. Ukraine has already started this work, but it needs international support to scale it up.

Taking care of these vulnerable groups will require a redesign of social and labour market policies. Social support of the state and communities should cover a broad spectrum of needs ranging from prosthetics, to rehabilitation, to education and to psychological support. Integration and inclusivity will become the focus of government policies for years to come.

6 THE COST AND FUNDING

The estimates of the reconstruction cost vary from \$349 billion (World Bank 2022) to \$1.1 trillion¹⁴ and the ultimate bill will not be known until the war is over (the government cannot assess human losses and economic damages on the territories now occupied by Russia, banks will need to do asset quality review, we need to know how many refugees will return to Ukraine, and so on). This is a staggering sum but it is commensurate with the scale of destruction and suffering as well as Ukraine's needs to invest heavily into physical and human capital (for example, the share of investment in GDP will likely need to stay at about 30%, compared to 15–18% pre-war). Raising this amount will be a challenge but Ukraine and its partners can rely on a variety of sources, ranging from

14 According to Werner Hoyer, president of the European Investment Bank EIB (www.bnnbloomberg.ca/ukraine-reconstruction-may-cost-1-1-trillion-eib-head-says-1.1781648).

frozen (and subsequently seized) Russian assets (and/or some form of reparations), to donor aid, to financing provided by multilateral institutions. It is equally important to ensure that the money is well spent. The chapter on the design of reconstruction aid focuses on this issue, but other chapters touch upon this matter too. Transparency, coordination, leadership, long-term planning and Ukrainian ownership are some of the key ingredients for the success of this effort.

It is also clear that public funds are not going to be enough to pay for the modernisation of the country, and hence, private investment will be critical. Public-private partnerships, concessions, subsidised 'war' insurance, and so on should incentivise foreign direct investment, technology transfer and cooperation between Ukrainian and foreign businesses and organisations. Although public funds will play a dominant role in the early stages of reconstruction when the focus is on humanitarian aid and restoring critical infrastructure, private funds should take over in the longer term. This phased approach will not only make Ukraine's reconstruction palatable to foreign taxpayers but also improve the allocation of resources in the long run.

To complete the reconstruction in the shortest possible time, it is better to start earlier. Certainly the best support for the reconstruction would be minimisation of damages. To do this, Ukraine needs more weapons delivered faster. Preserving the economy is equally important. For example, Ukraine needs external aid to cover the cost of the war. Direct aid to Ukrainian businesses (e.g. hiring Ukrainian workers remotely or helping Ukrainian firms enter the EU market) can help not only to keep the economy running but also to lay the groundwork for its recovery and integration into the European Union. Finally, institutional reforms can start already today (e.g. completing the judicial reform, training judges, continuing the civil service reform). Design of the reconstruction agency and selection of its staff can also start early.

7 BEYOND UKRAINE

The Russian invasion has upended the framework of European security and challenged the global rules-based order. Many institutions turned out to be unable or inadequate to address the threats and challenges. For example, the United Nations with the central role of the Security Council has been impotent in preventing or stopping the aggression. Tragically, Russia, currently a permanent member of the Security Council, is an aggressor not only violating the territorial integrity of a neighbour country but also threatening the rest of the world with nuclear strikes. Furthermore, Russian aggression undermines other cornerstones of global security, such as the non-proliferation of nuclear weapons.¹⁵

¹⁵ In 1994, Ukraine gave up its nuclear weapons (at the time, the third largest arsenal in the world) in exchange of assurances from the United States, United Kingdom and Russia (!) that they will protect the territorial integrity of Ukraine.

In a similar spirit, humanitarian organisations also turned not only to be ill-prepared but also to have poor oversight. For example, the Red Cross could not provide effective monitoring of prisoners of war in Russia and apparently there is nothing anybody can do about it. The decision-making model of the European Union proved slow and ineffective in nearly every arena, from imposing sanctions on Russia, to giving adequate and timely military and economic aid to Ukraine, to safeguarding the energy security of the Union. Russia's war on Ukraine has also made it abundantly clear that information warfare is no less dangerous than conventional warfare. And yet, the civilised world was unprepared to handle fakes and hatred on social media¹⁶ – a major source of information for many people – where Putin's propaganda workers are as dangerous as the founders and journalists of Thousand Hills Radio who incited genocide in Rwanda.

The scale of the deficiencies exposed by the war is well beyond Ukraine and calls for a concerted response. For example, if the global community is committed to preventing future wars, the security architecture must be reformed so that 'big' countries cannot invade 'small' countries, nuclear powers do not blackmail the rest of the world, and punishment for war crimes is inevitable irrespective of whether the perpetrators come from 'small' or 'big' countries. The European Union will need to rethink its place and role in the emerging global environment. It can no longer afford to be a pacifist club free-riding on American military might. Its key decisions cannot be held hostage to any member of the Union, especially members with autocratic regimes or members whose leadership is potentially compromised by aggressive foreign actors. We all cherish freedom of speech, but uncontrolled development of social media has proliferated disinformation, hate speech, superstitions and prejudices and at the same time deprived quality journalism of revenues. Where one should draw the line (e.g. disclosing the ultimate owners of accounts, improving media literacy, introducing a 'code of ethics' for social networks) is a central question for society.

These issues are beyond the scope of this book, but it is important to flag these problems. 'Business as usual' since the 'end of history' is not an option. We must solve problems today rather than postpone them to the future. Reshaping the global security architecture to ensure lasting peace (and this is possible only when a would-be aggressor is swiftly defeated and strongly punished) will not be an easy task; it will require a lot of strategic thinking, strengthening horizontal ties and taking on responsibility. Perhaps, the alliance of countries working on the reconstruction of Ukraine may form a new worldwide organisation – an alternative to the UN, which would be able to prevent wars rather than dealing with their consequences. The bravery of the Ukrainian people fighting for their freedom and democracy in the most difficult of conditions should inspire the world to be courageous in taking on these global challenges.

16 In Ukraine in 2020-2021 social media was already the primary source of news while TV was in fourth place (Fedosenko 2021).

8 CONCLUDING REMARKS

The aim of this book is to set a framework for Ukraine's post-war reconstruction. Despite the fog of war, preparation and planning can and should be done now so that reconstruction can commence on the first day of peace in Ukraine. In fact, some institutional reforms can start before the war ends to lay foundations for all subsequent reforms.

The reconstruction will be a monumental endeavor. No single book – including this book, which has 14 chapters on a broad range of issues and sectors – can offer an exhaustive account for every sphere and policy necessary for success. Obviously, there are many possible paths for reconstruction. Importantly, the Ukrainian government, with the participation of the Ukrainian people, should decide which way Ukraine will go. While deliberating future policies, the Ukrainian people and their allies should appreciate the scale of the damages, pre-war challenges, objectives and tools necessary to achieve these objectives. We hope that this book will be instrumental in making an informed decision about the structure, pace, goals, and funding for Ukraine's reconstruction.

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CHAPTER 1

Ukraine's EU integration

15

Pavlo Klimkin^a and Ivan Mikloš^b

^aCentre for National Resilience and Development; ^bStrategic Council for the Implementation of the Slovak Recovery and Resilience Plan

EXECUTIVE SUMMARY

Granting Ukraine EU candidate status signals that the EU is ready to take on a larger geopolitical role and rise to the challenges of the 21st century. It is also a recognition that Ukraine belongs in Europe, and not to the 'Russian space'. Both Ukraine and the EU had to undertake a lot of effort to reach this understanding. This effort, however, has its fruit. Ukraine is not starting its EU integration from zero; many reforms have been implemented under the Association Agreement and complementary agreements signed by the EU and Ukraine since 2014. However, there are no shortcuts for Ukraine either. Before joining the EU, the necessary legislation has to be not just adopted but also implemented. This requires strong and robust institutions, and the EU can help Ukraine develop such institutions. Transformation (rather than reconstruction) of Ukraine will be a process intertwined with Ukraine's EU integration, during which not only Ukraine but also the EU will change (for example, there are already discussions on changing EU decision-making mechanisms and some of its policies).

The experiences of 'new' EU member states show that countries that implemented reforms swiftly are currently better off than those which, like Ukraine, went through a very sluggish reform process. Thus, Ukraine needs to introduce the necessary reforms swiftly and make full use of the opportunity window opened by the war. The experience of Eastern European states also suggests that one benefit of EU integration, in the form of increased foreign direct investment, can be realised before Ukraine is formally admitted, since the mere process of integration makes a country more attractive for investment. For this, Ukraine should implement the needed reforms – first of all in its judiciary.

To be successful, these reforms should involve Ukrainian society so the new rules are not perceived as something 'imposed from above'. For this to be the case, major stakeholders (government, business, civil society) will need to understand the strategy for Ukraine's EU integration and specific milestones of that strategy. This strategy must be developed jointly by Ukraine and the EU.

1 INTRODUCTION

Granting Ukraine EU candidate status is a game-changer, and not just for the EU and Ukraine. It poses a number of fundamental questions. For example, how does one see and perceive the ‘Europe of the 21st century’ and its relations with other key players? For the first 20 years of the 21st century, the EU has been following the template of the 20th century. With all the discussions about forthcoming challenges, there was little or no appetite to embrace them. Predictability, risk aversion and manageability have been the EU’s guiding principles. The decision on Ukraine’s candidate status has become the ‘moment of truth’ for the EU. This was the choice between the EU becoming a geopolitical player and taking all the resulting risks and opportunities, or finally and ultimately degrading to just an economic union based on four freedoms. Granting Ukraine candidate status signals that the EU has chosen the first option – to become a geopolitical player. This implies that the EU is putting its credibility behind reshaping Europe and Eurasia.

The decision to grant Ukraine candidate status was unique in three main aspects.

- First, while granting candidate status to the Western Balkans was also geopolitical, driven by the suffering and tragedies of the Balkan war, this is the first time in EU history when such a decision has been made *during* a war and without even a widely accepted idea for the endgame. This decision is certainly more than just a reaction to the sense of sympathy and compassion among the citizens of the EU member states. Neither is it just a political signal of support during the war. The EU remembers only too well Russia’s efforts to prevent the signing of the Association Agreement in 2014. The widespread belief that only Ukraine’s potential NATO membership was a sensitive issue for Russia turned out to be completely wrong, but it required a full-scale war to change this belief. The EU has made the decision that was not only right from the moral point of view, but also maintained and developed the Union’s credibility. This credibility will be fundamentally damaged if Ukraine’s accession process stumbles because of Russia. The Russian war is an existential fight for Ukraine, and disruption of the EU accession process is a major goal of the war. From now on, countering this Russian intent will become a joint exercise for the EU and Ukraine.
- Second, the decision on candidacy signals that the EU no longer sees Ukraine as a post-Soviet country. Until now, the unwritten consensus was that post-Soviet countries, except for the Baltic states, could not become EU members. This was both for geopolitical reasons (not wanting to meddle in the Russian sphere of influence) and related to values (‘post-Soviet’ states were seen as mentally close to Russia and not ‘European’). In 2014 this unwritten consensus was questioned, but

it took the full-scale Russian war against Ukraine for the EU to abandon it. Any concept like 'common neighbourhood' does not make sense anymore, and no other concept of buffer states is feasible. The Maidan in 2014 and the war showed that Ukrainians are ready to sacrifice their lives for European values.

- Third, Ukraine is a big country by European standards, both in terms of territory and population. It would significantly change the political and economic balance within the EU. The discussion about changing the EU decision-making process had already started. It is possible, and even likely, that a new wave of enlargement would imply changing the EU's basic treaties. Moreover, it would lead to fundamental rethinking of relations between 'Old' and 'New' Europe as well as of these concepts themselves. In a similar spirit, the immense agricultural potential of Ukraine and the scale of its territory would question the functioning of the Common Agricultural Policy and EU Regional Policy. It is likely that these policies would have to be revised. The policies consume a major part of the EU budget, so any considerable adjustments to them are extremely sensitive.

These three major factors make Ukraine accession unique, and together they push this process into uncharted territory. The good news is that Ukraine has already done a lot of 'homework' towards the EU accession.

2 WHAT UKRAINE HAS DONE SO FAR FOR EU INTEGRATION

The history of Ukraine can be (and one day will be) written as the history of European integration of Ukraine. Here, we provide a short synopsis to place European integration into historical context and to understand not just *what* has been achieved but *why* it has been achieved.

In the first years of independence, an understanding of what European integration actually was and what it was for did not exist in Ukraine. The Ukrainian leadership fundamentally missed an opportunity to grasp the importance of getting closer to the EU. Relations with EU countries had been built, the work on the Partnership and Cooperation Agreement (PCA) had started. But the latter lacked any ambitions for Ukraine; it was a standard set of basic provisions mixing political declarations and a few sectoral issues.

No reform pressure has been triggered by the PCA, as more cooperation does not necessarily require more reforms. These agreements were very similar for Ukraine, Russia, Belarus and other post-Soviet countries. The EU wanted to legally accommodate new countries and to include some WTO-related provisions into the PCA, while the post-Soviet countries were still far from WTO (at that time, the General Agreement on Tariffs and Trade, or GATT) membership.

The Partnership and Cooperation Agreement between the EU and Ukraine was ready in 1994 and ratified in 1997. There was no hint of European integration in it. At the same time, the Central European countries were able to draft and sign Association Agreements, and a line was drawn between those that were considered 'European' and those that were considered 'post-Soviet'. Baltic countries went to the first group. Considering the Baltic states a part of 'Europe' was largely a geopolitical decision: a number of key EU countries wanted to have a string of relations with Russia over the head of Central Europe. On top of that, the Baltic states were politically and mentally much more ready and willing to start real reforms because they did not have any other choice after the breakup of the Soviet Union – getting rid of their dependency on Russia implied implementing swift and decisive reforms.

Amazingly, there was little discussion on this fundamental missed opportunity in Ukraine at the time. European integration as a chance to transform Ukraine was seen as either out of reach or as hurting ties with Russia. For the EU, it was a simple and comfortable solution to handle the post-Soviet space.

The benefit of concluding the PCA was getting the new institutional framework for EU–Ukraine relations, both at the political level – summits and PCA councils – and at the working 'bureaucratic' level. All that machinery had to be maintained, which triggered the creation of special units within Ukrainian ministries (departments in the Ministry of Foreign Affairs, Ministry of Justice and Ministry of Economy and smaller units in all other ministries). Small coordination units were created within the Secretariat of Cabinet of Ministers and the Presidential Administration. These units lacked any power to impact the politics and policies of Ukraine but were surprisingly effective in preparing dozens of new experts on the EU and on EU–Ukraine relations. These experts became the driving force for subsequent efforts.

After 2000, this nascent process of bringing the EU and Ukraine closer became bolder as Russia was trying to suffocate any hint of Ukraine's independent position. The Ministry of Foreign Affairs introduced the position of State Secretary for European Integration. Ukraine started discussing opening of the EU markets for some Ukrainian products, such as dairy products and honey. Within the Ministry of Justice, a special department in charge of adjusting Ukrainian legislation to the EU acquis was created. Those who worked on the EU–Ukraine agenda felt emboldened and supported in their efforts. Ukrainian civil society discovered the EU agenda and started actively working on it. All of this created a 'wind of change', a different social mood as many people started believing that EU accession was feasible, and suddenly a large-scale discussion on it developed in the active part of Ukrainian society. The Ukrainian leadership supported this 'wind of change', although half-heartedly as it wanted more independence from Russia but to continue to have access to cheap Russian resources. Russia's determination to keep Ukraine within its orbit culminated first in the stand-off around Russia's attempts to build a ground link from its territory to the Ukrainian island of Tuzla in 2003 and then in

the Orange Revolution, when Russia tried to set up a regime controlled under its control. Tuzla was the first attempt of Putin's Russia to show to Ukraine that the country was in Russia's sphere not only of influence but also of domination. Even modest steps towards policy diversification, let alone reorientation towards Europe, triggered a tough response.

Overall, the years 2000–2004 created a professional and institutional basis for further efforts towards Ukrainian EU integration. Good personal contacts were established, and many documents and reports in different fields fundamentally deepened the common understanding of the challenges and problems. Both sides started discussions on the lack of PCA potential and the necessity to start working on an Association-type agreement. Russian economic dominance was visible, but some EU investors started looking for opportunities in Ukraine. This created a flurry of Russian efforts to change the Ukrainian leadership at the time to a purely pro-Russian one, as well as comprehensive attempts to control the Ukrainian energy sector.

Russia wanted to keep Ukraine in its exclusive sphere of influence and tried to establish Viktor Yanukovich as the new pro-Russian president of Ukraine in 2004. Its attempt failed, opening the way for a new Ukrainian leadership. This created a unique chance to apply for EU membership and to introduce sweeping reforms. The former chance was missed and trust in successful reforms soon started to fade due to high levels of corruption and vested interests, lack of progress on law enforcement and the justice system. The EU dimension of Ukraine's policy was strengthened by creating the position of vice-prime minister on European integration, but otherwise there were few institutional changes. It was clear that the EU–Ukraine agenda would need to be radically changed politically and legally to adhere to the expectations of Ukrainians. The key priorities for Ukraine were to establish a new basis for EU–Ukraine relations, gain better access to the EU market and to start working on a visa-free regime. The answer to this was two-fold. First, the EU and Ukraine decided to start working on the Association Agreement to replace the outdated PCA (the work on Association Agreements for Moldova and Georgia started at the same time).

The second answer was to launch the development of a new political framework for Eastern Europe. As a result, the European Neighbourhood Policy was split into two dimensions: Southern and Eastern, with the latter named the Eastern Partnership (EaP). Poland and Sweden were the main drivers of this approach. The Eastern Partnership was aimed at making a 'European' twist and a very light integration approach, while the Southern approach was purely focused on neighbourhood goals.

The Association Agreement negotiations created a new momentum in Ukraine. First, they required Ukrainian experts to study the EU *acquis* and assess the probable impact on Ukraine. Implementation of this task created a completely different depth of knowledge of EU law and brought the discussions and projects within civil society to a new level. The most innovative idea proposed by Ukraine was to include into the Association Agreement text a legally binding obligation to approximate Ukrainian

legislation to that of the EU. This was done via special annexes to every section citing the legal pieces and timing of their implementation. This approach was different from the previous Association Agreements. The idea was to get Ukraine as close as possible to the EU and its four freedoms, which was hard for the EU to accept politically at that time.

Even before the negotiations on the Agreement were finalised, the EU and Ukraine decided to start working on a so-called Association Agenda – a politically, but not legally, binding document. The idea was to begin the implementation of the already provisionally agreed clauses in the Association Agreement draft before its formal signing and entry into force. The idea proved to be remarkably effective as it helped to launch the incorporation of the EU *acquis* into the Ukrainian legislation, albeit on a limited scale.

The negotiations were wrapped up in 2012 and the Association Agreement was initiated but not signed because of pressure and outright blackmail by Russia. The final Agreement text was a compromise between the pro-European forces in Ukraine, who wanted ‘more integration’, and the EU, which wanted to maintain a vague and non-binding approach to integration. Thus, the Association Agreement had a different meaning for everybody involved. For the EU, it was a way to gradually change Ukraine, to ‘make it better’, more transparent, rules-based and more ‘Europe-compatible’. For the pro-European forces in Ukraine, it was a potentially powerful tool to get closer to the EU and for the Ukrainian leadership at the time to balance Russian attempts to subjugate Ukraine politically and economically. The latter reason allowed the level of ambitions to approximate the EU *acquis* to be raised to the maximum possible extent under the given political conditions.

It was clear to Russia that Ukraine adopting EU rules, even on a limited scale, posed a fundamental threat for the Kremlin of letting the country out of its sphere of influence. The Revolution of Dignity (also known as the Euromaidan) in 2013–2014 came as a reaction to the Association Agreement not being signed and, in a broader perspective, to sliding towards Russia. After the Revolution, the Association Agreement was signed, which created a new reality for European integration. Real momentum and a new sense of purpose were built by efforts to establish a visa-free regime between the EU and Ukraine. First, having four batches of clear-cut benchmarks was inspiring. Second, the system of checking whether they were achieved through targeted EU missions was very effective. Third, the whole process was about building trust between the EU and Ukraine’s institutions. Finally, the political and societal significance of obtaining visa-free travel was crucial and built positive pressure to be results-oriented. The joint work on the visa-free regime remains an example of good interaction and coordination.

Apart from a very specifically defined goal, the visa-free regime was focused on horizontal issues such as law-enforcement reforms and infrastructure for fighting corruption, including the National Anticorruption Bureau and the National Agency on Corruption Prevention. The latter had become a game-changer for Ukraine and Ukrainian society as

the real scale of assets owned by politicians became clear. Since 2015, tackling corruption has become a major issue on Ukraine's political agenda. The key goal was to start building trust between the EU and Ukraine's institutions, in which fighting corruption was the most significant factor.

One of the critical areas in the Association Agreement is the Deep and Comprehensive Free Trade Agreement (DCFTA). Since 2014, EU has become Ukraine's major trading partner, accounting for 48% of Ukraine's trade in goods in 2022.¹ On 4 June 2022, the EU cancelled all trade barriers (tariff, quotas, etc.) outlined in Annex 1 to the Association Agreement. It also froze all antidumping and other trade investigations.² The decision was taken for one year against the backdrop of the unique circumstances of the Russian war and will certainly help improve Ukraine's economic resilience and access to the EU Common Market.

On the eve of the full-scale invasion, at midnight of 24 February 2022, the Ukrainian electricity system was decoupled from Russia and Belarus and started functioning in testing mode jointly with the EU system. Despite all the challenges, it proved to be very resilient. On 16 March 2022, the Ukrainian and Moldavian electricity systems were synchronised in emergency mode with that of the EU. For permanent functioning a number of measures still should be undertaken, and some of these will be difficult to perform during the war. Nevertheless, the parallel functioning is stable and critical for maintain the resilience of the Ukrainian system. It is a great example of how critical moves can be made under emergency conditions and how the war had pushed for deeper and more profound integration.

Another critical area is transport. Ukraine joined the Trans-European Transport Network (TEN-T) programme in 2017. Under this programme, the development of transport corridors is structured in two batches: short-term until 2030, and long-term until 2050. On 29 July 2022 in Lyon, the EU and Ukraine decided to upgrade the TEN-T transport maps in order to adjust them to war-time needs and to match the accession process. At the same time, Russian and Belarusian routes were reconsidered and downgraded, which is also a fundamental change in the EU position.

The Cabinet of Ministers estimates³ that Association Agreement is 70% implemented based on the adopted and enacted legislation foreseen by the Agreement. However, to determine the actual level of implementation, a detailed and meticulous audit is needed in every sphere. At the moment the European Commission is working on the overall audit, but more detailed sectoral audits will certainly be needed.

1 First six months of 2022, National Bank of Ukraine data (see <https://bank.gov.ua/ua/statistic/sector-external>).

2 https://export.gov.ua/news/3876-ies_skasuvav_mita_na_ukrainski_tovari

3 As reported by the vice-prime minister on EU integration (see www.ukrinform.net/rubric-politics/3555222-ukraine-fulfilled-70-of-its-obligations-under-association-agreement-with-eu-stefanishyna.html).

During the Association Agreement implementation, Ukraine kept coming up with ideas to broaden the scope of approximation. The Agreement contains a clause allowing the Association Council to decide on changing the scope of approximation. One of the most striking examples is the Ukrainian idea to gradually implement all EU legislation in the gas sphere by changing Annex XXVII of the Agreement as the only effective opportunity to make the Ukrainian gas transit system an indispensable part of the European network.

Although Ukrainian achievements on the path towards European integration can be described as uneven across different spheres, politically, economically, institutionally and legally Ukraine has come close to the point where further progress can be only incremental without changing the framework of relations with the EU to a fully integrational mode. Candidate status is exactly this kind of opportunity. It should create a new driving force for sweeping rather than evolutionary reforms. Recovery and the EU accession taken together should trigger massive and unprecedented transformation of Ukraine. The 'build back better' principle for post-war reconstruction creates the basis for this transformation.

To put Ukraine's integration into a historical perspective, we now review the experience of Eastern European countries. This exercise not only highlights political and economic difficulties and benefits of the integration process, but also provides a number of useful lessons for the structure of the integration process.

3 REFORMS AND INTEGRATION: TWO SIDES OF THE SAME COIN

Three decades of post-communist transition in the countries of Central and Eastern Europe have confirmed that progress in systemic reforms and Euro-Atlantic integration have been crucial to the success of post-communist transformation. These two processes were and are strongly interlinked, mutually conditional, complementary and mutually supportive.

It is Ukraine and its comparison with the reforms and integration of other comparable countries (in particular, Poland, the Baltic countries and Slovakia, but also Bulgaria and Romania) that best confirms this. In principle, without political and economic reforms, not only is accession to the EU impossible, but also the start of the integration process. It is the people's desire for the prospect of EU accession that creates strong incentives for politicians to push for the necessary reforms, despite the political costs and risks involved.

Countries that had already decided to apply for EU⁴ membership in the early (or during the first half of the) 1990s had then defined relatively clear reform goals. These guided them in the difficult process of post-communist transition to implement the necessary reforms in building the institutional framework of parliamentary democracy and a functioning market economy.

In contrast, Ukraine (and the other countries that remained part of the Commonwealth of Independent States) did not have these goals and this integration anchor. This was one of the reasons (though not the only one) why reforms were absent in Ukraine and why a distorted, corrupt oligarchic system emerged during the 1990s, in which the oligarchs captured the state and buried attempts at reform and EU integration. The most famous example of such a failed attempt was the fate of the Orange Revolution in 2004. What were the other reasons?

3.1 Three models of post-communist transition and the impact of European integration

Although the reasons for the different success rates of post-communist economic developments are very diverse and difficult to quantify, in principle we can say that geography and history have played a key role. Countries that were geographically closer to the advanced Western countries with market economies were more successful at reform and integration. Equally, the longer a country had a deformed political system (especially communism) and the shorter its historical experience of democracy and a market economy, the slower and more unsuccessful the reform and integration process has been. Geography and history are of course also related to religion, cultural and civilisational values, informal rules, trust among people, effectiveness of institutions, education, existence of elites, interest in public affairs, and many other aspects and preconditions for a successful post-communist transformation.

The relationship between democracy and post-communist reform progress is also interesting. Although in the early 1990s it might have seemed (and indeed many observers feared) that democracy would make a successful transformation impossible because of the political costs of the inevitable transition recession and people's fear of uncertainty and new conditions, the opposite turned out to be true. The most democratic post-communist countries are also the most successful. European integration has played a significant role here.

4 The European Agreements, which set the framework for trade liberalisation between the EU and post-communist countries, were concluded by the mid-1990s by ten countries that later joined the EU either in the first wave of enlargement in 2004 (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia) or in the second wave in 2007 (Bulgaria and Romania).

Political economy usually distinguishes between two basic approaches to post-communist economic transformation: a ‘radical approach’ (which its opponents have referred to as shock therapy) and a ‘gradual approach’. Ever since the fall of communism, there have been heated political as well as academic debates about which one is better and more appropriate. The Polish reforms led by Leszek Balcerowicz were a typical example of the radical approach, while gradualism was associated with the Hungarian post-communist transformation. Today, the data suggest that “...a strategy of rapid, multifaceted and simultaneous reforms worked much better than a slow reform process” and that “in general, the rapid pace of reforms led to less, not more, economic disruption” (Treisman 2014). However, the problem is that this bipolar division is too simplistic. It does not capture the nature of the different starting conditions, or the role the will of the countries to integrate into the EU played in the transition process.

In our opinion,⁵ there are not two but three basic models of post-communist transformation: radical, gradual and spontaneous. The spontaneous model is a subset of the gradual model, but such an important and specific subset that it requires special attention, especially in the context of the European integration of Ukraine (and other candidate countries).

The gradual model of transformation has been successful in only two countries – Hungary and Slovenia. Elsewhere it has led to failure, which has been reversed in some countries (Bulgaria, Romania, and partly Slovakia), mainly thanks to their integration into the EU.

The specific conditions in Hungary and Slovenia existed because partial market reforms had already been in place for at least two decades before the fall of communism. These created a somewhat hybrid system of a partially planned, centrally controlled economy, but with relatively strong elements of a market economy. In both countries, opportunities for gradual transformation had been building for many years before the fall of communism. Slovenia was the smallest and most economically advanced part of Yugoslavia, which for decades had pursued a relatively liberal political and economic model with independence from Moscow. Moreover, Slovenia is a small country and neighbours Italy and Austria. Unlike all other parts of the former Yugoslavia, it was not marked and hampered by the military conflict after the break-up of the country.

The same was essentially true for Hungary. The communist regime had been relatively liberal and open since the late 1960s. There was a relatively strong small and medium-sized business sector, central planning was not binding but only indicative, and, most importantly, Hungary had been gradually introducing several market economy institutions since the late 1960s. In other words, there were some reforms that Slovenia

5 For more details, see Miklos (2021).

and Hungary did not have to after the fall of communism because they had already made them long before, under the communist regime. A comparison of the extent of differences in the timing of reform measures in Hungary and Czechoslovakia in Table 1 clearly illustrates this.

TABLE 1 CHRONOLOGY OF REFORMS IN HUNGARY AND CZECHOSLOVAKIA

Reform measure	Hungary	Czechoslovakia
Abolition of binding plans	1968	1990
Abolition of central rationing (quotas)	1968	1990
First steps towards price liberalisation	1968	1991
Unified exchange rate	1981	1991
Accession to the World Bank and the IMF	1982	1990
Private enterprises	1982	1991
Bankruptcy Act	1982	1992
Two-tier banking system	1987	1990
New income tax system	1988	1993
New value added tax system	1988	1991
Commercial Code	1989	1991
Liberalisation of foreign trade	1989	1991
Unemployment benefit system	1989	1991

Source: Kornai (1996), cited by Zidek (2017).

After the fall of communism, the old political-economic institutional framework broke down quickly. Formal rules based on the leading role of the Communist Party; on a command economy and central fixing of prices, production, investment, consumption and credit; on the absence of political and economic freedom; on the absence of political and economic competition; on the absence of private property and entrepreneurship – all this suddenly ceased to be valid in a matter of days and weeks.

Thus, the old system collapsed and a new one did not exist. Quite logically, an institutional vacuum was created.

All other post-communist countries⁶ (except Hungary and Slovenia) had only two realistic alternatives after the fall of communism: either a rapid and radical or a spontaneous transformation. Indeed, without the rapid establishment of a new institutional framework, chaos, macroeconomic instability, high inflation, and the absence of any rules – i.e. spontaneous transformation – quite logically ensued. Ukraine was a textbook example of such a development.⁷ People from the former communist nomenclature

⁶ And apart from the rest of Yugoslavia, where, except for Slovenia, the war was happening.

⁷ For more details see Miklos and Kukhta (2019).

(especially the ‘red directors’ of large state-owned enterprises), the communist secret police and organised crime gradually gained economic and then political power. They carried out a textbook capture of the state (Hellman 1998) and made real reforms, and hence the country’s integration into the EU, impossible.

3.2 Poland, Romania and Bulgaria versus Ukraine

Poland launched radical reform under the leadership of Leszek Balcerowicz from the early 1990s. This consisted of opening the economy, price liberalisation, currency devaluation coupled with internal convertibility, and a restrictive monetary and budgetary policy to tame inflation once price liberalisation was launched. Another stated priority was privatisation.⁸

In Bulgaria, Romania and Ukraine, the early 1990s were associated with a very similar spontaneous course of reforms. The old system had collapsed and a new one was not explicitly created by the government and parliament, so it started to emerge spontaneously. This difference is best illustrated by the way in which the countries in question handled inflation in the first half of the 1990s. While in Poland inflation was⁹ 208.6% (in the Czech Republic, only 103.4%), in Bulgaria it was 647%, in Romania 805.7% and in Ukraine 7,303%. Similar differences in favour of the radical reform model can be found when comparing the rate of economic growth (or decline) after the fall of communism.

Table 2 shows inflation for the first twelve years of reforms in each of the three transition models.

TABLE 2 AVERAGE AND MAXIMUM ANNUAL INFLATION RATES, 1991-2002

	Gradual transformation		Radical transformation		Spontaneous transformation			
	Avg.	Max.		Avg.	Max.	Avg.	Max.	
Slovenia	12.3%	32%	Czech Rep.	6.6%	11%	Romania	99.8%	256%
Hungary	18.1%	34%	Slovakia	8.3%	13%	Bulgaria	155.9%	1,058%
			Lithuania	17.1%	72%	Russia	161.4%	875%
			Latvia	19.2%	91%	Moldova	235.0%	1,308%
			Poland	22.3%	45%	Belarus	531.6%	2,220%
			Estonia	22.5%	90%	Ukraine	696.3%	4,735%
<i>Average</i>	<i>15.2%</i>	<i>33%</i>	<i>Average</i>	<i>16.0%</i>	<i>53.7%</i>	<i>Average</i>	<i>196.7%</i>	<i>1742%</i>

Note: the first number is average inflation, the second number is maximum inflation.

Source: UN Economic Commission for Europe (2004).

8 A very similar transformation model was launched in Czechoslovakia under the leadership of Vaclav Klaus from the beginning of 1991.

9 Sum of annual inflation rates for 1991 to 1995 (source: EBRD).

In the gradual and radical transformation countries, average and peak inflation were very similar and not very high. In the spontaneous transformation countries, average inflation was twelve times higher in 1991–2002 and the highest inflation was on average 52 times higher than in the gradual transformation countries, and 33 times higher than in the radical transformation countries.

Despite all the above, Romania and Bulgaria managed to escape the trap of spontaneous transformation more or less successfully (Romania more so than Bulgaria; see Table 3). The EU accession process, which was successfully completed for these two countries in 2007, was a major factor.

TABLE 3 GDP PER CAPITA IN PURCHASING POWER PARITY, 1992 AND 2021 (%)

	1992	2021
Ukraine	100	100
Bulgaria	105	188
Romania	68,5	249
Poland	93,9	264

Source: World Bank (data.worldbank.org).

3.3 The specific example of Slovakia

Slovakia's reform and integration story can be instructive and inspiring for Ukraine for several reasons. After the fall of communism, Slovakia was a part of Czechoslovakia and enjoyed the successful radical reforms launched in early 1991 under the leadership of Vaclav Klaus. We assume that if Slovakia had welcomed the fall of communism as an independent country, the reform process would most likely have been spontaneous and similar to that of Bulgaria, rather than Poland. This was due to the absence of ready and committed reform leaders, which was another prerequisite for successful radical reforms immediately after the fall of communism and one of the important reasons for spontaneous transformation in other countries, including Ukraine.

Between 1992 and 1998, Slovakia was ruled by the populist and anti-reform government of Vladimir Meciar, which not only led to the division of Czechoslovakia from 1 January 1993, but also to a halt in reforms, an increase in corruption and isolation of the country, and ultimately to Slovakia's exclusion from accession negotiations to join the EU, NATO and the OECD. Slovakia was considered at that time (along with Lukashenko's Belarus and Milosevic's Yugoslavia) as an example of illiberal democracy in Europe.

Slovakia submitted its application to join the EU in 1995. In its opinion of July 1997, the European Commission concluded that Slovakia did not meet the political criteria set by the Copenhagen European Council in 1993 (the ‘Copenhagen criteria’). Based on this assessment, the European Council then decided at its meeting in Luxembourg in December 1997 to exclude Slovakia from opening accession negotiations.¹⁰ Slovakia thus dropped out of the common integration efforts of the Vyshegrad Group (the ‘V4’), not only as far as the EU is concerned but also as far as NATO is concerned.¹¹

The then Prime Minister Meciar reacted to this development by saying that if the West did not want Slovakia, it would turn to the East. This threat mobilised all democratic, reformist and pro-Western political parties and civil society. In autumn 1998, although Meciar won the election, he was unable to form a government because he remained isolated. A new broad coalition was formed by nine political parties of different ideological orientations. However, they were all united by the priority of erasing the ‘integration deficit’ and, above all, of Slovakia’s accession to the EU together with its V4 neighbours. Brussels reacted to the Slovak election results by offering to set up a high-level working group to prepare the relaunch of the EU accession preparation process. The new government accepted this offer, launched the necessary reforms and took measures for macroeconomic stabilisation. Subsequently, in December 1999 the European Council in Helsinki invited Slovakia to join the accession negotiations. Slovakia thus had lost two years, but the new broad coalition government of Mikulas Dzurinda managed to erase this ‘integration deficit’ and Slovakia joined the EU on 1 May 2004 together with the other V4 countries, the Baltic countries, Slovenia, Cyprus and Malta.

Slovakia has not only caught up with the other V4 countries in integration, but since 1 January 2009 it has been the only country of this grouping to join the euro area.

This turnaround was made possible by the fact that the two governments of Mikulas Dzurinda in 1998–2006 showed a very strong will and courage for reform an integration. Dzurinda’s first government (1998–2002) was concerned with closing the euro integration gap and the reforms that were a prerequisite to do so. The second government (2002–2006) carried out reforms which were not necessary from the point of view of EU accession, but which led to a fundamental change in the country’s image, brought in a lot of foreign direct investment, kick-started high growth and rapid catching-up with the developed countries, and ultimately enabled Slovakia’s entry into the euro area.¹²

Slovakia managed to fundamentally change its image in a relatively short time. While in 1997 the country was still considered a “black hole of Europe” (Madeleine Albright),¹³ in 2004 it was declared the most reformed country in the world by the World Bank and began to be referred to by the world media as the ‘Tatra tiger’.

10 Negotiations have been opened with the Czech Republic, Hungary, Poland, Slovenia, Estonia and Cyprus.

11 The other V4 countries (Czech Republic, Poland and Hungary) joined NATO in 1999, Slovakia only in 2004.

12 For a more detailed account of the Slovak reform story, see Miklos (2014).

13 www.economist.com/europe/2010/05/20/another-direction

European integration has played a crucial role in this success story. The state of the economy and society inherited in 1998 from the Meciar governments was desperate and many of the reform measures were unpopular and politically risky. Moreover, there were nine political parties in the coalition, the second strongest being the former Communist Party, which opposed any unpopular but also pro-market reforms. Moreover, there were natural divisions between the conservative and liberal parties, as well as between the Slovak and Hungarian parties. Prime Minister Dzurinda was able to stabilise and moderate all these problems, contradictions and pressures, and under his leadership the coalition was able to push through all the necessary reforms and maintain the government for two particular reasons. The first was Dzurinda's undisputed political leadership skills. The second, even more important, was the widely perceived priority (not only by coalition politicians, but also by their voters) to make up for the integration deficit and join the EU together with the country's Czech, Hungarian and Polish neighbours. Without this integration anchor, it would not only have been impossible to make all the necessary reforms, but also to keep such a broad and diverse coalition together for the whole term of office.

3.4 Integration and reform, trade and investment

In principle, there is a correlation between reforms, integration, trade and investment. The more reforms, the faster the integration; the more integration, the more trade and investment. But the reverse is also true. The greater and closer the trade relations and the more investment that comes from the old EU member states to those that are applying for membership, the more guaranteed is the success of integration. This can be seen very clearly in the ten Central and Eastern European countries (the 'CEE10' countries) that joined the EU in the first (2004) and second (2007) waves.

Crucially, although the EU¹⁴ was not able and ready to quickly accept the new post-communist countries as members after the fall of communism, it opened up to them through trade and investment. Bilateral agreements between the EU and individual countries (the European Agreements) provided the rules for trade liberalisation right from the early 1990s.¹⁵

While these European Agreements did not explicitly promise future EU membership, they created a framework for ever closer economic cooperation and thus also implicitly led to an acceleration of integration. This was already evident in June 1993, when the EU summit in Copenhagen offered the associated countries of Central and Eastern

14 At that time, the European Community.

15 Agreements with Czechoslovakia, Hungary and Poland had already been signed in December 1991. By the mid-1990s, all CEE10 countries that joined the EU in the first and second waves of enlargement had signed such agreements.

Europe the prospect of membership and defined its conditions,¹⁶ without setting specific dates. However, it was clear that the economic conditions for accession in particular (a functioning market economy and resistance to competitive pressures within the EU) could not be met without trade and investment interconnectivity.

This trade openness towards the EU is also linked to a wider openness towards the rest of the world. It is no coincidence that countries that have not rapidly liberalised their trade with the EU have also been slow to join the WTO. While most CEE10 countries joined the WTO in 1995–1999,¹⁷ other transition countries did so much later (Ukraine in 2008 and Russia in 2012).

Thus, the linking of EU markets with those of the CEE10 countries started immediately after the fall of communism. The countries that were not stuck in spontaneous transformation and either were able to successfully implement a radical reform model¹⁸ or had the prerequisites for a successful gradual model of reforms¹⁹ were the fastest. As Gros and Steinherr (2004) point out, the reorientation of foreign trade towards the advanced Western economies, and especially towards the EU, started in the successful post-communist countries immediately after the fall of communism. Moreover, the overall volume of this trade, i.e. the economic openness of the transition countries, increased significantly.

As Gros (2014) notes, “countries that did not conclude European Agreements were at a disadvantage. This aspect of the European Agreements was ultimately decisive and led to significantly different development paths”. Such countries included Ukraine, and the facts show that “the Eurasian Union promoted by Russia will never be able to rival the EU in trade integration. Russia has simply not integrated itself into the global value chain and therefore cannot offer this integration to its neighbours.”

Besides the volume and geographical structure of foreign trade, its material structure is even more important, particularly the share of exports of finished products (especially those with higher value added) and exports of raw materials and supplies. As reported by Francois and Worz (2011), between 1995 and 2007, CEE10 exports increased by 440%, well above the world average growth rate (175%). Such growth would not have been possible without structural and qualitative changes in exports, which in turn would not have been possible without significant growth in FDI.

16 There are three conditions. The first is to ensure the stability of institutions guaranteeing democracy, the rule of law, respect for human rights and the protection of national minorities. The second is the establishment of a functioning market economy and the ability to withstand competitive pressures and market forces within the EU. The third is the ability to assume the obligations of membership, including adherence to the objectives of political, economic, and monetary union. At its Madrid Summit in December 1995, the European Council extended the Copenhagen criteria to include the obligation to ensure the establishment of the necessary administrative capacity for the implementation of the *acquis*.

17 Except for Lithuania, which joined in 2001.

18 Poland, Czechoslovakia and the Baltic countries.

19 Hungary and Slovenia.

Investment²⁰ is a crucial prerequisite for success, especially in the case of post-communist countries, which suffer from underinvestment, an outdated economic structure (especially industry) and a lack of private and public investment resources of their own. At the same time, they usually have the potential of a relatively well-educated, skilled and cheap labour force, so that such countries offer very lucrative mutually beneficial conditions for FDI. However, this is only if at least relatively standard conditions for the protection of property rights, the quality of public services and the business environment are in place. This, again, is linked to reforms and integration.

Empirical evidence suggests that a rate of investment in fixed capital in excess of 25% of GDP is a necessary (though not sufficient) precondition for high and sustainable economic growth (Sharma 2016).²¹ The fixed capital investment rate²² in Ukraine averaged 15.9% of GDP over 2016–2020, with GDP reaching €136.2 billion in 2020. This implies a need to increase investment in fixed capital by about €13 billion or more per year. This is a large sum and there are three potential sources, but two of them (public investment and domestic private commercial sources) were already limited in the pre-war period. In times of war or post-war reconstruction, they will be even more limited. Official grants and loans from the allies, the EU and the international financial institutions could cover the resources that will be lacking as a result of the war, but they will not cover the investment gap that already existed before the war, which can only be covered relatively swiftly by foreign direct investment. However, these will depend on real progress in integration and reforms.

An analysis of the benefits of EU integration for the new member states shows two important things from which Ukraine could benefit significantly in the future. First, the benefits of EU membership for the new countries have started to materialise in advance, i.e. before formal accession to the Union (Campos et al. 2014). The second piece of good news for Ukraine could be that the worse the country's initial conditions, the greater the benefits of integration.

3.5 Developments in Ukraine after the Revolution of Dignity: Integration and reform fiasco or success?

Considering all the above, it is evident that until 2014 Ukraine was a textbook example of spontaneous transformation. It produced a dysfunctional, corrupt oligarchic system, albeit with a strong non-governmental sector and an essentially pluralistic democratic political system, but one that was distorted by oligarchs and corruption.

20 More specifically, foreign direct investment.

21 This is a growth rate of around 6% on average and over at least ten years.

22 According to data from the European Commission in its assessment of Ukraine's application for candidate status.

Since 2014, however, there has been a fundamental change. For the first time, the country has really started to make the necessary reforms and has begun to work in earnest on the EU accession process. The most important factor was Russia's annexation of Crimea and occupation of eastern Ukraine convincing the majority of the previously pro-Russian part of the Ukrainian public that the only real alternative and a necessary condition for a decent life (if not for themselves, at least for their children and grandchildren) was the country's Euro-Atlantic integration. Following the unleashing of a full-scale criminal war against Ukraine by the Putin regime, support for the country's Euro-Atlantic orientation is even stronger today.²³

Ukraine made many necessary reforms between 2014 and 2022 and has made significant progress in implementing the EU-Ukraine Agreements.²⁴ There are areas where major positive changes have been made, but there are still important sectors and areas where problems and old orders remain. From 2014 until the outbreak of the war, Ukraine was changing in the right direction and was transforming into a functioning market economy.²⁵ There also has been clear and visible progress in meeting the Copenhagen criteria, as demonstrated by the fact that Ukraine (and Moldova) have been granted candidate country status. The positive opinion²⁶ of the European Commission on Ukraine's application for candidate status speaks volumes about the (largely) positive results of the implementation of the EU-Ukraine Agreements, including the implementation of many chapters of EU Community law. Unlike the CEE10 countries, Ukraine had already started implementing individual chapters of Community law before the official start of accession negotiations and before the granting of candidate status.

Thus, reform and integration progress after 2014 has clearly taken place, which has manifested quite significantly in the geographical reorientation of Ukrainian trade, but very little in the inflow of investments, restructuring and modernisation of the Ukrainian economy, growth in the export performance of the industry or economic growth and real convergence.

The logical questions are: if the reform and integration progress is so significant, how is it possible that Ukraine has not benefited more from the process so far (before the war, between 2014 and 2021) and has not emulated the CEE10 countries, which already benefited from this process before joining the EU? And how is it possible that, despite a very low starting economic level and obviously high untapped potential, reform and integration progress has not resulted in greater economic growth? The answer to this question is very important. It will allow us to identify bottlenecks and threats to be avoided, mistakes to be learned from, but also opportunities to be seized.

23 According to a survey in September 2022, 86% of Ukrainians support joining the EU and 83% support joining NATO (see https://ratinggroup.ua/en/research/ukraine/dinam_ka_zovn_shno-pol_tichnih_nastro_v_naselennya_1-2_zhovtnya_2022.html).

24 Association Agreement and Deep and Comprehensive Free Trade Agreement (AA and DCFTA).

25 For more details see Miklos and Kukhta (2019).

26 https://neighbourhood-enlargement.ec.europa.eu/opinion-ukraines-application-membership-european-union_en

Among the reasons for the insufficient (or at least inadequate) real effect of reform and integration progress are the worse external and internal conditions in Ukraine after 2014 compared to the CEE10 countries in the 1990s and the 2000s. The external ones are mainly related to the decline in integration appetite in the old member states. This is linked to their own internal problems and threats, as well as to disappointment with developments in some of the new member states (especially Hungary, but also Poland, Bulgaria and Romania). To this must be added the influence of social media in spreading discontent, scepticism, disinformation and so on. Moreover, Ukraine (unlike the CEE10 countries in the 1990s and 2000s) did not have a clear promise of membership until June 2022.

Ukraine's internal difficulties were in turn due to the conflict with Russia in the east of the country, as well as the depth of inherited problems and distortions.

Yet, Ukraine was already receiving significant financial, technical, expert as well as humanitarian assistance and support from Western allies, international financial institutions and the EU before the full-scale war between 2014 and 2021 (Mathernova 2019).

The biggest subjective reason for the lack of reform progress is that many more reforms should and could have been made. Also, those that were made were often pushed through by Western partners under the threat of withholding financial assistance. The most effective instrument throughout this period was the threat of default. If the International Monetary Fund (and subsequently other international institutions) suspended the programme and cooperation with Ukraine, default would be a real threat. The lack of ownership of the reforms by the Ukrainian political leadership has not become a thing of the past after 2014, or even now,²⁷ although progress compared to the past is evident.

The greatest weakness of the reform and integration efforts after 2014 so far is in law enforcement, the judiciary, law enforcement agencies, the fight against corruption and the limitation of the influence of oligarchs. Nothing demonstrates this better than the fact that the European Commission's overwhelmingly positive opinion on Ukraine's application for candidate status contains seven specific recommendations for necessary reforms, six²⁸ of which relate to the above-mentioned areas.

27 The process of appointing a new head of the Specialised Anti-Corruption Prosecutor's Office illustrates this problem well. Under pressure from Western partners, a transparent selection and evaluation of candidates for the position of the Head of the Specialised Anti-Corruption Prosecutor's Office was carried out, based on which on 21 December 2021 the selection committee selected Oleksandr Klymenko as the best candidate for this post. Klymenko, a NABU investigator, scored 246 points in the evaluation, while Andriy Syniuk, a prosecutor in the Prosecutor General's Office, scored 229 points. However, as Syniuk was the favourite of the Presidential Office, the proposal to appoint Klymenko was blocked for more than half a year. Apparently, this could also be related to the fact that Klymenko was investigating allegations of corruption against Oleg Tatarov, the Deputy Head of the Presidential Office, Yermak. This investigation was then 'resolved' by transferring it from the competence of the NABU and the Specialised Anti-Corruption Prosecutor's Office to other investigative bodies and the General Prosecutor's Office. It was only in July 2022 that Klymenko was finally appointed as the Head of the Specialised Anti-Corruption Prosecutor's Office, but this was most likely related to the fact that this was one of the seven explicit conditions and requirements of the EU in connection with the approval of Ukraine's candidate status in June 2022.

28 The only recommendation of a different category is the protection of the rights of national minorities.

It is here that the fundamental problem seems to lie. It is precisely these areas that are extremely important for foreign investors, especially in the area of FDI. Moreover, these topics are very attractive to the media. If we add to the hunger of the media (both domestic and foreign) for scandals the active Russian propaganda and the influence of social media, it is not surprising that problems and failures are discussed much more often than reform and integration successes. All the more so if those successes are only partial, and even then imposed from the outside. This then shapes public opinion, which also influences the opinion of the vast majority of investors.

Indeed, Ukraine's more difficult external and internal conditions for the realisation of reform and integration progress were already a reality before the war. The problem, however, is that the response to the more difficult conditions should not be less reform, but more. Not less ownership of those reforms, but more. Not less courage, will and willingness to push for, communicate and implement reforms, but more. Only then can it work. Only then can it produce the desired and expected effects and results under such conditions.

4 WAR, REFORM AND INTEGRATION

War is a terrible thing, but it has changed everything. The war has opened the eyes of EU countries and enabled Ukraine (and Moldova) to quickly gain candidate status. It has united and mobilised Ukrainian society, increased the level of support for the Western geopolitical direction of the country,²⁹ increased people's trust in the country's political leadership³⁰ and even increased confidence in the country's current direction.³¹ It will be difficult but very important to maintain this trust and support (or at least as much of it as possible) after the war is over. Whether this can be done will depend not only on post-war developments, but also on how the war ends. It is already evident that if it were to end in any bad compromise (e.g. surrendering a part of Ukraine's territory to the aggressor), it would very likely lead to such instability and internal political tensions that it would make it impossible not only to successfully rebuild the country but also to push through the necessary reforms and complete the integration process. Here, the attitude of Ukraine's Western allies will be fundamentally important. As long as there is a will on the part of Ukraine and Ukrainians to defend and fight back, they could only be pushed into a bad compromise by unwillingness (or lack of willingness) of the allies to continue to support Ukraine, especially militarily.

29 In June 2022, support for joining the EU and NATO stood at 90% and 73%, respectively, while before the war in December 2021 it was only 58% (EU) and 48% (NATO).

30 While in December 2021 President Zelensky was trusted by 38% of people (and distrusted by 61%), his trust in June 2022 was at 85%. And while in January 2021 as many as 53.1% of Ukrainians did not believe that Zelensky could handle the role of Commander-in-Chief of the Armed Forces in the event of a war with Russia, in April 2022 78% of respondents were satisfied with his performance in this capacity (2% were dissatisfied, 10% had no clear opinion).

31 In December 2021, more than two-thirds (67%) of Ukrainians thought the country was heading in the wrong direction. Less than a quarter (24%) thought the country was heading in the right direction. After the outbreak of the war, during March-July 2022, the share of those who considered the country's direction to be correct ranged between 73% and 80%

All of the above facts and context of this chapter make clear not only the conditionality of reform and integration, but especially the fact that there is no reasonable alternative to reform and the Euro-Atlantic integration of Ukraine. And the war has laid this fact completely evident.

4.1 Post-war conditions for the successful completion of European integration

Despite the rapid acquisition of candidate status, it is first necessary to realise and accept that the completion of integration will likely be neither quick nor easy. The Ukrainian story is unique. Ukraine has won the respect and admiration of people all over the world. Still, it would be very dangerous and counterproductive if, on that basis, Ukrainians or their leaders assumed the country would be offered any concessions or shortcuts in meeting the pre-accession conditions and criteria.

Another important fact is that as long as the country is at war and does not control its external borders, entry into the EU is unprecedented.³² It will thus also be important when and especially how the war ends.

However, the most crucial condition for the successful completion of Ukraine's integration into the EU will be the mutual alignment of reforms, accession negotiations and the country's post-war reconstruction. This will be an enormous challenge, especially as each of these processes is a major challenge in itself. The processes will be intertwined and will take place in an environment of still relatively weak institutions, particularly the judiciary, law enforcement, protection of property rights, protection of the public interest, and corruption.

The reconstruction of Ukraine will involve hundreds of billions of dollars³³ in investments, grants and loans from various public and private sources. The issue of efficient and transparent use of these resources will be crucial. Failure to do so may complicate not only the successful reconstruction of the country but also its integration into the EU. It should not be forgotten that a significant part of the funds for the reconstruction of Ukraine will come from taxpayers in EU countries. Each of these countries will ultimately³⁴ have to explicitly agree to Ukraine's accession to the EU.

Official foreign resources for Ukraine's reconstruction will certainly be important, but it is already clear that they will not be enough for a successful reconstruction. The extent to which Ukraine can attract foreign direct investment will thus be crucial. The reconstruction of the war-torn country will offer great and unique investment opportunities. However, they will be conditional (especially for private capital) on

32 All the more so if it is a large country whose external border will be that of the EU, with a neighbour such as Russia behind it. So, Cyprus is not a precedent in that sense.

33 The Ukraine Recovery Project presented by the Ukrainian government in early July 2022 envisages public and private resources of US\$750 USD over ten years.

34 Following the successful prior conclusion of negotiations on all 35 chapters of EU Community law (*acquis*) and the approval of the European Commission, the European Parliament and the European Council.

the protection of property rights and at least certain standards of public services and business environment – in other words, on reforms. This is especially the case in those areas where progress has so far been insufficient, which was the main reason why FDI inflows to Ukraine since 2014 were so low and insufficient.

Reforms cannot be made without reformers who do not wait for orders from above but enforce the necessary changes and build and strengthen the institutions necessary for the normal functioning of the system. As Jean Monnet so aptly put it, “nothing can be done without people, but nothing lasts without institutions”. As noted above, one of the main reasons why the post-2014 reform and integration progress, while significant compared to earlier times, is still insufficient and why it is not yielding more visible results is the lack of ownership of the reforms by the Ukrainian political leadership itself.

In the future, this style of running the country may be even more critical, as the war has undoubtedly strengthened the trend to even greater centralisation of power and further strengthening of ‘manual management’ in post-war conditions.

Besides the difficulties and risks described above, however, Ukraine also has very strong positive preconditions for managing the process of reconstruction, reform and integration. Ukraine is a large country with a huge number of talented, well-educated people who have gained valuable experience in reform, integration and investment projects in recent years, both abroad and in the domestic business, governmental and non-governmental sectors. Also, the EU, Western partners, international financial and other institutions have gained a huge amount of experience and knowledge of Ukraine’s realities, needs, opportunities and constraints, especially in the post-2014 period. It will be equally important to learn from the good³⁵ as well as the bad³⁶ experiences of post-war reconstruction in other countries.

5 CONCLUSION

It is clear that Ukraine’s path into the EU cannot simply follow the template of Eastern European countries. Making ‘geopolitical discounts’ cannot be a way forward either, because it would question the integrity of the EU and wouldn’t serve Ukraine well. At the same time, an unprecedented set of challenges related to Ukraine’s post-war recovery and the threat of Russia for European security create a qualitatively different momentum. As a result, a ‘more of the same’ approach is not an adequate response. Instead, EU accession should be based on the following principles.

35 For example, the Marshall Plan after the Second World War.

36 For example, the post-war reconstruction of Iraq and Afghanistan.

First, we have to talk about the transformation rather than the ‘recovery’ of Ukraine. It should embrace both horizontal and sectoral issues. This comprehensive transformation will be successful if the changes are sweeping and decisive. It should match speed with quality, maintaining the first and not compromising the second. Transformation and EU accession should not just go in parallel; it should be one integrated process under the EU and Ukraine common leadership. The success of this process would mean a lot for the credibility of both Ukraine and the EU. A common approach to tackling corruption and pushing forward the case for rule-of-law progress should be made the number one horizontal priority.

Second, speed is critical because only fast, irreversible changes can build trust in Ukraine and Ukrainian institutions. An evolutionary approach would mean being dragged down by key changes, would decrease resilience and would allow Russia more time for its destructive activities.

Third, security should feature prominently in the transformation/EU accession. It will be fundamentally different from the previous EU accession patterns. In this context, managing risks is of utmost importance. Comprehensive transformation/EU accession is only possible if all economic actors – governments, international financial institutions and private businesses – are convinced that their risks can be managed securely and cost-effectively.

Fourth, comprehensive changes should be based on a clear-cut common EU–Ukraine strategy. The ownership of what should be done and how should belong to Ukraine, but common strategy and actions are needed to gain trust and momentum. For example, local governance has to get enough policy-shaping and decision-making powers. To the same end, transformation/EU accession shouldn’t be a closed and bureaucratic process, it should be open for civil society and business to engage in. Their effective and institutionally guaranteed participation is critical. A new institutional structure, perhaps based on the post-war recovery of Ukraine, can provide institutional capacity building and expertise (e.g. sending targeted groups of specialists to work within Ukrainian institutions on a permanent basis) as well as weaving Ukrainian institutions into the EU institutions. The organisation of reconstruction should primarily address limited Ukrainian institutional capacity and the need for transparency and efficiency of the process.

Finally, the new reality after the Russian invasion of Ukraine suggests that it is not only Ukraine that needs a radical change. In order to be ‘ready’ for Ukraine, the EU should become a genuinely global player and change its decision-making system. Ukraine should become part of this discussion from the very beginning as a future EU member.

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Ukraine's post-war reconstruction and governance reforms

Tymofiy Mylovanov^{a,b} and Gerard Roland^{c,d,e}

^aKyiv School of Economics; ^bUniversity of Pittsburgh; ^cUC Berkeley; ^dCEPR; ^eNBER

EXECUTIVE SUMMARY

Wars often act as accelerators of history. This is also true with Russia's war of aggression against Ukraine. As much as Russia is inflicting huge destruction, death and suffering on the Ukrainian people, Ukrainian success against the Russian aggression also creates new opportunities for Ukraine's future development. Here are the main ideas we put forward.

After the war, Ukraine will have a chance to get rid of the remains of the Soviet laws and to transform into a modern and model democracy. It will have a chance not only to modernise its infrastructure, economy, education and healthcare systems, but also to overhaul its political and judicial systems and become a full member of the EU.

Ukraine needs EU and other international support in building strong institutions, reloading its judicial system and completing its civil service reform. Merit-based promotion of people to higher offices and enforcement of laws without any compromises will ensure democratic development of Ukraine and prevent it from slipping into authoritarianism. With this in mind, we do not recommend any reforms that would strengthen the powers of the president and weaken those of the parliament. We support further decentralisation of decision-making powers towards communities.

Given the cost and complexity of post-war reconstruction, which should be coupled with European integration, we suggest establishing an EU-led reconstruction agency that will both lead the reconstruction and prepare Ukraine for EU accession (the agency would 'sunset' on the date of EU accession). This agency can also become a supplier of qualified and non-corrupt people to Ukraine's civil service.

The agency should take the form of a multi-divisional organisation with each operational division associated with a reconstruction goal. Each division should be centralised at the national level, possibly with subdivisions in various regions. This organisational form reflects the multiple goals of reconstruction as well as the need for speed in the implementation of reconstruction goals.

It is very important that the Ukrainian government owns the reconstruction – that it sets the priorities and suggests the projects for the reconstruction agency to implement. The agency will have a veto right over projects, while the courts will provide the final decision if the veto is challenged. It is equally important to involve Ukrainian experts in development of the projects and use the principle of matching funds, so that the Ukrainian public and private sectors have a stake in those projects.

To ensure quick implementation of the reconstruction projects and at the same time efficient use of funds, we recommend: (1) ex-post audits rather than ex-ante project evaluations (especially taking into account that complicated projects may change during the implementation), (2) framework agreements and (3) open contracting. Certainly, Ukraine must rely on the existing procurement system ensuring transparency (ProZorro) and further digitise not only procurement but oversight of contract implementation.

As stressed in many chapters of this book, judicial reform is key to reconstruction efforts. It is a necessary condition not only for the inflow of investment but also for punishing collaborators, solving issues during the reconstruction and – together with competition laws – for ensuring that oligarchs do not regain their power after the war (or that new oligarchs do not emerge). To support deoligarchisation and ensure democracy, two more reforms will be needed: political reform that lowers barriers to entry for political parties and thus facilitates an inflow of ‘fresh blood’ into politics, and media reform that reduces the dependence of journalists on oligarchs and ensures that they are producing a public good (i.e. information) in a responsible way.

Today, Ukraine is at the forefront of the fight against imperialist autocracies who aim to destroy life under conditions of freedom, human rights and rule of Law. Ukraine deserves the full support of democracies not only during the war, but also after it. In this chapter, we provide ideas that will hopefully help guide the debates on how to reconstruct a democratic and European Ukraine.

1 INTRODUCTION

Those who support Ukraine in its fight against the unprovoked Russian invasion believe that post-war Ukraine must become a model democracy that will catch up economically with the more economically successful transition countries. The 2014 Euromaidan movement that led pro-Putin president Yanukovich to flee to Russia clearly demonstrated the will of Ukraine’s youth and a large part of its population to become part of democratic Europe and to distance itself from Russia’s autocratic regime. The Euromaidan movement was supported by a very diverse set of people, differing by geographic location, ethnic or national origin, language as well as political orientation. The massacre of the ‘heavenly hundred’ on 10 February 2014 by Yanukovich’s special Berkut troops reinforced the will among the Ukrainian population to be truly independent from Russia.

Since 2014, Ukraine has undergone important political changes in order to become a well-functioning European democracy so as to fulfill the fundamental aspirations of the Euromaidan movement. These changes have been difficult and have faced strong opposition from oligarchs and from all the forces interested in blocking reforms and in maintaining Ukraine as the corrupt kleptocratic state it had become after its 1991 independence. The strongest opposition to Ukraine's democratic reforms has come from the barbarian full-scale invasion of Ukraine by the Russian Army on 24 February 2022.

War often acts as an extraordinary accelerator of history. Russia's ruthless destruction of whole cities like Mariupol or Severodonetsk (and many others) and its baseless and cruel massacres of tens of thousands of civilians have only strengthened the will of Ukrainians to live in a modern, free and democratic country based on the rule of law and fundamental respect of human rights. In June 2022, Ukraine, together with Moldova, became a candidate to join the EU.

What seemed unlikely or unrealistic less than a year ago is now becoming attainable. Reformers who, since 2014, have fought hard to fight corruption and the political influence of the oligarchs – sometimes with success, sometimes with less success – now see the prospect of a more radical transformation of Ukraine's governance to get rid of the remains of its Soviet laws and to transform it into a modern and model democracy. Just like Ukraine will have the chance after the war to modernise its infrastructure, its economy, its education and health systems in a similar way to what happened in Western Europe after World War II, it will also have a historic opportunity to overhaul its political and judicial system and be fully part of 21st first century Europe. Ukraine's EU candidacy was fought hard and won with the blood of thousands of innocent Ukrainians. The EU must aim to expand to welcome Ukraine as a full-fledged member state following a post-war integration process (see the chapter on Ukraine's integration into the EU in this volume).

The centre of gravity of the first Cold War was the Iron Curtain that separated Soviet satellite countries from Western European democracies and Germany between East and West, and the Berlin Wall that separated East and West Berlin. Whatever the outcome of Russia's aggression in Ukraine, Ukraine will be the centre of gravity of the new cold war between Russia and its allies and democratic Europe and its allies. It is therefore not only in the interest of Ukraine to build institutions that deliver freedom, welfare and prosperity, but also in the interest of democratic Europe as a whole.

The struggle between autocracy and democracy that is taking place on the battlefield in Ukraine also concerns advanced democracies in general. It is no coincidence that the United Kingdom, despite having left the EU, is a key partner in the democratic alliance of countries supporting Ukraine against the Russian invader. In the United States, despite its long distance from Ukraine, the Biden administration understands very well the strategic stakes of Russia's war in Ukraine as well as its international implications (in terms of the Russia-China alliance and the dangers China's growing power and its

crusade against democracy represent to Taiwan but also to smaller Asian countries). Putin has clearly expressed his will to change the rules of the game at the international level, to abandon efforts to build a rules-based international order and to go back to 19th century international politics based on military force and threats, bullying, invasion and colonisation of smaller countries. The invasion of Ukraine is only one step towards this reactionary goal. Defending Ukraine against the Russian invasion has far-reaching international stakes in the global fight between democracy and autocracy. In order for Ukraine, as the centre of gravity of the new cold war between democracy and autocracy, to become a prosperous country like West Germany during the first Cold War, it must get its governance reforms right, and this strategic goal is in the interest of all democracies affected by the new cold war.

It has been repeatedly emphasised that Russia's aggression in Ukraine is a colonialist aggression. Russia itself has expanded greatly in the last two centuries by colonising territories in all directions to become the world's biggest country.¹ After the break-up of the Soviet Union, Russian leaders want to put all the former Soviet republics back under the Russian yoke. The two wars against Chechnya were also colonial wars to preserve Russia's colonies within its borders.

Several principles are important to keep in mind when the time will come (hopefully sooner rather than later) for Ukraine's post-war reconstruction. First, Ukraine must become a full-blown liberal democracy, with all the institutional safeguards of democracy. This orientation must be defended both within Ukraine but also by all supporters of Ukraine among advanced democracies. Second, to sustain this orientation and given that Ukraine has become the centre of gravity of the new cold war between democracy and autocracy, and therefore the forepost of the democratic world, Ukraine must become a full-blown member of the EU following a clear process of accession. Third, one must recognise Ukraine's agency within this process. Ukraine has fought Russia's invasion since 2014. Despite overwhelming expectations that the 2022 Russian invasion would result in annexing Ukraine again as a Russian colony, Ukrainians have fought hard and courageously, winning worldwide admiration. Since 2014, Ukraine has matured a lot. The Ukrainian people have not only shown steadfast determination in their aspirations and beliefs, they have also matured politically and militarily. While Ukraine's post-war reconstruction will require a lot of financial help from abroad as well as expertise to help reform its institutions, Ukraine's agency in this process must be fully recognised.

The main ideas of this chapter are as follows:

1. Ukraine must become a full-blown democracy from day one after the war.
2. Nationalist ideology should not be repressed in any way, but the objective should be a liberal democracy.

1 A good overview of Russia's colonisation of Ukraine is provided by Timothy Snyder at <https://bit.ly/3rWgaxN>.

3. Right after the war Ukraine must adopt the right institutions (prepared during the war) that will lead to accession to the EU.
4. The special conditions of immediate post-war reconstruction will not only need external funds, but also an EU-led reconstruction agency that will simultaneously help Ukraine prepare for EU accession.
5. Judicial reform should be the absolute priority in governance reforms and should be done with the help of the reconstruction agency.
6. Ukraine should continue its efforts to establish an efficient civil service and to decentralise its organisation of government.
7. Ukraine does not need major constitutional change in the immediate post-war period, but the powers of the president should not be increased and nor should the power of the parliament be decreased.
8. Special care will be required to prevent both current oligarchs from recovering part of the influence they had before the war as well as emergence of 'new' oligarchs, and we propose a whole series of measures in that direction.

Obviously, in this chapter we cannot cover in full detail all important governance changes that need to happen in post-war Ukraine. Moreover, there is not necessarily a unique blueprint for reforms to transform Ukraine into a modern European democracy, and some of the ideas expressed in this chapter may clearly be improved upon. What we feel is important is to clearly outline the strategic objectives for Ukraine's post-war governance reforms and some key points that are necessary for the success of these reforms. We also feel it is equally important to indicate policy mistakes that need to be avoided in order to ensure reform success.

2 POST-WAR UKRAINE MUST AIM TO BE A FULL-BLOWN LIBERAL DEMOCRACY WITHOUT ANY COMPROMISE

Today Ukraine is fighting for its freedom and the right to exist as a democratic state. This 'big goal' should be kept in mind during the reconstruction stage. It will be tempting to justify the concentration of power by the 'need for speed' in reconstruction (discussed at length below). A large part of Ukrainian society may even support concentration of power (for example, the Social Monitoring surveys by the Institute of Sociology show that up to 2020, about 55-60% of Ukrainians believed that a few strongmen could do more for Ukraine than laws and discussions). At the same time, the full-scale war may

have changed many popular beliefs (we see a huge increase in support for EU and NATO integration² and the Ukrainian language³), and a recent National Democratic Institute (NDI) poll shows that 94% of Ukrainians believe it is important that Ukraine becomes a fully functional democracy.⁴

The recommendations that we provide in this chapter are intended to ensure that the Ukrainian state fulfills the aspiration of Ukrainian people for democracy.

The first threat could be a slip into autocracy, repeating the paths of Hungary or Poland. Viktor Orban, a Hungarian politician who in the 1990s embraced liberal democratic ideas, was elected on a nationalist platform in 2010 and has remained in power ever since. Orban's populism has constructed an autocratic state from what had been a democracy less than 15 years ago. Orban even coined the term 'illiberal democracy' to characterise his increasingly authoritarian regime. In Poland, nationalist forces led by the PiS (Law and Justice) Party of Jaroslaw Kaczynsky came to power in 2015 on a nationalist illiberal programme and have taken important steps to reduce the independence of the judiciary and to stifle liberties. Interestingly, Orban's authoritarian government is sympathetic towards Putin's autocratic regime, while the PiS is strongly opposed and sees Russia's threat as existential – an understandable position when one knows Poland's history.⁵

Another threat is a populist dictatorship. Populist leaders have been elected in many countries, including the oldest and most stable democracies like the United States and the United Kingdom. Populist politicians could establish a non-democratic regime that blames internal or external enemies for economic difficulties of the country (Donald Trump blamed the "deep state" and immigrants, while Hugo Chávez blamed "imperialistic powers"). Populist leaders appeal mostly to the public as 'saviours' who are the only ones able to run the country and who demand loyalty and tolerate no dissent. This is to a large extent what has happened in Russia under Putin. Building on the bonanza of worldwide economic growth in early 2000s, he worked incessantly to transform Russia into a populist dictatorship based on loyalty to his persona. He used the ideology of Russian nationalism and imperialism to rally support for his regime.

There is currently no sense in speculating who in Ukraine might be a likely candidate for a populist or nationalistic dictatorship, but such an evolution would clearly jeopardise the EU accession of Ukraine and betray the aspirations of the Euromaidan.

2 https://ratinggroup.ua/en/research/ukraine/dinam_ka_zovni_shno-pol_tichnih_nastro_v_naselennya_1-2_zhovtnya_2022.html

3 https://ratinggroup.ua/en/research/ukraine/desyatyy_obschenacionalnyy_opros_ideologicheskie_markery_voyny_27_aprelya_2022.html

4 www.ndi.org/sites/default/files/NDI%20Survey%20ENG.pdf

5 Poland disappeared as an independent country at the end of the 18th century when it was partitioned and occupied by Russia, Prussia and the Austro-Hungarian empire. It regained independence for a short period after World War I until it was partitioned again by the Molotov-von Ribbentrop pact. Poland was a satellite country of the Soviet Union until 1989.

Therefore, as we argue further, Ukraine needs strong institutions to ensure its democratic development. For example, a key institution is merit-based promotion of people to higher offices. Reliance on loyalty rather than merit has been prominent in many areas, including politics. However, this system creates the preconditions for enormous concentration of power. As a part of Ukraine's movement towards the EU, the country should replace this patronage system with transparent and rules-based selection procedures that have been already legislated in many spheres but not always enforced. Furthermore, because Ukrainian laws explicitly prohibit discrimination of any kind, transparency will ensure inclusivity, thus further reinforcing democratic tendencies.

Only an inclusive democracy can provide a durable foundation for the success of the country (which includes aligning Ukraine with EU standards) and serve as a safeguard against 'strong hand' leaders⁶ and other autocratic tendencies that can emerge after wars.

3 UKRAINE MUST ADOPT THE RIGHT INSTITUTIONS DIRECTLY AFTER THE END OF THE WAR (AND PREPARE ALREADY DURING THE WAR)

Right after the end of the war, Ukraine must choose the correct institutions for its future. This must be very clear from day one. During the war, the country is necessarily run in a way demanded by the military situation, with all efforts and resources dedicated to the single goal of military victory. Military talent is what is mostly needed in terms of leadership quality.

As soon as the war ends, the goals will shift towards reconstruction and building the seeds for a prosperous and peaceful Ukraine. Whereas both wartime and post-war management are needed, the goals are not the same. Reconstruction will mobilise resources not towards a single goal but multiple goals adapted to the various reconstruction needs, both across geographic areas and across economic and societal sectors. This will also require important leadership skills, but these skills will not necessarily be the same as during the war. Some military leaders may be good peacetime leaders because of their overall management skills, but it will not necessarily be the case for everyone. Some – possibly many – military leaders who will have proved heroes in the military field will not necessarily have the right skills to be peacetime leaders.⁷ Post-war political transitions are often unpredictable. For example, Winston Churchill heroically led the British people when threatened by the Nazis during the Blitzkrieg. Churchill was, however, defeated electorally by Clement Attlee's Labour Party in the 1945 elections, leading among other things to reforms like the introduction of the still popular National Health Service. In Portugal, the Salazar dictatorship was brought down by young officers

6 Given the great success of Ukraine's military defence operations, elements of the country's military may be tempted to seize power after a successful war to expel the Russian invaders, gambling on their popularity and claiming that the military would be much more successful than a democratically elected government at running the country. As we will see below, this is a fallacious proposition. War heroes and skilled military leaders may not necessarily have the talent to run a country in peaceful times.

7 In reverse, before becoming a heroic wartime President, Zelensky's performance as Ukraine's president was very mixed.

from the Portuguese Army, under the leadership of popular Colonel Otelo de Carvalho. Even though he later ran for president in Portugal, he was not elected and later failed to have a productive political career. Many other examples can be found of heroic military leaders who the people did not trust electorally once the war was over.

The reason Ukraine must adapt the right institutions directly after the war is not only because the conditions of reconstruction will be different than those of the war. Since the war will have been a critical juncture in Ukraine's history, the institutions that are established right after the war will likely have great inertia. This has been true for many critical junctures in history. The French Revolution and the US War of Independence have obviously had a strong influence over the next centuries of these countries' histories, and one can cite many other examples. There is thus every reason to believe that the institutions that will be established in post-war Ukraine will influence its future for at least decades to come.

It would be a grave mistake to think that one should wait until after the early reconstruction phase before establishing the right institutions for Ukraine's future. Let us discuss some of the arguments on that issue.

One argument is that reconstruction will require speedy decision making, and normal democratic consensual decision making is too slow so one should wait until the end of the early reconstruction phase before establishing normal democratic institutions. It is true that the early post-war reconstruction of Ukraine will require speedy decisions in many areas; we discuss this question in the next section. Nevertheless, as we also discuss below, there are solutions to the need for speedy decision making that are compatible with the establishment of democratic institutions from the very beginning. Arguing that democratic institution-building should be delayed because of the specificities of post-war reconstruction risks creating flawed institutions that will likely persist for a long period of time.

Another argument is that as long as Russia is not permanently defeated and rendered unable to wage war again, Ukraine should remain on a warpath and cannot afford to establish the democratic institutions it would like. A similar argument has sometimes been formulated after the Russian invasion of Crimea and parts of the Donbas, claiming that Ukraine did not have the luxury of being able to focus on institutional reform because of the Russian aggression. This argument is flawed for two reasons. First of all, military preparedness is not at all incompatible with democracy. In other words, it is quite possible to establish democratic governance while being prepared for an aggression (this is the situation Taiwan has been facing for many decades, for example). Second, a permanent militarisation of the whole country risks creating inertia and giving power to would-be autocrats intent on building a non-democratic state.

4 THE EARLY PHASE OF RECONSTRUCTION WILL REQUIRE SPEEDY DECISION MAKING AND COORDINATION

The early phases of reconstruction will require a rapid response in many areas. These include emergency food and medical supplies; temporary shelter for those whose dwellings were destroyed by the Russian Army; and restoring basic infrastructure like power and communication lines, sources of clean water, railroads, roads, and so on. Most of the emergency aid will require speedy delivery.

The imperative for speed in the early reconstruction phase has implications for the organisation of government and methods for the allocation of resources (i.e. the relative role of government and markets). Here, it is useful to turn to organisation theory.

Lessons from organisation theory (Weitzman 1974, Bolton and Farrell 1990) indicate that to the extent that speed and target effectiveness are important, which will be the case in the early post-war reconstruction period, there are clear advantages to using direct commands to allocate resources (relative to the standard market mechanism relying on prices) and to relying a lot on centralised decision making. The need for more centralisation and less use of market mechanisms compared to 'normal' peace time implies that Ukraine's institutions during the early reconstruction period must take into account these special provisional transitory requirements. One must, however, make sure that these provisional institutions do not persist and will credibly be modified to become institutions for 'normal' peace time. How can this be done?

In trying to answer this question, there are several potential pitfalls to avoid. One pitfall would be to ignore the need for speed in the early reconstruction period and to insist on having 'normal' democratic institutions without taking into account the special conditions of the immediate post-war reconstruction. This would risk creating frustration and unnecessary tensions if there is a lack of adequate decision making, which can open the door to all sorts of abuse and institutional drift, including the threat of a military junta or a populist dictatorship.

Another pitfall would be, as stated above, to treat the governance of the reconstruction period as identical to that during the war. While both share a need for speedy decision making, the goals of the reconstruction period are more numerous, diversified and less interconnected compared to wartime management. This calls for less centralisation than under military mobilisation, which is concentrated on the unique goal of winning the war. Excess centralisation in the reconstruction period risks creating decision-making bottlenecks and excess prioritisation of the more important sectors – a defect shared with traditional central planning.⁸

8 Note that already during the war, many regional leaders and leaders of *hromadas* have taken initiatives themselves without relying on the central government.

In any case, given the imperative for speed in the early reconstruction phase and the predictable weakness of markets in this period, it will be important to have a sufficiently strong and competent Ukrainian government administration that will inevitably have to intervene quickly and competently in the allocation of resources, producing a form of ‘coordinated capitalism’. Building strong state capacity early on will not only be legitimate but also very necessary for the success of the reconstruction.

5 HOW TO RECONCILE THE NEED FOR SPEED AND CORRECT INSTITUTIONS: A EUROPEAN-LED UKRAINE RECONSTRUCTION AGENCY

The solution to the joint need to establish correct institutions right after the war and for speed in decision making lies in the creation of a temporary, European-led Ukraine reconstruction agency that would act in cooperation with the Ukrainian government. This is one of the main ideas of the *Blueprint for the Reconstruction of Ukraine* (Becker et al. 2022) and also present in this book. We first discuss some principles for such an agency and then discuss at more length the relationship between that agency and the Ukrainian government and civil society.

Just like the management of the Marshall Plan was done by a specialised agency (the Economic Cooperation Administration, or ECA), Ukraine’s reconstruction plan and management of aid funds from multilateral donors should be coordinated by a self-standing, EU-affiliated agency in coordination with the Ukrainian government. Let us call this the **Ukraine Reconstruction and European Integration Agency** (UREIA). This agency should also help prepare Ukraine to reform its institutions to be aligned with the European regulatory and legal framework. Being a transitory agency, the UREIA should be shut down at the time Ukraine enters the EU. The chapter on programme design by Barry Eichengreen and Vladyslav Rashkovan in this volume discusses at more length various options for such a reconstruction agency. In our view, there is an obvious need for such an agency to help Ukraine’s reconstruction. It should be led by the EU because it should not only help Ukraine in its physical reconstruction after the war, but simultaneously help reform its institutions to prepare entry into the EU. For equally obvious reasons, that agency should be located in Kyiv and work in very close collaboration with the Ukrainian government.

The UREIA should be accountable for the use of its funds to the donors (the EU, the United States, international organisations, etc.) and its operations will need to be transparent. At the same time, it will need to enjoy operational autonomy to allow it to operate as speedily and efficiently as possible and also to avoid being captured by particular political interest groups.⁹ Having well-defined goals and the objective of

⁹ The Economic Cooperation Administration (an implementer of the Marshall Plan) was established as a self-standing agency of the US government rather than embedded within the State or Treasury Departments precisely in order to streamline hiring and operations. The ECA was given a special status and exempted from government regulations which could impede flexibility or speed.

speedy and efficient operation, it can and should operate efficiently without constant day to day political intervention, from whatever side. The leadership of the agency should reflect the key stakeholders – i.e. multilateral international organisations and the main donors, the EU and the Ukrainian government. While reflecting key stakeholders, leaders of the agency should preferably be independent experts or competent and well-known political figures who are not dependent on particular interest groups (such as senior politicians who have most of their career behind them). The UREIA should be able to give budgetary support to the Ukrainian government and to coordinate with other multilateral organisations also providing budgetary support, such as the IMF. To ensure credibility of aid conditionality, the agency should have the authority to delay or withdraw aid.¹⁰

A very important point to mention is that within the leadership of the UREIA, there should be a more than proportional number of experts from transition countries (Baltic countries, Central European countries) or Nordic countries with many interactions with transition countries (Finland or Sweden), while there should still be a presence of experts from other countries. The reason is simple to understand but nevertheless important to emphasise: people from transition countries and countries with close interactions to them understand better both the threat from Russia as well as the specific requirements of post-communist reforms. This understanding is much less present in western European countries, and then only among experts on eastern Europe in those countries.¹¹ Moreover, part of the elite in many western European countries has been captured (consciously or not) by Russian interests. There is no point introducing (albeit unconsciously) a ‘fifth column’ of Russian imperialism in Ukraine’s reconstruction and path towards the EU. This does not mean that Western Europeans should be excluded from the governance of the UREIA; only that one must build on existing competences, which are mostly present among eastern and northern members of the EU. Also, even though the agency should be EU-led by nature, its technocratic nature should not prevent non-European experts from being hired and involved, in particular from the United States.

The UREIA’s organisational structure will need to reflect its multiple goals. It should take the form of a multi-divisional organisation where each operational division is associated with a reconstruction goal, be it road infrastructure, energy, telecommunications, or institutional reforms to prepare Ukraine for entry into the EU. Each division should be centralised at the national level, possibly with subdivisions in various regions. This organisational form reflects the multiple goals of reconstruction as well as the need for speed in the implementation of reconstruction goals.

10 The ECA was able to suspend aid to Greece after aid was channelled to purposes that were inconsistent with agreed goals. In contrast, note that while US officials tried to impose conditionality on aid in Afghanistan, the Afghan authorities could ignore conditions.

11 Comments from western European politicians about the ‘decades’ it would take for Ukraine to enter the EU typically reflect this limited knowledge about the realities in Ukraine since 2014. Moreover, the distance of the war from most of western Europe helps to maintain the ignorance among west European elites about the issues Ukraine has been grappling with since 2014.

Given the imperative for speed in the early phases of reconstruction, the UREIA should spend more resources on ex post compared to ex ante evaluation. Overly tight evaluation at the proposal stage is costly in terms of time, while ex post audits are more appropriate and also probably more efficient. Indeed, one problem with ex ante project evaluation, apart from the cost of delay in implementation, is that the implementation may in practice deviate from the project. Strict audits at the implementation stage create a strong incentive for those who submit the projects to behave correctly and not engage in corrupt behaviour (the chapter on anti-corruption by Torbjörn Becker and co-authors elaborates on this).

The most important issue for the successful operation of the UREIA is its relationship with the Ukrainian government and Ukrainian civil society. This should be based on both mutual trust and an overall goal of efficiency.

A fundamental principle is that Ukraine must 'own' the reconstruction. Aid programmes should be aligned with the ultimate objectives of Ukraine (e.g. closing the per capita GDP gap vis-a-vis successful EU accession economies, becoming a member of the EU, building a carbon-free economy). Aid should reinforce national success via national institutions.

There are several principles to make this work. The first is to have the Ukrainian government formulate the requests and priorities for project funding by the UREIA. More precisely, the Ukrainian government should have sole responsibility for the formulation of projects and priorities within the budget of the UREIA as defined by its governing body representing the various international donor agencies. These requests should be reviewed and approved by the agency, who should monitor the implementation and check whether disbursement of funds corresponds to the planned projects. In order to avoid bureaucratic delays, the need for a systematic stamp of approval for all projects should be avoided, but the agency should have the right to veto particular projects that it deems either inappropriate or inefficient. It should also have the right to freeze implementation of a project if there is suspicion of corruption or malpractice. The Ukrainian government, for its part, should have the right to contest vetoes by the UREIA and to bring cases to the newly built Ukrainian judicial apparatus.¹² The agency should also have the right to ask for judicial review of particular projects or of their implementation. In order not to overburden the judicial apparatus, innovative conflict resolution mechanisms should be considered. The use of a form of competition mechanism could go a long way towards efficiency (but also integrity). For example, in case the UREIA contests a particular project proposed by the Ukrainian government, it should have the right to auction off particular reconstruction projects to the best bidder. This would go a long way towards efficient conflict resolution.

¹² As we will argue below, rebuilding Ukraine's judicial institutions will be a top priority of reforms from day one. And as we will explain in more detail, the newly built judiciary apparatus should be closely involved in many aspects of the activities of the UREIA.

This first principle is not just a technical detail, but seems fundamental for a well-functioning collaboration between the UREIA and the Ukrainian government. As it has both more at stake and better information, it is natural that concrete proposals for reconstruction should be initiated by the Ukrainian government and not by UREIA. Otherwise, this would create frustration on the Ukrainian side and not make efficient use of relevant information on projects. On the other hand, the UREIA, being responsible for the efficient use of donor funds, should have sufficient veto rights over how the money is spent.

A second principle is to involve as much as possible Ukrainian experts in all levels of decision making in the UREIA and to establish close links with different levels of Ukrainian government. Hiring criteria for the UREIA should meet high standards and provide reasonable salaries (not too high so as not to attract those who prefer money above everything else, but not too low so as to chase away high-level experts).

A third principle concerns the use of matching funds. The Ukrainian government or Ukrainian businesses should cover a share of the reconstruction costs to ensure that they have incentives to use the money well.¹³ There must be flexibility in the use of this principle. Relying on matching funds for every single project may lead to biases in favour of proposals from administrations within Ukraine that would have more easy access to liquidity. In order to avoid such biases, it would probably be better to (1) require matching funds for the overall budget of UREIA, and (2) come up with creative ways of accepting matching funds from the Ukrainian side. On the latter, instead of requiring rigid matching fund formulas, the Ukrainian side may come up with different ways of applying the 'matching fund' principle – for example, a commitment to give back future returns from a project over time in a flexible way, or non-monetary forms of matching such as commitment to provide particular materials or labour resources.

The operation of the UREIA and its collaboration with the Ukrainian government will obviously need to be designed so as to prevent corruption from seeping in. For example, strong anti-corruption protocols should be designed and implemented to ensure effectiveness of reconstruction efforts and continued support of donors, with a special focus on the design of audits and ex post evaluation. The UREIA could help provide technical assistance to strengthen public procurement. It could also partner with the European Public Prosecutor's Office to bolster its credibility on corruption and get technical assistance (including auditing of Ukrainian anti-corruption efforts). In other words, the best EU practices should set the standards.

13 This was done under the Marshall Plan by allowing recipient governments to sell merchandise and commodities delivered as aid to the private sector. Receipts were then deposited into 'counterparty fund' accounts, whose release was controlled by the US government.

One can also learn from Ukraine's positive experiences in the fight against corruption.¹⁴ Ukraine's digital system for public procurement, ProZorro, has been praised for its innovative character. By digitalising all aspects of public procurement and making the process transparent, ProZorro eliminates opportunities for corrupt and non-transparent practices. Note that the system was established with the support of Transparency International, the well-known anti-corruption NGO.

As the example of digital public procurement shows, a major principle in the fight against corruption is to maximise transparency by minimising opportunities for human intervention to organise collusive corruption in various government allocation procedures. This can be done without creating unnecessary delays and inefficiencies that one might want to 'bypass' through corruption. Digitalisation is one way forward, but there are others – for example, automatic and secured recording of meetings between officials and the private sector.

Combining speed with anti-corruption can also be done via framework agreements. These allow direct 'off-the-shelf' purchasing, with no time-consuming procedures, from preselected suppliers that have already passed a competitive screening/vetting stage – typically arranged by a central purchasing agency – and have committed to sell the relevant goods or services at pre-established conditions for a given period of time. Framework agreements allow for rapid second-stage procurement, offer more transparency, were used successfully during COVID-19 by numerous countries, and have been suggested as useful for emergencies in general.

Another important method is related to open contracting. Open contracting limits corruption while maintaining efficiency in the procurement process. The Open Contracting Data Standard (OCDS) is a set of guidelines for how to publish data and documents at the different stages of public procurement contracting to increase transparency. Ukraine had already made significant advancements in this area prior to the full-scale war. For example, during the pandemic, while COVID-related emergency procurement contracts could be signed outside of the ProZorro system, the contracting entity was required to upload the contract and all related documents together with a structured report within 24 hours of conclusion. An additional report had to be submitted after the contract was fulfilled.

Contract design should emphasise (wherever possible) fixed-price contracts with clear deadlines and specifications, measurable outcomes and verification protocols. Uniform contracting, management and report systems should be established. Disputes should be resolved via special judicial procedures (more on that below).

14 More detailed discussion is provided in the chapter on anti-corruption in this book.

A key ingredient, though not a sufficient one, to maintain the integrity of both UREIA and Ukrainian government officials is to fire any official who in the past has been indicted of corruption or to suspend anyone seriously accused of corruption. Since judicial proceedings take a long time, it is only normal that those who are seriously accused of corruption should be suspended from official responsibilities.¹⁵ Those who have been accused unjustly should be able to recover their responsibilities without prejudice and with possible compensation for income loss.

Protecting whistleblowers is also an important mechanism to discover corruption. In 2019, Ukraine adopted both legal protection as well as financial incentives for whistleblowers (10% of the sum involved).

Why would the establishment of a temporary reconstruction institution, like the UREIA proposal outlined here, be a good solution to the twin requirements of speedy operation during the early reconstruction phase and the need to establish the right institutions from the start? As explained above, the design of the agency should satisfy the need for speed. At the same time, also by design, the UREIA proposal satisfies the requirement for transparency, best practice and anti-corruption objectives. Moreover, as stated above, since the agency should also be in charge of Ukraine's process of integration into the EU, it would help Ukraine from the beginning to adapt its institutions to the requirements of being a well-functioning EU member.

We have mentioned the need for a multi-divisional organisational form for the UREIA, with partition of the organisation along sectoral and project lines, as well as the need for close interaction between the UREIA and the Ukrainian government. A few remarks are in order when concluding this discussion.

First, if there is a failure of international organisations to agree on the need and the structure for UREIA, we advise the Ukrainian government to directly propose the establishment of this structure to the EU. The use of a reconstruction agency as an outlet to help prepare a country for accession to the EU would be unusual compared to previous instances of EU accession, but the conditions facing Ukraine are also highly unusual given that it will be emerging from a deadly war of invasion by Russia.

Second, while it makes sense for the UREIA to be structured as a multi-divisional organisation, there is no need for Ukraine to adopt the same structure in its organisation of government. The UREIA will only be a transitory organisation and while the Ukrainian government may put in place a similar structure for the need of reconstruction, but there is no need for it to adjust its organisation of government to that of the UREIA.

15 It is important to emphasise that these accusations should be serious enough; one must avoid frivolous lawsuits where people can be unjustly accused by their political enemies.

6 THE PRIORITY OF JUDICIAL REFORM

A fundamental principle is that Ukraine cannot become a full-fledged advanced democracy if it does not prioritise the establishment of the rule of law. In other words, judicial reform should take absolute priority. In the absence of a non-corrupt and well-oiled judicial system, Ukraine will be unable to successfully reform its institutions. Lack of sufficient progress in judicial reform has been one of the main flaws of the post-Maidan process.

One of the big problems in judicial reform, on top of the opposition from corrupt forces inside the Ukrainian state apparatus, has been the difficulty of replacing all the corrupt judges inherited from the Soviet era and the pre-Maidan period of intense corruption. First of all, it takes time to select and train competent judges. Moreover, the training of judges needs to be done by non-corrupt judicial experts. Training of new judges by corrupt and cynical lawyers is obviously counterproductive.

Fortunately, the war has created conditions that could facilitate radical judicial reform. First of all, support for reform during the reconstruction will be much more comprehensive than any foreign institutional aid so far. Ukrainian judges will be trained and seconded by international legal experts, helping them to make their decisions in a competent way. Second, the war has created so much destruction that rebuilding institutional infrastructure from scratch does not seem like an outlandish proposition any more, given the enormous needs of rebuilding physical infrastructure. Third, the war has reinforced the need for well-functioning institutions. There is no point undergoing so much destruction, death and suffering to simply go back to the status quo ante. Too high a price has been paid by the Ukrainian people to accept any compromise with the objective of having the rule of law.

There are several reasons why judicial reform should take priority. Many important judicial decisions need to take place right at the start of reconstruction.

First of all, there will be the process of punishing all those who collaborated one way or another with the Russian invaders. Instead of letting mob rule lawlessly punish collaborators on the basis of hearsay, true facts or emotions, there will be the need for special tribunals to punish the collaborators. This will be an opportunity for young but also well-trained incorruptible Ukrainian judges to acquire experience in the provision of justice. This should be a highly transparent process that will be watched and scrutinised by all Ukrainian society as well as by the international community. After World War II, the punishment in western European countries of Nazis, pro-Nazis and their collaborators was a highly visible process that drew attention from the whole

public. Even though these special tribunals will need to make decisions faster than under normal times, they will be subject to the basic principles of fair justice: the need to bring forward verifiable evidence, arguments based on principles of law, rights of the accused to a fair defence, possibility of appeals, and so on.¹⁶

Second, the operations of the UREIA will need the involvement of the Ukrainian judiciary in many aspects. The enforcement of decisions and contracts as well as adjudicating disputes arising from these decisions and operations should already be an important activity for a newly rebuilt Ukrainian judiciary.

Third, a well-functioning and independent judiciary is the key condition for the rule of law, and the rule of law is critical to a well-functioning democracy. Any departure from that stance will risk Ukraine drifting towards a non-liberal democracy. Rule of law affects expectations of economic and political agents about legal behaviour. If these expectations are the wrong ones – i.e. that corrupt behaviour will go unpunished or that the law does not apply in equal measure to all – it will be very difficult to stabilise the rule of law.

The priority of judicial reform may appear less ‘glamorous’ than other reforms, but it really is the backbone of a reformed governance system under the rule of law.

While the need for priority of judicial reform is in general well understood, it may fail if it does not take into account who has the most interest in successful judicial reform and who has an interest in blocking it. Those who have an interest in blocking it are the oligarchs that have been using their influence in the state apparatus to enrich themselves. Their influence, as in other post-communist countries, has been extremely deleterious. Despite being a small group, their wealth has made it possible for them to essentially control large parts of the economy and of the government sector. Successful judicial reform and the fight against corruption will require breaking the influence of these oligarchs. We discuss this issue below.

On the other hand, successful judicial reform will require mobilising the support of those who have a stake in its success. These mostly fall into three categories: (1) the Ukrainian middle class, including entrepreneurs and small businesspeople; (2) international donors; and (3) the general public. Ukrainian entrepreneurs have suffered from the influence of oligarchs and been de facto excluded from competing for government contracts and other business opportunities. Given the corruption in the judicial apparatus and the government administration, they had no way to defend their interests. This group will have a strong interest in the establishment of the rule of law and will push for it,

16 The need for trials of collaborators in Russia's war of aggression is quite different from the situation facing transition countries after the collapse of communism. In some countries and in East Germany, show trials of communist leaders were avoided in order to encourage some form of healing process. Most of the elite had collaborated in one way or the other with communist regimes, the countries could not afford to alienate the whole former elite. Many countries nevertheless established some form of lustration, i.e. the prohibition of former communist leaders from taking up important civil service positions. The case of Ukraine is different and is closer to the need for trials of collaborators of Nazis during World War II.

provided that measures are taken at the same time to reduce the influence of oligarchs. International donors obviously have an interest in making sure that their money is well spent and not diverted for corruption purposes. Moreover, they will have both the funds and the technical resources to help Ukraine achieve a successful judicial reform. As for the general public, it of course has an interest in the rule of law, but its interest in judicial reform will be especially important after the war with the trials of those who collaborated with the Russian aggressor. Overall, from a political economy perspective, the post-war period will feature many more stakeholders in judicial reform than before the war. This is grounds for optimism about the success of judicial reform very soon after the end of the war.

How should the overhaul of the Ukrainian judicial system be organised? Multiple paths should be pursued in doing this. A first principle is to follow the post-war needs. As indicated above, immediate post-war needs will be tribunals to judge the major collaborators with the Russian government. The selection of judges for these tribunals will need to be relatively rapid, but it will need to be done with the help of the UREIA. Second, judges will be needed to enforce contracts in relation to the work of the UREIA and the post-war reconstruction. This selection can be done less quickly and will involve a lot of training.

A second principle is to start from the top of the judicial hierarchy. This is the only way to ensure integrity of the future judicial system. Moreover, it is at this level that the help of foreign independent experts in selection and training will be most effective. Indeed, the help of foreign experts in the process of judicial reform will also be crucial in preparing for accession to the EU.¹⁷

Third, there should be a separate process of training new and incumbent judges. Incumbent judges will continue their current operations during the transition period while being trained, but they will need to be evaluated by an evaluation commission examining the past career paths of those judges. A realistic timeline should be set for achieving the overhaul of the whole system in order to avoid unnecessary delays. Judges who have not passed the evaluation or who have not followed the new training requirements should be suspended. Obviously, some flexibility will be needed in the implementation of the whole process to ensure transparency and quality of evaluation and training.

¹⁷ This is already happening - the Ethical Commission, which includes international experts, already selects the members of the Higher Council of Justice. Next, they will select the Higher Qualification Commission of Judges, which then will re-evaluate and select judges. As the judicial apparatus is being rebuilt top-down, it will be important to vet all candidate judges for integrity and incorruptibility.

7 SEPARATION OF POWERS BETWEEN THE EXECUTIVE AND THE LEGISLATIVE BRANCHES OF GOVERNMENT

Since 2014, Ukraine has had a semi-presidential system, sometimes also called a premier-presidential system. The president is directly elected and has broad powers. Prior to 2014, the president had a central role in forming the government. This is no longer the case as the government is now accountable to the parliament – a feature of parliamentary systems. The president, however, has direct power over foreign policy and defence. He or she can select the foreign minister and the defence minister, and they are accountable to him or her. The president also has the right to make legislative initiatives, has veto rights over legislative decisions of parliament. He or she also has the right to appoint the prosecutor general as well as governors of oblasts, though the latter need to be proposed by the Cabinet of Ministers.

Compared with other democracies, including in Central Europe, the powers of the president are stronger in Ukraine, though they are not as strong as in Latin American presidential systems. The biggest danger, in our view, would be a drift towards a stronger presidential system, like the one that existed under Yanukovich or Kuchma. Given that since 2020 Ukraine had has a proportional electoral system for the parliament, a strong president could, as in Latin America, use divide-and-rule tactics and contribute to the fragmentation of political parties in a way that would strengthen his or her de facto role. Indeed, proportional electoral systems tend to produce a larger number of parties represented in parliament compared to majoritarian electoral systems. Fortunately, Ukraine has – like Germany – a 5% rule that filters out smaller parties.

We do not recommend important changes to the Constitution in the immediate post-war period. Even after the war, the Russian threat will likely not have disappeared and the current system has allowed Ukrainian institutions to defend the country against the invader. We warn against attempts to further increase the power of the president. Approval of the parliament is key for appointment of the prosecutor general, as well as the power to demand his or her resignation.

Successful functioning of the legislative branch of government requires a sufficiently strong party system. This can be achieved via incentives related to institutional rules and through political culture. The institutional rules relate to the functioning of party discipline in legislative votes within parliament. This is usually enforced via (1) roll call votes (i.e. transparent voting behaviour of individual legislators), and (2) the party's role in placing candidates on electoral lists. Ukraine has electronically recorded roll call votes, which enables party whips to enforce discipline. Moreover, it has an open lists system for parliamentary elections. Closed list systems are often more conducive to enforcing party discipline, but they have the disadvantage of not letting the public have any say in

either punishing or rewarding individual members of parliament. We do not recommend changing Ukraine's party list system. Since parties set up the order on the list and since most voters vote for a party instead of a candidate, parties have sufficient disciplining power over individual representatives.

Nevertheless, there are other rules that can help strengthen the party system in Ukraine. In our view, the main one should be a strong and transparent public system for the funding of political parties. We discuss this topic below, as public funding of electoral campaigns can also undercut the political influence of potential oligarchs.

Since the rules leading to party discipline are generally strong enough, the main obstacle to a stronger party system in Ukraine seems to be the political culture. This should not be surprising. Advanced democracies have seen, at least since the 2008 crisis, major changes in the relative power of parties. Old parties have become weakened and new parties have emerged, sometimes only to disappear after a few elections. Ukraine needs time before stable parties emerge. The war will certainly not have helped, and important political shifts in the first few post-war electoral cycles can be expected. Nevertheless, one should be clear that it is a good thing to see strong political parties emerge and develop.

8 CONTINUED CIVIL SERVICE REFORM

Ukraine's civil service administration has functioned quite well since the February invasion in non-occupied territories, continuing to provide basic services. The war will have boosted values of integrity and public service. Before the full-scale war, a lot of efforts were put into digitising many aspects of the civil service. Efforts have also been made to increase the quality and professionalism of civil servants, and Ukraine has put in place professional training of civil servants and candidates for the civil service. It will be important to have a transparent selection and promotion process for them. A key obstacle before the war was the level of remuneration. This will still be important in the future. Nevertheless, it will be clear in the direct post-war period that the whole population will have to make sacrifices in the reconstruction process, and the adjustment of civil service remuneration to a more competitive level will certainly not be a high priority.

One particular way to help boost the civil service in the immediate post-war period is to facilitate the recruitment of demobilised veterans as auxiliary aid or as civil servants to government administration.

9 HOW CAN THE REAPPEARANCE OF OLIGARCHS BE PREVENTED?

Breaking the power of oligarchs has been a constant theme in post-Maidan Ukraine, which, like most transition countries, has experienced the rise of these people who have benefited from the transition process to become immensely rich in a short amount of time. This happened not through wealth creation, as is usually the case for entrepreneurs, but mainly through rent-seeking and corrupt political influence. Ukraine, like all former

Soviet Union republics, is no exception to the rule. Oligarchs close to Kravchuk and then Kuchma were able to benefit from privatisation deals that were rigged to be allocated to them. Unlike in Russia, where Putin has been able to crush all oligarchs who were not willing to submit to his will and to that of the group of *siloviki*¹⁸ around him, Ukrainian oligarchs kept competing with each other and supporting different political parties and factions.

Presidential elections in Ukraine have seen a shift in the balance of power between various oligarch groups and networks. Petro Poroshenko, the previous Ukrainian president, was himself an oligarch. When Zelensky was elected, he was said to be beholden to Igor Kolomoisky. Indeed, politics in Ukraine has been under the influence of oligarchs since the country's independence and transition to the market economy. While the power of oligarchs was initially seen as inevitable by a large part of the Ukrainian population, young people who fought in the Euromaidan have become increasingly impatient with the corruption and undue influence of the oligarchs. The situation has changed dramatically since the full-scale Russian invasion. The mobilisation of the whole of Ukrainian society to support the war effort has short-circuited the influence of the oligarchs. There is nevertheless no guarantee that the influence of oligarchs, old and new, will not rise again once the war is over and Ukraine returns to a more normal economic situation. Reformed post-war governance must thus make sure the power of the oligarchs is broken so that Ukraine can function like a normal democracy. How can this be done?

The chapter on anti-corruption efforts in this book deals in detail with Ukraine's fight against corruption before and after the war. The general public in transition countries, especially the youth born after the end of communism, has shown less and less tolerance towards corruption. There have been numerous demonstrations against corruption in many countries (Romania, Slovakia and Russia, among others) demanding major reforms. In Ukraine, corruption was an important motivation in the Euromaidan movement, leading then-president Yanukovich to flee to Russia. Despite this enormous political will, changes have been slower to happen in Ukraine than in other countries. The reason is that oligarchs have managed to control parts of the state apparatus, which they then use for personal enrichment (e.g. Roland 2018), and also to block or sabotage reforms either within parliament or the state apparatus.

18 This is the network of former KGB officers that Putin has been using over the years to build his power base and eliminate that of his rivals, like Berezovsky or Khodorkovsky.

A first lesson we can draw from the experience of anti-corruption reforms throughout the world is the need for an independent anti-corruption bureau composed of incorruptible investigative judges and with the power to bring corruption cases to court. Since 2014, Ukraine has made the right steps in this direction, with the establishment of the National Anti-Corruption Bureau of Ukraine (NABU) and the Higher Anti-Corruption Court (HACC), whose judges are selected with the help of international experts. This is in line with one of our main points in this chapter: the priority of judicial reform.

An anti-oligarch law pushed by President Zelensky was passed in November 2021 and entered into force in July 2022. The law was seen as controversial and was criticised for being populist and too vague, mainly consolidating the power of the president. The bill defined an oligarch as someone who meets at least three out of four criteria: ownership or control over media outlets, control over a business monopoly, influence over activities in politics, and having a net worth above 2.4 billion hryvnia (roughly €70 million). The law also creates a mandatory registration of tycoons and of those with links to oligarchs. According to the law, oligarchs would be banned from holding public office, funding political parties and taking part in privatisation of state assets. These steps would have to be taken by a National Security and Defense Council (NSDC) set up by the president himself. Critics argue that the implementation of the law should not be in the hands of the president, but rather in the hands of an independent judiciary.

Western donors have helped post-Maidan Ukraine by making loans and grants conditional on anti-corruption governance reforms.¹⁹ Nevertheless, Russia's invasion of Ukraine has completely changed the conditions for fighting the power of the oligarchs. First, one of the main reasons for Russia's invasion has been Ukraine's determination to introduce democracy and the rule of law and refusal to live under a kleptocratic state. The fight for the rule of law has now a patriotic anti-Russian motivation, and thus benefits from much wider and greater support. Second, people realise that relative to the horrible sacrifices made to defend Ukraine's independence against Russia's imperialist regime, the costs of fighting to improve governance without any compromise towards oligarchs and corruption will seem small.

19 When Joe Biden was vice-president of the United States, he was very active in this area. In contrast, one of the most shameful episodes from recent US history was when Donald Trump as US president allegedly sent Rudy Giuliani to Ukraine to seek 'dirt' on Biden and his son Hunter. Giuliani and Trump then gave their support to Viktor Shokin, the former Prosecutor General who was generally recognised as one of the most corrupt actors in the Ukrainian state apparatus (under his watch there were zero indictments for corruption) and who had been finally ousted in 2016. Giuliani and Trump falsely pretended that the firing of Shokin was a personal vendetta of Biden's to protect his son. The fact that a current US president presented Shokin as a victim rather than as one of the main actors of corruption was truly stomach-churning for all the Ukrainian reformers who had been fighting against corruption since 2014 and before that. Trump himself behaved in a corrupt way towards the Ukrainian government by allegedly refusing to deliver promised weapons to Ukraine until President Zelensky would agree to deliver dirt on Hunter Biden.

The first priority is to implement and strengthen existing laws against the influence of oligarchs and their corruption within the state apparatus. This means installing, with foreign help, a truly non-corrupt judicial branch of government and giving more powers to the NABU and the HACC. Renewal of the judicial branch of government is a costly endeavour, given that honest and competent judges need to be selected and trained properly. To do this relatively quickly requires a lot of financial resources as well as expertise but, as stated above, the cost will appear worthwhile after the costs of the war.

The second priority is to establish a rigorous and effective competition policy. Oligarchs were able to thrive because they managed to protect their businesses from competition via their influence activities within the state apparatus. Moreover, they were able to obtain the wealth via rigged privatizations and government corruption to purchase other businesses and build conglomerates.

It is well known how oligarchs in Ukraine, as in other post-communist countries, became rich. The most important way was through rigged privatisations. In the Kuchma era, each big privatisation of a large state-owned enterprise (SOE) was designed so that only one candidate would emerge as the 'best' candidate to receive the asset. This is one of the main origins of the wealth and power of oligarchs. Another one was through the creation of banks that were set up by oligarchs to 'lend' themselves money that would later become a non-performing loan. Oligarchs used their economic power to engage in influencing activities to consolidate monopoly positions and acquire new ones, and started to build large media companies loyal to themselves. Oligarchs also used their economic and political power to build conglomerates to diversify their assets. For example, Rinat Akhmetov not only has large control over coal mines and steel factories, but also owns companies in telecoms, real estate, transportation, energy and retail. Poroshenko not only owns a chocolate empire but also has a big stake in the media sector. Kolomoisky, the previous owner of Privatbank, has positions in airlines, oil, gas, metallurgy and real estate.

While a rigorous competition policy is not in itself sufficient to break the power of oligarchs, it can go a long way towards reducing their influence. Encouraging entry in oligarch-controlled sectors should significantly reduce monopoly profits and benefit consumers. Also, a long strand of research has shown that conglomerates are not economically very useful, that is, they do not add value for society (e.g. Rumelt 1974, 1982, Bhagat et al. 1990 and many more). The only reason conglomerates often appear is when financial markets are deficient. Becoming part of a conglomerate then appears as a substitute to give firms access to finance. Coming back to Ukraine, breaking up the conglomerates owned by oligarchs would go a long way in reducing their influence in a more permanent way after the war.

Economists advocating a strong competition policy to prevent oligarchisation often sound like a broken record. We should, however, remember the lessons from the end of the Gilded Age in the United States, a period when the country also had its oligarchs. The so-called robber barons (Rockefeller, Morgan, Vanderbilt, Carnegie and Stanford being only some of the most well-known names) held monopoly positions in sectors like oil, rail, shipping, steel and finance. The reaction to the robber barons from people like Henry George and others led to the establishment of the Sherman Antitrust Act of 1890, which outlawed monopolies, trusts and cartels. This was the first of many anti-trust laws in the United States, which contributed strongly to ending the Gilded Age.²⁰

There are reasons to strengthen existing competition laws in Ukraine. For example, the Anti-Monopoly Committee (AMC) should be able to directly enforce fines for companies breaching antitrust laws, and the nomination of state commissioners to the AMC should follow a transparent process, similar to that governing the selection of members of the HACC. Obviously, the strengthening of pro-competition and anti-conglomerate laws in Ukraine will be fought tooth and nail by oligarchs, who will use all their political influence to prevent such laws from passing or, more viciously, introduce amendments that would make these laws toothless. The best way to prevent this from happening is to use donor conditionality. As has been the case with IMF loans since 2014, it would be totally justified for donors funding the reconstruction effort for Ukraine to insist that such laws pass. Those within Ukraine who are fully committed to the fight to reduce the influence of oligarchs would certainly welcome outside help in the form of donor conditionality. In any case, now that Ukraine is a candidate to enter the EU, it will have no option other than to implement existing EU competition laws, which have worked quite well in recent years.

Apart from strengthening the rule of law and competition policy in Ukraine, it would also be important to avoid mistakes of the past, whereby economic reforms have been used to give economic power to oligarchs and would-be oligarchs. A first possible mistake would be to repeat the flawed privatisation policies of the past where control over productive assets was given to oligarchs without using really competitive auctions and in a totally non-transparent way. An important potential pitfall to avoid is giving oligarchs control in the process of government bond issuance. Reconstruction bonds will play a fundamental economic role in post-war Ukraine. Those who have funds or who have access to international financial markets may purchase large amounts of bonds, making the government dependent on oligarchs for financing the post-war reconstruction debt. There are many possible ways to prevent oligarchs gaining influence via the post-war bond purchasing process, and these should be discussed carefully.

20 One should not ignore the fact that competition policy in recent years has become more lax towards monopolisation compared to the EU (e.g. Philippon 2019) and that the United States is in need of a new 'progressive age' like the one at the turn of the 20th century that decreased the power of the robber barons.

Last but not least, political finance reform will be crucial. Oligarchs have used their funds to support various political parties, thus ensuring protection of their own interests. A key way to cut the political influence of oligarchs is campaign finance reform. Here, the United States is not a good example as private corporations and Wall Street have had a similar – albeit legal – influence on political parties. Ukraine should instead look to the experience of European countries that have rules for the allocation of public funds to political parties during electoral campaigns (e.g. Reed et al. 2021). There are also rules for how much time each political party is allowed to have on the main TV networks. This would go a long way towards reducing the political influence of oligarchs. While none of the European campaign finance laws is perfect, they represent an immense improvement over the United States, which allows nearly unfettered private financing of political campaigns.

The German case is quite representative of public funding of political parties. Parties represented in the Bundestag (i.e. parties receiving more than 5% of the vote share) receive public funds for their activities amounting to roughly €2 billion over an electoral cycle. The distribution of funds takes into account the size of the parties (larger parties receive more funds than smaller ones), without necessarily following a particular rule of proportionality. Parties of course have other legal sources of funding: membership fees and corporate donations. Interestingly, corporate donations have decreased substantially over the years. One reason for this is the absence of tax exemption for such donations, but generally corporate donations are not popular in the country since they are seen as corporations trying to ‘buy’ access and influence. Parties have the obligation to report on the use of their funds, and the name of any donor giving more than €10,000 must be reported in a party annual report on the use of funds.²¹ There are also limits to private donations. If the sum of private donations exceeds the legal limit, public funding is correspondingly decreased by the amount of the excess private donations. Parties are also allocated airtime on public TV and radio channels as well as space on billboards.

Obviously, even when there are systems of public financing of party political campaigns, there will always be incentives to cheat – both on the side of oligarchs and on the side of political parties. Hidden transfers to political parties may give a competitive edge, and such practices have been observed in Europe.²² Nevertheless, there is also strong judicial scrutiny of corruption in campaign financing, which limits the opportunities for corruption in Europe. Strong scrutiny will also be necessary in Ukraine, once more showing the critical role of judicial reform to reduce the influence of oligarchs.

21 Ukraine has already adopted a similar law on party financing. One area that needs closer attention is the part on transparency and strict implementation of the Law. This must be done through strengthening the Corruption Prevention Agency.

22 Helmut Kohl, the architect of German unification, had to resign as Chancellor when it was revealed that his party had received hidden transfers to finance its electoral campaign. Kohl always refused to give the name of the donor(s).

10 MEDIA REFORM

When discussing governance reform in a post-war Ukraine, the issue of media reform will be as important, if not equally important, as judicial reform. It is well known that particular oligarchs have been able to spread their influence among the general public via the media they control. In 2016, Ukraine's ten largest TV channels were all owned by oligarchs. For example, Kolomoisky has used the 1+1 channel to defend his economic interests.

Some progress has been with by the anti-oligarch law of 2021, and in 2022 Akhmetov decided to transfer the licenses of his media group to the Ukrainian state. Also, all media under Russian control were closed down, which is a good thing given Russia's constant policy since 2014 to destabilise Ukraine, with the goal of destroying its independence.

The problem of media control by oligarchs is not unique to Ukraine. For instance, Rupert Murdoch has used his influence to fund conservative media like Fox News in the United States or various news outlets in the United Kingdom to further an ultra-conservative agenda and to spread fake news and biased reports over what is going on in the world. Viktor Orban has used his political power to silence media that were critical of him and to gain quasi-total control over the media in Hungary, transforming it into a de facto autocratic nation-state regime. Putin did the same in Russia when he came to power, killing media freedom by 2003. Silvio Berlusconi used his control over TV channels and media in Italy to gain control over the government for a good part of the 1990s and beyond, doing great damage to Italy's economy and political system. Similar remarks can be made about the Springer group in Germany, and Vincent Bolloré and Bouygues in France.

In a world of social media and abundance of media, a return to the post-World War II period where governments controlled the few media that existed (the BBC in the United Kingdom, the big networks in the United States) is obviously not recommended. Moreover, government monopoly over the media has dangers of its own. In the French Fifth Republic, control of the media by Gaullist governments meant that some information would be hidden from the general public. Government control over the media carries with it the danger of lack of media freedom, especially in young democracies.

Here also, one must find various ways of guaranteeing media freedom from the government while avoiding overly strong private sector interests to monopolise the main media. Competition policy to guarantee free entry into the media sector will not be enough. Other policies will be necessary, and policy experimentation with media reform in Ukraine may help needed reform in more advanced democracies. This is especially important given that information is a public good and that guarantees of journalistic independence are crucial in order to prevent information from being blocked or falsified.

Of particular interest for Ukrainian media reform may be the ideas of Julia Cagé and co-authors (Cagé 2016, Cagé et al. 2019, Cagé and Huet 2021) to guarantee simultaneously the independence of journalists and adequate funding.

The issue of funding media and journalistic work is a crucial one. Throughout advanced Western democracies, most forms of media have lost their sources of funding. In recent decades, private newspapers, radios and TV channels have relied heavily on advertising as their most important source of revenue. Unfortunately, with the advent of social media and big platforms like Google and Facebook, the price of advertising in traditional media has gone down drastically, forcing many newspapers to shut down. Since information is a public good, it has become possible to get access in many ways to articles for free that cost the precious time of journalists. The reduction in revenue sources for the media has led to potentially dangerous concentration of media ownership in the hands of wealthy ideologists. The reduction in revenue sources has thus coincided with reduced independence of journalists.

The ideas of Cagé and her co-authors are particularly interesting in this context. How should journalistic independence be protected? Several principles are proposed with that goal in mind. The idea is that respect of those principles by the media should be a condition for receiving state subsidies. First of all, in enterprises with more than, say, ten journalists, 50% of the votes on the company board should be represented by journalists and media staff (with at least two thirds of those being salaried journalists). This would give journalists the right of veto over the choice of the managing director as well as over the sale of a majority of shares to some outside shareholder. In case of such a veto, journalists should have the obligation to find, within a year, an alternative source of funding. Besides these democratic governance principles, media companies should have the obligation to be completely transparent as to their private sources of funding. One possible way of doing this is an obligation to disclose the real identity of any shareholder having more than 5% of the shares of a media company. Two other measures proposed by the authors are (1) that at least 35% of the sales revenue of media enterprises should go to personnel expenditures (half of that sum being reserved for the wages of journalists); and (2) the obligation to keep a minimum percentage of profits within the firm as reserve funds. The former is meant to subsidise only those media firms that have a sufficient number of journalists, and the latter is to ensure long-run funding stability. Turning to the issue of funding, there should not necessarily be any one model for media firms, as flexibility helps funding. In order to guarantee the perennity of state funding, Cagé and co-authors propose that the state give each citizen a voucher worth €10 that they can allocate to the media outlet of their choice. This would give citizens some leverage over the allocation of state funds. Many of these ideas are worth exploring in the context of Ukraine's post-war institutional reforms, but also in the context of advanced democracies.

Julia Cagé's ideas on transparency can be especially useful in the context of Ukraine, as the obligation for transparency on the real owners of media outlets may help prevent oligarchs as well as hidden pro-Russian interests from returning through the back door. Note that her ideas also provide a good blueprint to ensure that the media landscape remains competitive. Indeed, there could be the danger of excessive mergers in the future, forcing out smaller independent media companies. State rules for media subsidies respecting the four principles outlined above are key to maintaining healthy competition in the media landscape.

11 MAINTAIN THE DRIVE TOWARDS DECENTRALISATION

Ukraine's governance before 2014 suffered from excess centralisation and was close to French-style centralisation. This has several disadvantages. First, it tends to make the political process too polarised as too much political power is concentrated in the centre, which tends to create 'winner takes all' situations. This polarisation can also be a source of instability, especially in young democracies as certain political forces may be tempted to use non-democratic means to seize power. Decentralisation dilutes the overall distribution of power, thereby mitigating possible polarising effects within the electorate. Second, excessive centralisation is often associated with distortions in the allocation of resources: excessive uniformity, or mismatch between the supply of public goods and the specific needs of local communities. Decentralisation helps to improve the allocation of resources as local governments are better informed on local needs than central government. Third, decentralisation helps local politicians build expertise and competence. It is no coincidence that many of the best politicians have acquired political and management expertise as mayors of large towns or chief executives of regions (states, provinces, districts). This helps to ensure high quality of politicians, something which is crucial not only in young democracies but also in older ones. Fourth, decentralisation helps improve accountability to voters. This happens not only because there is less distance between voters and local politicians when the latter have power, but also because voters can compare the performance of their local politicians to that of other localities. Decentralisation thus helps to create healthy competition by making voters aware of best practices.

Despite strong initial centralisation, Ukraine has made important steps towards decentralisation, especially under the government of Prime Minister Groyzman (2016–2019) with the help of international organisations. Key elements have been the transfer of power to municipalities and the introduction of 'amalgamated *hromadas*' (local communities) allowing small municipalities to voluntarily create larger units. These units have received rights over tax collection and public policy. This is an original 'bottom-up' form of decentralisation. Another smart element of the decentralisation reform was to

start directly with municipalities – the level of government that is closest to citizens. Decentralisation towards the oblasts first would likely have been a mistake as it might have weakened the central government without providing many of the advantages of decentralisation.

The need for speed in post-war reconstruction may not allow all the advantages of decentralisation to be used. The UREIA reconstruction agency will have to work in a more centralised way given this need for speed. Priority should be given to national reconstruction goals such as rail and road infrastructure, electricity, water and telecommunications provision. Nevertheless, at the reconstruction stage, local governments and communities (*hromadas*) should be encouraged to make reconstruction requests for their unit, which will then be evaluated and prioritised by the UREIA. Moreover, local governments should also engage in their own reconstruction efforts by being given the power to raise local taxes to fund reconstruction projects. They should also be allowed, as they are now, to raise funds from donors to fund projects. This may involve some competition with centralised fundraising efforts, but this should not be a reason to deny local authorities the power to raise funds; donors are usually able to prioritise their donations. It is desirable for local governments to raise funds by matching them with their own funds, in order to prevent reckless demands towards donors. To summarise, while the reconstruction priorities will most certainly be at the central level and the imperative of speed will also require centralisation, local authorities should be given broad powers right away, preparing them for a more decentralised governance in the future.

12 HOW SHOULD TERRITORIES RECOVERED FROM THE RUSSIANS BE DEALT WITH?

Assuming that Ukraine will recover all or part of its territories that have been occupied by Russia since 2014, should these territories and its citizens have special status? Obviously, the immediate aftermath of the occupation should involve territorial consolidation by the army. As long as there is a danger of Russia trying to recover some of territories it used to occupy, there is a need for a strong military presence to defend the territorial integrity and also to ensure a minimum level of economic functioning. Nevertheless, several remarks are in order. First, citizens in areas occupied since 2014 should receive immediate confirmation of their Ukrainian citizenship. There is no reason to discriminate in any way against citizens of Crimea, Donetsk and Luhansk. All or most pro-Russian forces will have fled to Russia, leaving mostly pro-Ukrainian citizens behind. Second, there should be trials of collaborators, as in areas occupied since 2022. As soon as the Russian military danger disappears and emergency aid has been provided, local elections should be organised and municipalities should have the same right as in the rest of Ukraine. They should also participate in the next cycle of national elections. Any form of discrimination against citizens living in areas occupied by the Russians since 2014 would only backfire and be divisive.

13 CONCLUDING REMARKS

Since the Revolution of Dignity of 2014, Ukrainian civil society has been energised in a remarkable way, showing its commitment to transforming the country from a post-Soviet kleptocratic state with strong ties to Russia to a modern democracy based on the rule of law. Since 2014, millions of Ukrainians have thought about how to carry out this transformation, and many important changes have been made to reform Ukraine's governance in that direction. These changes have been rightly perceived by Putin as an existential threat to his autocratic regime and his tsarist-style imperial ambitions. While the war has inflicted massive destruction and casualties, it has also led to an acceleration of history. Ukraine is now firmly in the camp of democracy and the rule of law. More than that, it is at the forefront of the fight against imperialist autocracies that attempt to destroy life under conditions of freedom, human rights and rule of Law. Ukraine deserves the full support of democracies not only during the war, but also after it. The ideas on the governance of Ukraine under immediate post-war conditions expressed in this chapter will hopefully help guide the debates on the reconstruction of a democratic and European Ukraine.

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CHAPTER 3

71

Anti-corruption policies in the reconstruction of Ukraine

Torbjörn Becker,^a Jonathan Lehne,^a Tymofiy Mylovanov,^{b,c} Giancarlo Spagnolo^{d,e,f} and Nataliia Shapoval^b

^a*SITE, Stockholm School of Economics*; ^b*Kyiv School of Economics*; ^c*University of Pittsburgh*; ^d*University of Rome Tor Vergata*; ^e*Stockholm University*; ^f*CEPR*

EXECUTIVE SUMMARY

Corruption has been a major drain on growth and development for Ukraine since the breakup of the Soviet Union and has its roots in the communist system and incomplete transition that followed the breakup. Over the years, corruption has been a recurrent theme in discussions between Ukrainian governments and international donors, financial institutions and the EU. The IMF has made anti-corruption policies and institutions part of conditionality in past programmes, and the problems of corruption are regularly discussed in reports from the IMF, the World Bank, and the EU.

In the reconstruction process, there will be significant financial inflows from Ukraine's international partners, which has raised concerns about Ukraine's history with corruption. The chapter shows that after the Maidan Revolution of Dignity in 2014, there have been improvements in various corruption indicators for Ukraine that are often overlooked in discussions of corruption in the country. However, there is still a need for significant improvements in this area and a clear strategy for anti-corruption policies in the reconstruction of Ukraine.

A key ingredient is the overall institutional setup, with an institution specifically tasked with coordinating donors and the Ukrainian government. This institution should be involved both in setting overall priorities and monitoring that projects are delivered according to plans in a transparent manner that can be scrutinised by both donors and citizens of Ukraine. More generally, the anti-corruption framework should be guided by four principles: remove opportunities for corruption and rent extraction; focus on monitoring and transparency; make information and education an integral part of the anti-corruption efforts; and ensure that the anti-corruption and legal institutions are working and trusted.

In the past, corruption has occurred through several channels that are discussed in the chapter, including in the financial system, public procurement, state-owned enterprises, uncontested and overregulated markets, improper use of public assets, illicit trade, and tax evasion and fraud. In addition, petty corruption in a wide range of public services has been present. The key anti-corruption policies in the reconstruction of Ukraine should therefore include a transparent, well-managed institution that would include major donors as well as the Ukrainian government which would not only disburse funds but also monitor the use of these funds ex post.

Public procurement should be strengthened further and ensure that transparency and monitoring are not sacrificed for the sake of speed in the reconstruction process, since this is a long-term endeavour. After the war ends, bank recapitalisation should be done transparently, and generally developing the financial system will reduce opportunities for misuse of public funds.

State-owned enterprises should be reformed in several steps to limit opportunities for corruption and increase transparency. This also applies to other parts of government operations, including market regulation, taxes, licenses and management of public assets. Other forces to mobilise and support anti-corruption efforts include information around EU accession, supporting a strong civil society, creating a framework for independent media, and providing education at all levels. Although EU accession can support anti-corruption efforts, the bulk of the work must be done by Ukraine itself, starting at the highest political level and all the way down to civil society and citizens.

1 INTRODUCTION

Some of the key points from the CEPR report *A Blueprint for the Reconstruction of Ukraine* (Becker et al. 2022) are that the cost of the war is already enormous and keeps rising each day the war is going on; most of the support to reconstruct Ukraine needs to be in the form of grants, not loans; the ownership of the reconstruction process should stay with the Ukrainian government; and there are institutional and other mechanisms to deal with corruption concerns. This chapter will address the last point.

By 5 September 2022, the estimate from the Kyiv School of Economics of documented damage to physical infrastructure alone was \$114.5 billion.¹ A good portion of this should in principle be paid by the aggressor state, Russia. However, the need for support from other parties, such as the EU and the United States, will still be very significant and in the order of hundreds of billions of dollars over the reconstruction period. The (mainly) grants will ultimately be contributions by taxpayers in donor countries, who will want to know that the money they send reaches all of Ukrainian society rather than corrupt individuals that act in their self-interest.

1 <https://kse.ua/russia-will-pay/>

Ukraine's problem with corruption is already a central theme of the discussion about providing military and financial support to the country today. There is no doubt that Ukraine's history is full of stories about corruption. In fact, President Zelensky would not have been the hero he is today without the TV series that focused on politics and corruption.

Corruption has also been a constant issue in Ukraine's relationship with international donors. In its November 2021 review, the IMF stated: "In particular, under the agreed policy priorities the Ukrainian authorities are committed to [...] **(iv) tackling corruption and pushing forward with the implementation of judicial reform**; and **(v) reducing the role of the state and vested interests in the economy to improve the business environment, attract investment and raise the economy's potential. [...] Similarly, adverse Constitutional Court rulings challenged the anti-corruption framework in fundamental ways that required restoring its effectiveness before the review could proceed.** In a push to make progress on delayed structural benchmarks, the authorities have recently met seven of the nine structural benchmarks set at the time of the program request" (emphasis added).

Of the seven principles for the reconstruction of Ukraine set out at a donors' conference in Lugano,² the third concerns transparency, accountability and the rule of law: "The recovery process has to be transparent and accountable to the people of Ukraine. The rule of law must be systematically strengthened and corruption eradicated. All funding for recovery needs to be fair and transparent" (emphasis added).

The government of Ukraine is of course aware that corruption needs to be tackled in the reconstruction phase and on the path to EU accession. In the recovery plan outlined by the National Recovery Council in July, tackling corruption is one of the components in improving the business environment and attracting investments (National Recovery Council 2022). Finalising the anti-corruption system is also part of the rule of law reform that is one of the priority initiatives to strengthen institutional capacity and a 'de-oligarchisation' process, which are seen as fundamental to the recovery plan. A more detailed plan to fight corruption is provided in a July draft by an "Anti-corruption policy" working group.³ The plan states: "To sum it up, solving the problem of corruption should be one of the priorities for Ukrainian society, especially at the stage of state restoration".

The problem of corruption is of course not unique to the economic and political system of Ukraine in the last decades. In his overview article, Bardhan (1997) starts with the sentence "Corruption is an ancient issue" and goes on to cite a 4th century text from India to make his point. In the academic literature, corruption is often defined as

2 <https://reliefweb.int/report/ukraine/outcome-document-ukraine-recovery-conference-urc2022-lugano-declaration-lugano-4-5-july-2022>

3 Available at https://uploads-ssl.webflow.com/621f88db25fbf24758792dd8/62c16a7e8758bbd81a8a35d9_Anti-corruption%20policy.pdf

the abuse (or misuse) of public office for private gain.⁴ This is the definition in Mauro (1998), who also provides an overview of the topic and notes how corruption issues have toppled governments in both major industrial countries and developing ones. He also notes that in transition countries, the move from planned to market economic systems allowed for the appropriation of rents that came from excessive profits in various parts of these economies. This transition was also associated with a move from well-organised systems of corruption to more chaotic ones as new actors got involved in rent seeking in the process. Mauro also writes that a key principle is that for corruption to exist, there must be rents. These rents can be created by available resources widely defined, or by government interventions and other restrictions that create excessive profits. It can be compared to Sir Francis Bacon's idiom that "opportunity makes the thief", which here becomes "rents make the corrupt official".

Removing rents and opportunities for corruption then becomes a central theme for policies that aim at reducing corruption. In many cases, different policies to reduce corruption and create economic incentives for individuals to not engage in corruption (the anti-corruption 'carrot') will need to be complemented by laws and institutions that punish those that still choose to do so (the 'stick'). Bardhan (2012) highlights the strong deterrent effect punishment has in the experimental literature on corruption, but at the same time notes that China, with the harshest penalties (execution), still has rampant corruption. He also provides several cases where monitoring policies are important as compliments to improved economic incentives for public officials to not engage in corrupt behaviour.

There are by now many studies of the causes of corruption. Treisman (2007) summarised the insights from cross-country studies at that time and concluded that high levels of development, openness to trade, liberal democratic systems with a high share of women in government and a free press tend to reduce corruption at the macro level, while fuel exports, overregulated businesses and unstable macroeconomics are associated with higher levels of corruption. Treisman noted that there are empirical issues associated with subjective measures of corruption and causality in many cases, and argued for more studies based on experience-based measures. Svensson (2005) also finds that high income levels, high levels of human capital and freedom of the press are correlated with lower levels of corruption.

Many questions about the causes of corruption have not, or cannot, be addressed by traditional cross-country studies at the macro level but have instead been investigated in experimental settings. These studies often dig deeper into individual choices that go beyond political economy factors and focus on psychological factors and behavioural science. In many cases, individuals' beliefs about how other people behave influence their

4 Svensson (2005) uses the term "misuse" rather than abuse. Banerjee et al. (2012) instead define corruption as "the breaking of a rule by a bureaucrat (or an elected official) for private gain", so that the rules define what corruption is. Shleifer and Vishny (1993) have yet another definition of corruption as "the sale by government officials of government property for personal gain".

own behaviour. This is related to questions about culture and environment as factors that determine corruption. Banerjee et al. (2022) conclude that dishonest behaviour at the individual level is independent of the person's cultural origin in general, even if there are some counter-examples. Barr and Serra (2010) show that the level of corruption in the home country of undergraduate students explains how likely they are to act corruptly in an experimental setting. However, this effect disappears when the experiment is performed on graduate students that had been in the UK for a longer time period. This suggests that if you learn that people around you are not corrupt, you become less likely to act corruptly yourself.

Bardhan (1997) outlines a theoretical framework with multiple equilibria that generates two stable states – one where no one is corrupt, and one where everyone is corrupt – based on the idea that everyone tries to behave like everyone else. This is not due to some fundamental 'culture of corruption' where individuals are corrupt by birth, but rather that individuals live in an environment where there is a high level of corruption. Moving from a corrupt equilibrium to a non-corrupt one requires reforms or a shock that is significant enough that most people start to expect that others are no longer corrupt. A possible policy implication is that piecemeal anti-corruption reforms will not move a country to a low-corruption equilibrium.

Although there are some cases where corruption in second-best environments can improve economic performance ('greasing the wheels'), the overwhelming conclusion from the academic literature is that corruption is bad for growth, with the seminal paper being Mauro (1995). The channels from high corruption to low growth include misallocation of resources and reduced investment, tax evasion and lack of public goods provision, as well as government expenditures being directed toward non-transparent areas that are not efficient ways of generating growth (e.g. Svensson 2005, Mauro 1998, Shleifer and Vishny 1993). In short, there are strong efficiency and growth arguments for eradicating corruption on top of any moral and legal issues.

Based on what we know from the literature cited above and where Ukraine is coming from, we will argue that the anti-corruption reforms and measures needed in the reconstruction of Ukraine should be based on the following key principles:

1. remove opportunities for corruption and rent extraction;
2. focus on monitoring and transparency;
3. make information and education an integral part of the anti-corruption efforts;
4. ensure that the anti-corruption and legal institutions are working and trusted.

Joint implementation of these principles could shift the equilibrium from a high-corruption to a low-corruption society. The post-war environment, with a sense of common purpose and enhanced trust, could be used to make this shift happen.

The remainder of this chapter will provide a short background to Ukraine's pre-war problems with corruption, including the often-ignored progress that was made in dealing with corruption after the Revolution of Dignity in 2014. It will then go into what has changed with the full-scale war in Ukraine and issues of corruption in other post-conflict settings. This is followed by a discussion of anti-corruption priorities in the reconstruction of Ukraine based on the key principles outlined above. A concluding section summarises the main points of the chapter.

2 CORRUPTION AND ITS FIGHT IN PRE-WAR UKRAINE

After the collapse of the Soviet Union, Ukraine practically turned into a 'criminal' state. In this period, a lot of property was captured during privatisation by 'thieves-in-law'. The work of the first two presidents eventually led to a recapturing of control by the state over organised crime. However, in this process, oligarchs and powerful financial groups, connected and protected by various state agencies, courts, security services and law enforcement, appeared.

Ukraine's ranking in corruption perception indices reflects the problems the country has had with a poorly managed transition after the breakup of the Soviet Union and the gradual nature of reform efforts that have since followed. Ukraine shares this fate with other post-Soviet states that have not made it into the EU, while the transition countries that have joined the EU have fared significantly better regarding control of corruption.

This context shaped the political economy of Ukraine. The people who were first to capture state property and set up 'businesses' grew rich and powerful and started shaping policy and politics in the country. These business groups built their own banks, captured regulations of the whole markets, took the mass media under control, and started financing their own politicians. The same people then controlled appointments to important positions in state-owned enterprises (SOEs), in government, regulators and courts. This contributed to a culture where businesses 'help' politicians achieve certain goals and then expect favours back at a later stage. This is of course not unique to Ukraine, but the scale of the issue has been more prominent in Ukraine than in EU countries.

The main channels that allowed connected individuals to unfairly enrich themselves at the expense of the rest of society include:

1. recapitalisation of banks and general use of banks controlled by oligarchs and selected business groups;
2. improper public procurement, primarily in construction and through procurement categories of SOEs in the utilities sector;
3. skewed tariff regulation of cargo railways, gas, coal, electricity;
4. diversion of state- and communal-owned assets, natural resources and land;

5. illicit and grey trade through customs;
6. tax avoidance (VAT refund schemes, etc); and
7. monopolisation and capture of markets by creating barriers to entry.

Ukraine also suffered from petty corruption in access to public services such as healthcare, education and social support.

Given the above account of corrupt practices and the importance the IMF has attached to corruption in its past discussions with Ukrainian officials, it is no surprise that an IMF Selected Issues paper was devoted to the issue in 2017 (IMF 2017). The key message was not very encouraging and reflected the more general narrative on Ukraine and corruption. It states: “The level of corruption in Ukraine is exceptionally high.... Reducing corruption is therefore essential to speed up the process of economic convergence to the rest of Europe...”.

Although the IMF paper was written in 2017, this was a bit too early for a full evaluation of the anti-corruption efforts that had been implemented. Some of the reforms implemented after the Revolution of Dignity had a significant impact on the businesses that had previously enjoyed favourable treatment by the state. First of all, one of the largest channels for diverting money to connected individuals and specific business groups – namely, malignant practice in the banking sector – was closed.⁵ The scale of the problem was enormous – in 2014–2015 almost half of the 180 commercial banks were found to be insolvent because of various unlawful practices. These banks were holding 30% of total banking system assets, and the total estimated value of the loans put for resolution was approximately €14.7 billion. The banking sector reform led to the closure of 103 banks (Mylovanov et al. 2017). In 2016, policymakers nationalised the largest bank, PrivatBank, which had been controlled by the oligarch Ihor Kolomoysky, whose malignant practices had resulted in huge non-performing loans (NPLs). According to an ongoing US investigation into fraud and money laundering, Kolomoysky and his accomplices had stolen around \$6 billion from the bank⁶. At the beginning of 2022, 74% of the bank’s loan portfolio was still non-performing⁷ (in 2017, this ratio was 88.8%). Since the reforms and clean-up, the reformed private banking sector has flourished. The NPL share in the total loan portfolio dropped from 56% in 2017 to 27% in early 2022. In the private sector, the ratio changed from 26% to 15%. The less-reformed part of the banking sector, populated by the state-owned banks, performed worse, with the NPL ratio changing from 60% to 27.4% over this period.

5 Data on wrongdoing in the banks and types of the schemes are available at <https://badbanks.bank.gov.ua> (in Ukrainian).
6 www.justice.gov/opa/pr/united-states-files-civil-forfeiture-complaint-proceeds-alleged-fraud-and-theft-privatbank

7 In 2017 the National Bank of Ukraine changed the methodology for classification of the NPLs which resulted in an increase in the share of NPLs in the bank’s total loan portfolio from 14% in 2016 to 88.8% in 2017. For details, see <https://bank.gov.ua/en/stability/npl>

Another major source of corruption related to public procurement. In Ukraine, public procurement constituted 10–15% of GDP and nearly 30% of the state budget in 2013–2017. Typically, 60% of this procurement was related to construction, which had a reputation for being highly corrupt. It is hard to tell how much corruption was involved in this, but it was presumably a significant amount because the old system was fully manual and required bidders to come to the procurement agency in Kyiv to participate in a sealed bid process. Bustamante et al. (2022) and Kyiv School of Economics (2016) report that the design of the ProZorro electronic platform, with multiple front interfaces (privately owned electronic marketplaces have full access to the central database), created more trust by the market and civil society. The system provided public access to the whole public procurement database through an open API and dashboards with extensive tender analytics. Trust in the system helped with the expansion of the system to e-sales of non-performing loans in 2016 as described above (Mylovanov et al. 2017).

Comparison by Shapoval et al. (2017) of procurement data for the periods before and after the reform shows that ProZorro led to significantly more competition and transparency. The volume of the public procurement market in 2016, after implementation of ProZorro, was \$10.4 billion, which was 17% higher than in 2015. It became mandatory to display below threshold procedures in the system. The number of suppliers increased three-fold, while the number of buyers who had a practice of contracting only one supplier decreased from 11% to 5% and the average value of these purchases decreased by 70%. Kovalchuk et al. (2019) report that the share of procurement contracts awarded by competitive procedures rose from 2% in 2015 to 84.7% in 2016, and to 59.2% in 2017, while the value of procurement awarded by competitive procedures increased from 24.5% in 2015 to 28.4% and 70.3% in 2016 and 2017, respectively. The authors report “evidence of a greater number of bids, higher savings, and greater participation in provision of contracted goods and services (more unique winners per tender in each entity), as well as strong evidence of reduced time to procure goods and services”.

The overall effect of the new procurement system on prices is hard to tell. A 2017 Kyiv School of Economics study found, based on detailed data on the natural gas market, that ProZorro auctions brought on average 3% savings compared to the negotiation procedures controlling for purchase volumes, type of supplier, type of payment, and so on (Kyiv School of Economics 2017).

Reforming state-owned enterprises is not yet completed. However, some corruption was eliminated after the Revolution of Dignity through significant changes in management and the introduction of proper corporate governance practices for SOEs. As an example, the major publicly owned oil and gas company, Naftogaz, became profit-generating in a couple of years after the post-Revolution management change, bringing gas tariffs for households closer to the market price and changing the system of household subsidies. In 2014, Naftogaz’s debt was nearly 10% of GDP. Some markets, including those for gas and electricity, were reformed to introduce market rules, but many others did not go through comprehensive reforms.

In sum, the two largest out of the seven major corruption spheres – the banking sector and public procurement – were significantly reduced after the Revolution of Dignity, and several other sectors were at least partially reformed (e.g. electronic VAT refunds, renting out communal and public property via auctions, small privatisation).

At the institutional level, since 2014 Ukraine has established several government agencies tasked with combatting corruption. The National Agency for Prevention of Corruption (NAPC) is a central executive body that develops anti-corruption policy. The National Anti-Corruption Bureau (NABU) investigates cases and prepares them for prosecution. The Special Anti-Corruption Prosecutor's Office (SAPO) is an independent unit of the Prosecutor General office that prosecutes the cases investigated by NABU. The Asset Recovery and Management Agency (ARMA) is charged with the recovery of stolen assets. As of December 2021, NABU had initiated 859 investigations, resulting in 360 indictments and 70 convictions.⁸ The relatively low conviction rate in the early years of NABU operations is explained by the majority of cases being blocked in Ukrainian courts (Glušac and De Vrieze 2020). As a result, Ukraine established a High Anti-Corruption Court (HACC) in 2019, which is responsible for all corruption cases under NABU's jurisdiction. While specialised anti-corruption courts exist in several countries, Ukraine's is characterised by a unique feature of the selection process: to ensure the integrity and independence of the judges appointed to the HACC, the selection process includes a council of international experts with the power to block candidates (Kuz and Stephenson 2020).

In addition to the creation of new institutions, Ukraine's anti-corruption efforts have been focused on transparency. Ukraine's current government has heavily emphasised the digitisation of government services as epitomised by the creation of a Ministry for Digital Transformation. An internationally acclaimed example of Ukraine's digitisation is the e-procurement platform, ProZorro. Initially developed by volunteers linked to Transparency International Ukraine, it is now a mandatory system for public procurement. The electronic asset declaration system is another highly visible element of the anti-corruption reforms. All public officials in Ukraine are required to submit e-declarations annually that list incomes and assets of themselves and their family members. To reduce money laundering and increase transparency of international transactions, Ukraine maintains a national database of politically exposed persons,⁹ with profiles of over 48,000 officials and their associates (Halushka and Kalenluk 2021).

On paper, Ukraine's reforms align with many recommendations from international institutions and the academic literature. However, their adoption can, at best, only be seen as the start of a lengthy transition to a low-corruption equilibrium. Their implementation has been met with significant resistance from vested interests. Some reforms were

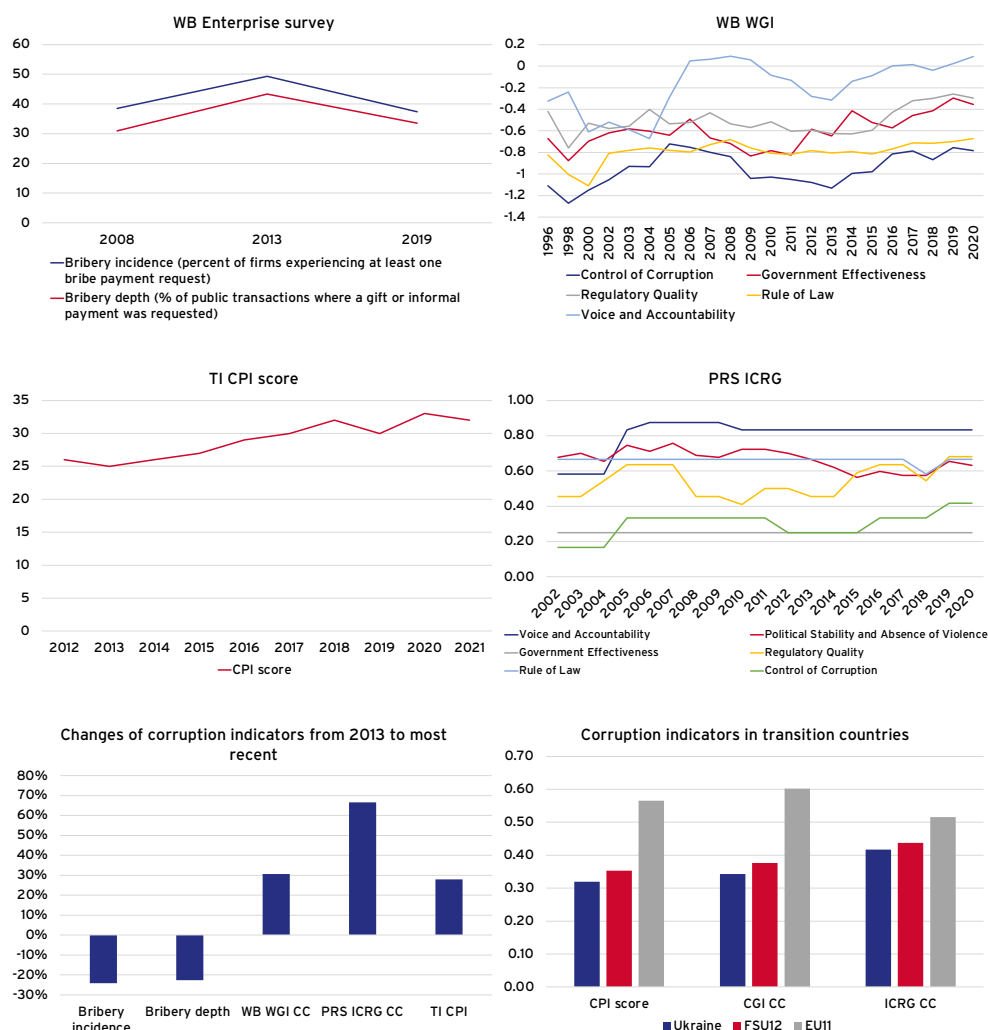
8 <https://nabu.gov.ua/en>

9 In Ukraine's law "On Prevention and Counteraction to Legalization (Laundering) of the Proceeds from Crime", politically exposed persons are "individuals who are or have been entrusted with prominent public functions in Ukraine or in foreign countries".

stalled after partial implementation or were subject to backsliding (Nizhnikau 2022). Describing the creation of the new anti-corruption agencies, De Waal (2016) writes: “While Western governments pressed for the new agencies to be created as quickly as possible, well funded, and staffed with well-paid professionals, Ukraine’s government and parliament showed no signs of haste, allocated insufficient funding for them, and did not select top professionals to fill positions in the new bodies”. Recently, the selection of the heads of NABO and SAPO has become highly politicised and controversial, with Ursula von der Leyen calling for their “appointment as soon as possible” in a speech to Ukraine’s parliament in July 2022. More generally, political appointments and appointments at SOEs remain an issue in Ukraine. Among the pessimistic observers, Kos (2022) summarises the situation before the war by stating: “Even when some positive developments occurred, the corrupt actors in all three branches of power and at all levels began a concerted campaign to keep the situation as it was before: non-transparent and corrupt, thus ensuring impunity for the perpetrators”.

The question, then, is whether the reforms that followed the Revolution of Dignity had any effect on perceived levels of corruption. To find out, we provide an updated picture of the indicators that were used in IMF (2017) to see if these changed during the last years. Figure 1 shows that all the corruption indicators improved after 2014. The final chart shows the percent change in the indicators from 2013 to the most recent observations for each indicator. The bribery indicators have declined by almost 25%, while the corruption control indicators have improved by 30% to 60%. These are from low bases and the indicators still place Ukraine too far down the country rankings of corruption, but still the positive developments of recent years are often ignored. They are also in stark contrast to the comment in IMF (2017) that: “Regarding the evolution of corruption over time, Ukraine has witnessed no improvement over the last 10 years” (p. 5).

FIGURE 1 CORRUPTION INDICATORS BEFORE THE FULL-SCALE WAR



3 WHAT HAS CHANGED IN THE FULL-SCALE WAR?

The Russian aggression in Ukraine has clearly changed many things in Ukrainian society and how the West views the country and its political leaders. President Zelensky has led the defence of the country with greater success than many expected in the early days of the war. His skills as a communicator have been an important factor in mobilising the country as well as generating support from the rest of the world. This has been vital to both defending against the aggressor and keeping the economy at an impressive level given the challenges. Clearly, the president has strengthened his hold on power while at the same time uniting the country and giving the people a sense of a common goal – the

continued independence of Ukraine and a better future. These are also important factors in the fight against corruption. But perhaps more importantly, the war provides the ultimate ‘conditionality’ for anti-corruption: if public funds are not used in an efficient way, Ukraine may lose the war, which is an outcome that nobody in Ukraine can risk.

The power balance has also shifted as a direct consequence of the destruction brought by the war and the break-up of previous connections with more or less Russia-oriented interests. Businesses have been destroyed or crippled, reducing the power of some oligarchs and aligning with the president others who were not previously in his camp.

The media has also been centralised and Russia-oriented channels have been closed. Controlling information and winning the information war is of course an important part of the president’s and the government’s strategy to generate support for the war both domestically and internationally. However, it also affects political power in many other ways that can either be beneficial to or complicate the fight against corruption in the future. It may be beneficial because it reduces the influence of oligarchs in democratic and political processes, but it can also limit the crucial role of an independent media when it comes to investigating how the political system uses its powers. This is certainly an issue to return to when the war is won (this is discussed further in the chapter on governance and institutions).

During the war, different businesses and other parts of society have made special contributions to the defence of the country. These contributions are vital for the country to survive and unite. Many people have also been involved directly in defending the country as part of the armed forces or in volunteer units. They all deserve some form of compensation for their sacrifices during the war, and it will be important for this to be handled in a fair and transparent manner during and after the war. In the United States, for example, firms led by veterans get favourable treatment in procurement. If this is done in a very transparent manner, it may reduce demands for compensation in other forms.

Some more specific channels of corruption and illegal business practices discussed above have been shut down as a result of war-time policies. This includes the significant reduction of illegal trade in oil, while in the gas market, regional gas networks have been nationalised to the benefit of regular citizens. Kos (2022) points out that the general chaos of war may lead to more corruption. It may also lead to loss of lives and human capital, including among those that were part of the anti-corruption movement prior to the war. On the other hand, there are fewer resources from which people can enrich themselves in the ways discussed above when there is a war to fight and win, and more draconian measures and punishments can be adopted to fight corruption than in peacetime. For example, the currently most successful US anti-fraud tool, the whistleblower reward programme under the False Claims Act, was first introduced by President Lincoln during

the US Civil War to fight corruption in military procurement (Nyrerod and Spagnolo 2021). In the end, the prevalence of corruption is a question of how strong the forces that work to reduce corruption in the war are compared to the factors that increase corruption risks.

3 CORRUPTION IN OTHER POST-CONFLICT SETTINGS

Comparing countries globally, there is a strong correlation between corruption and conflict. Most of the worst performing countries on Transparency International's 2021 Corruption Perceptions Index are – or have recently been – affected by war (Afghanistan, the Democratic Republic of Congo, Libya, Somalia, South Sudan, Syria and Yemen are all ranked in the bottom ten). Unsurprisingly, corruption has become a “major preoccupation for peacebuilding actors and analysts” (Zaum and Cheng 2011). The literature emphasises that wars are conducive to corrupt practices because monitoring is weak and money flows through unorthodox channels.

After the conflict ends, corrupt actors may seek to consolidate established patterns of extraction (Lindberg and Orjuela 2011). In the inevitably institutionally fragile environment, post-conflict reconstruction funds can rapidly amplify the opportunities for corruption. Domestic governments and their international partners frequently face a trade-off between disbursing funds quickly to provide relief and support economic activity and ensuring that rigorous mechanisms of oversight and accountability are in place (Bray 2009). However, when the main target of international funds is long-term reconstruction rather than emergency relief, the trade-off becomes much less binding; in large projects that will take years to complete, the fact that rigorous procurement takes a little more effort and time to complete may become a price well worth paying. Still, lengthy and cumbersome ex-ante procedures leading procurements to take ages, often followed by ignoring the monitoring of ex-post outcomes, have not been effective either in improving procurement or in reducing corruption. To guarantee effectiveness in procurement, the monitoring should be of transparency in the allocation and intensive ex-post outcome evaluation.

The source of the funds can be an important determinant of spending procedures. Under the US-run Coalition Provisional Authority in Iraq, repatriated Iraqi government funds “were sent in cash by the plane-load and disbursed without much regard to accountability” (Le Billon 2008). By contrast, taxpayer money authorised by the US Congress was subject to strict disbursement rules and was spent much more slowly. The general lesson is that transparency, reporting and accountability are vitally important in reducing corruption in the reconstruction phase, when it is not a matter of spending money quickly to save lives or avert disasters.

International support for post-conflict reconstruction can also be accompanied by outsiders who see an opportunity for gain while facing limited oversight. For example, several officials appointed by the United Nations Mission in Kosovo (UNMIK) were accused of corrupt practices themselves and of delaying broader corruption investigations in the country (Rose-Ackerman 2008). At the time, UNMIK officials were immune from prosecution by Kosovo's justice system. In a report on American reconstruction projects, the US Special Inspector General for Iraq concluded that 40% of assessed projects "had major deficiencies, including overcharging by subcontractors, expenditures unaccounted for, waste and fraud" (Transparency International 2013).

Reducing the risk of corruption on the donor side or in international organisations will be important in the reconstruction of Ukraine. This is also relevant when assessing the companies or parties that will be doing the actual reconstruction work – we should not assume that there is no corruption in companies that come from donor countries. On the contrary, there are many examples of European companies that were engaged in business practices that generated significant fines from lawmakers, with companies from the UK and Germany at the top of the list (Nyneröd and Spagnolo 2021).

In several important respects, the situation in Ukraine differs from cases typically discussed in the academic literature on post-conflict corruption. Relative to the modal country emerging from a conflict, Ukraine has greater human capital, higher per capita income, (somewhat) stronger democratic institutions, and closer ties to the EU. In addition to these broad differences, specific aspects of the Ukrainian case contrast with common narratives in this field.

First, the war in Ukraine is the result of an invasion by a foreign country – not a civil war. One of the dominant explanations for the prevalence of corruption in post-conflict settings is that rival groups can be incentivised to keep the peace through access to state resources (Zaum and Cheng 2011). Examples of such implicit agreements following civil conflicts have been described in Afghanistan, Bosnia and Herzegovina, Lebanon, Palestine and Sierra Leone (Galtung and Tisné 2009). To the extent that war with Russia is predominantly a unifying force within the country, it could provide a consensus for reform and this risk may be reduced. However, the literature also identifies a related form of corruption that is not necessarily limited to civil conflicts. After the end of the war, groups that are perceived to have contributed disproportionately to victory are sometimes granted privileged access to state funds. As after any conflict, it will be important for Ukraine to ensure that corruption is not used to "reward the winners" (Le Billon 2003).

A second distinguishing feature of the Ukrainian case is the likely continuity of government and institutional structures. The end of conflicts is often associated with regime change, for example, the removal of an incumbent party, the establishment of a new form of government, or international agencies assuming temporary control of domestic affairs. These periods give rise to uncertainty and an institutional vacuum that

is conducive to corruption. Belloni and Strazzari (2014) describe how the chaotic post-war environments in Bosnia-Herzegovina and Kosovo allowed criminal syndicates to operate (and to cooperate with parts of the emerging administrations). Over time, the corrupt practices that emerge in a chaotic post-conflict period can become ‘standard operating procedures’. While Ukraine is likely to avoid a free-for-all in which new corrupt systems take place, it should also be noted that continuity may mean the preservation of corruption patterns that characterised the pre-war status quo.

A third key difference between Ukraine and many countries emerging from conflict relates to the timing of anti-corruption reforms. Post-conflict reconstruction often initiates anti-corruption reforms such as the establishment of independent oversight agencies and judicial reform. International actors can require such reforms as part of the conditionality associated with reconstruction aid and may be heavily involved in their implementation (examples include East Timor, Kosovo, and Liberia; see Zaum and Cheng 2011). The efficacy of such foreign-led reform efforts has been questioned, in particular the focus on the de-jure adoption of formal institutions. As part of the EU visa liberalisation negotiations, Bosnia-Herzegovina created an anti-corruption agency and adopted a “legal framework modelled on the best practices of Western democracies” but the implementation of these reforms has been underfunded and ineffective (Belloni and Strazzari 2014). In the case of Ukraine, these reforms started well before the beginning of the full-scale war. In fact, Ukraine’s anti-corruption infrastructure was also the precondition for the visa-free regime with the EU. The political class tried really hard to undermine its work. Nevertheless, joint efforts of Ukraine’s civil society and international partners keep the reform in place.

4 ANTI-CORRUPTION PRIORITIES IN THE RECONSTRUCTION OF UKRAINE

Ukraine has been pursuing anti-corruption reforms since 2014, including the creation of new agencies, the adoption of new legislation, and the digitisation of government services. However, the IMF (2021) notes that the anti-corruption reforms were stalled by vested interests and stresses the importance of continued efforts to reform the system. While implementation is an ongoing process, the fact that these formal structures are already in place in Ukraine is likely to be an advantage in the reconstruction process compared to other post-conflict countries discussed above. Still, Kos (2022) points out that human capital and capacity at these and other government institutions have been affected negatively by the war and argues that this is an area where swift action is needed to restore capacity and ensure strong leadership in the anti-corruption work. Table 1 summarises potential sources of corruption in post-war Ukraine and the institutions and tools that can be used to mitigate corruption risks in different areas.

TABLE 1 POTENTIAL SOURCES OF CORRUPTION AND MITIGATION

Possible source of corruption	Main agency/institution	Main activities/tools
International funds for reconstruction	Ukraine reconstruction fund	Coordination Conditionality Project planning Transparent procurement Ex-post monitoring Reporting
Public procurement	ProZorro, international procurement systems	Digital platforms Transparency Reporting Harmonisation with EU rules
Bank recapitalisation	National Bank of Ukraine	Transparent process Continue privatisation of state-owned banks Foreign partners
State owned enterprises	State property fund; various ministries and government agencies	Professional boards Cleaning up the sector (3,700 SOEs) ¹⁰ Privatisation
Taxes (income, VAT)	Tax service, Ministry of Finance	Digitalisation Simplification
Custom duties	Custom service, Ministry of Finance, Ministry of Economy	Joint operations of customs with the EU countries Continued digitalisation of customs declarations and integration of the data between regions and customs points
State and local government assets (land, forests, water, networks, etc)	State Property Fund, State Agency of Land Resources, State Land Cadastre, State Agency of Forest Resources, State Agency of Water Resources, State Geology and Subsoil Service	Auctions (Prozorro.Sale, CETAM, Ukrainian Energy Exchange)
'Red tape' (licences, permits, etc.)	Ministry of Economy, Ministry of Communities and Territories Development, other ministries and government agencies	Cutting red tape Streamlining and digitising
Distorted markets	Antitrust committee	Deregulating markets Enforcing competition laws

10 See the chapter on business environment for more extensive consideration of SOEs.

4.1 International funds for reconstruction

Massive inflows of foreign funds are expected when reconstruction starts, and the anti-corruption work in Ukraine must be supported at the highest level by both the Ukrainian government and president and their international partners. The Blueprint therefore proposed a governance structure where the Ukrainian government and the democratic system of Ukraine are the clear owners of the reconstruction process, and they are complemented by a special EU-connected institution that coordinates the donor side and facilitates transparency and accountability (Becker et al. 2022). This institution should be involved in the overall planning and prioritisation of large reconstruction projects that require international support. There is a need for strict anti-corruption conditionality linked to the use of international funds in the reconstruction process. This conditionality should aim to support the anti-corruption institutions and reforms that were already underway in Ukraine since 2014 but also add a special focus on using reconstruction funds in the most efficient manner for the benefit of the entire Ukrainian society. Complicated and lengthy ex-ante procurement procedures should be kept at a minimum reasonable level and be complemented by intense ex-post monitoring and transparent reporting on projects to both domestic and foreign audiences. This can speed up the reconstruction process without increasing the risk of funds being misused. (The institutional setup is discussed in more detail in the chapters on the design of the recovery programme and on governance and institutions). This is in line with key principles 1 and 2 on reducing the opportunities for corruption and ensuring a high level of monitoring and transparency.

4.2 Public procurement

In addition to this institutional setup at the macro level, there are several more technical suggestions on how to arrange public procurement in the emergency phase of the reconstruction process.

The first is *open contracting*, which is about avoiding the inefficiencies of complicated (and often ineffective) ex-ante procurement procedures and instead maintaining accountability through *transparency and ex-post monitoring* – for example, publishing data and documents as soon as a contract is awarded, making the contract invalid until all the information has been published and then following up with one (alternatively, more detailed published reports during and after the execution of the contract). Ukraine has already championed this form of accountability for emergency procurement during the pandemic. The innovative policies it implemented with its central ProZorro platform and in cities like Mariupol are seen as success stories in international comparisons (OECD 2020, OCP 2021).

The second component is strong *whistleblower protection* and, possibly, *rewards*. This is important to uncover corruption and has been used successfully in the United States to uncover and deter various types of fraud for centuries (Nyrreröd and Spagnolo 2021).

Third, Ukraine could use *framework agreements* for rapid second-stage procurement to help transparency and increase efficiency in the current state of emergency. These tools require an initial competitive selection of long-term suppliers, after which administrations can directly buy ‘off the shelf’ from the selected suppliers without lengthy procedures but at the same time preserving transparency, competition and accountability. The US Congress identified these as effective tools to limit inefficiencies, waste and corruption after catastrophe relief in their investigation of what happened in the wake of Hurricane Katrina (US House of Representatives 2006).

Although the emergency phase of reconstruction warrants special, speedy procurement procedures, most of the following reconstruction process will be long-term and should adhere to the best possible standards of planning, procurement, transparency and reporting. As mentioned earlier, there is an already-developed digital system of procurement at the central and local levels in Ukraine. This procurement system is based on Ukrainian laws and procedures, which will evolve over time as the country adjusts its laws and regulations to become an EU member. The fewer exceptions there are from not using the procurement system and processes, the lower the risk of systemic corruption during the reconstruction. Given the complexity and scale of many reconstruction projects, it will likely be necessary to develop existing or new institutions that have the expertise to deal with such projects. These suggestions are also consistent with principles 1 and 2 in the introduction.

4.3 Bank recapitalisation

The war has impacted the financial health of companies and households, and at some stage, non-performing loans in the banking sector will need to be addressed. The level of non-performing loans was already high before the war, although on a downward trajectory. The IMF (2021) discusses the problems involved in this process and how the legal system was not able to deal with criminal charges against bank managers and others that were involved in the diversion of funds and later in hindering the recovery of assets. After the war, the process of dealing with both new and old NPLs will likely include the use of significant amounts of public funds to restore the health of the banking sector. As in any situation with significant use of public funds, this process will have to be managed carefully and with transparency to ensure efficiency, fairness and accountability. The chapter on the financial sector points out that the legal framework for NPL resolution needs to be updated for this. Here, the technical assistance as well as financial assistance from international partners can be particularly valuable.

4.4 State-owned enterprises

SOEs should be reformed in several steps to reduce opportunities for corruption, ensure economic efficiency, and avoid transfers of valuable assets to individuals or companies in a manner that does not benefit citizens. Linked to the above discussion of the banking sector, IMF (2021) points to weaknesses in implementing corporate governance reforms in state-owned banks. More generally, the IMF notes that there had been several cases of interventions that were not in line with good corporate governance practices.

SOE reform should proceed in several stages. First independent boards with members that are appointed based on relevant merits and expertise rather than political connections should be established. Second, SOEs should operate on market conditions without special favours (regulation, pricing, financial support from connected banks). Third, SOEs that are not natural monopolies or enterprises of special strategic interest could be considered for privatisation, which was also a part of the IMF recommendations before the war (if the wrong SOEs are privatised, public monopolies could be replaced by private ones). Finally, the actual privatisation should be done in a transparent way following international best practices to ensure that society maximises the value of its assets. Privatisation in a rush risks creating new oligarchic structures and unfair wealth transfers from the public to those that control the privatisation process. If privatisation is a carefully designed process that includes the use of IPOs where stocks are listed, it could also provide an opportunity to build a more robust stock market in Ukraine. The need to develop a stock market to create a better balance between equity and debt is discussed in the chapter on financial markets in this book. Privatising through IPOs coupled with the right guarantees can also be a way of attracting more foreign direct investment, according to Kornieieva (2018). Again, removing opportunities for rents and promoting transparency is in line with principles 1 and 2.

4.5 Taxes, duties, public assets, market regulation, licenses, etc.

Various levels of government and the civil service more generally control significant flows of public funds and assets as well as how markets function. There have been several papers on how the incomplete transition process from a planned economy to a better regulated market economy with healthy competition has significantly reduced growth in Ukraine and is a source of corruption. This is discussed at great length in World Bank (2018), where the problems are also linked to the above discussion of the oversized role of SOEs in distorted markets. The dismal growth performance connected to poor institutions and inefficient markets is also discussed in IMF (2021), which calculates that growth in Ukraine could run at over 7% per annum if institutions and markets are reformed in such a way that structural reform gaps with Poland are closed.

The political economy of taxes, regulations, permits and SOEs is one of the fundamental sources of corruption where political and business interests intersect with civil service appointments and favours. The World Bank (2018) provides a long list of reforms that are needed to deal with these issues. At a fundamental level, there is a strong need to eliminate the culture of opaque deals between politics and business in the oligarchic structure that has been prevalent in Ukraine. This will foremost require a strong political consensus, but anti-corruption efforts can also be aided by more widespread use of digitalisation, transparent monitoring and reporting, and removing 'red tape' and market distortions.

Special taxation regimes and tax privileges have been an outcome of business-politics deals. These deals have a long and rich history in Ukraine – from free economic zones that covered 10% of Ukraine's territory in 2003 (IMF 2003), to industrial parks, tax exemptions for certain industries (e.g. agriculture)¹¹ and 'investment nannies'. Marchak and Markuts (2020) estimate that the volume of tax privileges (and the corresponding budget losses) have been comparable to the financial support that Ukraine received from the IMF during 2010–2020. These tax privileges were effectively a subsidy received by select producers at the expense of taxpayers, but the subsidy was 'invisible' to taxpayers. In a weak institutional environment, tax privileges will be at best inefficient, and at worst corruption-enhancing. Thus, this practice should be limited, especially during the reconstruction when calls for special needs are likely to be strongest. If the government decides to support some locations or industries, subsidies should be transparent and a part of the budgetary process.

When markets are allowed to be competitive, this reduces rents and the temptation to get involved in distributing such rents in corrupt schemes. Changing how these things work in practice will require changes at many levels of society. This includes civil service reforms that aims to professionalise services with training, review of compensations and perks, and transparent and merit-based hiring and firing. Van Rijckeghem and Weder (1997) is an early study that documents how higher pay for civil servants is associated with less corruption. Other papers discuss how high the pay has to be for this to be true and that it should also be linked to increased monitoring. There will also be a need to formalise interactions of businesses with policymakers (to regulate lobbying). These reforms are again in line with principles 1 and 2 – less rents and more transparency are crucial steps to reduce corruption.

11 For example, tax privileges for agricultural sector did not improve its productivity (Nivyevskiy 2016).

4.6 Other forces to mobilise in anti-corruption efforts include the EU accession process, civil society, media, and education at all levels

Ukraine's status as an EU candidate country is good news in many ways and provides a solid path to institutional reforms that can also reduce corruption. The fact that transition countries that have joined the EU fare much better than transition countries that did not in terms of corruption indicators is encouraging, but is of course also subject to selection concerns. Ukraine should use the opportunity that EU accession provides to complete the anti-corruption plan it has laid out.

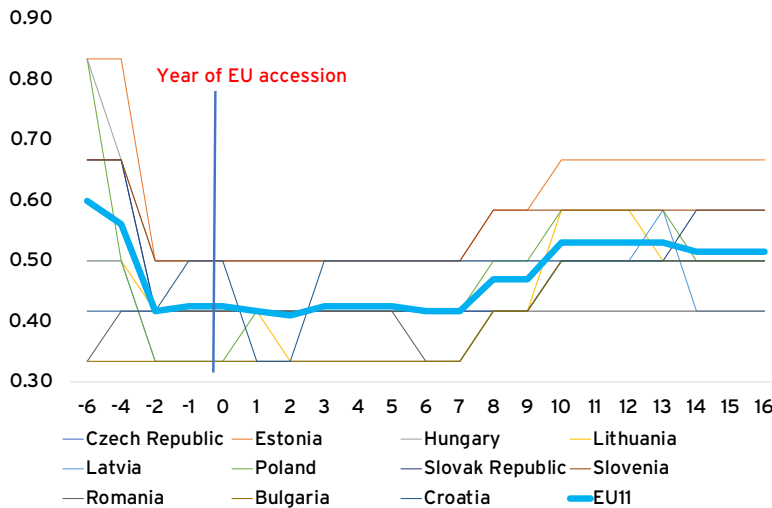
Although transition countries that joined the EU are less corrupt than other transition countries, there are significant variations between these countries as well, and EU accession alone will not take care of corruption automatically in Ukraine or elsewhere. Citizens, civil society and international partners will have to monitor and support the general anti-corruption reform agenda of Ukraine to make the most of the EU accession process. The risk is otherwise that increased bureaucracy that can come with the implementation of some EU regulations can lead to new risks of corruption, as discussed by Alfano et al. (2020). This could be a short-run risk and once countries grow richer, the companies become more interested in regular business activities that generate higher profits than in corrupt practices in a low-profit environment.

Looking at corruption indicators for transition countries that joined the EU, the general (unconditional) pattern is that there is an improvement after a country joins the EU, but also that some countries later undo some of this progress. Looking at the International Country Risk Guide (ICRG) indicator in Figure 2, Poland and Latvia are examples of this pattern. Looking at the corruption perception index by Transparency International, Hungary is another example of an initial improvement followed by a decline later on. The lesson for Ukraine and its international partners is that EU accession alone will not take care of corruption concerns but will have to be complemented by a good legal framework and anti-corruption effort by Ukraine and supported by all international partners.

The reconstruction process will have a significant impact in the local communities where it is implemented, and it will be important to engage citizens and civil society to maximise the value of the projects and minimise corruption. Transparency, dissemination of information, accountability and participation of local stakeholders will be key to achieve these goals. The efforts to root out corruption should also be communicated to the public in Ukraine. The period after the war, with changed mindsets and a sense of common purpose, should be used to send a clear message that Ukraine is breaking with past corrupt practices. This could include education in schools as well as general media campaigns to all parts of society. Over time, a new media landscape that strengthens Ukraine's democracy (discussed in the chapter on governance and institutions) should be encouraged and can also contribute to the anti-corruption efforts.

These measures are in line with principles 3 and 4 in the introduction.

FIGURE 2 ICRG CONTROL OF CORRUPTION INDICATOR FOR TRANSITION COUNTRIES THAT JOINED THE EU



Note: Year 0 is the year of EU accession.

5 CONCLUDING REMARKS

The most fundamental challenges for Ukraine’s anti-corruption efforts are the deep-rooted legacies of transition, rather than the immediate risks of post-conflict reconstruction. The anti-corruption reforms going forward should be guided by the principles outlined in the introduction of this chapter:

1. Remove opportunities for corruption and rent extraction.
2. Focus on monitoring and transparency.
3. Make information and education an integral part of the anti-corruption efforts .
4. Ensure that the anti-corruption and legal institutions are working and trusted.

The post-war environment in Ukraine could be a unique possibility to move society from a high-corruption equilibrium to a low-corruption one if there is a strong consensus for this at all levels of society and among international partners.

Since 2014, Ukraine has adopted a range of anti-corruption reforms designed to promote transparency and accountability. Their implementation is an ongoing process that has met with significant resistance from vested interests. Reconstruction efforts could help to entrench these reforms by incorporating the new institutions in the monitoring of disbursements.

In addition to institutional and technical ways of dealing with corruption, the mindset of the people in Ukraine has changed dramatically since the full-scale Russian aggression started. The war is making the common good of a strong democratic Ukraine visible to everyone. The mindset of people in Ukraine will be an important ingredient in many aspects of rebuilding the country once the war is over, and rooting out corruption will be a strong common goal.

In sum, dealing with corruption in the reconstruction of Ukraine will rest on four pillars that support the principles outlined above: (1) the institutional framework at the macro level; (2) completing the anti-corruption reforms that were started before the war; (3) removing sources of corruption that are related to how the economy functions (procurement, SOEs, regulations, licenses, taxes, etc.); and perhaps most importantly, (4) the Ukrainian society's strong commitment to building a better future together. With this in place and the right support from the EU and the rest of the democratic world, there is a greater chance that Ukraine can become a prosperous home for all its citizens.

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CHAPTER 4

Ukraine's business environment¹

97

Yegor Grygorenko^a and Monika Schnitzer^{b,c}

^aDeloitte Ukraine; ^bUniversity of Munich; ^cCEPR

EXECUTIVE SUMMARY

The Ukrainian business community includes about 500 large enterprises, with a turnover of above US\$100 million, as well as around 400,000 small and medium-sized enterprises (SMEs) and nearly 1.6 million individual entrepreneurs. Traditional challenges for large enterprises have been access to new markets and to foreign capital. For SMEs, traditional challenges have been corrupt government institutions and the tax burden, in particular the administrative tax burden. Traditional challenges for both large companies as well as SMEs have been the judicial system and poor protection of property rights, as well as a lack of qualified human capital. New challenges driven by the war and affecting all types of companies are the destruction of infrastructure, depressed demand for goods and services, a lack of working capital funding and insurance, as well as logistical problems. Rebuilding the economy and providing new business opportunities will require solving the old as well as the new problems. To address these challenges, the government should focus on the following areas:

Commercial boost: A state procurement programme would close urgent needs and also support local SMEs. To facilitate business, creating alternative transport routes – for example, by railway via neighbouring countries and river barges – would be helpful.

Access to finance: The 5-7-9% Affordable Loans Program of the government should be boosted, and private FDI should be attracted. An effective way of fostering investment would be to secure EU support in the form of funds for co-investment and guarantees.

Insurance: Attracting financing and FDI is hampered by the lack of insurance against military risks. International reinsurers no longer provide war risk capacities for insurers operating in Ukraine. Thus, insurance programmes that cover such risks should be established.

Tax reform: Enterprises would benefit from a reduction of tax rates and, most importantly, from a simplification of the tax administration.

1 This chapter has benefitted a lot from multiple exchanges with experts with a very good knowledge of the Ukrainian economic and business conditions.

Reforms of property rights protection, judicial system and fighting corruption: Effective judicial reforms that guarantee rule of law and eradicate corruption have to be implemented.

Infrastructure: Reconstruction programme are needed, as well as effective legal procedures for reimbursement of lost property and damage.

Reconstruction can and should be used to invest in sustainable companies and infrastructure and to boost exports of high value products. To achieve fast and effective results, the government might focus on the needs of ‘priority sectors’, most importantly agriculture, steel and iron, and startups, in particular IT start-ups, which account for Ukraine’s largest exports in goods and services.

A prerequisite for **agricultural exports** is the repair and construction of grain silos. Required are safe rail routes, investments in equipment fleet, as well as deepening of the value chain.

Post-war reconstruction will generate demand for **steel products**. ‘Green steel’ may become a growth engine for exports and investment. Investment should focus on flexible and innovative production capacity. A close partnership with the EU to become part of European value chains would help.

The **IT sector** is suffering from many specialists having moved abroad due to the war. Financial support, access to foreign funding, improved protection of property rights (rule of law) would help. Startup accelerators that provide training and mentoring support should be promoted.

1 THE UKRAINIAN BUSINESS ENVIRONMENT

1.1 Introductory remarks

The term ‘business environment’ made its way into the professional lexicon of economists and policymakers in the late 1950s–1960s, more as a useful general concept coined by the management theorists and organisational behaviour scholars (e.g. Weimer 1959) than as a specific well-defined term. Keith Davis (Davis and Blomstrom 1966) defined it as “the aggregate of all conditions, events and influences that surround and affect business” in any given geography and time period. Since then, however, the usage has evolved gradually into one focused on specific institutional and policy features of the market economies that may have significant conducive or arresting impact on economic growth (see, for example, how the phrase is applied by the OECD and World Bank in their relevant publications).

In this chapter, we discuss the Ukrainian business environment in a similar but even narrower sense: we are interested in those factors, normally external from the point of view of business owners and managers, that drive their decisions to invest – either by launching new businesses or by adding to the capital and technology stock of the existing

ones – and expand business operations within the country. This focus on investment-enabling factors may leave out some elements of the environment, such as consumer habits or social trends, but it allows us to come up with ideas and recommendations that may lead to specific policy actions ‘now’, in the initial stages of Ukraine’s reconstruction.

With this notion of a business environment in mind, we start by briefly describing the Ukrainian business environment as it was on the brink of the full-scale Russian invasion.

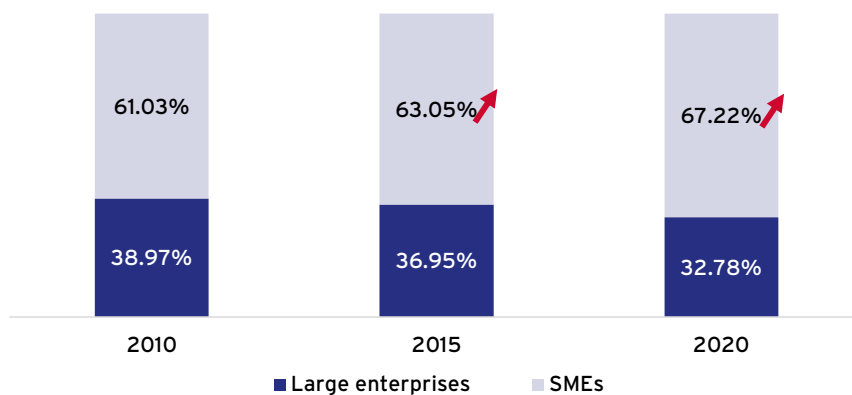
1.2 The Ukrainian business community and business environment before the war

The Ukrainian business community

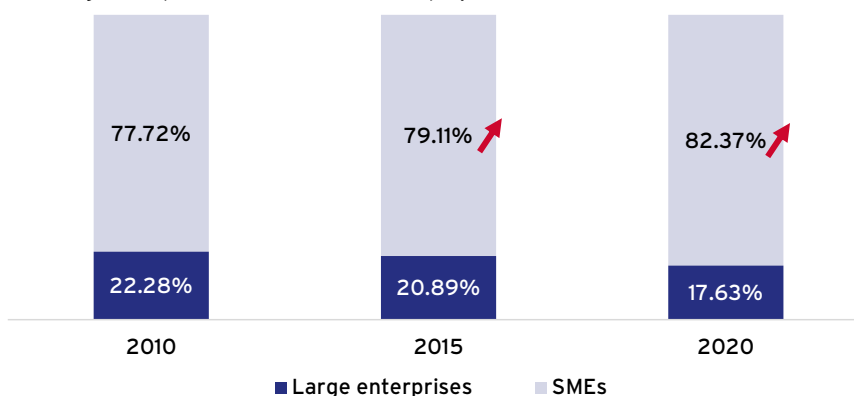
The Ukrainian business community consists of two uneven segments, whose challenges and needs partly overlap but are largely different. On the one hand, there are around 500 large enterprises, with a turnover of above US\$100 million. A significant proportion of these are either controlled by the state or belong to multi-industry conglomerates, the largest of those being controlled by groups historically labelled as ‘oligarchs’. These companies account for approximately 30% of the total corporate sector turnover (Figure 1).

FIGURE 1 STRUCTURE OF UKRAINIAN BUSINESS BY SIZE SEGMENT

a) Share of large enterprises and SMEs in total turnover



b) Share of large enterprises and SMEs in total employment



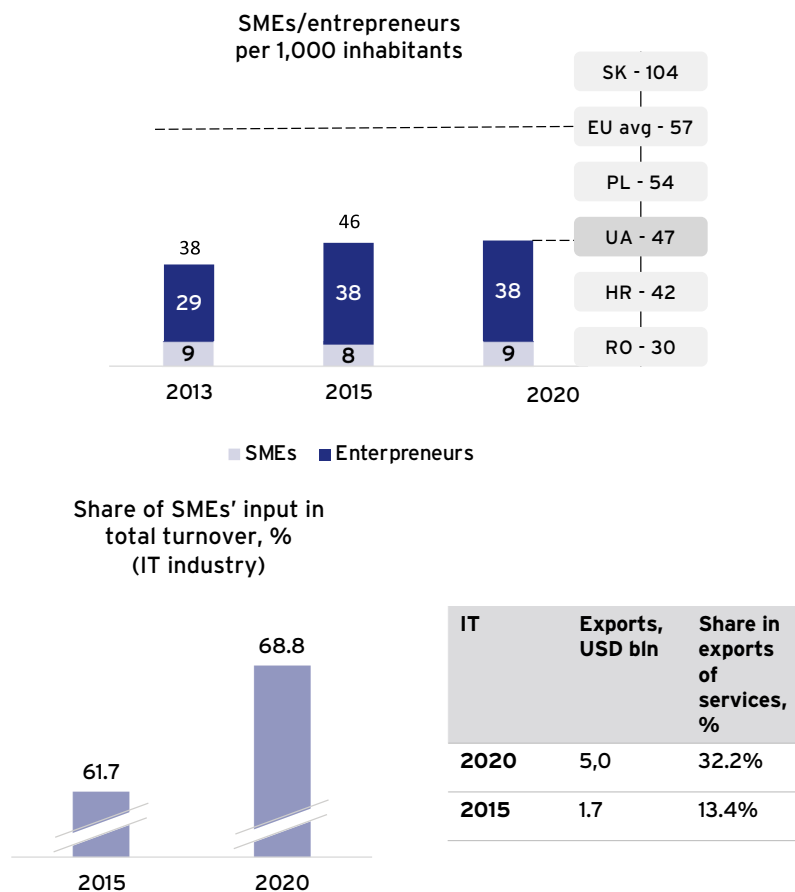
Source: State Statistics Service of Ukraine

Then there are around 400,000 small and medium-sized enterprises (SMEs) and around 1.6 million individual entrepreneurs. Together, they account for the remaining roughly 70% of total turnover. Yet, according to analyses run on large samples of these SMEs by local consulting firms, only around 60% of the registered SMEs are active, while around 40% have no regular business activity. The latter may be satellite companies to large businesses launched for tax optimization purposes, ‘sleeping’ shelf-companies, and so on

The role of small and medium-sized enterprises

Since 2014, Ukraine has been a relatively free market economy and has shown some vibrant entrepreneurial activity. The role of SMEs has been steadily increasing since 2014, by all metrics such as turnover share, employment, average sales. This is mainly due to the rapid development of industries like IT or services. With the partial opening of the market for agricultural land, the number of SMEs in agriculture has also accelerated, although this sector had already shown positive development before.

FIGURE 2 SMEs PER 1,000 INHABITANTS AND SHARE OF SMEs IN TOTAL TURNOVER

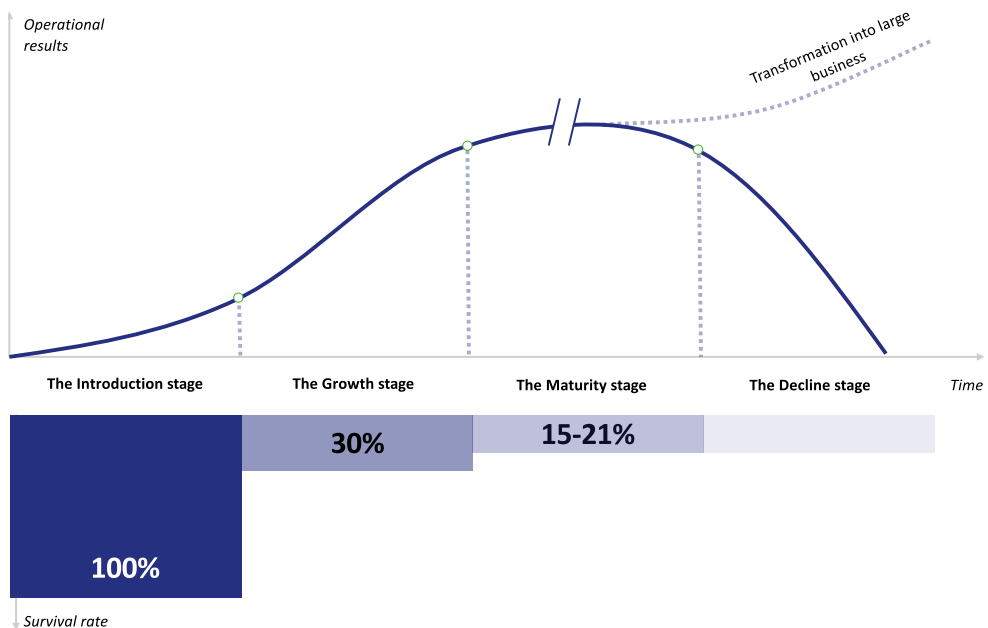


Source: State Statistics Service of Ukraine, Lviv IT Cluster (2021) and Deloitte Ukraine research.

The number of active businesses per capita (including those without establishing a legal entity) is relatively high at 45+ per 1,000 inhabitants (Figure 2). This number is comparable to Poland; it is somewhat smaller than the EU average, but larger than in most European countries. The number grew quickly between 2013 and 2015 but has stagnated since. More importantly, only around 15% of businesses are legal entities and thus employers, while typically one would expect this share to be around 20–25%. To calculate the percentages of active businesses, we use Deloitte Ukraine estimates, which are based on (1) the Ukrainian legal registers and publicly disclosed reporting; and (2) a data sample originating from four large banks and covering cumulatively over 20% of the population. This procedure allows the official data to be cleaned of the vast number of inactive and 'sleeping' entities and/or artificial SMEs established for tax optimisation purposes, which account for around 40% of all businesses registered in Ukraine.

The high number of active businesses is generally a result of the high churn rate among SMEs. The number of openings does not seem to be declining and may even have increased. But the average lifespan of companies remains short – very few survive their first year of the operation. SMEs typically follow a cycle of four stages: an introduction stage, a growth stage, a maturity stage and a decline stage (Figure 3).

FIGURE 3 THE SME LIFECYCLE



Statistically, around 70%² of businesses do not survive the introduction stage. The business activity during this stage mostly depends on the financial capabilities of the owner, partners and sponsors, if any. Even though 56% of corporate loans are given to SMEs, very few are issued at the earliest stage, which greatly affects the survival rate of businesses.

In addition, growth rates are modest. In the growth stage, enterprises face increased costs while there is still a lack of stable income. Among those small enterprises that survive stage one, just 50–70% go on to successfully survive the growth stage. Getting loans at this stage still remains too expensive for SMEs. In addition, subsidised credit programmes are not widely used in Ukraine – before the full-scale war broke out, only 2,500 businesses (out of over a million potentially eligible ones) received loans under the 5-7-9% Affordable Loans Program in 2020. So unless a company is successful in raising funds, it is limited in its further development, especially if it operates in a capital-intensive sector.³

So, while overall there seems to have been no lack of people willing and ready to start a business, which has become a lot simpler since 2014 due to liberalisation and digitalisation, there is a relatively high failure rate and a lack of investment into expanding and growing a business.

Only 15–21% of newly established SMEs enter the third stage – the maturity stage. It is easier for mature enterprises to get financing, both internal and external, since their liquidity and solvency have increased. The duration of this stage is difficult to measure since it depends on numerous factors: relevance of technology, efficiency of financial management, a stable workforce supply, market competition, etc. Currently, among active SMEs in Ukraine around 40% were registered more than eight years ago and around 74% are profitable.

At a certain point of the cycle, an SME can turn into a larger business. Typically, this requires a transformation of their business and operational models. Currently, a very small number of medium-sized enterprises in Ukraine become large businesses. The majority of these are international organisations, large holdings or state-owned enterprises. The number of large businesses has been decreasing over the recent years due to the reorganisation of state-owned enterprises. In 2010, there were 586⁴ large companies, while in 2020 there were only 512.

2 Deloitte analysis based on the data from the State Fiscal Service of Ukraine, the State Statistics agency, several banks, and YouControl (an NGO that compiles the data from electronic registries).

3 The 5-7-9% Affordable Loans Program was implemented by the Government of Ukraine to provide simplified access to bank lending. Enterprises can receive loans at reduced interest rates through state compensation of interest rates to the level of 0%, 5%, 7% and 9% per annum for loans in national currency.

4 There are several legal criteria applied in Ukraine: minimum sales of €40 million, a minimum balance sheet value of €20 million, a minimum number of employees of 250. The final designation is the weighted average of the scores along these three criteria. For practical purposes, the vast majority of those entities that end up classified as large have a turnover above €100 million.

Growing into a large business is difficult for SMEs in Ukraine because of a lack of affordable loan programmes at the earliest stages of development. Moreover, the low attractiveness of the country for foreign investors hampers the chances of raising foreign capital. Many SMEs use immature management practices, which are not adequate for growing into large companies. Finally, the traditional focus of Ukrainian companies on Commonwealth of Independent States (CIS) markets means that they have not been exposed to strong competition. Entering into new markets in Western Europe is difficult due to a limited understanding of new markets and rules of play.

Despite these obstacles, SME development has been the key driver behind the sectoral shift in the economy. Most spectacularly, over the last five years the IT industry has grown very rapidly, both in terms of share of exports and GDP contribution.

Challenges faced by large enterprises and SMEs

The challenges faced by large enterprises and SMEs have been quite different. Before the war, the main challenges for large enterprises were integration into new markets and dealing with export barriers, getting access to foreign capital markets, the judicial system and poor protection of property rights. For SMEs, the main challenges were the judicial system and poor protection of property rights, petty corruption at various regulatory government agencies (which often involves local municipal authorities, although central government may also be implicit), complicated tax administration and a high overall tax burden, and a lack of accessible financing.

Traditionally, the government has focused on the problems of large companies, while SMEs often lack resources to deal with the problems on their own. Yet, there is a strong sense that the development of the economy depends largely on the development of small and medium-sized businesses. Half of the respondents to the Ukrainian Chamber of Commerce and Industry's "Expectations of Business in 2021" survey⁵ believed that regulations for small businesses should be different from regulations for large and medium-sized businesses, while the other half believed that regulations for large, medium and small businesses should be the same.

Certain sectors, most importantly services, may be able to overcome these hurdles, because they have lower capital requirements and often an enhanced ability to protect their cash flows and properties by focusing on export markets. This holds especially for innovative, digital-related sectors like IT, but also for consumer-oriented delivery services and for creative industries more generally.

5 <https://ucco.org.ua/en/press-center/ucco-news/ochikuvannia-biznesu-2021>

The Ukrainian business environment before the full-scale war

In the “Expectations of Business in 2021” survey, the majority of respondents (69.5%) assessed that the state of the business environment (“quality of state regulations and their implementation by authorities”) had worsened in 2020. For 2021, the forecasts were mixed and cautiously neutral.

When asked about possible ways to improve the business climate in Ukraine, more than 90% of respondents listed the reduction of corruption in state authorities, the deregulation of business activity in order to lower the cost of doing business, a significant reduction of the number of state regulations, and limits to state intervention in the regulation of business activity. More than 80% of respondents stated a simplification of labour legislation, the proper fulfillment of the requirements of the Law on State Regulatory Policy by the authorities, as well as cheaper loans and tax benefits.

These very problems mentioned by the survey participants also seem to explain the low willingness of foreign private investors to get involved with Ukraine, which leads to low inflows of foreign direct investment (FDI).

In a survey carried out in September 2021 by the American Chamber of Commerce in Ukraine (AmCham Ukraine) among 100 CEOs and top managers of AmCham member companies, 90% gave an upbeat forecast for their companies’ financial health at the end of 2021.⁶ Compared to the pandemic year 2020, two thirds of the respondents reported an increase in revenues, about half reported an increase in the number of employees, and about one-third reported an increase in investment.

1.3 The status quo six months into the escalated war

A number of surveys have been carried out to assess the current status of businesses after half a year of war. We report on three of these, covering three different – although not mutually exclusive – parts of the business community. The first is a survey among 117 representatives of AmCham member companies, which covers mostly medium-sized or large/medium-sized companies, many of which are subsidiaries of multinational enterprises (MNEs).⁷ It finds that after six months of war, 72% of the companies are fully operational, while 27% are partially operational and 1% are on hold. 83% have been able to pay full salaries, 16% pay reduced salaries, while 1% pay no salaries at all. 22% of the respondents report damages to their plants, factories, facilities, storehouses and offices, half of them unreparable, half with only minor damages. 6% of the respondents report that their assets are under occupation. 96% of the respondents report that they intend to continue operations in Ukraine in 2023.

6 ACC Ukraine “Business Climate Survey: Post-pandemic horizon”, September 2021 (<https://chamber.ua/news/results-of-ukraine-business-climate-survey-post-pandemic-horizon/>).

7 AmCham Ukraine “Doing Business After Six Months of War in Ukraine” survey, August 2022 (<https://chamber.ua/news/doing-business-after-six-months-of-war-in-ukraine-amcham-ukraine-latest-survey-results-72-of-members-fully-operational/>).

The second survey, carried out by Advanter, covers mostly smaller and medium-sized companies and was responded to by 842 participants.⁸ Compared to the business situation on the eve of the full-scale war against Ukraine, almost 40% of participants report that their enterprise has shut down or almost shut down operations, while about 11% report that their enterprise has not changed or even increased its business volume. Nineteen percent of participants report that their business has been relocated, mostly within Ukraine, or is contemplating relocation, while 81% have not relocated their business at all. The share of relocations is largest in the IT sector, with more than 10% of businesses relocating mostly or fully abroad.

A third survey, carried out in July 2022, targeted owners and managers of small, medium-sized and large Ukrainian businesses, with the majority of participants being from small businesses.⁹ Only 22% of the 104 respondents report that their businesses are working as before. Half are working only partially, and 19% of participants report that they have suspended operation. Twelve percent report full or partial relocation of their business, 20% are in the process of partial or complete relocation, and 18% report that their business needs to relocate but has not done so yet. Around half of respondents report that they do not need to relocate their business. Of those who have relocated, 72% did so within Ukraine, 17% within Ukraine and abroad, and 11% relocated abroad. The preferred destinations for relocation are EU states (62%). Eighty-three percent of participants believe that Ukrainian businesses are capable of being competitive and successful in European markets.

As the surveys indicate, the full-scale invasion of Ukraine by Russia has resulted in new challenges, which apply to both large companies and SMEs but have a more severe impact on SMEs. As a first consequence, companies have had to deal with a decrease in demand for goods and services. Seventy-five percent of businesses report a significant decline in demand, with 70% searching for new customers and sales channels. Twenty percent of businesses face late payments from customers or no payments at all.

As a second consequence, enterprises are faced with a lack of funding. Forty percent of businesses are in need of working capital, which is scarce as bank credits have dried up almost completely. Thirty-six percent of businesses are actively searching for funding. Only 4% of the organisations surveyed have taken advantage of the 5-7-9% Affordable Loans Program in 2022.

A third consequence of the war is logistical problems. Forty-four percent of businesses are experiencing difficulties with logistics and transportation. There has been a breakdown of normal transportation chains across regions caused by the blockade of ports, as priority is given to military and humanitarian shipments, and by fuel shortages due to Russian strikes on oil-processing facilities and fuel storages. Moreover, 20% of

8 <https://decentralization.gov.ua/en/news/15408>

9 Gradus "Ukrainian Business Survey", July 2022 (https://gradus.app/documents/269/Gradus_Forbes_ENG.pdf).

warehouses in Ukraine (totalling around 400,000 square metres) have been destroyed by Russian missiles. The risk of doing business has also increased as a consequence of the war. The risk for an individual SME away from the frontline of being hit by a random rocket, for example, is not that large – roughly comparable to becoming a victim of a traffic accident. But it is still significant and de facto not insurable.

The war has also intensified some of the existing challenges, such as the availability of human capital and labour force. Since February 2022, at least 5.1 million people¹⁰ have moved abroad, with 25%¹¹ of them uncertain about returning in the foreseeable future.

Other problems such as corruption and tax administration remain relevant as well, though less pressing. First observations are that the property rights and corruption issues are now moving to the background – partly, because there are more immediate issues, partly, because there seems to be lower tolerance for petty corruption within the central government and fewer opportunities for it. Property registers have been closed for a prolonged time, small businesses are less willing to concur with “corruption tax,” etc.

1.4 Improving the business environment to prepare for the future

The business environment in Ukraine was improving before the war but there is still some way to go, in particular when aiming for EU accession in the not-too-distant future. In some aspects, such as launching a business, there has been progress over the last seven years. It is important to preserve what has been achieved. When it comes to running a business, enterprises are still subject to a large number of regulations, and an important aim must be to improve administration and deter corruption.

Deregulation as such does not seem to be a top priority in the near future. Similarly, establishing special economic zones, as some have argued, is not needed. This is not about fostering the transition from a planned economy to a market economy, as was the rationale in behind the establishment of special economic zones in China. Rather, Ukraine needs to improve its business environment as a whole, with a special focus on new challenges imposed by the war.

Thus, to prepare for the future, the government should address both traditional and new, war-related challenges, while at the same time accounting for differences between large enterprises and SMEs.

Traditional challenges for large enterprises are access to new markets and access to foreign capital. Traditional challenges for SMEs are corrupt government institutions and the tax burden, in particular the administrative burden. Traditional challenges for both groups of firms – large as well as small and medium-sized companies – are the judicial system and poor protection of property rights, as well as a lack of qualified human capital.

10 Estimate of the Ukrainian Ministry of Foreign Affairs, as of July 2022

11 As reported by the Gradus survey (https://gradus.app/documents/301/Gradus_EU_wave_10-UA.pdf).

New challenges driven by the war and affecting all types of companies are the destruction of infrastructure, depressed demand for goods and services, a lack of working capital funding and logistical problems.

To address these challenges, the government should focus on the following areas:

A commercial boost

As 70% of businesses state that attracting new business is their key priority for 2022–2023, implementing a state procurement programme would not only close urgent needs but also support local SMEs. Prioritising local companies in public procurement could provide a needed boost. Furthermore, an increase in regional economic development programs and increasing the SME participation in them would support the local economy. To facilitate business, creating alternative transport routes – for example, by railway via neighbouring countries and river barges – would be helpful (more on this in the chapter on infrastructure in this book by Volodymyr Bilotkach and Marc Ivaldi).

Access to finance

The total needs of SMEs alone are estimated at \$73 billion, and the average amount needed per firm (ticket size) is between \$30,000 and \$300,000 in additional funding. The government therefore needs to boost the 5–7–9% Affordable Loans Program. However, the government alone will not be able to secure finance. An important goal needs to be attracting private FDI, since the expenses cannot all be covered by the government and international donors. The ultimate aim should be to fuel investment levels up to 30–35% of GDP for the next eight to ten years, with at least half of that coming not from the government. An effective way of fostering investment would be to secure EU support in the form of funds for co-investment and guarantees.

Insurance

An important reason for the lack of financing for enterprises is that they cannot obtain insurance against military risks. While the immediate risk for enterprises outside of the war zone is relatively low, as explained above, military risks are not insurable. The problem for insurance companies is that since July 2022, international reinsurers do not provide war risk capacities for insurers operating in Ukraine. The current lack of insurance only hinders the development of Ukrainian business and investment, but is also one of the main deterrents to the inflow of FDI into the country.

Establishing insurance programmes that cover such risks is therefore of high importance. Yet, to date there have been no suggestions on how to change this during the immediate war activities. An expert group, the Ukraine 'War Insurance' Group (Nikolsko-Rzhevskyy et al. 2022), has put together recommendations for providing future war risk insurance that is financed by a donor consortium fund, controlled by the Cabinet of Ministers of Ukraine and supervised by the National Bank of Ukraine (NBU) as the primary regulator of the insurance market. The group recommends that the fund subsidise the war risk insurance in Ukraine after the end of the active phase of the war, phasing out the subsidy over time and ending it after ten years.

Tax reform

Enterprises would benefit from a reduction of tax rates and a simplification of the tax administration. Yet, while some have called for a drastic tax rate cut, arguing that this would reduce incentives for a black market economy and decrease corruption, this does not seem feasible because of the huge budgetary losses it would entail.

A more productive approach is to ease the administrative burden of taxation (for example, by simplifying the tax system). Mastering the current tax system requires extensive legal advice, something SMEs in particular cannot afford.

Reforms to property rights, the judicial system and corruption

Ninety-three percent of Ukrainian business representatives think that the government should implement genuine and effective judicial reforms, guarantee rule of law and eradicate corruption. These traditional pre-war issues are likely to become relevant even before the end of the war and certainly after it ends, so it is important to demonstrate progress now and implement reforms to address these issues, rather than waiting until the war ends.

Infrastructure

As of the end of August 2022, the damage to infrastructure, both as a result of direct Russian attacks in some regions and accelerated amortisation due to overuse, is estimated at \$113.5 billion. This concerns roads/rail/air, energy generation, warehousing capacity, irrigation/melioration systems at a basic level, and so on. Moreover, one in five organisations in Ukraine report that their assets have been damaged during the six months of the full-scale war. Infrastructure reconstruction programmes therefore need to be created and implemented. In addition, effective legal procedures for reimbursement of lost property/damages must be developed.

Human capital

There will be a huge demographic and labour force issue. More than 5 million people (up to 15% of population) have left the country, half of them children and young adults and the rest mostly economically active people. While ending the war will be the most important prerequisite to attracting them back to Ukraine, more investments in social infrastructure are needed, as well as education and health care reforms. Surveys indicate the necessity of labour law modernisation. Immigration and reintegration policies, as well as active employment programmes, will help to reintegrate returning Ukrainians into the labour market. These programmes need to be designed and implemented in cooperation with business and academia (see the chapter on the labour market by Giacomo Anastasia and co-authors and the chapter on education by Martin Kahaneč and co-authors).

1.5 Boosting exports to foster future growth

Empirical studies point to the importance of trade and trade-promoting policies for increasing GDP (Frankel and Romer 1999). Exporting in general increases within-firm productivity (De Loecker 2013), while the mix of export goods has important implications for the rate of a country's growth (Hausman et al. 2007). Thus, boosting exports would be a valuable strategy to foster Ukraine's future growth prospects. Moreover, given that presently, the bulk of Ukrainian exports are commodities or semi-finished goods, moving towards higher value-added products seems like a sensible strategy (see the section on agriculture below).

The importance of prioritising the export sectors

To illustrate how promoting exports can foster growth, we take a closer look at some of the countries that have successfully used this strategy and made significant progress in their economic development. As their cases show, prioritising export sectors, especially in higher value-added industries, can be an important driver of growth. Another catalyst is investing in innovative high-tech sectors, promoting research and development, as well as reskilling the workforce.

The first reference group includes the Republic of Korea, Hong Kong, Taiwan and Singapore – known as the four Asian Tigers. The main drivers of the growth of their economies in the second half of the 20th century were export-oriented policies, strict development policies and investment in innovation. The four countries followed different approaches: Singapore and Hong Kong implemented neo-liberal trading regimes that promoted free trade, while Taiwan and South Korea adopted hybrid regimes that suited their export businesses – in particular, by implementing export incentives for the traded goods market.

It is worth noting that the focus was mainly on the export of high value-added products. The largest export sectors (by volume) for the four Asian Tigers in 2020 were electrical machinery, equipment and parts thereof; television image and sound recorders and reproducers, and parts and accessories for such articles (up to 50% of total exports from Taiwan, around 30% of total export from Singapore and the Republic of Korea and 24% of total export for Hong Kong); and nuclear reactors, boilers, machinery, and mechanical appliances (13% on average from all exports in 2020 for each country).

Prioritising exports in addition to other development initiatives helped the four countries to reach an average real GDP growth rate of 7.5% per year for three decades (from the mid-1960s until 2000).¹²

12 <https://corporatefinanceinstitute.com/resources/economics/four-asian-tigers/>

Vietnam is another example of a country that has made remarkable progress in its development since 1986, after changing its economic strategy to an ‘open-door’ policy. The country has shifted its focus from exporting raw materials and textiles to being a manufacturing hub for large foreign businesses. In 2020, 40% of total exports were machinery, and electronics; 15% were textile and footwear. In comparison, in 2000 more than 18% of exports were crude petroleum (raw materials) and more than 25% were textiles and footwear.¹³

Israel’s way of achieving economic growth since the mid-1970s was to transform the structure of its economy, prioritising innovative, high-tech industries. Given the circumstances, the country also focused on developing the defence sector, in particular manufacturing complex military systems for both domestic market and exports. Currently, Israel is ranked as one of the top ten largest exporters of military equipment (SIPRI 2022). This experience might be a useful blueprint for Ukraine as it has a high internal demand for military equipment and the potential to become one of the leading military manufacturers.

In recent years, Israel has become a booming innovation economy (ranked in the top ten in the Bloomberg Innovation Index 2021) due to special government programmes aimed at supporting the science and technology sector. In particular, in the last ten years the country has spent more than 4% of its GDP on public research and development, and this number is increasing (from 4.0% in 2010 to 5.4% in 2020). Israeli high-tech has continued to prosper and was the economy’s primary growth engine during the past years. The product of high-tech sectors grew by more than 10% in 2021, thereby maintaining its relative share of Israel’s total GDP (15.3%). Furthermore, in 2021 high-tech exports accounted for 54% of Israel’s exports (16% high-tech products, 38% high-tech services). This sets an example for Ukraine, where high-tech sectors currently amount to about 5% of GDP.

While these examples provide strong indications of how promoting exports can boost growth, they should not simply be copied without a careful analysis of how they can be used in the best interest of Ukraine, to make sure that they are not used by lobby groups as a pretext for receiving preferential treatment at the expense of other industry sectors.

EU integration

Finally, the prospect of joining the EU brings new opportunities, but also new restrictions (green energy, labour protection policies, trade liberalisation, etc.). To prepare Ukrainian businesses, cooperating with export credit agencies from other countries could help to attract funding. Exporters should receive institutional support like training and introductions to the market. Companies also need to attract financial

13 <https://oec.world/en/profile/country/vnm?depthSelector1=HS4Depth&yearSelector1=exportGrowthYear6>

and technical support to ramp up compliance with industry certifications and standards that are needed to enter the EU market (e.g. traceability of produce). Moreover, access to Ukrainian labour force in the EU should be provided through cooperation with employment agencies (via the European Employment Services Network, or EURES).

2 SECTORAL ANALYSIS

To achieve fast and effective results, the government might focus on the needs of 'priority sectors' – most importantly, agriculture, steel and iron, as well as startups (in particular, IT startups). In this section, we provide a deeper analysis of these sectors.

2.1 Agricultural sector

Status quo before the war

Agricultural products are Ukraine's most important exports. In 2021, they totalled \$27.8 billion, accounting for 41% of the country's \$68 billion in overall exports of goods. Around 14% of Ukraine's population is employed in agriculture.

Ukraine is in a privileged position for the production of agricultural products, especially field crops, cereals and oilseeds. More than 55% of its land is arable land. The soils are particularly rich in nutrients and the climate is temperate, with warm summers, sufficient rain and severe winters, which is good against pest infestation and reduces the need to use of pesticides.

Ukraine is one of the world's top agricultural producers and exporters. It plays a critical role in supplying oilseeds and grains to the global market. In the marketing year 2021/2022, it produced more than 30% of the global production of sunflower and sunflower oil, and more than 27% of the world's sunflower meal (USDA 2022). This made it the number one global exporter of sunflower oil (46% of global exports) and sunflower meal (54% of global exports). It is the number six producer and number three exporter of rapeseed (20% of global exports), the number four producer and number three exporter of barley (17% of global exports), and number six producer and number four exporter of corn (12% of global exports).

Like the Russian Federation, Ukraine is a key supplier to many countries that are highly dependent on imported foodstuff, many of which fall into the least developed country (LDC) and low-income food-deficit country (LIFDC) groups.

Impact of the war

Some agricultural land (currently around 5%) has been directly affected by war impacts such as tanks or mines.

In addition, due to drafting into military service and the migration of workers, there is a shortage of farmers, such as tractor operators working in the fields.

Active fighting has also damaged inland transport infrastructure (mostly railways) and seaports along the Black Sea, as well as storage and processing infrastructure. Particularly problematic is the impairment of export capacities due to the closure of ports and damage to grain silos, which are used as temporary storage. There have been efforts to boost Ukrainian exports of agricultural products through alternative transport means, for instance by rail via neighbouring countries and river barges. Yet, shipments by rail are constrained by a lack of carriages in neighbouring countries and transborder shipment to Poland via rail is hampered by conflicting gauges.

Another impediment to doing business is the lack of insurance that covers war-related risks, as discussed above.

Shortcomings in the past

Because acreage is available on a very large scale, maximising productivity per unit area has not been a priority to date. Compared to Western European growing regions, less high-quality fertilizer and pesticides are used, resulting in lower average yields.

The agricultural industry is dominated by large agricultural holding companies with cultivation areas of up to 100,000 hectares. In comparison, Western European farms tend to be around 70 hectares. One consequence of the size of Ukrainian companies is that they are less successful in implementing efficient incentive and management structures. This increases the risk of corruption. The adoption of digital technologies to increase production efficiency has hardly been exploited so far, for example for the optimal application of fertilizers and pesticides.

Going forward

The overriding goal must be to secure export structures, not only in the interest of the economic situation in Ukraine itself but also against the background of the importance of Ukrainian exports for securing the world's food supply.

An important prerequisite for this is the repair of damaged grain silos or the construction of new silos. In order to create alternatives to export by sea, safe rail routes are needed, with appropriate loading capacities. Currently, the most favourable option would be rail transport to Romanian ports on the Black Sea. Rail transport to Western European countries would not only take much longer, but there is also a lack of port capacities in the West to transport the grain further by sea. Transport by rail has so far been hampered by the different gauge widths of the rail lines in different countries.

The second part of the reconstruction strategy should be to create an inventory of equipment fleet (tractors, combines, etc.) and quickly fill gaps in the equipment. For this, agricultural companies need to attract funding. Western guarantees could be used to support the delivery of machinery.

The third part of the rebuilding strategy, looking further ahead, should incorporate rethinking the cropping mix and focusing on increasing productivity. For example, Ukrainian cropland would be well suited also for growing soybeans (harsh winters, dry hot summers). To increase the productivity of the agricultural sector as a whole, it would be helpful to increase the depth of value added, for example by processing the grain into flour, or by using grain production in animal breeding. A success case has been the processing of sunflower seeds to produce sunflower oil, which took six to seven years to become fully operational. This indicates, however, that the potential for deepening the value chain is limited in the near future, because it takes time to get the production facilities and the necessary infrastructure in place. In the case of exporting flour instead of grain, for example, the potential to process grain into flour is estimated to be 20% in the next five years. Finally, it would be helpful to boost investments in irrigation.

2.2 Steel and iron sector

Status quo before the war

The Ukrainian steel and iron sector has traditionally been one of the major exporters and investment engines in Ukraine. Steel exports are not as important as they were 15–20 years ago, when their share in Ukrainian exports reached 30%. But the sector has still accounted for close to 20% of exports in recent years.¹⁴ In the wake of the first wave of Russian invasion, steel iron ore investments experienced a slump in 2015–2016. However, since then investment programmes have picked up, generating close to \$1.5 billion in annual fixed capital investments,¹⁵ which represents well over 5% of the total average annual investment.

Although largely leveraging the legacy of the Soviet-era oversized integrated steel mills, the sector had been slowly restructuring and renovating – expanding into more value-added products and experimenting with innovations. Trade barriers with the EU and the lack of FDI into the sector, which is still dominated by large local oligarch-style players, have historically hampered the pace of this restructuring, but this has started to change in the last few years.

One of the more ambitious, if experimental, investment themes to emerge lately is ‘green steel’. Ukraine is in an advantageous position to support the announced EU shift towards zero-carbon steel, as it has rich iron ore deposits, developed enrichment capacity, relatively cheap energy, and infrastructure for hydrogen transportation. Moreover, all of this is relatively close to the major processing capacities locally and in Europe – all the components to become a feedstock of direct reduced iron (DRI) and semi-processed inputs for the potential ‘green steel’ value chain.

14 Sources: Ukraine Statistical Office (<https://ukrstat.gov.ua>) and National Bank of Ukraine (<https://bank.gov.ua>).

15 Source: Ukraine Ministry of Finance (<https://mof.gov.ua>).

Impact of the war

The steel and iron sector has been especially hard hit by the war. To begin with, in Mariupol Ukraine has lost two of its major steel mills – Azovstal and MMK Illich (the first most likely damaged beyond repair by military action). Together, they accounted for up to 40% of the country's finished steel capacity. Close to 50% of the iron ore deposit base is in territories currently outside of Ukraine's control or heavily impacted by the ongoing military action.

Logistics are now a major hurdle. The country's maritime ports have been shut down for several months and now handle only limited volumes of agro-exports. Its rail network has far from the required capacity to sustain traditional export volumes and is overburdened by strategically more important agricultural exports.

Local demand is depressed, as most projects in heavy industries and infrastructure are on hold. In addition, global demand dynamics are not favourable for Ukraine – China's economy continues to slow down, no significant sanctions have been imposed on Russian steel, and there appears to be oversupply in the market. As a result, Ukraine is no longer a top 20 global steel producer. Exports are down to around 30% of their pre-war levels and the remaining capacity utilisation is down to only 15–20%.

The future of Ukrainian steel: What should be done

The current prospects may look bleak, but a lasting decline can be averted if the situation is handled skillfully. Post-war reconstruction, even if of any level of significance, may provide a boon. Most likely, it will generate significant demand for long steel products¹⁶ and even require additional capacity deployment in flat steel products¹⁷ (given the destruction of Azovstal). The 'green steel' theme remains speculative, but if properly developed it may become another growth engine for exports and investment.

Playing smart will most likely mean *not* trying to restore everything demolished by the war (specifically, the integrated steel mills in Mariupol) but rather investing in more flexible and innovative production capacity and in infrastructure (transport, energy, other enablers for low carbon value chain and exports). The export focus should be on net rather than gross exports. While pre-war export levels may be hard to achieve immediately, smart investments could help to replace imports (e.g. reducing iron ore imports, launching local production for wind power generators, decreasing imports of construction components).

16 Long steel products are made from billets and blooms, which are mainly used in the construction sector. They include rebar, wire rod, merchant bars, rails and sections.

17 Flat steel products are made from steel slabs and include plate, strip, hollow sections, large diameter welded pipe and structural beams.

Restructuring the steel and iron sector will require government support – not so much in terms of financing, but more in terms of securing a close partnership with the EU to help embed the Ukrainian iron ore and steel industry into European value chains (mutual infrastructure projects, removal of trade barriers, joint ‘green steel’ and security programmes, potential access to the EU infrastructure funds). A successful restructuring will also require a major shift in attitude among local ‘steel barons’. They will need to be more open to FDI and equal partnership with European investors.

In the end, the success of this restructuring will depend on reducing the fundamental investment climate risks. This requires a stable and controlled military situation, access to natural resources (ore, energy, coking coal), availability of insurance and secure property rights. If all of the above is addressed adequately, the sector may become a magnet for annual investments approaching \$10 billion and rapidly achieve a positive impact on net exports after the end of the war.

2.3 IT SECTOR AND STARTUPS

Status quo before the war

Ukraine was in 11th place in the IT competitiveness ranking among European middle-income countries in 2021 (IT Ukraine Association 2021). The IT sector has taken over first place in the export of services and generated more than 4% of Ukraine’s GDP in 2021. Over the past three years, the industry has more than doubled its exports, generating \$6.9 billion in export revenue in 2021. If the current trend were to be maintained, the forecast for export revenue in 2022 is \$8.5 billion. More than 5,000 IT companies (including startups) are active in the labour market. Over the past three years, the industry has increased its number of specialists by more than 50% (Lviv IT Cluster 2021).

There are more than 2,000 tech companies and startups registered in Ukraine.¹⁸ Investments in the IT startup sector increased ten-fold over a period of five years, from \$39 million in 2014 to \$509 million in 2019.¹⁹ Between 2020 and 2021 alone, investment in Ukrainian startups increased by 45%. In the first quarter of 2022, 11 venture deals worth \$11.5 million were made (Kreston Ukraine et al. 2022). Forty percent of Ukrainian startups are geared to the export market, while for 60% of startups the key market is Ukraine.²⁰

War-related challenges

A major challenge for the IT industry is that, as a consequence of the war, 43% of IT specialists want to or are considering moving abroad.²¹ Twenty percent of IT specialists have already moved abroad since the beginning of the full-scale war, while around 3% of workers have been mobilised to the military or to the territorial defence force.

18 <https://techecosystem.gov.ua>

19 <https://ukraine.ua/invest-trade/startup-ecosystem-ukraine/>

20 <https://ukraine.ua/invest-trade/startup-ecosystem-ukraine/>

21 <https://itcluster.lviv.ua/en/projects/it-research/>

IT companies are also suffering from contracts being terminated by clients and face increased cyber-security risks.

More than half (55.7%) of IT startups continue their operations exclusively from Ukraine. Since the beginning of the war, they have lost about 12.7% of their employees. Ninety-one percent of startups confirm that they need financial support to continue operations and/or expand their business (Komarnytska et al. 2022). Ukraine has dropped 16 positions in the Global Startup Ecosystem ranking compared to 2021, and now ranks 50th.²²

Non-war-related challenges

In general, the IT industry, including startups, is hampered by a lack of qualified human capital. Access to foreign investment markets is also considered a challenge by the IT industry, as is insufficient protection of intellectual property. Startups in particular find it difficult to attract clients. They also mention a lack of mentoring and support programmes as a challenge.

What should be done

In light of the above challenges, providing financial support, including help with accessing funds abroad, would be helpful. Moreover, ensuring favourable conditions for the protection of property rights (rule of law) is needed. Finally, investment in startup accelerators that provide training and mentoring support should be promoted.

3 CONCLUSION

Ukraine's economy has come a long way since 1991. While before the war the judicial system, corruption and getting access to foreign products and capital markets were dominant concerns for small and large businesses, they are now struggling with much more fundamental problems such as destroyed infrastructure, lack of demand and a lack of access to finance and insurance. Rebuilding the economy and providing new business opportunities will require solving the old as well as the new problems. Reconstruction can and should be used to invest in sustainable companies and infrastructure. Boosting exports, deepening value chains in agrobusiness, building up green steel production, and fostering IT startups will provide opportunities to move the economy ahead.

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International trade and foreign direct investment

Veronika Movchan^a and Kenneth Rogoff^b

^a*Institute for Economic Research and Policy Consulting, Kyiv*; ^b*Harvard University*

EXECUTIVE SUMMARY

Ukraine is a small open economy with high reliance on foreign trade and a generally favourable trade regime. In joining the WTO in 2008, Ukraine committed to low tariff protection and extensive non-discriminatory access to its service markets. The Association Agreement with the EU signed in 2014 resulted in further trade-related reforms bringing Ukraine's legislation and practices closer to the EU norms. That harmonisation has resulted in reduced non-tariff barriers in trade with the EU and created opportunities for better access to third markets.

Over the last decade, several structural changes in Ukraine's trade occurred. Ukraine has become a significant player in the global food market, becoming the second-largest supplier of grains after the United States and the dominant supplier of sunflower-seed oil. In parallel, Ukraine has emerged as a global IT service supplier, and the industry has continued to thrive despite the full-scale war. In imports, the country managed to reduce its energy imports substantially. Geographically, the EU has become the largest trade partner of Ukraine, while Russia lost most of its economic linkages.

While external trade is essentially a success story, foreign direct investment looks more like a failure. FDI inward flows have been small and insufficient to cover development and modernization needs even prior to the full-scale war. In principle, Ukraine offers legal protection and tax privileges to investors and has multiple agencies responsible for attracting FDI. In practice, however, poor performance on such fundamental issues as the rule of law, protection of property rights, and the fight against corruption have deterred investors.

The full-scale war has had a devastating impact on Ukraine's foreign economic links. During the spring of 2022, its goods exports almost halved, mainly because of the Russian blockade of Black Sea ports. The recent deal to allow the sea shipment of grains and related goods and fertilizers is important, but not sufficient to recover exports in full. Because of the blockade, trade has become increasingly concentrated on the EU, with its share jumping from 40% to over 70% of the total exports.

At the same time, the full-scale war has triggered a historic shift in Ukraine's relations with the EU. In June 2022, Ukraine became an EU accession candidate country. This important milestone in Ukraine's status within Europe will govern the country's reform path for the years to come. Given the significant transformational power of the preparation for the EU accession, we expect reconstruction and modernization to be realized within this dominant political objective.

However, a rapid post-war economic recovery is possible only if based on solid exports and significant foreign capital inflows. This means the country will have to complete fundamental reforms related to the rule of law and to property rights protection. These are preconditions for the EU accession talks and key to attracting foreign investment. In parallel, Ukraine will continue sectoral reforms allowing economic integration with the EU even before the country becomes an EU member state.

It is expected that the role of public-private partnerships and private money per se will dominate the post-war recovery. International donors' primary role in trade and investments is technical and financial assistance in reforms aiming at EU integration and the funding of (new) insurance schemes for exporters and investors. The costs of foreign technical assistance should be relatively modest (a few billion dollars), but the cost of insuring operational risk against a future resumption is obviously going to be very dependent on the nature of the peace.

1 UKRAINE'S TRADE AND FOREIGN DIRECT INVESTMENT: MAIN TRENDS AND POLICY RECOMMENDATIONS

Ukraine is a small open economy with high reliance on foreign trade and a generally favourable trade regime. In 2021, the ratio of trade (exports plus imports) to GDP was 83% in Ukraine compared, for example, to 118% in Poland. By joining the WTO in 2008, Ukraine committed to low tariff protection and extensive non-discriminatory access to its service markets and has generally followed through on its commitments.

The Association Agreement with the EU signed in 2014 resulted in further trade-related reforms bringing Ukraine's legislation and practices closer to the EU norms, a considerable step forward. That harmonisation has resulted in reduced non-tariff barriers (NTBS) in trade with the EU and created opportunities for better access to third markets.

Since then, Ukraine has remained active in concluding free trade agreements, and as of January 2022, it has had 19 free trade agreements (FTAs) with 47 countries, covering over half of its trade in goods.

Over the last decade, Ukraine has become a significant player in the global food market, becoming the second-largest supplier of grains after the United States and the dominant supplier of sunflower-seed oil. Notably, Ukraine has been shipping genetically modified organism (GMO)-free plants, including maize and soybeans, which are in high demand in the EU.

Nevertheless, the country's participation in global value chains has remained limited. Ukraine is a supplier of raw materials (grains, iron ore) and intermediate goods such as sunflower-seed oil in bulk, various ferrous metals, ignition wiring sets and so on, but its role in final production remains modest. At the same time, Ukraine has emerged as a global IT service supplier, and the industry has continued to thrive despite the full-scale war.

While external trade is essentially a success story, foreign direct investment (FDI) looks more like a failure. FDI inward flows have been small and insufficient to cover development and modernisation needs even prior to the full-scale war. In principle, Ukraine offers legal protection for investors and has multiple agencies responsible for attracting FDI. In practice, however, poor performance on such fundamental issues as the rule of law, protection of property rights and the fight against corruption have deterred investors. Dealing with widespread corruption, a legacy of the country's Soviet past, has long stood as the number one development problem in Ukraine, although recent years have seen improvement, and there is hope that the full-scale war will prove a turning point, with EU ascendency providing both strong motivation and political impetus for reform.

The full-scale war has had a devastating impact on Ukraine's foreign economic links. During the spring of 2022, its goods exports almost halved, mainly because of the Russian blockade of Black Sea ports. The recent deal to allow the sea shipment of grains and related goods and fertilizers is helpful but hardly sufficient to recover exports in full. Notably, the agreement does not cover other major export products such as metals and ores, nor does it cover imports. In August 2022, grain shipments reached about 2.5 million tonnes, more than doubling compared to spring months but still about half of pre-full-scale war levels. Despite elevated global grain prices, Ukraine's exports of goods in 2022 are likely to be at least one-third lower than a year ago.

Because of the blockade, trade has become increasingly concentrated on the EU, with its share jumping from 40% to over 70% of the total exports; the EU and Moldova are the only easily accessible trade partners at present. Trade with the EU increased even in nominal terms despite a general deep dive in overall trade value. IT exports have continued to grow despite the full-scale war; in the first half of 2022, computer services increased by 30% year-on-year.

The full-scale war has resulted in a historic shift in Ukraine's relations with the EU. In June 2022, Ukraine became an EU accession candidate country, setting specific and measurable goals for Ukraine's policy for a decade and defining a clear path for future reforms. The candidacy does not exclude the implementation of the 2014 Association

Agreement with its continuing integration benefits, but presages further and faster integration than seemed possible before the full-scale war. It is a major step for Ukraine, though to take full advantage of it, the country must continue to make steady progress on governance issues.

Apart from Ukraine's candidate status, the full-scale war – and the Russian blockade – has dramatically advanced plans for improved transport and logistic links between Ukraine and the EU. A significant expansion of transport corridors and an enhancement of crossing points are envisaged. The EU and Ukraine have already signed a temporary agreement ensuring better access to the EU for Ukrainian road carriers. Land shipping remains much more expensive than sea transport for most products, thus restoring port access to the Black Sea in full remains the most important factor in resuming Ukraine's successful pre-war trade progress. Nevertheless, over time the improved land logistics with the EU will have a major impact regardless. Following the baseline assumptions for this volume, we assume that full Black Sea access will be restored post-war but take into account the possibility of higher insurance rates, especially if low-grade hostilities leave lingering uncertainty.

Taking into account observed full-scale war damages and new potential growth areas, Ukraine's expected export pattern could include the following:

- **Preserving the leading role of grains and other agriculture and food products** in exports, which seems feasible given that in 2022, despite the full-scale war, the grain harvest is expected to be about two-thirds of the record-high 2021 harvest and only about 14% less than in 2020.¹ Moreover, the 2020 land market reform that removed a long-lasting moratorium on agricultural land sales had only just begun to have its impact before the full-scale war and is likely to continue to lead to further growth long after.
- **Recovering metal exports.** The bombings, the blockade and the loss of workers to the military and migration have led to a sharp reduction in metal exports in the near term. However, access to domestic iron ores, increased supply of metal scrap, trained personnel, established global market networks and expected strong domestic demand create grounds for the sector to recover in the long run, with new, more efficient plants being constructed to replace ones that have been destroyed. Of course, this also depends on how quickly the wartime diaspora returns.

1 According to Latifundist.com, grain harvest is expected at 54-56 million tonnes in 2022 (<https://latifundist.com/novosti/59952-analitiki-pidvishchili-prognoz-urozhayu-zernovih-v-ukrayini-na-2022-rik>). The Ministry of Agrarian Policy and Food stated that, as of 29 September 2022, Ukraine has already harvested 26 million tonnes of grains, almost competing threshing of wheat and barley (<https://minagro.gov.ua/news/v-ukrayini-rozpochalosya-zbirannya-kukurudzi>). The harvesting of maize has just started and can reach 30 million tonnes. Ukraine harvested 86 million tonnes of grains in 2021 and 65 million tonnes in 2020.

- **Expanding weapon exports.** Ukraine is likely to see an increase in weapons exports in the medium to long run when peace is restored. It had significant capabilities prior to the war, being the fourth-largest global arms exporter in 2012.² Since the Russian aggression in 2014, Ukraine's defence industry has reoriented towards domestic needs, and its share in global arms exports slipped from 2.5% in 2012–2016 to 0.7% in 2017–2021 (Wezeman et al 2022). Still, in 2021, Ukraine was the fourteenth largest global arms supplier. The war resulted in rapid development and increased credibility of Ukraine's weapons, creating post-war market opportunities.
- **Offering new innovative products.** Ukraine has proven extremely innovative in a number of new medical products and technologies related to caring for victims of war, and this, too, is likely to develop into a new export industry. For example, Ukrainian medical experts have achieved important advances in haemostatic or anti-burn medicines, and aside from the contribution to human welfare, there are possibilities for commercialisation and export.
- **Increasing energy exports.** Ukraine's development of the green energy sector, facilitated by the preparations for EU accession and as a likely condition of post-war aid, implies that exports of energy, including electricity and, later on, hydrogen, can turn Ukraine into a net exporter of energy products. The chapter in this book on energy provides more details.
- **Strengthening IT and business service exports.** The IT sector is expected to retain its leading role in Ukraine's service exports, being among the key sectors with limited exposure to security threats. Exports of business services such as consulting will also likely expand, continuing the pre-war pattern. At the same time, exports of transport services will probably stay suppressed and revenues related to transiting Russian oil and gas to Europe will likely vanish.

As for imports, the short- and long-term structures will probably differ.

In the short term, Ukraine will need to import all petroleum-processing products as its production facilities have been destroyed. At present, for example, gasoline and diesel fuel must be hauled overland in trucks, which is highly inefficient. The same problem applies to many other products, as Ukraine is forced to replace the missing domestic production in sectors that have suffered substantial war devastation.

However, in the long run, the role of energy imports is likely to fall sharply in response to energy-efficiency measures and restored domestic production. At the same time, the reconstruction and modernisation needs will further boost imports of machines and equipment, which are already the largest import category.

2 www.kyivpost.com/article/content/ukraine-politics/ukraine-worlds-4th-largest-arms-exporter-in-2012-according-to-sipri-321878.html

Geographically, it seems plausible that trade will be more oriented toward the EU even after sea shipping is fully restored. That has been the experience of other countries that have joined the EU and is a natural byproduct of membership in a customs union. Nevertheless, the share of exports to the EU is likely to return closer to the pre-war levels as the demand for many Ukrainian products, particularly in agriculture, will stay mostly outside the EU.

Promising sectors for the future FDI inflows include:

- **Energy**, especially green energy, given the security risks associated with traditional energy sources and existing climate commitments.
- **Machines and equipment, including military equipment like drones.** Ukraine has its own products, but given ongoing security risks, it will welcome foreign investments into domestic production under the NATO standards.
- **Information technology and communication (ITC).** The sector has been developing intensively even despite the war and should become one of the key export drivers for the country.
- **Construction and construction materials.** The extensive reconstruction needs – given the scope of devastation – will make this sector a ‘Klondike’ for investors, both domestic and foreign. In addition, the development of modern infrastructure aligned with the EU standards will be the task for years, offering investment opportunities, also in a public-private partnership format (see the chapter on infrastructure for more details).
- **Agriculture and food.** The sector is internationally competitive and has appeared to be quite resilient to security shocks.
- **Metal production.** The extensive devastation of existing production facilities, coupled with available resources and a trained labour force, make the sector recovery attractive.
- **Production of medical devices and pharmaceutical products.** The war experience has intensified innovation, making it attractive to potential investors.

The country’s EU candidate status and reconstruction needs are potentially an excellent attraction for foreign investors. However, as the experience of other former Soviet bloc countries illustrates, the full benefit will require addressing a number of concerns on top of the dislocation and destruction caused by the full-scale war. These concerns relate to deep-rooted problems – namely, the protection of property rights, the rule of law and the fight against corruption – and there is no magic bullet for them.

Moreover, both trade and FDI – and the economy in general – will depend on the availability of human capital (the return of refugees and/or inflow of migrants), infrastructure reconstruction and access to finance.

Given its candidate status, Ukraine should now bring European integration requirements into the frame of all its policy changes, including those related to reconstruction. EU membership entails the implementation of many norms still not embedded in the Ukrainian legislation. To ensure the efficient use of funds, these norms should be taken into account when planning the reconstruction. These can be, for instance, norms related to environmental protection, energy efficiency and construction.

Our recommendations on trade and investment policies include:

- **Implementing current EU-Ukraine Association Agreement opportunities.** This includes, for instance, the conclusion of the Agreement on Conformity Assessment and Acceptance (ACAA) of industrial products and the mutual recognition of equivalence for food products. The Association Agreement also envisions concluding special transport agreements that should allow the replacement of the temporary wartime agreement on road transport with a long-term deal opening access to the EU market for Ukrainian carriers. For telecommunications, postal, maritime and financial services, achieving internal market treatment will be essential. Further opening of the public procurement market, in addition to the access provided through the WTO Government Procurement Agreement, will be important.
- **Joining recent EU sectoral initiatives.** For instance, Ukraine is interested in joining the EU Digital Single Market³ and taking part in the EU Green Deal⁴ implementation.
- **Concluding further FTAs with a focus on countries with which the EU has negotiated, or is negotiating, FTAs,** such as Morocco, Tunisia and Algeria. These are countries in the Mediterranean region, and an FTA with them would allow better use of the Pan-European-Mediterranean Convention on preferential rules of origin (the PEM convention). Other potentially promising partners for FTAs are South Korea, India and Indonesia.
- **Completing fundamental reforms related to the rule of law and property rights protection.** This is the major priority not only to attract foreign investment but to promote long-term growth in general.
- **Introducing new risk-insurance schemes.** In anticipation of post-war tensions or, at a minimum, the tail risk of further tensions, a multi-donor fund to cover non-economic risks for foreign investors will be needed. There has been some

3 <https://eufordigital.eu/discover-eu/eu-digital-single-market/>

4 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

experimentation with such donor funds at the World Bank,⁵ though the viability of this on the scale of Ukraine's economy may be difficult to secure. For better trade financing, the Export Credit Agency capitalisation by international donors will help to boost exports.

- **Further developing quality infrastructure,**⁶ including rebuilding laboratories and other specialised facilities affected by the full-scale war, establishing new facilities and improving Ukrainian public servants' capacity in spheres related to quality control.
- **Establishing better transport and logistic links between Ukraine and the EU** for all transport means. For this, the development of intermodal transportation hubs in Ukraine is needed.

Successful implementation of these recommendations requires ongoing commitment and active involvement of Ukraine and its partners. Given the ongoing transformation of Ukraine's legislation and institutions in the country's preparation for EU membership, the EU role in implementing these recommendations is exceptionally high. This concerns not only financial and technical support but also the readiness to swiftly integrate Ukraine into sectors and spheres envisaged by the Association Agreement and sectoral deals.

2 BASIC TRADE FACTS: THE SITUATION BEFORE THE FULL-SCALE WAR IN UKRAINE

2.1 Statistics and trends

Ukraine is a small open economy dependent on foreign goods, services and capital markets.

Historically, Ukraine's trade openness (exports plus imports as a share of GDP) has fluctuated around 100%, though recently its exposure to foreign markets has fallen, with the trade-to-GDP share falling to 83% in 2021 compared to 108% in 2015. Still, Ukraine's trade openness is comparable with the EU average⁷ and well above the world average (Figure 1).

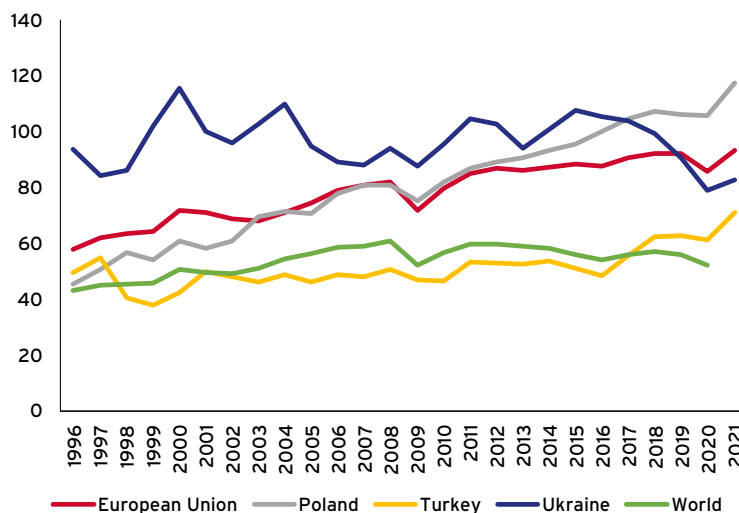
5 In September 2022, the Ministry of Economy and Multilateral Investment Guarantee Agency (MIGA), a part of the World Bank Group, announced plans for a pilot project for providing guarantees for foreign investors in Ukraine. The initial allocation for Ukraine is US\$30 (see www.me.gov.ua/News/Detail?lang=en-GB&id=1885d3ee-e1fd-47bd-b44e-ec3cd42dd456&title=TheMinistryOfEconomyOfUkraineHasAgreedWithMigaToLaunchAMechanismForInsuranceOfInvestmentsDuringTheWar).

6 Quality infrastructure refers to the public and private institutional framework needed to implement standardisation, accreditation and conformity assessment services including inspection, testing, laboratory and product certification (see <https://europa.eu/capacity4dev/new-tbtprogramme-new/wiki/quality-infrastructure-1>).

7 Both intra-EU and extra-EU foreign trade are taken into account.

According to the balance of payments figures, in 2021, Ukraine exported US\$82 billion of goods and services and imported \$84 billion. Ukraine's trade remained below its 2012 peak value, despite a solid post-COVID-19 recovery fuelled by high global prices. While exports came close to peak 2012 values prior to the full-scale war, imports have remained at lower levels, partly due to a substantial reduction in fuel imports. In particular, Ukraine stopped importing natural gas directly from Russia at high prices, while imports from Europe were at market prices⁸ and in lower volume.

FIGURE 1 FOREIGN TRADE IN GOODS AND SERVICES (% OF GDP)



Note: Includes both intra-EU and extra-EU foreign trade

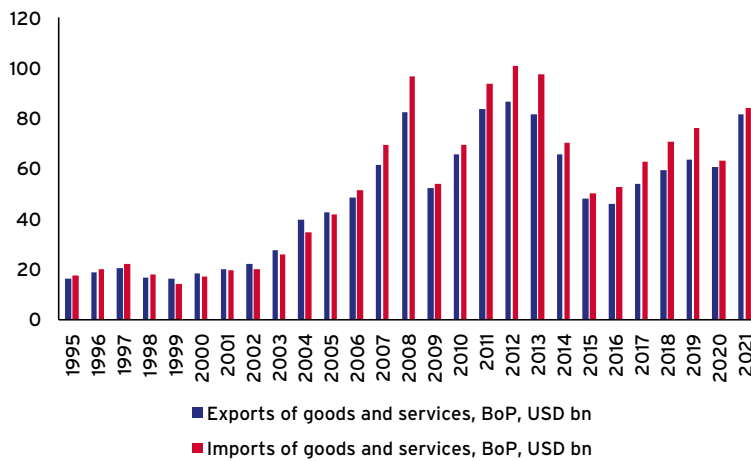
Source: <https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS>; trade in goods and services

Ukraine has had a negative trade balance in most years since 2006 (Figure 2). This trade deficit would be perfectly sustainable if it were coupled with strong FDI inflows. However, in Ukraine debt flows have dominated and the ongoing negative trade balance has been a recurrent source of vulnerability, leading to serial IMF programmes.

Trade in goods has been dominant for Ukraine's economy, with services accounting for only about one-fifth of total trade. In 2021, according to the balance of payments, Ukraine's goods exports amounted to \$63 billion, while service exports were \$18 billion. In imports, the respective figures were \$70 billion for goods and \$14 billion for services.

8 The gas contract between the state-owned energy companies Naftogaz (Ukraine) and Gazprom (Russia) signed in 2009 envisaged excessively high gas prices, a 'take-or-pay' clause and prohibition of re-exports, ballooning Ukraine's fuel imports up. In 2014, Naftogaz and Gazprom entered into mutual arbitration at the Stockholm Chamber of Commerce. Since November 2015, Ukraine has stopped purchasing gas directly in Russia and switched to purchases from multiple European suppliers. This has allowed cheaper natural gas imports compared to the Gazprom contract. In 2017, Naftogaz won the Stockholm arbitration against Gazprom. Thus, Gazprom's market power abuse was confirmed.

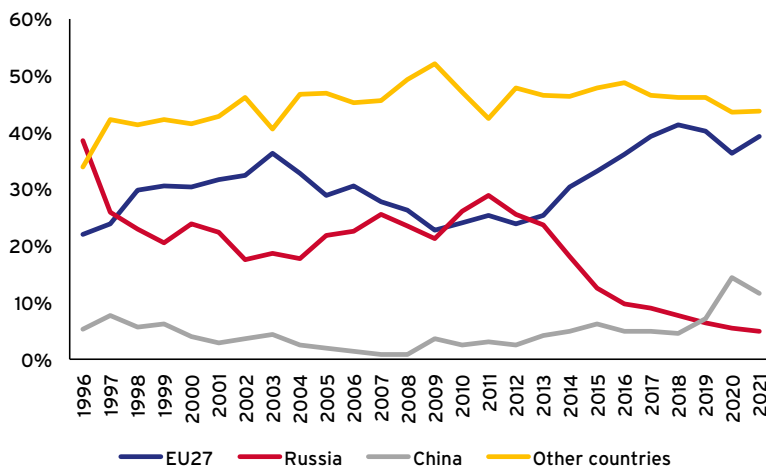
FIGURE 2 UKRAINE'S EXPORTS OF GOODS AND SERVICES, BALANCE OF PAYMENTS (BILLIONS OF CURRENT US\$)



Source: <https://data.worldbank.org/indicator/BM.GSR.GNFS.CD>; <https://data.worldbank.org/indicator/BX.GSR.GNFS.CD>

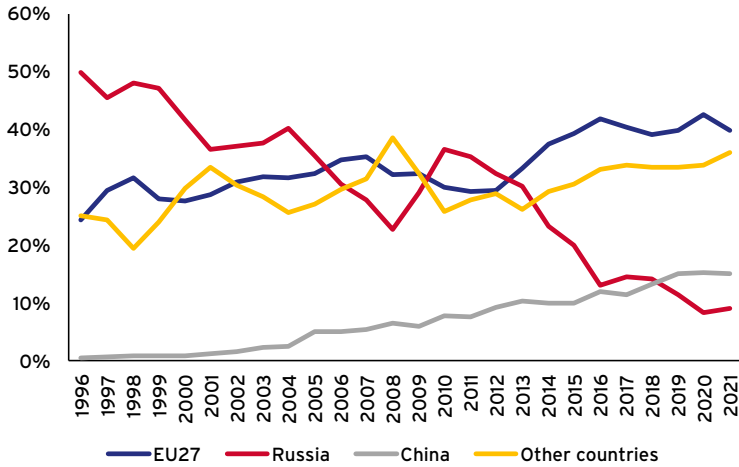
The last pre-full-scale war years significantly changed the geographic composition of trade as Ukraine reoriented from Russia towards the EU and Asia (Figures 3 and 4). The decline in trade with Russia accelerated dramatically after Russia's 2014 occupation of Crimea and a part of Donbas. In 2020, Ukraine doubled its goods exports to China amid COVID-driven reduced demand in the EU; however, in 2021, the EU partly regained its share.

FIGURE 3 UKRAINE'S EXPORTS OF GOODS (% OF TOTAL)



Source: Ukrstat, <https://ukrstat.gov.ua/>; authors' calculations.

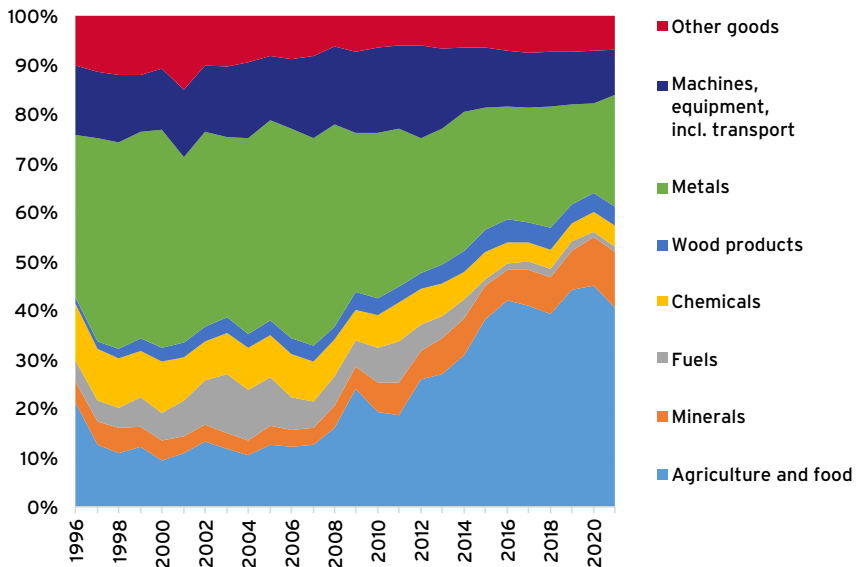
FIGURE 4 UKRAINE'S IMPORTS OF GOODS (% OF TOTAL)



Source: Ukrstat, <https://ukrstat.gov.ua/>; authors' calculations.

In terms of product composition, agriculture and metals have traditionally been the two largest export categories for Ukraine. However, they switched roles over the last decade (Figure 5). While metal exports did not fully recover after the 2008–2009 crisis, exports of agriculture and foods progressed steadily (Figure 6).

FIGURE 5 UKRAINE'S GOODS EXPORT STRUCTURE (% OF TOTAL)

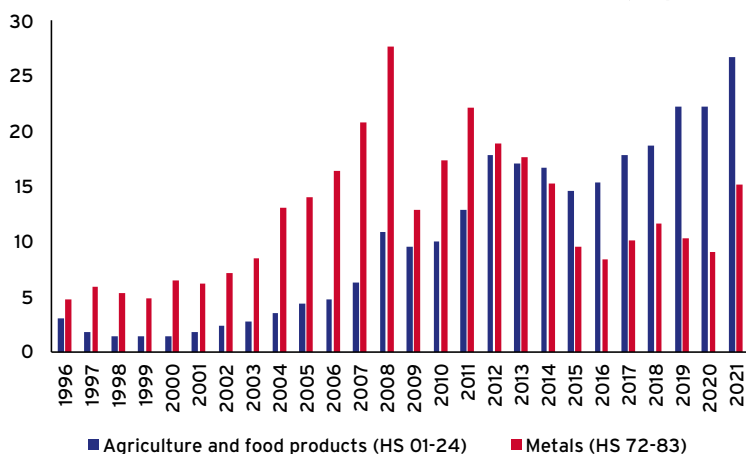


Source: World Integrated Trade Solution (WITS), authors' calculations

In 2021, Ukraine exported \$27 billion worth of agriculture and food products, making it the second largest exporter of grains after the United States and the largest global exporter of sunflower seed oil (Movchan 2022). Ukraine was also among the top ten exporters of soybeans and poultry. Notably, Ukraine has been shipping GMO-free plants, including maize and soybeans, which are in high demand in the EU.

The agrifood export expansion was backed by a strong increase in yields for all key crops. This productivity improvement was triggered by major sectoral reforms from the late 1990s to the early 2000s, when the government dissolved the collective farms and introduced private ownership of agricultural land. The 2020 land reform (see the discussion below) is expected to boost production and exports further, though its full effect has been delayed by the full-scale war.

FIGURE 6 UKRAINE'S EXPORTS OF AGRIFOOD PRODUCTS AND METALS (US\$ BILLIONS)

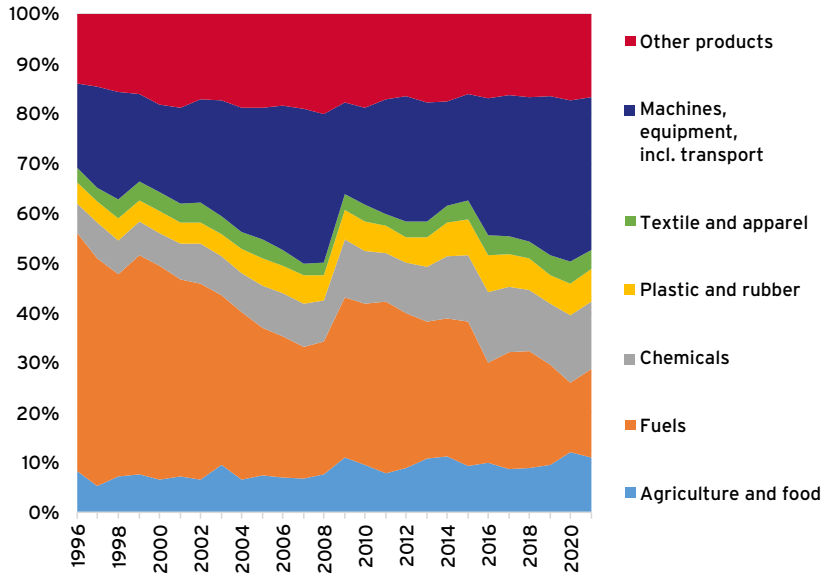


Source: WITS, authors' calculations.

Metal exports amounted to \$15 billion in 2021, having fallen by almost 50% since the peak in 2008. After 2008, Ukraine's metallurgy started to lose international competitiveness due to a failure to upgrade highly outdated technologies, in part due to difficulty in attracting FDI. Other adverse shocks included the loss of production assets and mineral deposits due to Russia's aggression in 2014, heightened international trade protection measures (anti-dumping and safeguards) and elevated prices for inputs, including iron ores, metal scrap, and energy.

In imports, the key structural changes are the reduced imports of energy products and the expanded role of machines and equipment, including transport equipment (Figure 7). Both changes are important. The lower imports of energy reflect major reforms in this sector (see the chapter on energy Tatyana Deryugina and co-authors), while the increase in capital goods imports signals growing demand for technical modernisation.

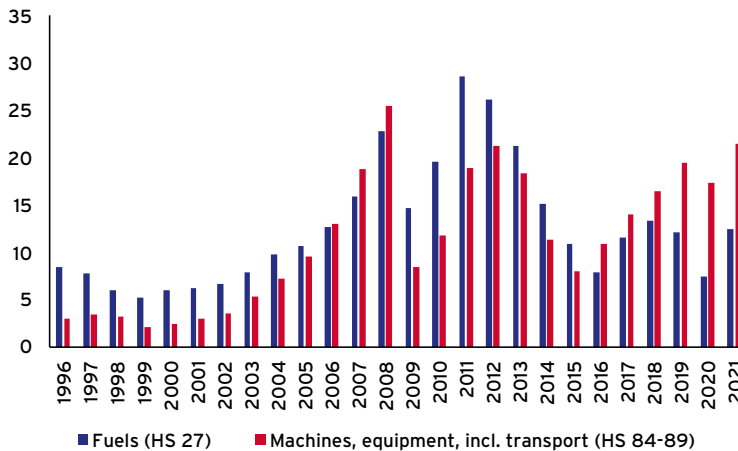
FIGURE 7 UKRAINE'S GOODS IMPORT STRUCTURE (% OF TOTAL)



Source: WITS, authors' calculations

In 2021, Ukraine imported \$12 billion in fuel, compared to \$29 billion at its peak in 2011. Despite this sharp drop in trade, many challenges remain. Although Ukraine stopped buying natural gas from Russia, it continued importing petroleum-processed products from Russia and Belarus and coal from Russia. Ukraine also continued importing nuclear rods from Russia, though it was gradually reducing this dependence.

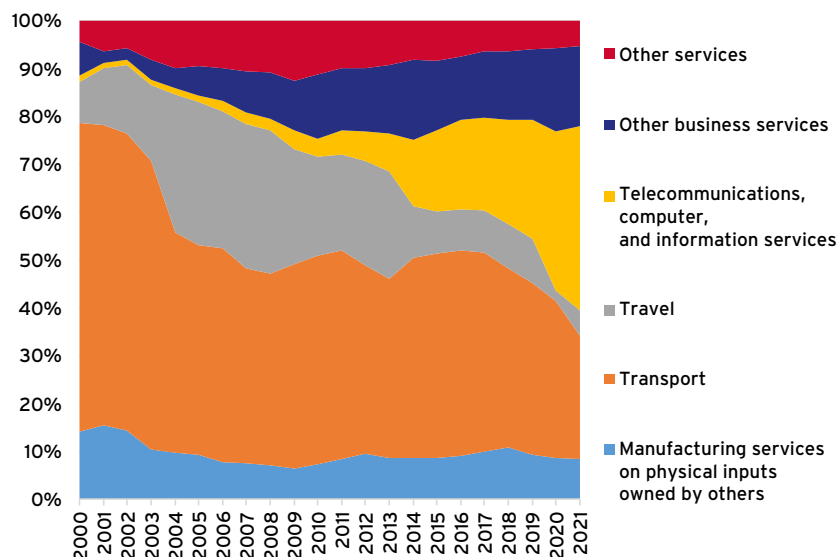
FIGURE 8 UKRAINE'S IMPORTS OF FUELS AND MACHINES AND EQUIPMENT (US\$ BILLIONS)



Source: WITS, authors' calculations.

In services trade, the structural changes have been remarkable, and services are an area that continues to show great promise. The positive change was a swift development of the ITC sector and its exports; its share of Ukraine's service exports increased from 1% in 2000 to 39% of the total in 2021, when exports reached \$7 billion (Figure 9).

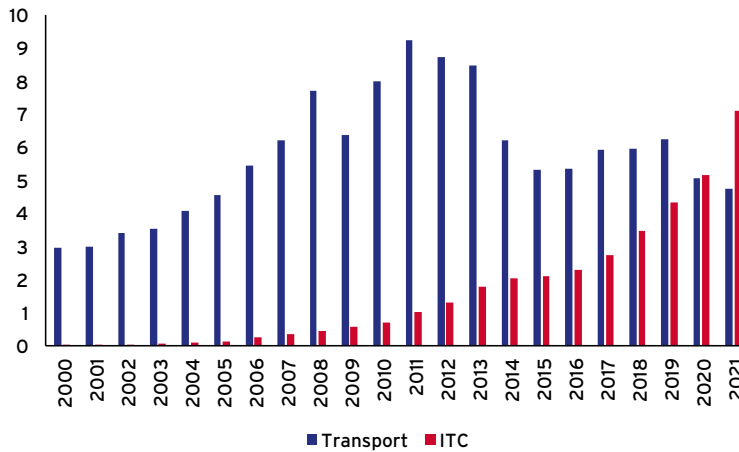
FIGURE 9 UKRAINE'S SERVICES EXPORT STRUCTURE (% OF TOTAL)



Source: National Bank of Ukraine, authors' calculations.

But there have also been setbacks. Ukraine has faced reduced exports of transport services since 2014 caused by several shocks, many of them related to the Russian aggression against the country. Ukraine's pipeline transit revenues have notably reduced since 2014 and one may expect further declines, although the outlook is highly uncertain. Since 2014, Ukraine has also suffered from the loss of access to Crimea and the truncated transit between Russia and the EU through Ukraine by rail and roads. The war escalation in February 2022 resulted in the loss of access to Azov Sea ports and the blockade of Black Sea ports (the latter being partly removed in July thanks to the so-called 'grain deal' described below). Again, the baseline scenario for this book is that access will be substantially restored post-war. Nevertheless, the deficit of road permits for Ukrainian cargo transport to the EU has been another factor. In 2020, these shocks were topped by COVID-related transport disruptions, especially for passenger transportation. Revenues from travel exports (tourist and business visitors) also dropped after Russia occupied and annexed Crimea and were further hit by the COVID-19 crisis.

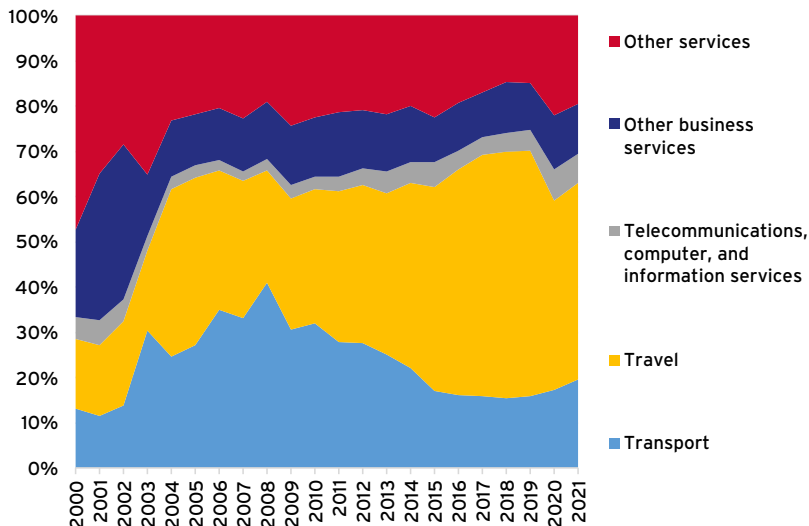
FIGURE 10 UKRAINE'S EXPORTS OF TRANSPORT AND ITC SERVICES (US\$ BILLIONS)



Source: National Bank of Ukraine.

In imports, the major change before the full-scale war was the increased role of travel, as Ukrainians discovered relatively cheap Turkish and Egyptian resorts (Figure 11). The visa-free regime with the EU introduced in 2017 was another factor stimulating travel. The COVID-19 outbreak sharply limited travel in 2020, but in 2021 the sector started to revive. As a result, in 2021, imports of travel services were worth \$6 billion, compared to a peak of \$8 billion in 2019 (Figure 12).

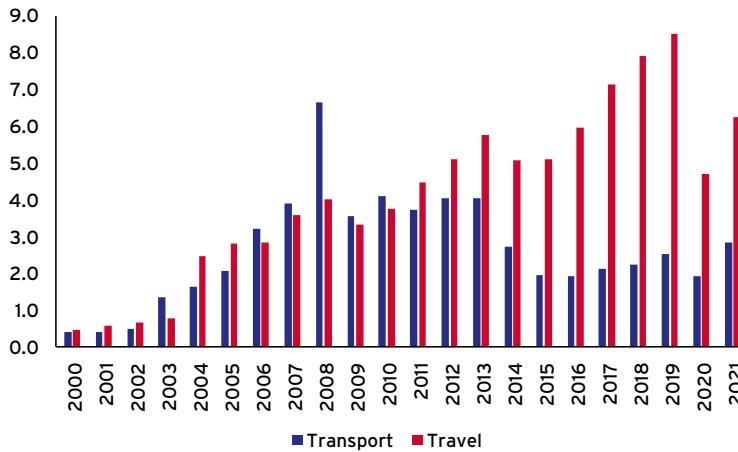
FIGURE 11 UKRAINE'S SERVICE IMPORT STRUCTURE (% OF TOTAL)



Source: National Bank of Ukraine, authors' calculations.

Along with exports, imports of transport services have also fallen since 2014 due to the disruption of trade with Russia after its aggression.

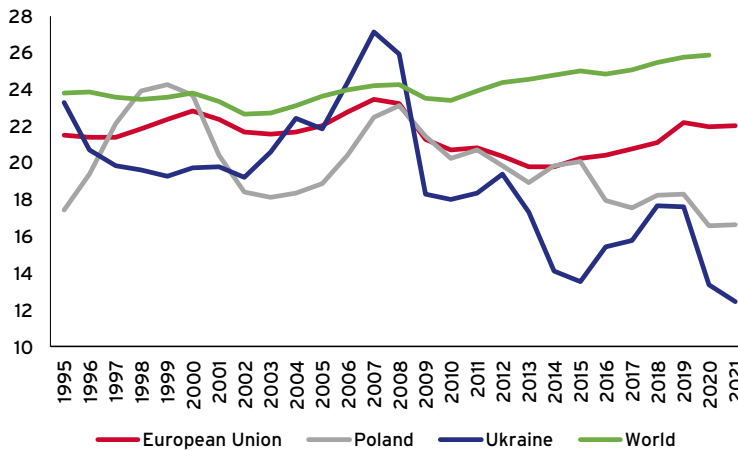
FIGURE 12 UKRAINE'S IMPORTS OF TRANSPORT AND TRAVEL SERVICES (US\$ BILLIONS)



Source: National Bank of Ukraine.

Despite its favourable geographic location, well-educated labour force and rich natural endowments, Ukraine's capital stock is not representative of its long-run potential. The share of gross fixed capital accumulation in GDP has been on a downward trend since the mid-2000s, falling to 12% of GDP in 2021, which is less than half the world average (Figure 13).

FIGURE 13 UKRAINE'S GROSS FIXED CAPITAL FORMATION (% OF GDP)

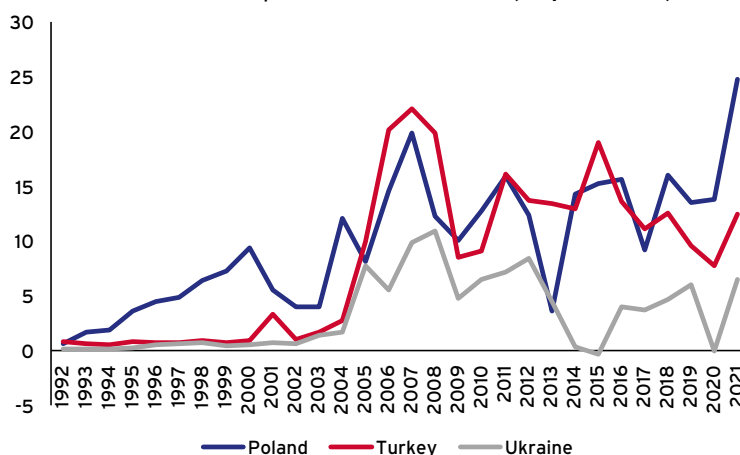


Source: <https://data.worldbank.org/indicator/NE.GDI.FTOT.ZS>

The primary source of investment for enterprises is self-finance as the banking system has remained underdeveloped and the stock market is close to non-existent. As we have already emphasised, the role of foreign capital in capital investments is also very low, ranging from 1% to 3% over the last decade.

FDI inflows into Ukraine have been very volatile and quite limited compared to its neighbours, such as Poland or Turkey. After comparable inflows in the early 1990s, both Poland and Turkey have since managed to attract far more FDI. In Ukraine, the largest FDI inflows were registered before the 2009 global crisis, although they were still lower than in Poland (Figure 14). In 2014–2015 and 2020, Ukraine's FDI inflows were close to zero or even negative.

FIGURE 14 FDI INFLOWS IN UKRAINE, POLAND AND TURKEY (US\$ BILLIONS)



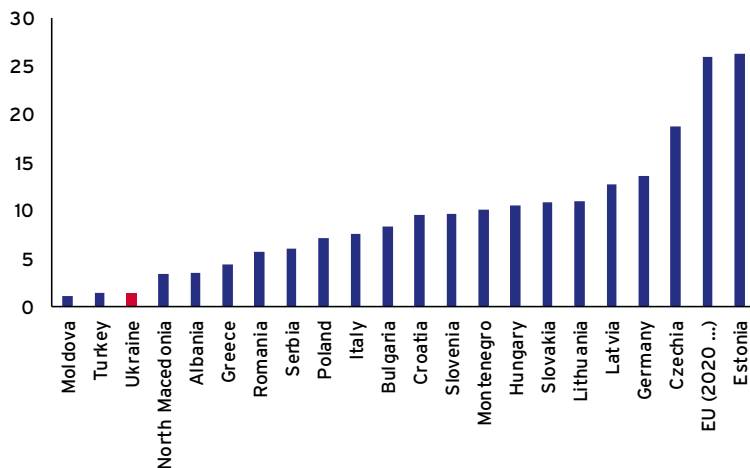
Source: UNCTAD, <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx>

As of the end of 2021, Ukraine's inward FDI stock (the cumulative flow of FDI accounting for depreciation) constituted \$64 billion. This implies that Ukraine has one of the lowest levels of FDI stock per capita among the EU member states and candidate countries. Ukraine's FDI inward stock was \$1,400 per capita in 2021, exceeding only that of Turkey and Moldova. Poland had an FDI per capita stock of \$7,100 in 2021, while the EU average was \$25,900 (Figure 15).

The structure of the FDI inward stock has changed over the last decade (Figure 16). In the 2000s, the main sectors with FDI were financial services (primarily banking) and metal production. The latter included the largest case of open privatisation with foreign participation, namely, the re-privatisation of the Kryvorizhstal steel plant to ArcelorMittal in 2005. However, there was no further major FDI into metal production, while many foreign banks left the country in the 2010s,⁹ diluting the shares of these two sectors in the FDI stock. As of 2021, the trade and extractive industries became the sectors with the largest FDI stock.

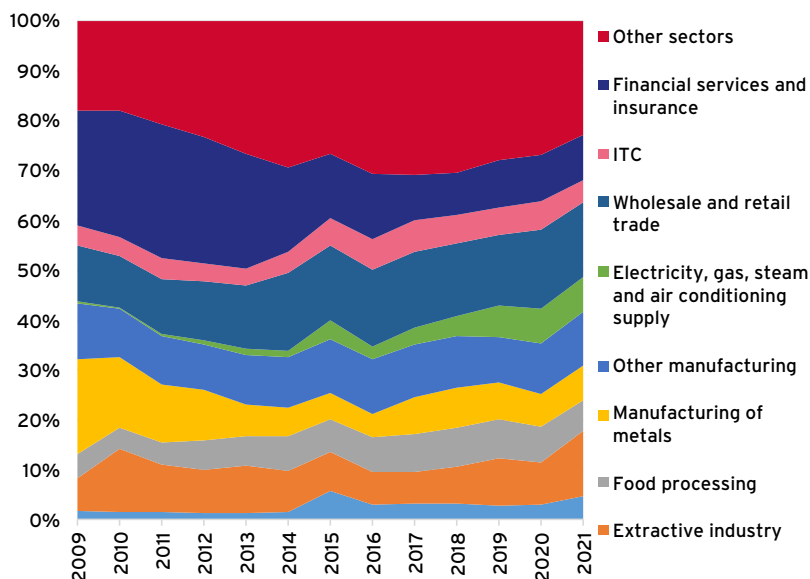
⁹ The number of foreign banks in Ukraine started to decline before 2014, following a peak in 2010–2011. As of 1 January 2011, there were 55 banks with foreign capital. This number fell to 49 by 1 January 2014 and to 35 by 1 January 2020. As of 1 January 2022, 33 banks with foreign ownership were in the country (see https://bank.gov.ua/files/stat/Osn_Pok_2001-2015.xlsx for 2001–2015 and https://bank.gov.ua/files/stat/Indicators_Banks_2022-09-01.xlsx).

FIGURE 15 FOREIGN DIRECT INVESTMENT STOCK PER CAPITA, 2021 (US\$ THOUSANDS)



Source: UNCTAD, <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx>

FIGURE 16 FOREIGN DIRECT INVESTMENT STOCK BY SECTOR, 2009 - 2021 (% OF TOTAL)



Note: For 2009-2014, the structure of FDI is reported as of January 1 of the next year; for 2015-2021, the structure is reported as of December 31 of the current year.

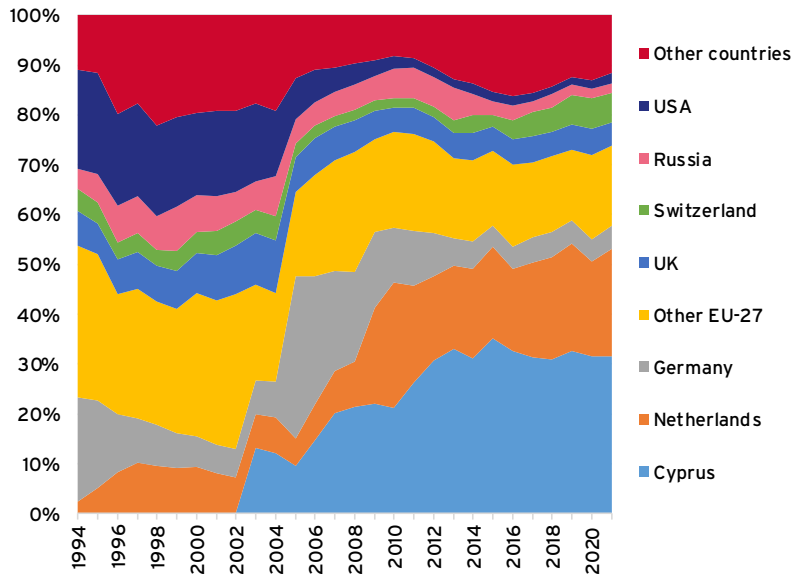
Source: Ukrstat for 2009-2014; National Bank of Ukraine for 2015-2021; authors' calculations.

Since the early 2000s, the EU has been the primary source of FDI into Ukraine. In 2021, the EU27 accounted for 74% of the inward FDI stock. Cyprus and the Netherlands are the dominant partners, supplying 53% of the stock. However, the fact that these two countries are the largest sources of FDI is problematic, as these inflows include round

tripping, potentially related to tax evasion. According to the National Bank of Ukraine (NBU) estimates, round tripping accounted for almost a quarter of FDI in 2010–2020,¹⁰ with the largest volumes of FDI round tripping registered for Cyprus, the Netherlands, Switzerland and Austria.

Notably, the role of Russia as a source of FDI has always been very moderate, at about 6% on average in 1994–2014 and shrinking to 2% of total FDI stock in 2015–2021 (Figure 17).

FIGURE 17 FOREIGN DIRECT INVESTMENT STOCK BY SOURCE, 1994-2021 (% OF TOTAL)



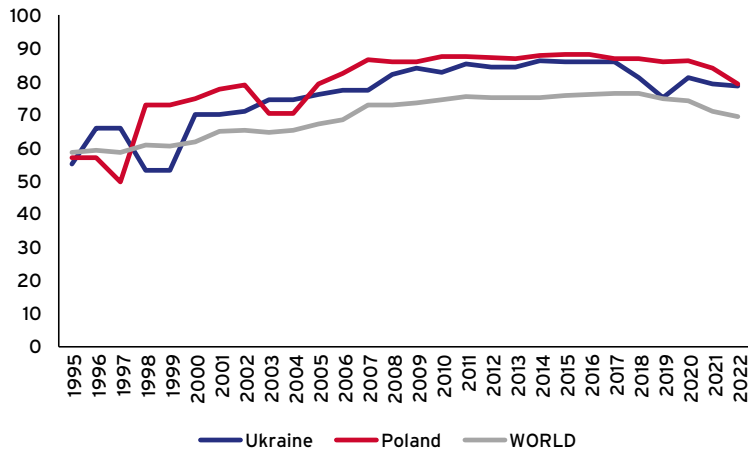
Note: For 1994–2014, the structure of FDI is reported as of January 1 of the next year; for 2015–2021, the structure is reported as of December 31 of the year

Source: Ukrstat for 1994–2014; National Bank of Ukraine for 2015–2021; authors' calculations.

According to international assessments, Ukraine scores highly in foreign trade policy and practices, while its investment policy performance is unsatisfactory. For instance, Heritage Foundation assessments of Ukraine's trade freedom have ranged between "free" and "mostly free" since the early 2000s, while its investment freedom has been evaluated as "repressed" since 2002. Since 2014, Ukraine's investment freedom has improved but is still "repressed" (Figures 18 and 19).

10 <https://bank.gov.ua/en/files/rRSNvteXHvOavxA>

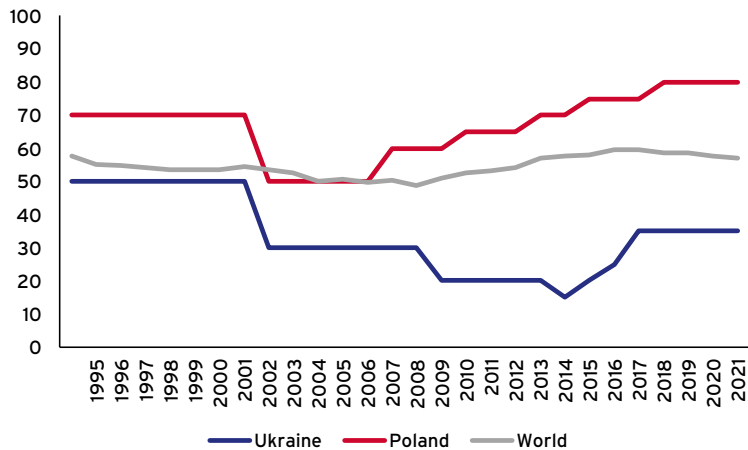
FIGURE 18 HERITAGE FOUNDATION TRADE FREEDOM INDEX



Note: Below 50 = repressed; 50 to 60 = mostly free, 60 to 70 = moderately free, 70 to 80 = mostly free, over 80 = free.

Source: <https://www.heritage.org/index/visualize?cnts=ukraine|poland&src=ranking>

FIGURE 19 HERITAGE FOUNDATION INVESTMENT FREEDOM INDEX

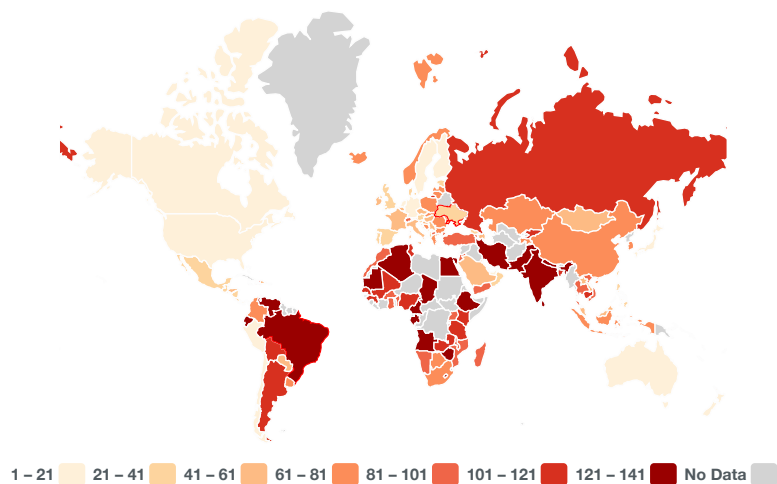


Note: Below 50 = repressed; 50 to 60 = mostly free, 60 to 70 = moderately free, 70 to 80 = mostly free, over 80 = free.

Source: <https://www.heritage.org/index/visualize?cnts=ukraine|poland&src=ranking>

According to the World Economic Forum (2019), Ukraine was ranked 32 out of 141 countries in trade openness (Figure 20), on a par with many EU member states and even surpassing Poland and Bulgaria. It is noteworthy that Ukraine's ranks for the trade openness sub-components (prevalence of non-tariff barriers, trade tariffs, complexity of tariffs and border clearance efficiency) were lower, ranging from 43rd to 91st.

FIGURE 20 TRADE OPENNESS ACCORDING TO THE WORLD ECONOMIC FORUM, 2019



Source: <https://govdata360.worldbank.org/indicators/he082f372>

In particular, the country is ranked 90th out of 141 countries for border clearance efficiency. Ukraine's mediocre performance in border clearance is confirmed by the OECD Trade Facilitation Indicators, where Ukraine lags behind Poland in nine out of eleven spheres. Ukraine scores higher than Poland in the involvement of the trade community, but lower in many functional indicators related to formalities and also in border cooperation (Table 1).

TABLE 1 OECD TRADE FACILITATION INDICATORS

	Ukraine	Poland
A Information availability	1.050	1.857
B Involvement of the trade community	1.667	1.625
C Advance rulings	1.000	1.909
D Appeal procedures	1.625	1.455
E Fees and charges	1.583	2.000
F Formalities - documents	0.778	1.875
G Formalities - automation	0.667	1.538
H Formalities - procedures	0.800	1.852
I Internal border agency cooperation	0.500	1.364
J External border agency cooperation	0.636	2.000
K Governance and impartiality	1.222	2.000

Note: The Trade Facilitation Indicators (TFIs) take values from 0 to 2, where 2 designates the best performance that can be achieved.

Source: <https://sim.oecd.org/Default.aspx?lang=En&ds=TFI&d1c=eca&d2c=ukr&cs=asiap>

2.2 Previous reforms and policies

As noted in the introduction, Ukraine has quite a liberal trade regime. The country's average applied most favoured nation (MFN) duty is 4.4%, compared to 5.2% in the EU and 10.7% in Turkey, though the United States has even lower duties at 3.4% on average (Table 2).

TABLE 2 SIMPLE AVERAGE MFN IMPORT DUTIES APPLIED BY UKRAINE, THE EU, THE UNITED STATES AND TURKEY, 2021

	Ukraine	EU	US	Turkey
All products	4.4	5.2	3.4	10.7
Agricultural products	9.1	11.7	5.2	41.1
Animal products	10.6	17.0	2.2	101.1
Dairy products	10.0	39.5	19.4	128.4
Fruit, vegetables, plants	9.7	10.9	4.6	33.5
Coffee, tea	5.7	5.9	3.3	31.9
Cereals & preparations	12.4	14.5	3.1	34.2
Oilseeds, fats & oils	8.3	5.7	7.2	13.1
Sugars and confectionery	19.4	24.3	14.9	92.4
Beverages & tobacco	7.4	19.9	18.1	36.5
Cotton	1.4	0.0	3.5	0.0
Other agricultural products	5.4	3.1	1.0	10.5
Non-agricultural products	3.7	4.1	3.1	5.8
Fish & fish products	2.5	11.5	0.7	34.5
Minerals & metals	3.2	2.0	1.7	3.4
Petroleum	0.8	2.5	1.9	3.2
Chemicals	3.1	4.5	2.8	4.7
Wood, paper, etc.	0.3	0.9	0.5	1.0
Textiles	3.8	6.5	7.9	6.5
Clothing	11.3	11.5	11.6	11.5
Leather, footwear, etc.	5.5	4.1	3.9	4.1
Non-electrical machinery	2.1	1.8	1.2	1.8
Electrical machinery	3.7	2.1	1.4	2.8
Transport equipment	5.8	4.7	2.9	4.7
Manufactures, n.e.s.	5.5	2.1	2.1	2.6

Source: WTO.

Ukraine, similarly to many other countries, protects its agriculture and food market by imposing higher duties compared to those applied to industrial goods. The average applied MFN duties on agricultural products in Ukraine is 9.1%, more than twice its industrial duties. The highest duties are levied on imports of sugar, the import duty on which outside the tariff rate quota¹¹ is set at 50%. The second highest import duty is applied on imports of sunflower seed oil, at 30%.

Nevertheless, in general, in Ukraine, only 1.1% of agricultural tariff lines apply MFN import duties exceeding 25%, and none exceeds 50%. For comparison, 8.6% of EU agricultural tariff lines apply MFN import duties of between 25% and 50%, 2.9% of tariff lines have duties from 50% up to 100%, and 0.5% have duties over 100%.

Ukraine's tariff schedule has a high level of transparency and predictability. First, Ukraine has all its tariffs bound, with the bound rate¹² at 5.8% on average, slightly above the average EU bound rate of 5.3% on average. For comparison, Turkey has 49.5% of unbound tariffs for agriculture and 17% for non-agricultural products. Second, Ukraine predominantly uses ad valorem tariffs, with non-ad valorem tariffs in only 1.1% of agricultural tariff lines and none for industrial products. The EU applies non-ad valorem tariffs for 31.6% of agricultural tariff lines and for 0.5% of non-agricultural tariff lines (Table 3).

TABLE 3 BOUND MFN IMPORT DUTIES BY UKRAINE, THE EU, THE UNITED STATES AND TURKEY, 2021

	Ukraine	EU	US	Turkey
Bound import duty, all products	5.8	5.3	3.3	28.9
Agricultural products	11.0	12.6	4.5	61.8
Non-agricultural products	5.0	4.1	3.2	17.2
Share of bound duties:				
Agricultural products	100%	100%	100%	50.5%
Non-agricultural products	100%	100%	100%	43.0%

Source: WTO.

11 A tariff rate quota (or tariff quota) is a two-tier tariff setting different rates depending on the traded amount. The rate within the quota is lower than the rate outside the quota. It is an instrument of partial liberalisation, allowing access to the market without clear-cut quantitative restrictions.

12 The bound rate is the maximum MFN import duty a WTO member state can apply to other members. The bound rates are committed in a country's accession schedule. The bound rate generally cannot be exceeded without compensating the affected parties. Any member is free to apply lower MFN rates than bound rates.

As a part of its WTO commitments, Ukraine established only one non-tariff quota – on sugar – which accounts for only 0.3% of Ukraine’s agricultural tariff lines, and thus de facto does not use this protectionist tool. The EU, for instance, applies quotas to 13.5% of its agricultural tariff lines, and the United States applies quotas to 5.9%. Relatedly, Ukraine is greatly reducing the required paperwork for trade in services, another form of NTB.

Generally, Ukraine does not have licensing of international trade. The list of products subject to quantitative restrictions is minimal. In 2021, Ukraine banned exports of silver, gold and precious metal scrap, licensed exports of anthracite, and established quotas and licenses on trade in ozone-depleting substances in line with the Montreal Protocol.¹³ (Again, we are referring to the pre-full-scale war regime, which should be resumed when the peace is restored – the baseline in this book. During the full-scale war there have, of course, been more restrictions, though arguably far less than there should have been, for example, on the use of scarce foreign exchange for the importation of luxury cars.)

Ukraine applies technical regulations broadly in alignment with EU and international norms. Inspection of the standard importer’s conformity declaration confirms compliance with these regulations’ mandatory requirements. For example, the importer is required to use a third-party conformity assessment only for high-risk products. Importantly, the list of documents required for moving goods across the border does not include the declaration of conformity. However, the importer must have it to place the product on Ukraine’s market.

Most standards are aligned with international or European standards. In all cases, in line with the WTO Agreement on Technical Barriers to Trade (TBT), standards are voluntary, i.e. businesses can choose whether to produce under the formal standard, in many cases providing the presumption of conformity with mandatory safety requirements embedded in technical regulations or to comply with technical regulations directly, without referring to a particular standard (important for innovative products).

As noted earlier, Ukraine has already concluded 19 free trade agreements with 47 countries, including the EU, the European Free Trade Association (EFTA), the United Kingdom, Canada, Israel, North Macedonia, Montenegro, Georgia, most CIS states and, in January 2022, with Turkey.¹⁴ That covers 58% of Ukraine’s trade in goods in 2021.

13 <https://zakon.rada.gov.ua/laws/show/1329-2020-%D0%BF#Text>

14 The full list of Ukraine’s FTA partner countries includes 27 EU member states (Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden), four EFTA member states (Iceland, Lichtenstein, Norway, Switzerland), Georgia, Moldova, Armenia, Azerbaijan, Belarus, Uzbekistan, Tajikistan, Turkmenistan, Kyrgyzstan, Kazakhstan, North Macedonia, Montenegro, Canada, Israel, the United Kingdom and Turkey (the latter agreement was signed in 2022 and is still to be ratified)

Ukraine joined the Pan-European-Mediterranean Convention on preferential rules of origin, allowing diagonal cumulation¹⁵ among the participants of the Convention, with which Ukraine has FTAs including the EU, EFTA, Georgia, Moldova, Israel, North Macedonia and Turkey.

Since the launch of the Deep and Comprehensive Free Trade Agreement (DCFTA) provisional implementation in 2014, Ukraine has implemented many necessary reforms aimed at reducing non-tariff barriers to trade. The major changes have occurred in the spheres of industrial and food safety, customs, public procurement, protection of intellectual property rights, financial markets, digital services, transport, energy, and environment (see the Appendix for details). In line with the Association Agreement, Ukraine has been preparing for extensive economic integration with the EU.

The legal framework for FDI has also been sufficiently attractive. The framework law on foreign investments regime was adopted back in 1996 and then amended several times. It established key guarantees, including a national treatment regime, state guarantees and the right to remit profits.¹⁶ In 2019, a new law on concessions aligned with international practices was adopted, which improves creditor rights protection and resolves previous legal hurdles that prevented the concession development in the country.¹⁷

In 2021, several laws provided extensive tax privileges to invest. First, the Verkhovna Rada (Ukraine's parliament) adopted the law on state support for investment projects with significant investments in Ukraine, known as the law on 'investment nannies'. It envisaged:¹⁸

- state guarantees on stable legislation for 15 years;
- compensation for losses caused by state agencies; and
- state support of up to 30% of the amount of significant investments by exemptions from corporate income and land taxes, VAT and import duties on equipment, and simplified land lease with the pre-emptive right for the acquisition of such land.

15 Diagonal cumulation is a rules of origin provision in the preferential agreement allowing one country to consider products originating from a partner country as its domestic products when determining the originating status for preferential treatment in the third country. Thus, a producer in country A may process a product using materials imported from country B and export this product to country C under the label "made in country A", getting the preferential treatment in country C.

16 <https://investmentpolicy.unctad.org/investment-laws/laws/253/ukraine-law-on-the-regime-of-foreign-investments>

17 <https://cms.law/en/ukr/news-information/ukraine-s-new-concession-law>

18 <https://ukraineinvest.gov.ua/incentives/investment-projects-with-significant-investments/>

Second, the law on industrial parks was extended.¹⁹ The incentives for initiators, managing companies and participants of industrial parks include credit interest rates compensation, exemption from corporate profit tax and VAT and import duties on imported new equipment, compensation for connecting to the electricity grid, and so on. The industrial parks aim to attract investments into manufacturing, ITC, R&D and recycling.²⁰ A special tax regime has been established for IT companies participating in Diia.City, a virtual economic zone.²¹

While tax preferences play a role in attracting investors, preferential treatment generates substantial corruption risks, especially when coupled with rule of law deficiencies. Ukraine has had a dismal experience in the past with special economic zones, which ended up being used chiefly for tax evasion.²² Therefore, success of the fundamental reforms in the rule of law domain remains the precondition for the success of these special investment regimes (more on this in the chapters on business environment, corruption and governance).

The 2020 land reform is supposed to become another important factor for the country's economic development. The moratorium on sales of agricultural land lasted for almost two decades, hampering the sector development and feeding the grey land market and corruption. The agricultural land market was launched in July 2021,²³ although with significant limitations on the size of land plots and ownership per person until 2024. Moreover, foreigners remained prohibited from owning agricultural land in Ukraine. Still, the European Bank for Reconstruction and Development (EBRD) expected that the reform would unlock \$40–50 billion for agro-business lending.²⁴

2.3 Challenges

Trade

Despite the substantial progress, many issues in Ukraine's and its partners' foreign trade regimes still required attention before the full-scale war.

Some policy challenges are external and thus largely dependent on Ukraine's trade diplomacy and its partners' readiness to liberalise. A clear example of an external barrier is the fact that Ukrainian business still faced **tariff rate quotas on the EU market** under the DCFTA. That meant only partial liberalisation of market access for several key Ukrainian agricultural and food products (Taran 2020) (this barrier was temporarily

19 <https://zakon.rada.gov.ua/laws/show/1710-20#Text> (in Ukrainian).

20 <https://ukraineinvest.gov.ua/incentives/industrial-parks/>

21 <https://ukraineinvest.gov.ua/incentives/it/>

22 <http://ojs.econindustry.org/index.php/ep/article/view/188/230> (in Ukrainian).

23 <https://zakon.rada.gov.ua/laws/show/552-IX#Text>

24 <https://www.reuters.com/article/us-ukraine-ebd-reform/ebd-ukraine-land-reform-to-unlock-40-50-billion-for-agribusiness-lending-idUSKBN19S1IX>

removed in 2022). The use of safeguard barriers on Ukraine's metal exports by the EU and the United States is another example of a particularly important external NTB to Ukrainian exporters. Although this barrier was also temporarily removed for a year, at present it is still set to return.

The **untapped opportunities of the Pan-European-Mediterranean Convention** (PEM Convention) on preferential rules of origin are partly attributed to the limited number of FTAs with the PEM Convention members. The conclusion of new FTAs will allow better use of the convention to promote the integration of Ukrainian companies into regional value chains.

However, many issues can and should be addressed by Ukraine jointly with its partners.

In particular, although Ukraine has made significant progress in reforming its product safety regulatory and institutional framework, the reforms have not been completed. This means that many opportunities for the **further reduction of NTBs in goods trade**, and thus trade costs, are still to be captured. NTBs entail costs of compliance with mandatory requirements and the costs of conformity assessment confirming that a product satisfies these requirements. Thus, the reduction of trade-related costs could be achieved through lower expenses on compliance, conformity assessment, or both. Harmonisation with EU standards helps reduce the costs of compliance. However, without mutual recognition of conformity certificates – through the ACAA for industrial goods and recognition of equivalence for food products – businesses cannot enjoy full access to the EU market. Both Ukraine's reform efforts and the EU's efforts in verifying and confirming the progress are required to remove these barriers.

In transport, Ukraine needs to obtain **more road transport permits from the EU member states**. Since 2017, Ukraine has been facing an aggravated problem of access to the EU market by road due to the deficit of permits.²⁵ That was, in effect, an NTB that the EU placed on Ukraine's goods. At the same time, Ukraine has reformed its permit distribution system to avoid artificial shortages and improve the traceability of permits. In July 2022, a temporary road transport agreement removed this barrier, but it can be reinstated if the agreement's safeguards are enacted.

In service trade, the DCFTA contains many **reservations regarding market access and national treatment of Ukraine's service providers** by EU member states; in contrast, access to Ukraine's service market has been very liberal.²⁶ The legal and institutional alignments with the EU allow for overcoming these barriers.

25 See Saha et al. (2019) for the situation in 2017-2019 and Movchan et al. (2022) for the 2021 update

26 See the chapter on services in Emerson et al. (2021).

The forthcoming EU **Carbon Border Adjustment Mechanism** (CBAM) imposing additional trade costs on partners to avoid carbon leakages and encouraging partners to use carbon pricing policies matching those of the EU²⁷ is another example of required mutual efforts. The mechanism will be put in place in 2026, although reporting commitments start from 2023. The CBAM will be applied to several product categories including electricity, iron and steel, fertilizers, aluminium and cement. The pre-full-scale war assessments of the CBAM impact showed that Ukraine could lose about 0.1% of its GDP annually due to the mechanism.²⁸ To avoid the CBAM, the country has to implement a carbon-pricing mechanism. Ukraine has been preparing for these changes, but extensive EU assistance is needed.

In **customs**, long queues of trucks on the Ukraine-EU border have been endemic. The Ukrainian customs service has been under reform for years, but complaints about queues and smuggling remain. However, as discussed below, the full-scale war and the urgent need to improve the efficiency of land border crossing fostered the changes.

The **protection of intellectual property rights** (IPR) is another area requiring Ukraine's continuous attention. For many years, the country has had limited access to the Generalized System of Preferences (GSP) in the United States due to problems with IPR protection.

Export financing has also remained among the unresolved issues for years. The Verkhovna Rada adopted the law on a Export Credit Agency (ECA) in 2017,²⁹ and several years later the ECA was established.³⁰ However, its functioning remained truncated due to legal deficiencies in its design (Janus 2021). The law on the ECA was significantly revised in March 2022 after the war escalated. The positive changes, including the increase in its statutory capital and placement of the institution under the supervision of the National Bank of Ukraine, increase the chances for the eventual success of the agency (Janus 2022). The establishment of an internationally trusted Supervisory Board to replace the one dismissed in November 2021 is still expected.

Investment

We have already noted that inward FDI flows are weak and an area where Ukraine needs major improvements.

At present, Ukraine's labour goes into the EU in cyclical migration rather than having EU capital come to Ukraine. In principle, Ukraine's labour should be an attractive asset for inward FDI investment. Ukraine has a well-educated and large labour force, while the average wage is quite low. However, with the introduction of visa-free travel to the EU and the increased ease of obtaining work permits in Poland and other Central European

27 www.consilium.europa.eu/en/press/press-releases/2022/03/15/carbon-border-adjustment-mechanism-cbam-council-agrees-its-negotiating-mandate/

28 https://kse.ua/wp-content/uploads/2021/12/211115-KSE_CBAM_for-publication.pdf (in Ukrainian).

29 <https://zakon.rada.gov.ua/laws/show/1792-19#Text> (in Ukrainian).

30 www.eca.gov.ua/

neighbours, investors have a choice. They can build a plant in Ukraine and face all the associated challenges of its imperfect business climate, or they can open a plant in near-border areas of Poland or Slovakia, with much better business climates and access to finance, and bring employees from Ukraine on a shift basis.

As emphasised earlier, the key obstacles to investment are the **rule of law, protection of property rights and corruption** (more on this in the chapters on business environment, corruption, and institutions). According to the American Chamber of Commerce in Ukraine survey presented in September 2021, “93% of businesses stated that implementation of real and effective judicial reform, the rule of law, fair justice, and eradication of corruption is #1 strategic step Ukraine’s Government should take first to achieve economic growth, improve the business climate, and attract FDI”.³¹ The European Business Association echoes these findings. In a December 2021 survey, it reported that a weak judicial system (cited by 87% of CEOs participating in the survey), a high level of corruption (85%) and the shadow economy (76%) remain the top barriers to the development of business.³²

While the war with Russia and the occupation of Ukraine’s territories in 2014–2015 have been among the important factors deterring investment, they have not been dominant. For instance, already in 2017 the EBA survey showed that the “military conflict with Russia” was only number four among barriers to investment, surpassed by corruption, lack of trust in the judicial system and state capture.³³

Large-scale privatisation as a way to attract foreign investors has remained largely unsuccessful. The only positive case is the second privatisation of Kryvorizhstal to Mittal Steel for \$4.7 billion back in 2005. Mostly, privatisation auctions have suffered from low transparency and vested interests. After 2014, several laws aimed at facilitating privatisation and attracting foreign investors were adopted,³⁴ but progress was limited.

3 IMPACT OF THE FULL-SCALE WAR

The full-scale war has had a devastating impact on the Ukrainian economy, with real GDP down by about 39% in the second quarter of 2022. The annual drop GDP is expected to be between 30% and 40% depending on how the military actions continue.

31 <https://chamber.ua/news/90-of-businesses-forecast-upbeat-financial-health-of-their-companies-at-the-end-of-2021-new-survey-by-the-american-chamber-of-commerce-in-ukraine-and-citi-ukraine/>

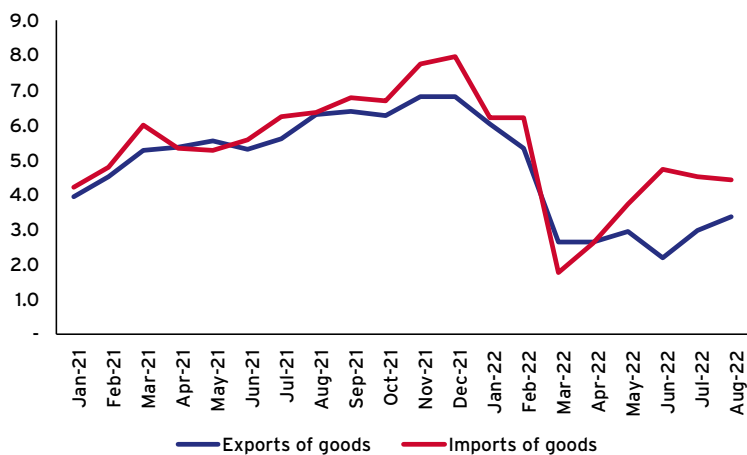
32 <https://eba.com.ua/en/biznes-lidery-deshho-pogirshlyly-otsinku-investklimatu-v-ukrayini-opytuvannya-eva/>

33 https://lb.ua/economics/2017/09/14/376427_shcho_zavazhaie_inozemnim_investoram.html (in Ukrainian).

34 <https://ces.org.ua/en/privatization-in-ukraine-high-jump-after-years-of-crawling/>

Trade has also suffered, especially exports. According to the Ministry of Economy, Ukraine's foreign trade started to revive in the second half of the summer of 2022 after the deep drop immediately after 24 February. The reduction of goods exports was most acute in June 2022 when it dropped by almost 60% in annual terms amid the ongoing blockade of Black Sea ports, logistic hurdles on land borders with the EU and disrupted production within the country. Exports started to revive in July, and in August they grew by 14% month-on-month, but remained 46% less than a year ago (Figure 21).

FIGURE 21 UKRAINE'S MONTHLY EXPORTS AND IMPORTS OF GOODS (US\$ BILLIONS)



Source: Ukrstat, Ministry of Economy.

In March 2022, imports of goods fell by over 70% year-on-year, dragged down by both disruptions of economic links and temporary administrative restrictions. Immediately after the full-scale war began, the National Bank of Ukraine introduced limitations on foreign currency purchases intended for imports of goods and services except for critical imports.³⁵

However, already during March, the list of critical imports expanded to cover almost 90% of goods. Moreover, the Parliament introduced a temporary exemption from import duties and VAT on imports starting in April.³⁶ This resulted in a faster recovery of goods imports compared to exports, widening the trade deficit and putting pressure on foreign reserves.³⁷ Both the list of critical imports for goods and import tax exemptions were

35 <https://zakon.rada.gov.ua/laws/show/153-2022-%D0%BF#Text> for the list of critical imports (in Ukrainian).

36 The Parliament exempted from import duties all products, except for alcohol and tobacco, if these products are imported by business entities for free circulation in Ukraine. Moreover, businesses using certain simplified taxation scheme were exempted from paying value added tax on imports (see <https://zakon.rada.gov.ua/laws/show/2142-%D0%86%D0%A5#Text>, in Ukrainian).

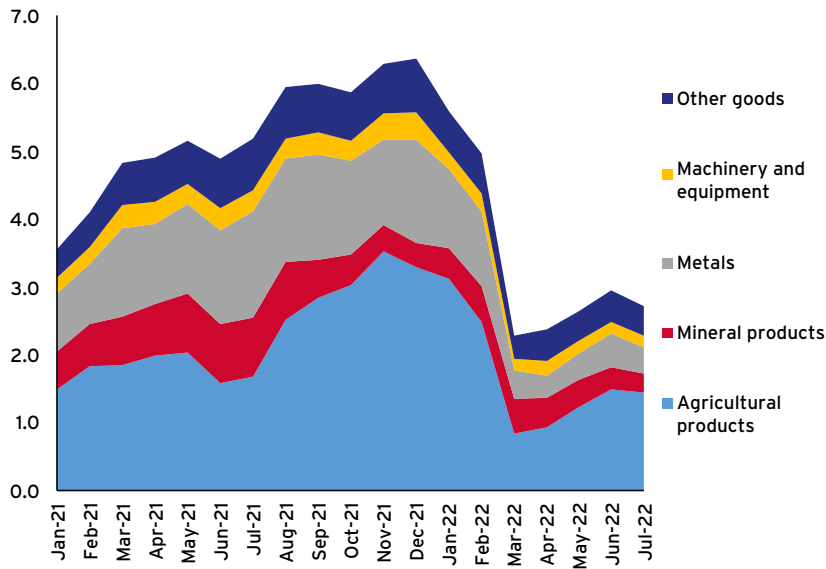
37 On 21 July 2022, the NBU devalued the Ukrainian hryvnia by 25% vis-à-vis the US dollar to cope with the changed economic environment (see <https://bank.gov.ua/ua/news/all/nbu-zafiksuvav-ofitsiyinyi-kurs-grivni-do-dolara-ssha-na-novomu-rivni-ta-vjiv-nizku-dodatkovih-zahodiv-dlya-zbalansuvannya-valyutnogo-rinku-ta-pidtrimannya-stiykosti-ekonomiki-v-umovah-viyni>, in Ukrainian).

lifted in July.³⁸ Moreover, the hryvnia was devalued by 25% and the central bank key rate increased to 25%. So far, capital controls remain in place and the hryvnia exchange rate essentially fixed (see the chapter in this book by Ralph De Haas and Alexander Pivovarsky on the financial sector for more details).

As noted in the introduction, the EU has become Ukraine's largest trade partner, accounting for over 70% of goods exports compared to 40% in 2021. In imports, the share of the EU is about 50% as many imported goods are just transited to Ukraine through the EU.

In terms of product composition, trade has not dropped uniformly across products (Figures 22 and 23). Exports of metals and iron ores suffered the most as these are bulk products that used to be shipped through seaports, which are currently blocked, and two large steel mills were destroyed in Mariupol. In imports, a major structural change was the increase in purchases of mineral products, particularly petroleum-processed products, after Ukrainian production and storage facilities were destroyed.

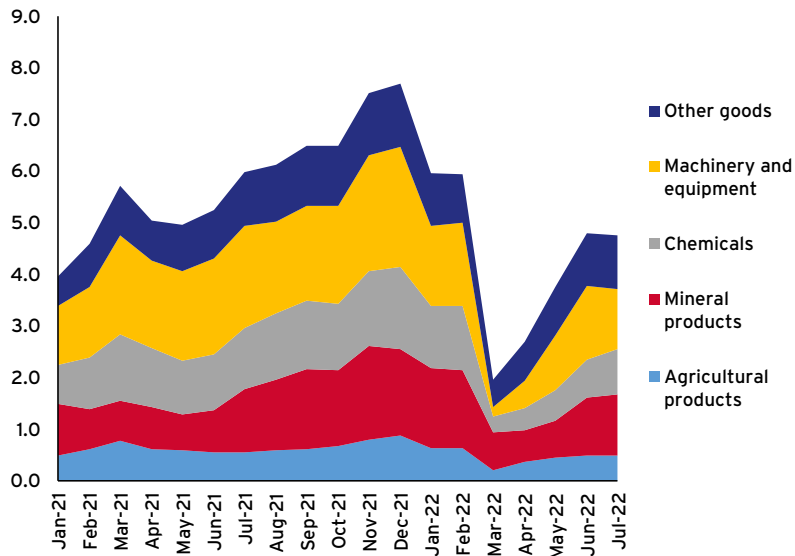
FIGURE 22 UKRAINE'S MONTHLY GOODS EXPORTS, 2021-JULY 2022 (US\$ BILLIONS)



Source: National Bank of Ukraine, trade in goods according to the balance of payments methodology.

38 The list of critical imports for services and works has remained in force, although also quite broad. The list applies towards cross-border service imports. There are also different NBU regulations limiting payments in hryvnia abroad.

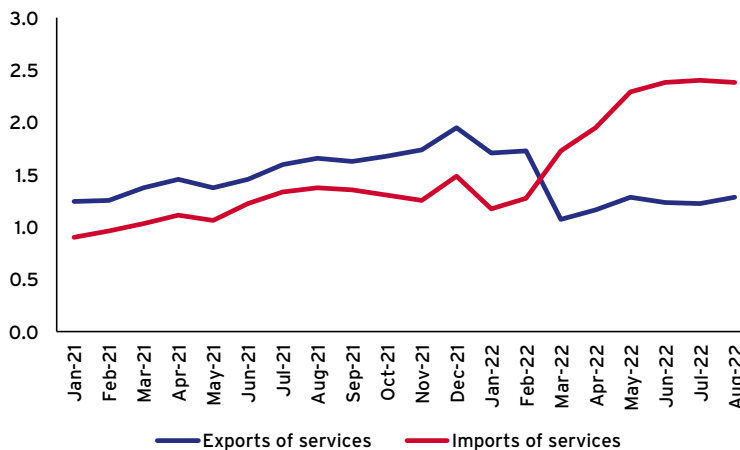
FIGURE 23 UKRAINE'S MONTHLY GOODS IMPORTS, 2021-JULY 2022 (US\$ BILLIONS)



Source: National Bank of Ukraine, trade in goods according to the balance of payments methodology.

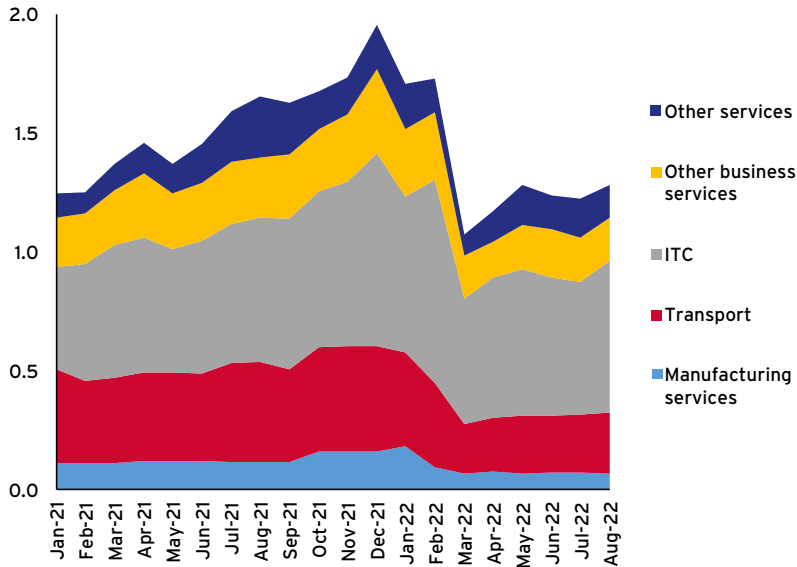
The response of Ukraine's service exports to the full-scale war was similar to that of goods exports, although not as dramatic. In March 2022, service exports dropped by 22% (Figure 24), disrupting the upward trend of post-COVID recovery. In the first eight months of 2022, the drop was only 6%, but it is likely to deepen as the base effect shows up. The expansion of IT service exports (Figure 25) is unlikely to compensate for other losses. At the same time, service imports grew by 73% compared to the first eight months of 2021, driven by external migration and the resulting expansion in travel expenses (Figure 26).

FIGURE 24 UKRAINE'S MONTHLY TRADE IN SERVICES, 2021-JULY 2022 (US\$ BILLIONS)



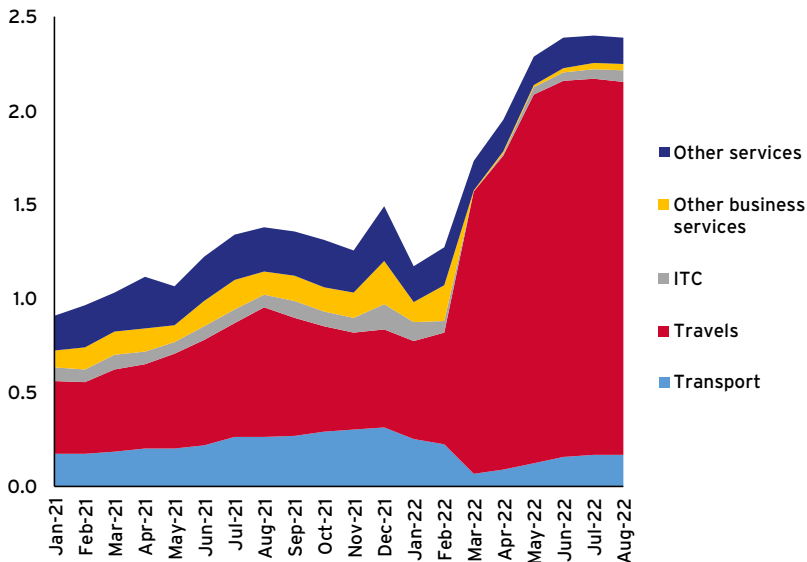
Source: National Bank of Ukraine.

FIGURE 25 UKRAINE'S MONTHLY EXPORTS OF SERVICES, 2021-JULY 2022 (US\$ BILLIONS)



Source: National Bank of Ukraine.

FIGURE 26 UKRAINE'S MONTHLY IMPORTS OF SERVICES, 2021-JULY 2022 (US\$ BILLIONS)



Source: National Bank of Ukraine.

Ukraine is making efforts to foster production and exports, supporting the relocation of companies and extending government credit programmes. The Export Credit Agency is expected to provide some export financing in 2022, though the institution is still in the process of being established.

While levying a massive toll on Ukraine, the full-scale war has also intensified some international processes, especially concerning the EU. On 23 June 2022, Ukraine was granted EU candidate status, a decision that was unthinkable in January 2022.

Several countries, including the EU and the United Kingdom, opened their markets to Ukraine for a year. In particular, the EU has abolished not only the remaining (quite low) import duties but also tariff rate quotas on agricultural products covering about 10–15% of Ukraine's exports to the EU and safeguard measures on metals.

Some positive developments have already occurred in logistics. The 'grain deal'³⁹ between Ukraine and Russia, arbitrated by Turkey and the United Nations, allowed a partial lifting of the Black Sea ports blockade by Russia and the resumption of grain exports from Ukraine.

In May 2022, the European Commission released an action plan for EU-Ukraine Solidarity Lanes to facilitate Ukraine's agricultural export and bilateral trade with the EU.⁴⁰ To address the immediate supply needs of railways, the plan proposes to:

- Urgently mobilise the available necessary equipment, rolling stock, vehicles, barges and vessels on the EU market.
- Make available the required rail slots between transshipment centres and EU ports.
- Prioritise Ukrainian agricultural export shipments towards freight corridors with the best available capacity.
- Identify the critical transshipment/gauge changing centres at and beyond EU-Ukraine borders to optimise volumes.
- Facilitate lending and selling and stepping up manufacture of mobile grain loaders to relevant transshipment locations.
- Investigate whether additional top-level guarantees for freight carriers are needed and cooperate with international financial institutions to provide them (we have already mentioned small World Bank programmes that do this for other countries, but the sums needed for Ukraine to cover full-scale war tail risk are much larger than in any existing programme; more details on this in the chapter on business environment).
- Establish a matchmaking platform to facilitate exchanges between logistics chain actors to optimize cargo flows and identify a dedicated Solidarity Lanes contact point for problem notification.

39 <https://ukragroconsult.com/news/opublikovano-tekst-zernovoyi-ugody-pidpysanoyi-sogodni-v-stambuli/> (in Ukrainian).

40 https://transport.ec.europa.eu/news/european-commission-establish-solidarity-lanes-help-ukraine-export-agricultural-goods-2022-05-12_en

In July 2022, Ukraine and the EU signed a one-year agreement on road transportation to ease the impact of the port blockade.⁴¹ The agreement cancels road permit requirements, a long-standing point of contention between Ukraine and several member states. Moreover, the mutual recognition of driver's licenses has been established.

4 Reconstruction

4.1 Baseline assumptions

The accelerated economic recovery of Ukraine is to be based on a strong recovery of foreign trade and the FDI boom, as domestic resources cannot be sufficient to fund the country's needs.

The baseline assumption for Ukraine's massive reconstruction is the de-occupation of Ukraine's territory, achievement of long-lasting peace and, thus, the resolution of major security concerns. Importantly, some security issues will remain even after reaching long-lasting peace as long as an imperialistic Russian regime is in power. Moreover, there will be a need to demine vast territories on land and water.

Full access to Ukraine's seaports is another baseline assumption needed for a successful resumption of goods trade.⁴²

On a positive note, Ukraine's governmental institutions at both the national and local levels have remained functional in all government-controlled territories, allowing policy implementation. Moreover, the full-scale war, as discussed above, has opened up new opportunities. Specifically, Ukraine's EU candidacy streamlines the reform path, makes the policy changes more predictable and familiar for many international players, and – if security concerns are resolved at least to some extent – makes the country much more attractive for investment.

Although the baseline for the reconstruction discussed in this book is the period after the full-scale war, many recommendations can be implemented while military actions are still ongoing. Ukraine cannot wait until the war ends to start reconstruction, as the country needs a functioning economy during the full-scale war. It is impossible to rely only on international assistance to meet Ukraine's needs. The summer of 2022 showed wide gaps between promises of international aid and the actual delivery of these promises. While extensive external support remains crucial, the best way to ensure Ukraine is economically resilient in the short to medium run is the immediate support of reforms and reconstruction.

41 https://transport.ec.europa.eu/news/supporting-ukrainian-exports-and-improving-connections-eu-eu-strengthens-cooperation-ukraine-and-2022-06-29_en

42 The assumption regarding the de-occupation of Ukraine's territories means that Ukraine can access and use all its seaports, including ports in Crimea and the Azov Sea. However, the ports in Odesa, Mykolaiv and Kherson regions are key to recovering Ukraine's sea trade.

4.2 Available technologies, resources and policies

The aim of trade and investment policies is to allow accelerated economic recovery.

To achieve this, Ukraine's trade policy should be export-oriented, with a focus on participation in global (European) value chains, development of diversified exports with higher value-added and limited exposure to security threats (like ITC or business services) or new niches developed due to the war. This means ensuring deep integration in the EU market, even before becoming a member of the Union, and the opening of other markets. In investments, the business climate is key.

Ukraine is well-positioned to succeed in reforming trade and investment policies aimed at boosting economic recovery.

The Association Agreement with the EU, coupled with Ukraine's recent candidate status, provides a strong boost for reforms. The recommendations embedded into the European Commission's opinion regarding Ukraine's candidacy status include issues essential for attracting FDI, in particular concerning the continuation of judicial reform and the strengthening of anti-corruption institutions. The Ukrainian government has already announced that it is taking these recommendations seriously and aiming to demonstrate substantial progress as early as 2022. The successful implementation of these reforms would mean the resolution of concerns related to property rights and the rule of law in general.

The government has also intensified legal convergence with the EU norms embedded in the Association Agreement that have not yet been adopted. It is expected that by the end of 2022, most legal commitments will be implemented, thereby making up for previous delays and surpassing the schedule. However, some time will be needed for the European Commission to verify this alignment.

Ukraine has already started a new campaign to attract FDI. In September 2022, President Zelensky launched⁴³ the 'Advantage Ukraine' initiative focused on attracting future investment by advertising the country's investment climate and sectoral opportunities.⁴⁴ The online platform offers potential investors information support and direct communication with responsible public officials.

43 www.businesswire.com/news/home/20220905005440/en/President-H.E.-Volodymyr-Zelenskyy-rings-bell-at-NYSE-to-signify-Ukraine-is-open-for-business

44 <https://advantageukraine.com/>

4.3 Organisational structure

The organisational structure for trade and investment policy reforms should be aligned with both the institutional framework for the country's general recovery efforts and the existing institutions responsible for the development and implementation of these policies. It is advisable to rely on existing structures to reduce administrative costs, ensure policy continuity and preserve institutional memory, unless these institutions are tainted by corruption scandals or new institutions are required to meet international commitments.

The Ministry of Economy is expected to be a central state authority responsible for these changes. However, there are several other important state stakeholders. In particular, the changes in trade and investment policies need to be aligned with the EU integration efforts, which this requires a strong role for the Vice-Prime Minister on European and Euro-Atlantic Integration as well as the Government Office coordinating European and Euro-Atlantic Integration.

There are also several other government institutions responsible for trade and investment policy implementation. For example, UkraineInvest is the governmental advisory body helping to bring FDI into the country. The Entrepreneurship and Export Promotion Office aims to support SME development and export promotion. There are also specialised institutions like the State Service on Food Safety and Consumer Protection, which is responsible for a wide range of tasks related to both agricultural and most manufacturing product safety, and the State Service on Medicine and Drug Controls, which deals with medicine safety issues. These institutions are likely to be beneficiaries of specialised projects related to reconstruction and the EU integration efforts.

For trade and investment, the role of public-private partnerships and private money must be dominant.

The role of international donors should be focused on the following:

- Technical and financial assistance to ensure full alignment with the EU norms and practices for economic integration with the EU, including the realisation of opportunities embedded in the Association Agreement and other EU-Ukraine agreements.
- The participation of international donors in the capitalisation of Ukraine's Export Credit Agency (ECA) to upscale its activities and promote exports through financial means.
- A multi-donor fund to cover non-economic risks for foreign investors.

As for the latter, the World Bank Multilateral Investment Guarantee Agency (MIGA), jointly with the Ministry of Economy, announced a pilot project⁴⁵ to provide guarantees to foreign investors, but the initial scale (\$30 million) is likely to be insufficient for Ukraine's needs and will require upscaling (the chapter on the Yegor Grygorenko and Monika Schnitzer business environment by the has more discussion on war risk insurance).

Public-private partnerships are expected in infrastructure projects (see more in the chapter on energy by Tatyana Deryugina and co-authors and the chapter on infrastructure by Volodymyr Bilotkach and Marc Ivaldi).

The EU's role needs to be much more intense than during the period of the Association Agreement implementation prior to the full-scale war. The previous experience showed several drawbacks of implementation, including the insufficient allocation of European Commission resources to checking Ukraine's draft legal acts quickly, delays with recognition of progress and no formal progress evaluations, which also delays integration. These issues should be resolved to ensure efficiency.

The expected time horizon for the EU integration preparations is approximately five years, and it should be the same for trade and investment policy changes. However, the changes will be done in parallel and front-loaded in many cases. For instance, the legal changes associated with the Association Agreement implementation are expected to be adopted in 2022 or early 2023, but the institutional development will take more time.

4.4 Estimates of the cost

There are several types of costs associated with trade and investment integration.

First are public costs linked with legal harmonisation and the capacity development of involved institutions, especially quality infrastructure. Given that Ukraine has already progressed in aligning with the EU norms and practices related to trade integration, additional investments are expected to be quite modest (under \$1 billion).

Second, there are costs imposed on producers to implement new norms. Before the full-scale war, many Ukrainian businesses, especially export-oriented ones, had already absorbed these costs. However, the process of legal alignment has not been completed, meaning that further investments in implementing changed norms are needed. The full-scale war destruction has further aggravated the financial constraints of businesses, and thus state/international support for alignment with these norms would be beneficial. It is hard to provide an exact budget, but we can use some international comparisons for benchmarking. For instance, the EU programme for the Competitiveness of Enterprises

45 www.me.gov.ua/News/Detail?lang=en-GB&id=1885d3ee-e1fd-47bd-b44e-ec3cd42dd456&title=TheMinistryOfEconomyOUkraineHasAgreedWithMigaToLaunchAMechanismForInsuranceOfInvestmentsDuringTheWar

and Small and Medium-Sized Enterprises (COSME) has a budget of €2.3 billion for all member states and several other countries for seven years (2014–2020). Thus, we can expect up to \$1 billion to be sufficient to cover the adjustment costs of Ukrainian businesses.

Third, infrastructure costs (e.g. motorways, railroads, border crossing points, multimodal transport hubs, electricity grids, high-speed internet) are needed for the successful functioning of the economy, including trade and investment. These costs are discussed in other chapters of this books, but they essentially serve as preconditions for the success of trade and investment policies.

The Polish experience provides another benchmark for our cost estimates. According to Golinowska (2019), in the pre-accession period, Poland received three types of funding:

- Polish Hungary Assistance for Restructuring their Economies (PHARE): €0.4 billion per annum aimed at infrastructure (roads, sewage plants etc.), private sector development, environmental protection, public administration reform, social protection and employment, health care.
- Special Accession Program for Agriculture and Rural Development (SAPARD): €0.17 billion per annum, aimed at the modernisation of the agriculture and food industry and infrastructure of rural areas.
- Instrument for Structural Policies for Pre-Accession (ISPA): €0.6 billion in 1990–2003, aimed at big infrastructure, environmental protection and transport network projects at the local level.

Since gaining membership in 2004, Poland has received in total €164 billion in EU support,⁴⁶ which has mostly been spent on various infrastructure and environmental projects.

Fourth, there are the costs associated with risk insurance, including the functioning of a fund for covering non-economic risks for foreign investors and the support of the ECA. If we assume a target of \$250 billion of FDI attracted within ten years, an average investment project duration of five years and 8–10% risk coverage, the funding needs for foreign investors could be about \$10–12.5 billion. Depending on the security situation and project needs, the required funding could be much higher. As for the ECA, its current statutory capital is about 2 billion hryvnia (\$54 million). Given the pre-full-scale war exports at over \$80 billion, the available capital is hardly sufficient and should be gradually expanded to at least \$0.5 billion. In sum, that would mean \$10.5–13.0 billion for both FDI and export insurance.

46 <https://pie.net.pl/en/15-years-in-the-eu-poland-received-a-total-of-eur-164-in-support/>

There are also other needs – for example, for organizing information campaigns and investment roadshows and the support of export networking (participation in trade fairs and trade missions, etc.). However, these costs are expected to be small compared to all other needs, in the millions rather than billions of dollars.

Thus, there are several types of costs and ‘price lists’. While the investments required for trade and investment policy per se are quite moderate, insurance coverage and infrastructure costs can be extremely high. Unlike Poland, Ukraine should not only achieve certain cohesion with other EU member states but also reconstruct and modernise after the full-scale war.

5 Historical comparisons

This chapter focuses on trade and direct foreign investment, so it is beyond our scope to go deeply into historical analogies for reconstruction such as the Marshall Plan; this topic is taken up elsewhere in this book. But it is worth including a short discussion of the environment for trade and investment, particularly in the context of a post-war nation, which is the appropriate context given the baseline assumptions of this book. In particular, we assume that Ukraine regains access to its former shipping routes in the Black Sea. There are numerous historical examples of countries whose development was derailed after losing shipping access (for instance, Bolivia, which lost its coast to Chile during a conflict in the last part of the 19th century). There are also examples of countries that suffered immense physical damage during wartime and yet, thanks to a legacy of institutions and human capital, were able to rebuild successfully (for example, West Germany and Japan after World War II), relying very much on an open trading regime.

However, it is important to understand that in most of the historical examples, the resumption of full trade liberalisation took place gradually, with Japan and Germany (and indeed all of Western Europe) retaining a complex regime of exchange controls for a decade or more after World War II. These exchange controls typically had an array of different rates corresponding to different types of imports and exports and, in effect, amounted to a system of tariffs and subsidies. In other cases, there were only one or two exchange rates, but they were kept at significantly overvalued levels using severe capital controls as, say, Argentina does today. During the full-scale war, Ukraine has begun to institute such controls, as already noted, but if anything, too slowly, given the overriding imperative of winning the war while protecting society. But after the full-scale war, EU agreements will make implementing any such controls difficult. We have detailed at length all the steps Ukraine is taking to gain rapid trade integration with the EU, and implementing capital controls, and especially a goods-specific menu of exchange controls as in post-war Europe, is effectively off the table. This raises the question of how to ramp up trade after the war without running large trade deficits that put unsustainable pressure on the currency. We would highlight this as especially important for Ukraine, which has suffered World War II levels of destruction, but in its trade regime is jumping several decades ahead of what European countries achieved under the Marshall Plan.

We are not questioning the imperative of the transition to ever freer trade, especially with Europe, but simply emphasising that the unique relationship with Europe creates special issues. There is some precedent in the other countries of the former Soviet Union that joined the EU, but of course, they did not suffer the devastating destruction of invasion. The nearest analogy for Ukraine is perhaps Estonia, which during the 1990s chose a much faster pace of liberalisation than did, say, Latvia (which maintained tariffs up to 75% on a third of agricultural goods even as late as 1999) or Lithuania. It is interesting to note that Estonia ended its early-1990s hyperinflation by adopting a currency board that started in June 1992 and ended with its adoption of the euro in January 2011. Currency boards often fail (typically because they are not sufficiently backed), and one should not assume that the Estonian example can be adopted in a much larger economy. But this does seem like an important example to study in the post-war transition, given that Estonia chose extremely rapid trade and investment liberalisation, a course Ukraine has effectively already decided on.⁴⁷

A less optimistic analogy is Bosnia-Herzegovina, which was also devastated by full-scale war in the 1990s and continues to suffer significant tensions, as does the region as a whole – again, a possible parallel if the Russian aggression continues at a low boil even after peace. Ukraine had much more time to develop institutionally before its descent into all-out war compared to Bosnia, where the Dayton accords took place in the 1990s. Bosnia conformed only very slowly to WTO agreements, despite a number of regional free trade agreements, with the WTO being vastly less ambitious than the EU, particularly in service trade. The slow pace of reform in Bosnia, and corresponding very slow growth, would seem an example to avoid.

There is much more to be said, of course, but again discussions of historical context are much better done in a broader context of overall post-war economic policy.

6 SENSITIVITY ANALYSIS

The main assumption of this book is that long-lasting peace will be established, and thus, Ukraine – and the international community – will be able to channel most resources into reconstruction rather than security and defence. However, other scenarios are also regrettably plausible. The prolongation of active military actions for another year or more, a second attack on Kyiv, or an unstable ceasefire like the Minsk agreements that appeared to be a pause before the escalation of Russian aggression would require adjustments of trade and investment policies, likely delaying many changes. Still, while Ukraine remains an independent state, its orientation to the EU market and commitment to integrating into the EU will stay strong. Thus, the country will move along the policy lines stipulated in the chapter, while the war developments will regulate the speed but not the direction.

47 For a discussion of the Estonian experience, see Feldmann (2003).

7 CONCLUSION

The full-scale war has significantly impacted Ukraine's foreign trade and FDI inflows. However, it has also triggered geopolitical changes that will frame the country's future, including its future trade and investment policy. In June 2022, Ukraine was awarded EU candidate status. This important milestone in the country's status within Europe will govern its reform path for the years to come. Given the significant transformational power of the preparations for EU accession, we expect reconstruction and modernisation to be realised within this dominant political objective.

However, a rapid post-war economic recovery will be possible only if based on solid exports and significant foreign capital inflows. This means the country will have to complete fundamental reforms related to the rule of law and to property rights protection. These are preconditions for the EU accession talks and key to attracting foreign investment. In parallel, Ukraine will continue sectoral reforms allowing economic integration with the EU even before the country becomes an EU member state.

It is expected that the role of public-private partnerships and private money will dominate the post-war recovery. International donors' primary role in trade and investments is technical and financial assistance in reforms aiming at EU integration and the funding of (new) insurance schemes for exporters and investors. The costs of foreign technical assistance should be relatively modest (a few billion dollars), but the cost of insuring operational risk against a future resumption is obviously going to be highly dependent on the nature of the peace.

APPENDIX: OVERVIEW OF KEY TRADE AND INVESTMENT POLICY REFORMS IN 2014-2021

Below we list a range of areas where Ukraine is moving to conform its legislation and institutions with the EU. As one can see, this is a very large project involving enormous expert resources at a time when human capital is scarce. Nevertheless, Ukraine is making steady progress.

Technical barriers to trade (TBT)

This is a fast-moving area, covering an extremely broad spectrum of issues, some quite technical. By aiming to conclude the Agreement on Conformity Assessment and Acceptance (ACAA) of industrial products with the EU, Ukraine greatly facilitates future trade integration. The ACAA is a special case of a mutual recognition agreement of conformity assessment (MRAs) offered by the EU to its partners.

Unlike the usual MRAs, the ACAA is based on aligning the partner country's legislative system and quality infrastructure⁴⁸ with those of the EU. On the one hand, it means that the preparation for the ACAA is much more cumbersome than for the usual MRA. On the other hand, this alignment provides an additional guarantee of the high reliability of the conformity assessment procedures, thus opening the door for MRAs with a wider array of countries.

Below we give a quick overview of past progress and ongoing change:

First, Ukraine has progressed significantly in aligning its legislation with EU norms. The country has already harmonised its framework TBT legislation, i.e. general requirements regarding technical regulation, metrology, accreditation, conformity assessment and market surveillance. Moreover, Ukraine has also passed scores of new technical regulations using the EU directives as a basis. The process is well underway. For instance, 25 out of 27 technical regulations envisaged in the DCFTA have been adopted and implemented.⁴⁹ The precondition for the conclusion of an ACAA is that Ukraine's technical regulations are identical to the currently applied EU directives. Prior to the full-scale war, the EU had been conducting an expert assessment mission in preparation for forthcoming ACAA talks; this is now scheduled to resume.

Alongside alignment with the EU directives, the government had to cancel other legal norms, such as sanitary and labour safety norms, that contained additional mandatory requirements regarding product characteristics, production methods and processes, and hence duplicated technical regulations. For example, a long-lasting cumbersome heritage of the Soviet Union, the mandatory product certification, has now been cancelled. Important progress has also been achieved towards institutional alignment, in some respects a more difficult and fundamental step. Since 2016, the State Service on Food Safety and Consumer Protection (SPSA) has been established as the key responsible authority in the sphere of non-food products market surveillance.

Sanitary and phytosanitary (SPS) measures

The SPS reform has been extremely comprehensive, involving having Ukraine align with over 250 SPS EU norms.⁵⁰ By the beginning of 2022, Ukraine had adopted legislation covering about two-thirds of these commitments, as estimated by the state monitoring platform Pulse of the Agreement.⁵¹

48 See footnote 7.

49 The full list as of April 2022 is at www.me.gov.ua/Documents/Download?id=84de50b5-ca95-4913-9d1b-20f4ad74bfaf (in Ukrainian).

50 www.kmu.gov.ua/ua/npas/248928183 (in Ukrainian).

51 <https://pulse.kmu.gov.ua/ua/direction/sanitarni-ta-fitosanitarni-zahody> (in Ukrainian).

The most important change concerned the introduction of the principles of the Hazard Analysis and Critical Control Points (HACCP) methodology aimed at reducing food risks for consumers by controlling the key potential hazards.⁵² The key legislation was adopted in 2014,⁵³ and the HACCP has been mandatory for all entities since September 2019.

New laws were adopted on food safety and quality,⁵⁴ food safety control,⁵⁵ veterinary medicine,⁵⁶ information for consumers⁵⁷, and so on. New institutions and procedures have been introduced to ensure compliance with these new laws. In particular, before 2016, the policy implementation functions were dispersed among several public agencies, including the State Veterinary and Phytosanitary Service, the State Inspection for Consumer Protection, and the State Sanitary and Epidemiological Service. In 2016, the State Service on Food Safety and Consumer Protection of Ukraine took over all of their functions.⁵⁸

In 2020, Ukraine and the EU mutually recognised the equivalence of safety systems certification for grain seeds.⁵⁹ This decision reduces trade costs, providing benefits similar to those generated by the ACAA for manufacturing products. Currently, Ukraine's aim is to get the same equivalence recognition for most agricultural products even before the EU accession.

Customs

Customs-related reforms have progressed slowly but steadily. Before the full-scale war, Ukraine managed to implement multiple steps contributing to the reduction in costs and time spent on documentary compliance in cross-border trade. These include:⁶⁰

- The introduction of online administrative services for exporters and importers, increasing efficiency and reducing corruption risks.
- The launch of authorised economic operators (AEO), the mechanism allowing to simplify customs formalities for traders that meet integrity criteria.
- The introduction of an electronic 'single window' at customs⁶¹ that allows all required documents to be submitted and processed in a single place.

52 www.fda.gov/food/guidance-regulation-food-and-dietary-supplements/hazard-analysis-critical-control-point-haccp

53 <http://zakon2.rada.gov.ua/laws/show/1602-18> (in Ukrainian).

54 <https://zakon.rada.gov.ua/laws/show/771/97-%D0%B2%D1%80#Text> (in Ukrainian).

55 <https://zakon.rada.gov.ua/laws/show/2042-19> (in Ukrainian).

56 <https://zakon.rada.gov.ua/laws/show/1206-20> (in Ukrainian).

57 <https://zakon.rada.gov.ua/laws/show/2639-19#Text> (in Ukrainian).

58 <https://dpss.gov.ua/>

59 <https://craneip.com/eu-recognized-ukrainian-seed-certification/>

60 See the chapter on customs in Emerson et al. (2021).

61 https://mof.gov.ua/uk/the_only_window_for_international_trade-472 (in Ukrainian).

- Strengthened protection of intellectual property rights when moving goods across the border, in particular the establishment of IPR objects register at customs⁶² and mechanisms to enforce IPR for goods moving across the border.

On 1 October 2022, Ukraine joined the EU Common Transit Convention and the Convention on the Simplification of Formalities in Trade in Goods. This enables easier movement of goods across the EU and other common transit countries (Norway, Iceland, Switzerland, North Macedonia, Serbia, Turkey and the UK) by applying a single customs declaration between the participating countries, mutually recognised financial guarantees and fewer controls.⁶³ The application of a common IT product (NCTS) increases customs efficiency and transparency.

Of course, because of the ongoing war destructions and the partial blockade of ports, moving products by land remains a cumbersome and costly process compared to transportation structures in neighbouring countries. However, the reorientation of Ukraine's goods trade flows towards the EU also created pressures on the European transport and logistic infrastructure.

Public procurement

To overcome corruption risks and increase public spending efficiency, since 2016 all public procurements above a certain threshold have been conducted through the online public procurement system ProZorro⁶⁴. This e-procurement system became the category winner for the public sector in the World Procurement Awards 2016.⁶⁵ The legislation also contains disclosure requirements for all public procurement transactions, even if the purchase was below ProZorro thresholds. The business intelligence platform associated with ProZorro offers further analytical tools to increase transparency and monitoring efficiency.

Until recently, Ukraine has been applying an equal treatment of Ukrainian and foreign companies in public procurement. In 2021, Verkhovna Rada adopted a law introducing public procurement preferences for domestic producers. However, these localisation preferences are not applied to the EU and other signatory parties of the WTO Government Procurement Agreement (GPA).⁶⁶

The public procurement reforms allowed the country to join the WTO GPA in 2016, opening access to public procurement markets in 48 countries worth over \$1.7 trillion.⁶⁷

62 <https://cabinet.customs.gov.ua/ipr/reg/overview> (in Ukrainian).

63 See <https://www.kmu.gov.ua/en/news/rada-asotsiatsii-ukraina-ies-1-zhovtnia-ukraina-zmozhe-pryiednatsia-do-mizhnarodnykh-mytnykh-konventsii> (in Ukrainian).

64 <https://zakon.rada.gov.ua/laws/show/922-19#Text> (in Ukrainian).

65 www.procurementleaders.com/world-procurement-awards/winners

66 <https://zakon.rada.gov.ua/laws/show/1977-IX#Text> (in Ukrainian).

67 [/www.wto.org/english/tratop_e/gproc_e/gp_gpa_e.htm](http://www.wto.org/english/tratop_e/gproc_e/gp_gpa_e.htm)

Services

The Association Agreement envisages the provision of so-called internal market treatment by the EU for Ukrainian service providers in four areas:⁶⁸

- International maritime transportation
- Postal and courier services
- Electronic communications
- Financial services

Although Ukraine has been interested in EU market integration in all four areas, the digital sector is definitely the priority, given the country's advances in IT and e-government.

A law on electronic trust services implementing the new EU regulation on electronic identification and trust services was passed in 2017.⁶⁹ The law develops a unified system of electronic trust services⁷⁰ and introduces mutual recognition of Ukrainian and foreign public key certificates and electronic signatures and seals. A new law on electronic communications introducing the EU regulatory standards into this market was adopted in 2020.⁷¹ Ukraine has updated its law on e-commerce⁷² respectively.

New intellectual property legislation in many areas is being introduced to support Ukraine's strong IT sector and other trade in intellectual property. Major changes occurred in the national intellectual property system, work of collecting societies (i.e. organizations licensing and managing copyrighted works on behalf of copyright owners), geographical indications, trademarks, patents and industrial designs, and, as mentioned above, customs enforcement.⁷³ This means major changes from Soviet-era disregard for IPRs.

Ukraine has also progressed with the adoption of EU norms in banking and insurance regulations. For instance, bank supervision was brought much closer to EU rules, including the implementation of the Basel principles on effective supervision, improved rules on capital buffers, the introduction of the new liquidity ratios, and so on. The law aiming to simplify business and attract investment by securities issuers⁷⁴ updated the rules for issuing securities and public offers of securities, information disclosure rules

68 See the chapter on services in Emerson et al. (2021).

69 <http://zakon3.rada.gov.ua/laws/show/2155-19> in Ukrainian.

70 Electronic trust services means an electronic service consisting of the creation, verification, validation of electronic signatures, electronic seals, electronic time stamps, electronic registered delivery, website authentication and certificates related to those services (see www.lawinsider.com/dictionary/electronic-trust-services).

71 <https://zakon.rada.gov.ua/laws/show/1089-20> in Ukrainian.

72 <https://zakon.rada.gov.ua/laws/show/675-19#Text> in Ukrainian.

73 See the chapter on IPRs in Emerson et al (2021).

74 <https://zakon.rada.gov.ua/go/2210-19>

for security issuers and regulation of professional security market participants. Ukraine has thereby implemented part of the EU Markets in Financial Instruments Directive (MiFID/MiFID II) regulations, considered the most cumbersome of the new EU financial markets regulations. This is a major undertaking, to say the least.

Progress was also achieved in reforming other service sectors, including transport.

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The reconstruction and development of Ukraine's financial sector after the war¹

Ralph De Haas^{a,b,c} and Alexander Pivovarsky^a

^aEuropean Bank for Reconstruction and Development (EBRD); ^bCEPR; ^cKU Leuven

EXECUTIVE SUMMARY

Before Russia's February 2022 invasion, Ukraine's financial sector was small, fragmented and overly reliant on state banks. The sector has nevertheless weathered the initial shock relatively well, reflecting the central bank's restructuring efforts over the past decade.

Even during the war, the authorities can start preparing for the post-war reconstruction and repositioning of the financial sector. Preparations should include the comprehensive asset quality review that will be needed straight after the war; subsequent bank-specific recapitalisations; and designing a (centralised) mechanism for resolving non-performing loans. State banks should be put on a credible privatisation path while ensuring they become less reluctant to write off or restructure non-performing loans.

Ukraine's EU candidacy will guide its regulatory alignment with European standards and (re)engagement with foreign investors. To develop capital markets, priority should be given to consolidating the fragmented equity market infrastructure; introducing financial collateral legislation and strengthening creditor protection; and legally recognising modern financial instruments to adjust the balance between debt and equity risks.

Ukraine may continue to face elevated geopolitical risks after the war. The financial deepening process will then depend on risk-sharing arrangements with the EU, bilateral donors and multilateral development institutions.

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1 INTRODUCTION

A deep, liquid and resilient financial sector can be a powerful engine of long-term economic development (Beck et al. 2000). Well-functioning financial systems mobilise domestic and foreign savings and allocate them efficiently to profitable investments. Strengthening Ukraine's banking sector and developing its capital markets will therefore be an essential part of the post-war reconstruction and development effort.

Very large volumes of domestic and external funds will have to be mobilised. The cost of reconstruction and recovery, as well as the decontamination of mines and explosive remnants of war, is estimated by the World Bank (2022) at over €350 billion as of September 2022 (almost twice the level of Ukraine's pre-war GDP) and is likely to grow. This financing needs to be channelled swiftly to the right projects without compromising financial stability. This will be the balancing act at the heart of Ukraine's financial reconstruction in the short to medium term.

In the longer term, two strategic considerations will guide Ukraine's financial development. First, the country's EU candidacy should provide a useful institutional anchor to guide regulatory alignment and (re)engagement with foreign investors. Second, even after the war, Ukraine's geopolitical situation will likely remain uncertain for a considerable period of time. Financial deepening may therefore benefit from, and initially even depend on, risk-sharing arrangements with the EU, bilateral donors as well as multilateral development institutions.

This chapter consists of three parts. The first part reviews the strengths and weaknesses of Ukraine's financial system at the time of Russia's invasion. The second part briefly discusses the country's wartime financial resilience so far. The third part sets out key reform priorities for Ukraine's post-war financial reconstruction. These specific priorities reflect a few more general objectives, such as ensuring a swift recovery of the banking sector and developing the country's capital and equity markets.

2 UKRAINE'S FINANCIAL SECTOR BEFORE THE INVASION

2.1 Overview

Ukraine's pre-war financial sector was relatively underdeveloped and heavily bank-based. The country's financial underdevelopment is rooted both in its experience during the post-socialist transition and the low quality of its market institutions (Pivovarsky 2016). In the early 1990s, many Ukrainians lost most of their accumulated rouble savings due to the collapse of the Soviet Union and subsequent hyperinflation. The resulting lack of trust in the financial system was exacerbated by the negative experience with

mass privatisation in the mid-1990s. At the time, controlling stakes in companies and banks were quickly accumulated by a small group of people (some of whom subsequently became oligarchs) while minority shareholder rights were violated with impunity (Pivovarsky 2003).

In the early years of the post-socialist transition, some observers expected that institutions supporting financial development would emerge naturally, as new private owners would lobby the state to create them. However, the majority shareholders of private companies turned out not to be interested in this. The deficient legal framework and limited investor protection, especially of minority shareholders, thus remained key impediments to Ukraine's financial development, as has been the case in many other emerging economies (La Porta et al. 1998).

The traumatic transition experience and weak institutions, combined with high economic inequality (and thus a thin local investor base) has held back Ukraine's financial markets. Moreover, the severe macroeconomic (and more recently, security) shocks that Ukrainians have experienced over the past decades, and the associated asset price collapses and devaluations, have contributed to strong risk aversion in society. Many households have resorted to hoarding foreign currency cash, investing in real estate or holding short-term bank deposits (often also in foreign currency).

As a result, firms and investors interested in funding commercial projects had to rely either on internal funding, relatively expensive bank loans, or funding from international markets.

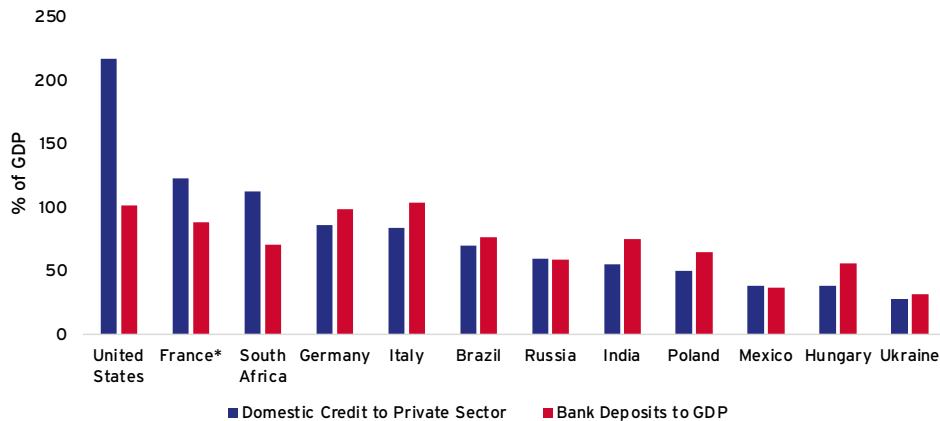
2.2 The banking system

A shallow banking system dominated by state banks

Even though Ukraine's financial sector is predominantly bank-based, the total stock of bank lending to the private sector stood at just 28% of GDP at the end of 2021. This total constituted around one half of the banks' overall assets, with the rest on-lent to the central government. The country's deposit base remained low, too, by comparison with other large emerging markets (Figure 1). There exists therefore substantial scope to deepen Ukraine's banking system in support of private sector development.

Before the 2008/9 global financial crisis, the state controlled two large banks responsible for less than a quarter of all banking assets. During that crisis, the government nationalised and recapitalised several smaller private banks that were deemed to be systemically important. The country's largest bank, PrivatBank, which for a long time had been plagued by unprofitable related-party lending, was nationalised in 2016 as well. Following that nationalisation, the state's share in the banking system increased further to over half of all banking assets.

FIGURE 1 UKRAINE'S BANKING SYSTEM IN INTERNATIONAL COMPARISON



Note: Data refer to 2020 except for the French deposit data (which is for 2019).

Source: World Bank.

Already in 2018, the government drew up a strategy for the privatisation of state-owned banks. It invited international financial institutions to acquire significant minority stakes in two state banks to help prepare them for privatisation to strategic investors. At the same time, steps were taken to improve the corporate governance of state banks, including by increasing the share of independent directors on their boards. However, preparing state banks for privatisation turned out to be challenging, and the appetite of international investors has been limited so far. The authorities therefore pushed the privatisation timeline back to 2025.

Non-performing loans and the Deposit Guarantee Fund

For years the Ukrainian banking system suffered from weak risk management, widespread related-party lending and regulatory forbearance. After Russia's annexation of Crimea and the onset of the war in Donbas in 2014, Ukraine experienced a severe economic crisis. The National Bank of Ukraine (NBU) responded by implementing a major programme of internal professionalisation and an overhaul of the banking sector. As a consequence of the crisis and the introduction of proper oversight by the NBU, the share of non-performing loans (NPLs) on banks' balance sheets increased from less than one fifth of the total in 2013 to over half of all loans in 2017.

Following two rounds of asset quality reviews, more than 80 banks – responsible at the time for one third of all banking assets – were closed, and PrivatBank was nationalised. Other large banks were recapitalised and strict limits for their related-party exposures were actively enforced by the central bank. In addition to curbing related-party lending and accelerating NPL restructuring, other reforms included promoting transparency of bank ownership, strengthening macro- and microprudential supervision, and tackling money laundering activities by banks.

As the NBU closed failing banks during the clean-up of 2014–17, many of their liabilities and assets migrated to the balance sheet of the Deposit Guarantee Fund (DGF) created in 1998 with a function to repay depositors of resolved banks that participated in DGF. In 2012, the DGF powers were extended as it was tasked with not only deposit insurance but also bank resolution. All banks, with the exception of state-owned Oschadbank (the largest bank in terms of personal deposits, which were already explicitly guaranteed by the state), were required to participate in the insurance scheme administered by the DGF.²

The DGF's financial buffer was insufficient to handle the full scale of the 2014–15 crisis. To address the shortfall, the fund had to borrow from the NBU and the Ministry of Finance. This was done on market terms, which put additional pressure on the DGF's financial position. Towards the end of 2020, Ukraine's financial stability council approved a procedure for restructuring the DGF's debt and restoring its solvency (put in Law in 2022). The procedure included turning the repayments to the Ministry of Finance into contingent liabilities, using funds recovered from failed banks' previous owners to replenish the DGF. As a result, the DGF was able to honour its obligations to the depositors of failed and liquidated banks. It also established a specialised department for the consolidated sale and management of the banking assets it had absorbed and managed. Over time, the DGF has used the country's electronic procurement and asset sale system, ProZorro.Sales, to sell some of these assets.

The Kyiv Approach

To handle the large stock of NPLs in a way that is relatively favourable to borrowers, including by avoiding drawn out legal processes, the Ukrainian authorities introduced a simplified method for NPL resolution known as the 'Kyiv Approach'. Based on the 2016 Law of Financial Restructuring (LFR), this approach allows for the voluntary out-of-court restructuring of non-performing liabilities. A secretariat set up by several international institutions assists with LFR restructurings.³

The goal of the LFR was to assist banks and borrowers with the restructuring of loans, and to salvage viable businesses.⁴ Cases involving multi-creditor restructurings, and where borrowers and lenders could not reach amicable agreements, can in principle be submitted for resolution by arbitration. However, before the war, all cases settled under the LFR (equivalent to around 2% of GDP) were handled through the voluntary, bilateral procedure. Furthermore, the LFR was used primarily to restructure loans of state-owned financial institutions, while privately-owned commercial banks preferred workouts outside of the LFR framework (see also Section 4.1).

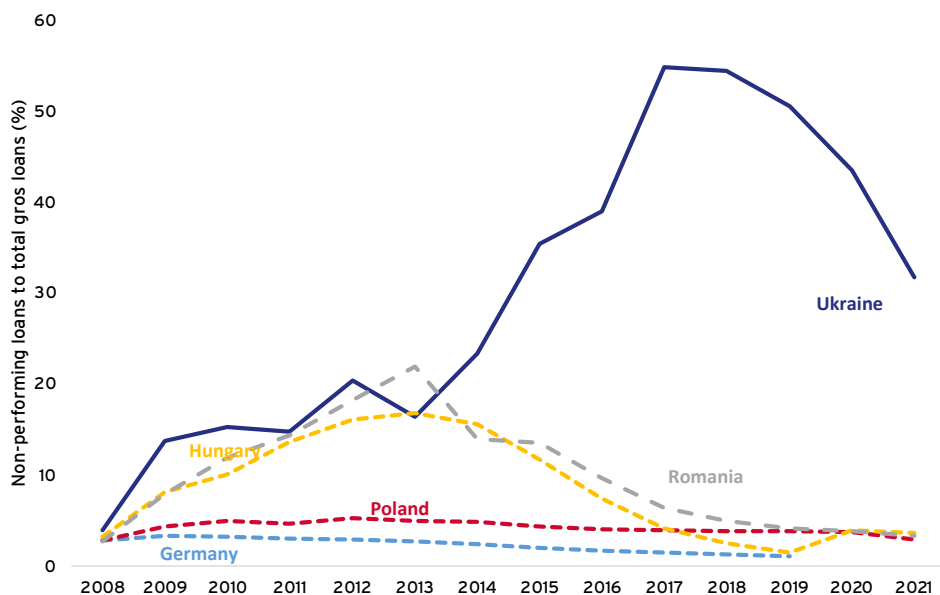
² Since April 2022, Oschadbank also participates in the DGF.

³ Although the Kyiv Approach was to be phased out in 2022, an amendment to the law was recently signed by Ukraine's president which extends the LFR until 1 January 2028.

⁴ All Ukrainian enterprises with outstanding debt to at least one Ukrainian or foreign financial institution, and whose business is deemed financially distressed but viable, are eligible to participate in an LFR restructuring. The debtor must obtain the consent of one or more financial institutions holding at least 50% of all claims against the debtor (excluding any liabilities to related parties).

After peaking in 2017, NPLs started to come down as a result of the financial sector clean-up, the writing down of loans and related institutional improvements (Figure 2).

FIGURE 2 NON-PERFORMING LOANS IN UKRAINE AND COMPARATOR COUNTRIES



Source: IMF Financial Soundness Indicators.

2.3 Non-bank financial institutions

Non-bank financial intermediation was also underdeveloped before the war. The insurance sector remained highly fragmented and the stock of insurance assets equalled less than 2% of Ukraine's GDP at the end of 2021. The sector was dominated by car insurance while life insurance was only just emerging. Venture and equity funds were few and far between. They also tended to be small and sponsored by international organisations, thus mobilising few domestic or international private savings. Other non-bank financial institutions – including credit unions and payday lenders – were scarce and small as well.

2.4 The money market

For many years, the Ukrainian authorities had a rather ambivalent approach to developing local currency markets. This was in part the result of their commitment to a tight control of the hryvnia exchange rate. However, with the transition of the monetary policy framework from a hybrid regime towards inflation targeting in 2016, and while liberalising the foreign exchange market, the NBU had started to engage actively in

money market development.⁵ At end-2021, most activity in the interbank money market was in the unsecured segment, which also formed the basis for calculating the Ukrainian Overnight Index Average (UONIA). UONIA was launched in June 2020 and is published daily.

Pre-war repo market activity was shallow but had been expected to gradually increase on the back of recently established on-exchange anonymous repo platforms. These platforms were supported by the three local stock exchanges, with settlement and clearing executed via Ukraine's clearing house. The NBU had invited international financial institutions to operate in the local currency market, including by offering swap facilities to provide hryvnia funds against foreign exchange for on-lending to businesses and municipalities.

2.5 The bond market

Ukraine's public debt securities market was small but growing steadily, mainly driven by sovereign issuances. The private sector segment was dominated by international issuances. This exposed local borrowers to external vulnerabilities and limited market access for smaller companies. Secondary market trading remained limited too.

The share of domestic bonds in the total stock of marketable securities had been increasing slowly from one third in 2015 to 50% in 2021, mostly on the back of sovereign issuances. A favourable tax treatment and access to settlement through the Clearstream international central securities depository (as of May 2019) attracted significant international inflows into the domestic government securities market. Before the full-scale war, non-residents held about one tenth of the total outstanding volume of local securities. The expectation at the time was that the (imminent but since postponed) inclusion of Ukraine's local currency-denominated sovereign bonds into several benchmark emerging market indices would have further boosted inflows from non-resident institutional investors.

2.6 The equity market and capital market infrastructure

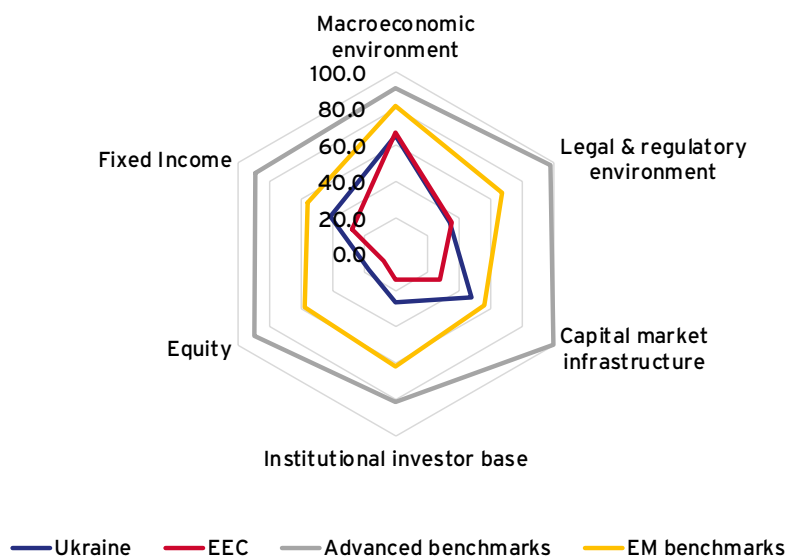
Ukraine's equity market was underdeveloped prior to the full-scale war: total domestic market capitalisation stood at just 5% of GDP in 2021. During the five years before the war, only one initial public offering took place and that was of a regional football club raising less than US\$2 million. Reputable companies chose to list their shares internationally – in Frankfurt, London or Warsaw – and liquidity was therefore concentrated in those markets.

5 In August 2015, the NBU announced its transition to inflation targeting and declared the first inflation target (12%) to be achieved in 2016 and a medium-term target (5%) to be achieved by the end of 2019.

Despite the consolidation trend, the country's capital market infrastructure remained excessively fragmented: the small market was scattered across four licensed stock exchanges, each with limited activity. Secondary market activity was limited on each of these exchanges. There were also two securities depositories and a separate clearing house.

Figure 3 summarises the development of Ukraine's financial markets and puts it in an international perspective. The EBRD Financial Markets Development Index (FMDI) combines 54 indicators split across two equally weighted sub-indices covering (1) necessary conditions for sustainable market development, and (2) asset class-specific indicators reflecting the extent of such development.⁶ It is clear that Ukraine not only underperformed relative to a benchmark of advanced economies (grey) but also relative to several emerging markets (yellow). Having said that, Ukraine performed slightly better than some of its immediate neighbours in the Eastern Europe and Caucasus (EEC) region (orange).

FIGURE 3 UKRAINE'S FINANCIAL MARKET DEVELOPMENT INDEX, 2021



Source: EBRD (2021).

Note: EEC includes Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine. Advanced benchmarks include Canada, Cyprus, France, Germany, Japan, Sweden, United Kingdom, and the US. Emerging Market (EM) benchmarks include Colombia, Peru, South Africa and Thailand.

Before the war, the MSCI – a leading international index provider – classified Ukraine as a frontier (standalone) market, the lowest classification. This reflected the small size and liquidity of the market as well as the difficulties in accessing it.

6 See EBRD (2021) for methodological details.

2.7 Financial supervision

Ukraine's financial markets are regulated by two authorities. For many years, the NBU has been responsible for supervising Ukrainian banks, including their securities transactions. In mid-2020, it took over regulatory responsibilities for non-bank financial institutions, including insurance, leasing, financial companies, credit unions, pawnshops and credit bureaus. The NBU also serves as a custodian for government bonds and runs the country's system of interbank payment settlements (SEP).

The National Securities and Stock Market Commission (NSSMC) is the regulatory and supervisory authority for securities and derivatives markets, as well as for non-state pension funds, construction financing funds, real estate funds and their administrators/managers. The NSSMC is less well-resourced than the NBU although it has received substantial advisory assistance to support its functioning.

Prior to the full-scale war, a nascent digital finance sector had started to emerge. During the COVID-19 pandemic, incentive payments for vaccinations were distributed by the authorities via an e-government application (with participation of intermediating commercial banks).

3 THE WARTIME RESILIENCE OF UKRAINE'S FINANCIAL SECTOR

3.1 Banking sector

Ukraine's banks have so far withstood the shock of the Russian invasion relatively well.⁷ This reflects the clean-up and recapitalisation of the banking system following the 2014-15 financial crisis (which ensured that by 2022 the remaining banks were relatively profitable, liquid and well-capitalised) as well as the subsequent forbearance policy by the NBU during the war. As of October 2022, deposit runs have not materialised, which reflects an uncapped government guarantee of retail deposits during martial law. In fact, by May 2022, hryvnia retail deposits had increased by about 11% relative to pre-war stocks, though corporate and foreign currency retail deposits decreased.

Since the full-scale invasion, the role of the state in Ukraine's financial markets has increased dramatically. Banks have curtailed private sector lending while loan demand plummeted, too. Under martial law, the NBU is prioritising the continuity of payments and ensuring that the banking system remains operational, stable and liquid. Acting pre-emptively during the first months of the war, the central bank extended unlimited unsecured refinancing to banks, with a maturity of up to one year. Since May 2022, as the situation stabilised, banks could only receive secured loans from the NBU.

7 The liquidation of two Russian-controlled banks (accounting for 2% of sector assets) and the declaration of insolvency of Megabank reduced the number of active banks to 68. In August 2022, Sich Bank was declared insolvent as well.

The NBU's monetary financing of the country budget has, as expected, accelerated inflation. To rein in price increases, protect reserves and create positive real rates of return on hryvnia assets, the NBU raised its key policy rate by 15 percentage points to 25% in June 2022.

3.2 Capital markets

Ukraine's financial markets have been severely disrupted by the full-scale Russian invasion. The imposition of martial law on 24 February 2022 was accompanied by capital controls, a move to a fixed exchange rate, and the start of the NBU's monetary financing of the state budget. All financial market activity, including the repo market, has been suspended except for trade in war bonds and, since August 2022, all state securities. A moratorium on cross-border foreign exchange operations is in place and the release of cash from foreign currency accounts is prohibited for corporations and limited for households.

The government continues to issue domestic bonds which, alongside concessional foreign funding and direct monetary financing, help bridge a substantial monthly financing gap. However, as such issues were offered at below-market rates, they generated little market interest and settled on the NBU balance sheet and, to a limited extent, on the balance sheets of state banks. Over the first six months of the war, the stock of government securities held by commercial banks declined by ten percent.

4 REFORM PRIORITIES AFTER THE WAR

4.1. Overarching objectives

For the financial sector to become an effective growth engine, it will be critical to address Ukraine's long-standing challenges related to the rule of law and corruption (discussed in detail in the chapters in this book on governance by Mylovanov and Roland and anti-corruption by Becker et al.). Other prerequisites include the re-establishment of an effective macroeconomic policy framework, in particular reducing over time the war-time fiscal dominance, as well as a return to inflation targeting. Social policies leading to lower income inequality but also greater self-reliance, including through long-term private savings, would help create a local investor base. Finally, it will be critical for much of the future international reconstruction support to be channelled to commercially viable projects through commercial investors, in many cases with the active involvement of international financial institutions.

The remainder of this chapter outlines several post-war reform priorities based on the following overarching objectives:

1. **Ensuring a swift recovery of the banking sector.** A rapid resolution of non-performing loans and related bank recapitalisations will be key. The country cannot afford a banking sector bogged down for years with problematic legacy loans, thus complicating the funding of new investments.
2. **More market-based finance.** As soon as the war ends, a commercial and market-based allocation of resources will need to be re-established. This recognises the need to privatise state banks and offer domestic tools to mobilise local savings. These steps will be even more important given Ukraine's history of (mis-) allocation of resources by the state and related governance challenges. If the security situation were to remain uncertain after military hostilities cease, it will be critical to mobilise international support for war insurance to back commercial investments (the chapter in this book on trade and FDI by Movchan and Rogoff elaborates on this).
3. **Developing a local investor base and an equity culture.** A balanced and resilient financial sector should not be excessively debt-based but will also offer public and private equity through market channels (EBRD 2015). The war will have erased a significant share of equity in the economy. Hence, the foundations will need to be laid for the development of efficient and liquid capital markets.
4. **Increasing the share of sustainable finance.** The enormous reconstruction challenge presents an opportunity to increase the share of sustainable projects supported by the financial sector. This would let Ukraine contribute to the fight against global warming and to mobilise impact investors.
5. **Fostering financial inclusion.** The deepening of the financial sector should benefit broad segments of Ukraine's society and improve people's lives in a durable way.

4.2. Dealing with the NPL legacy of the war

By mid-2022, the damage to physical assets in Ukraine was estimated by the Kyiv School of Economics to exceed 100 billion euro. Some bank collateral has been damaged or destroyed or is now located in occupied territories. Other enterprises were mainly affected by the economic contraction and dislocations triggered by the war, although their assets are intact and their business models may be viable once peace is re-established. As auditors currently cannot visit many business premises, a comprehensive and detailed evaluation of asset quality can only be completed after the cessation of hostilities. Soon after the war, a comprehensive asset quality review (AQR) will be needed in order to allow the NBU to calibrate bank-specific recapitalisation needs.

After the AQR, a sector-wide and strategic approach to NPL resolution will need to be launched. This process should be efficient and quick, and avoid discriminating across types of banks (for example, state versus private or domestic versus foreign banks). Governments can choose between decentralised, semi-centralised and centralised approaches to debt restructuring (Laeven and Laryea 2009, De Haas and Knobloch 2010). In a decentralised approach, the ownership and management of bad assets remains with the originating banks. Governments then take a hands-off approach and let creditors and debtors work out and restructure problem loans bilaterally, using the existing insolvency legislation and the court system. In the case of Ukraine, the Kyiv Approach would provide an additional tool, although it is yet to be utilised by all banks.

Governments can also follow a more active decentralised approach. For example, they may facilitate large-scale voluntary work-outs between banks and debtors outside of the court system (the ‘London approach’). This involves setting up a general framework that groups of creditors can use to organise voluntary out-of-court solutions when a firm defaults. Creditors cooperate in steering committees under the guidance of a lead bank to restructure defaulting firms in a coordinated fashion. The majority of the creditors need to agree on the work-out plan and implement it. When it works well, this approach may allow a relatively large proportion of firms that need financial restructuring but are fundamentally sound, to continue as a going concern. Company failures due to excessively costly, burdensome and lengthy court procedures are avoided. Paradoxically, however, this approach will only work if creditors can at least to some extent threaten defaulting firms with more formal liquidation procedures in case of insufficient cooperation. It is thus not a full substitute for imperfect formal insolvency procedures through the court system.

Fully decentralised approaches are feasible as long as the stock of non-performing assets in the banking system is relatively limited. A crisis may, however, lead to such a widespread rise in distressed debt that systemic stability is threatened. This will particularly be the case if NPLs threaten to overwhelm banks’ normal work-out procedures. Moreover, bankruptcy cases may be so numerous that local courts cannot cope with them in a reasonable amount of time. Even if both the banks and the courts would in principle be able to handle a very large number of case-by-case foreclosures of collateral, such an uncoordinated approach may still be suboptimal for the banking system as a whole because collateral prices may be depressed further. A case can thus be made for more centralised debt restructuring programmes if there is evidence that the scale of the problem will lead to economy-wide implications or if there is a clear lack of capacity in the judicial system (or in the banks themselves) to deal with defaulting firms on a case-by-case basis. Ukraine’s post-war situation will almost certainly fall within that category.

A second approach the government can follow is a semi-centralised one in which distressed assets of a number of banks are spun off into an equal number of private or semi-private 'bad banks'. The Swedish approach in the early 1990s is an example of this. Most of the large Swedish banks set up their own 'bad bank'. This approach would work reasonably well in concentrated systems with several large banks.

Lastly, a third approach is to set up a centralised and publicly owned asset management corporation (AMC) or 'bad bank.' The centralised approach was chosen by many Asian countries in the aftermath of the 1997–98 financial crisis (Schaefer and Zimmermann 2009) and several EU countries following the European sovereign debt crisis (e.g. Ireland, Spain and Slovenia). See Box 1 for a description of how the centralised approach to NPLs worked in South Korea after the 1997–98 financial crisis.

The main advantage of a centralised approach lies in economies of scale. Centralised AMCs are better able to consolidate and gradually work out similar assets. They can translate their size into greater negotiating power against large and politically influential borrowers. A centralised solution is also more amenable to using international donor funding (as will likely be available in the case of Ukraine). There is also a managerial argument for a centralised approach. Where loan resolution expertise is scarce, it might be easier to coordinate the recruitment and training of qualified people in a single institution rather than having several agencies compete for the same small pool of people.

BOX 1 KOREA'S EXPERIENCE WITH LARGE-SCALE NPL RESOLUTION

In 1997–98, the Republic of Korea experienced a severe liquidity crisis that followed a period of rapid financial and capital market liberalisation that was not accompanied by adequate management of prudential risks in the economy. Following the crisis, in order to address the systemic and large-scale NPL stocks, the Korean government adopted a successful centralised approach. In March 1998, the IMF estimated NPLs to peak at 17% of total banks' gross loans (28% of GDP). By end-2002, the NPL ratio had declined to less than two percent.

While the Korean approach involved a government agency to handle the NPLs, it was fundamentally market-based. NPL resolution was part of various financial restructuring measures that the government embarked on to reform both the under-supervised banking sector and the highly leveraged corporate sector under an agreement with the IMF. Out of 33 banks in 1997, five commercial banks with a low capital adequacy ratio and nonviable prospects were liquidated and 11 banks had been merged with others by the end of 2007.

The government established a Non-performing Asset Management Fund (NPAF) which issued commercial bonds guaranteed by the state that would compensate commercial banks for the non-performing assets being transferred to it. The responsibility for operation and management of the fund was delegated to the Korea Asset Management Corporation (KAMCO).

BOX 1 (CONTD.)

KAMCO employed a formula for a blanket purchase of NPLs based on readily available market data (such as court auction winning rates for collateral) with an agreement to distribute any residual profits following future resolution while bearing all the losses, if any, post-acquisition (ex post facto settlement). As the overall environment for rational valuation methods had improved over time, KAMCO started calculating the present value of assets since 1999 while standardising the valuation methods. Table 1 provides more detail on the evolving approach to NPL acquisition by KAMCO.

TABLE 1 SUMMARY OF METHODOLOGY FOR ACQUISITION OF NPLS BY KAMCO (1997 TO PRESENT)

Period	Method	Background	Benefit	Drawback	Purchase criteria
1997	Blanket purchase with ex post facto settlement	Little previous experience, compressed time frame	Easy negotiation for acquiring NPLs	Disputes regarding settlement, accounting issues	75% of valid collateral value for ordinary secured loan
1998	Blanket purchase at a predetermined price	Shortcoming correction of ex post facto settlement	Quick process, no accounting issues	Arguments around the predetermined price	45% of principal balance for ordinary secured loan
1999	Calculating present value with successful bid ratio	Stabilising economy allowed for identifying more realistic prices of NPLs	Reflecting possible market prices	Quasi-discounted cash flow with less appropriate discount rate	NPV with national average bid ratio used in court auctions for collateral sales
Present	Discounted cash flow with credible statistical data	Growth of NPL market, more logical approach	Easy agreement on NPL price, fully reflecting market prices	Higher cost due to the need to engage private accounting firms into the valuation process	NPV with credible statistical data including successful bid ratio

Source: KAMCO.

As soon as the market stabilised, KAMCO started to develop various financial products to maximise the recovery rate from the acquired NPLs. Approaches included pooling of assets and selling them via international bidding as well as issuing asset-backed securities (ABSs). The Korean Financial Services Commission (FSC) supported this process by, for example, drafting legislation on asset-based securitisations. Hence, KAMCO effectively contributed to establishing conditions for a private sector market for NPLs. Subsequently, a high volume of NPL portfolio sales attracted well-known names in the distressed asset business to the Korean NPL secondary market. The successful securitisation of NPLs through ABS issuance also led to the development of an ABS market backed not only by impaired assets but also by sound ones, further developing Korea's local capital markets.

Both semi-centralised and centralised solutions – if applied transparently and accompanied by an adequate recapitalisation of banks – can prevent banks from becoming excessively risk-averse. They can also help avoid that too many staff members continue to be focused on NPL management functions. This should help improve the environment for new lending. In contrast, simply ring-fencing bad assets on banks' balance sheets may not be sufficient to regain investors' confidence. Banks may consequently not be able to raise new capital.

The situation in post-war Ukraine likely warrants either a centralised or a semi-centralised approach given the magnitude of the problems. Moreover, it is important to stress that a (substantial) part of all NPLs may be the direct result of hostilities and occupation rather than economic distress per se. Recovering (some of) the loan value in these cases will be different from traditional post-crisis workouts that involve lawsuits, negotiations and/or the collection of collateral from debtors. Instead, it will resemble the foreclosing of collateral during the 2014–2015 occupation of Crimea.

In particular, loans that lost value due to the war, and that might be recovered later from Ukraine's claims on Russian assets frozen in third countries, could be centralised in a specialised agency. The role of that agency would then be to provide evidence of how the collateral loss is linked to the war. Alternatively, an existing state institution – such as the Deposit Guarantee Fund (DGF) – could be mandated with the responsibility for administering such a centralised approach. The legal procedures related to reparation payments and linking them to collateral loss may take time and will be surrounded by significant uncertainty. Having bad loans concentrated in one institution may then free up capital in the banking system to restart lending in the meantime. Other loans could be worked out through a simplified approach to out-of-court resolution and arbitration, such as through a further revised and improved Kyiv Approach.

Getting the sequencing of AQR, the creation of a new agency (if needed) and recapitalisation right will be crucial. Preparations for an in-depth asset quality review could and should start during the war. Once the war ends, a detailed asset quality review should take place immediately, followed by a swift recapitalisation, using prepared and bank-specific recovery plans. While bank recapitalisation during the war is unlikely, planning should start early to ensure continued confidence in the banks. For those banks that continued to be profitable, initial recapitalisation may already start during the war.

Large-scale equity injections will likely be needed when the war ends and the AQR has been finalised. Recapitalisation can be done through direct injections of capital or subordinated debt by the government; by foreign parents of the remaining international bank subsidiaries; or by private owners of independent local banks. In the case of state banks or any new nationalisations, recapitalisations should be followed by bank commercialisation (introducing independent board members, market-based salaries,

proper risk management and underwriting standards, improved transparency) and, lastly, privatisation. It will be critical to engage early with the European banking groups operating in Ukraine, and their home country regulators, to ensure that the approach to recapitalisation does not lead to their exit from the country.

4.3 Restarting a stable development of the financial sector

Further commercialisation of the banking sector

Ukraine's banking sector has long suffered from the harmful effects of politically motivated lending. Hence, its post-war restart will be an opportunity for the Ukrainian government to clean up not just banks' balance sheets but also their shareholder and management structure where needed and with international support. This will involve implementing even stricter due diligence of bank owners and managers to weed out related lending, building on the positive experience after the 2014–15 crisis.⁸

Deepening Ukraine's banking sector will require the privatisation of most of its main state lenders, which will likely account for an even greater majority of all banking assets after the war. The stage for reforming state-owned banks was set in February 2018, when the authorities approved the key principles of strategic reform of state banks. Four priorities were identified at that time: implementation of strategies to restore commercial soundness and profitability; improvements in corporate governance, discipline and strategy execution; measures to improve the quality of assets and strengthen balance sheets; and exit of the state from the ownership of banks in the medium term.

To increase market-based lending, planning should start to privatise state banks, possibly by selling them to high-quality foreign strategic investors with a long-term interest in the country. In light of the likely high degree of uncertainty immediately after the war, the government could incentivise international banking groups to enter, scale up (or to remain) in Ukraine by offering mezzanine-type funding⁹ to them at attractive terms for the post-war period, thus allowing them to (re)generate capital over time. Governments of donor countries and international financial institutions should be mobilised to provide such funding. The government can also (partially) privatise banks by listing them on a domestic or an international stock exchange.

8 Higher due diligence standards with regard to bank owners are especially needed to prevent banks with politically connected owners from becoming systemic in nature. This may also prevent problems like those currently experienced with Alfa-Bank – a subsidiary of Russia's largest private bank and one of Ukraine's largest banks – of which several key shareholders have been sanctioned by Western authorities (as was the parent bank).

9 Mezzanine financing is a hybrid of debt and equity funding that gives the lender the right to convert debt into an equity interest in the company in case of default.

A key problem to be addressed urgently is that state banks remain reluctant to write off or restructure debt in a way that would reduce the value of any (collateralised) state assets. While there is no legal restriction on financial restructuring by state banks outside of the LFR,¹⁰ in practice the perception is that any loan restructuring that entails a (partial) write-off may be challenged by law enforcement agencies and considered as misappropriation or damage to state property.¹¹ This could lead to criminal charges against management or loan officers in case the Prosecutor's office would want to protect the perceived interest of the state by opening investigations.¹² State banks therefore continue to 'evergreen' loans by substantially extending maturities, thus preventing a more thorough clean-up of their balance sheets. Transferring all state banks' NPLs under management of a centralised AMC should also be considered.

Regulatory alignment with the EU

Ukraine is now an EU candidate country and aims to pursue EU membership as soon as possible. Even before accession, regulatory and institutional alignment with existing EU frameworks can provide important economic benefits. It would help make the Ukrainian regulatory and supervisory framework more robust and the banking sector more resilient over time. Alignment is done against the EU's bank prudential framework, namely, the Capital Requirement Regulation (CRR) and Directive (CRD), through which the Basel Committee standards have been implemented in the EU.¹³ The process usually culminates in a positive equivalence opinion issued by the European Commission based on the technical assessment conducted by the European Banking Authority (EBA).

Regulatory and supervisory alignment can help in levelling the playing field for subsidiaries of international banking groups and support long-term sustainability of cross-border activities in Ukraine. For example, alignment of Ukraine's framework for professional secrecy and confidentiality with EU standards will allow Ukrainian representation on joint supervisory and resolution colleges. Moreover, achieving equivalence of supervision with the EU will significantly reduce the regulatory cost of European banks' operations in Ukraine. This will incentivise foreign banks to continue to support their Ukrainian subsidiaries and make it more attractive for other financial institutions to (re)enter the country.

10 Importantly, Article 8 in the LFR states explicitly that in that framework state-owned banks are authorised to participate in financial restructurings and that they can agree to all measures contemplated by the restructuring plan, including haircuts. To date, however, none of the LFR restructurings have involved haircuts on principal or interest, suggesting that even within the relatively protected confines of the Kyiv Approach, state banks feel uncomfortable with any restructuring that would involve reducing the value of assets involved.

11 Based on Article 191 (embezzlement) or Article 190 (fraud) of Ukraine's Criminal Code.

12 In contrast, in the case of private banks, the Prosecutor's office usually only opens investigations if the bank itself asks to investigate actions of specific officer(s), which is rare in practice.

13 Preparations should also be started for the implementation of EU Sustainable Finance Regulations. Awareness and ability to manage climate-related risks can strengthen resilience of banks' business models to physical and transition risks from climate change.

Developing the hryvnia money market

To ensure a return to macroeconomic stability after the war, and a stable recovery of the financial sector, Ukraine will need to revert to the flexible exchange rate regime and inflation targeting framework. Over time, like other EU countries, Ukraine may want to consider adopting the euro. Yet, in the years immediately following the war, it will benefit from a flexible exchange rate to absorb shocks and to manage the inflationary pressures stemming from both a rapid convergence of real wages (starting from a very low base) and expected large international financial inflows.

Hence efforts will need to be undertaken to encourage the development of deep and liquid hryvnia money markets, building on the efforts made before the war. The authorities should encourage the development of new financial products linked to the benchmark UONIA index. The further deepening of domestic repo markets, with risk control through the settlement centre, needs prioritisation, in particular given the constraints faced by banks on bilateral repos amid a tightening of counterparty limits. These actions will also help lay the basis for a deepening of the banking system.

Developing debt and equity capital markets

It will be critical to rebalance the financial sector towards capital markets as Ukrainian companies and entrepreneurs will need a wider range of instruments to support the growth of their businesses. Moreover, many enterprises will have depleted their equity base during the war, thereby also limiting their ability to take on additional debt.

Further regulatory reforms and alignment will be needed to reinvigorate the nascent securities market. Ukraine still lacks a financial collateral law, which is vital and fundamental for banks, corporates and alternative debt providers to raise money efficiently and to utilise derivatives, repo and securities lending and capital market instruments. Reforms of the derivatives markets are needed to ensure Ukraine will obtain a clean legal opinion on netting and close-out netting from the International Swaps and Derivatives Association (ISDA). This will allow all payments owed between two parties to be combined in one net payment, thus reducing overall risk. Additional reforms should enable the issuance of covered bonds as well as securitisations.

As there may be significant interest among a range of social and responsible investors to support Ukraine's economic recovery, the securities market regulator (NSSMC) should prioritise designing and implementing regulations enabling the issuance of corporate and municipal bonds with specific social use of proceeds. Social, sustainability and sustainability-linked bonds can be an important funding source during the post-war recovery. Although they are common bond instruments, their proceeds are used to finance or refinance eligible social and infrastructure projects (such as affordable infrastructure, access to essential services, or food security). To qualify as a social, sustainability or sustainability-linked bond, certain conditions have to be met related to the use of proceeds, the process for project evaluation and selection, and the management of proceeds and reporting.

It will be important to develop a roadmap for the alignment of Ukraine's legislative and regulatory framework related to capital markets with the EU acquis. This would include approximation of laws and regulations in the areas of financial market infrastructure, securities market, and investment services.¹⁴ Priority should also be given to ensuring that legal and accounting/tax frameworks recognise instruments that are widely used elsewhere to adjust the balance between debt and equity risks. Instruments like convertible debt/bonds, warrants, mezzanine and preferred equity are likely to be in high demand during the reconstruction phase.

The government may want to consider creating a pool of capital that would effectively blend donor finance and private capital. Such mixed funding could be deployed in the form of hybrid, self-liquidating equity such as mezzanine instruments or debt combined with warrants. This could be managed by a development finance institution for the purpose of working with selected banks. Such a structure could allow for a relatively simple and large-scale deployment of equity capital.

Moreover, the country may stimulate the development of the local equity market by creating a new and privately managed institution with minority stakes in state-owned companies. This would follow the recent example of a similar fund established and operated effectively in Romania (*Fondul Proprietatea*). This fund could be used to help firms to implement further governance improvements and strengthen their operations and profitability, leading to them ultimately being listed on the local stock market at higher valuations or to transfer them to strategic investors (in the case of state-owned banks, for example).

Further steps could include establishing a trade repository, possibly within the NBU, for over-the-counter (OTC) derivative transactions and exploring digitisation initiatives. These could include, for example, using distributed ledger technology in capital markets services; introducing smart contracts for securities documentation; and developing e-voting frameworks for securities' holders. These reform areas can be pursued in the medium to longer term and should be aligned with the EU.¹⁵

In parallel with addressing the challenges in the legal and regulatory context, it will be necessary to further expand the local investor base. Policy options include introducing a mandatory accumulation pillar of the pension system, when conditions are right, and incentivising voluntary individual pension savings. For the equity market to take off, it will also be necessary to continue improving legislation related to equity ownership.

14 Specific EU policy frameworks for Ukraine's alignment would include the Directive on Markets in Financial Instruments (MiFID II) and related regulation (MiFIR), the Central Securities Depositories Regulation (CSDR), the Market Abuse Regulation (MAR), the European Market Infrastructure Regulation (EMIR), the framework for harmonising approaches to collective investment schemes (UCITS), the Alternative Investment Fund Managers Directive (AIFMD) and more.

15 The first EU-wide regulations in this field - the Markets in Crypto Assets Regulation (MiCA) - was approved by the European Council in 2022.

It should be quick, easy and inexpensive to be able to prove and transfer corporate ownership. This requires transparent listing, delisting and squeeze-out laws. Lastly, it will be imperative to consolidate the infrastructure for capital markets and consider attracting an international exchange platform to Ukraine.

Housing finance

In the immediate aftermath of the war, the need to conduct extensive asset quality reviews, and the likely recapitalisation requirements of banks, may delay their capacity to deploy large-scale housing-related lending. In this context, the role of well-designed donor and state-supported solutions will be paramount. The government can ensure the long-term sustainability of reconstruction efforts by deploying market-based solutions that assist the financial sector in scaling up housing finance.

Housing guarantees could help to reduce the risks to the credit provider and hence the rate borrowers pay. Guarantees can be provided both to individuals seeking mortgages as well as to builders and developers seeking out project financing or construction loans. The eligibility criteria of these guarantee schemes can help the government to target certain borrowers – for example, veterans or those whose properties were destroyed during the war. First-loss risk-sharing mechanisms, as well as blended finance products, can be used to the same effect.

Though it will take time to develop the required frameworks, the introduction of new financial products will help mobilise additional private resources. Covered bonds and securitisations, for which legal frameworks are currently being developed, can be used by both financial institutions and properly governed state structures deploying the government's lending programmes. Covered bonds and their dual recourse element will reduce risks for outside investors that may otherwise consider the market too risky to enter. In addition, the creation of a comprehensive framework for infrastructure and social bonds will also help attract investors. Combining both, in the form of a social covered bond for example, may help to optimise private sector funding opportunities.

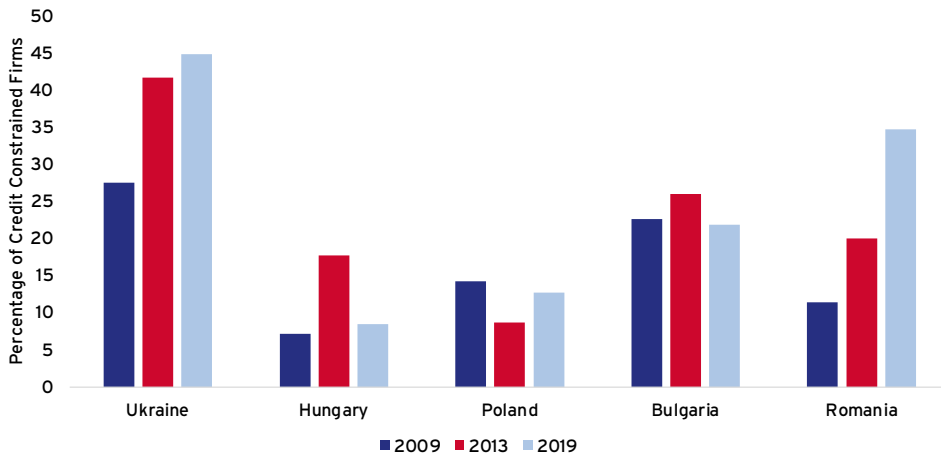
Small business finance and financial inclusion

The deepening of Ukraine's financial sector should benefit broad segments of the country's population, thus helping to restore jobs and livelihoods. Banks – especially those that traditionally have focused on large, state-owned and/or connected companies – will have to adjust their lending practices to become more inclusive and broad-based lenders. This will entail developing a better understanding of the financial and non-financial needs of individuals and small and medium-sized enterprises (SMEs). Even before the war, the share of SMEs that were credit constrained was high and increasing (Figure 4).

The Ukrainian government introduced several SME-focused COVID-19 support policies and programmes, which provided partial interest rate compensation as well as credit guarantees. Some of these programmes may be used again after the war, for example to stimulate banks to lend to underserved market segments such as female-owned SMEs and to segments with a higher risk profile, such as start-ups and new sole proprietorships

with limited credit history. Delivering prompt financial support to war-affected businesses will enable successful entrepreneurs to maintain their entrepreneurial and organisational capital. Replacement and reestablishment costs can be especially high for women and young entrepreneurs who tend to have less access to networks and face disproportionate barriers in accessing credit even in normal times.

FIGURE 4 CREDIT CONSTRAINED SMES IN UKRAINE AND IN COMPARATOR COUNTRIES



Note: A firm is defined as credit constrained if it had a loan application rejected or was discouraged from applying for a loan. Reasons for discouragement include complex application procedures, unfavourable interest rates, too high collateral requirements, the offered loan was too small or the maturity was too short, expectation that the loan would not be approved. A firm is defined as an SME if it employs between 5 and 99 people.

Source: EBRD-EIB-World Bank Enterprise Surveys.

In line with attempts to rebalance Ukraine's financial system towards a greater use of equity instruments, the government can explore tax incentive schemes to support firms that would like to raise equity. The government can also strengthen the role of Factoring Hub, created in 2020, to make factoring services available to a broader group of SMEs. Lastly, donor-sponsored advisory support for SMEs can help war-affected but viable companies scale up and, where appropriate, digitalise their operations. Small-scale exporters can be supported in meeting EU standards. This will be especially important for businesses that were reliant on trade with Russia and Belarus and that need to access new markets.

The digitalisation of banks' delivery mechanisms may be crucial to make their products and services more accessible to underserved individuals and businesses. Special attention should be paid to improving remittances and cross-border payment services, in order to financially connect a new foreign diaspora with friends and family back home. Remittances inflows should be harnessed to support people's livelihoods, including through facilitating new entrepreneurial initiatives. Digital tools can also be used to improve financial literacy among the general public, drawing on practices introduced in other Eastern European countries, such as Estonia.

Mobilising external financing while maintaining financial stability

After the war, Ukraine will to a large extent need to be financed with external funding, which will involve large-scale financial inflows for an extended period of time. Great care should be taken to maintain macroeconomic stability during this period, in particular by avoiding excessive inflows of foreign funding to low-productivity investments or consumption. Earlier episodes of rapid financial inflows have been followed by busts, thus undermining popular support for a market-based financial and economic system.¹⁶

Dollarisation of bank loans and deposits has declined since the recent highs of almost 60% in 2014, for the most part because of new NBU regulations prescribing that new credit to households is to be extended in local currency. Foreign currency loans nevertheless remain high, at around 30% immediately before the full-scale war, although this to a large extent reflects legacy foreign currency loans to households as well as foreign currency lending to (oftentimes hedged) corporates.

As international donors assist Ukraine with its rebuilding efforts after the war, it will be critical to ensure that donor inflows are predictable over time and progressively rely on commercial solutions with the goal to establish a vibrant financial and capital market in Ukraine once the reconstruction period ends. Setting aside a large pool of resources to offer risk insurance via specialised agencies – such as the World Bank’s Multilateral Investment Guarantee Agency (MIGA) – would be critical to mitigate political and war risks. This may be needed for an extended period of time as the durability of any peace agreement will need to be tested.

Strengthening the supervisory authorities

The regulatory and enforcement powers of the National Securities and Stock Market Commission (NSSMC, the regulatory and supervisory authority for securities and derivatives markets) and its funding modalities need further strengthening. This will make it easier for the NSSMC to comply with international best practices and allow Ukraine to sign the International Organization of Securities Commissions (IOSCO) Memorandum.

The NBU’s supervision of the insurance sector needs strengthening too. By-laws will need to be finalised following the adoption of the new law on insurance and the ‘umbrella’ law on non-bank financial institutions. The NBU should also prepare for a post-war and long-overdue clean-up of the insurance sector, similar to the 2014 overhaul of the banking sector. This would allow the healthier players in the sector to grow and, once the situation stabilises, to attract new credible global investors into Ukraine’s nascent insurance sector.

16 Ukrainian households that were more deeply affected by the 2008-09 global financial crisis became more disillusioned with market-based economic systems and private ownership (De Haas et al. 2016).

Once the banking and non-bank financial sectors are stabilised, supervisory capacity re-established, and public finances permit, the authorities should restart discussions about tax-efficient individual savings accounts; encouraging the uptake of the voluntary pillar of the pension system (pillar III); and in time consider the introduction of mandatory private pensions (pillar II).

Financing the green transition

The post-war reconstruction will provide an opportunity to accelerate the 'greening' of Ukraine's economy and delivering on Ukraine's commitment under its Nationally Determined Contribution (NDC). Since Ukraine became a candidate to the EU, over time it would have an obligation to deliver on the EU common binding obligations in this area (the Copenhagen criteria).

The financial sector will be central to channelling finance towards sustainable investments, especially if the authorities were to allocate some reconstruction funds towards this goal or work with international financial institutions offering green incentives (such as unfunded risk participation, first loss risk coverage, and trade facilitation instruments). The NBU is a member of the Network for Greening the Financial System (NGFS), a network of central banks and regulators on greening of the financial systems. Such fora should present an opportunity to identify best practices in this area and, if needed, to obtain support with their deployment in Ukraine.

4 CONCLUSIONS

The financial sector can play a crucial role in supporting the recovery of Ukraine's economy after the war and, ultimately, its convergence with that of the EU. Even while the war is still ongoing, the authorities should start preparations for a clean-up and turnaround of the commercial banks. This includes planning for a comprehensive asset quality review and the subsequent recapitalisation of the sector as well as setting up processes for simplifying and perhaps centralising the resolution of non-performing loans.

Given Ukraine's unsatisfactory experience with establishing good governance in state banks and companies, soon after the war it will be critical to prepare for a full or partial privatisation of state banks to credible private investors, possibly with support from bilateral donors and international financial institutions.

As European integration is Ukraine's key overarching strategic objective, it will be important to ensure that any policies adopted align well with those in the EU. The ongoing alignment efforts should proceed promptly and include both the banking sector and the capital markets. Indeed, Ukraine's nascent capital markets require special attention. There is a long pipeline of laws and regulations that need to be adopted to establish the

regulatory frameworks needed for issuance of capital market securities. For the equity market to emerge and thrive, efforts to improve governance, eliminate corruption and protect minority shareholders will be key. The country's fragmented capital market infrastructure requires consolidation and partnering with a major (European) exchange.

International financial institutions will need to play a critical role in Ukraine's reconstruction and recovery process, similar to their role in fostering the modernisation and EU convergence in more advanced post-socialist countries. Immediately after the war, the role of those institutions will likely be outsized given their local know-how, commercial orientation, focus on good governance and ability to mobilise talent and, ultimately, trust of their leading shareholders with a strong interest in supporting Ukraine. It will be important to establish an effective process for their coordination to ensure that the enormous funds needed to support recovery after the war are channelled efficiently and without delays.

Equally importantly, it should be recognized that Ukraine and its financial sector will continue to face elevated geopolitical risks after the war. Longer-term country risk cover, for example by the EU or by multilateral development banks, may therefore remain necessary for an extended period of time.

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Rebuilding Ukraine's energy sector: Challenges and Opportunities¹

Tatyana Deryugina,^a Oleksandr Kravchenko^b and Mar Reguant^c

^aUniversity of Illinois; ^bMcKinsey & Co.; ^cNorthwestern University

EXECUTIVE SUMMARY

Russia's war on Ukraine has had a significant toll on Ukraine's energy system and on global energy markets. Ukraine has sustained massive damage to its energy infrastructure and lost control over some power generation assets. At the same time, any crisis brings new opportunities. Ensuring that Ukraine's energy sector has a prosperous and sustainable future, however, requires systematic planning and policy change.

In the short run (during and immediately after the war), Ukraine's priority should be to improve energy security. To that end, Ukraine should improve its interconnection with the European electricity and natural gas infrastructure by eliminating bottlenecks in existing electricity connections and integrating its extensive gas pipeline network with European liquefied natural gas (LNG) terminals. Ukraine should also encourage efficiency in energy consumption to ensure that sufficient energy is available to meet everyone's basic needs.

In the longer run, Ukraine should pursue energy efficiency improvements more aggressively. Energy efficiency standards for new buildings should be improved, and promising programmes to improve energy efficiency in existing buildings should be scaled up. Consumption-based billing should be utilised whenever possible, and any financial support to help low-income households with higher energy bills should be implemented in a lump-sum, refundable fashion to maintain correct conservation incentives. Modernising and optimising heat production capacities (including through electrification and biomass) and the distribution network can further reduce gas use. Ukraine should also facilitate private sector involvement in energy efficiency and help ensure that qualified labour is available and that relevant supply chains (for example, of energy-efficient doors and windows) function well.

1 We thank Yuriy Gorodnichenko, Olena Pavlenko, Ilona Sologub, and participants at the CEPR Workshop for the Reconstruction of Ukraine for helpful comments and conversations that have greatly improved this chapter.

At the centre of Ukraine's long-term future is closer integration with Europe, and this will be as essential for its energy sector as for other sectors. Beyond continuing to improve its interconnection with European energy markets, Ukraine should work to reduce energy losses and implement reforms to make its energy sector more competitive. In the medium term, Ukraine can become self-sufficient in natural gas through a combination of energy efficiency improvements, development of its natural gas resources, and greater biomethane production. Ukraine must also work to develop its renewable energy sector – including wind, solar, hydrogen, biomass and other alternative fuels – to its full potential. To that end, the most important step is instituting policy reforms that facilitate private investment. In line with Europe, Ukraine should also pursue electrification of transport (e.g. passenger cars) and housing (primarily heating) to shift its energy consumption mix away from fossil fuels in the longer run and fully participate in the energy transition.

European and other partners must consider the massive damage inflicted on Ukraine and recognise that the country will need to be supported financially in the short and medium term to allow it to rebuild effectively while fully participating in the green energy transition.

1 INTRODUCTION

Russia's war on Ukraine has put a significant toll on Ukraine's energy system and on global energy markets. Ukraine has sustained massive damage to its energy infrastructure and lost control over some power generation assets, which may jeopardise the country's structurally 'long' energy balance. The threat of interruptions in Russian energy supply has caused a spike in global energy prices, with Europe being the most exposed. The decarbonisation agenda is being challenged as European countries relaunch coal generation to balance their energy systems. At the same time, any crisis brings new opportunities. To ensure that Ukraine's energy sector has a prosperous and sustainable future, however, requires systematic planning and policy change. This chapter outlines key pre-existing challenges in Ukraine's energy sector and how these can be solved in the country's post-war future.

The conclusions that emerge are as follows. In the short run (during and immediately after the war), Ukraine's priority should be to improve energy security. This can be done by improving its interconnection with the European electricity and natural gas infrastructure and encouraging efficiency in energy consumption. With investment in biogas and fracking technology to take advantage of its unconventional fossil fuel deposits, Ukraine can become self-sufficient in natural gas in the medium term, which will strengthen energy security. But eliminating energy inefficiency should also be prioritised, as reducing energy waste not only promotes energy independence but improves the financial positions of Ukrainian households and of its government. To

help these initiatives materialise, Ukraine's government should institute policy reforms that facilitate private investment and competition and that attract more private sector actors to the energy sector more generally, as implementation is unlikely to be successful without substantial private sector involvement.

At the centre of Ukraine's long-term future is closer integration with Europe, and this will be as essential for its energy sector as for other sectors. To this end, Ukraine must continue improving its interconnection with European energy markets and, with private sector involvement, develop its renewable energy sector and potentially hydrogen production. Building two new reactors at the Khmelnytsky nuclear power plant will help Ukraine reduce carbon emissions and provide Europe with additional carbon-free energy. European and other partners must consider the massive damage inflicted on Ukraine and recognise that the country will need to be supported financially in the short and medium term to allow it to rebuild effectively while fully participating in the green energy transition.

The rest of the chapter is organised as follows. In the next section, we briefly outline the pre-war energy situation in Ukraine. In Section 3, we describe the wartime energy situation in both Ukraine and Europe. Section 4 suggests several energy-related opportunities that Ukraine can pursue even before the war is over. Section 5 outlines more longer-term opportunities.

2 UKRAINE'S ENERGY SITUATION PRIOR TO THE WAR

Ukraine's economy has been one of the most energy-intensive in the world for quite some time.² In 2019, Ukraine's energy intensity, defined as energy consumption per dollar of GDP, was more than twice as large as that of Poland or Germany. Although part of the explanation is Ukraine's industrial mix (Canada's energy intensity is even higher, for example), low energy efficiency plays a significant role as well. Industrial processes often use outdated technology; building energy efficiency is low; the relevant physical capital (e.g. boilers for building heat) is old and poorly maintained; and opportunities for improving energy efficiency are underprovided. Firms and individuals find it difficult to make even privately profitable investments in energy efficiency because of the lack of affordable financing, limited incentives due to historically regulated household energy prices, and, in the case of residents of multi-unit homes, logistical and organisational challenges.

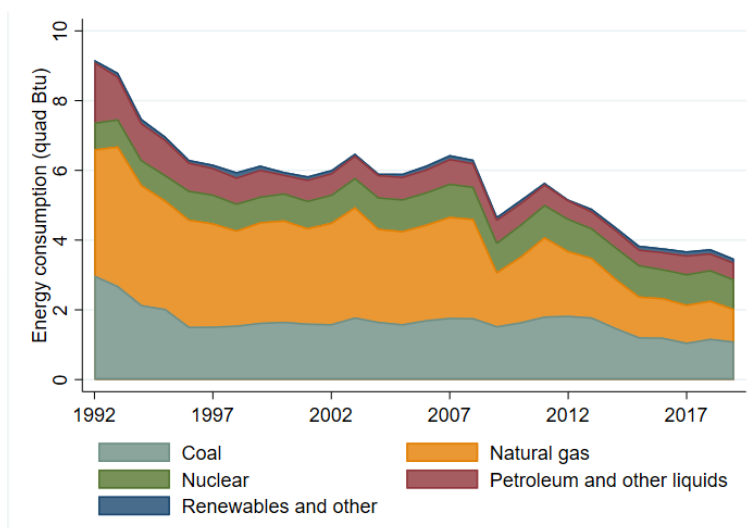
Figure 1 shows Ukraine's energy consumption over time by source.³ In 2019, just over a quarter of Ukraine's primary energy consumption was natural gas; coal accounted for a further 32% and nuclear for another 25%. More than half of Ukraine's electricity production in 2019 was from nuclear power (an unusually high number not just for similar countries but as a whole), and almost 40% was from fossil fuels. Energy consumption

2 www.eia.gov/international/rankings/world?pa=285&u=2&f=A&v=none&y=01%2F01%2F2019&ev=false

3 www.eia.gov/international/analysis/country/UKR

has on average fallen with time. The declines of the 1990s were largely driven by general post-Soviet deindustrialisation, while those after the year 2000 are due to a combination of lower demand/economic activity (especially following the 2014 illegal annexation of Crimea by Russia and the war in Donbas) and improved industrial energy efficiency (Pikh 2021). Yet, as we discuss later, considerable opportunities for energy efficiency improvements remain.

FIGURE 1 TRENDS IN UKRAINE'S ENERGY CONSUMPTION, 1992-2019



Source: US Energy Information Administration.

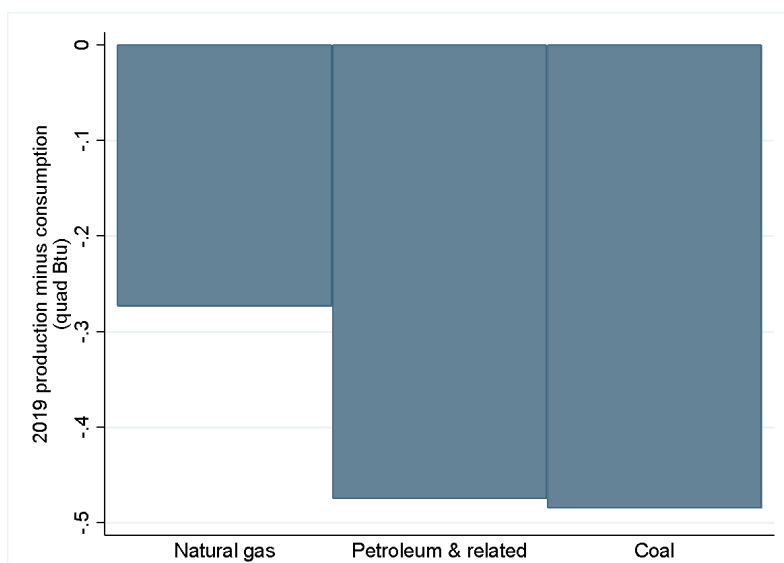
As Figure 1 suggests, Ukraine had barely begun to tap into its renewable energy potential. Between 2017 and 2020, wind and solar energy production increased five-fold, but still only made up less than 1% of total energy production in 2020 (biofuels and waste made up 4.9%, and hydro made up 0.8%).

Although Ukraine's electricity generation capacity has historically exceeded electricity consumption, Ukraine was not self-sufficient in energy as a whole prior to the war: energy production covered only 64% of consumption in 2019. To cover the deficit, Ukraine relied on fossil fuel imports, especially of coal and petroleum. Figure 2 shows the difference between energy production and consumption in 2019 by energy type (the difference between production and consumption is exactly zero for nuclear and very small for renewables). Deficits in petroleum and coal were each nearly 0.5 quadrillion British thermal units (Btus), adding up to almost 30% of total energy consumption. The deficit in natural gas was also substantial. A large share of petroleum product imports came from Russia and Belarus,⁴ which clearly presents a problem going forward.⁵

4 www.eia.gov/international/analysis/country/UKR

5 By contrast, Ukraine's crude petroleum imports largely came from Azerbaijan, Libya, and Lithuania (see <https://oec.world/en/profile/bilateral-product/crude-petroleum/reporter/ukr>).

FIGURE 2 DIFFERENCES BETWEEN UKRAINE'S ENERGY PRODUCTION AND CONSUMPTION BY TYPE, 2019



Note: The difference between nuclear energy consumption and production is zero; the reported difference between renewable consumption and production is very small and omitted from this graph.

Source: US Energy Information Administration.

The illegal annexation of Crimea and Donbas war that started in 2014 affected Ukraine's energy sector and policy in several ways. Coal production in the Donbas region, which made up a large share of overall coal production, was severely disrupted. Ukraine also stopped importing natural gas from Russia in 2015 and lost control of (untapped) oil and gas reserves in the Black Sea (IEA 2020). These disruptions forced Ukraine to begin seriously addressing energy sector inefficiencies, especially the significant natural gas subsidies that were in place at the time. The events of 2014 also accelerated Ukraine's integration with the EU, as Ukraine became much more EU-oriented and proceeded to synchronise its energy sector to be in line with EU norms much more quickly than it likely would have otherwise.

Prior to the full-scale invasion of 2022, Ukraine had been making progress in the energy sector along several important dimensions. Natural gas subsidies were being reduced, and regulation of energy markets was moving toward European standards more generally. In 2010, Ukraine joined the Energy Community Treaty, which allowed it to pursue integration into the EU energy markets (electricity and natural gas). The Energy Community focuses on creating and maintaining legal and market stability; enhancing energy security; policy synchronisation; promoting competition; improving energy efficiency; and renewable energy development.⁶ Joining the treaty not only provided Ukraine with opportunities but also compelled it to begin making changes to meet

6 <https://eur-lex.europa.eu/EN/legal-content/summary/the-energy-community-treaty.html>

relevant requirements in these areas. By early 2022, the gas market was already well-interconnected with the European Network of Transmission System Operators for Gas (ENTSO-G), and synchronisation with the European Network of Transmission System Operators for Electricity (ENTSO-E) was in progress. Ukraine was also pursuing several other worthwhile reforms of its energy sector (for example, closing unprofitable coal mines), although not all of them were on track. Building on this solid foundation while learning from and addressing past problems will undoubtedly help Ukraine rebuild its energy sector more efficiently after the war.

Similar to other countries, Ukraine has several government bodies responsible for energy policy design and implementation, the primary such organisation being the Ministry of Energy.⁷ Energy efficiency and renewable/alternative energy policies are the purview of the State Agency on Energy Efficiency and Energy Saving (SAEE), which is an agency within the Ministry of Energy. The Ministry of Environmental Protection and Natural Resources regulates subsoil use and is thus a key ministry for designing fossil fuel extraction policy, for example, while the Ministry of Finance is responsible for energy-related taxation. The Cabinet of Ministers coordinates and oversees each of these ministries. The National Commission for State Regulation of Energy and Utilities (NKREKP) oversees the natural gas and electricity markets as well as the heat sector. The Antimonopoly Committee of Ukraine is responsible for protecting economic competition in a variety of markets, including energy, and the State Nuclear Regulatory Inspectorate (SNRI) is responsible for nuclear safety. Continued cooperation and coordination among the ministries, other national and sub-national government organisations, international organisations working in Ukraine and the private sector will be key for successfully implementing the reforms and projects suggested below.

3 WARTIME ENERGY SITUATION

3.1 Ukraine

Because of its strategic importance, the energy sector has been a priority target for Russian attacks. According to an audit by the Kyiv School of Economics (KSE), total war-related losses in the energy sector were estimated at about \$12 billion as of June 2022, with US\$2 billion in direct damage (KSE 2022). For example, eight combined heat and power plants (CHPPs) have been destroyed or damaged; the largest oil refinery in Ukraine (the Kremenchuk oil refinery) was damaged and stopped operations; and natural gas production fell by 10–15% because of lost fields in the Kharkiv region. Even more importantly, as of August 2022, a significant share of Ukraine's generation capacity – more than 30% – was not controlled by Ukraine. This includes more than 10 gigawatts (GW) of thermal generation (e.g. Zaporizhzhia thermal power plant (TPP),

⁷ Additional detail can be found in OECD (2019), although it should be noted that some changes have taken place since then. For example, in 2020, the Ministry of Energy and Environmental Protection (MEEP) was split into the Ministry of Energy and the Ministry of Environmental Protection and Natural Resources.

Starobeshevska TPP, Uglehorska TPP), about 6 GW of nuclear generation (Zaporizhzhia nuclear power plant) and more than 3 GW of renewable energy systems (including 90% of Ukraine's wind energy capacity). For context, Ukraine's generation capacity was 55 GW in 2021.⁸

The consequences of the massive drop in production capacity have been partially dampened by the war-related decline in consumption. According to the National Recovery Plan presented in Lugano in July 2022, electricity consumption during the first few war months dropped by 30–35% (NCRU 2022). The main reason for the drastic consumption decline is a fall in industrial activity (especially metallurgy), followed by a decline in economic activity more generally. Preliminary estimates indicate that electricity and gas consumption will decline by 20–30% in the 2022–2023 season compared to the same period prior to the full-scale war, mainly because of a large drop in industrial output but also because of extensive population migration. The electricity consumption profile has also shifted geographically due to the significant population displacement created by the war.

War-related damage has obvious negative implications for immediate energy security as well as for energy security over the medium term. For instance, among damaged CHPPs, non-operational ones remain in the large cities of Chernihiv, Okhtyrka and Kremenchuk. As of the end of June 2022, almost 600,000 consumers were without electricity, and about 180,000 consumers were without gas. The risks posed by this damage and potential future damage are especially high in light of the upcoming winter season, as the 2022/2023 heating season is expected to be one of the most difficult ones since Ukraine's independence from the Soviet Union in 1991.

The war has greatly accelerated the integration of Ukraine's energy system with the European Network of Transmission System Operators (ENTSO-E). The willingness of Europe to establish the interconnection during the war demonstrates that Ukraine's grid is perceived as very resilient, and indeed there have been no stability problems so far. The integration opens new avenues for power trade cooperation, while the significant drop in energy consumption has improved Ukraine's natural gas balance and reduced import dependence.

3.2 Europe

Although the focus of this chapter is on Ukraine's energy sector, its future is closely tied to that of Europe, and thus a discussion of the European energy situation is in order. The war has created massive challenges for European energy markets. Interruptions in the supply of Russian gas have pushed the EU to launch unprecedented crisis mitigation measures, both on the supply and demand side.

8 www.eia.gov/international/analysis/country/UKR

Historically, Europe depended heavily on Russian gas, importing 155 billion cubic metres (bcm) or almost 40% of its total gas consumption in 2021 (IEA 2022). Greece, Finland and Eastern European countries are even more dependent on Russian gas supplies, obtaining more than 50% of their natural gas from Russia.⁹ In absolute terms, however, Germany and Italy import the most gas.¹⁰ For the first half of 2022, Russian gas flows to Europe are already down 29 bcm compared to the year before, and they are expected to decrease by as much as 60–70 bcm for the whole of 2022 compared to 2021, if Nord Stream 1 were to resume operating at 20% of capacity. However, Nord Stream 1 has not been operational since early September, and the recent damage to the pipeline¹¹ makes it unlikely that it will resume operating any time soon, implying that gas flows will decrease even more than expected.

Europe has introduced several measures to address the natural gas deficit. First, alternative supply sources have been activated to compensate for lost Russian gas volumes. This includes piped gas (mainly from Norway) as well as additional liquified natural gas (LNG) volumes re-directed from Asia to Europe. However, additional volumes of LNG imports are constrained in the short-term by the availability of LNG on the market and by infrastructure bottlenecks: receiving LNG terminals and pipeline connectivity within Europe.

Second, the EU has introduced measures to reduce gas demand. Europe has reduced its overall gas consumption by about 20 bcm, or 11%, between January and April 2022, and the European Commission has put forward a proposal to cut its natural gas consumption by 15% (40–50 bcm) in August 2022 to March 2023. Despite its Green Deal agenda, Europe has activated additional coal power generation to tackle the energy crisis; this has not reduced the amount of gas converted into power, however. Gas generation capacity is still needed to compensate for declines in nuclear and hydro generation in 2022, which are mainly driven by water scarcity in Germany and Italy and by reduced availability of nuclear power in France. As a result, gas prices – which were already high in early 2022 – have spiked multiple times in 2022. And even though the measures undertaken by Europe to address the difficult energy situation have yielded some results (e.g. gas storage sites are being filled ahead of time, and German storage sites were 75% full in mid-August), the energy crisis is putting a massive toll on consumers. Since the war started, wholesale gas prices have several times exceeded €200/MW – an unprecedented level for Europe – and remain high.

9 www.statista.com/statistics/1201743/russian-gas-dependence-in-europe-by-country/

10 www.reuters.com/business/energy/energy-crisis-sires-new-european-order-strong-italy-ailing-germany-2022-09-30/

11 On 26–27 September 2022, two pipes of Nord Stream 1 and one pipe of Nord Stream 2 were damaged by what seems to be sabotage. At the time of writing, the investigation was ongoing.

As a result, longer-term energy prices, energy balance, and sources of gas imports remain big open questions for Europe, especially in the context of Europe's decarbonisation agenda (e.g. its 'Fit for 55' climate targets). Carbon futures have at times reached nearly €100 and may grow further in the future. Coal generation, which is being used as a lever to address immediate energy crisis, does not seem to be a feasible longer-term solution to the problem.

The current energy crisis in Europe also underscores pre-existing trends: ramping-up of electrification, a focus on zero-carbon sources of power, and growing use of hydrogen (H₂) for balancing and decarbonisation. These are the critical elements of Europe's energy security. Even absent the war, these trends would have meant elevated electricity prices and an increasing need for zero-carbon energy imports in the short and medium term, which opens up a potential opportunity for Ukraine.

4 WARTIME PRIORITIES AND OPPORTUNITIES FOR UKRAINE

As Ukraine goes through a period of unprecedented volatility, energy security should be the main priority. To that end, Ukraine's near-term approach toward its energy sector development should be aimed at (1) mitigating and preparing for likely risks, and (2) making the most of synergies that exist between Ukraine's and Europe's energy sectors. Because of the war, Ukraine is almost certainly constrained in its capacity to carry out extensive reforms, launch major programmes and make or attract sizable private investments in the energy sector. For these reasons, many promising opportunities should be pursued only when the war is over. At the same time, there exist some no-risk and low-risk opportunities that Ukraine can start pursuing even while the war is ongoing.

Because Ukraine's generation capacity has been significantly higher than its energy consumption historically, the country already had substantial export opportunities prior to the war. With a 30% drop in electricity demand in 2022, Ukraine has over 3 GW of excess power generation capacity. A large share of this energy surplus is low-carbon and cost-competitive nuclear energy. Ukraine's recent synchronisation with ENTSO-E allows for a significant ramp-up of power exports to Europe. However, because of transmission bottlenecks, less than 1 GW of the energy surplus can currently be exported. To capture its full export potential, Ukraine therefore needs to eliminate bottlenecks in existing interconnectors.

Thus, in the short term, Ukraine could expand its interconnection infrastructure and support Europe via electricity exports, which would partially dampen the negative consequence of Russian gas shortfalls. A stronger connectivity between Ukraine's and Europe's energy systems will also help Ukraine strengthen its energy security, for example to prepare for the worst-case scenario in which the country permanently loses power generation in the occupied territories. With about one third of generation capacity and one fifth of electricity consumption located in occupied territories (as of August

2022), a permanent loss of these assets from the Ukrainian energy system could lead to a power deficit on peak demand days. An expansion of the interconnection infrastructure is therefore critical not only to Ukraine's energy export growth, but also to ensuring that peak demand can be met in scenarios where Ukraine does not regain control of the currently occupied territories. Because of the uncertainty as to the fate of occupied territories, whether Ukraine becomes a net exporter in the medium-term future is likewise uncertain.

Several initiatives have already been launched to build the required interconnection infrastructure. In June of 2022, for example, Ukraine's Minister of Energy and Poland's Minister of Climate and Environment signed a Memorandum of Understanding on energy security, which sets out to revive a key power line between the two countries (Khmelnyskyi-Rzeszow) before the end of the year.

Ukraine should also work to maximise the operational efficiency of its nuclear plants. Ukraine has a long history of nuclear energy, but in the last few years, the load factor of nuclear generation in Ukraine was significantly lower than that of comparable benchmarks: about 70% versus more than 85%. Part of the gap is explained by the age and technical condition of Ukrainian assets; however, part of the utilisation gap can be tackled with moderate capital expenditures on maintenance and by introducing modern operational and repair practices. Working to increase the uptime of existing reactors will allow Ukraine to maximise exports and mitigate the risks of permanently losing generation capacity in occupied territories.

Ukraine's gas storage facilities and existing pipeline infrastructure can also be instrumental in de-risking gas supplies to Central Europe, in case of further deterioration in Russian supplies. Historically, Turkey has resisted allowing passage of liquified natural gas through the Bosphorus Strait; as a result, it is unlikely that Ukraine will be able to build an LNG terminal on the Black Sea. However, given already-strong integration of Ukrainian gas infrastructure with ENTSO-G, Ukraine can be connected to European LNG terminals (e.g. Turkey, Greece or Poland) relatively quickly, which will diversify potential sources of gas to land-locked Central Europe and maintain flexibility in the deficit market.¹² Integrating Ukraine with European LNG terminals could also provide additional volumes for the currently underutilised pipeline toward Slovakia and Austria. Moreover, vast gas storage capacity in western Ukraine provides an additional benefit of seasonal storage for other European countries. To that end, Ukraine should cooperate with its European partners to further increase connectivity of Ukrainian gas infrastructure with the European gas network.

12 Another option could be debottlenecking reverse flows of gas from Slovakia to Ukraine. However, given the anticipated overall tight gas market in Europe, Ukraine might face challenges in sourcing gas via Slovakia in the short term.

5 POST-WAR OPPORTUNITIES FOR UKRAINE

5.1 Energy efficiency and electrification

The war has significantly affected gas demand, with an expected decline in consumption of as much as 30% in the 2022–2023 season compared to the previous year, mainly because of industrial consumption declines. There are several short-term levers that can allow Ukraine to efficiently reduce natural gas consumption further. First, according to National Recovery Plan estimates, household gas consumption can be reduced by as much as 40% through a combination of energy efficiency improvements, heating electrification, and biomass utilisation. Second, according to the Recovery and Development Plan presented in Lugano, up to 2 bcm of natural gas consumption can be replaced by biomethane in the medium term, and several experts express even more optimistic forecasts of biomethane potential (Geletukha 2021). Investment in energy efficiency, heating system modernisation and biomethane production are decentralised and can be launched even during the war period.

On the consumption side, Ukraine should ramp up its existing energy efficiency programmes and launch new ones to optimise its energy consumption, especially of natural gas. A key focus should be the energy efficiency of buildings and heating systems. Ukraine should move toward consumption-based billing whenever possible. Doing so will provide correct incentives for energy use and could meaningfully reduce consumption. For example, Ito and Zhang (2020) find that introducing consumption-based billing for heating usage in China reduced consumption by about 8–10% in the first three years, even though about 30% of households opted out of the consumption-based billing. Accounting for the opt-out decisions raises the estimates to 12–15% in the first three years. The biggest up-front costs of such reforms consist of (1) installing devices that allow households to control their own heating (e.g. thermostatic radiator valves) in cases where households lack such controls, and (2) installing heat-cost allocators (HCAs), devices that measure each radiator's heat output and can therefore be used for individual-based billing. Even in buildings where heat is centrally provided, individual controls and HCAs can lead to large energy savings of up to 30–35% (Semikolenova et al. 2012).

Energy expenditures prior to the war were a large share of people's incomes (Alberini and Umapathi 2021). As a result, reforming energy prices must be accompanied by well-designed social assistance programmes that preserve appropriate incentives to avoid wasteful consumption while supporting low-income households. In this area, Ukraine was already on the right track prior to the full-scale Russian invasion. It was phasing out natural gas subsidies and joined the EU₄Energy Programme, which promotes evidence-based policy in the energy sector. In 2015–2016, Ukraine made a lot of progress in eliminating gas subsidies and improving the financial sustainability of the natural gas sector while scaling up a social assistance programme to help poorer households cope with higher energy prices (World Bank 2017). The programme, called the Housing Utility Subsidy, was initially designed as a deduction from household's utility bills, calculated

based on their income and expected energy consumption. Starting in 2019, however, the funds were actually transferred to the households, improving incentives to conserve energy, and starting in August of 2020, Ukrainians could choose their gas supplier. Some special groups (e.g. civil servants and veterans) receive other discounts. Such reforms to move to market prices while simultaneously providing lump-sum transfers to low-income households should continue after the war and expand to other areas (e.g. electricity).

Of course, pricing reforms should be accompanied by efforts to improve building energy efficiency. About half of the Ukrainian population lives in multi-unit buildings, and in urban areas that share rises to over three-quarters. In such cases, many potential energy efficiency improvements require coordination among residents, which may be difficult to achieve. Yet opportunities for such improvements should be plentiful: in 2013, less than 10% of the housing stock was estimated to have been built after the dissolution of the Soviet Union in 1991, and only 2% of it was built after 2000. The typical multi-unit building was 30–50 years old (UNECE 2013). In a case study of Russia, which has a generally similar building stock, Bashmankov (2016) estimates that through a combination of more efficient new buildings, renovations of some existing buildings, demolition of others and improved appliance efficiency, it is possible to reduce the fossil fuel consumption of buildings by half by 2050 while doubling total building area. Rochas et al. (2014) study renovation of existing buildings in Latvia and estimate that similar (or even larger) efficiency improvements are possible. Beyond reducing energy consumption and improving occupant comfort, such energy efficiency improvements will also reduce the number of households who need assistance to pay their energy bills, allowing the government to redirect some of the spending on such transfers to other uses.

For new buildings, Ukraine should create energy efficiency standards and strengthen supervision to ensure that these are met. Better insulation, efficiency of heat generation and delivery, and more energy-efficient windows and doors are key for improved energy efficiency in existing multi-family buildings. Although these should ideally be implemented jointly, addressing the most pressing energy efficiency challenge faced by a particular building (e.g. old leaky windows or large district heat losses) can deliver meaningful savings even if other issues are not addressed. To facilitate other energy efficiency investments, the government of Ukraine should empower owner associations and encourage the creation of housing management service companies that can take advantage of economies of scale to provide state-of-the-art advice and services to owner associations. Education programmes to help residents understand the potential returns to greater energy efficiency should be scaled up.

Modernising and optimising heat production capacities (including through electrification and biomass) and the distribution network can further reduce gas use. In the short run, district heating plants should be repaired minimally to ensure heat availability during the heating season. In the longer run, however, many will need to be replaced.

Although improving energy efficiency should be in everybody's interest, high capital costs make even very profitable investments difficult. Thus, low-cost financing, possibly with repayment linked to resulting energy savings, should be made available, ideally provided with the support of other European countries and the international community. Ukraine's government can also work on ensuring that local supply chains are reliable (e.g. funding critical supply chain investments) and that qualified labour is available to evaluate the necessary energy efficiency measures and perform the work (e.g. supporting reskilling programs). More generally, coordinating key stakeholders and ramping up the scale of promising energy efficiency programmes could greatly accelerate the pace of energy efficiency improvements in Ukraine.

Ukraine's National Recovery Plan estimates indicate that energy efficiency improvements will require an investment of \$45-55 billion. Renovating existing buildings will cost \$30-40 billion and yield natural gas savings of about 4 bcm per year. Modernising and optimising heat production capacity through upgrading central heating boilers for biomass and electricity will cost about \$10 billion and yield similar-sized natural gas savings, although in this case the natural gas will be replaced with alternative fuel. Finally, insulating heating pipes in heat distribution networks will cost about \$3-\$5 billion and yield annual natural gas savings of about 0.2 bcm.

Given the scale of Ukraine's energy efficiency problem, addressing it will take decades rather than years. However, because the potential for improvements is so large, even partial progress can deliver meaningful results. While the cost of implementation is difficult to calculate precisely, the net present value of the resulting energy savings will almost surely exceed the costs if renovations are done properly.

In line with Europe, Ukraine should also pursue electrification of transport (e.g. passenger cars) and housing (primarily heating) to shift its energy consumption mix away from fossil fuels. Here, a key role for the government will be to plan and coordinate electric vehicle charging infrastructure, especially in cities where households are not able to install private chargers. Developing a hydrogen (H₂) ecosystem, which we discuss in more detail below, can provide additional opportunities for electrification and decarbonisation of industry and municipal transport. Electrification not only improves environmental outcomes but also reduces Ukraine's dependence on imported fossil fuels, thus strengthening its energy security.

5.2 Regulation of energy markets

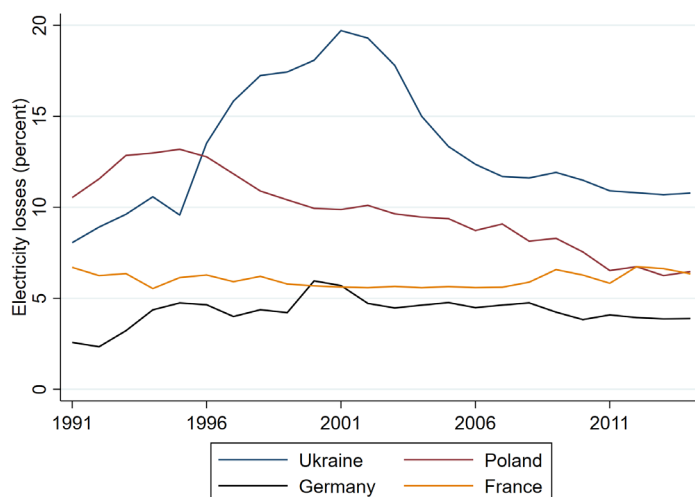
Ukraine had only recently (in July of 2019) switched from a single-buyer electricity market to a more competitive one. These recent changes have included the establishment of day-ahead and intra-day trading and of balancing and ancillary service markets, along with bilateral contracts to liberalise tariff-setting. The reform has also entailed promoting

competition in the retail market by unbundling distribution companies that previously performed both electricity supply and distribution functions. Moreover, to integrate with the EU market, Ukraine has sought to ensure that Ukrenergo, its transmission system operator, met the requirements to join ENTSO-E.

More generally, Ukraine has already made significant progress towards bringing market sector regulation in line with the European standards, and it should continue to do so. Both gas and electricity market reforms have been developed in coordination with the Energy Community and have led to significant levels of wholesale market liberalisation. The gas market, which has already been tightly connected with ENTSO-G, has demonstrated strong signs of healthy competition based on high numbers of traders and low marginality in the trading business. Limited integration of power markets has limited competition in the electricity market, however, which has led to market imbalances (e.g. low efficiency of nuclear power sales). Synchronisation with ENTSO-E and increasing electricity flows capacity between Ukraine and the EU should further increase market efficiency and solve most of the existing imbalances in the wholesale market.

Some large inefficiencies remain in production, transmission and distribution. In some of these areas, regulation could play a big role in improving market outcomes. For example, the transmission and distribution branches, which are a natural monopoly, are a particular area of need. Figure 3 shows that losses in the Ukrainian electricity grid are very large compared to other countries. While Poland still has large electricity losses compared to other European countries, it has been able to make substantial progress. Ukraine, on the contrary, has gone through periods of very large electricity losses, and continues to have losses at around 11%.

FIGURE 3 ELECTRICITY LOSSES IN UKRAINE (%) COMPARED TO OTHER EUROPEAN COUNTRIES



Factors that explain the poor performance of Ukraine's transmission and distribution network include the large debt of state-owned energy companies combined with consumer price subsidies, limited incentives to reduce losses due to cost-plus regulation, and lack of capital. Under cost-plus regulations, the marginal costs of the losses are covered and therefore there are limited incentives to reduce them. To ensure that these entities invest in their operations and promote the efficiency of their services, Ukraine considered adopting a regulatory asset-based (RAB) tariff.¹³ The aim of the RAB approach is to incentivise entities transmitting and distributing electricity to increase the value of their assets through upgrades. Explicit incentives for loss reduction should also be considered.

More recent evaluations confirm this urgency for investment (Prokip 2019). For instance, 90% of electricity transmission lines are outdated. The distribution lines have depreciated by 60%, and thermal electrical power stations have depreciated by 80%. The transition to incentive-based tariffs should also allow the distribution and transmission system operators to realise €7.5 billion in investment resources, almost twice the amount that would be realised without the reforms in place. And with greater investment volumes, losses in both distribution grids and transmission grids are expected to decrease.

Going forward, anti-trust laws might also play an important role in ensuring the functioning of the market and need to be better enforced. Speculative trades in the day-ahead market have harmed not just the profitability of traditional generators but also threaten progress made in the renewable energy market, as artificially low prices in the day-ahead market combined with high renewable feed-in tariffs made the situation unsustainable for renewable energy buyers (EBA 2021). In 2020, the government of Ukraine decreased the feed-in tariff and bailed out the companies required to buy renewable energy. However, renewable energy generators lost money and some investors announced that they would not start any new investments in Ukraine until there was stability and reasonable certainty that agreements would be kept. Such policy reversals clearly deter investors and must be avoided as much as possible going forward.

5.3 Natural gas production

Not only can Ukraine become self-sufficient in natural gas, but it can also pursue natural gas exports in the medium run. While decarbonisation is ongoing, natural gas will continue to play an important role in balancing power, including in Central Europe, which is highly dependent on coal generation. Ukraine's self-sufficiency in natural gas can be achieved through a combination of energy efficiency improvements, biomass heating and biomethane, after which increased natural gas production and export opportunities can be pursued.

13 <https://ua.energy/main-events/ukrenerg-transition-rab-regulation/>

Longer-term natural gas production can be increased on the back of vast natural gas reserves and further biomethane ramp-up. Naftogaz estimates that Ukraine has about 300 bcm of strategic gas reserves in the Dnieper Donets Super Basin (mainly unconventional playfields), and about 200 bcm Black Sea deep water gas reserves. Additional production from these fields is estimated to reach 2–3 bcm per year (unconventional fields) and up to 9 bcm per year (deep water) by 2030. Economically effective development of unconventional reserves would require fracking technology, which can be done in line with state-of-the-art health and environmental practices to minimise environmental impacts.

5.4 The green transition

Ukraine should stimulate investment in alternative energy sources (including biomass, biomethane and bioethanol) as soon as possible to reduce its dependence on imported energy (especially gas and oil products) and capture the vast potential of Ukraine's agricultural sector. One way to do this is by partially compensating firms for the cost of investment capital, for example through state guarantees or interest rate compensation. Coordinating and streamlining connections to the gas grid in the case of biomethane will also encourage investment.

More generally, Ukraine should begin preparing for a 'green transition' partnership with the EU. This means conducting a technical assessment of pipeline conversion for hydrogen and validating renewable energy source potential in 'lower-risk' regions (e.g. Poltava, Volyn oblast). More so than ever, Ukraine also needs to create as reliable of an investment environment as possible given the war situation. Policy must be consistent over time to ensure that investors do not fear their assets becoming stranded.

In the longer term, Ukraine can play a pivotal role in supporting the European energy transition toward a sustainable energy mix by supplying cost-effective zero-carbon energy at scale. Cost-competitive renewable power generation, existing infrastructure and strong hydrogen ecosystem potential are good ingredients for Ukraine to become a strong 'green energy partner' for the EU. This would involve Ukraine not only building a strong and more resilient energy system but also leveraging its energy sector to attract sizable foreign investment and catalyse economic growth. Approximately one third of the €1.8 trillion NextGenerationEU fund is committed to the EU Green Deal, and some of this amount can flow into Ukraine's energy sector for the mutual benefit of Ukraine and the EU. Ukraine has at least three competitive advantages in becoming a strong partner for the European Green Deal.

Ukraine's first competitive advantage is that it has a strong position in 'low-carbon' electricity. Because of massive deindustrialisation following the fall of the Soviet Union, Ukraine has historically had a surplus of electricity generation capacity, including in zero-carbon nuclear power. At the same time, there are opportunities for Ukraine to further expand renewable power generation, if reliable export opportunities are available.

Most significantly, Ukraine's onshore wind factor is highly favourable in some regions, allowing it to deliver cost-competitive renewable energy if a level playing field is secured along other dimensions (i.e. rule of law, cost of capital, and military-related risks). For example, in parts of Dnipropetrovsk, Zaporizhzhia and Poltava oblasts, the wind ratio exceeds 40%. Assuming a cost of capital close to the European level, Ukraine's National Recovery Plan estimates the cost of such electricity to be very competitive vis-à-vis its peers in Central Europe. Additionally, Ukraine has vast hydro energy potential which could be realised in the form of baseload capacities, primarily on Dnipro and Dniester. Attracting private investment is critical for Ukraine's green transition as it would bring not only required funding, but also so much needed know-how and technologies. A side advantage of Ukraine developing a renewable energy ecosystem is that wind and solar energy are by nature more decentralised and less vulnerable to attacks than fossil-fuel and nuclear power. As a result, Ukraine's energy system will naturally become less susceptible to attacks as it becomes greener.

Ukraine's second competitive advantage is that it has a well-developed energy infrastructure, including large electricity and gas transmission capacities to Europe. ENTSO-E synchronisation, which was finally accomplished in March 2022, will allow Ukraine's electricity sector to further integrate into the European market and unlock opportunities for 'green' electricity exports. Ukraine can also follow the example of Snam, an Italian gas transport group that has successfully retrofitted its natural gas system to be hydrogen-ready. In the longer run, Ukraine's massive gas transmission system can form a strong basis for future hydrogen exports.

Finally, Ukraine has all the elements to develop a hydrogen ecosystem to maximise exports of green products to Europe. Existing cost-competitive, low-carbon energy forms a strong basis for hydrogen production in Ukraine. There are also several sectors of the Ukrainian economy – such as metallurgy, ammonia, and fertilizers – that would benefit from the ability to consume hydrogen and thereby maximise value added in the country.

For instance, 'green metallurgy' is an industry where Ukraine is well-positioned to integrate into the European value chain. In the last several years, many European steel producers have announced massive modernisation of existing capacity, aimed at decarbonising steel production. As this trend continues, several bottlenecks are likely to arise along the European supply chain, including low-carbon metallics. Ukraine is well-equipped to satisfy this deficit thanks to its vast magnetite iron ore reserves, existing beneficiation and pelletising practices, and hydrogen production potential.

Ukraine can also leverage its vast agricultural potential to scale up biomethane production. As mentioned earlier, short- and medium-term estimates for biomethane are around 2 bcm per year. However, much higher potential can be realised if Ukraine can attract more private investment in bioenergy as war-related risks decrease and if energy prices remain high. According to estimates of the Bioenergy Association of Ukraine, total biogas potential in Ukraine exceeds 10 bcm per year during the next ten years and up to 20 bcm per year by 2050.

Given that Ukraine is now an EU member candidate, it will ultimately need to ensure that its regulations meet and are appropriately synchronised with European standards. This includes eventually adopting European carbon regulation and joining Europe's Emissions Trading System (ETS). While a carbon tax or a cap-and-trade system where permits are auctioned off could provide a source of recovery funding, it would also be a significant burden on Ukraine's businesses, especially those in energy-intensive sectors (e.g. steel). Because carbon is a global externality and given Ukraine's vast rebuilding needs, the country must be given ample time and financial support to gradually reduce its carbon emissions and introduce EU-level carbon pricing.

5.5 Other considerations

By 2040, many existing nuclear blocks will be expiring, creating conditions for an energy deficit. This deficit can be closed either by new nuclear blocks or by renewable energy sources with balancing capacities. Although the decision about how to fill this deficit can be deferred to 2030 or later and will depend on economic and technological considerations, building two new nuclear units at the Khmelnytskyi NPP could be a good ex-ante move to combat the expected deficit.

Ukraine was pursuing many sensible pre-war policies in the energy sector, and these should be continued. For example, efforts to close unprofitable coal mines were underway but stalled. These coal mines are government-owned and are thus a drain on the budget, but closing them is politically challenging, as alternative employment opportunities have historically been scarce. As Ukraine transitions to a greener energy mix, the benefits of keeping these coal mines will continue to fall (although some coal electricity generation may be needed for some time for load balancing). Thus, Ukraine should make the gradual closing of these coal mines a priority to free up funds for other purposes. However, the closings should happen in conjunction with reskilling and other social mobility programmes to compensate coal mine workers who will no longer be employable in the industry.

Going forward, transparency and accountability will be key for successful rebuilding, and the energy sector is no exception. Prior to the war, Ukraine scored low on transparency (i.e. information availability) in its energy sector and lots of room for improvement was noted (DiXi Group et al. 2020). For example, monthly data on production and consumption of natural gas and electricity were not available, data on electricity and gas

markets as well as on energy prices were not sufficiently detailed, and some data were not available in machine-readable format. Some information is released with a long delay, limiting its usefulness. Information availability helps private companies compete in energy markets; improves the ability of consumers and citizens to hold private companies and representatives accountable; helps with investment planning; facilitates innovation and solutions to problems; allows policymakers to design better regulation; and enables a variety of domestic and international organisations to better evaluate the effectiveness of reforms and policy changes. Thus, the quality and implementation of many of the programmes and reforms suggested in the preceding sections would undoubtedly be improved by better data availability, and Ukraine should prioritise making detailed energy statistics that are in line with EU best practices publicly available. Doing so will require mandating that private companies and state-owned enterprises collect and report certain information to the relevant government agencies in a timely manner. Ukraine should then release this information in machine-readable formats and also develop other tools to facilitate information access (e.g. price comparison websites). Reporting on progress made towards national goals (e.g. 'Energy Strategy of Ukraine by 2035') should also be done in a timely, consistent and thorough manner.

6 CONCLUSION

Although the total cost of the measures proposed above is difficult to calculate, the National Council for the Recovery of Ukraine has estimated that Ukraine could engineer a significant green transition with about \$100–\$150 billion. Most of this amount would be spent on building up new zero-carbon power generation (some nuclear but mostly renewable), ramping up hydrogen production (including about 1.5 megatonnes of hydrogen exports to Europe), increasing gas production (including biomethane) and modernising the energy infrastructure.

Who should implement Ukraine's green energy transition? In consultation with the Ministry of Energy, the state should define a predictable and fair regulatory framework (including standards for housing energy efficiency, EVs, carbon regulation, etc.) in line with EU principles. Private businesses, state-owned enterprises and other national and international organisations should develop projects to realise the transition. Empowering decentralised action and promoting competition will set a powerful foundation for a green transformation.

The benefits of successfully implementing the suggestions discussed above are massive. Reducing Ukraine's reliance on imported oil and gas will help protect its economy from price fluctuations in those two commodities, strengthen energy security and reduce CO₂ emissions, supporting the EU in its green transition. Simultaneously improving energy efficiency while promoting green energy and market competition will position Ukraine's energy sector to become a locomotive for post-war growth. Such an opportunity must not be missed.

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Rebuilding Ukrainian transport infrastructure

Volodymyr Bilotkach^a and Marc Ivaldi^{b,c}

^a*Purdue University*; ^b*Toulouse School of Economics*; ^c*CEPR*

EXECUTIVE SUMMARY

This chapter reviews the key issues associated with post-war reconstruction and institutional reform of Ukraine's transport infrastructure sector. The focus is on intercity and international railways, highways, ports and aviation infrastructure. We cover both the reconstruction of physical infrastructure and the key issues related to the institutional regulatory framework in the sector after the war. The following key points are raised: the reconstruction cost is expected to be large; private sector capital will likely need to be involved; we advocate for public-private partnerships (PPPs) rather than privatisation; and decisions on institutional framework in the relevant sectors must be evidence-based, as the evidence on the impact of regulatory reforms in the transport infrastructure industries is often mixed.

The Ukrainian railroad network bears signs of colonial legacy, some of which will need to be removed after the war. East-west connectivity within the country will need to be improved, which will likely require constructing new rail links. Changing the track gauge to the standard one used in Europe should become a key infrastructure project in this sector. The cost of this project is difficult to estimate – we believe it could range from US\$43.7 billion to nearly \$130 billion. However, the key benefit of denying Russia the use of Ukrainian rail infrastructure for war logistics in the next attack will be worth the cost. On the institutional side, we believe that vertically integrated structure should allow advantage to be taken of the relevant economies of scope. At the same time, any decisions in this area must be based on robust data analysis.

Ukraine's highway network has seen considerable investment in the years prior to the invasion. Some steps to involve private sector investments through PPPs have been undertaken. The framework for continuing such private sector involvement (which will be required given the monumental nature of the post-war reconstruction) will thus be in place. Investors will likely put pressure on to introduce tolls for road use.

In relative terms, Ukrainian ports have sustained more damage than other transport infrastructure sectors. Moreover, the Azov ports may continue to face restrictions on their operations after the war. After the war, we will see increasing demand for private sector investment into the port infrastructure – based on what was happening before the invasion, we can expect PPPs to develop in this sector. We also believe that separation of infrastructure and services will be the institutional model of choice for the ports, based on the European experience.

Ukraine's aviation sector was well integrated into the European aviation ecosystem before the full-scale invasion. After the war, some considerable infrastructure investment will be required to rebuild several damaged airports. Private sector funds can be deployed through either privatisation or concession arrangements. The latter have been rather popular in Eastern Europe recently, so supplanting this experience to the Ukrainian aviation sector should not be a very difficult task.

1 INTRODUCTION

This chapter outlines key issues related to the post-war reconstruction of Ukraine's transport infrastructure. Its focus is on the intercity (and international) transport infrastructure. This includes railroads, highways, ports, as well as the aviation-related infrastructure (airports and air navigation facilities).

We assume that the war will end with Ukraine's victory and the eventual restoration of the country's territorial integrity within Ukraine's internationally recognised borders. We also assume that the threat of future Russian invasion will not disappear after the Russian forces have been driven out of Ukraine. We fear that low-level hostilities, including Russian missile attacks against Ukrainian infrastructure, will continue, although more advanced air defence capabilities that Ukraine will acquire will likely drastically reduce the effectiveness of such attacks. We take no position on the future of the Russian Federation. We suppose, however, that any potential geopolitical events in Russia will have little impact on the assumptions we are making here.

We further assume that for some relatively prolonged time after the war, travel and trade links between Russia and Ukraine will be very limited. This will have implications for flows of trade and people beyond Ukraine. Specifically, the vision of Ukraine as a potential transit country for East-West trade flows (most importantly, China's Belt and Road Initiative) will have to be abandoned, or at least downsized. This can have implications for the planned reconstruction of intercity infrastructure in the country after the war.

At the time of this writing, the overall damage to Ukrainian transport infrastructure is significant (the Kyiv School of Economics estimates damages to transport infrastructure at more than \$40 billion). However, most of the key bridges (especially those across the river Dnipro) remain serviceable. Railway services are operational across the entire territory under Ukrainian government control, and are quickly restored following de-

occupation. While some airports have sustained considerable damage, air service to the nation's key gateways (Kyiv Boryspil, Odesa and Lviv) can be restored promptly once safety can be assured. Ports, especially those on the Sea of Azov (Berdyansk and Mariupol), have sustained more damage than other parts of transportation infrastructure, in relative terms. Of course, this assessment may be affected by the reality on the ground, as Russian forces are increasingly targeting civilian infrastructure facilities in their attacks.

We believe that reconstruction of the transportation infrastructure ought to have a dual focus. In addition to rebuilding facilities, roads, bridges, ports and airports damaged during the hostilities, we need to focus on the institutional framework that will ensure the infrastructure and services are run as efficiently as possible. Furthermore, we need to consider the possibility and the desirability of involving private sector capital, as public funds alone – including any donor assistance – will likely be insufficient to ensure full and prompt financing of the reconstruction effort.

In the rail sector, we advocate for improving connectivity within the country (the rail network in Ukraine was built mostly around the Moscow-centred Russian and then Soviet radial grid) and changing the track gauge to align with the 1,435 mm gauge used in most of Europe. This project, assessed to cost at least \$43.7 billion (and potentially as much as \$130 billion), will play the dual role of facilitating trade with the EU and disrupting Russian military logistics in case of another attack. On the institutional side, we believe that vertically integrated structure should allow advantage to be taken of the relevant economies of scope. At the same time, any decisions in this area must be based on robust data analysis. We also advocate for sound economic regulation of the infrastructure provider, using incentive regulation mechanisms.

As private sector investment in the Ukrainian highway network will be necessary (most likely through some form of public-private partnership, or PPP), we can expect investors to put pressure for introducing user charges. We view tolls as the most efficient way to charge users. We also advocate for introducing sound economic regulation of highway operators, employing incentive regulation mechanisms to ensure efficiency subject to predetermined service quality standards.

In relative terms, Ukrainian ports have sustained more damage than other transport infrastructure sectors. Moreover, the Azov ports may continue facing restrictions on their operations after the war. After the war, we will see increasing demand for private sector investment into the port infrastructure – based on what was happening before the invasion, we can expect PPPs to develop in this sector. We also believe that separation of infrastructure and services will be the institutional model of choice for the ports, based on the European experience.

Ukraine's aviation sector was well integrated into the European aviation ecosystem before the invasion. After the war, some considerable infrastructure investment will be required to rebuild several damaged airports. Private sector funds can be deployed through either privatisation or concession arrangements. The latter have been rather popular in Eastern Europe recently, so supplanting this experience to the Ukrainian aviation sector should not be a very difficult task.

The remainder of the chapter is organised as follows. The next section reviews some recent studies focusing on infrastructure rebuilding. This is followed by a brief discussion of the implications of the post-war geopolitical situation for the Ukrainian transport infrastructure sector. The following four sections analyse the pre-war state of and post-war recommendations for the rail, highway, port, and aviation infrastructure, respectively. The last section of the chapter offers some concluding comments.

2 RECENT INFRASTRUCTURE REBUILDING STUDIES

Europe has not seen a full-scale military conflict of this intensity since World War II. The Yugoslav Wars of 1991–2001 could be comparable in terms of the number of casualties (sadly, the Russia–Ukraine war might have surpassed that already). But unlike in the current war, advanced missiles were not widely used to deliberately damage civilian infrastructure. While transport infrastructure in the Balkans was in some ways similar to that in Ukraine, the extent of damage was less than what Ukraine will face after the war is over. If we were to look for a similar relative scale of infrastructure destruction in recent times, the war in Syria would provide us with a good example. However, the Syrian transport infrastructure is fundamentally different from that of Ukraine.

We can thus say that previous post-war infrastructure rebuilding experience might be of limited use for planning post-war reconstruction efforts in Ukraine. Sakalasuriya et al. (2016) indicate that there is a general dearth of literature on the topic of post-conflict infrastructure reconstruction. Yet, some lessons from the relevant studies can be reviewed and summarised.

Sakalasuria et al. (2018) propose a conceptual framework for analysing post-conflict reconstruction. They emphasise the importance of careful planning before executing reconstruction projects.

Hoeffler (1998) reviews the state of infrastructure rebuilding in 12 African nations affected by military conflicts. She concludes that, given the lack of public funding, private sector involvement was needed to ensure progress in reconstruction efforts. She also notes, however, that the investors' perception of sub-Saharan Africa was a considerable obstacle to attracting private sector capital. Harvie and Saleh (2008) document Lebanon's infrastructure rebuilding after the civil war and note that the reconstruction left the country with considerable public debt. Earnest (2015) surveyed stakeholders involved in infrastructure reconstruction projects in post-war Kosovo. The respondents indicated

that implementation of those projects proved considerably more complicated than expected. Poor quality of planning and implementation of reconstruction projects in an environment of complexity, change and uncertainty was noted as the key factor behind this finding.

The key pitfalls of post-war infrastructure rebuilding are thus financing and implementation of the reconstruction projects. Some studies note the importance of involving private sector capital. The issue of institutional reform of transport infrastructure sectors has not received much attention in the above-mentioned studies, despite its obvious importance.

3 IMPLICATIONS OF POST-WAR GEOPOLITICAL SITUATION

The war is going to drastically affect the position of Ukraine in the global trade and transport network. Alternatively, we may say that the country's drift away from Russia, which started with the invasion of Crimea and Donbas in 2014, will be cemented for the longer term. In fact, Ukraine has drastically reduced its trade links with the aggressor state since that time. According to World Bank data,¹ the value of Ukrainian exports to Russia was over \$15 billion in 2013. By 2019 it had shrunk to \$3.2 billion – an almost five-fold decline. Direct commercial air services between Russia and Ukraine were suspended in 2014; and East–West overflights in Ukrainian airspace were largely discontinued after Russians shot down flight MH17 in the sky over Donbas on 17 July 2014.

While the longer-term vision of Ukraine as a transit country for the East–West flows of goods and people was not fully abandoned after 2014, no structural changes to Ukrainian rail and road infrastructure have been implemented. The structure of these networks still bears the signs of colonial legacy. Post-war reconstruction of the Ukrainian transport infrastructure must be implemented keeping in mind the new geopolitical reality, which will involve limited ties with Russia and increasing interconnections with Eastern European EU member states, and the EU at large.

Any role Ukraine may play as a transit country in East–West trade flows will imply an increasing role for sea shipping – for instance, goods carried via the road or rail networks from Eastern Europe may be transferred onto ocean vessels at Ukrainian Black Sea ports. The importance of Azov ports will diminish. Moreover, Russia will likely continue creating obstacles for the operation of those ports, even when it is fully driven out of Crimea.

1 <https://wits.worldbank.org/>

Surface transport networks play a vital role in a country's national defence strategy. The Ukrainian rail and road networks, developed during colonial times, will likely need to be reorganised with a view to repelling future assaults from the East. Changing the rail gauge would also serve this purpose, given the importance of rail transport for Russian war logistics in this conflict.

In general, the Ukrainian government and international donors must be ready to embrace the need to introduce drastic changes to the pre-war Ukrainian transport network. That network was defined by Ukraine's colonial past; and the country will break free from being a colony following victory in this war. It will be necessary to take – admittedly financially costly – steps to reinforce the new status of Ukraine as a full-fledged member of the European family of nations.

4 RAILROADS: LEGACY, RECONSTRUCTION AND INSTITUTIONAL REFORMS

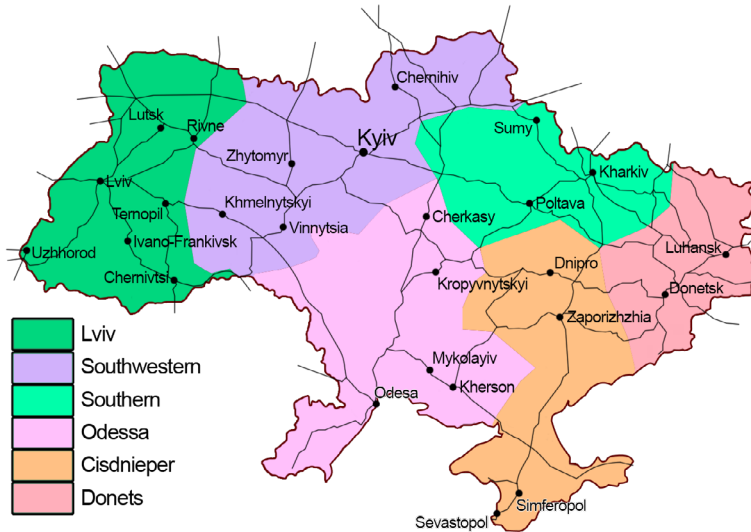
4.1 Legacy

Ukraine's rail network is rather well-developed. Furthermore, before the full-scale invasion the country had been on course to modernise the institutional regulatory framework with a view to introducing competition in the provision of rail services. The nation's rail system is run by the vertically integrated, state-owned, joint-stock company Ukrzaliznytsia (this rather unimaginative name is a shortened version of "Ukrainian railways" in the country's official language). The company is in charge of managing and providing passenger and cargo transportation services on over 23,000 kilometres (about 14,300 miles) of rail network, over 1,700 stations, and all the relevant infrastructure. Ukraine's track length makes the country's rail network the 13th largest in the world. Before the invasion, Ukrzaliznytsia was among top-ten providers of passenger and freight rail transport services worldwide (as measured by the number of passengers carried and weight of cargo transported, respectively). At the time, the company employed over 400,000 people – more than Deutsche Bahn, the chief rail operator in Germany. This latter fact calls into question the overall efficiency of Ukrzaliznytsia's operations.

As we noted above, Ukrainian railways before the full-scale invasion were on track towards institutional reform, aimed primarily at introducing competition in the provision of services. According to Grushevska et al. (2016), the aim of the planned institutional reform was the introduction of horizontal competition among the rolling stock owners in both passenger and freight services (locomotives were excluded), and the removal of cross-subsidisation between the profitable freight transport sector and the loss-making passenger services. Management of rail infrastructure and ownership of locomotives would remain in the hands of the state-owned company (current, Ukrainian legislation does not allow privatisation of rail infrastructure).

The key elements of colonial legacy in the Ukrainian rail network can be clearly observed in its structure (Figure 1). The Ukrainian rail network is organisationally separated into the same six regional divisions that were set up during the USSR. Even the names of these divisions have remained unchanged. Some of those names may sound bizarre to an observer unfamiliar with the country's history. Most vividly, the 'Southwestern' rail district is located in the centre of Ukraine, while the 'Southern' district is in the country's northeastern corner. These names refer to the districts' positions relative to Moscow.

FIGURE 1 MAIN RAILWAYS OF UKRAINE



Source: Wikimedia Commons

As the country's rail network was developed (except for the parts of western Ukraine annexed by the Soviet Union during the World War II) around the Moscow-centric rail network, established during colonial times (under Russian Empire and later the USSR), rail connectivity within Ukraine is sub-optimal. Most notably, east–west rail connectivity is rather limited on routes that do not include Kyiv. Oftentimes, routes between southeastern and southwestern parts of Ukraine go through or just south of Kyiv, meaning loss of time and efficiency. Some issues are present with north–south rail connectivity as well. For instance, a direct rail link between Kyiv and Odessa is absent. The latter city was directly linked by rail with Moscow, so a Kyiv–Odessa rail link was considered redundant under the Russian colonial paradigm.

Ukrainian railways use the 1,520 mm track gauge – another legacy of the Russian Empire (note that the same gauge is still in use in Finland and the Baltic States). Most of the other countries in continental Europe (except for in Spain and Portugal) use the standard 1,435 mm track gauge. Some standard gauge tracks exist in the western part of Ukraine, but they are mostly unused at this time. Nevertheless, on 24 May 2022 Ukrainian Prime Minister Denys Shmyhal announced plans to downgauge Ukrainian railways to

standard gauge, starting in the west of the country. While we strongly support the idea of downgauging despite the costs it will involve (more on this below), we also believe that the project must start in both the east and west of the country. Downgauging the tracks will not only facilitate trade, but also boost Ukraine's defence capabilities against any future Russian attack.

4.2 Reconstruction

As we noted before, Ukrainian railways have remained operational throughout the conflict. Outside of the active combat areas, rail infrastructure objects have sustained damage from missile strikes. However, such attacks have only led to short-term disruptions in rail operations. Furthermore, Ukrzaliznytsia has been able to rather swiftly restore service to areas liberated by the Ukrainian armed forces. For instance, it took less than a week to restore passenger services to Balakliya in Kharkiv region when the town was liberated after about six months of Russian occupation. Areas of Ukraine that have seen considerable fighting, especially those in Donbas, will require significant infrastructure reconstruction efforts, including rebuilding of bridges, stations and other facilities. Loss of locomotives and rolling stock has been significant as well; as Grushevska et al. (2016) note, however, Ukrainian rolling stock is largely outdated.

We believe the most important project that should be undertaken on Ukrainian railways after the war is changing the track gauge to the standard 1,435 mm. The benefits of this are two-fold. First, standard track gauge will facilitate trade links between Ukraine and the EU, which is already – and will continue to be – the country's chief trading partner post-war. Second, and no less important, downgauging will be crippling for Russian military logistics in the event of another attack. Russians have used rail transport extensively to deliver heavy weapons and ammunition close to the front lines, especially during fighting in Donbas region. We could even say that, if changing the track gauge is enough to deter a Russian attack similar to the one that commenced on 24 February 2022, the benefits of this project will certainly outweigh the costs.

The scope of the track gauge change project appears monumental, and the perceived costs would be large. But what are those costs? They are not easy to estimate, but large-scale track gauge changes are not unprecedented. The United States and Canada implemented a large-scale gauge standardisation project in the 19th century (for details, see Puffert 2000). While some estimates for the costs of individual track gauge change projects from that time are available, they vary widely and may not be very useful for the current Ukrainian situation due to changes in technology and the relative costs of production factors over time. Currently, Project Unigauge in India, which commenced in the 1990s, is aimed at changing all of the country's main railroads to the same broad gauge. However, information on the cost of that project is not readily available.

We can nevertheless provide some ballpark estimates of the cost of changing the track gauge in Ukraine. A project in Lithuania to change 335 km of tracks to standard gauge is expected to cost €580 million, or €1.73 million per kilometre.² New 250 km railroad being constructed in nearby Latvia is estimated to cost €5.8 billion, or €23.2 million per kilometre. This suggests that downgauging to standard gauge costs roughly 7.5% of the expenses associated with constructing a new railroad from scratch. We should also note that the construction cost reported for the Latvian 250 km rail project is significantly lower than the assessed global average cost of building new railroads. A study in 2021 by the Eno Center for Transportation estimated, based on the analysis of numerous rail construction projects around the world, that on one kilometre of railroad costs on average \$107 million to build.³

The cost of rebuilding railroads – or any infrastructure for that matter – in Ukraine after the war would be difficult to estimate at this time. We can, however, suppose that it will be lower than what we see in countries like the United States. For the purpose of argument, let us consider scenarios where a kilometre of rail costs anywhere between \$25 million and \$75 million to build. Supposing that changing the gauge will incur a cost equal to 7.5% of the cost of railroad construction gives us a range of \$1.9–5.6 million per kilometre for transferring to the standard gauge. The total cost of changing the entire system's gauge will be between \$43.7 and nearly \$130 billion. Spread over at least a decade – perhaps 15–20 years would be a more realistic timeline for this project – the total cost appears manageable.

Replacing or retrofitting locomotives and the rolling stock will incur additional cost, which is difficult to assess now. The figure will potentially be in the tens of billions as well. For instance, in 2020 Ukraine operated a park of about 1,700 electric locomotives. Replacing all of these with new units would attract a price tag of up to \$10 billion.

Optimising rail connectivity within the country will require constructing new railroads. Given the above-mentioned figures for the costs associated with that, we can see that the total can add up quite quickly. For example, an approximately 500 km direct rail link between Kyiv and Odesa would cost between \$12.5 and \$37.5 billion.

4.3 Institutional reforms

Institutional reforms in the railway sector around the world have focused on addressing two fundamental questions. The first is whether management of rail infrastructure should be vertically integrated with provision of services. The second issue is the feasibility of competition for the provision of services (passenger and cargo transportation) over the rail network. Addressing those key questions requires considering some related issues.

2 <https://en.thepage.ua/economy/ukraines-switch-to-european-railway-gauge>

3 <https://www.enotrans.org/enotransitcapitalconstructiondatabase/>

The first is the ownership and organisational form of the rail infrastructure operator. Second is the issue of economic regulation mechanisms to be used. As far as competition for provision of services is concerned, a key point is whether to set up competition ‘on the market’ or ‘for the market’.

Several institutional setups of the rail sector have been implemented around the world. Grushevska et al. (2016), and some other studies we will reference later, include a good discussion of those setups. At the basic level, the institutional setting includes the following. The traditional setup is a vertically integrated model (used, for instance, in the United States, Canada, China and Ireland).⁴ Some countries (most notably Germany) introduced vertically separated models with open access competition in services (also known as competition ‘on the market’).⁵ In some European countries, open access competition has led to the emergence of new service providers which have been able to obtain significant market share over time. Franchise bidding arrangements (or competition ‘for the market’) has taken hold most notably in the UK. Passenger services there are awarded to regional franchises for the period of 5–7 years. Some open access operators are also present, but they are responsible for less than 1% of the passengers carried on the UK’s rail network.

Regardless of the institutional structure chosen for a country’s rail network, some form of economic regulation tends to be put in place. Where vertical integration is not preserved, at a minimum infrastructure access charges are subject to economic regulation, since the infrastructure operator retains its monopoly position. Regulation of passenger fares and/or freight rates is not ubiquitous, but regularly present. We argue that economic regulation, if implemented, must be sound and incorporate incentive regulation mechanisms to ensure companies operating in the industry retain incentives for increasing efficiency of their operations without sacrificing safety and quality of service.

When analysing the outcome of various reforms in the rail industry, the focus of analysis is usually on efficiency. A reform can be deemed successful if customers obtain access to lower-cost services without compromising on safety and the salient service quality parameters. Lower cost should also translate into lower passenger fares and freight rates.

A number of studies have analysed the outcome of rail reforms with a view of the above-mentioned considerations. Nash et al. (2013) compare experiences in the UK, Sweden and Germany. They find that German railways show the slowest increase in fares and public support (in terms of public funds allocated to the rail sector). This result was contrary to expectations as, out of the three countries, the extent of competition seems to be lowest in Germany. Mizutani et al. (2015) estimate cost functions for vertically separated, vertically integrated and intermediate models. They do not reach a clear conclusion as to which of the three would produce the lowest costs. Smith et al. (2018)

4 Under this model, a single company operates both the rail infrastructure and the services on this infrastructure.

5 In contrast to vertically integrated model, under vertical separation infrastructure is run separately from the services.

reach a similar conclusion upon evaluating the cost effects of economic regulation for 17 European railways. Analysis of the UK experience by Smith and Wheat (2012) found that franchised operators' costs increased at above the rate of inflation between 1997 and 2006.

Cost function estimation by Ivaldi and McCullough (2008) suggests considerable economies of scale and scope from vertical integration in the railway sector, using data from the United States. Pittman (2005) reaches similar conclusions. Cherbonnier et al. (2018) analysed competition 'on the market' versus 'for the market' in the context of a vertically separated setup. Their analysis, using data from France, suggests that competition 'for the market' (that is, a franchise bidding arrangement similar to the UK model) has more potential to generate benefits for the traveling public as compared to competition 'on the market'. At the same time, neither is guaranteed to produce lower fares.

The main lesson we can draw from the literature is that institutional reforms of the railway sector should be informed by solid data analysis. We could say that preponderance of evidence points to economies of scope from a vertically integrated setup, which could indicate its desirability for the Ukrainian case. Whether competition 'for the market' or 'on the market' is chosen for services, allowing European operators to compete in the Ukrainian market could lead to transfer of technology and managerial expertise, and improve customer experience in the longer term.

Regardless of whether a vertically integrated or separated institutional setup is chosen, we will likely end up with a single, state-owned operator for the rail infrastructure. It will be important to ensure that such an operator is subject to economic regulation that creates incentives for it to increase efficiency, such as a price-cap incentive regulation mechanism (also known as CPI-X). This mechanism, used extensively in the economic regulation of infrastructure industries, stipulates price increases at a rate that is equal to the rate of inflation (measured by consumer price index, or CPI) minus the rate of expected efficiency improvement (denoted by X).

As we noted above, before the full-scale invasion, the Ukrainian government was set up on a path towards reform that would eventually lead to the separation of infrastructure from carriage operations in the railway sector. We suggest that further analysis – including evaluation of the extent of economies of scale and scope associated with vertical integration – be conducted before this course is confirmed.

5 HIGHWAYS

Ukraine's highway network is reasonably well-developed and provides good connectivity throughout the country. In this sector, we do not see clear connectivity gaps similar to those we pointed to when discussing rail infrastructure. Perhaps the main deficiency of the Ukrainian highway network, as compared to that in European countries, is lack of

a motorway system (Figure 2). Roadside infrastructure, despite some progress in this area over the last decade, remains underdeveloped as well. The World Bank assesses the country's road construction and maintenance capability as "relatively underdeveloped".⁶ Road safety levels are another issue of concern. According to the World Health Organization (WHO), in 2016 (the latest year for which the numbers are available on the organisation's website) Ukraine's death rate from road traffic incidents stood at 19.1 per 100,000 people.⁷ This compares very unfavourably with 6 per 100,000 people for Germany, 8 for France, and even the EU's highest of 16.4 per 100,000 for Poland.

FIGURE 2 UKRAINE'S HIGHWAY NETWORK



Ukraine had invested a considerable amount of money into road infrastructure improvement just before the start of the full-scale invasion. The 'Great Construction' project, launched in 2019, provided for \$5.3 billion in investment into road and highway construction. Another notable development in the road infrastructure investment area is the Road PPP Program, launched in October 2020 by the Ministry of Infrastructure of Ukraine in cooperation with the World Bank, the G20 Global Infrastructure Facility and the International Finance Corporation.⁸ The aim of the programme was to attract

6 <https://blogs.worldbank.org/ppps/ppps-drive-ukraines-road-sector-development>

7 <https://apps.who.int/gho/data/node.main.A997>

8 <https://roadppp.in.ua/en/>

\$9 billion from the private sector to rehabilitate and maintain 4,500 km of highways. This programme can be used after the war as a vehicle to attract private sector funding for road reconstruction.

Reconstruction of the nation's highway network will be a large-scale task after the war. In addition to the damage and destruction due to the fighting, roads (including those far from the active combat areas) will have sustained considerable impairment from being used for transporting the heavy military equipment. We see the following issues as relevant for the post-war reconstruction effort. First, highways are dual-use infrastructure – their importance for defence must not be underestimated. Reconstruction of the highway network after the war will have to be implemented with a view to optimising their use to repel any future Russian attack. This might require some new road construction. We will leave this issue outside of this study, however, as national defence is not our area of expertise.

Reduced Russia–Ukraine ties after the end of hostilities – most importantly, a reduction in the volume of trade (both between Russia and Ukraine and transit goods going through Ukraine into Russia and vice versa) – will also have implications for the prioritisation of highway reconstruction projects. We can see one potential risk here. Highways in the eastern part of Ukraine may end up being underfunded as lack of attention to roads going into Russia will spill over to local highways in the eastern areas of Ukraine. The government should keep this risk in mind.

The key issue for the post-war highway network will be the attraction of private sector capital into road reconstruction. Demands on public funds and on any resources provided by donors for post-war reconstruction will likely exceed the supply of funds. The above-mentioned Road PPP Program can serve as a model for attracting private sector capital into road construction. However, this raises another issue – the investors will want to see a return on their capital. Thus, road user charges will need to be implemented on key highways that will receive private sector investment.

Eastern European countries have accumulated considerable experience with highway construction over the last three decades. Carpintero (2010) and Queiroz et al. (2013) review some of that experience. Private sector participation in road construction projects has grown considerably in the first decade of this century. At the same time, Carpintero's analysis suggests that the number of highway construction projects (and the road mileage constructed) fell considerably short of initial expectations. Spain's experience, analysed by Baeza and Vassallo (2010), shows that demand projections for the use of toll roads tend to be overoptimistic.

Several schemes for funding highways have been implemented around the world. Funding roads through taxes on motorists (including vehicle registration fees and petrol taxes) remains the most common way of financing road infrastructure. Private and some of the publicly operated highways are funded through user charges (e.g. Florida's Turnpike). de Palma and Lindsey (2000) develop a theoretical framework to demonstrate

that toll roads can increase allocative efficiency and improve social welfare. Within Europe, various mechanisms for financing motorways are in place. In Germany, the UK, Benelux countries and a number of other states, roads are funded from taxes on motorists, with tolls levied on some users (e.g. trucks are charged a toll for accessing the German *Autobahn* network). Many European countries, including Spain, Italy, France, Portugal, and Croatia, have opted for levying user charges proportional to the level of road use (tolls that vary depending on the distance driven on a motorway). Smaller-sized states, such as Austria, Switzerland and Slovakia, charge fixed fees to motorway users (in Austria, for example, one can purchase a ten-day, two-month or annual vignette).

As for the private sector investment in the Ukrainian highway network, we advocate for PPPs rather than privatisation in this area. PPPs are more likely to ensure that development of the road network is driven not only by profit motives, but also by social welfare and national defence considerations. We view tolls as the most efficient way to charge users. We also advocate for the introduction of sound economic regulation of highway operators, employing incentive regulation mechanisms (such as price caps) to ensure efficiency subject to predetermined service quality standards.

6 PORTS

Ukraine's river ports and sea ports play a crucial role in the country's trade, especially in agricultural commodities (Figure 3). This infrastructure sector has been affected by the Russian aggression since February 2014. Occupation of Crimea and subsequent closure of the peninsula's ports to legal international maritime traffic has affected the Ukrainian economy and trade logistics. Russia has, through its control of the Kerch Strait, been creating problems for the Sea of Azov ports (Berdyansk and Mariupol), mostly disrupting trade logistics by arbitrarily creating delays at the Strait.

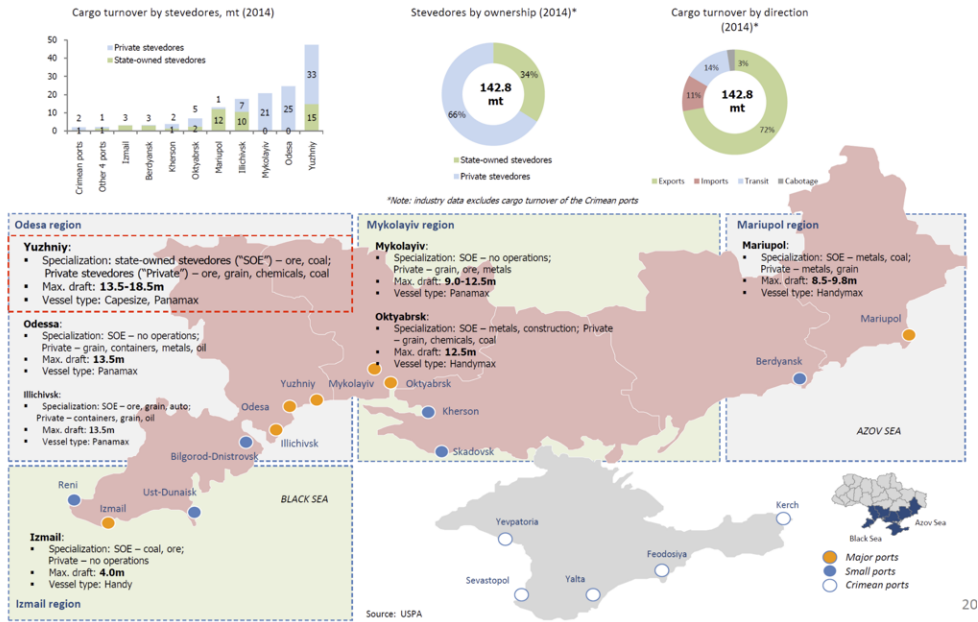
Nevertheless, Ukraine's ports have been developing very dynamically since 2014. While the country's container ports lost nearly 40% of their throughput between 2013 and 2015, the recovery in the subsequent years was swift. Throughput had nearly recovered to 2013 levels by 2017, reaching an all-time high in 2018 (according to UNCTAD data).⁹

Ukrainian sea ports are managed by the Ukrainian Sea Port Authority – a state-owned enterprise. Prior to the full-scale invasion, the sector was moving towards establishing PPPs for the country's key ports.¹⁰ Just as with roads, PPPs in the port sector were seen as a vehicle to fund infrastructure improvement. Many of the country's river ports have been privatised.

9 <http://unctadstat.unctad.org/countryprofile/maritimeprofile/en-GB/804/index.html>

10 <https://www.ebrd.com/news/2021/ebd-and-ifc-to-help-modernise-ukraines-black-sea-port-of-chornomorsk.html>

FIGURE 3 UKRAINE'S NETWORK OF SEA PORTS AS OF 2015



Source: Ministry of Infrastructure of Ukraine

In relative terms, Ukrainian port infrastructure has sustained more damage than other sectors covered in this chapter. The port of Mariupol shared the fate of the city, while some of the Black Sea ports have sustained missile strikes, resulting in destruction of, or serious damage to, their facilities. In the first several months of the full-scale invasion, Russian naval forces further compromised civilian maritime traffic in the Black Sea by installing naval mines – some of those might still be adrift at sea. Several instances of the Russian navy attacking merchant ships have also been documented. Some of the Black Sea ports in Ukrainian controlled territory are currently operational, aided by the agreement on facilitating exports of grains brokered by Turkey and the UN, as well as Ukraine's newly acquired anti-ship missiles that keep the Russian fleet hundreds of miles from Ukrainian shores.

Post-war reconstruction efforts in the port sector will involve, in addition to the reconstruction of physical infrastructure and institutional reforms, providing security against Russian attacks. We believe this is a feasible task for the Black Sea ports. However, ports at the Sea of Azov will likely continue to face operational challenges stemming from Russia's control of – or at least proximity to – the Kerch Strait. Even when Russian forces are driven out of Crimea, they will still be able to interfere with maritime traffic there. The geography of the Kerch Strait is similar to that of the Strait of Hormuz in the Persian Gulf area, where Iran stirs trouble for the shipping industry from time to time.

At the same time, the presence of NATO warships in the Black Sea, along with Ukraine's military capability, will likely serve as a robust deterrent against hostile actions by the Russians (similar to how the presence of the US Navy's Fifth Fleet in the Arabian Gulf ensures safety and security of navigation in that part of the world).

Institutional reforms of the port infrastructure should focus on increasing efficiency. The literature clearly demonstrates that more efficient port operations increase trade flows (Blonigen and Wilson 2007) while decreasing maritime transportation costs (Sanchez et al. 2003). At the same time, privatisation of port infrastructure alone does not necessarily lead to efficiency improvement (Cullinane and Song 2002).

We are likely to see continued efforts to bring private sector capital into Ukraine's ports. PPPs will be an important vehicle for securing funds for reconstruction of and upgrades to the port infrastructure. Another institutional issue to consider is that of separation between infrastructure and operations. The European approach here is one of separation, as opposed to the integrated model adopted in North America (Rodrigue and Notteboom 2010). For this reason, we expect separation to be the model of choice for Ukrainian ports post-war. From an industrial organisation point of view, the key concern with the vertically integrated setup is the threat of market foreclosure – i.e. vertically integrated ports discriminating against companies competing in the service provision. On the other hand, separation could lead to inefficiencies if economies of scope similar to those documented for the railways were present in the ports sector.

To build analogies with other transport sectors, separation of infrastructure and operations is a common approach to running the airports – in fact, only very small airports provide ground handling services to airlines, while skills requirements for air navigation services ensure that airports would not be able to offer aerodrome and approach control services by themselves. The possibility of vertical integration of airport infrastructure and services is only considered in some theoretical studies. We believe ports are similar to airports in this respect.

As far as the economic regulation of ports is concerned, this sector is different from rail, as ports tend to compete both with each other and against other modes of transport. Competition between ports is documented in, among others, OECD (2011), Cullinane et al. (2006) and Yap and Lam (2006). In this case, economic regulation would only be justified if ports both possess the market power and are judged likely to abuse it. We suggest that studies of the market power of ports must precede any determinations in this matter. Furthermore, injections of private sector capital will most likely lead to increasing independence in ports' managerial decision-making (currently, all seaports are run by one state-owned company). Finally, competition between sea and rail transport may intensify, especially when Ukrainian track gauge is changed to the standard one used in Europe.

7 AVIATION INFRASTRUCTURE: AIRPORTS AND AIR NAVIGATION

Ukrainian airspace is currently closed to civilian traffic. Before the full-scale Russian invasion, the Ukrainian aviation sector was better integrated into the European market and better prepared for working under the post-war conditions than other transport industries in the country. Following the annexation of Crimea, Ukrainian authorities closed the airspace over the peninsula. However, Russian airline companies continued to fly there – in violation of both Ukrainian and international law. When the Ukrainian government closed its airspace (even for overflights) to the Russian airline companies continuing their services into Crimea, the Russian government responded by banning Ukrainian airline companies from using Russian airspace. The Ukrainian government then reciprocated by banning all Russian aircraft operators from Ukrainian airspace. There have thus not been direct commercial services between the two countries since late 2014 – a preview of what we are likely to see for some time after the war for other transport modes. For a more detailed recent overview of the Ukrainian aviation sector, see Taranenکو (2020).

Until 17 July 2014 one of the key Europe–Asia routes – the one going over Donbas – remained open to civil aircraft flying at cruising altitudes. That ended abruptly when a missile launched from a Buk anti-aircraft system, belonging to the Russian armed forces and brought into Ukrainian territory controlled by the Russians and their local collaborators, shot down the commercial flight MH17, resulting in 298 fatalities. Closure of airspace above Donbas swiftly followed. This had dramatic financial implications for Ukraeroruh, the state-owned provider of air navigation services, which collected considerable revenue from overflights.

In 2019 – the last full year before the pandemic – Ukrainian airports located in the territory controlled by the country’s government handled nearly 25 million passengers.¹¹ To put this into some perspective, this is the 2019 traffic volume handled by one top-30 European airport, such as Berlin, Athens, or Stockholm. For a country of the population size of Ukraine, the civil aviation sector remained somewhat under-developed by European standards. For example, airports in Spain – a country with similar population size to Ukraine – handled over 88 million passengers in 2019.

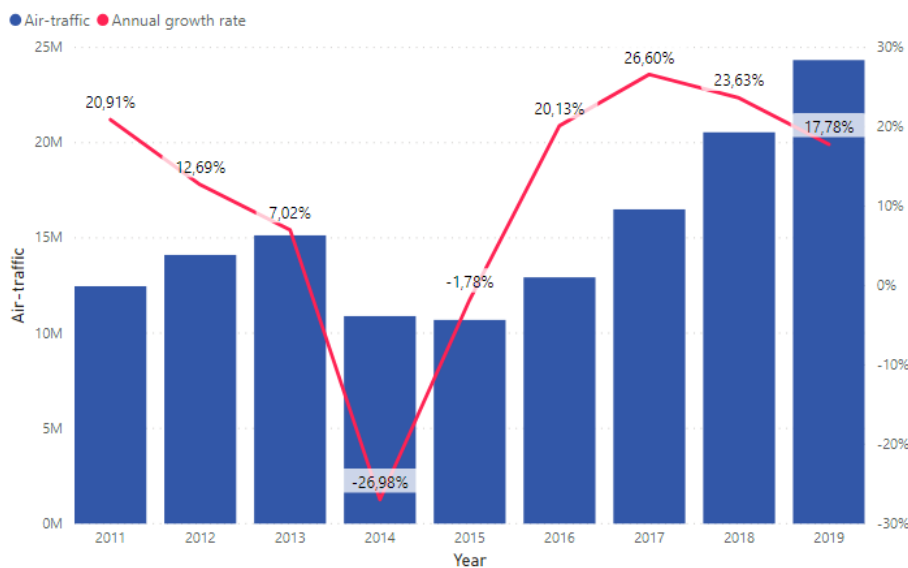
Ukraine’s largest airport by far is Kyiv Boryspil. The true gateway to the country, it handled about 15 million passengers in 2019, accounting for close to 60% of the country’s air passenger traffic. The other airports in the top five before the invasion were Kyiv Zhuliany, Lviv, Odesa and Kharkiv, in that order, handling about 8 million passengers combined (and at least one million each). None of the other airports in the country

11 Simferopol airport handled around 5 million passengers in the same year, according to the Russian occupation authorities who illegally operate that airport.

handled more than half a million passengers in the last year before the pandemic. The top five busiest airports in Ukraine have changed dramatically since the start of the Russian aggression in 2014. In 2013, the country's busiest airports were Kyiv Boryspil, Kyiv Zhuliany, Simferopol, Donetsk and Odesa, in that order.

The Ukraine–EU airline market has been liberalised for some time with most capacity and frequency restrictions removed, culminating in the EU–Ukraine Open Skies Agreement, signed in October 2021. Facilitated by significant liberalisation of the visa regime (holders of Ukrainian biometric passports have not had to obtain Schengen visas for short-term trips since June 2017) and the entry of European low-cost carriers, the number of passengers served by Ukrainian airports more than doubled between 2015 and 2019 (see Figure 4).¹² In addition, Ukraine is a member state of Eurocontrol – an international organisation working to achieve safe and seamless air traffic management across Europe. Founded in 1960, Eurocontrol currently has 41 member states.

FIGURE 4 PASSENGERS TRAVELLING BY AIR IN UKRAINE, 2011-2019



Source: Taranenko (2020)

Russian aggression in 2014 led to closure of two of then top-five airports in the country. While Simferopol is still operating under the management of the occupation administration (which has even built a new passenger terminal there), Donetsk airport is inoperable – its facilities having been largely destroyed in the heavy fighting in 2014 and 2015. In the current phase of the Russian invasion, Dnipro airport was reported to have sustained considerable damage. Missile attacks were also reported at some smaller

12 Excluding Simferopol airport in Crimea, which has continued to handle illegal traffic to/from Russia.

regional airports. However, the infrastructure at most of the key airports, including Kyiv Boryspil, Kyiv Zhuliany and Lviv, appears not to have sustained any serious damage. Overall, when the war is over, commercial flights to and from Ukraine can be resumed within weeks.

Just like in other transport sectors, Ukrainian aviation infrastructure has been mostly owned and controlled by the state. Airports operate as state-owned enterprises, while air navigation services (both aerodrome and *en route*) are provided by the state enterprise Ukraerokh. In this sector, Standards and Recommended Practices (SARPs) set by the International Civil Aviation Organization (ICAO) provide a solid framework to ensure safe and secure operation of civil aviation. Uniformity of operating practices worldwide will facilitate reintegration of Simferopol airport into the Ukrainian aviation ecosystem once occupation of Crimea ends.¹³ Donetsk and Dnipro airports will, however, require significant reconstruction investment (the cost will likely run in hundreds of millions of dollars).

Attitudes towards private ownership of aviation infrastructure differ around the world, especially as far as airports are concerned. The vast majority of air navigation service providers (ANSPs) are government-owned. In some countries, air navigation services are provided by a government division (e.g. the Federal Aviation Administration in the United States, or Direction des Services de la Navigation Aérienne in France). Recently, as the relevant market segment has been opened for competition ‘for the market’ in some European countries, small private ANSPs have started to appear. Some of these have managed to secure contracts for the provision of aerodrome air navigation services at some airports. Only four large ANSPs, offering both aerodrome and *en route* air navigation services, are partially owned by the private sector: NATS in the UK, Nav Canada, ENAV in Italy, and Skyguide in Switzerland.

In contrast to the air navigation service providers, many airports around the world have been privatised. Privatisation has taken hold in Europe, Australia, Japan and some other countries. In the United States, on the other hand, airports are publicly owned and run – usually by local or regional authorities.

Thus, from an institutional reform point of view, the key issues in the airports sector will be privatisation and economic regulation. On balance, the evidence presented in the literature suggests that private sector ownership makes airports more efficient. The seminal study in this area (Oum et al. 2008) finds that airports owned by private firms, autonomous public corporations or independent authorities are more cost efficient than fully government-owned airports. At the same time, partially privatised airports are less efficient than either fully public or fully private ones. The second key finding of Oum et

13 Since the start of the invasion on 24 February 2022, Russia has suspended its civilian aviation traffic to Simferopol.

al. (2008) is that privatisation of one or more airports in cities with multiple airports improves the cost efficiency of all airports in that city. Finally, the authors find that ownership structures in which management can exercise a larger degree of autonomy improve cost efficiency at airports, regardless of the owner's identity.

Other studies that find privatised airports to be more efficient than publicly owned ones include Graham (2009), Pels et al. (2003), Tsui et al. (2014) and Chen et al. (2017). On the other hand, Martini et al. (2012), analysing evidence from Italian airports, found that airport efficiency increases with the higher stake of public local authorities in the airports' ownership structure. This could be explained by the fact that local authorities may be more sensitive to problems related to noise and local air pollution, since they affect their voters. This argument could potentially mitigate the expected benefits from privatisation of airports when accounting for externalities. Likewise, Parker (1999) found no improvement in airport performance when UK airports were privatised in July 1987.

In light of both the above-described evidence and the expected demands on public funds, we can foresee the need for public sector participation in airport development after the war. Whether airport privatisation will be required (or if there will be an appetite for it) remains to be seen. We would in any case recommend making sure the local authorities retain ownership shares and/or a say in managing local airports. Moreover, instead of the central government planning development of aviation infrastructure (which may include, for instance, some kind of a master plan for the airport sector), we believe that decisions on developing regional connectivity should be made at the regional level. Some level of central government involvement will be inevitable, but the balance between such involvement and competition between regions for airline services must be maintained.

An alternative way to involve the private sector while retaining public ownership is airport concession arrangements. These have become rather popular in Eastern Europe over the last two decades. A typical arrangement of this kind involves employing an external company or a consortium to manage the airport over an extended time period (up to 20–30 years). The managing company pays the government (who retains the ownership of the airport) a concession fee, and usually undertakes to upgrade the airport infrastructure. Before 2014, an idea for a similar concession arrangement was entertained for Kyiv Boryspil airport. After the war, such arrangements could be considered to help rebuild major airports that have sustained considerable damage (i.e. Donetsk, Luhansk and Dnipro). Regional airports that did not have well-developed infrastructure before the war and sustained damage from Russian bombardments (such as Vinnytsia and Kryvyi Rih airports) could also benefit from concessions.

Economic regulation of aeronautical charges (fees charged by the airport to the airlines and other users of its aeronautical infrastructure) also takes different forms around the world. Some countries (including many European states) use different forms of rate-of-return regulation, with the use of incentive regulation mechanisms. In the United States, there is no direct economic regulation of airports. Hard regulation is effectively

substituted by general guidelines, essentially preventing airports from abusing their market power – non-compliance with these guidelines may lead to the airport losing access to a pool of federal funds. In Australia and New Zealand regulation is replaced with monitoring of charges, with a credible threat of reintroduction of rate-of-control regulation should airports be found to be abusing their market position. Some airports – notably, most airports in the United Kingdom – are free to set charges as they see fit. In that country, the Civil Aviation Authority conducts periodic market power assessments to determine which airports should face regulated charges. Currently, only London Heathrow and London Gatwick – the country’s two largest airports – face regulated fees.

We believe that some form of the UK’s regulatory approach may work for post-war Ukraine. Competition with surface transport and between airports (aided by developed surface transport network) will likely imply that most Ukrainian airports (with the possible exception of Kyiv Boryspil) will not be found to possess market power. However, regulatory determinations of this kind will need to be backed by market power assessments.

8 CONCLUDING REMARKS

The post-war Ukraine will be a country on its way towards European integration, with minimal links to Russia. At the same time, the country will continue to face the threat of another Russian assault. Prospective NATO membership may make full-scale invasion unlikely, but it will not preclude hybrid attacks of some form. Post-war transport infrastructure needs to be rebuilt and reformed to reflect this reality.

Prior to the Russian invasion, the Ukrainian rail sector had been on a reform path which would ultimately had led to the introduction of competition for provision of services. Public–private partnerships have been attempted in road and port sectors. The country’s aviation sector was already reasonably well integrated into Europe and detached from Russia since 2014 (with the exception of occupied Crimea, which kept receiving illegal services by Russian air carriers up until 24 February 2022).

In this chapter, we have discussed both post-war reconstruction and institutional reform issues. The scope of reconstruction requirements and costs is difficult to estimate at this stage, since the war is ongoing. However, some large-scale transport infrastructure reconstruction projects can already be identified, including rebuilding some of the airports and reconstruction of damaged port infrastructure, rail lines and roads. Wartime experience gives us some cause to be cautiously optimistic – liberation of Ukrainian territories has been followed by swift restoration of passenger rail services, and some of the key airports and air navigation infrastructure have so far not sustained serious damage, suggesting that civil aviation activities could be resumed within weeks after the end of hostilities.

In relative terms, port infrastructure has so far sustained the most damage. However, we suggest spending the most on infrastructure reconstruction and upgrades in the rail sector. Ukraine's rail grid was built around the Moscow-centred radial network, which means that rail connectivity both within Ukraine and between Ukraine and Europe was not a high priority. Also, Ukraine's track gauge is wider than that in Europe. Changing the track gauge, despite the time and cost involved, is a worthwhile investment. It will serve the dual purpose of facilitating trade links with Europe and disrupting Russian military logistics, thus raising the cost of another attack on Ukraine for the aggressor.

Demands for infrastructure rebuilding and upgrades will obviously exceed the government's ability to pay for them with the public funds. This will necessitate the involvement of private funds. We anticipate the use of PPPs rather than privatisation. Most of the country's transport infrastructure has remained publicly owned up to now – with the exception of river ports. Privatisation would require legislative action and would likely not be as readily acceptable to society as PPPs.

In the rail sector, the key institutional reform issues will be separation of infrastructure from service provision and economic regulation. The choice of model should be evidence-based rather than politically motivated. Studies suggest considerable economies of scope and density between infrastructure and service provision, implying that a vertically integrated model should not be discarded as a possibility. Evidence from European and UK rail companies do not point to a clear winner among the organisational models employed there. The Ukrainian government's pre-war approach to reform, set to eventually lead to some form of vertical separation, may need to be reviewed.

Regardless of the model and the degree of private sector involvement in the railroad industry, there will be a need for robust economic regulation (at a minimum, of the company managing the rail infrastructure). Similarly for highways, if road user charges are implemented, economic regulation of these will be required. We believe that the regulatory requirements will be different in the port and aviation sectors. Competition between ports (as well as between airports) will ensure that most of them will not require government intervention in the setting of charges for the use of this infrastructure. Yet, such regulatory determinations must be evidence-based, following, *inter alia*, studies to analyse the extent of market power of ports and airports.

The post-war geopolitical reality of minimal links between Ukraine and Russia will in particular change the intensity and pattern of use of the surface transport infrastructure in the eastern part of Ukraine. As private sector capital will play a role in funding this infrastructure after the war, we can anticipate pressure on the government to reduce the level of funding for highways and railroads in the east of the country. This is, however, going to be the region in need of the lion's share of reconstruction funding. This point stresses the preference for PPPs rather than privatisation of transport infrastructure in Ukraine – the former will ensure a certain level of emphasis on social welfare in decision-making related to transport infrastructure investment.

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Accelerating urban economic growth in Ukraine¹

Richard K. Green,^a J. Vernon Henderson,^b Matthew E. Kahn,^a

Alex Nikolsko-Rzhevskyy^c and Andrii Parkhomenko^a

^a*University of Southern California (USC);* ^b*London School of Economics;*

^c*Lehigh University*

EXECUTIVE SUMMARY

Over 70% of Ukraine's population lives in cities. Rebuilding Ukraine means rebuilding its cities. Examples of successful urban rebuilding after wars include cities in Germany and Japan after World War II and Sarajevo after the Balkan Wars.

While Ukraine has a regular city size distribution, its national population is declining and Kyiv was the only major city to grow since 1989. Ukraine's measured GDP per capita is the lowest in Europe, which presents a challenge to recovery and rebuilding. A further challenge relates to institutional capacity to undertake massive infrastructure investments. Ukraine will require massive aid and institutional capacity building.

For political and social reasons, Ukraine needs to rebuild cities such as Donetsk, Mariupol, and Kharkiv. But these cities were on a bad trajectory even before 2014, as economic activity moved east to west since 1990. Ukraine is undergoing a structural transformation out of heavy manufacturing into services, with the loss of Russian markets and heavy-industry firms that are not competitive on world markets.

The country's eastern cities need to transform to attract people. The state-dominated capital market should resist the temptation to prop up industrial firms. Three areas where the public sector could create jobs are national bureaucracy, universities and healthcare facilities.

Generally, eastern cities will shrink in size, but some more so than others. There are examples of industrial cities that transformed their economic bases and shrunk successfully (Pittsburgh) and others that have not (Detroit). Successful cities have maintained high-quality government services.

1 The corresponding author is J. Vernon Henderson (J.V.Henderson@lse.ac.uk). An early draft portion of this chapter was written in consultation with Igor Balaka, Andriy Kolos, Olga Solovei, and Anatoliy Tkachenko. We thank Daniel Angel for excellent research assistance. We also thank participants of the CEPR Workshop on Ukraine in Paris for comments and suggestions.

Policies to make cities more competitive include greening and freeing capital markets. Ukraine's road and rail networks are dense, but not modern. The country needs a limited-access highway network comparable to the rest of Europe, and standard gauge railroads to link to the West.

The Soviet legacy means Ukraine's housing stock is unusual in two ways: high rates of ownership and most people living in flats. Freer housing markets would have different mixes of housing typologies.

Many cities – even those with considerable destruction – may have an oversupply of housing units because of large drops in population. Rehabilitation of damaged homes and the use of prefab and mobile homes will help in the short term. Refugees are where housing is not, and housing is where people are not.

After the war, many people will want to return home. For those whose dwellings were destroyed, it will be most effective to provide vouchers equal to the value of destroyed units. However, in many cities property values could be lower than replacement costs, and stipends may need enhancement. Vouchers should enable recipients to purchase new or existing units, rent units, or self-build anywhere in the country. Supply should meet the market demand test.

To allow for more competition and transparency, privatisation of land markets and abandonment of Soviet-style allocations are needed. Land should be auctioned in an open and transparent process to individuals and developers.

Development of a competitive, transparent construction market that allows for the entry of new firms and foreign developers is essential. Major urban construction projects are notorious for cost overruns and delays. Credible competition creates better incentives to deliver.

Ukraine needs benchmarks for reconstruction progress, but has unusually poor data. Creating publicly available data on real-time indicators of urban reconstruction and local quality of life will create accountability incentives and help cities benchmark their relative progress.

1 INTRODUCTION

Once its war with Russia is over, Ukraine will need to rebuild its economy. It will not only face the challenges of rebuilding, but also of invigorating an economy that was underperforming before the full-scale war, and indeed, even before the Russian invasion of Crimea. Rebuilding the nation's cities will play a central role here because Ukraine is a heavily urbanised country, with 70% of its residents living in cities.² Ukraine is more urbanised than other European countries of the former Soviet Union with the exception of Belarus.

A robust debate exists in the urban economics literature about whether urbanisation leads to economic growth or vice versa. That debate is not particularly germane in the context of Ukraine, because the country is already urbanised and has a fairly typical size distribution of cities. Rebuilding and improving its economy will therefore require the rebuilding and improvement of its cities.

Before delving further into the specifics of Ukraine, let us set the stage by noting that we have many examples of the successful rebuilding of post-war societies, meaning that there is cause for optimism. Nor is this a new phenomenon – the Romans rebuilt their city relatively quickly after being attacked and pillaged by the Gauls in the fourth century BC. There are three immediate examples of places that had success rebuilding rather quickly after devastating wars: the former Axis powers in the aftermath of World War II, South Korea in the aftermath of the Korean War and the Balkan states that were previously collectively Yugoslavia. Davis and Weinstein (2002) showed that Hiroshima and Nagasaki both resumed their population growth paths within 30 years of their devastation and that the most thoroughly bombed cities had the most rapid rate of recovery after the war.

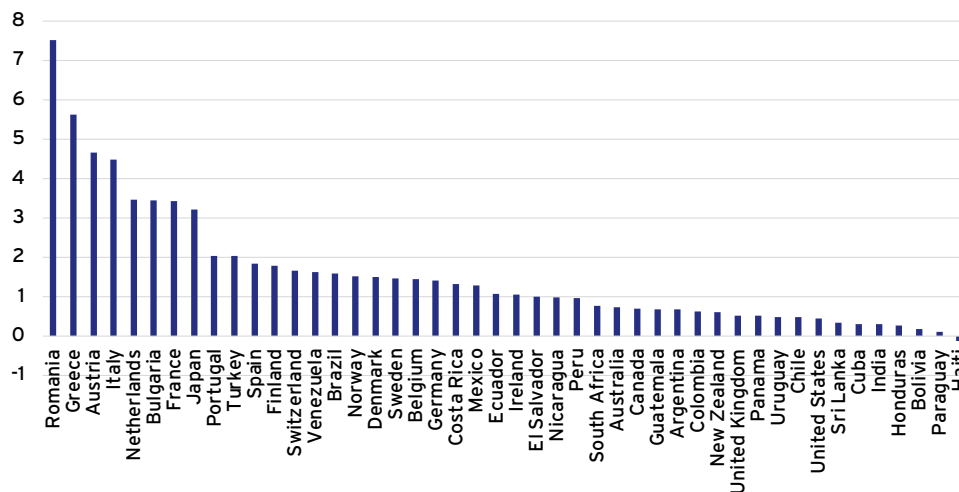
In the 25 years following World War II, the economies of Japan and Germany, places that were devastated by the war, saw per capita GDP grow by 321% and 140%, respectively. In contrast, the United States' per capita GDP grew by 40% (Figure 1). The high numbers for Japan and Germany do not just reflect a low base, because by 1970 they were among the world's wealthiest economies.

South Korea had similar economic success in 25 years following the end of its conflict – by 1988, its per capita GDP was nearly ten times larger than it was at the time of the ceasefire in 1953. While its base was especially low at \$1,300 per capita, by 1988 it was about 80% as affluent as Japan and Germany in 1970, and of course, shortly thereafter joined the ranks of high-income countries. The story is similar for the six Balkan countries that emerged shortly after the end of that conflict. Per capita growth between 1993 and 2016 (the most recent year for which data are available for all countries) ranged from 73% in Macedonia to 495% in Montenegro (Figure 1).

2 <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=UA>

These facts are encouraging – places can and do recover rapidly economically from devastating conflicts. Do policymakers simply need to apply the lessons of the past to Ukraine’s future to be successful? The answer is ‘not exactly’.

FIGURE 1 GDP GROWTH, 1945-1970



Source: Bolt and van Zanden (2020).

For example, much of the success of the rebuilding of Germany is rightfully attributed to the Marshall Plan (for a contrarian view, see Henderson 2008). The United States provided more than \$13 billion (in 1948 dollars) under the Marshall Plan between 1948 and 1952, along with another \$13 billion in aid in the immediate aftermath of World War II. US GDP in 1948 was \$275 billion, and over a six-year period it provided nearly 10% of one year’s GDP in aid. Perhaps more importantly, US GDP accounted for half of the world’s GDP in 1945, and Western Europe’s considerably less than a half. The amount of aid the US provided was inordinately large.

However, money alone is clearly not enough. The United States provided large amounts of aid to Afghanistan and Iraq, and yet both countries have failed to grow. The successes in West Germany came as the result of initial conditions and institutional reforms, as well as the aid provided. Carlin (1996) notes:

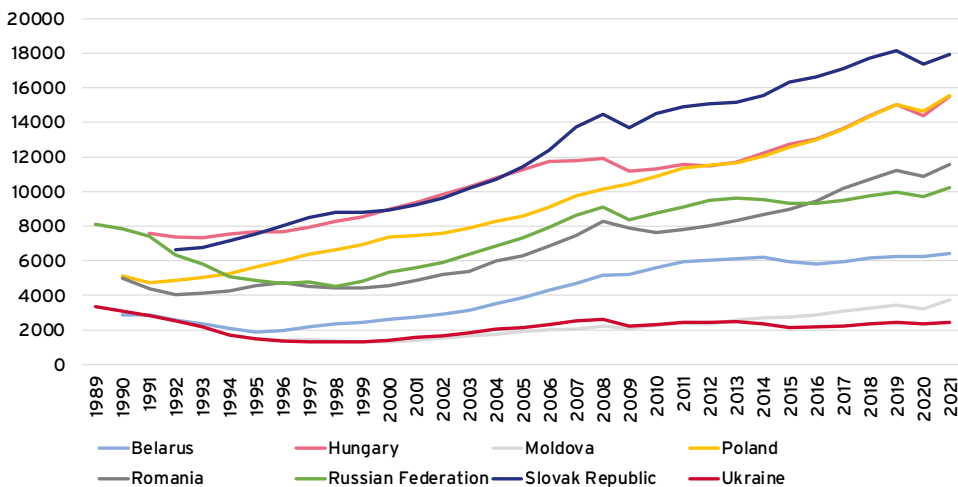
Between the cessation of hostilities in 1945 and the economic and currency reform of mid 1948, West German economic recovery was constrained by both physical and institutional factors. Destruction of the industrial capital stock and of the labour force were not responsible for the low level of output. Behind the appearance of chaos and destruction was an industrial capital stock considerably larger and of more recent vintage than before the war. The balance between wartime investment and

destruction had favoured the German economy relative to that of the 17 other major Western European countries. The industrial capital stock was just higher in 1948 than in 1939 with a more favourable age structure and technically more advanced, in spite of disinvestment and dismantling after 1945 (Krengel, 1958).

She also attributes much of West Germany's success to currency reform, rigorous enforcement of property rights and the lifting of price controls.

Moreover, with the exception of South Korea, all the places listed above were economically successful relative to their peer groups (a term we shall soon define) prior to their physical destruction. Ukraine has *not* been successful economically relative to its peer group. Before the first Russian invasion (of Crimea and parts of Eastern Ukraine in 2014), per capita GDP in Ukraine was lower than it was in the aftermath of the break-up of the Soviet Union, and in 2021 it was even lower still. Before the second invasion in 2022, it was the second poorest country in Europe and had fallen considerably behind other European members of the former USSR, such as Latvia, Lithuania, Estonia and even Belarus (see Figure 2). Some might argue that the Baltic states are not really peers, because they had long faced west and were brought into the Soviet Union after World War II. But Belarus, like Ukraine, has long been within the Russian orbit. Among all its neighbours, Ukraine is the poorest, and has grown the least since 1989. While we understand that much of Ukraine's economic activity is 'off the books', our understanding is that GDP estimates attempt to take that into account. Moreover, its neighbours have 'black economies' of their own, and clearly their growth trajectory has been better than Ukraine's. We will discuss within this chapter some of the reasons why Ukraine has had such a weak growth – among them being outdated transportation infrastructure both within and between its cities.

FIGURE 2 GDP PER CAPITA, 1990-2021 (CONSTANT 2015 USD)



Source: Federal Reserve Economic Data: <https://fred.stlouisfed.org/>

Ukraine's poor economic performance before the Russian invasion makes it quite different from countries that recovered quickly in the aftermath of wars. The one exception to this may be South Korea, which was extremely poor before World War II and the Korean War and had a sub-30% literacy rate. Whether by design or not (Kim 1991), the first thing South Korea did in the aftermath of the war was to use aid to invest in human capital. By 1962, a year many see as the turning point for industrialisation in South Korea (Kim 2018), the literacy rate had increased to nearly 80% (Lucas Jr 1993).

Beginning in the early 1960s, President Park Chuing Hee began an economic development strategy based on industrialisation and exports, a strategy that led to an inflection point in the development of that country. As we think about systems of cities, we also need to note that the urban population of South Korea has grown six-fold since 1960. The Seoul Capital Area (Seoul, Inchoen, and Gyeonggi Province) has grown five-fold since 1960, while the second largest city in South Korea, Busan, has grown three-fold. The Seoul area now has half the population of all of Korea, up from about one-quarter in 1960. Seoul and Busan's share of Korea's urban population has actually shrunk over the past 60 years.

As dominant as Seoul appears to be, then, and as small as South Korea is geographically (it has one-sixth the area of Ukraine), South Korea's success is not simply built on the one dominant metropolis; other places in that county have thrived as well. Yet while the South Korea of 1953 shares with Ukraine a modest starting point for post-war development, it has many differences as well. South Korea was a rural society in the aftermath of its war; Ukraine is largely urbanised. South Korea had high illiteracy before its war; Ukraine does not.

Ukraine was not in a good starting place and has sustained serious damage in its eastern cities, meaning that a rebuilding 'miracle' may take time. Rebuilding must show promise from the beginning in order for the institutions necessary for rebuilding to be sustained. But a credible rebuilding process requires that the Ukrainian people know that the path to prosperity will take years, if not decades. Even after South Korea's economy began accelerating in the 1960s, it was not prosperous enough to join the OECD until 1996.

The rebuilding process will require integrating a clear set of 'rules of the game', incentives, data collection and transparency to facilitate a cost-effective process that yields high quality of life and productive cities. We suggest a set of rules that increase the likelihood that competitive cities and neighbourhoods emerge to give urban Ukrainians a vibrant menu of options. Such a menu will help shorten the time until urban life is back to normal, reduce the social costs of urban living, and maximise the social benefits and positive agglomeration externalities of cities.

Spatial competition will play out as urban workers and firms choose where to locate. In choosing what city to move to, people will trade off job opportunities, housing prices, quality of life and the opportunity to return to their family and friends. Firms will calculate what their profits will be in each possible destination location. These locations will differ with respect to their factor prices and with respect to their transportation costs of inputs and outputs.

Cities in western Ukraine will face less risk from Russia and are economically closer to Western Europe. Cities towards the east, such as Donetsk, Mariupol and Kharkiv, have suffered great damage. As Davis and Weinstein (2002) show in the Japanese context, heavily damaged cities can snap back quite quickly. The authors also show, however, that cities return to their prewar population trajectories. The trajectories of Donetsk, Mariupol and Kharkiv were negative before the spring of 2022. Not coincidentally, these cities also relied disproportionately on heavy manufacturing for employment. The evidence suggests that the firms doing the heavy manufacturing were not competitive, particularly in a world where the future orientation of exports will be towards the West. As such, the cities of eastern Ukraine were already following the trajectory of cities in Northern England in the 1960s, the Rust Belt of the United States in the 1970s, and the cities of the former East Germany in the 1990s. Our view is that for these cities to repopulate, they must reinvent themselves with a very different economic base. They might also accept the possibility that their long-term populations will be lower than their peaks, which must be the case given that Ukraine's population was falling even before the Russian invasion. We shall discuss cities that have successfully shrunk themselves into prosperous, pleasant places.

We will note the importance of considering policies that help to repopulate eastern Ukraine and achieve economic growth in this region so that workers and firms move there voluntarily. This will be a central government goal and a focus of aid efforts. However, we will emphasise the difficulties involved: the past and ongoing industrial decline; the low quality of higher education; the risk associated with future conflict and incursions, corruption and the like. All workers and firms should have a choice concerning where they locate within the nation, albeit influenced by policy. During the war, there has been an active policy to encourage firms to move to the western regions.³ This push may lead to persistent changes due to agglomeration effects. Moreover, the rust-belt decline in the east already involved an outflow of population pre-war, and out of over 13 million war refugees, many came from eastern regions of the country. How much repopulation is realistic and what will be the cost to the national economy of focusing on repopulation of eastern Ukraine? We will discuss key issues that might help make return and eastern cities more attractive to firms and workers.

3 www.nytimes.com/2022/08/15/business/war-ukraine-factories.html

A long tradition in urban economics studies the interplay between where firms locate and where workers locate. A high-stakes ‘chicken or egg’ issue arises for Ukraine going forward. Do policymakers focus on attracting employers to locate in the eastern region, creating industrial clusters that will lure back workers? Or do policymakers focus on building liveable cities that attract workers and have firms follow them?

We delve into specific details about the inner workings of Ukraine’s cities, focusing on the damaged eastern cities. Within cities, classic trade-offs emerge. Population density and home prices decline with distance from employment, shopping and cultural centres. Population and employment density tend to be high near the centre. With technology revolutions in the first part of the 20th century, manufacturing employment decentralised and then even suburbanised, levelling the classic density gradient to some degree. As Western economies evolved from manufacturing, dense clusters of city centre financial and business services emerged in bigger cities. Transportation quality and speed play a key role in determining these observables. A city’s layout also depends on its history, urban planning and resource prices. The high density of cities creates positive spillovers, learning and trade, but can also exacerbate negative effects, such as congestion and pollution, if such social costs are not priced through incentives to care for the commons. In part, the optimal degree of city centre density in Ukrainian cities will depend on their industrial base.

We also consider the appropriateness of the housing stock in Ukrainian cities, both from the standpoint of those who own houses and in terms of typology. Ukraine is among Europe’s leaders in homeownership and the share of households who live in flats. This is not necessarily in the best interest of Ukrainian cities.

In a post-war setting, urban capital investment is accelerated as there is a ‘big push’ to quickly rebuild to ‘get back to normal’. On the one hand, this creates exciting opportunities to build a new set of roads, homes and urban infrastructure that facilitate trade and social interaction.⁴ On the other hand, an enormous expansion of foreign direct aid and investment creates accountability challenges and raises questions of the actual urban multiplier. How much physical capital, and of what quality, will be built using the new funds? Given the considerable amount of money that will be spent to rebuild Ukraine’s cities, it seems inevitable that public sector procurement issues will arise as they do around the world, as well as issues in allocating housing and land, as discussed below. In 2021, Ukraine ranked 122 out of 180 countries in Transparency International’s Corruption Perception Score.⁵ While this is an improvement over its 2013 rank of 144, it still does not inspire confidence that aid to the country will be used efficiently without strong oversight and reform.

4 Kwon (2022) discusses how high-speed rail is changing the system of cities in South Korea.

5 www.transparency.org/en/cpi/2021/index/ukr

Throughout this chapter, we consider prospective policies and offer policy recommendations while being keenly aware of the considerable uncertainty about the future. This uncertainty takes several dimensions that we attempt to sketch out. Given uncertainty, a prudent rebuilding strategy bundles in investments that unlock the potential of individuals and places without ‘locking in’ future sunk investments that may fail to offer the promised rates of return. Facing this reality, we cannot offer a guaranteed recipe for success. Instead, we seek to highlight key trade-offs and to propose a development strategy that builds in ‘real options’ so that decision makers can reoptimise in the future as they have more information about the evolving opportunities and challenges posed in rebuilding. That suggests an approach where cities receive initial allocations, but then the sizes of subsequent allocations depend on each city’s response and, hence, the demand forces those responses reflect.

We discuss various empirical metrics for judging city quality of life and productivity as a way to benchmark progress in real time. We propose a series of real-time spatially tagged data, including lights at night, cell phone coordinates and real estate transactions, for measuring the health of the local economy.

Despite uncertainty about how the war will end, we need to form a set of assumptions for our analysis. We assume that Ukraine will win the war and that it will not last more than a few years. We also assume that Ukraine will be able to take back territories lost to Russia. Finally, we assume that trade with Russia will be minimal, while at the same time the Ukrainian economy will continue its integration with the EU.

2 THE SYSTEM OF CITIES AND REGIONAL CONVERGENCE

Urbanisation plays a central role in a nation’s economic growth. Ukraine features over 40 cities with more than 100,000 people.⁶ The population distribution of these cities reflects a commonly found distribution of economic activity within countries (i.e. it more or less follows Zipf’s law). Most notably, unlike the capitals of Japan or South Korea, for example, Kyiv is not particularly primate as its share of the nation’s urban population is less than 12%. Many cities play an important role. Together, these cities form a system.

In this section, we describe the economic geography of these cities before the war. This history matters for planning for the post-war period, as pre-war trends in industrial and regional activity reflect evolving comparative advantages of different regions. We discuss the forces that would promote economic growth and recovery of cities in the east, but recognise that recovery will not be uniform across cities. Moreover, we focus not on restoring pre-war populations but on developing cities with a healthy long-term economic growth potential so as to contribute to accelerating the overall economic growth of Ukraine. What factors will encourage residents and firms to return to eastern

6 www.econ.brown.edu/Faculty/henderson/worldcities.html

Ukraine and sustain growth and a good quality of life? Crucial will be the operation of capital, land and housing markets and upgrading technologies. Also crucial are the inter-city transport infrastructure investments needed to promote exports to the rest of Ukraine and to other nations.

2.1 Key economic geography facts

For the purposes of analysis, we divide Ukraine into seven regions: West, Centre, Kyiv, South, Crimea, East, and Donbas. Figure 3 shows the regions on the map. Note that Crimea came under Russian control in 2014. Also, disguised under the label of separatist republics, Russia has partly occupied the Donbas since 2014.

As in any country, economic activity in Ukraine differs by region. While agriculture (11% of national GDP)⁷ and services (65%) are more or less equally spread across regions, mining and manufacturing (17% of national GDP) are heavily concentrated in the East and the Donbas regions, although some cities in the South and Kyiv are also important manufacturing centres. As of 2019, the shares of mining and manufacturing in regional employment were 34% in the East region and 40% in the Donbas region. While the two regions account for just 13% of all of Ukraine's workers, they constitute over 30% of national mining and manufacturing employment. The key manufactured goods produced in the two regions are heavy industrial machinery and fabricated metal products, while mining focuses on coal and iron ore.

FIGURE 3 DEFINITION OF REGIONS IN UKRAINE FOR THIS CHAPTER

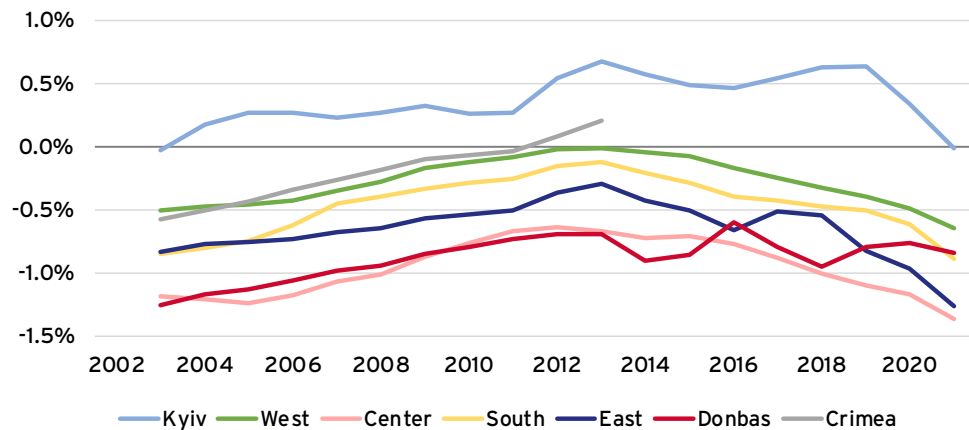


Source: Authors' definition of regions.

7 Agriculture's share of GDP in Ukraine is higher than any other European country save Moldova, which is not coincidentally the only economy in Europe with a lower per capita GDP.

One of the defining features of Ukraine is its declining population. Ukraine has one of the lowest birth rates in the world (1.23 births per woman) and has also been losing people to emigration. As a result, its population fell from 52 million in 1990 to 41 million in 2021.⁸ However, not all regions lost population (see Figure 4). Kyiv expanded from 4.4 to 4.7 million between 2002 and 2021 and its share in the total population of the country went up from 9% to 11%. In 2018, the Kyiv region accounted for as much as 32% of new residential construction in the country. The West experienced a slower population decline than the rest of the country, and its share in the total population grew from 23% to 25% since 2002. The East and the Donbas suffered greater losses, with high losses post-2014. The current war has created a further enormous refugee problem that we discuss below.

FIGURE 4 POPULATION IN UKRAINE'S CITIES (% YEAR-ON-YEAR CHANGE)



Source: National Statistics Committee and authors' calculations.

These population trends have been mirrored to some degree in overall regional economic performance. Figure 5 shows the share of each region in the country's output. Kyiv has been a magnet of economic activity: its share in output went up from 21% in 2002 to nearly 30% in 2020. As we will see later, services dominate Kyiv's economy. The capital's output per capita is nearly three times higher than for the country as a whole.⁹ The share of the West has also grown, from 15% to 18%.

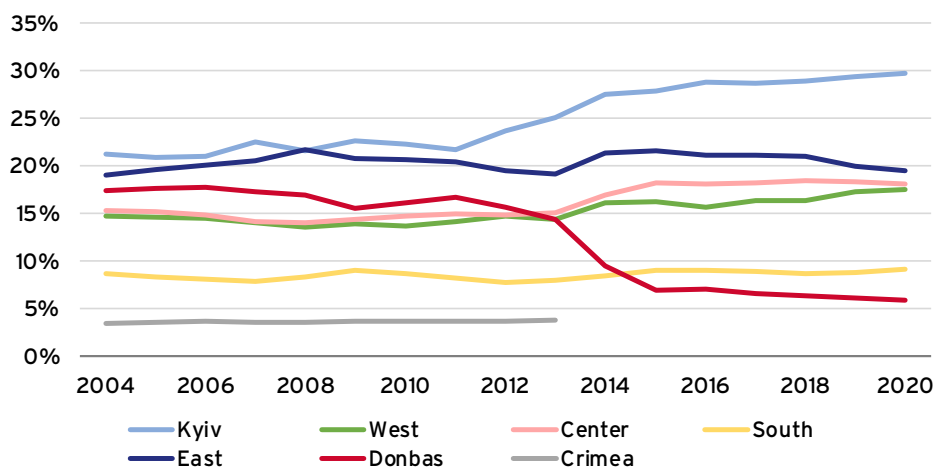
Similarly, the share of the Centre increased from 15% to 18%. The relative shares of the South and East have remained stable, while the share of Donbas plummeted from 17% to 6% post-2014.

8 Part of the decline in population is due to the annexation of Crimea by Russia in 2014 and the war in the East that also started in 2014. Yet, demographic and economic causes explain most of the population loss.

9 In 2020, Ukraine's GDP per capita was \$3,750. In the Kyiv region the number was \$9,814, and in the city of Kyiv it was \$12,690.

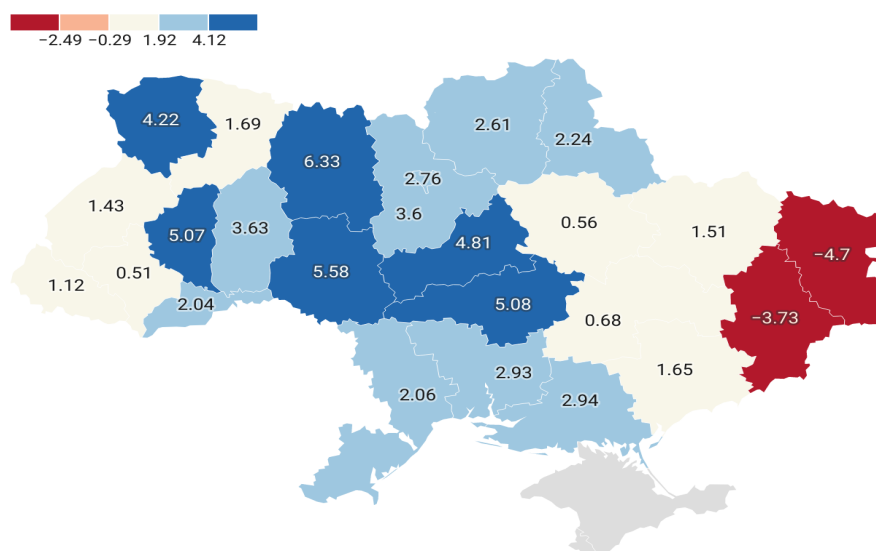
Note that the downward population and output trends in eastern Ukraine started before 2014 and accelerated with the annexation of Crimea and the war in the eastern part of the country. Figure 6 looks at real growth of regional output per capita. Poor performance in the East and the South reflects the forces behind outmigration from these regions prior to the current war. The fastest growing oblasts in terms of per capita income are nearly all in the Kyiv, Centre and West regions.

FIGURE 5 SHARE OF OUTPUT OF UKRAINIAN REGIONS (% OF NATIONAL OUTPUT)



Source: National Statistics Committee and authors' calculations.

FIGURE 6 ECONOMIC GROWTH OF REGIONS IN UKRAINE



Created with Datawrapper

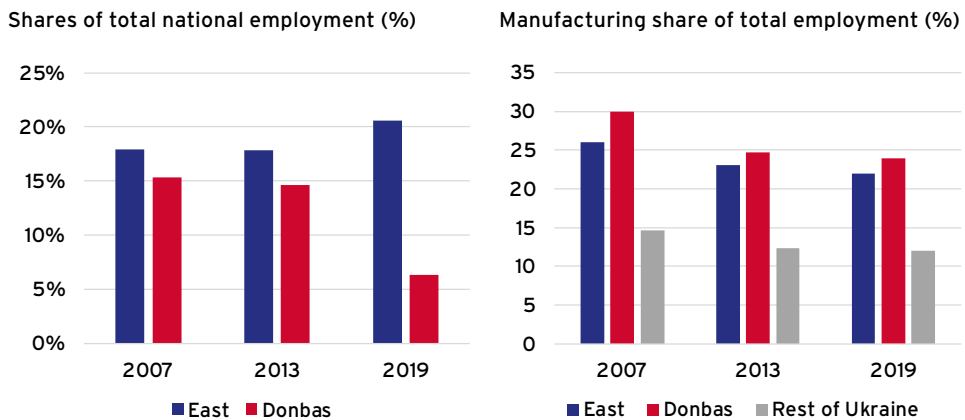
Note: Annual average percentage change of GRP per capita from 2004 to 2017 (constant 2010 prices).

Source: Getzner and Moroz (2022).

Part of the issue overall for Ukraine and its eastern part is structural transformation as the country transitions away from mining and manufacturing. The combined share of mining and manufacturing in Ukraine's employment went from 19% in 2007 to 16% in 2013, and to 15% in 2019. Since 2014, the war between Ukraine and Russia has affected a large part of the Donbas and has caused a massive decline of economic activity in the region, which is traditionally a cradle of Ukraine's mining and manufacturing (in 2007, it accounted for 15% of the country's employment but 30% of mining and manufacturing employment). However, the war does not seem to explain the structural transformation that has been taking place since at least 2007.

As can be seen in Figure 7, manufacturing's share of total employment fell in the Donbas between 2007 and 2013 and has kept falling since. These manufacturing jobs did not relocate elsewhere; they simply disappeared. Similar reductions happened in another mining- and manufacturing-heavy region, the East, as well as in the rest of Ukraine. In the East and the Donbas regions, older manufacturing workers are retiring, people are switching out of manufacturing as plants close or modernise and become more automated, and younger potential workers are moving to the West. The war will only speed up this process, which started before 2014 and continued after.

FIGURE 7 REGIONAL SHARES AND MANUFACTURING EMPLOYMENT SHARES OF EAST AND DONBAS REGIONS



Source: National Statistics Committee and authors' calculations.

A closer look at changes in the economic structure of the East and the Donbas suggests a transition similar to the one that has been happening in the American Rust Belt since the 1970s. Table 1 shows that huge job losses in industries that have traditionally been the trademarks of these regions – mining, metallurgy and the production of vehicles –

declined much more than the rest of manufacturing between 2015 and 2019. These three sectors accounted for 43% of manufacturing employment in the East and 52% in the Donbas during 2015–2016. At the same time, jobs in other manufacturing industries in the East region have increased by 4%.

It is not clear how much of the recent decline in the Donbas is due to the first Russian invasion in 2014 and the resulting reduction in trade with Russia versus structural change. But the East was not directly affected by the war. Still, it could be affected indirectly via two opposing channels. On the one hand, some economic activity could have shifted regionally from the Donbas to the East. On the other hand, firms in the East could have lost buyers in the Donbas and in Russia, which led to falling employment there.

One event highlights the decline in manufacturing employment in these two regions. The city of Zaporizhzhia in the East is home to the only producer of automobiles in Ukraine, ZAZ. Since Soviet times, the company has had a reputation for producing low-quality, cheap vehicles. After years of unprofitable production subsidised by the state, ZAZ's output started falling in 2015 and its production all but stopped by 2019. This example of a single company likely applies to many other producers in the region that have not been able to significantly improve their product since the collapse of the Soviet Union and lost out to foreign competition after international trade became possible in the early 1990s.

TABLE 1 EMPLOYMENT IN MANUFACTURING MINING AND UTILITIES, 2015/6–2019 (% CHANGE)

	East	Donbas
Mining	-13%	-33%
Metallurgy and finished metal products (except machines and equipment)	-13%	-49%
Vehicles	-48%	-81%
All other manufacturing and utilities	+4%	-26%
Absolute overall losses (1,000s of workers)	600 to 562	292 to 191

Source: National Statistics Committee and authors' calculations.

2.2 The refugee issue

The war has already displaced over 13 million people, nearly one-third of Ukraine's population, causing the largest relocation of people in Europe since World War II.¹⁰ Around 6 million of the refugees have moved abroad, mostly to other European countries, while the remaining 7 million have moved to other regions within Ukraine, primarily to

central and western areas of the country. Many of the refugees may not come back, and this will cause Ukraine's population to decline even further, beyond what is expected given nationally declining fertility. Similarly, it is unclear how many of the internal migrants can be induced to return to their homes primarily in eastern Ukraine.

Refugees from conflict areas currently present an elevated demand for housing, public services and infrastructure in non-conflict areas to the west. The government will, for understandable political and military reasons, want some or all who migrated west to return east after the war. However, the future prosperity of Ukraine will depend on the government accommodating the preferences of the labour force, meaning that it should not withhold resources for construction and reconstruction from the country's centres of economic activity.

How much should the government encourage people and firms to return to eastern Ukraine, in the face of a general pre-war out-migration to the West and Kyiv and an uncertain future that may not entail a permanent and agreeable settlement? That is a question we try to address in the sections below. Our proposition is that for the future security and development of Ukraine, it will be important to have economically healthy cities in its eastern regions. Many of these may be much smaller than in 2014. Rather than a stick approach to force population back to the east, we favour an approach with government intervention that induces people and firms to return by making cities attractive and economically healthy places to live.

Migrants make location choices for many reasons, and it is unclear whether a refugee from Mariupol would want to settle in Kyiv, Lviv or Chernivtsi, or return home – provided Mariupol is reunited with Ukraine. As a result, it is difficult to predict changes in demand for living in each individual Ukrainian city. As we will detail below, while the government should jump-start public investments at preliminary levels in most cities, it should retain the option to expand those commitments in cities which respond well. The government and economists should remain humble about their ability to predict final post-war population shifts. In general, the government should let people choose where to settle, firms choose where to reopen, and developers choose where to build real estate. It can facilitate these choices via appropriate policies, such as housing vouchers for households, public investments, relocation subsidies for firms and incentives for developers, as discussed below. But specific commitments to any city should be initially limited to see which cities do better, with the option then to spend more in those cities.

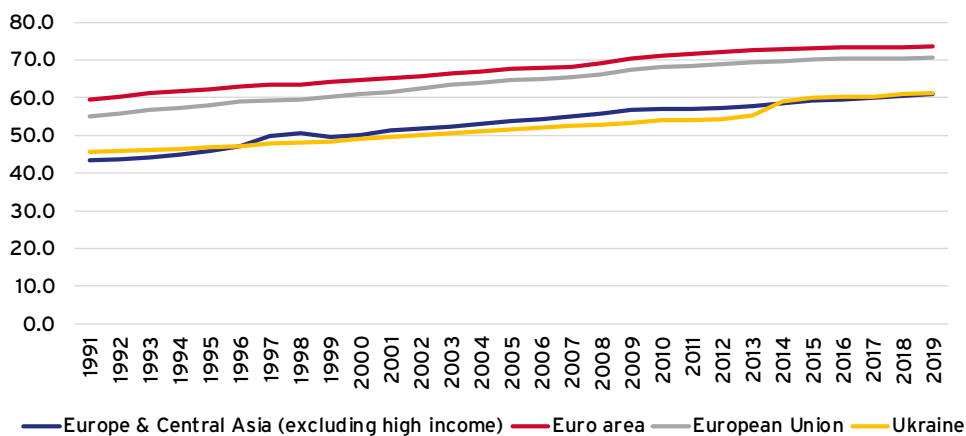
2.3 Forecasting the potential for recovery in eastern Ukraine

Given the national population decline, the pre-war move westward and the difficulty in attracting back refugees, we can reasonably conclude that the population in eastern Ukraine will be significantly smaller than it was pre-war. A city's competitiveness is based not just on its comparative advantage, but also on agglomeration economies. If eastern regions lose 25% of their population, a good outcome is *not* that all cities will

end up at 75% of their prior size. Rather, those with comparative advantages tuned to the future of Ukraine's export base and internal structural transformation will do better; and to do better, those cities will need to operate at a competitive scale to foster agglomeration economies. Some cities may fully recover while others will languish. As noted, planning for flexibility in marshalling market forces is crucial. Can we say more about the possibilities for individual cities?

A classic method for predicting future growth of cities is to look at the composition of their current industrial export base, predict the growth of each individual industry nationally and then apply those national growth rates to the composition (relative shares) of each city's industrial base (Bartik 1991). The idea is that cities each have a comparative advantage, based not just on resource availability but on historical patterns of production because of durable industry-specific capital stocks and historical local industry-specific knowledge accumulation. What a city has done in the past is a good short- to intermediate-term predictor of what it will do in the future. We can look at Ukraine as a whole within the world context, and see that it continues to trail in the industry that has had the most growth worldwide over the past 30 years – namely, services.

FIGURE 8 SERVICE EMPLOYMENT SHARE IN THE EURO AREA, THE EU, NON-HIGH-INCOME EUROPE AND UKRAINE, 1991-2019



Source: International Labor Organization.

Note the jump in service share in 2014 (see Figure 8). This is likely the result of Russia's occupation of parts of the east in 2014 and the decline in manufacturing we noted above. The future of Ukraine's economy, as in most parts of the world, will depend on growth in its service sector, meaning that those cities that are best positioned to host services will be the most attractive.

This presents a challenge for eastern Ukraine. Its manufacturing is in rapid decline and it seems to be generally non-competitive in its traditional heavy industry sectors, although continuing modernisation for some more viable firms is a possibility. However, we note that while the past economic composition of a city is a good intermediate-term predictor in a general context of future comparative advantage, cities do dramatically alter their industrial bases over the years. New York, Chicago and Los Angeles were all at one time heavily reliant on manufacturing for employment; now none of them is. For it to be economically successful, eastern Ukraine must develop its service sector.

To get a better sense of possible future industry development in eastern Ukraine, in Table 2 we show location quotients (LQs) for different industries by region for 2013. A location quotient is each industry's share of regional employment divided by that industry's share of national employment. An LQ of 1 for an industry-region means that region mimics the nation in terms of the intensity of the industry. An LQ greater than 1 indicates relative concentration of that industry in a region. The numbers highlighted in red show LQs below 1 and in blue above 1; more intense colour shows bigger deviations from 1. The table reveals the heavy concentration even in 2013 of modern traded services (information, finance, real estate and administrative) in Kyiv and of manufacturing and mining in the East and the Donbas, which were noted above.

TABLE 2 LOCATION QUOTIENTS, 2013

<i>Macro regions</i>	Agriculture	Manufacturing, mining, utilities	Construction	Wholesale and retail trade	Transportation	Hospitality	Information, communications	Finance and insurance	Real estate	Professional, scientific, technical	Administrative and assistance services	Public administration	Education	Healthcare	Arts, sports, and recreation	Other services
<i>Kyiv</i>	0.15	0.76	1.01	1.01	1.05	1.37	2.85	3.23	2.15	3.02	2.12	1.39	1.01	0.95	1.51	0.90
<i>West</i>	1.43	0.77	1.14	0.89	0.85	1.12	0.68	0.63	0.61	0.56	0.64	0.95	1.16	1.06	1.00	1.35
<i>Center</i>	1.43	0.89	0.88	0.91	0.97	0.65	0.67	0.67	0.64	0.62	0.76	1.10	1.04	1.07	0.92	0.78
<i>South</i>	1.26	0.64	0.89	1.01	1.33	1.12	0.80	0.78	1.18	0.74	0.98	1.04	1.04	0.92	1.07	1.08
<i>East</i>	0.65	1.44	0.92	1.08	0.95	0.90	1.18	0.97	1.26	1.11	0.96	0.82	0.94	0.92	0.76	0.74
<i>Donbas</i>	0.65	1.54	1.11	1.11	1.10	0.86	0.60	0.66	0.78	0.66	1.04	0.78	0.78	0.91	0.94	0.96
<i>Crimea</i>	0.99	0.60	1.00	1.18	0.88	1.51	0.74	0.70	1.01	1.20	1.24	1.15	0.88	1.26	1.10	1.38

Source: National Statistics Committee and authors' calculations.

What can Table 2 tell us about the potential for the East and the Donbas in the future? As can be seen, even in 2013 the Donbas had a credible LQ in private administrative and assistance services. This suggests that in post-war Ukraine, this region may become more specialised in back-office, administrative and support services, given the ongoing decline of its manufacturing base. At the same time, both the Donbas and the East had a relatively low LQ in public administration. This suggests that there may be room to move a large number of government jobs to the region. This approach has been tried

in the United States when, in response to the economic decline in the state of West Virginia, the government encouraged relocation of some jobs there. Hence, one possible reconstruction strategy for the Donbas and the East could be to become the 'back-office capital' of Ukraine for both the private and public sectors.

Table 2 also illustrates the relative scarcity of education and healthcare jobs in the Donbas, as well as in the East. The US experience shows that coordinated efforts to bring jobs in these sectors can spur economic growth in the long run. For instance, Liu (2015) shows that the land-grant programme to create universities in the United States in the 19th century led to stronger population and income growth in the long run in places where universities were established. Therefore, another possible strategy for urban growth in the Donbas and the East is to encourage the creation of universities and medical centres. The expansion of medical centres would also help Ukraine deal with trauma suffered in the region. These steps will not only create high-skilled jobs in the region but also attract other supporting jobs in the service sector and make universities and medical centres anchors of long-run economic development.

2.4 Enhancing the competitiveness of the eastern region

We now turn to policies that are relevant to making eastern Ukraine more attractive to firms and people. The eastern cities compete with other Ukraine's cities for people and jobs. Urban and regional economists emphasise that within a system of cities, those that feature low productivity and low quality of life will have low real estate prices. This acts as a compensating differential rewarding those who choose to locate in this area. If the threat of future war lurks for eastern cities, then this will only accentuate the real estate price discount in these areas. This idea will affect our discussion of housing policies in the next section.

The US experience highlights some success stories such as Pittsburgh, which made the transition from heavy manufacturing to upskilling its economy. Unfortunately, this transition took decades. Then there are other American cities, such as Detroit, that both deindustrialised (with the loss of vehicle manufacturing jobs) and were misgoverned so that local services were poor and taxes were high. In such a case, the durable housing stock remains and as demand declines, home prices drop. Many US Rust Belt cities have suffered from a poverty magnet effect due to the combination of a durable housing stock and the decline of local manufacturing activity (Glaeser and Gyourko 2005). One takeaway lesson from the US experience pertains to 'history versus expectations'. Cities are more likely to pivot and make a comeback if workers and firms have legitimate reasons for being optimistic about the trajectory of a place.

The lurking threat of future war risk acts as a tax on investment in the east and on migration to the east. Even when the war ends, the risk of a future war will remain. As already noted, millions of people and thousands of firms who left eastern Ukraine may be wary of returning to areas bordering Russia or on the coasts of the Black and Azov

seas. Equally at issue is that the share of Russia in Ukraine's goods exports fell from 25% in 2013 to 5% in 2021, and the war will surely lead to a further reduction or a complete halt of trade with Russia. This will disproportionately affect areas close to the Russian border, where the share of Russia in exports remained relatively high (e.g. 15% in the Sumy region and 16% in the Kharkiv region in 2021). Third, one of the consequences of the war will be greater integration with the EU. As a result, areas closer to the EU may attract economic activity and new residents.

There are many reports of smaller firms from the east already relocating in western Ukraine for at least the duration of the war. As such firms start to prosper in the west, this will create path dependence with agglomeration forces in places where they cluster, making a return eastward less likely. However, for larger plants, given eastern Ukraine's history of heavy manufacturing and the high transport costs of moving raw and semi-processed materials, eastern Ukraine will remain the best location for any surviving and competitive heavy industry firms, especially those exporting to Turkey, Georgia and parts of Asia. Such firms might not survive if they move west. Then the issue is to what degree, with access to Russian markets cut off, firms will remain competitive and return to pre-War production. Moreover, given that markets for eastern products may increasingly be in the west of Ukraine and the EU, restoring inter-city transport and investing in such transport will be critical to foster eastern development as discussed in the next section.

In formulating policies as discussed below, it is important to worry about coordination failures. Policies to resuscitate particular cities and regions may conflict with initial private intentions of firms and households. What if people move back to, say, Alchevsk, a city in the Luhansk region, but firms do not because they have lost access to the Russian market? Or, what if firms move to western Ukraine to be closer to the EU market but they cannot hire workers because there is not enough housing for migrants from other regions? Well-functioning labour, land and capital markets should minimise such failures, and any policies implemented by the government should support these markets.

As noted above, focusing on fully rebuilding *all* damaged eastern cities is a daunting task and would come at an enormous economic cost, inhibiting the overall development of Ukraine. Part of the option value strategy would be for the Ukrainian government to not just start with preliminary investments, but to focus those on a handful of focal cities in its reconstruction efforts with the expectation that growth in these cities will uplift economic activity in other surrounding areas. How should these cities be selected? In addition to thinking about government and private service development, health and education, another criterion concerns a measure of 'market potential' commonly applied in urban and trade economics (Hanson 2005). This metric takes into account the existing industrial composition of a city and captures how close a given city is to the markets where its output can be sold. The absence of publicly available data on industrial structure at the city level prevents us from building market potential indices for individual Ukrainian cities. However, existing information suggests that Mariupol and Donetsk could be at

the top of the list. Mariupol is the largest Ukrainian port on the Sea of Azov and was responsible for the bulk of seaborne trade in goods produced in the Donbas and the East. Donetsk was the largest city in the Donbas, a major transportation hub, and home to an array of industries.

At the same time, trade potential is not the only factor that determines the attractiveness of a city. Ukraine can also focus on rebuilding places that can offer high quality of life. For example, Berdyansk on the Sea of Azov is a resort city. Its natural amenities could attract not only the tourism sector but also an increasing number of remote workers who could keep their jobs in Kyiv or Dnipro, while enjoying the amenities of Berdyansk.

We now turn to more general policies to make eastern Ukraine more attractive to workers and firms.

Human capital investment

Within a nation, cities compete to attract jobs and people. In this section, we have documented the industrial specialization of the eastern region and have presented facts that deindustrialisation is taking place. As noted above, the experience of the United States offers examples of cities, such as Pittsburgh, that have transitioned from relying on manufacturing to upskilling and focusing on services, technological advances and health care. Pittsburgh is an enviable city, albeit one that is smaller than at its industrial peak size 50 years ago. A robust correlation from urban economics is that cities with a larger share of adults who are college graduates feature more productive firms and workers (Moretti 2004). Local universities play a key role here in attracting talent and creating a 'brain hub'. Past research from Sweden has documented the role that investments in regional universities can play in accelerating local innovation and creating a firm start-up culture (Andersson et al. 2004, 2009). For Ukraine, enhanced investment in human capital is crucial to growth, and potentially focusing more on the development of educational institutions in the east could stimulate growth there.

Ukraine does have an unusually high share of its adult population with a bachelor's degree or more. Nevertheless, the country needs to evaluate the quality of education produced by its universities, none of which ranks in the top 1,000 in the world based on one ranking scheme.¹¹ This contrasts with Poland, which has two in the top 500 and 13 in the top 1,000.

Investing in cross-region trade infrastructure

Ukraine needs strong intercity transport, as well as transport for exports (Hanson 2005). As we expect the Russian export market to be fully closed for the foreseeable future, exports must go to other places. A lot of heavy shipping goes through seaports, so restoring ports, and rail and truck transport to those ports, is critical. But the switch for cities from looking to markets to the east to looking to the west raises new issues.

11 www.webometrics.info/en/distribution_by_country

Rail plays an important role. While Ukraine's railways have been maintained, they are Soviet-gauge and the tracks may be dated. To facilitate trade, it will help to redo tracks to integrate better with the EU (see the chapter in this book on infrastructure by Volodymyr Bilotkach and Marc Ivaldi). Is this an opportunity to upgrade and improve track quality and match EU gauge, have dual tracking and the like? Is it also the time, with aid money in the future, to consider high-speed intercity rail used by the service sector?

Ukraine does have a high road density by world standards and 98% of its roads are paved, but it does not have good conditions for trucks. According to the CIA Factbook, Ukraine has few miles of controlled access highways, leaving it well behind its western neighbours. Part of inducing firms to return to or to stay in the east will be to vastly improve intercity transport. The plan is to invest heavily in highway systems, which seems like an excellent idea. That strategy does involve risk in the form of high investment in things that are easily targeted militarily. Obviously, this is all part of a package assessment. Depending on how the war ends and how permanent any settlement is, the trade-off will be between investing heavily in eastern Ukraine through infrastructure provision and subsidies or inducements to firms and residents versus the risk of those investments being destroyed in the future.

Regional capital flows and the spatial risk premium

Private capital investors seek out low-risk, high-return investments. Under the right conditions, investing in the east's cities could yield competitive rates of expected private and social returns to capital, but there is considerable risk. The potential for future conflict with Russia and the uncertainty concerning the flows of war refugees returning to their cities poses risks for those who invest in sunk capital such as buildings, local infrastructure and factories.

The supply of such capital is crucial because the demand for capital investment in the east will be huge. Capital will be needed to restart businesses, build homes and real estate and to finance the loans for buying such assets. In the absence of spatial subsidies for investment, the eastern cities are likely to feature a higher equilibrium interest rate than the rest of the nation's cities. A form of 'war insurance' to cover risk from future conflict could help, but may not have the credibility for investors that subsidised loans would have. The state has an unusually large presence in capital markets, as pointed out in other chapters in this book. We hope that state-owned banking will operate on the same principles as private banking and not be used to finance unwise investments. Subsidised loans policies for the east should apply uniformly to all banking activities, state or private.

Investing in decarbonising the eastern cities

One strategy for making eastern Ukraine more attractive to people is to invest in upgrading overall quality of life. Here we discuss improving energy efficiency and reducing local pollution as part of improving quality of life. Public health and environmental economic studies have documented the detrimental effects of particulate matter (PM_{2.5}) air

pollution on health, productivity and longevity. Consider the case of Turkey. Economists have documented how the country phased in natural gas power plants to replace coal fired power plants and that this caused a reduction in PM_{2.5} in these cities and reduced infant mortality (Cesur et al. 2017, 2018).

According to WHO data, Ukraine ranks among the worst countries in terms of deaths attributed to air pollution.¹² The death rate is very close to that of China. As documented in the chapter on energy, over the last 20 years Ukraine has consistently had a higher carbon intensity than Poland or the EU, but a type of convergence has taken place. In 2019, Ukraine's economy was twice as carbon-intensive as that of Poland.

The country's housing stock contributes to explaining this fact. The housing stock is very old (and energy inefficient), with over 90% of units built before 1991 and 71% of housing built from 1960 to 1990, and has a bias towards multifamily units in apartment blocks and towards cheaper, energy-inefficient units.¹³ The destruction of the housing stock presents an opportunity to build more energy-efficient and modern housing.

Given that Ukrainian winters are quite cold, heating is an important source of energy consumption. In recent decades, many urbanites have relied on natural gas for winter heating. According to a blog by the Kennan Institute, “[a] third of households in Ukraine rely on centralized heating and more than half have a centralized hot water supply, both mostly powered by natural gas. Some 80% of households rely on a centralized gas supply. Any interruption of the gas supply in winter would pose a threat to millions of households”.¹⁴ This threat can be mitigated by substituting electricity for natural gas in winter heating and cooking. As the housing stock is rebuilt, this option should be considered. In the United States, a growing percentage of homes have made this switch (Davis 2021). Reducing natural gas consumption will reduce demand for natural gas imports and the electricity will be cleaner if the power grid is greened over time.

As part of becoming greener cities, the real estate sector should move away from centralised heat and water supply, which is typically inordinately wasteful, to one where households install, pay for and regulate their own usage, to allow people to conserve. Moreover, when people pay for what they use, this creates additional incentives to weatherise their homes. While natural gas is a cheaper way to heat in cold climates, given that Ukraine is a net exporter of electricity, building in electricity options for hot water or home heating is an option that would also reduce emissions. The modern alternative of electric heat pumps greatly reduces the costs of electric home heating in milder climates.

12 [www.who.int/data/gho/data/indicators/indicator-details/GHO/ambient-and-household-air-pollution-attributable-death-rate-\(per-100-000-population\)](http://www.who.int/data/gho/data/indicators/indicator-details/GHO/ambient-and-household-air-pollution-attributable-death-rate-(per-100-000-population))

13 State Statistics Service of Ukraine, *Social and Demographic Characteristics of Households in the Ukraine in 2013*.

14 www.wilsoncenter.org/blog-post/will-ukraine-have-enough-gas-winter-answer-depends-russia-and-naftogaz

The greening of the electricity grid will contribute to urban environmental progress. In recent years, the grid's energy shares have included 54% nuclear and 29% coal. As Ukraine seeks to enter the EU, it is likely that one of the requirements will be a greening of the grid and a phasing out of the reliance on coal in generating power. If Ukraine can increase its share of power generated by nuclear and other low-carbon sources, then the electrification of the economy can proceed and emissions will decline.¹⁵ If Ukraine seeks to build up its nuclear power capacity, it is likely that it will turn to Western nations for capital and expertise and sources of fuel for this sector, building upon its long relationship with the Westinghouse Electric Company.¹⁶

Integrating increased reliance on green power during a time of rising electricity demand raises the risk of power blackouts. The introduction of dynamic pricing for electricity can help the electricity market to clear in real time. Electricity demand will grow in Ukraine as economic development takes place and as more vehicles and home heating rely on electricity to operate. Given that it is costly to store electricity, the grid must constantly keep supply and demand in balance. Dynamic pricing would send the right conservation incentives. The rollout of smart meters allows consumers to programme these devices to adapt to anticipated price spikes. The US experience with dynamic pricing demonstrates that such incentives do encourage conservation (Wolak 2011).

The chapter on energy in this book by Tatyana Deryugina and co-authors discusses in greater detail possible steps that Ukraine can undertake to make its housing stock more energy efficient.

3 REBUILDING DAMAGED CITIES IN UKRAINE

In this section, we turn to the actual rebuilding of Ukraine's cities. The vast majority of aid will go to rebuilding cities, and how wisely this money is spent will affect people's lives for decades. We will note some attractive features about the layout and planning of Ukraine cities, and the operation of transport and land and housing markets.

15 www.washingtonpost.com/world/2022/08/25/ukraine-nuclear-plant-energy-grid/

16 <https://world-nuclear.org/information-library/country-profiles/countries-t-z/ukraine.aspx>

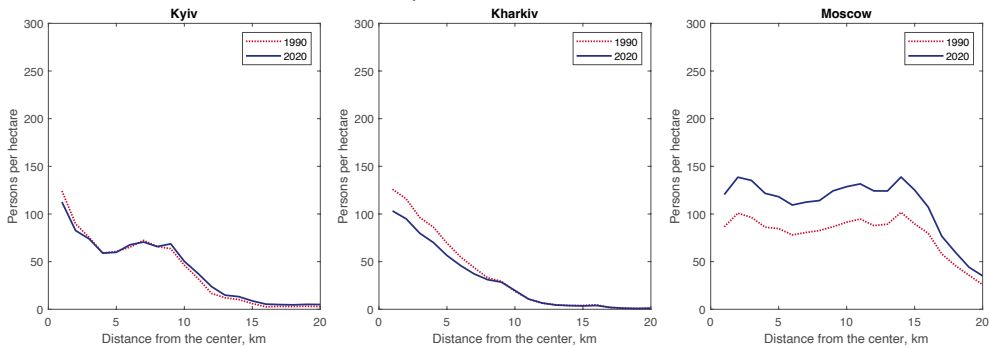
3.1 Background

Ukrainian cities' urban form

The physical form of most Ukrainian cities bears the mark of Soviet planning.¹⁷ Some distinguishing characteristics of Soviet urban planning include: (1) the prevalence of apartment block housing with plentiful public spaces surrounding them, (2) a focus on public transport and a disregard of infrastructure for private vehicles, and (3) a somewhat ad-hoc spatial distribution of residential and non-residential real estate due to the absence of functioning real estate markets before the early 1990s. We examine these issues.

While there are ad hoc aspects to the spatial distribution of activity in cities, Ukrainian cities do not follow the Soviet-era hypothesised mode of being 'hollowed-out', as is the case with some Russian cities where people were relatively massed away from the city centre (Bertaud and Renaud 1997), compared to other cities worldwide. Figure 9 shows density gradients, that is, average population per hectare at each distance from the city centre. Kyiv and Kharkiv show regular gradients in 1990, with about 12,500 people per square km near the city centre and density declining noticeably with distance from the centre. That contrasts with Moscow with its flat gradients. Note that these three cities do have high overall densities compared to many Western European cities, including London, reflecting the high portion of people in flats. The density of Ukrainian cities is particularly striking given that the country as a whole is among the least dense in Europe (see Figure 10).

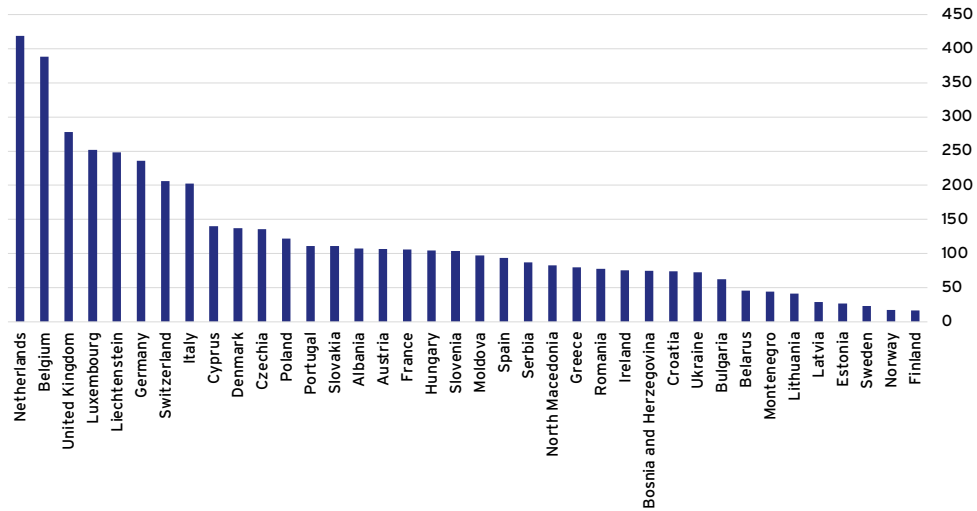
FIGURE 9 DENSITY GRADIENTS IN KYIV, KHARKIV AND MOSCOW



Source: Authors' calculations using the GHS satellite data.

¹⁷ Western Ukraine is an exception. It only became a part of the Soviet Union after World War II, and prior to that most of its territory belonged to Poland. As a result, cities like Lviv, Ivano-Frankivsk and Uzhhorod appear more Polish than Soviet.

FIGURE 10 POPULATION DENSITY IN EUROPE BY COUNTRY, 2019



Source: CIA World Factbook.

In market economies, high densities near the centre reflects the desire for access to jobs and amenities. The Alonso-Muth-Mills model (Alonso 1969) pins down the minimum land cost of a city as the cost of non-urban uses at the periphery. Land costs rise from the periphery because transport costs fall as one gets closer to the centre. Because land costs more in the centre, the capital-to-land ratio – i.e. building density – gets higher in the centre. Market-based densities in the centre are therefore a function of city size, and Ukrainian cities have high central densities in light of their sizes. Soviet planning explains these phenomena – the combination of large blocks of flats and near exclusive reliance on public transportation to move people led to dense, relatively small cities.

Since 1991, there has been a modest degree of decentralisation, with drops in density in the centre as people suburbanised. Again, this is consistent with what has happened in cities worldwide over the last century, as they have improved their transport systems to make access to the city centre and jobs easier. But the highest and best use of land, as improved, is likely to leave things largely as they are. The residual land value of lower-density redevelopment is almost certainly lower than the value of the current use, especially in the East, where land values are very low.¹⁸

Earlier we discussed the strategy of making cities in the East more attractive by modernising energy use to create green(er) cities. Here we discuss an existing and attractive aspect of Ukraine cities. As we noted above, Soviet urban planning allowed for generous public spaces and that space persists in many cities. Public areas surround nearly every apartment block. Figure 11 shows a satellite image of a typical residential

18 For a nice discussion of how to determine whether it is economically sensible to convert from one property use to another, see <https://propertymetrics.com/blog/highest-and-best-use/>.

neighbourhood in Kyiv. Most of the buildings are relatively tall, with between five and 20 stories. These buildings are either purely residential or mixed-use, with commercial floorspace on the first floor. At the same time, there are plenty of public areas, often covered with trees. These public areas include playgrounds, small parks, sports facilities, and so on. This urban design allows for a combination of high residential density and abundant public spaces. While many of these public areas have been misused and have fallen into disrepair in the last 30 years, we view this feature as something that the largest Ukrainian cities should retain and improve to make them more liveable (Cohen et al. 2009).¹⁹

FIGURE 11 A HIGH-DENSITY RESIDENTIAL NEIGHBOURHOOD IN KYIV



Source: Google Earth.

Aspects of the residential sector

Not surprisingly, given a falling population and limited economic growth since 1990, the housing stock in Ukraine is very old, with over 90% of units built before 1991 and a bias towards multifamily units in apartment blocks and towards cheaper, energy-inefficient units.²⁰ According to the State Statistics Service, 55% of housing units are flats in Ukraine. The share of multi-family units in urban areas is at least 75%. This is considerably higher than in comparable European countries, including Poland. Reconstruction presents an opportunity to focus less on Soviet-style apartment blocks and to provide modern housing, as discussed in this section and later on.

19 Although we should also note how improving parks is tricky and doesn't always succeed under the best of intentions.

20 State Statistics Service of Ukraine, *Social and Demographic Characteristics of Households in the Ukraine in 2013*.

Officially, about 95% of households nationally own their residential units, although the real number may be closer to 85–90%. Regardless, this is a high percentage compared to the EU, where on average only 70% of people reside in owner-occupied housing.²¹ The low incidence of rental units is common in former Soviet Union states. This is partly because the government-owned housing stock was privatised, with occupants encouraged in the 1990s to buy their assigned housing at minimal prices. Ukraine has also historically had low labour mobility. In most countries, people who rent are typically young and/or mobile, staying in a place for a limited time. Finally, like people in other countries with underdeveloped financial markets, Ukrainians see real estate as the most reliable vessel for saving and investing. Given Ukraine's geopolitical situation, today many more people may wish to be mobile and not locked into a place by ownership. Allowing and even encouraging a greater degree of renting is an important policy and will be one of our recommendations.

Ukraine is different from most developing countries because it has strong, well-defined private property rights in the single-family housing sector. However, the property rights of those living in Soviet-style flats are not so well-defined because the land on which they live is largely government-owned. Instead of homeowners' associations, governments are usually the managers of large buildings. This presents a problem in rebuilding, as we shall discuss after briefly describing the level of destruction in Ukrainian cities.

Destruction in Ukrainian cities

The war with Russia has destroyed many Ukrainian cities. The destruction of cities in the east of Ukraine is highly variable, and the end result is still unknown. Some cities are mostly rubble. In Mariupol, over 30% of buildings are destroyed or severely damaged.²² Many other major cities in eastern and southern Ukraine have also suffered widespread damage, including Kharkiv, Zaporizhzhia and Severodonetsk. However, given the patterns of pre-war land use and population densities in Ukrainian cities, we see no need to redesign the layout of cities. Moreover, destruction so far has been more in residential neighbourhoods than in downtown areas. Downtown areas tend to define the layout of cities via the transport networks running through and out of them, such as the major road arteries and commuter rail networks that define neighbourhoods throughout the city. Larger cities like Kharkiv and Dnipro already have commuter rail and underground systems.

Many people (although the ultimate number will depend on the success of the economic reconstruction) will want to return to the land they lived on and own (as their main asset), to see neighbourhoods rebuilt, and utilise the past social capital they had built up with neighbours. But a more prosperous Ukraine requires improving these neighbourhoods with better infrastructure.

21 <https://ec.europa.eu/eurostat/cache/digpub/housing/bloc-1a.html>.

22 Source: <https://uadamage.info/>.

3.2 Accelerating the process of rebuilding and improving cities

Planning

The first steps in reconstruction involve clearing the rubble and rebuilding infrastructure. This involves a strong role for government and then for planners who will help direct any adjustments to city layout, including the design of the transport network (highways, major thoroughfares and side streets, as well as commuter rail systems). There are also public facilities such as schools, parks, government administration buildings, hospitals, and so on. Then there is the layout of utilities (water and gas mains and sewers). Up to half of urban land is used for such public purposes. The layout of these, especially transport, drives where private investment occurs.

It is hard to assess local governments' administrative and technical capacity to carry out planning, and the political will to reform (this being a long-standing issue). While cities may not need to be redesigned from scratch, there will be considerable changes, including widening roads and partially redesigning some destroyed neighbourhoods. Restructuring cities to any degree can involve the taking of private lands to, for example, widen roads or add commuter rail lines. Normally, governments invoke eminent domain to take land for public use. In Kyiv, the viability of invoking eminent domain has been an issue, but since cities own much of the land in eastern Ukraine, this may not be such an issue there (according to <https://uadamage.info/>). More importantly, with so little construction in the East since 1990, the region's cities may need technical support in recruiting transport engineers and planners to work there. Aid packages should bundle in access to national and international expertise to advise in the planning process.

In discussing rebuilding, we start with transport and then turn to buildings in general and the residential sector in particular.

Transport

Soviet cities were not built for cars; they were built for pedestrians and transit users. In 1983, car ownership in the Soviet Union was just 32 per 1,000 people.²³ In the 1990s, Ukraine's economy collapsed and the quality of public transportation declined. Later, as the economy started to recover, especially in large cities, more and more households purchased cars to get around the city. In 2020, car ownership in Ukraine was nearly eight times higher than it was in Soviet times, at 245 cars per 1,000 people. However, it is still significantly below the car ownership rates of Ukraine's eastern European peers: Poland has 849 cars per 1,000 people, Slovakia has 513 and Hungary has 463.²⁴ If Ukraine's cities are to function as modern cities, they need to adapt to a world of greater automobile use.

23 www.upi.com/Archives/1983/10/28/Soviet-dream-parking-space-for-every-car/98074361600/

24 https://en.wikipedia.org/wiki/List_of_countries_by_vehicles_per_capita

Road infrastructure has not caught up, and traffic congestion has become a major issue in Ukraine's large cities. One recent study found that the metropolitan area of Kyiv is the 39th most congested city in the world, despite not being near the size of the world's top 100 largest metro areas (Akbar et al. 2022).²⁵ Reconstruction presents an opportunity to construct some type of radial, and for larger cities, circumferential (ring roads) major arteries that will help people and goods move through the city. One acute issue in large Ukrainian cities is parking. The lack of parking facilities and poor enforcement of parking rules result in the haphazard scattering of cars around the city, often on sidewalks as well as public spaces. Moreover, parking is typically free. The introduction of paid parking and strict enforcement could raise funds for building large parking garages throughout cities.

At the same time, Ukrainian cities need to offer effective public transport. In many cities around the world, bus public transit is slow and cheap. Low speeds in cities reduce commutes and face-to-face interaction. Richer people tend to drive rather than take public transit. However, in cities such as London and New York City, congested roads and relatively high-quality public transit encourages many residents, including high-income ones, to regularly use public transportation and often not own a car. In addition, policies such as congestion charges in central areas of very large cities may be beneficial. As shown by the London Congestion Charge or the Singapore congestion scheme, the introduction of charges increases the demand for public transit, and it creates a middle-class constituency that lobby for improvements in the quality of public transit (Small 2005). In aggregate, this creates scale economies and reduces the carbon footprint of the transportation sector.

As noted above, Ukrainian cities are dense. High density supports the widespread and efficient use of public transport with frequent service and stops at reasonable intervals. But how can Ukraine improve its public transport? Public transportation in large Ukrainian cities relies heavily on buses and minibuses. Larger cities, including Kyiv and Kharkiv, also have subway and commuter rail; however, these often don't reach many large residential areas on the periphery. Buses, minibuses and trolleybuses account for 65% of public transport passengers, while subway and light rail account for 31% (although the latter share is likely to be larger in bigger cities with developed subway and light rail networks). A relatively affordable and fast way to improve the quality of public transit would be to introduce a rapid bus network where buses would travel on dedicated and, importantly, protected lanes and therefore avoid traffic congestion.²⁶ Rapid bus networks have been implemented in several large cities in the developing world, and studies have

25 Their sample includes over 1,200 cities around the world and nearly all major cities outside of China. The list of the 100 largest metro areas was obtained from www.citymayors.com/statistics/urban_2020_1.html.

26 Dedicated bus lanes were introduced in Kyiv several years ago. However, these lanes are not protected and, in most cases, are simply an additional lane on a regular street. As a result, private cars often abuse these lanes, which slows down buses.

shown that they had significant positive effects (Tsivanidis, 2022). Cities such as Rome have experimented with dedicated bus lanes, which increase bus speeds (Russo et al. 2022). If Ukrainian cities adopt road pricing in congested areas, this would allow for the introduction of dedicated bus lanes and increase the quality of life of bus riders.

Along with implementing bus rapid transit, Ukrainian cities could offer rides in newer, cleaner buses. The inventory of public buses is old and polluting. Electric buses fuelled by a green grid would be much cleaner but much more expensive to phase in. In Europe, nations are buying electric buses for approximately \$600,000 each.²⁷ In the medium term, Ukraine could purchase used buses from nations like Spain that are phasing out their internal combustion engine buses. These used vehicles could be smog-tested to guarantee that they are cleaner than the buses currently on the roads in Ukraine (Davis and Kahn 2010). While these recommendations concern intra-city transportation, inter-city connections matter too. The chapter on transport infrastructure in this book discusses inter-city transport in greater detail.

By pricing roads and parking, and encouraging public transit, Ukraine can sharply reduce both its PM_{2.5} levels and its greenhouse gas levels. These 'green city' gains would have immediate beneficial impacts on health and quality of life and would help Ukraine achieve its goal of joining the EU. The chapter in this volume on energy discusses in more detail possible steps that Ukraine can undertake to make its transport greener.

Buildings

Buildings include commercial, residential and public buildings. The war has destroyed more residential neighbourhoods than downtowns, and so we will focus on residential reconstruction. However, the issues we raise will also apply to the commercial sector. For the (re)construction of public facilities and buildings, a classic issue is whether relevant city departments or state-owned units do the construction. We understand such construction will be put out to bid and done by private firms with greater expertise typically than state units. We discuss overall contracting issues below, noting that there are two sources of corruption: the bidding process (now for huge projects) and the construction. Construction is notoriously corrupt in many countries, including the United States.

A key choice will be whether a lot of the restoration is left to subsidised individual initiative in housing construction, which enshrines self-building and flexibility, or whether it occurs more in the form of centrally planned huge developments, which have the advantage of scale economies. What happens to people who have lost their residences, and what policies might work best for them and the recovery of Ukraine?

27 <https://chargedevs.com/newswire/oslo-transit-agency-orders-183-solaris-urbino-18-electric-buses/>.

4 HOUSING POLICY

While the post-Soviet privatisation of land in Ukraine produced robust, defensible property rights for owners of single family homes, as noted above, such rights are not as transparent in the multi-family sector. Property rights are important in allowing those who moved away from the east to liquify the wealth they have left in their homes while also allowing those whose houses were destroyed to obtain a new house at a reasonable cost.

There are two parts to housing policy: (1) the immediate short run, and (2) how that phases into intermediate and long-term rebuilding.

4.1 Accommodation without construction

Today, existing properties are relatively cheap. In some eastern regions, prices are half of what they were before the war. By contrast, the price per square metre of new construction has doubled in some regions, reflecting the risks and costs of engaging in a new development. These conditions should inform how Ukraine rebuilds its cities in the east.

In some cities with high rates of exodus and low rates of return, for the longer term, this could largely solve the housing problem without the enormous costs of rebuilding and the long delays in rehousing the population due to construction lags. With smaller cities and towns in the future, in some places there may be a sufficient supply of housing, especially in cities where destruction is more limited. The other side of the coin, however, is that it still remains economically beneficial to start new projects in the western region of Ukraine, where there is relative parity between the prices for new and existing construction due to a spike in demand as a result of an inflow of refugees that drove the secondary market prices up.

Related to utilising existing and unoccupied housing is converting non-residential properties into housing for internally displaced persons and renovating them if needed. There are potentially abandoned commercial properties in cities. However, one interesting example of short- or intermediate-term provision is that a large number of recreational facilities and summer camps, especially in various prime vacation destinations, remained under state management and were not privatised. These underutilised assets in eastern Ukraine could help meet immediate housing needs at a relatively low cost.²⁸

28 They come equipped with hotel-like facilities (multi-unit building) or detached wooden cabins. Both typically offer shared bathrooms but neither comes with a kitchen, so that would be an issue. Another issue is that these units are not designed for year-round living - they are not equipped with heating, and not properly weatherized for the winter, the wiring is designed for low-load appliances, etc. However, doing basic renovations and modifications and weatherising the units is estimated to cost about 25% of building units from scratch (~\$250/square metre) and could be done quickly.

4.2 Construction, voucher programmes and land privatisation

Given a national policy of making eastern cities more attractive and competitive as part of maintaining the east–west balance and having a strong Ukraine, considerable reconstruction will be necessary. For more damaged cities with greater economic recovery potential, timely reconstruction of many neighbourhoods will be essential to attract back workers and firms. Before delving into the types of housing reconstruction and initiatives underway in Ukraine, we lay out a basic premise.

Those whose housing units have been destroyed should receive a voucher to either spend on building materials and construction costs on their land, to buy an existing or newly built government or private unit anywhere in Ukraine, or to rent over a period of years. The simplest plan would be to offer a single voucher programme for destroyed units, whether single-family homes or flats. The voucher could be a household-specific deposit in designated banks that can be spent on certain categories of goods (analogous to the COVID scheme) over a period of years. The general size of vouchers should be based on the pre-war value of what they owned previously, but *may need to be proportionately larger, given higher costs of construction in the future.*²⁹ While in principle vouchers could be viewed as simple compensation for lost property to be spent on anything, the state and aid agencies that will fund much of voucher cost may want to constrain aid money to be devoted to reconstruction.

It seems there may be fairly accurate records of the sizes of houses and flats and records of who actually lived where. Such records also include public utility servicing. To carry out evaluations based on pre-war values, there could be assessments based on pre-war sales prices using hedonic techniques with housing characteristics (lot size, floor space, materials, etc.), and neighbourhood characteristics. Such procedures are the foundation for property tax assessments in many countries, ranging from Uganda to the United States.

Unfortunately, the recorded sales prices pre-war would be unreliable for the case of Ukraine. The main reason is that the vast majority of real estate transactions were in cash in US dollars, with the recorded transaction amount being significantly lower than the actual sales price. More accurate and widely available would be data on ‘asking’ prices, which should be close to actual sale prices. Researchers routinely use asking prices for evaluations of property values. These data should be relatively easy to collect as

29 There is the issue of repairs to damaged units and perhaps a separate voucher programme for that, or just dispersal of monies locally for repairs. There could be much more elaborate schemes for destroyed houses which offer more guidance but are much more complex to administer. For example, there could be a choice of ownership or rental vouchers, with the latter geared to people who move westward but are uncertain about where to settle. A rental voucher would be an annual amount guaranteed for, say, seven years to be spent on renting (and any remainder paid in a lump sum if the family purchases before the seven years are up). In general, the thinking is that, in most countries, people spend about 2.5-3 times their annual income on a purchase and about 35% of annual income on renting.

several national realtor firms operating in Ukraine keep records. However, this will likely require working with multiple regional real estate firms and requesting past data from them. This will ensure that the resulting dataset is sufficiently rich and that all the cities and villages – large and small – are well represented.

The United States carried out such a programme in the aftermath of Hurricane Sandy hitting the New York City area in 2012 to compensate owners for lost housing.³⁰ Ukraine used a similar programme to compensate for lost properties after the 2014 invasion of the Donbas, and also in Kharkiv when the city was expanding its metro. Of course, the latter two examples represent more homogenous markets than the entire Ukraine. One of the advantages of this data-driven approach would be the reliance on a strict statistical model that would not require the use of appraisers, thus eliminating a very obvious channel for corruption.

Worldwide, housing vouchers have proven to be more efficient and equitable for housing provision than state-led construction (Austria and Singapore may be exceptions to this). While it will be expensive to provide vouchers to all who have lost their homes, it will be even more expensive to build everyone a new home.

Vouchers could be supplemented with mortgage loans, and the recent introduction of government-subsidised affordable mortgages to purchase a primary residence at a very low-interest rate is a step in the right direction.³¹ However, this instrument has not really been used in Ukraine to date. Having mortgages would be a major institutional advance to allow people more flexibility and supplement aid funding run through the state. From the government's perspective, it allows the financial aid to be stretched over time for at least a decade. However, it is not necessarily a priority.

Proposed initiatives that distinguish lost homes from lost flats are already underway. Under one set of plans, those who had single-family homes are to return to their land and receive grants to rebuild. One idea is for people working with contractors to self-build on their own land as soon as the situation permits.³² This legislation offers an individual choice of what size unit to build initially and when to enlarge. Alternatives include the state contracting to rebuild entire city blocks of single-family attached or detached homes, which would likely involve a 'one size and type fits all' approach. Another possibility is for private developers to assemble land and build new units for sale. These possibilities raise issues of the state's capacity, the construction industry's capacity, individual choice and utilising individual initiative, and the role of aid agencies and prospects, which we discuss below. Regardless, a voucher programme would provide the funds for people to have the choice to rebuild, buy a state-built unit, buy a privately built unit, or buy an existing, surviving unit anywhere in Ukraine.

30 www.nytimes.com/2013/02/04/nyregion/cuomo-seeking-home-buyouts-in-flood-zones.html

31 www.epravda.com.ua/columns/2022/09/6/691166/

32 Bill #7198 (https://itd.rada.gov.ua/billInfo/Bills/Card/39283?fbclid=IwAR2n3I-4dPl61zFzJhFay2KmtaB_81YISGLrDiuRj673vu33yHldwE6xeX4); for a brief review in English, see <https://brdo.com.ua/en/news/compensation-for-ukrainians-for-destroyed-property-the-parliament-passed-a-bill/>.

Proposed plans would be different for the 75% or more of the urban housing stock in multi-family units where the city owns the land. One proposed plan is to have people allocated a government-built unit that would be in the same vicinity and of roughly the same size as held by the owner before destruction. The sale of such units would be prohibited for several years. Allocating units in or near their former neighbourhoods to those who have been displaced or fled areas under attack is intended to induce/force a return to those areas. One issue that worries us is corruption, in particular in the procedure to determine the order in which the affected families will be allocated the newly constructed apartments. Another issue that we have discussed at length is that the economic development and security of Ukraine may dictate a smaller population in eastern Ukraine than in the past, with smaller but vibrant cities. A recommendation if the state wants to engage in the construction of flats is that these be sold, not allocated, and people buy them using vouchers. Such allocations should meet a market demand test.

Given the expected permanent population declines in many cities, an effective policy would also allow the replacement of destroyed Soviet-style flats with single-family homes or duplexes. Outside of Kharkiv, cities in the East are unlikely to house more than 500,000–750,000 people. For cities of this size, a much greater proportion of single-family homes than available pre-war is appropriate.

Land privatisation

This discussion raises the critical issue of allocating land in cities in a context where the city owns much of the land. We advocate for a much greater degree of privatisation and allowing land markets to function – a move away from Soviet-style land allocations. This also would help alleviate the strong local political forces and nepotism that have dominated land allocations in many places in the past. Those who own land individually under single-family homes, in contrast to the proposed Bill #7198, should have the flexibility to either return to their land or sell it to those who have a greater desire to return. We expect land values in eastern Ukraine cities to be quite low post-war and even pre-war, given that most cities had declining populations.

For land under destroyed flats, abandoned commercial land, and vacant or farm land near urban outskirts, the state could auction the parcels. Individuals could use part of their vouchers to buy land. Development companies could compete in these auctions and perhaps dominate them. They would buy up (at auction) bundles of contiguous parcels on which to do large-scale developments. As noted below, auctions of any kind need to be open and transparent to avoid corruption problems of the past. The land could be privatised and sold as freehold. If the state is unwilling to do that, it could auction the land as leaseholds on, say, 99-year leases. The state would need to clarify the rights and renewal process at the end of the 99 years.

The various options we have suggested would allow city reconstruction to be mostly demand-driven, within the limits of city planning and land use regulation.

Modular and prefab housing

Finally, we note there is the modular housing option. Potentially, modular housing offers a faster time to build and the possibility for foreign exporters to compete for contracts, lowering the marginal cost of building such housing. There are effectively two types of modular housing: temporary and cheap short-term refugee-type housing; and more permanent, long-term housing. We recommend that cheap modular houses not be used to host a family for more than a certain period of time (for instance, one year). This will ensure that the refugees and the authorities consider them temporary houses, not permanent solutions. Giving this type of housing a shelf-life prevents enclaves of slum-like housing that historically tend to turn into high-crime, high-unemployment areas. However temporary modular homes might be a great short-term option for owners of detached houses, who are working on rebuilding their homes using the government provided vouchers. One of the advantages of this approach is that these lots will already have all the necessary utility connections, the absence of which would have significantly increased the fixed costs of setting up a liveable modular house.

The ‘prefab’ option is an alternative to traditional construction for more expensive and permanent modular homes. This type of modular housing represents a type of ‘competitive fringe’ that can be considered a competitive mechanism if standard construction turns out to take too long or to be too expensive. It is important to note that, while Ukrainians are used to long-lived brick and mortar construction, better prefabricated houses can have decades of life.

5 CONTRACTING, FINANCING AND ACCOUNTABILITY

5.1 Encouraging competition in construction

In a typical city in a richer or growing country, there is ongoing reconstruction, expansion and remodelling. This creates a competitive construction industry with many large firms in a region building apartment complexes and designing residential single-family developments/estates or even enormous gated communities. It also involves an array of smaller contractors working to build individual homes, doing major repairs and remodelling. For single-family homes, there may be distinct advantages to self-building in some situations. The process can start quickly, subject to availability of materials and construction crews. People can build a basic structure that can be modified later, offering flexibility. They can use migrant construction workers or engage with aid agencies.

However, a concern is that some cities in eastern Ukraine may lack a highly competitive construction industry. This is even a concern in the United States, where there is a much higher rate of new construction (Cosman and Quintero 2021). Some cities will start with an overall initial construction capacity constraint with almost zero construction for years. The return of refugees could create instant demand of possibly thousands of units. While any housing reconstruction will offer a strong local stimulus that increases labour force participation and induces in-migration of construction workers, such construction can

take a long period of time to evolve. How do we encourage redevelopment of this industry in all cities, so that construction is done competitively? Aid processes can be geared toward bringing in construction workers from Poland or Turkey and even contracting foreign firms for local economies lacking capacity. They can be geared to encouraging local firm development, as well as bringing in construction firms from other parts of Ukraine. All of this will be governed by a contracting process.

5.2 Incentives and the structure of urban contracting

There are two sources of corruption in the awarding of contracts by a *hromada* to have blocks of flats built, or for large-scale single-family home developments.³³ The same corruption issues arise in public infrastructure projects. The first issue is the awarding of contracts itself and the extent to which this is a transparent and uncorrupted bidding process. At the moment, our understanding is that contracts will be awarded through a simplified public procurement procedure. This procedure favours larger firms with stronger organisational capital and supply networks. An agency responsible for the dispersal of aid monies, rather than an open auction process, would determine the recipients of contracts. An official concern is that small operators may enter an auction with low bids but then offer low-quality construction. Thus, the idea is to limit the action to large known firms. One set of concerns with this process is nepotism, corruption, and lack of transparency that open auctions would remedy. A particular worry is the lack of competition. In some localities, there may be few or no large firms at the local level that know the area, and regionally based firms will have limited capacity to operate in a large array of communities (*hromada*). Involving foreign firms and allowing new credible firms to emerge seems critical to developing a competitive bidding process with transparent and open auctions.

The next issue involves construction quality. What ensures that buildings are well constructed, safe and durable, in an industry that is subject to corruption worldwide? Fundamental to maintaining quality are inspection processes at different points of construction. That requires local capacity to carry out inspections without long delays to construction. However, the fundamental problem in many countries is that inspection processes can be subject to corruption – the cost of a bribe is less than the cost of maintaining quality. The threat of prosecution in the courts may not be a reliable and timely mechanism. Self-building has the advantage that the final client, the resident, can monitor quality to some degree, but residents have limited expertise in things like cement quality. They may also lack recourse for poor construction, apart from firing and replacing contractors.

33 *Hromada* is the lowest level of government in Ukraine. It usually represents a municipality or, in rural areas, a group of villages.

More generally, there is a challenge for Ukraine to develop viable uncorrupted audit processes for both construction and any process to report fraud. Other developing countries have struggled with this issue. Ukraine is a country where *hromada* leaders are subject to election. In such contexts, the promise of ex-post testing of construction quality and publication of results can help with the issue for public projects. In other contexts, a fraudulent activity could lead local officials to be fined and fired. In Indonesia, for example, the testing of road quality ex post (drilling down and testing materials used and depth) and publicising results led to a vast improvement in quality (Olken 2007). Presumably, this came from both an embarrassment factor for local leaders living in the community and the threat of not being re-elected. However, such programmes may need to be administered from above. The study on Indonesia also suggests that informal mechanisms such as programmes where individuals anonymously report corruption have much weaker impacts. That challenges central government capacity. Here there is the usual trade-off: huge penalties to discourage corruption but infrequent monitoring versus more comprehensive monitoring. While it would help if donors monitored quality, this may not be realistic unless they are doing the construction. Of course, a specific form of aid could be to monitor corruption, if there is the ability to penalise and to publicise results.

5.3 Financing

Who will pay for construction (both rehabilitation and new), and for subsequent maintenance and operational costs?

We presume that the EU and other countries will step in with massive aid for housing and public infrastructure construction. For example, there are reports that the Netherlands will fund Dutch firms to help rebuild specific infrastructure in several cities in eastern Ukraine.³⁴ But for general, large-scale aid towards housing and infrastructure projects, the idea is that aid funds will be allocated by the centre to *hromada* to administer. Obviously, there are corruption issues when so much money needs to be spent quickly and with, possibly, quite limited oversight. More crucially, if a voucher programme allows people to purchase where they want, this cannot be administered locally. As noted above, compensation would be proportional to, but realistically greater than, pre-war values. A national voucher programme would let consumers decide where to locate. People would use the vouchers to purchase in a place, and that would drive demand for flats and houses – demand dictates construction.

34 www.government.nl/latest/news/2022/08/22/extra-dutch-support-for-ukrainian-war-effort-and-reconstruction

This reduces the role of the *hromada*, but they would have to perform the allocation of land. Apart from encouraging greater privatisation of land, there is the issue of city planning and the capacity of local governments, with planners and traffic engineers, to re-layout cities with higher- and lower-density neighbourhoods, commercial spaces and transport infrastructure and to layout cities that are greener. However, many layouts may simply replicate what was there previously, with planning having more of a role in making adjustments.

What about the maintenance and operation of infrastructure? Property taxation in Ukraine is trivial. However, under recent reforms, the share of local governments in all government-raised revenue rose to almost 20% in 2021 from 14% in 2014, while the local government share in expenditures fell to 24% from 30%. While local governments are still subsidised, this is a move in the right direction. A key issue will be how to increase the local tax capacity of *hromada* in the future. Another issue is whether the current transfers that cover the local shortfalls in revenues are geared to help poorer communities and are general allocations rather than having many strings attached. Post-war, it is not clear what the revenue-raising capacity of local *hromada* in eastern Ukraine will be, and ongoing revenue sharing by the centre may play an important role in financing operating budgets of local *hromada*.

5.4 Real-time benchmarks of reconstruction progress

The creation of publicly available data on real-time indicators of urban reconstruction will both create accountability incentives and help different cities to benchmark their relative progress.

We anticipate that the reconstruction process will face delays due to supply chain issues and contracting negotiations. We expect that some contractors will seek to use their market power to negotiate extraordinarily favourable terms that raise project costs for infrastructure and new real estate construction. Sunshine laws for data collection and sharing will increase accountability here, as what would have been private information will be disclosed.

A reconstruction database listing the contracts that have been issued using foreign funding would help to create ‘sunlight’. In the United States, cities such as Los Angeles have ‘open chequebooks’ that list every expenditure made by the city and list what the expenditure was on and who received the money.³⁵ If Ukraine could fully implement this approach and monitor the quality of data, this would inform the media, citizens and different cities about the flow of funds. This transparency would address corruption concerns and help to bring about accountability.

35 <https://lacity.spending.socrata.com/#!/year/2022/>

Satellite data on night-time lights provide a monthly metric to measure how the aggregate amount of economic activity is changing within cities over time. If a given city features a very low growth rate in satellite-recorded night-time lights, this is a clear signal that the city is not recovering in terms of population or average economic activity. As infrastructure and the capital stock is rebuilt, night-time light dynamics both within cities and across cities can be used to judge the pace of the urban recovery. Satellite data can be augmented with road sensors to count vehicles crossing roads and to measure their average speed.³⁶

The cost of installing and operating monitors for PM_{2.5} air pollution is declining over time. This creates the possibility for the deployment of monitors close to busy roads and downwind of industrial facilities in order to benchmark air pollution dynamics. Water pollution monitors along major rivers offer key information for judging the quality of sewage treatment and for monitoring industrial emissions.

As we discussed earlier, geocoded census data in Ukraine should be updated. Ideally, resources should be invested to improve the quality of the demographic census and to enact an economic census that would record not just employment and sales activity of firms and their industries, but also business starts and closures. School enrolment data can be collected to track the count of children enrolled at different schools.

In the United States, Zillow and other property tech firms collect geocoded data on every housing transaction in the nation. If such data could be recorded in Ukraine, then city-specific price indices could be created. Such information would provide additional information on the health of local housing markets.

6 CONCLUSION

In the aftermath of World War II, the Marshall Plan played a key role in the rebuilding of Europe's cities. We anticipate that a similar effort will take place to rebuild Ukraine's damaged cities.

The rebuilding of Japan's and Europe's cities after World War II took well over a decade. Technological advances and the introduction of economic incentives could play a key role in helping Ukraine to accelerate this development process. Economists have documented that a 'silver lining' of urban destruction is the opportunity to build back the capital stock in ways that facilitate greater urban productivity and improved local quality of life (Hornbeck and Keniston 2017).

36 <https://highways.dot.gov/public-roads/novdec-2007/new-look-sensors>

This chapter has focused on the role of place-based investments to create a strong system of cities that allows people to confidently return to the cities in the East. We have emphasised the interplay between a city's history and investors' expectations about its future in determining the growth of local economic activity (Krugman 1991). In the face of considerable uncertainty about the economic performance of eastern cities going forward, which firms and workers will seek to locate there? Some individuals may 'play it safe' and avoid these areas. In this case, a type of coordination failure could emerge if individuals and firms choose to locate elsewhere. A credible rebuilding plan that achieves early observable performance goals would help to anchor expectations and attract economic activity to return to the East. Young people will be more likely to live their lives in eastern Ukrainian cities if these cities are safe, liveable and offer vibrant economic opportunities.

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The labour market in Ukraine: Rebuild better¹

Giacomo Anastasia,^a Tito Boeri,^{b,c,d} Marianna Kudiyak^{e,f,c,d} and Oleksandr Zholud^g

^a*Fondazione Ing. Rodolfo DeBenedetti*; ^b*Bocconi University*; ^c*CEPR*; ^d*IZA*; ^e*Federal Reserve Board of San Francisco*; ^f*Hoover*; ^g*National Bank of Ukraine*

EXECUTIVE SUMMARY

The Ukrainian labour market not only needs to be rebuilt, it needs to be rebuilt better. The unprecedented challenges imposed by the reconstruction can only be faced by a labour market that promotes participation and eases the reallocation of workers across jobs. This was not the case for the labour market in Ukraine before the bloody Russian invasion. Reconstruction will therefore require a mix of emergency measures to deal with the legacies of the war and structural reforms to address pre-existing inefficiencies of the labour market. In this chapter, we illustrate the challenges in light of experience of other European countries that have gone through military conflicts in the recent past and propose strategies for action.

Among the challenges are that millions of workers (at least 10% of the labour force) will need to change jobs; the matching of vacancies and jobseekers will in many cases involve repeated changes of residence due to the destruction of the housing stock and the mismatch between the regional profile of worker displacement and of firms relocation inherited from the war; former refugees, internally displaced people and war veterans, often injured and carrying with them the mental scars of the war, will have to be reintegrated in the labour market; a significantly larger fraction of the working age population than before the full-scale invasion will have to be mobilised to avoid bottlenecks in the recovery from the war; and immigrants from other countries will have to be integrated and involved in the reconstruction of the country.

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The detailed proposals developed in this chapter are consistent with a four-pronged strategy for reconstruction aimed at:

- investing in human capital for the future by offering remedial education to students who have lost years of education, and offering retraining to job losers who are still far from retirement;
- making a better use of existing human capital, increasing the labour force participation of women and tackling youth unemployment among internally displaced workers;
- protecting the most vulnerable groups (job losers, veterans, fragile and older workers) in a sustainable fashion; and
- promoting the return of *ideas*, if not of *people* (i.e. involving in the reconstruction the human capital migrated abroad that will not return back home).

These policies will require technical assistance from EU countries with longstanding experience with labour market policies in times of reallocation. They will also involve large budgetary outlays, especially for a country coming out of a war. Who should pay for these policies is a matter that European policymakers will have to address. In this chapter, we confine ourselves to proposing some broad criteria for the funding of the reconstruction of the Ukrainian labour market. Those measures which concern the architecture of the future Ukrainian labour market institutions and welfare state – for example, partial unemployment insurance, employment conditional incentives and active labour market policies – are to be designed to be permanent, and should be financed over the long run by Ukrainian taxpayers in a sustainable way. Other measures are intended to tackle the immediate issues arising in the post-war labour market. Among these are public work programmes and the creation of an infrastructure allowing for a significant scaling up of remote working and distance learning. Indeed, some of these measures need to be taken even before the war is over. In particular, programmes tailored to the specific needs of internally displaced persons are badly needed today and not just tomorrow. These emergency programmes should be financed largely by instruments connected with EU accession, possibly through grants rather than loans. Apart from EU Structural Funds, the instrument for temporary Support to mitigate Unemployment Risks in an Emergency (SURE) can be mobilised. Currently, SURE is available to member states that need to mobilise significant financial means to fight the negative economic and social consequences of the pandemic. The windfall gains of countries of oil and gas producers, such as Norway and the Netherlands, after the surge of oil and gas prices can also be reoriented towards the reconstruction of Ukraine.

Finally, we argue that progress made in implementing these policies will have to be constantly monitored and subject to rigorous evaluation. Thus, substantial effort should be made to ensure that Ukraine has a modern statistical system for monitoring the labour market. Existing data are not sufficiently detailed and harmonised. Improving data quality would also allow for greater target efficiency of welfare transfers.

1 INTRODUCTION

Ukraine was one of the first labour markets in history in which labour services were offered in exchange for in-kind benefits. According to Herodotus, who is considered the first known historian of mankind, what is now known as Ukraine was once a conglomerate of ethnic groups interacting under a well-defined division of labour between the populations living along the coastal regions, the steppe and the forests. This labour market has been destroyed and rebuilt several times under the invasions characterising the history of this nation located at the gates of Europe. The reconstruction of Ukraine after the bloody Russian invasion will be no less demanding than the previous ones. Fortunately, this time Ukraine can count on the solidarity as well as the financial and technical support of other Europeans.

In this chapter we first take stock, in Section 2, of the labour market conditions before the war, and the way it had reacted to the COVID-19 pandemic. In Section 3, we present evidence on the way the labour market has been operating in a war economy and after the out-migration of almost one fifth of Ukraine's population. In Section 4, we draw lessons from the experience of other countries that have gone through military conflicts in the recent past. Finally, in Section 5, we try to identify reforms that could help in rebuilding a better functioning labour market than the one operating before the war. We conclude by assessing the scope for support that other European countries can provide to the institutions carrying out this very demanding task.

2 THE UKRAINIAN LABOUR MARKET BEFORE THE WAR

The Ukrainian labour market was fairly depressed before the full-scale Russian invasion on 24 February 2022. The unemployment rate for the fourth quarter of 2021 was at the two-digit level and the jobless rate had never been below 7.5% in the previous five years, despite a relatively low and declining labour supply (Table 1).

Labour force participation, at 62%, was below the OECD average (73%). Unlike in other countries coming from central planning, participation rates of prime working age women were particularly low and declining over time (Figure 1).² The gender gap in participation was 12 percentage points.

2 All tables in this section present key statistics that characterised the Ukrainian labour market in: (1) 2001 (or earliest internationally comparable data), as in 2001 Ukraine shifted to collecting data in line with international recommendations (ILO, OECD and the System of National Accounts or SNA); (2) 2013, the last year before the Russian invasion, which started in February 2014 (data include the occupied Crimea and parts of Donetsk and Luhansk oblasts); (3) 2015, the first year when Ukraine lost control over the occupied Crimea and parts of Donetsk and Luhansk oblasts, but when the active large-scale military actions were paused and new demarcation lines were set, which had remained almost unchanged until 24 February 2022; (4) 2019, the last year before the COVID-19 pandemic, which had a notable impact on the labour market; and (5) 2021 (or 2020), the most recent year for which annual data are available. When not otherwise specified, the source for these data is the State Statistics Service of Ukraine (SSSU).

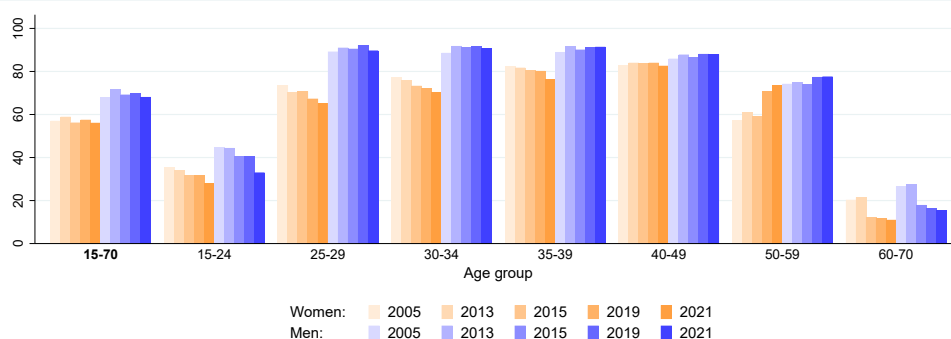
All this was registered despite an employment structure indicating a growing relevance of services, notably of retail trade in which women are more represented. The share of agricultural employment (17%) was still high by EU standards.

TABLE 1 OCCUPATIONAL STRUCTURE AND EMPLOYMENT BY SECTOR

	2001	2013	2015	2019	2021
Total employed (millions)	19.97	20.40	16.44	16.58	15.61
Employment rate (aged 15-70)	55.4	60.2	56.7	58.2	55.7
Employment rate (working age)	64.1	67.3	64.7	67.6	65.3
Unemployment rate (aged 15-70)	10.9	7.3	9.1	8.2	9.9
Unemployment rate (working age)	11.7	7.8	9.5	8.6	10.3
Employment by sector (% of total employment)	2001	2013	2015	2019	2021
Agriculture, forestry and fishing	21	18	17	18	17
Industry	22	16	16	15	15
Wholesale and retail trade; vehicles repair	17	22	21	23	23
Public administration and defence, mandatory social security	6	5	6	5	6
Education	8	8	9	8	8
Other sectors	26	31	31	30	31

Note: The definition of working age in SSSU labour force surveys has changed during these years. Pre-2012, it was women aged 15-55, men aged 15-59. In 2013 it was women aged 15-56, men aged 15-59. In 2015: women aged 15-58, men aged 15-59. In 2019 and 2021, it was all people aged 15-59. For 2013, the figure on total employed includes Crimea, while rates and sectoral statistics do not (data not available). Data for 2001 are based on the previous classification of economic activities in the European Community (NACE).

FIGURE 1 LABOUR FORCE PARTICIPATION RATE, BY SEX AND AGE GROUP (%)



Note: The year 2005 is reported because it is the first one in which the present breakdown by age was used.

An ageing population and a very low fertility rate were inducing a fall in the working age population and putting pressure on the predominantly pay-as-you-go pension system. Immigration was not sufficient to compensate for the decline in the resident population. Since 2005, Ukraine was losing on average about 200,000 persons per year – the equivalent to a medium-sized town disappearing from the landscape every twelve months. This is a considerable amount of people if we consider that, as of the end of 2021, the population of Ukraine was estimated at 41.2 million persons.³

The COVID-19 pandemic exacerbated these structural problems. The pandemic-related restrictions imposed in 2020-2021 on trade, transport and services, as well as the uncertainty over the spread of contagion, induced strong declines not only in the demand but also in the supply of labour. The initial impact of the pandemic was more on participation than on unemployment. Among the factors inducing a decline in labour supply were that (1) individuals not to not work did not return to their previous employment after the quarantine restrictions were lifted, and (2) temporal limitations on public transportation made it almost impossible to search for another job at some distance from home.

In this context, a further reduction of labour force participation of women was observed. Two key factors seem to have been behind this development: (1) the concentration of employment losses in women-dominated occupations in services, and (2) the fact that the burden of care for young children (most kindergartens and schools were closed) disproportionately fell on mothers. This would explain the dramatic fall of female participation in the 25–29, 30–34 and 35–39 age groups, while the rates for similarly aged men groups remained stable or even slightly increased (Figure 1).

The impact of the pandemic on employment was, as in most OECD countries, mitigated by the expansion of remote working. Short-time work schemes were also used, but much less so than in OECD countries. At the same time, the informal sector failed to provide alternative employment opportunities to displaced workers, unlike in previous recessions where the shadow economy had operated as a kind of automatic stabiliser. Indeed, the pandemic affected the informal sector more than the formal sector, leading to a decline in the shadow employment rate (the share of informal employment in total employment) (see Table 2).

Incomes of displaced workers were supported by increased coverage and duration of unemployment benefits, which were extended to workers who had not been paying social security contributions as they were previously working in the informal sector. New transfers to employers and to the self-employed were introduced to keep businesses afloat. Pensions were increased, contributing to further to the decline in labour force

3 These estimates are based on the latest available Census, which was conducted in December 2001, i.e. 20 years ago. Census data have been updated with administrative data on births, deaths and registered migration.

participation experienced by Ukraine since 2019. Effective labour supply was also reduced by a relatively long duration of unemployment, notably in urban areas (Table 3). This, together with the job reallocation caused by the recovery from the COVID-19 crisis, created serious bottlenecks in the labour market.

TABLE 2 INFORMAL EMPLOYMENT AND THE SHADOW RATE, AGES 15-70

	2013	2015	2019	2021
Informal employees (% of total employed) (1)	8.1	12.6	9.6	8.3
Informal self-employed (% of total employed) (2)	15.5	13.6	11.3	11.0
Shadow rate (1+2)	23.5	26.2	20.9	19.3

Note: The shadow rate is defined as the ratio of informal over total employment.

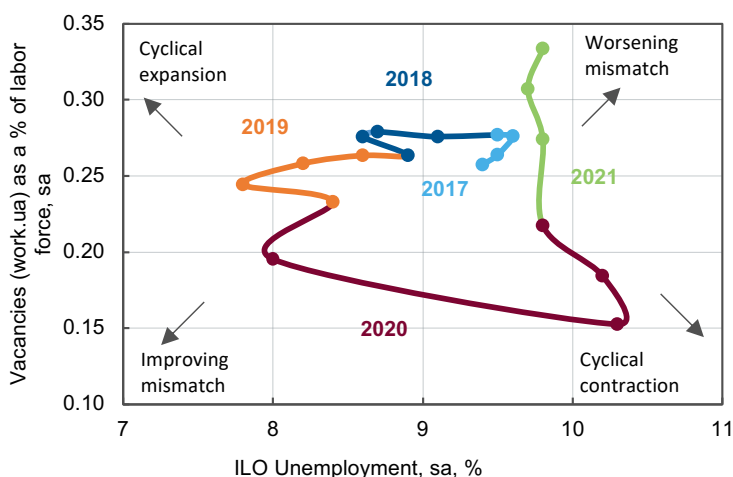
TABLE 3 UNEMPLOYED POPULATION AGED 15-70, BY SEX AND TYPE OF AREA, 2020

	Total	Females	Males	Urban	Rural
Unemployed population (thousands)	1,674.2	763.2	911.0	1,101.0	573.2
By duration of job search (%)					
Up to 1 month	12.6	11.2	13.7	11.5	14.6
From 1 to 3 months	22.0	21.3	22.5	19.5	26.8
From 3 to 6 months	27.3	27.4	27.3	27.1	27.8
From 6 to 9 months	10.6	11.8	9.5	10.9	9.9
From 9 to 12 months	6.3	6.8	6.0	6.8	5.5
12 months and more	21.2	21.5	21.0	24.2	15.4
Average duration of job search (months)	6	7	6	7	6

In 2021 firms faced labour shortages. A shift outwards of the Beveridge curve (Figure 2),⁴ with more unfilled vacancies at any given level of unemployment, was associated with an increase in wages, with nominal growth (18.2% year-on-year in January 2022, the latest available data) real growth (7.4% year-on-year) in wages largely outpaced developments in the previous years (National Bank of Ukraine 2022).

4 The Beveridge curve provides a graphical representation of the relationship between the unemployment rate and the job vacancy rate (the number of unfilled jobs as a proportion of the labour force). If the curve moves outward, a higher level of unemployment corresponds to any given level of vacancies. This implies decreasing efficiency of the labour market, likely caused by larger frictions in the matching of vacant posts and jobseekers.

FIGURE 2 BEVERIDGE CURVE FOR UKRAINE



Source: National Bank of Ukraine (2022).

3 THE LABOUR MARKET CONSEQUENCES OF THE WAR

Right after Russian missiles began to fall on Ukrainian cities and the invading armies crossed borders on the north, east and south of the country, life for more than 40 million Ukrainians changed drastically. Different surveys report that about one third of the population left their homes, migrating within the country or abroad.⁵ A large share of those who did not relocate lost their jobs. According to a poll by the Advanter Group conducted in early March, three out of four small businesses reported that they had completely halted their operations, and another 10% were operating at 10–30% of capacity.⁶ During the first weeks of the invasion, most local shops and markets in the endangered cities were closed. The situation with larger companies was slightly better because they have larger financial cushions and greater diversification on both the input and output side. A survey of large enterprises by the American Chamber of Commerce in Ukraine showed that only 12% discontinued operations in Ukraine in March.⁷

At the macro level, the most important change was once more not the increase in the unemployment rate but the dramatic fall in the labour force. With millions leaving the country, labour supply declined in some cases even more than labour demand. Even those people who remained in their homes were often unable to get to work. Also, the majority of people who lost their jobs were probably unable or unwilling (for example, due to safety

5 Figures range from 19% (https://ratinggroup.ua/research/ukraine/pyatnadcat_obschenaci_opros_ukraina_vo_vremya_voynny_zanyatost_i_dohody_23-24_iyulya_2022_goda.html) to 39% (https://gradus.app/documents/302/Gradus_EU_wave_10_ENG.pdf wave of the study).

6 Advanter, "Study of the state of SMEs" (https://res2.weblium.site/res/621f33197345110023320e26/628b39e6cfded0023850518_optimized_1087?nowebp, in Ukrainian).

7 AmCham Ukraine, "Doing Business During War in Ukraine, week 4" (https://chamber.ua/wp-content/uploads/2022/03/Survey-Results_ENG_Doing-Business-during-War-in-Ukraine.pdf).

concerns, or setting up in a new place for internal and external migrants) to search for a new job, thus temporarily leaving the labour force. According to the July Rating Group survey, almost half of those who lost their jobs after the beginning of the full-scale war were not searching for a new one.⁸

3.1 Relocation of people

The full-scale invasion led to levels of migration not seen since World War II, both within Ukraine and abroad. According to the tenth wave of survey performed by Gradus in September 2022, 39% of respondents changed their place of residence (Figure 3).⁹ Of these, the largest share (62%) moved to another oblast,¹⁰ 22% moved within the same oblast (often from urban centres to nearby rural settlements in order to avoid air strikes on cities) and 16% moved to another country.

FIGURE 3 DECISION ON WHETHER AND WHERE TO RELOCATE



Source: Gradus.

8 Rating Group 15th national survey, "Ukraine during the war. Employment and incomes" (https://ratinggroup.ua/research/ukraine/pyatnadcat_obschenaci_opros_ukraina_vo_vremya_voynny_zanyatost_i_dohody_23-24_iyulya_2022_goda.html, in Ukrainian).

9 https://gradus.app/documents/302/Gradus_EU_wave_10_ENG.pdf

10 Oblasts are the first-level administrative divisions of Ukraine - the equivalent of regions (or provinces).

If the results of the Gradus survey are representative of the entire population of Ukraine, then currently there would be around 13 million people in Ukraine living in a different place than before the full-scale invasion.¹¹ Estimates from the United Nations High Commissioner for Refugees (UNHCR) of the numbers of internally displaced people (IDPs) are lower, but still at substantial levels – around 7 million Ukrainians would be involved.¹²

The Russian invasion of Ukraine has also caused the largest refugee crisis in Europe in more than 70 years. Since the end of February 2022, UNHCR reports 13.4 million border crossings from Ukraine and 6.3 million border crossings to Ukraine.¹³

Table 4 shows refugees from Ukraine recorded across Europe and bordering countries. Of them, more than 4 million (as of 30 September 2022) are currently registered for Temporary Protection or similar national protection schemes in Europe.¹⁴ This status enables them to choose their country of destination within the EU and to work immediately without any waiting period, unlike other refugees. This has allowed for further transnational mobility of Ukrainian refugees. Indeed, only about six out of ten refugees were planning to remain in the EU country that initially granted them asylum. About 10% of the refugees were planning to move to another host country (top choices were Germany and Canada) and another 15% were planning to return to Ukraine in the coming months, perhaps for family reunification. Among these, around 90% planned to return to the same oblast.¹⁵

Women and children represent around 90% of refugees.¹⁶ Four out of five refugees had to separate from at least one immediate family member who stayed behind in Ukraine. A substantial amount of human capital was involved in the displacement. Around half of refugees have completed their university studies and 25% have a vocational or technical education. Three out of four refugees were working before leaving Ukraine.

11 Responses are collected from towns with a population of 50,000 or more via an app that works on a smartphone; therefore, the respondents are not an exact snapshot of the population. The survey used only people aged 18 or over, but many families migrated with children.

12 <https://www.unhcr.org/ua/en/internally-displaced-persons>

13 This figure reflects cross-border movements, not individuals (source: <https://data.unhcr.org/en/situations/ukraine>).

14 Source: <https://data.unhcr.org/en/situations/ukraine>

15 These intentions are confirmed by more recent surveys such as Factsheet “Profiles, Needs & Intentions of Refugees from Ukraine”. They are based on 23,054 interviews conducted between May and mid-August 2022 by UNHCR and its partners in Belarus, Bulgaria, Hungary, Republic of Moldova, Poland, Romania and Slovakia. This was part of a “protection, profiling and monitoring” exercise to regularly collect and analyse data about the profiles, needs and intentions of refugees from Ukraine and to monitor changes over time (<https://data.unhcr.org/en/documents/details/95010>).

16 The data in this section are based on 4,900 interviews with refugees from Ukraine in the Czech Republic, Hungary, the Republic of Moldova, Poland, Romania and Slovakia between mid-May and mid-June 2022, complemented with seven focus group discussions conducted in Poland and Romania (<https://data.unhcr.org/en/documents/details/94176>).

TABLE 4 REFUGEES FROM UKRAINE, RECORDED BY COUNTRY

Country	Refugees	Country	Refugees
Albania	2,780	Latvia	38,915
Armenia	489	Liechtenstein	306
Austria	82,446	Lithuania	66,368
Azerbaijan	4,218	Luxembourg	6,561
Belarus*	14,219	Malta	1,518
Belgium	56,464	Montenegro	26,745
Bosnia and Herzegovina	231	Netherlands	79,250
Bulgaria	56,734	North Macedonia	5,817
Croatia	18,328	Norway	27,845
Cyprus	13,852	Poland	1,409,139
Czech Republic	439,043	Portugal	52,819
Denmark	35,193	Republic of Moldova	92,443
Estonia	57,257	Romania	80,498
Finland	38,588	Russian Federation*	2,772,010
France	105,000	Serbia and Kosovo	19,722
Georgia	26,135	Slovakia	95,375
Germany	997,895	Slovenia	8,171
Greece	19,413	Spain	144,668
Hungary	30,000	Sweden	45,895
Iceland	1,640	Switzerland	65,098
Ireland	49,999	Türkiye	145,000
Italy	170,646	United Kingdom	131,700
Total	7,536,433		

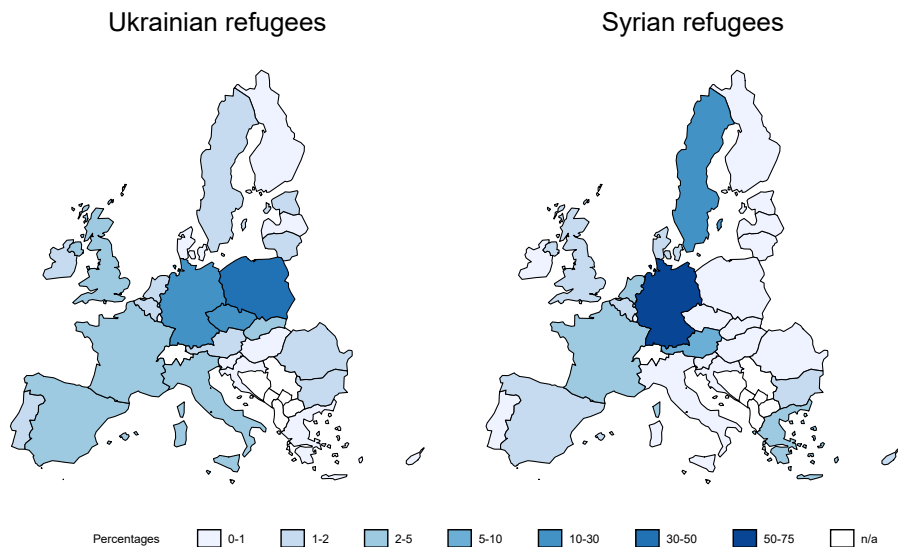
Notes: European and bordering countries are reported. For statistical purposes, UNHCR uses the term 'refugees' to refer to all refugees having left Ukraine due to the international armed conflict. However, we are aware that some of the refugees to Russia have been forcibly deported there (it is hard to tell their exact number, but it is probably in the hundreds of thousands).

Source: UNHCR, September 2022.

As stated above, under the Temporary Protection status, Ukrainian refugees are free to choose their country of destination within the EU. This was not the case for Syrian refugees in 2015 and the following years, when relocations were based on political willingness to accept migrants in different countries.

Figure 4 compares the destinations of Ukrainian and Syrian refugees in Europe. Darker areas denote concentrations of refugees in specific countries. The maps point to a more balanced geographical allocation of Ukrainian refugees. In the Syrian case, 60% of refugees went to Germany, another 11% to Sweden, 6% to Austria and 4% in France, Greece and the Netherlands. Thus, almost 90% of Syrian refugees were concentrated in six countries. In the Ukrainian case, concentration is mainly driven by geographical proximity to the country of origin, and about one third of the refugees are evenly spread across 24 countries.¹⁷

FIGURE 4 GEOGRAPHICAL CONCENTRATION OF UKRAINIAN AND SYRIAN REFUGEES IN EUROPE



Note: Comparison with EU countries (+UK), percentage of total refugees per category. For Syrian refugees, the reference year is 2021.

Source: UNHCR, September 2022.

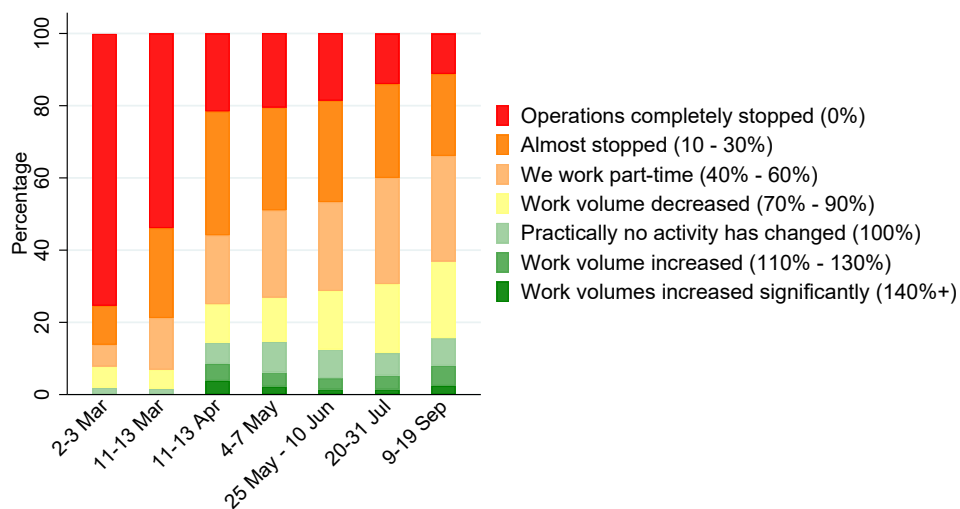
3.2 Relocation of firms

After the initial shock the situation started to gradually improve, but the speed of the recovery in different spheres was markedly uneven. New waves of the small and medium-sized enterprise (SME) polls conducted by Advanter suggest that by mid-March 2022 the share of completely stopped businesses had already fallen to 53%, and one month later to 21.6%. However, the recovery of employment has been far from full. In April, over a third (34.3%) of firms were working at 10–30% of capacity, and another 19.1% at 40–60%. The share of SMEs that were producing on the same scale or more than before the full-scale

¹⁷ As per UNHCR data, the total number of refugees from Ukraine relocating in the EU (+UK) is 4,331,735 while from Syria it is 1,031,904 (reference year: 2021). To grasp the magnitude of relocation, 1% of Ukrainian refugees is roughly equal to 4% of Syrian refugees in absolute numbers.

invasion was just 14.4%. Moreover, after an initial rebound, the situation from mid-April to July remained almost unchanged.¹⁸ Similar results are reported in a survey of SMEs by the European Business Association, which revealed that in March 42% of respondents had halted their work, decreasing to 17% in May and 16% in July.¹⁹

FIGURE 5 CHANGE IN THE STATUS OF BUSINESSES IN UKRAINE SINCE THE START OF THE FULL-SCALE INVASION



Source: Advanter.

Companies started to relocate their business. A survey of firms conducted at the beginning of July 2022 by Gradus showed that a third of all businesses have either fully (12%) or partially (20%) relocated or are about to relocate, and another 18% envisage relocating but have not started the process yet.²⁰

In most cases, the relocation of a firm does not coincide with the relocation of its workers. Most of the relocated businesses (72%) remained in Ukraine, the rest transferred their activity either fully or partially abroad – chiefly to Poland.²¹

The nature of the business is a key factor behind the choice of firms to relocate. Businesses in sectors such as IT and finance display a much higher share of relocations than retail, real estate or construction.²²

18 Another survey of SMEs in March-May presents similar results: only 21% of firms were operating at pre-war capacity, while 17% had completely halted their activities.

19 <https://eba.com.ua/wp-content/uploads/2022/08/1.png> (in Ukrainian).

20 https://gradus.app/documents/269/Gradus_Forbis_ENG.pdf

21 Another survey of SMEs found that as of early May, 71% of respondents remained in place, while the rest had either already relocated or were planning to (https://res2.weblium.site/res/621f33197345110023320e26/628b39e33ac0ae0022ed59fb_optimized, in Ukrainian).

22 https://res2.weblium.site/res/621f33197345110023320e26/628b39e0ae7d00238d2102_optimized (in Ukrainian).

3.3 Labour market tightness

The relocation of firms took place at the same time as some waves of return migration. Thus, the short side of the market became labour demand. As discussed in Section 1, before the full-scale invasion, the labour market was relatively tight due to the fall in participation and long-duration unemployment, and real wages had been growing significantly despite the global pandemic.

Since April 2022, the number of workers searching for a new job has increased much faster than the number of new vacancies. According to the job-seeking site grc.ua, which specialises in skilled/specialist labour, 12 people responded to each vacancy on the site on average in June 2022, which is four times more than in the same period the year before. Increased search intensity also allowed for faster filling of job openings. There is evidence that jobseekers have changed their attitude towards the job search process: fewer and fewer of them wait passively for an employer to pay attention to them, and instead increasingly use all available channels to signal their availability for work.

Due to the fact that many more women have migrated than men, and to a large extent abroad, some professions where jobs were traditionally chiefly held by women are in greater demand, especially in healthcare, retail and accounting. At the same time, there has been a huge drop in demand for jobs in entertainment (concerts, cinema, travel and hotels, etc.). There is no significant difference across genders in the share of people who have lost their jobs (40% for men versus 41% for women), but men are more actively searching for new jobs, possibly because non-employed women are often more involved in childcare and helping elderly family members.

According to a survey by Rating Group in July, among people who had a job before the full-scale invasion, 39% no longer work and another 19% are working remotely or partially.²³ This was the fifth wave of the survey, with previous waves conducted in March, April (two waves) and June. After the initial drop in the 'non-working' share from 53% in March to 39%, the share remained roughly the same from late April. The share of people who have lost their job is highest among low-wage workers (77%) and older workers (46% of those aged 51 and over), as well as among those who were forced to leave their homes (55%).

Examination of the geographical distribution of job-seekers reveals that the most affected regions are in the east and south of Ukraine, which is hardly surprising given that these regions are partially under Russian occupation or are part of the battlefield. However, even western regions of Ukraine, where no armed conflict has taken place except for air strikes, have a sizable share of people who have lost their jobs, and this share increased

23 https://ratinggroup.ua/research/ukraine/pyatnadcat_obschenaci_opros_ukraina_vo_vremya_voynny_zanyatost_i_dohody_23-24_izulya_2022_goda.html (in Ukrainian).

during the last wave of the survey in July 2022. Indirect effects of the war – for example, related to the breakdown of supply links and production chains, as well as a sharp change in the profile and magnitude of product demand – are likely to have played an important role in the nationwide rise in unemployment.

Unfortunately, wage data from the national statistical office are not available. However, we do have information from recruiting agencies about proposed wages from job offers and expectations of job-seekers.²⁴ According to the job-search website grc.ua,²⁵ in July–August 2022 average nominal wages remained almost the same as in the previous month and in the same month in 2021. However, the surge in inflation (in July inflation was at 22.2% on a yearly basis) implies a dramatic drop in real wages.

There is also considerable mismatch in the regional distribution of labour supply and demand. Relocations of both labour and businesses between oblasts usually were from all directions to western Ukraine as the furthest away from the frontlines. At the same time, according to the largest job-search site www.work.ua, most job-seekers are in the centre of Ukraine, rather than in the west.²⁶ A similar distribution is reported by [www.grc.ua](https://grc.ua): Lviv oblast (the most populous of the western oblasts) had the second largest share of new vacancies after the city of Kyiv in June (13.6%), with up to two people applying for each vacancy in all western oblasts, compared to six per vacancy in Kyiv and 13–14 per vacancy in Zaporizhzhya and Kharkiv oblasts.²⁷

4 WHAT HAVE WE LEARNED FROM PREVIOUS CONFLICTS IN EASTERN EUROPE?

There are three key lessons for the reconstruction of Ukraine that can be learned from the experience of other Eastern European countries that have recently been involved in military conflicts.

Lesson 1: Displacement worsens labour market outcomes

The war in Bosnia and Herzegovina was one of the major conflicts in Eastern Europe in contemporary history. Between 1992 and 1995, it displaced 1.3 million people, 1.1 million of whom resettled after the conflict. Kondylis (2010) analyses the labour market outcomes of displaced workers and finds that they were less likely to be working relative to people who stayed. While displaced men experienced higher unemployment levels, displaced women were more likely to drop out of the labour force. This result is somewhat surprising as it was mainly the most skilled workers and those in better health who had left the country at the beginning of the war.

24 We must underline that the coverage of vacancy data is limited and job acceptance rates are measured based on subjective statements rather than actual work contracts.

25 <https://grc.ua/article/30669>, <https://grc.ua/article/30602> and <https://grc.ua/article/30725>

26 www.work.ua/news/ukraine/2158/

27 <https://grc.ua/article/30545>

Research on the labour market consequences of the Kosovo war can shed light on the mechanism behind the observed detrimental effect of displacement on labour market outcomes when a war is over (Trako 2018). Displaced men coming back from exile were less likely to be employed in the agricultural sector and to work on their own account, while displaced women were more likely to be inactive. Loss of assets (land, livestock, etc.) in an agrarian skill-based economy, as well as loss of social networks in an informal labour market, might have decreased the probability of finding employment relative to stayers. However, shortly after returning home, displaced men and women tended to moved off-farm, finding jobs primarily in the construction and public administration sectors.²⁸

Youth unemployment is a serious concern after a war. Fares and Tiongson (2007) examine early unemployment spells and their longer-term effects among youth over the period 2001–2004 in Bosnia and Herzegovina. They find that youth unemployment was about twice the national average and that younger workers were more likely to go into inactivity or unemployment and less likely to experience transitions out of inactivity, holding other things constant. Regardless of age, initial spells of unemployment or joblessness appear to have long-lasting adverse ‘scarring’ effects on earnings and employment.²⁹ Although higher educational attainment is generally associated with more favourable labour market outcomes, the penalty from jobless spells is higher for more educated workers.

A cross-country analysis by Ivlevs and Veliziotis (2018) confirms a significant long-term labour market disadvantage from forced displacement: people who fled conflict 10–15 years earlier are more likely to (1) be long-term unemployed, (2) have experienced a recent job loss and (3) work informally.³⁰ People affected by conflict (both displaced and non-displaced) are more willing to acquire further education and training. These results are not uniform across demographic groups, however: displaced women consistently experience a greater labour market disadvantage than displaced men, and younger people (aged 18–34) affected by conflict are particularly keen to acquire extra education and training. Overall, the results in Ivlevs and Veliziotis (2018) highlight a long-lasting vulnerability of the forcibly displaced.

Internally displaced people (IDPs) are a special case. Torosyan et al. (2018) focus on Georgia, which experienced a large flow of internal migrants from the early 1990s until now. They find that labour market outcomes for IDPs are much worse than those for local residents. IDPs are 3.9–11.2% less likely to be in the labour force, depending on the period

28 Related to this, Sanch-Maritan and Vedrine (2019) show that in Bosnia and Herzegovina, conflict-induced displacement of agricultural households dramatically affects the adoption of new technologies in agriculture: displaced workers are less likely than stayers to adopt fertilizers and pesticides. The authors speculate on two possible mechanisms that link forced displacement and technology adoption. The first is behavioural factors, such as risk aversion. The second was the effect of the war on land ownership regimes. Displaced people find themselves caught in an ‘institutional poverty trap’, because their return threatens the unity of the new territories built on ethnic affiliation. Their future is very uncertain because, on the one hand, they farm land without property rights, and on the other hand, they cannot go back to their old property. This legal framework fosters legal insecurity and inhibits legitimate investment

29 See papers from the EXCEPT project on the impact of youth unemployment on subsequent lives at <https://www.except-project.eu/publications/>.

30 Data are from a survey conducted in 2010.

and duration of IDP status. IDPs are also up to 11.6% more likely to be unemployed, even 20 years after forced displacement. Those residing in a locality for more than five years ('protracted displacement') earn persistently lower wages than local residents with similar characteristics. This gap widens over time, reaching 11% in the last period under analysis. Without active policies aimed at the improvement of labour market outcomes of IDPs, there is no evidence of an improvement in outcomes in the long run. In the Ukrainian context, Vakhitova and Iavorskyi (2020), in a study of Luhansk and Donetsk oblasts after 2014, document that displacement has been associated with a large gap in terms of employment for both genders. After controlling for personal characteristics, the structure of the household, its location, non-labour incomes and endogeneity of displacement, they observe that the heads of displaced households are 20% less likely to be employed two years after resettlement.

The literature review on job interventions for refugees and IDPs by Schuettler and Caron (2020) identifies as specific challenges the loss of assets and separation from family members, the lack of skills required by the host labour market, the impact of forced displacement on health and economic behaviour (in terms of prospects and aspirations, risk-aversion and time horizon), the legal situation, a lack of social networks and discrimination, as well as a high likelihood of excess supply in the labour market at destination. The authors point to the importance of conducting thorough assessments of both the demand and supply side of the labour market, including the legal situation of those forcibly displaced and their perceptions and aspirations, before designing interventions. Making up for lost assets through cash injections seems particularly important, together with other interventions that tackle specific challenges that refugees and IDPs face. Changing when and how the right to work, residency status and freedom of movement are granted has important impacts on labour market outcomes. Intensive coaching and individualised assistance seems to help with matching.

Lesson 2: Wars generate large losses of human capital

The intensity of war has deep and long-lasting effects on educational attainments. Swee (2015) finds that in the context of the 1992–1995 civil war in Bosnia and Herzegovina, cohorts that endured greater war intensity were less likely to complete secondary schooling (but not primary schooling). These effects are much stronger for males than for females. Drafted male cohorts experience a deterioration in their physical and mental health relative to female and non-drafted cohorts, suggesting that military drafts may play an important role.

Focusing on the same conflict, Eder (2014) studies the effect of forced migration of parents on investment in their children's education years later. In comparison with households who did not have to move because of the war, displaced parents spend between 20% and 30% less on the education of their children in primary and secondary school. The result also holds for one-time expenditures on things such as textbooks, school materials and

tuition in secondary schools. Differences in income and the stock of durable goods can explain at most one third of the gap in spending. Other potential explanations for the reduced spending of displaced parents on education include altered preferences through exposure to violence, increased uncertainty about the future, and financial constraints.

Similarly, Efendic et al. (2022) find that individuals with greater exposure to conflict exhibited systematically worse educational performance and lower earnings two decades after the war. Their results also indicate that those who left the country and have since returned have significantly higher incomes and educational attainment, compared with those who did not move. Internal migrants, on the other hand, did not have different educational or income outcomes than those who remained in place throughout the conflict. Those who moved abroad benefited from additional educational and work opportunities. However, when voluntary migrants and those who were forced to move are separated, the latter have lower levels of income and educational achievement. It appears that the additional educational and labour market opportunities abroad could not fully make up for the disadvantages of forced displacement.

These detrimental effects of war on education have also been documented for other historical episodes. As Ichino and Winter-Ebmer (2004) point out, an important component of the long-run cost of a war is the loss of human capital suffered by children who receive less education. In the context of World War II, Austrian and German individuals who were aged ten during the conflict, or were more directly involved through their parents, received less education than comparable individuals from non-war countries, such as Switzerland and Sweden. They also experienced a sizable earnings loss 40 years after the war, which can be attributed to the educational loss caused by the conflict and imply significant consequences in terms of loss of GDP.³¹

Gorodnichenko et al. (2022) study the effect of war on a country's human capital and outline the key directions for rebuilding human capital in Ukraine: quantity and quality of schooling for children, quality of higher education, training and retraining programmes for adults, assistance for people with disabilities, post-deployment reintegration into the civilian sector, population growth and fertility, and promotion of self-motivating mechanisms.

Lesson 3: Conflict has long-lasting effects on both physical and mental health

Zilic (2018) analyses the health consequences for females of forced civilian displacement that occurred during the Serbo-Croatian conflict in 1991–1995. During that period, a quarter of Croatian territory was ceded, 22000 people were killed and more than half a million individuals were displaced. Unsurprisingly, results indicate that various

31 For an analysis of the consequences of shocks to human and physical capital on the creation of scientific knowledge, see Waldinger (2016)

dimensions of measured and self-assessed health are adversely affected by displacement. In terms of latent health, there is a positive selection into displacement: faced with armed conflict, individuals with better latent health, conditional on age and education level, were more prone to move.

Focusing on the 1992–1995 Bosnia and Herzegovina conflict, Shemyakina and Plagnol (2013) find that individual war-related trauma has a negative, significant and lasting impact on subjective wellbeing (the effect is stronger for those displaced during the war), while Bratti et al. (2015) show that six years after the conflict, war-traumatised individuals were 60% more likely to be at risk of depression and have worse labour market outcomes.

In the Ukrainian context, Coupe and Obrizan (2016) study how war affects happiness and find that the average level of happiness declined substantially but only in areas that experienced war directly, with the drop being roughly comparable to the loss of happiness a relatively well-off person would experience if he or she were to become a poor person. Osichuk and Shepotylo (2020) investigate the contemporaneous effect of conflict on civilians living outside of the conflict zone and find that in Russia and Ukraine over 2012–2016, the conflict significantly worsened financial wellbeing, mostly by worsening expectations, and that this is inversely related to the distance from the conflict zone. Their analysis also indicates an increase in chronic diseases in Ukraine over a longer period, while mental health was negatively impacted in both countries at the earlier stages of the war. However, in Russia this effect was significant only in the region bordering the conflict zone, while in Ukraine it was significant in regions farther away from the conflict zone.³²

These findings are consistent with evidence on other major armed conflicts. Kesternich et al. (2014) investigate the long-run effects of World War II on socioeconomic status and health of older individuals across Europe. Exposure to war and, more importantly, to individual-level shocks caused by the war significantly predicts economic and health outcomes at older ages: it increased the probability of suffering from diabetes, depression, and, with less certainty, heart disease, so that those experiencing war or combat have significantly lower self-rated health as adults. Experiencing war is also associated with less education and life satisfaction and decreases in the probability of ever being married for women.

Other lessons

Another fundamental channel through which conflict impacts labour market outcomes is its longer-term impact on firm performance and local economic development. Petracco and Schweiger (2012) explore the short-run impact of armed conflict on firms' performance and their perceptions of the business environment, focusing on the August 2008 conflict

32 For the analysis of the effect of the Russian invasion from 2014 to February 2022, see also Aslund (2018), Melnyk et al. (2019), Havlik et al. (2020) and Kharitonov (2020).

between Georgia and Russia. Despite its relatively short duration, this armed conflict had a significant and negative impact on exports, sales and employment for at least a subset of firms. Perceptions of some obstacles to the business environment were also affected, but not necessarily negatively. Young firms can experience a scarring effect from conflict, which may lead them to close down prematurely. Small, young firms may find it more difficult to deal with the aftermath of an armed conflict than large, established firm; they are likely to have fewer suppliers or customers and have less experience in dealing with an adverse business climate, and may not be aware of remedial measures available from institutions. What happens to them can have important consequences – several studies (e.g. Haltiwanger et al. 2013, Criscuolo et al. 2014) show that young firms contribute substantially to job creation.³³

On institutional trust, Alacevich and Zejcirovic (2020) investigate the effect of violence against civilians on voting, using data from elections in Bosnia and Herzegovina between 1990 and 2014 and exploiting variation in war intensity. They estimate a negative impact on voter turnout that persists for more than 20 years. Violence against civilians drives this negative effect: respondents in more affected municipalities report lower generalised trust, trust in institutions and voting.

5 BUILDING A BETTER LABOUR MARKET

In this section, we discuss policy options for a recovery of the Ukrainian labour market. Consistent with the other chapters in this book, the underlying assumptions are that the war is over, security issues have been sorted out, a long-lasting peace is on the horizon and Ukraine is a candidate for EU membership. In our scenario, the western part of Ukraine – notably its rural areas – are largely spared from the war destruction. Clearly, these policies will have to be enforced by a sufficiently efficient state machinery. This is why the prospect of EU entry is very important. It can be a powerful tool to set up systematic technical assistance, and also indirectly induce an improvement in the quality of Ukrainian institutions. This is essential for the success of the strategy outlined below also from the standpoint of societal involvement in the reconstruction. As argued by Justino (2022) based on evidence from other wars, the economic, social and political recovery of Ukraine will be dependent not only on reconstructing markets and infrastructure, but also on ensuring that social cohesion and trust in institutions are rebuilt so that any post-war government is able to succeed in maintaining a united population.

33 On the impact of war on later economic development, somehow optimistically, it is worth citing Miguel and Roland (2011). They investigate the impact of US bombing in Vietnam (the Vietnam War featured the most intense bombing campaign in military history and had massive humanitarian costs). Comparing heavily bombed districts to other districts, controlling for local demographic and geographic characteristics and using an IV approach exploiting distance to the 17th parallel demilitarized zone, US bombing did not have negative impacts on local poverty rates, consumption levels, infrastructure, literacy or population density through 2002. This finding indicates that even the most intense bombing in human history did not generate local poverty traps in Vietnam – that is, situations in which people who are poor are unable to escape from poverty. However, as Dell and Querubin (2018) point out, bombing increased the military and political activities of the communist insurgency, weakened local governance, worsened attitudes toward the US and South Vietnamese government and reduced non-communist civic engagement.

A rebound in economic activity should be expected at the end of the war. As reported by Hoeffler (2012), there is strong evidence that countries experience higher-than-average growth rates once a war is over (the ‘peace dividend’). Hoeffler finds that the economies of countries involved in conflict grow by about 1.6% less per year on average than peaceful states, but once the war ends their economies rebound. However, it takes more than 20 years on average for these economies to revert back to pre-war trend levels. Labour markets in this context need to be sufficiently flexible to reduce potential bottlenecks in the recovery and, at the same time, offer incomes to groups that presumably will find it hard for quite a long time to have stable employment. This means having a better labour market than before the war and an encompassing safety net.

There are four main sets of policies to be pursued in the years to come to rebuild a better labour market:

1. investing in human capital for the future (remedying gaps in educational attainment in schools and offering retraining to job losers);
2. making better use of existing human capital, increasing labour force participation of women and tackling youth unemployment among internally displaced workers;
3. protecting the most vulnerable groups in a sustainable fashion; and
4. promoting a return of ideas if not of persons, by involving Ukrainian refugees in job creation.

5.1 Investing in the future human capital

The pandemic and the war have created huge **gaps in educational attainment**. Schools were closed during the lockdown, resorting at best to distance learning. Right after the Russian invasion, most schools were closed nationwide. On 25 February, the Ministry of Education recommended that all educational facilities go on a at least two-week break.³⁴ Then the ministry recommended either shifting to online/remote teaching or continuing the break. Reopenings were mainly in the form of distance learning. The majority of schools and universities chose remote teaching if they were relatively safe (missile strikes were in all regions, so in-person studies were discouraged even far from frontlines). Most schools and universities finished the academic year 2021–22 online, while those in the newly occupied territories were still on a break (the chapter in this book on education by Martin Kahanec and co-authors provides more detail on this).

The situation has only partially improved in 2022–23. The external final exams (similar to the SATs in the United States) guiding enrolment to tertiary education were carried out later than usual. Since many potential new students are IDPs or refugees abroad, several waves of the test were organised, shifting the beginning of the 2022–23 academic

34 <https://mon.gov.ua/ua/news/sergij-shkarlet-vsime-zakladam-osviti-rekomendovano-pripiniti-osvitnij-proces-ta-ogolositi-kanikuli-na-dva-tizhni> (in Ukrainian).

year for first-year students by one month. The situation is more serious in schools. Schools that have shelters and are far from frontlines started to work in-person at the beginning of September 2022, with parents allowed to choose if their child would go into school or study remotely. In the occupied territories, Russia actively promoted a shift to the Russian curriculum, including importing both textbooks and teachers, but no school successfully reopened on 1 September 2022.³⁵ Thus, for some students, gaps in educational attainment can extend well beyond the loss of one year of teaching. Remedying these gaps in education accumulated in the last three years should be a priority matter for the reconstruction of Ukraine. Moreover, it is of foremost importance to improve not only the quantity but also the quality of education (Heckman 1998, 2006, Hanushek and Woessmann 2016).

There are a variety of methods to provide **remedial education** to students left behind by the two shocks that have dramatically hit the school system in Ukraine. Angrist et al. (2022) list some of these: (1) opening classes for Ukrainian refugees in selected schools in neighbouring countries, as well as expanding schools in parts of Ukraine where many internally displaced families have moved; (2) provide online, by-phone, or in-person tutoring possibly drawing also on the experience of the Ukrainians teachers who have left the country during the war; (3) adapt curricula – including providing tablets and online textbooks in Ukrainian – in countries receiving refugees so that a large number of refugee children can regain access to standard schooling.

Online remedial education can be a key driver of students' learning engagement. As suggested by Werner and Woessmann (2021), for this to be possible it is fundamental that all children have access to adequate digital devices and a good internet connection at home. The same is true for teachers, who may require some training. While online teaching is unlikely to fully substitute for in-person teaching, the daily interaction can better protect children's cognitive and socio-emotional development than pure self-studying. In addition to remedial education in schools, two further measures that have been shown to be quite effective in reducing gaps in educational attainments are tutoring and mentoring. Tutoring works better when carried out by educators or other professionals, and at early ages (Nickow et al. 2020). Ukrainian refugees abroad, including a large share of teachers, can contribute greatly to this mission.

Retraining of job losers is also a very important component of investments in human capital. The large-scale displacement suffered by the Ukrainian population has destroyed millions of jobs. In the post-war economy, some jobs will come back but a significant fraction of them will disappear and be replaced by new jobs. Construction, civil engineering, health and information technology will likely be the key industries offering jobs in the post-war economy. Major investments will be required in physical

35 <https://sprotyv.mod.gov.ua/2022/09/02/shkoly-bez-ditej-okupanty-provalyly-pershe-veresnya/> (in Ukrainian).

capital, residential building and infrastructure (Blinov and Djankov 2022).³⁶ The decline in agricultural employment will likely continue, creating hardship for those who have moved to rural areas during the war and resorted to subsistence agriculture to cope with the crisis. The only exceptions to this mass job destruction will be agricultural export industries.

Making the best use of human resources in this context implies retraining job losers. The Ukrainian government has set aside a budget and put in place a framework for training for blue-collar jobs, but implementation will be difficult and with growing demand for skilled professionals, much more should be done.³⁷

Investment in human capital beyond the school system can also be encouraged with fiscal as well as non-fiscal incentives (e.g. Heckman 1998).³⁸ Self-incentives could be amplified by easier access to retraining, improved working conditions and other mechanisms that enhance quality of work.

5.2 Increasing labour market participation of women and tackling youth unemployment

One of the ways to compensate for the loss of displaced workers and the loss of human capital involved by the refugee crisis is to increase labour market participation. In particular, women's participation should be encouraged by adopting employment-friendly family reconciliation policies. These policies were undersized in Ukraine before the war and were largely oriented towards informal childcare, allowing women to take up to three years of maternity leave.³⁹

To encourage **women's participation in the labour force** and at the same time support childbearing, the priority should be shifted from direct payments to parents providing informal care to creating a government-sponsored childcare infrastructure. Currently, there is a substantial deficit in childcare facilities in the main urban centres and satellite towns because in the last 30 years a lot of residential housing was built, but much less related social infrastructure. The reconstruction of the real estate should involve the creation of kindergartens and maternity schools.

This emphasis on formal childcare is a major turning point with respect to policies implemented in the past. For instance, one of the many promises of Victor Yushchenko's presidential campaign of 2004 was to significantly increase transfers to families that have a child. These policies seem to have had some effect on fertility but, as we have

36 <https://kse.ua/about-the-school/news/direct-damage-caused-to-ukraine-s-infrastructure-during-the-war-has-reached-over-105-5-billion/>

37 <https://zakon.rada.gov.ua/laws/show/2312-IX#%23Text>

38 Becker et al. (2020) study the long-run effects of forced migration of Poles after World War II on investment in education and find that Poles with a family history of forced migration are significantly more educated today than other Poles. The authors argue that these results are driven by a shift in preferences away from material possessions toward investment in human capital.

39 Source: Закон України Про відпустки - art. 18.

seen, they have not increased labour force participation of women; if anything, they contributed to its decrease. The trend in OECD countries is for a positive correlation between fertility rates and women's labour force participation. It is important that Ukraine's reconstruction moves in this direction, exploiting the experiments carried out in Europe with work and family reconciliation policies.

The experience of other countries involved in conflicts also suggests that **youth unemployment** may be a serious concern in the reconstruction of the Ukrainian labour market. Here, the main challenges relate to the obsolescence of skills learnt during formal education and matching frictions in a poor working labour market. A careful exam of school curricula, notably in vocational education, is warranted to improve the marketability of skills acquired in schools. Providing tertiary education opportunities involving training both within formal education structures and in firms, along the German *Fachschule* tradition, is another route to be explored (more on this in the chapter on education). As to matching frictions, policies should be tailored to youth. Indeed, growing youth unemployment has been a key issue in many countries in the aftermath of wars also because of their difficult labour market integration.

Coping with **internally displaced people** (IDPs) will be one of the major challenges for post-war Ukraine. International experience offers important insights regarding measures that could reduce unemployment among them IDPs. Here we draw on the comprehensive review of the existing literature on job interventions for refugees and IDPs by Schuettler and Caron (2020). To overcome liquidity constraints and the loss of assets linked to forced displacement, interventions that provide displaced people with financial capital may help.⁴⁰ These might be of two types: repeated (conditional or unconditional) transfers or one-shot grants or credits. The evidence on transfer programmes suggests that they reduce poverty and increase spending on basic needs. The impact seems similar for cash, voucher or in-kind food transfers, but cash gives more flexibility. It allows displaced people to save or to invest in education, which improves future job prospects. Repeated transfer programmes do not seem to have a positive impact on adult employment, while they might give displaced people some stability to search for better jobs.⁴¹ One-off grants or asset transfers have partially different goals: helping refugees and IDPs in overcoming the loss of assets, easing access to credit and supporting them in starting their own business or becoming self-employed. This plays a role especially when local labour markets are not able to absorb the labour supply shock linked to the arrival of forced

40 Currently, the government pays 2,000 hryvnia per adult IDP and 3,000 hryvnia per child per month. This is the equivalent of US\$69 and \$103, respectively, at the exchange rate before the full-scale invasion of 24 February 2022 (the exchange rate hryvnia/US dollar was at 29.15 on 23 February 2022). These transfers are extremely low: pre-invasion, the minimum monthly subsistence per working-age adult was 6,032 hryvnia in January 2022.

41 Evidence, especially on Syrian refugees, points to an increase in reservation wages and higher minimum quality of jobs that displaced workers are willing to take.

migrants. These measures can have positive effects on income, but legal uncertainty and unclear future prospects may lessen the impacts. To fight poverty, a combined approach that includes grants, entrepreneurship training, financial inclusion for the extreme poor, and so on seems to work best.

Regarding human capital, training programmes can address the skills mismatch IDPs might face in the hosting labour market, although the evidence on programmes focusing only on skills is not very positive. In addition, displacement status brings with it other challenges that, along with the lack of demanded skills, should be taken into account: the legal framework for displaced, constraints to participation, or a possible need to change occupation or location shortly after displacement. Although rigorous evaluations are still lacking, investing in IT and coding skills seems to have positive effects in the context of IDPs. These are portable skills that offer a competitive salary, allow individuals to work remotely with only the need for a computer and internet connection, and are in high demand in high-income countries, with the possibility of telemigrating. To improve the matching between demand and supply of jobs, job search assistance can help forced migrants to overcome informational asymmetries and the loss of social networks linked to displacement. Evidence on refugees in high-income countries suggests that matching programmes have positive effects on employment when job opportunities exist. However, these services cannot replace private networks; rather, they should support their reconstruction. The more intensive and individualised the better, but of course in turn these tend to be more costly.

Concerning subsidised employment in the private sector, offering wage subsidies for IDPs and refugees seems to increase short-term employment, but longer-term impacts are less clear. With regards to public sector employment, labour-intensive public work programmes have been frequently used – especially in low- and middle-income countries – to meet both the urgent need of the workforce in the aftermath of a shock (e.g. a natural disaster) and the need to provide income and employment to displaced people. They can potentially have important positive short-term effects on income, assets and consumption, but over the longer term they may distort the labour market, crowd out regular employment and reduce the subsequent likelihood of employment. With the massive destruction of cities and infrastructures caused by the Russian invasion, and the consequent need for a reconstruction workforce, public work programmes can play an important role in sustaining the participation of IDPs in the labour market. However, they should be tailored very carefully, given also the demographic profile of those forcibly displaced.⁴²

42 In June, the government adopted changes to the legislation that simplify hiring official unemployed for temporary public works, which mainly consist of removing rubble on sites that were bombed, construction of protective structures, and similar activities. This temporary work is paid at the minimum wage rate (6,500 hryvnia per month) and refusal to take the work leads to the cancellation of unemployment benefits. Bearing in mind that such a job often requires physical fitness and the payment is rather low, such practices are not well thought out.

In terms of interventions indirectly linked to improving the job prospects of displaced people, psychological support will be crucial to prevent mental health issues due to displacement impairing the ability of forced migrants to participate in the labour market. Together with this, a legislative effort should be made to assure that the legal framework – both national and local – will not be an obstacle to the integration of IDPs and returning refugees.

Policymakers should also be aware of the other side of the coin: receiving communities. The existing evidence on the impact of refugees in destination countries does not apply to intra-Ukraine displacement – a reinforced national identity, lack of a language barrier and widespread solidarity should mitigate many of the problems that emerged elsewhere. However, it is still important to note that there will also be some repercussions on that front. The analysis by Morales (2018) of the Colombian civil war suggests that a conflict-induced increase in labour supply decreases wages in the short run, but subsequent out-migration of local workers helps to mitigate these effects. The wage effect persists only for low-skilled women, suggesting the vulnerability of this group to the arrival of forced displaced people. On the same conflict, Calderón-Mejía and Ibáñez (2016) show that internal migrations substantially reduce wages for urban unskilled workers who compete for jobs with forced migrants. Thus, an emphasis on job creation will be fundamental for a positive integration of IDPs and local communities.

In order to face potential labour shortages, notably in the construction sector, Ukraine might also want to attract migrants from abroad. Before the full-scale invasion, there was a net inflow of migrants to Ukraine averaging 17,500 per year since 2005. This was not sufficient to offset the fall in the resident population, which averaged 237,500 over the same period. Ukraine was not a very appealing place to migrate to because there were more interesting alternatives on its eastern and western borders in terms of incomes per capita or social protection (in case of the EU). While its EU candidate status should boost Ukraine's attractiveness, low incomes may continue to be a significant deterrent to immigration.

Ukraine's status as an EU candidate and its defence of democratic values may also encourage immigration from those who oppose the current regimes in Belarus and Russia. Before the 2014 invasion, attitudes toward Russians were very positive in Ukraine: according to a KIIS regular survey in November 2013, 82% of respondents described their attitude towards Russia as "rather positive" or "very positive" and only 10% as "negative".⁴³ However, the full-scale invasion of 2022 has naturally led to notable worsening of attitudes. Now the absolute majority of the population supports closing the borders and the minimisation of contact with Russians and Belarussians.⁴⁴ Currently,

43 It is interesting to note that a similar survey in Russia by the Levada Centre between 2008 and 2019 consistently showed less favourable attitudes of Russian respondents with respect to Ukraine than of Ukrainians with respect to Russia (https://www.kiis.com.ua/materials/pr/20211217_stav/01.JPG).

44 Since 1 July 2022, Ukraine has a visa regime with Russia. So far, a visa-free regime has been preserved with Belarus to help Ukrainians who are fleeing occupied territories via Russia and Belarus, but essentially movement across the border with Belarus is closed.

there is a very strong negative sentiment towards residents of these two countries.⁴⁵ In this context, the Ukrainian government may wish to look to other countries as potential sources of migration. It is important to note that the recent popularity of Ukraine in the Western media may lead to an increase in the number of Western activists that visit the country. While in absolute terms their number will be small, their expertise and fresh views on many substantial issues can be a great boost to Ukrainians who work and study with them.

5.3 Helping the most vulnerable: Job losers, veterans and fragile and older workers

Bertheau et al. (2022), comparing the cost of **job loss** over three decades in Austria, Denmark, France, Italy, Portugal, Spain and Sweden, suggest that the labour market consequences of losing a job are vastly different across Europe. Scandinavian countries experience by far the lowest earnings losses: five years after job displacement, earnings of workers in Nordic countries are about 10% lower than pre-displacement levels. At the other extreme, those performing worst are workers from Southern European countries, whose earnings are around 30% lower. A large part of these differences is driven by dynamics at the extensive margin: around 20% of displaced workers from Spain, Portugal, and Italy are unable to find employment five years after job displacement, compared with only 5% in Sweden and Denmark. Interestingly, observed characteristics of workers and employers are not a source of difference in the cost of job loss. What seems crucial are labour market institutions: “a country’s overall spending on active labour market policies is a key factor in predicting earnings losses from job displacement”, while “other institutional factors, such as union coverage and employment protection legislation, have very limited explanatory power” (Bertheau et al. 2022). The findings of this study point to the serious consequences Ukrainian workers might face after the war. Many workers have lost their jobs and are thus at risk of permanent earning losses. Indeed, the Ukrainian labour market structure resembles more that of Southern Europe than of Scandinavian countries. To address this, the emphasis should be put on increasing the coverage of unemployment benefits and combining this with active labour market policies (public employment service, training, employment incentives operating in conjunction with unemployment benefits, etc.).

45 In the case of Russia, amplified by the fact that even anti-Putin Russians are often unconsciously imperialistically minded, following the narrative of ‘brotherly nations’ developed in the 19th century Russian empire and later adopted and promoted by the USSR. Since the state, Ukrainians have questioned this concept, but it is still a part of the historical narrative in Russia, so the majority of Russians never question it.

The full-scale invasion led to a surge in demand for **unemployment benefits** and placement services offered by the Public Employment Service. Expenditure for unemployment benefits contributed to widening the fiscal deficit to the extent that the government decided to set a cap on the level of benefits at 1.5 times the minimum wage.⁴⁶

Cutting benefits may move many potential workers from unemployment benefits to social assistance of the last resort, reducing their attachment to the labour force. A better strategy may be to reform unemployment benefits in such a way as to expand the scope of partial unemployment insurance, that is, measures enabling unemployment benefit recipients to combine benefits with low-income jobs and wage insurance (offering a temporary wage subsidy to workers changing jobs) (Boeri and Cahuc 2022). Clearly, setting up such schemes requires institutional capacity and resources. This is an area where technical assistance from the EU – and perhaps also temporary transnational funding – can be particularly important.

Properly designed partial unemployment insurance could also help in tackling **informal sector** employment. The informal sector tends to grow during periods of economic crises, including wars (Looney 2006). In fragile and conflict situations, for a large part of the population there is no other alternative to working in the informal economy to secure livelihoods. There are at least three reasons why Ukraine will probably follow this trend: (1) an increase in poverty and economic hardship will raise the incentive to evade reporting incomes; (2) the scale of internal forced migration may be associated with a rising shadow employment rate, as there is evidence that immigration is positively correlated with the size of the informal labour market (Bosch and Farré 2010); and (3) the weakening of institutions in charge of addressing informal sector employment, and shifts in priorities after the conflict, may provide a more favourable environment for the black (or grey) economy. Even if informal employment is not a first-order concern in the short term, we believe that, also given the prospect of joining the EU, efforts should be made to prevent informality from becoming widespread in the country. This would also improve the efficiency of the allocation of resources targeted to workers. To avoid encouraging flows of jobs to the informal sector, the administrative and tax burden on employment should be kept as low as possible. The links between contributions and coverage of social insurance (pensions and unemployment benefits, in particular) should also be made explicit in order to reduce the perceived tax burden on formal sector employment.

Regarding **labour taxation**, the total tax burden on labour is roughly in line with other European countries (Enache 2021). Currently in Ukraine, employees (except for several special categories) should pay from their gross wage 18% in personal income taxes, 1.5% in war tax and another 22% in social security contributions (SSCs). SSCs finance

46 According to the law, "[o]n changes to some legislative acts of Ukraine regarding some issues of the functioning of employment spheres and mandatory state social insurance in case of unemployment", a person can start receiving unemployment benefits after submitting (physically or online) requested documents (the number of which was reduced). While IDPs are eligible for benefits, and where they cannot supply some documents alternative sources are allowed (chiefly registers, for example in the tax service), people who have migrated outside and haven't returned within 30 days are not eligible.

a large number of social programmes and in particular state pensions. As of Q4 2021, there were 15.6 million working people in the country (based on the ILO methodology) and 10.8 million pensioners. Moreover, about one fifth of employees are in the informal sector and hence do not pay SSCs, and another 1.4 million are self-employed and paying lower SSCs (usually 22% of the minimum wage). All this makes it difficult to reduce taxes without reducing social protection. Additional fiscal revenues from progress in reducing the size of the informal sector – via tighter controls and a closer perceived link between contributions and social insurance – could, however, be explicitly allotted to reducing the tax burden on labour.

The number of **people physically injured during the war** continues to grow. While statistics on the emotional and mental impact of the war are scarce, the negative impact of war on overall health conditions goes well beyond physical injuries. Murthy and Lakshminarayana (2006), reviewing research findings on mental health consequences of war, find that among the consequences, the impact on the mental health of the civilian population is one of the most significant. Evidence points to a large increase in the incidence and prevalence of mental disorders.

Disability-inclusive infrastructure and workplace policies can empower and make it easier for people with disabilities to be part of rebuilding and development. The ICED (2019) offers an outline of the key challenges and opportunities in legislating for, designing and financing disability-inclusive infrastructure.

Particular attention should also be devoted to the reintegration of individuals serving in the Ukrainian armed forces or in other units involved in combat into civilian life after deployment, or for those who choose to return to civilian life. The **reintegration of veterans** requires tailoring occupational training and health programmes to the specific needs of the individuals who participated in combat activities (Angrist 1990).⁴⁷ Ukraine already has a Ministry of Veterans, similar to that in Croatia, and even before the full-scale invasion it had worked with over 400,000 of war veterans.⁴⁸ On 29 July 2022, the Parliament adopted a law that should help former military personnel to adapt to civil life.⁴⁹ The main idea is that the right to social and professional adaptation is now available to persons who are discharged from military service as well as family members of such persons, including family members of deceased war veterans.

47 See, for example, Dunigan et al. (2020) for a review and analysis of practices across US federal agencies.

48 <https://branitelji.gov.hr/> (in Croatian).

49 <https://zakon.rada.gov.ua/laws/show/2488-20/print> (in Ukrainian).

Evidence, mainly from the United States, on the long-term consequences of war on veterans' labour market outcomes points to significant and persistent earning losses in the years that follow military service.⁵⁰ Many veterans have problems returning to civil life.⁵¹ As pointed out by Coupe and Obrizan (2016), the large number of suicides among Ukrainian soldiers suggests this is and will be an issue in Ukraine.⁵² Already in 2019, Ukraine was ranked 19th in the world for suicide rates, with 17.7 suicides per 100,000 people (age-standardised according to WHO data).⁵³ This problem will only get worse after the war.

As suggested by Demers (2011), communities play a fundamental role in the reintegration of veterans. She proposes three policy options that might benefit veterans: (1) support groups, so that veterans can share their stories and find psychological relief; (2) transition groups for families and friends of veterans; and (3) military cultural competence training for mental health practitioners (such as therapists, social workers and counsellors). The latter two suggestions are motivated by the need to inform about the unique needs of veterans and the best practices to cope with them. The experience of US veterans' associations can provide guidance here.

Concerning labour market policies, ad hoc measures that target veterans can help ease their reintegration. Again, most evidence is based on the United States. For example, Heaton (2012) finds that tax credits for disabled veterans have a significant effect in reducing their unemployment. Angrist (1993) shows how subsidised education and training can increase schooling and in turn earnings, with the effect concentrated on those who attended college or graduate school.

Regarding the current situation in Ukraine, some caveats apply: (1) exact numbers on combatants are secret, but the estimate of soldiers currently fighting for Ukraine is between 700,000 and one million, among which there have been 30–40,000 wounded and 9,000 thousands; (2) the combatants are a mix of conscripts and volunteers; (3) military veteran status may be tricky to define in some cases; (4) compared to other historical episodes, veterans will not 'come back home' to a 'normal' situation, but will also have to bear the difficulties linked to reconstruction.⁵⁴ The fact that the army involves many voluntary soldiers makes the reintegration easier, as suggested by international evidence. Angrist (1998), in particular, finds that volunteer soldiers who served in the early 1980s were paid considerably more than comparable civilians while in the military, and had higher employment rates after service. Problems in defining the status of veterans and the level of destruction of real estate in Ukraine make the issue more difficult to tackle.

50 See, among others, Angrist (1990) and, on the cost of conscription in the Netherlands, Imbens and Klaauw (1995). Even when, as in the case of World War II, veterans appear to earn more on average, this is due to non-random selection into the military, as shown by Angrist and Krueger (1994).

51 For example, 44% of post-9/11 veterans say their readjustment to civilian life was difficult, according to a survey made by the Pew Research Centre (www.pewresearch.org/social-trends/2011/10/05/war-and-sacrifice-in-the-post-911-era/).

52 <https://www.bbc.com/news/world-europe-60318298>; https://en.wikipedia.org/wiki/Suicide_in_Ukraine

53 Male: 32.7; female: 4.7 (https://en.wikipedia.org/wiki/List_of_countries_by_suicide_rate).

54 www.bbc.com/ukrainian/features-62635359

Finally, problems with the sustainability of the Ukrainian pension system suggests that **early retirement** is not an option to be used on a large scale to deal with job loss. For those workers who are close to the retirement age and whose skills are not required in the new labour market landscape, an extended duration of unemployment benefits could provide a sort of bridging scheme to retirement.

5.4 Promoting the return of ideas if not of people

Ukraine has suffered a major outflow of individuals during the war, and this loss may not be temporary as a large share of the persons involved do not appear to be planning to return home in the short run. The longer the active military confrontation continues, the larger the share of migrants getting acclimatised to their host countries, and hence the greater the risk that they remain there even after peace is established. A survey of migrants to Germany suggests that 90% of Ukrainian refugees want to get a job in Germany and 22% are already working or planning to start working in the near future. Even over a longer time horizon such as a two years, the majority of refugees are not planning to come back. As we have documented, Ukrainian **refugees** are young and relatively well educated. Shortages of workers are likely to arise especially in healthcare and in schools.

It is important to avoid double taxation of refugees. In the EU, there is generally a 183-day threshold (i.e. half a year) for residency, beyond which someone residing in another state can be recognised as a resident there and taxed. Ukrainian refugees are now exposed to this risk.⁵⁵ In order not to further burden refugees, who are already in a precarious situation, EU states should waive double taxation for the period of the war. This would prevent some refugees finding it convenient to move tax residence to another country. The issue of double taxation is particularly relevant for those who work remotely. However, the European Commission does not have much power in this regard beyond moral suasion over individual countries' decisions.

Even if many of the refugees do not come back after the war is over, there can be relevant interactions between Ukrainians abroad and the domestic labour force. Internet connections and geographical proximity with the country of destination significantly reduce the extent of the brain drain associated with the migration of skilled workers. The experience of refugees to Germany from former Yugoslavia is revealing in this respect. The largest increases in exports from former Yugoslavia were registered in sectors with the highest share of refugees who had left the country to go to Germany (Bahar et al. 2019).

55 www.dlapiper.com/fr/france/insights/publications/2022/09/tax-considerations-for-ukrainian-refugees-and-their-employers/

One of a few positive effects of the COVID-19 pandemic was a notable increase in the number of people working remotely. According to the job-searching website work.ua, the share of vacancies which allowed remote working increased from 3.4% in Q2 2019 to 6.4% in Q2 2020, and to 6.5% in Q2 2021.⁵⁶ With the start of the full-scale invasion, the share surged again, to 13.9% in Q2 2022 (albeit with a much lower absolute number of vacancies).

The low absolute number of vacancies for remote working led to a three-fold increase in the number of applications – from 31 per vacancy in Q2 2021 to 104 in Q2 2022.

Remote working can be a powerful tool to bring back to Ukraine some of the human capital lost during the conflict. In addition, remedial education to cope with the gaps in educational attainment generated by the war can be organised by drawing on the contribution of refugees, as a significant share of these are former teachers. In Italy, online tutoring programmes in which voluntary university students operated as tutors for disadvantaged middle-school students during the pandemic effectively raised participants' cognitive achievement, socio-emotional skills (SES) and psychological wellbeing, with effects being particularly strong for low-SES children (Carlana and La Ferrara 2021). Also, a low-tech intervention that sent SMS messages with basic problem sets to parents, supplemented by live phone calls from instructors, appears to have improved children's cognitive outcomes (Angrist et al. 2020). These examples demonstrate that help provided through remote tools can effectively mitigate some of the legacy of school closures on children's development.

6 CONCLUSIONS

The Ukrainian labour market not only needs to be rebuilt, it needs to be rebuilt better. The unprecedented challenges imposed by the reconstruction can only be faced by a better-functioning labour market. Millions of workers will need to change jobs. The matching of vacancies and job seekers will, in many cases, involve repeated changes of residence due to the destruction of the housing stock and the mismatch between the regional profile of worker displacement and of firm relocation inherited from the war. Former refugees, internally displaced people and war veterans, often injured and carrying with them the mental scar of the war, will have to be reintegrated in the labour market.

A significantly larger fraction of the working age population than before the war will have to be mobilised to avoid bottlenecks in the reconstruction of the country. Immigrants from other countries will also have to be integrated and involved in the reconstruction. In this chapter, we have offered an account of developments since the beginning of the full-scale war, drawing on all data sources that we were able to assemble. We have also reviewed the literature assessing the labour market experiences of other European

56 www.work.ua/news/ukraine/2172/ (in Ukrainian).

countries having gone through military conflicts in the recent past. Based on these facts and findings, we propose a set of policies that could be implemented, possibly with the technical support of EU countries that have longstanding experience with these measures. These policies aim at addressing pre-existing structural problems as well as the new challenges imposed by the war. There is no one single priority: it is fundamental for Ukraine to invest in future human capital, to increase labour force participation, to help the most vulnerable people and to somehow involve in its reconstruction the human capital that has migrated abroad.

These policies will require large budgetary outlays, especially for a country coming out of a war. Who should pay for these policies is a matter that European policymakers will have to address. One option is to reorient the windfall gains of countries like Norway and the Netherlands after the surge of oil and gas prices towards the reconstruction of Ukraine.

Concerning labour market policies specifically, a couple of remarks are in order.

A crucial distinction among the policies proposed is that between structural and one-off interventions.

On the one hand, we have proposed measures relating to the architecture of the future Ukrainian labour market institutions and welfare state, concerning for example partial unemployment insurance, employment conditional incentives and active labour market policies. These policies should be designed to be permanent, and thus financed over the long run by Ukrainian taxpayers in a sustainable way.

On the other hand, some measures proposed in this chapter will have to cover the period shortly after the end of the war and are intended to tackle the immediate issues arising in the labour market. Among these are public work programmes and the creation of an infrastructure allowing for a significant scaling up of remote working and distance learning. Indeed, some of these measures will need to be taken even before the war is over. Among these is remedial education to cope with the huge educational attainment losses experienced by many Ukrainian students first with COVID-19 and subsequently with the war. Programmes tailored to the specific needs of IDPs are also badly needed today, not just tomorrow.

These emergency programmes should be financed largely by instruments connected with EU accession, possibly by providing grants rather than loans. Apart from the EU Structural Funds, the temporary support scheme put in place to mitigate unemployment risks in case of emergency, SURE, can be mobilised. SURE is currently available for member states that need to mobilise significant financial means to fight the negative economic and social consequences of the COVID-19 pandemic. It provides financial

assistance up to €100 billion in the form of loans from the EU to address sudden increases in public expenditure for the preservation of employment.⁵⁷ In the context of the accession process, the scope of SURE can be extended to support efforts to rebuild a better Ukrainian labour market.

Progress made in implementing these policies will have to be constantly monitored and subject to rigorous evaluation. Substantial effort should therefore be made to ensure that Ukraine has a modern system of statistical monitoring of the labour market (existing data are not sufficiently detailed and harmonised). This would allow a more tailored and rigorous allocation of welfare transfers.

Ukraine has for centuries been the gate to Europe. The human capital that it gathers is an asset for the entire continent, and the preservation and enhancement of this human capital is a matter of priority and concern for the EU as a whole.

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57 https://economy-finance.ec.europa.eu/eu-financial-assistance/sure_en

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APPENDIX

TABLE A1 LABOUR FORCE PARTICIPATION RATE BY SEX AND AGE GROUP (%)

	2005	2013	2015	2019	2021
Total					
15-70	62.2	65	62.4	63.4	61.8
15-24	40.2	39.3	36.3	36.2	30.6
25-29	81.4	80.8	80.8	80	77.7
30-34	82.9	83.9	82.3	82	80.8
35-39	85.6	86.6	85.2	85.8	83.9
40-49	84.3	85.8	85	86	85.2
50-59	64.8	67.1	65.9	73.8	75.4
60-70	22.9	23.8	14.5	13.7	12.8
Females					
15-70	57	58.9	56.2	57.5	56.1
15-24	35.5	34	31.8	31.7	28.1
25-29	73.5	70.2	70.7	67.3	65.1
30-34	77.3	75.9	73.3	72.2	70.4
35-39	82.4	81.7	80.5	80.2	76.4
40-49	82.9	84	83.7	84	82.6
50-59	57.2	60.9	59.1	70.8	73.6
60-70	20.3	21.4	12.2	11.8	11
Males					
15-70	67.9	71.6	69.2	69.9	68.1
15-24	44.7	44.4	40.6	40.5	33
25-29	89.2	91	90.5	92.2	89.7
30-34	88.6	91.8	91.2	91.6	90.8
35-39	89	91.6	90.1	91.3	91.4
40-49	85.9	87.8	86.5	88.1	87.9
50-59	74.2	74.9	74.1	77.4	77.6
60-70	26.7	27.5	17.9	16.4	15.5

Note: The year 2005 is reported because it is the first one in which the present breakdown by age was used.

TABLE A2 RELOCATION CHOICES IN EU OF UKRAINIAN AND SYRIAN REFUGEES

Country	No. of refugees from Ukraine	Share	No. of refugees from Syria	Share
Austria	82,446	2%	62,408	6%
Belgium	56,464	1%	19,188	2%
Bulgaria	56,734	1%	20,067	2%
Croatia	18,328	0%	548	0%
Cyprus	13,852	0%	10,735	1%
Czech Republic	439,043	10%	358	0%
Denmark	35,193	1%	19,706	2%
Estonia	57,257	1%	105	0%
Finland	38,588	1%	2,660	0%
France	105,000	2%	37,375	4%
Germany	997,895	23%	621,740	60%
Greece	19,413	0%	39,372	4%
Hungary	30,000	1%	869	0%
Ireland	49,999	1%	2,832	0%
Italy	170,646	4%	3,527	0%
Latvia	38,915	1%	312	0%
Lithuania	66,368	2%	463	0%
Luxembourg	6,561	0%	2,409	0%
Malta	1,518	0%	1,918	0%
Netherlands	79,250	2%	39,388	4%
Poland	1,409,139	33%	254	0%
Portugal	52,819	1%	861	0%
Romania	80,498	2%	2,258	0%
Slovakia	95,375	2%	25	0%
Slovenia	8,171	0%	326	0%
Spain	144,668	3%	14,987	1%
Sweden	45,895	1%	115,233	11%
United Kingdom	131,700	3%	11,980	1%
Total	4,331,735		1,031,904	

Source: UNHCR, September 2022.

Note: Comparison of EU countries (+UK). For Syrian refugees, 2021 is the reference year.

Education reforms during and after the war

Martin Kahanec,^{a,b,c,d} Snizhana Leu-Severynenko,^e Anna Novosad^f and Yegor Stadnyi^g

^aCentral European University; ^bCELSI; ^cUniversity of Economics in Bratislava; ^dGLO; ^eUSAID Economic Resilience Activity; ^fSavED; ^gKyiv School of Economics

EXECUTIVE SUMMARY

Human capital is Ukraine's most valuable asset today and will continue to be in the future. The education system is key to creating and maintaining this asset. Education will be crucial for Ukraine's reconstruction because it not only provides the necessary knowledge and enhances human capital, but also brings up good citizens by promoting human rights, integrity and responsibility.

Education reforms need to continue with the long-term view of the education system rather than sporadic small steps, focusing on advising and training rather than overwhelming regulation and, most importantly, aiming for quality rather than quantity. Education should be developed as a holistic system, with reforms of secondary schools, vocational schools and universities aligned under one strategy and complementing each other. All levels of education should help students to develop their talents and select occupations according to their preferences. Higher education institutions should not only provide education but also implement research as well as becoming centres of discussion on socially important issues. Education institutions will also need to deal with psychological trauma of the war, as well as the reintegration of students with multiple vulnerabilities. More generally, the education system will need to become much more inclusive, and this inclusivity should be perceived as a social rather than medical issue and appropriate resources (equipment, teacher training, etc.) should be provided. This calls for compensatory policies and greater flexibility of education and requires support and training for both staff and students.

The focus on quality also implies changing the structure of incentives (for example, funding universities based on performance rather than on the number of students, as well as introducing more competition and allowing universities more freedom to fundraise) and giving more autonomy and responsibility to educational institutions at all levels. The Ministry of Education should concentrate on policy development, establishing frameworks for quality management and control to ensure accountability to public

interest, and training for teachers (professors) as well as financial and managerial staff of educational institutions. There is a clear need to improve the efficiency of public spending on education, for example through merging educational institutions to exploit economies of scale.

As reconstruction will be coupled with Ukraine's European and transatlantic integration, the education sphere should focus on developing networks with foreign universities to intensify the exchange of ideas and talents and the development of joint projects. Forced migration of Ukrainians to the EU and other countries provides opportunities in this area.

1 INTRODUCTION

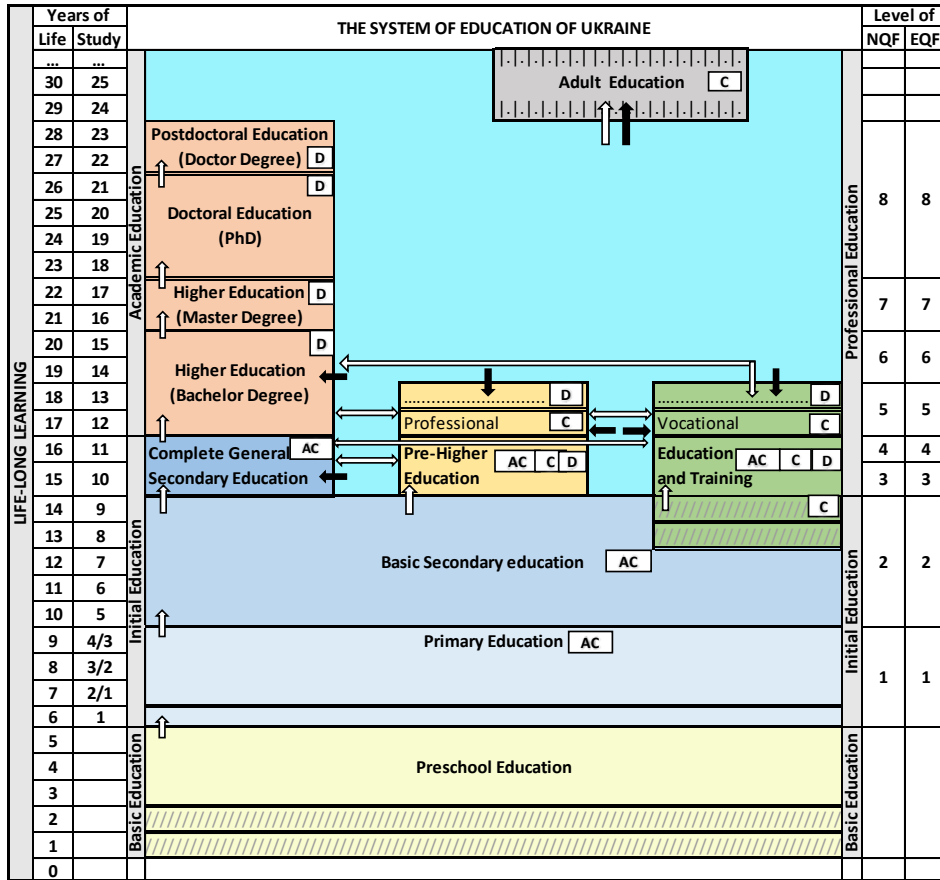
The educational system is a vehicle of human capital development, and its main objectives include transmitting knowledge, developing skills and fostering desirable character traits in the population. Education is the foundation of society which enables inclusive prosperity, good quality of life, social cohesion and political stability. It is a cornerstone of a democratic society, shaping people's identities, enabling their critical thinking and empowering them to voice their demands and secure their human rights.

This chapter covers the role of education in the reconstruction of Ukraine in the aftermath of the Russian invasion of the country and the ensuing Ukrainian liberation war. Figure 1 summarises the structure of the Ukrainian educational system as of September 2022. We distinguish three levels of education: primary and secondary school, vocational education and training (VET) and higher education. For each of these levels, we first look at the pre-war state and discuss the key statistics, challenges, and policy approaches adopted in the past. We then study the impacts of the full-scale Russian invasion of Ukraine since 24 February 2022. We evaluate the damage to the physical infrastructure, impacts on funding and effects on human resources in the sector, including displacement of employees and students. We consider limitations on the use of existing facilities given the lack of spaces protected against raids and strikes with secured electricity and heating and other utilities, and impacts on policies. Finally, we evaluate options for reconstruction and upgrading of education in Ukraine in view of its central role for the economic and social reconstruction of the country and its European and transatlantic integration. We draw some lessons from several other countries that share similarities with the situation in Ukraine.

The chapter is based on the data and information available as of September 2022. As the overall situation with the invasion and its impacts were highly unpredictable, the analysis and the assumptions on which it is based need to be viewed in light of this uncertainty. Although other scenarios are possible, we base our analysis on the assumption that Ukraine is liberated but there are protracted military threats from the Russian Federation. Another highly volatile factor is the mobility of people, including outflows to other countries, internal displacement, as well as return migration to liberated regions.

We assume that European and transatlantic economic and political integration will take place gradually over a longer period of time, with some instruments of integration and cooperation relevant for education already in place, but others requiring lengthier technical negotiations and political processes. We acknowledge that several scenarios of future development are possible, and we discuss our findings and recommendations with this view in mind.

FIGURE 1 THE STRUCTURE OF THE UKRAINIAN EDUCATION SYSTEM AS OF SEPTEMBER 2022



Legend

- A Attestation Certificate // // // // //, Optional opportunity
- C Certificate | . | . | . | Training providers of non-formal learning and Qualification Centres
- D Diploma Can serve as a Qualification Centre
- ➔** Available for Adults
- ⇔** Available for Young people

Source: www.govet.international/en/159632.php

In the specific context of conflict and post-conflict reconstruction, education relates to several areas of a country's response to a conflict and post-conflict reconstruction. First, education is a critical pillar of a country's capacity and resilience. It should support the political will and capacity to provide basic functions of the state and to safeguard the security and human rights of its people. Second, the educational system should provide for the inclusion of the whole population into reconstruction of the country and democratic state-building by fostering critical thinking, human rights and freedom, respect for diversity and otherness, and inclusiveness towards vulnerable and minority groups.

We recognise that the mobilisation of education as a key asset for the reconstruction of Ukraine will require, besides political commitment and leadership at the highest level, a proper process of education planning. Such a process typically includes a number of important steps (Box 1), each of which needs to take into account the impacts of the conflict on the context of the education planning and its reforms (Figure 4.2 in OECD 2007).

BOX 1 EDUCATION PLANNING

1. Context analysis
 - a. Macroeconomic context
 - b. Demographic context
 - c. Socio-cultural context
 - d. Politico-institutional context
2. Analysis, formulation, preparation and implementation of educational policies and plans
3. Analysing and monitoring the education system performance
 - a. Access
 - b. Internal efficiency
 - c. Quality
 - d. External efficiency
 - e. Equity
4. Analysis of the management capacity and addressing capacity needs
5. Analysis of cost and financing and projecting budgets

The mobilisation of all available resources and key actors will be critical for the success of the reconstruction efforts. This will include the existing tangible as well as intangible infrastructure, and human capital contracted directly as well as that harnessed by means of academic networks. Academic networks spanning over to the EU, the United States and other academically advanced countries will be of special importance for the circulation of talent and ideas and for their enabling role for collaborative research projects. Effective school governance structures and leadership, national as well as local governments,

municipalities, social partners and other stakeholders will define the success or failure of the reconstruction efforts. Accreditation and regulatory bodies will be of key importance for the licensing and monitoring of educational programmes and institutions. Civil society organisations, and parent and student representatives in particular, will play a key role in demanding high quality and effective and efficient delivery of educational services (OECD 2007). The support of the international community, including the Ukrainian diaspora, has significant potential to contribute to the reconstruction efforts.

The chapter proceeds as follows. Sections 2, 3 and 4 study primary and secondary schools, vocational education and training (VET), and higher education, respectively. Section 5 discusses some historical and current examples, parallels and lessons from which we can learn. Section 6 concludes and summarises the recommendations.

2 PRIMARY AND SECONDARY EDUCATION

2.1 Pre-war state of primary and secondary education in Ukraine

Ukrainian school education prior to 24 February 2022 encompassed 4.2 million schoolchildren and employed around 435,000 teachers. The network of schools has been steadily decreasing due to optimisation; in 2021 it consisted of 13,991 general secondary schools (these figures do not include schools that have been under temporary occupation in Crimea and parts of Luhansk and Donetsk regions since 2014).

Following the 2017 Law on Education, the Ukrainian school education system is represented by three stages: primary or elementary (grades 1 to 4) basic (grades 5 to 9) and high school or upper secondary (grades 10 to 12). Typically, Ukrainian children enter the 1st grade at the age of 7, however can legally be admitted at the age of 6.

The network is characterised by a large number of small schools. According to the Institute of Educational Analytics of the Ministry of Education and Science (MoES),¹ in the 2020/21 school year, in both rural and urban areas, there were 289 primary schools with fewer than 20 children, 464 basic schools fewer than 40 children, and 1,413 lyceums (10th and 11th grades) with fewer than 100 children. This contributed negatively to the efficiency of schooling, as extensive public funds could not yield even results.

Out of the total number of schools, 8,446 (60%) are located in rural areas. The ratio of teachers to students was below the 2019 OECD average, with only 10 students per teacher compared the OECD average of 13 students (MoES 2021). The OECD's Programme for International Student Assessment (PISA) for 2018 assessed that Ukraine was spending a total of US\$27,000 per student from 1st up to 10th grade at that time. For comparison,

1 <https://iea.gov.ua/naukovo-analitichna-diyalnist/analitika/informatsijni-byuletteni/2022-2/informaczijni-byuletteni> (in Ukrainian).

high-achieving, high-income OECD countries were spending an average of \$78,179 per pupil from the age of 6 until 15. PISA 2018 concluded that pupils in high-income countries with this amount of spending score an average of 89 points higher in reading than their peers in countries with per capita GDP below the \$20,000 benchmark.

Ukraine's primary and secondary school education has been characterised by several salient trends:

- A decreasing (and ageing) population.
- A large gap between rural and urban schools in terms of quality.
- Insufficient funding for the promotion of education quality (funds have been primarily allocated to support the essential elements such as salaries of teachers, utilities, printing of textbooks and school buses). Only since 2017, with the start of the New Ukrainian School, have there been considerable injections of state funds to modernise the educational environment, promote innovative in-service teacher training, and develop e-governance in schools.
- Insufficient salaries for teachers that discourage young, motivated professionals from entering the profession. The annual salary of a new teacher entering the profession in Ukraine's public educational institutions is only \$4,801 (UTSOYAO 2019). The thresholds to enter pedagogical studies in Ukraine's higher education institutions have been systemically low. The average scores in external independent testing of applicants to pedagogical universities in 2019 were 130–176 points out of 200 points maximum. For comparison, in order to enter the more prestigious and popular international law institutions, a prospective student should score at least 194 points.
- Lack of systematic and effective career guidance in schools, which hampers students in making good educational and career choices. This also impacts the career choices of boys versus girls. PISA showed that amongst high-performing students in mathematics or science, one in nine boys in Ukraine expect to work in science-related professions at the age of 30, while just one in 20 girls expect to do so. Only 3% of girls consider working in ICT professions, compared to 17% of boys.

Prior to the full-scale invasion of the country by Russia, Ukraine's primary and secondary school education had been showing steadily moderate results in terms of quality. According to the PISA 2018 results, 15-year-old students in Ukraine scored below than the OECD average in reading, mathematics and science. The difference was not very significant in reading and science, with 74% of Ukrainian students reaching at least Level 2 proficiency in these two fields compared to OECD averages of 77% and 78%, respectively. Achievement in maths, however, is substantially lower, with 64% of students in Ukraine attaining Level 2 or higher compared to the OECD average of 76%. Moreover, 36% of Ukrainian students could not perform even basic mathematical tasks (OECD 2019).

Unequal access to quality education has been one of the most challenging aspects of the Ukrainian school system. Evidence from monitoring assessments in Grade 4 indicates that inequality is driven by small classes in rural schools, differences between ‘regular’ schools and lyceums/gymnasiums and the availability of extracurricular educational activities in communities (UTSOYAO 2018). According to the PISA 2018 national report (UTSOYAO 2019), the education gap between students with better socioeconomic backgrounds living in large cities and their peers from small villages is almost three years.

This and other structural complications significantly hamper the general quality of school education. According to the World Bank (2019), 13 years of schooling for an average Ukrainian 18-year-old (including the senior year of pre-school) drops to 10.2 years after adjusting for the quality of learning.

However, a number of positive characteristics of the Ukrainian school system were observed in PISA 2018. Eighty-two percent of Ukrainian students reported that they were satisfied with their lives and schooling (the OECD average was 67%). Sixty-six percent of students hold a ‘growth mindset’, that is, they believe that they can proactively influence their intelligence. Only 1.6% of students repeat years of study, which is significantly lower than the OECD average. Furthermore, there was little to no gender inequality observed among the 15-year-old students, with girls scoring similarly to boys in mathematics and science.

Ukraine has not been investing enough in the development of its own national education quality monitoring tools. Apart from the monitoring assessment of the quality of primary school education (two cycles completed by 2022), there is no other tool to gauge quality comprehensively.²

2.2 Impact of COVID-19

Using data from 157 countries, World Bank analysts estimated in 2020 that, depending on the total duration of strict quarantines and school closures, the loss of education due to COVID-19 would equal 0.3 to 0.9 years of schooling (Azevedo et al. 2020). The exact extent of the effect on Ukrainian students’ mastery of the school programme is unknown, since no comprehensive monitoring study was conducted across the country.

2 External Independent Evaluation (ZNO) is used for entering higher education rather than for measuring the quality of schooling.

A monitoring survey of remote education in Ukraine during COVID-19 revealed³ that in the 2020–2021 academic year, almost half of elementary and high school students (46%) studied remotely for between one and a half and three months, and 13% for more than three months. Elementary school students spent less time studying remotely: 29% of students for between one and a half and three months and 10% for more than three months, while most students (38%) studied remotely for between three weeks and one and a half months.

Fewer pupils in primary school pupils in villages (31%) than in cities (56%) had access to education during distance learning in 2021–2022. Similarly, just 33% of teachers in villages and 60% in cities indicated that all students of basic and high schools had access to the educational process during distance learning.

The second cycle of nationwide external monitoring of the quality of primary education, which assessed the reading and mathematics competencies of elementary school graduates, demonstrated worrying results (UTSOYAO 2022). In 2021, the level of maths competence of primary school graduates had fallen compared to 2018. The Average score obtained by 4th graders who completed elementary education in 2021 (199.8) is significantly lower than that obtained by their predecessors who completed elementary school in 2018 (202.9). The share of primary school graduates who scored below the basic threshold of maths competence increased by 3.7 percentage points. In 2018, 13% of students who completed primary education did not possess basic mathematics knowledge or skills (i.e. they had significant difficulties solving the simplest problems related to familiar real-life situations), and in 2021 this share increased to 16.7%.

The share of 4th graders who demonstrated a high level of reading competence decreased from 17.5% in 2018 to 14.9% in 2021, while the share of primary school graduates who did not pass the basic threshold of reading competence increased over the three years from 13.2% to 16.9%.

While the above data are not enough to draw overarching conclusions, the decline in learning attainment in primary schools is a strong signal that the a similar deterioration in learning attainment likely took place in later stages of schooling. No make-up strategies for learning losses have been deployed nationwide after the peak of the pandemic, and any further efforts to remedy the learning gap were interrupted by the full-scale Russian aggression.

2.3 Previous reforms: The New Ukrainian School and decentralisation

After the Revolution of Dignity in 2014, Ukraine was committed to developing a modern school education system for the 21st century. The New Ukrainian School (NUS) became a major national policy step towards this goal.

3 <https://sqe.gov.ua/u-selakh-mayzhe-vdvichi-menshe-uchniv-mayut/> (in Ukrainian).

Embodied in the law “On Education” (2017) and the law “On General Secondary Education” (2020), NUS provided for a new 12-year-long, three-level structure of school education: primary, basic and upper secondary (high school). The first 12th grade cohort will graduate in 2029.⁴ The three-level structure of NUS was to replace the obsolete 11-year-old school system. High school education (10th to 12th grades) also aims to optimise the network of schools and pool resources in order to raise quality.

The reform introduced a new competence-based curriculum, and State Standards for Primary and Basic Education were approved. The new curriculum has proven to be paramount to introduce new competence-based learning in Ukraine, in order to equip children with the skills, competences and values needed in the modern world. Coupled with the new structure of schooling, the new curriculum (especially at the high school level) provides for extended time for focused learning, elective courses and proper career guidance to enable students to make informed and conscious further education and career choices.

Within the NUS, teachers have more pedagogical freedom. They can independently design educational and training programmes and experiment with teaching approaches. Educators can also arrange their professional development themselves, with public and private providers. Prior to NUS, teachers and principals could only receive professional development and training from state or communal institutions, which did not provide frequent, high-quality in-service training. Introducing new incentives in the sphere of in-service teacher training and opening it up to non-state actors promoted competition and raised quality.

In 2017–2020, the NUS reform was backed by relatively substantial financial investments. More than 4 billion hryvnia⁵ was allocated from the state budget to the creation of a new educational space. Funds were streamed to roll out nationwide in-service teacher training programmes on NUS. All primary school teachers went through online and offline training in new pedagogical approaches and inclusive education.

Access to quality education has been expanded. A network of 1,239 hub schools was in place in 2021, so that children from villages with small schools could get access to better equipped and staffed hub schools. Moreover, inclusive education reform was backed up by legislation and funding. Schools are obliged to create conditions for children with special educational needs, with funds provided by the state. In 2021 there were already 4,216 inclusive classes across the country.

Support for private schools was provided. From 2019, private schools could apply for state subvention funds using the principle that ‘the money follows the child’.

4 The first year (i.e. the first 10th grade) of the fully-fledged three-year high school will start in 2027. In the 2022/23 academic year, all 5th graders entered NUS classes.

5 About US\$160 million, based on the exchange rate at the time of \$1 to 25 hryvnia.

NUS reform went hand in hand with wider decentralisation efforts in Ukraine. The education management system was decentralised, with founders of schools – local governments – receiving more authority and responsibilities to govern them.

The State Service for Education Quality (SSEQ) was established to provide modern external and internal quality assurance systems in schools, in particular via institutional audits that provide schools with clear recommendations for improvements in their educational process.

The results of the first stage of NUS gradually became evident and tangible. A NUS monitoring conducted in 2019 showed that students of NUS pilot classes perform better at working in teams, solving complex tasks, justifying their position and making decisions in comparison to their peers from non-pilot classes.⁶ Eighty-one percent of surveyed parents involved in NUS expressed their satisfaction with the reform and support for it.⁷

The New Ukrainian School is a long and complex reform. It will take years of effort to further roll out and evaluate the outcomes. This challenge will be aggravated by the war and its devastating consequences.

2.4 Impact of the war

Russia's full-scale aggression against Ukraine has caused devastating effects on Ukraine's education. First and foremost, Ukrainian children were forced to leave the country in vast numbers with their family members. According to UNICEF, more than 50% of those fleeing Ukraine are children.

In a report⁸ on Ukrainian refugee children residing in the EU, the European Commission stated that as of May 2022 there were 528,110 school-aged children in Poland, 290,000 in Germany, 70,530 in Czechia, and between 30,000 to 40,000 in Italy, Romania, Spain and Slovakia. Unfortunately, the exact data for the new academic year are yet unavailable across the entire EU, but the Polish Minister of Education stated that 185,000 Ukrainian children started the school year in Polish schools.⁹

According to MoES data, in the 2022/23 academic year 743,460 school children will start their learning in offline mode in Ukraine, 1,732,638 in online mode, and 1,039,782 in a mixed format. The data on how many of the children studying online will do so from Ukraine or from abroad are not yet unavailable.

6 https://mon.gov.ua/storage/app/media/nova-ukrainska-shkola/2021/Monitorynh/Monitorynh_vprovadzheniya_reformy_NUSH_rezultaty_ta_rekomendatsiyi_26_02.pdf

7 *ibid.*

8 <https://eunighbourseast.eu/news/publications/supporting-refugee-learners-from-ukraine-in-schools-in-europe/>

9 www.rmfm24.pl/tylko-w-rmf24/poranna-rozmowa/news-spicie-czarnka-z-mazurkiem-nie-panski-interes-co-ja-robie-z-nld,6258142#crp_state=1 (in Ukrainian).

However, even if all those who study online do this from their homes in Ukraine, the number of children who won't attend Ukrainian schools – those who reside abroad and/or did not enroll for any modality of schooling in Ukrainian schools for the 2022/23 academic year – is more than 600,000.¹⁰ This huge figure is a harbinger of a potentially massive loss of human capital, since it is hard to predict how many of these children will return to Ukraine and when.

Within the country, there are different regions with very different problems in school education caused by the Russian invasion. Parts of the eastern and southern oblasts remain under occupation (as of September 2022). Teachers, parents and schoolchildren can be physically threatened and even tortured if they refuse to collaborate and go to schools which Russian occupiers claim to be 'Russian'. Ukrainian curricula and textbooks are not only forbidden but destroyed. The MoES data suggest that at the beginning of September 2022, there were 1,288 schools in temporarily occupied territories (not including the occupied Crimea).

Northern parts of Ukraine – Kyiv, Chernihiv region, parts of the Sumy region, as well as some of the liberated Kharkiv region communities – have suffered huge shelling and devastation during the months of battles or occupation. Numerous schools were completely destroyed or severely damaged, and most of the communities and schools were looted by the Russian army. As a result, access to school premises, as well as to educational instruments and equipment, is severely limited. According to the MoES, the total number of destroyed schools around the country at the beginning of September was 272, with 2,164 are seriously damaged.

Western and central parts of Ukraine have to deal with the accommodation and adaptation needs of the massive influx of internally displaced children. The MoES reports that 8,720 schools provide education to IDP children. The southern regions, such as Mykolaiv, parts of Kherson and Odesa, suffer from continuous shelling. As a consequence, no offline or blended education is possible there, at least at the beginning of the school year.

Funding to schools, and education in general, has been severely cut. There are no funds available from the central budget to replace the destroyed buses, to procure textbooks or to continue the New Ukrainian School. All available funds are going towards at least partial support of teachers' salaries. However, even this line of spending cannot be fully covered by the government. The World Bank allocates approximately \$200 million per month to support the salaries of teachers and civil servants.

10 This is the difference between the pre-war projection of the total number of children and the actual number enrolled.

2.5 Reconstruction of primary and secondary education

Given the situation of Ukrainian elementary and basic education described above, the approach to recovery of school education and further transformation should be based on general principles of autonomy coupled with responsibility, reducing inequality and raising the overall quality of education. To implement these principles, the following policy steps should be taken:

Proper governance

- Changes to the education system should be systemic and consistent across its parts, and prioritisation of policy steps should be clear.
- The New Ukrainian School should be continued and rolled out to the next grades, with sufficient funds secured for its proper implementation.
- Decentralisation should continue, with local communities managing schools of which they are founders. Communities should have the capacity, resources and a clear mandate to ensure a high-quality educational process. The central government should ensure overall quality via implementation of education standards and key performance indicators (KPIs), as well as a transparent and fair system of rewards and penalties for not achieving them.
- Educational institutions should have broad autonomy in the organisation of the educational process, while bearing responsibility for the quality of education.
- Along with the formulation of curricula, educational autonomy envisages decentralisation of the ordering and printing of textbooks. The MoES should no longer procure textbooks for the entire country; it should only set quality frameworks for them and approve draft textbooks, among other things checking them for anti-discrimination. This will also eliminate a potential source of corruption at the ministry.

Reducing inequality

- Government policy should prioritise closing the gaps between rural and urban schools and between regions and students of different socioeconomic backgrounds.
- The educational process and educational environment at schools should be as inclusive as possible and allow students with different educational needs to learn and develop successfully. Instruments for inclusion of IDPs and returning refugee students should be developed, along with instruments for the inclusion of students with disabilities or from marginalised families or communities.

- Early development and preschool education are the key to successful further education. The state should systematically invest in widening access to high-quality preschool education (especially in rural areas) and in preschool teachers' professional development. This will not only help students master school programmes but also extend opportunities to work for parents and thus help develop the human capital of both younger and older generations.

Ensuring quality

- The content of education and expected learning outcomes should be systematically reviewed in order to meet the standards of high-achieving OECD countries.
- School principals and teachers should be high-quality specialists with appropriate training who systematically and continuously work on their skills and qualifications. To ensure this, both monetary incentives and respective training programmes should be provided.
- Educational innovations should be primarily created in schools, with the Ministry of Education and Science providing conditions for this to happen and opportunities to scale up successful innovations.
- School education should provide an opportunity to high school students to make a conscious choice of their future studies and careers.
- Ukraine should participate in all key international quality studies of school education (PISA, TIMSS, PIRLS, etc.).
- High-quality data should be collected to monitor and measure education needs and reform progress; policy adjustments should be based on rigorous evidence and analysis.

2.6 Specific educational policies

Post-war reconstruction of educational institutions will take into account general population trends and government efforts in reconstructing certain areas (see the chapter in this book on urban development by Richard Green and co-authors). The general approach should be in line with the previous reforms and principles described above: high autonomy of local governments with central government setting the overall policy framework and quality standards. We envision that the pre-war trend of creating larger institutions to benefit from economies of scale and provide higher-quality education will continue.

At the same time, as discussed in the chapter on the labour market by Giacomo Anastasia and co-authors, Ukraine will need a massive reskilling because many jobs have been (or will be) destroyed by the war, but other jobs have been (and will be) created. Thus, the MoES has to develop a targeted programme to reskill or employ in other regions those educators who have lost their jobs during the war.

It is very important to continue systemic implementation of the New Ukrainian School, with corresponding adequate analysis and revision of policies over time. In line with this reform, each school should update its curricula according to the new education standards. The reform envisages the development of a network of academic lyceums, where students have the opportunity to form an individual educational trajectory and choose their study profiles. Special attention should be paid to establishing scientific lyceums, in particular lyceums focused on natural sciences, physics and maths, that will educate future innovators and skilled workers for high value-added industries, with specific attention to the military and defence. Schools should implement a strong and systemic career guidance component, especially for 8th grade students, with promotion of the VET track.

To help students overcome the consequences of COVID-19 and the full-scale war, schools (coordinated by the MoES) should implement programmes to make up for learning loss. These can be additional extracurricular activities and tutoring in core subjects. Systemic mental health support programmes for schoolchildren and teachers, and an ecosystem of relevant services within schools, social services and medical institutions, will be needed to overcome war traumas.

At the same time, both schools and society should move away from the medical understanding of inclusive education; with adequate support, students with special needs are capable of mastering the school programme. This support should be provided both in terms of funding (for example, for teaching assistant positions and special equipment) and training for teachers. The concept of inclusivity should also be widened to include not only students with health issues but also students from marginalised communities, IDPs and returning migrants.

Finally, education policy should be based on high-quality data, both industry-specific and general. Industry-specific data require the development of the educational measurement and evaluation system: investing in modernisation of external testing and the extension of external testing to basic school; and the creation of quality monitoring tools for elementary, basic and high school education (these should be digitised as much as possible).

General data require the implementation of the population census in order to understand the country's current demographic profile. These data are crucial for education policy. The census requires considerable resources, which likely will not be available in the first years after the war. Thus, a system of registering people's place of living and specifically accounting for school-age children should be established.

3 VOCATIONAL EDUCATION AND TRAINING

Vocational education and training (VET) in Ukraine ensures the provision of knowledge and skills in a wide range of vocational degrees.¹¹ A person with a VET education can work as an assistant, skilled worker, advanced worker or a specialist. Paradoxically, while companies struggle to hire blue-collar workers, school graduates are not eager to go to VET schools. One explanation is the low prestige of vocational schools since the Soviet era. Reforms in this sector have been aimed at narrowing the gap between labour market needs and the skills and qualifications that vocational schools provide.

3.1 Pre-war state of VET in Ukraine

As of 1 January 2022, there were 694 VET schools in Ukraine, of which 685 were managed by the MoES. The majority of VET schools are located in the Dnipropetrovsk, Lviv and Donetsk regions. There are currently more than ten different types of VET institutions. The ongoing reform process aims to reduce this to three or four types – for example, VET lyceums, VET schools, VET centres, and workers' vocational development centres – to make the network more transparent and clearly identifiable.

The VET system offers training in 407 professions, of which 316 are financed by regions (the regional order), although only 103 professions correspond to regional labour market needs. Traditionally, about 75% of VET students enter VET schools after 9th grade and acquire a double qualification (a secondary school diploma plus a VET qualification), 20% of students enter VET schools with complete secondary education, and 4% of VET students are adults. In VET schools, the share of male students is over 60%, while almost 60% of teaching staff are females (18,677 out of 31,324). The number of VET students declined from 315,600 in 2014 to 250,300 in 2022. One of the reasons for this is the decline in the share of youth (aged 15–24) in the overall population from 11.3% to 9.5%. In 2021, 89,996 out of 110,212 graduates from VET schools (82%) were employed in the industry, agriculture, transport, communications, construction, trade and catering or housing and utilities sectors. The rest of the 2021 VET graduates either continued their education, entered military service or did not find a job (State Employment Service 2021).¹²

The VET system is generally inclusive and provides knowledge and skills to young people of different categories, including orphans and single parents, young people from disadvantaged and low-income families, and people with special needs.

11 www.govet.international/en/159632.php

12 www.futureskills.org.ua/ua/map (in Ukrainian).

VET problems and reforms

The Ukrainian education sector has been under reform since 1991, but progress has been slow due to the absence of a comprehensive vision of the education system. Many approaches have been tried here and there but without clearly set goals and a roadmap, success has been limited.

This lack of a holistic and coherent vision is reflected in sporadic changes of the legal framework for the education sector. The framework Law on Education (adoption of which should have precluded the laws on specific education levels) was adopted in 2017, while the new Law on Higher Education was already in place since 2014. The new Law on Secondary Education was adopted in 2020, and the Law on Adult Education is still in the parliament as a draft. The VET system still operates under the old law from 1998 (with amendments) while the new law is under development. Currently, development of the VET sector is guided by the concept of state policy in “Modern Professional (Vocational) Education until 2027” (2019) and the “Strategy of Professional (Vocational) Education Development until 2023” (2020). The purposes of these documents is the modernisation of both the VET system and curricula to make vocational education more attractive to youth.

The major problem that vocational education has to solve is the ‘hunger for a skilled workforce’. The deficit of skilled workers has become more apparent since 2015, when labour migration to the EU intensified. It has forced many companies to improve working conditions and VET and businesses to make steps towards each other.

As the first step towards making the quality of education more responsive to the needs of employers, since 2016 Ukraine has started to implement elements of the German system of dual education.¹³ Prior to the full-scale war, 217 vocational education institutions (31% of the total) provided dual education for 12,395 students (5% of the total number). To provide dual education, vocational schools sign trilateral agreements with students and employers (Kulalaieva and Leu 2019) so that students spend 30–40% of their time learning theory in schools and 70–60% of time practicing at specific companies. The war has caused significant disruption to established partnerships between VET and businesses.

In 2010, Ukraine joined the Torino Process of the European Training Foundation (ETF). Since then, the initiative has produced four national reports (ETF 2011, 2015, 2017, 2020a). These assessments provide an external and forward-looking analysis of Ukraine’s human capital development issues and VET policy responses from a lifelong learning (LLL) perspective.

13 Law of Ukraine "On Education", "Medium-term plan of priority actions of the government for the period 2017-2020", Section III, Subsection 8, "Modernization of vocational education"; Order No. 660-r "On approval of the Concept of training specialists in the dual form of education" (<https://zakon.rada.gov.ua/laws/show/660-2018-p>, in Ukrainian); and Order No. 1551 "On approval of the Regulations on the dual form of professional (vocational) education" (<https://zakon.rada.gov.ua/laws/show/z0193-20#Text>, in Ukrainian).

ETF notes the progress in the transition from a traditional to a modern (i.e. flexible and person-centred) VET system (ETF 2021). The latter report offers four recommendations to keep up the progress: support capacity building and optimisation of training providers, support the changing role of teachers and trainers, increase private sector participation LLL, and monitor and support extending LLL opportunities.

In 2018, the Government of Ukraine and the European Commission signed an agreement¹⁴ on funding the “EU4Skills: Best Skills for Modern Ukraine”¹⁵ programme and its implementation in seven pilot regions (Chernivtsi, Lviv, Mykolaiv, Poltava, Rivne, Vinnytsia and Zaporizhzhia).¹⁶ The EU4Skills programme and the Ukraine VET Concept aim to ensure that the efficient step-by-step reforming process aligns VET with the labour market requirements, improves the quality of VET content and raises the attractiveness of VET in Ukraine. Some results can already be seen (Leu-Severynenko 2022), including the active upskilling of VET teachers, updating of VET curricula, modernisation of VET infrastructure (a practical training centres network), the creation of new VET standards (as of April 2022, there are 207 updated or new VET standards), and the use of modern approaches to improve the image of VET.

The major reform of VET education was implemented just recently, when the National Qualification Agency (NQA), created in 2019, significantly updated the National Qualification Framework (NQF), aligning it with the European Qualification Framework for Lifelong Learning (EQF), as Figure 1 shows. Next, the agency will work on in-depth harmonisation of the NQF and EQF to ensure the recognition of Ukrainian qualifications abroad, facilitate international academic and professional mobility, raise the quality of the vocational education network, and increase its capability to provide lifelong learning.

To implement this policy, the NQA trains accreditation experts¹⁷ and professional evaluators,¹⁸ who then will be able to work in qualification centres. These centres will be created at every VET school to confirm qualifications obtained in Ukraine or abroad through formal education, non-formal education or informal learning.¹⁹ NQA coordinates the development of modern professional standards corresponding to the labour market needs and supports the development of educational standards for both the VET and higher education sectors.

14 https://zakon.rada.gov.ua/laws/show/984_005-18#Text (in Ukrainian).

15 <https://eu4skills.info/en/>

16 https://zakon.rada.gov.ua/laws/show/984_005-18#Text (in Ukrainian).

17 <https://nqa.gov.ua/news/v-ukraini-vze-e-132-eksperti-iz-akreditacii-kvalifikacijnih-centriv/> (in Ukrainian).

18 <https://nqa.gov.ua/news/zaversuutsa-zanatta-dla-majbutnih-ocinuvaciv-rezultativ-navcanna-zdobuvaciv-profesijnih-kvalifikacij/> (in Ukrainian).

19 <https://nqa.gov.ua/qualification-centers/> (in Ukrainian).

In 2016, the MoES began VET decentralisation. The ultimate goal of this is to turn vocational schools from public entities into communal non-profit enterprises, which would allow them much more freedom in earning money and fundraising (a similar reform was implemented with respect to healthcare institutions). During the period 2016–2018, VET obtained the majority of funding from state and local budgets, followed by tuition fees, while contributions from private sector or international donors were very small (ETF 2020a).

The NUS foresees a step-by-step integration of VET into higher grades of secondary education. The plan is that by 2027, secondary school students will have an opportunity to choose the pathway of their professional life in academic or professional (vocational) areas and master their knowledge and skills accordingly.²⁰

In 2020–21, to attract attention and students to VET and ensure positive changes to the image of VET, the MoES started using the hashtag #пояснюємопрофесію (“we explain occupations”) on social media to provide the details about VET occupations to the broader audience.^{21,22}

3.2 Impact of the full-scale war

In the majority of regions, VET students have switched to online learning and secondary schools have simplified their graduation procedures so that students can continue their education in VET schools or universities. VET schools held early graduation (in April 2022 instead of June) and made their premises available for internally displaced people. In October 2022, 29,467 VET teachers started the training process for 227,056 VET students in 564 VET schools, using in-person (157 schools), distance (120 schools) or mixed (287 schools) learning.²³ Despite the war, VET reforms have continued.

The major war-related problems for vocational schools are similar to those in other levels of education: destruction of facilities, relocation of teachers and students, and reduced funding. Vocational schools, as with other educational institutions, need support to renovate their premises, move their operations online or into hybrid format, and pay salaries. As of 11 October 2022, 15 VET schools have been destroyed and 114 have been damaged.²⁴ Sixteen VET schools have already managed to renovate their premises,²⁵ but 125 still need renovation – among other things, to equip shelters to provide in-person training in a safe environment (at an estimated cost of €300,000).

20 <https://mon.gov.ua/eng/tag/nova-ukrainska-shkola> (in Ukrainian).

21 <https://mon.gov.ua/ua/osvita/profesijno-tehnichna-osvita/vstupna-kampaniya/vstup-2022-profosvita/video> (in Ukrainian).

22 <https://thanks-to-us.in.ua/> (in Ukrainian).

23 Presentation by Iryna Shumik, General Director of the MoES VET Directorate, at the International Forum on “VET for post-war reconstruction of the victorious Ukraine”, 11 October 2022.

24 *ibid.*

25 <https://saveschools.in.ua>

VET schools have provided their premises and dormitories to IDPs (who numbered over 17,000 in April). Some IDPs will continue to live in these premises through the winter because not all residential buildings will be heated. VET schools are therefore asking for donations of household appliances²⁶ to provide a comfortable stay for these people.

Due to the war, the decentralisation of VET schools has been postponed, and in 2023 the schools will still receive funds from both central and local budgets because the situation with local budgets is very uneven.

Online, digital or remote learning for VET is very challenging, but there has already been some progress. The MoES is creating a “Professional Education Online” platform that will ensure safe and efficient learning of theory, and will allow in-person practical training sessions to be planned in a more productive and safe manner. One way to ensure proper yet safe training is by using virtual reality (VR) and simulators. Several VET schools are already using VR training courses for 15 professions, and at least 50 occupations could benefit from similar courses. The average cost to create an online training course with partial simulation is €20,000. The total cost of switching VET education to a hybrid format (recording online and VR courses, providing laptops for teachers and students) is estimated at €7 million.^{27 28}

Not all professions can be mastered online, however. VET schools therefore need to modernise their equipment to provide quality education. The full modernisation of a VET school costs about €450,000, and about 200 schools need such modernisation.

To provide better education and career services, VET schools need to develop their teachers, including providing them with English courses and inclusivity training. They also need to establish career development centres to support students in their career choices, partner with employers to place students for internships and dual education, and so on. To prepare VET schools for greater financial autonomy, school management should undergo training in fundraising and project management, and generally improve their managerial skills.

3.3 Post-war reconstruction of the VET system

Despite the war damages described above, VET has continued to reform and develop (Leu-Severynenko 2022). The National Recovery Plan (National Council for the Recovery of Ukraine from the War 2022) provides a rather detailed outline for VET development (see Table 1).

26 <https://mon.gov.ua/ua/ministerstvo/diyalnist/mizhnarodna-dilnist/pidtrimka-osviti-i-nauki-ukrayini-pid-chas-vijni/nevidkladni-potrebi-osviti-i-nauki-ukrayini> (in Ukrainian).

27 <https://docs.google.com/spreadsheets/d/16gOXHnL5yW41beTrK1GfhkKXdOuTAj4H-uaXj8-PGnw/edit#gid=903215423>

28 https://drive.google.com/file/d/14MZM_9GQaAJSJ5ar1myZ0nsI6yRz4Jl4/view

The VET system should develop along previous lines, with the primary goal of meeting labour market needs. Thus, it should not only provide training for school graduates but also considerably extend adult education programmes, introduce modular curricula for quick upskilling, and widen dual education and work-based learning. The fact that some teachers and students have moved abroad can be used for the internationalisation of Ukrainian education at all levels. At the same time, VET should retain its social function and ensure development of soft and social skills for future professionals.

To meet these objectives, the next steps in the VET development are proposed as follows:

- Approve the new law on VET that would integrate it into NUS and connect with other education levels; provide a framework for qualification standards and lay the foundation for optimisation of the vocational school network.
- Provide more financial autonomy for VET schools; optimise the network of VET schools and modernise the infrastructure of remaining schools.
- Develop public-private partnerships in the sphere (update the legislation, create a communication platform and incentives for businesses to participate in it, develop KPIs, monitor and reward performance).
- Strengthen the VET practical component in collaboration with businesses as well as public and civil society organisations/NGOs. VET schools could then discuss their curricula with businesses that are likely to hire their graduates, invite representatives of businesses to provide guest lectures or guest courses, and so on.
- Provide professional development opportunities for adults (reskilling and upskilling courses) through the services of the VET network.
- Support the creation of VET schools-based qualification centres; continue building the network of training and practice centres via the active involvement of private sector and business representatives.
- Ensure monitoring and evaluation of reform results based on data and salient analysis; update VET development policy based on monitoring and evaluation results with a focus on improving VET quality.
- Advertise VET education and provide career guidance at schools explaining VET education opportunities.

The above steps should result in the following:

- VET in Ukraine is well-managed and financed at all levels, has a development roadmap, well-working legislation and a legally regulated policy monitoring system. National and local authorities efficiently coordinate, implement, monitor and reflect credible and relevant sector reforms.

- VET is flexible and responsive to labour market needs. VET uses short-, mid- and long-term planning at the national, regional and local levels. It allows the demand for a qualified workforce to be met and ensures sustainable workforce development for all sectors of Ukraine's economy.
- VET programmes are modular-based and adaptive to changes in technologies and production processes. A dual form of training is embedded into VET, supported by clear procedures, regulations and approaches. Mentorship is well-developed at VET schools and companies. All of this ensures the high quality of VET content and efficient skills development that meets employers' needs. VET graduates are highly qualified and able to start full-fledged professional activity from the first day of employment. They also have well-developed soft skills.
- VET schools are serving the needs of their regions and become 'gravity centres' of the communities where they are located. There are three or four types of VET schools, and they develop centres of vocational excellence (ETF 2020b) and qualification centres within them. VET schools provide services of initial training, upskilling, and reskilling for clients of different sex, age, professional background, training needs and experience.
- Faculty and staff of VET schools have well-developed skills (English, project implementation, international communication, etc.) and participate in international projects (e.g. Erasmus). They can attract funds from different sources and have enough financial autonomy to use these funds for development purposes.
- VET has a better reputation among potential and current trainees and employers. The share of secondary school graduates who choose VET continues to grow and more students choose VET as a part of their high school programme in terms of NUS reform.

TABLE 1 THE POTENTIAL DIRECTIONS OF VET DEVELOPMENT ALIGNED WITH CURRENT REFORM PROCESS AND PLANNED RECOVERY INTERVENTIONS

Advised interventions in 2017	Years						Progress as of 2022	Updated advised interventions as of 2022	Responsible parties	Timeline		
	1	2	3	4	5	6				2022	2023-2025	2026-2032
Creation of the National VET Council	X						Order About Priority Measure for the development of professional (vocational and technical) education (2021)	Resume the work of the National VET Council	GoU and social partners	X		
Creation of Regional VET Councils	X						Decree about the Model regulation on the regional council of professional (vocational and technical) education (2019, CMU)	Resume the work of the Regional VET Councils	Local authorities	X		
Development and approval of the National VET Strategy	X	X					Concept of implementation of state policy in VET "Modern professional (vocational) educator" up to 2027 (UA VET Concept) (2019, GoU) Development strategy of professional (vocational and technical) education until 2023 (2020, MoES) Concept of State targeted social program for VET development 2022-2027 (2021, GoU) Law for VET is still under development	Keep the process of creating and realizing the National VET Strategy	GoU and social partners	X		
Creation of a legally regulated policy monitoring system	X						Education Management Information System (EMIS) for the VET sector is under development.	Complete the creation and start using EMIS	MoES and social partners	X	X	
Strengthening the potential and capacity of national authorities to coordinate, implement and monitor credible and relevant sector reforms	X						Regional VET strategies are in place	Ensure upskilling of responsible specialists	MoES and social partners	X	X	
Development and approval of regional VET strategies	X						Regional VET strategies are in place	Adapt the strategies to the current situation and align with the priorities of the national level	Local authorities	X	X	X
Implementation of transitional measures and/or VET Strategy (3-5- years)	X	X	X	X	X	X	UA VET Concept (2020) EU4Skills Project interventions (2019)	Keep the reforming process going and attract additional funding for further steps realisation	GoU, MoES and local authorities	X	X	X
Decentralization and optimization of VET management	X						69 directors and deputy directors of VETs are trained	Continue training VET managers	GoU and MoES	X	X	
Optimization of the network of VET schools	X	X					Recommendations for VETs network optimization (2021, MoES)	Continue optimization process considering the needs of regions and VETs (if damaged or ruined)	GoU, MoES and local authorities	X	X	
Improvement of financing mechanisms	X	X					Transfer VETs from state to communal ownership (2021, MoES)	Ensure the state order for a qualified workforce. Financial independence to VETs	GoU, MoES and local authorities	X	X	
Improvement of legislation in VET	X	X	X				The Law for VET is still under development	Approve and launch the Law for VET	GoU and MoES	X	X	
Improving VET quality and ensuring its compliance with the needs of the labor market	X	X	X	X	X	X	2,500 trained VET teachers (2021, EU4Skills). 22 state educational/VET standards are approved and 30 ones are drafted (2021, MoES)	Set education-business partnerships, engage the companies to the training process	MoES, VET schools, social and business partners	X	X	X
Professional guidance and career development	X	X	X	X	X	X	8 regions piloted professional orientation concept; 4 out of 15 promo manuals for students; communication strategy; 5 promo videos for parents of VET students (2021, MoES and EU4Skills)	Implement PPP Model and mechanisms	MoES, VET schools, social and business partners	X	X	X
Modernization VET technical infrastructure and equipment	X	X	X	X	X	X	93 CDCs created at VETs (methodological recommendations) GoU created 194 training-practical centers (TPCs) Businesses and partners created 180 TPCs	Keep the promo campaigns going. Attract new partners to develop VET visibility. Equip CDCs to make them hubs for career development, guidance, engaging private sector	MoES, VET schools, social and business partners	X	X	X
Pilot testing of innovative models in selected VET schools or at the system level	X	X	X	X	X	X	The process is going on in terms of EU4Skills Project and the UA VET Concept realization.	Upgrade or build bomb shelters in VETs Rebuild the damaged VETs Keep piloting and using of best practices e.g. VR/AR, simulator-based learning, online/distance learning, practice-based training Keep implementation of dual education elements, pilot use of training in networks	MoES, VET schools, social and business partners	X	X	X

Source: Author's development; see the full version and the underlying study at www.auc.org.ua/sites/default/files/sectors/u-137/zvit_jevo.pdf (in Ukrainian).

4 HIGHER EDUCATION

4.1 Pre-war state

Challenges

Ukraine has a relatively large number of higher education institutions (HEIs). This is a consequence of the growing demand for higher education in the 1990s and 2000s, when more than 100 private HEIs appeared and dozens of VET institutions received de jure status as HEIs. In the 2007–2008 academic year, there were twice as many HEIs (universities, institutes and academies) with three times as many students as in the 1992–1993 academic year. However, over the past 15 years, the number of students has been constantly decreasing (because of a steep decline in the birth rate in the 1990s) and now amounts to slightly more than one million. Thus, the number of students before the full-scale aggression of Russia had fallen almost to the level of 30 years ago (see Table 2).

At the same time, the number of institutions remains significantly greater than it was at the beginning of 1990s. According to the latest data, 386 universities, institutes and academies offer bachelor's, master's and PhD programmes. Many more universities offer degrees in the social sciences and business than in the natural sciences or engineering. For example, in 2021, undergraduate majors in law or economics were offered by nearly 150 HEIs and majors in management were offered by more than 200 HEIs, while majors in mathematics, physics, chemistry, biology, electronics or energy were offered by only 20 to 30 HEIs.²⁹

TABLE 2 THE SIZE OF HIGHER EDUCATION IN UKRAINE

	1992-1993	2007-2008	2021-2022
Number of HEIs	158	351	386
Number of students	855,894	2,372,462	1,046,669
Number of students per 1,000 population	16.5	51.3	25.5
Number of faculty members	70,358	159,089	125,360

Source: State Statistics Service of Ukraine

29 Authors' calculations based on data from the Unified State Educational Database (<https://registry.edbo.gov.ua/opendata/entrant/>).

According to World Bank estimates, in 2017 there were 5.4 public HEIs per 1 million people in Ukraine, compared to around 3 HEIs per million population in Poland, Germany, Hungary, and Romania (World Bank 2019). There are also fewer students per teacher in Ukraine than in EU countries. For example, in neighbouring Poland there are on average 13 students per faculty member, compared to 8.3 students per teacher in Ukraine.³⁰

This situation leads to a wide dispersion of resources and reduces the efficiency of their use. According to the MoES, spending on higher education in Ukraine in 2019 amounted to 1.84% of GDP (1.34% if only public spending is considered). This is greater than the average in OECD countries (1.4%) and in Poland (1.2%) in 2018 (OECD 2021). However, considering Ukraine's low GDP, the absolute amount of funding for such a vast network remains insufficient. For example, the average salary of a Ukrainian professor was equivalent to \$5,700 per year in 2017–2018.³¹

Ukrainian universities are trying to compensate for the lack of public funding through tuition fees. However, most universities traditionally charge low fees; often the price is half of the amount of public funding they receive per student. To cover their costs, universities are increasing their numbers of students, but as they charge such low tuition fees they still do not receive enough money to ensure a quality education (and low-performing students are not expelled to avoid losing the tuition fees they pay). This creates a vicious circle, whereby while trying to compensate for the lack of funding from the state budget, universities increase their budget deficit even more. This negatively affects the quality of higher education.

The quality of education also suffers from the lack of financial autonomy. According to an assessment by the European University Association, Ukrainian HEIs have a high level of autonomy in academic matters, but significantly lower autonomy in financial and personnel matters (EUA 2016). For example, public universities must even coordinate the use of their own (non-public) funds with relevant ministries, they are significantly limited in creating their own system of remuneration (which leads to equalization of salaries) and they cannot manage their property.³² The low level of organisational and financial autonomy for Ukrainian public higher education institutions makes them unattractive to effective managers. In fact, one of the biggest challenges for Ukrainian universities is the lack of modern management, and especially crisis management, and the lack of leaders who are able to shape the vision of a university and work on its systemic implementation.

30 Authors' calculations; data for Poland from Statistics Poland (<https://stat.gov.pl/obszary-tematyczne/edukacja/edukacja/szkolnictwo-wyzsze-i-jego-finanse-w-2020-roku,2,17.html>, in Polish).

31 MoES "Strategy for the Development of Higher Education in Ukraine for 2022-2032" (<https://mon.gov.ua/storage/app/media/news/2022/04/15/VO.plan.2022-2032/Stratehiya.rozv.VO-23.02.22.pdf>, in Ukrainian).

32 The State Property Fund must approve the renting out of premises; it also receives part of the revenue.

The majority of HEIs do not have their own visions and missions; usually, the strategic development of a university is perceived as something of little importance and almost unrealistic in the Ukrainian context. Thus, the missions of universities are not deliberately articulated and do not represent a real guide for their operations. Neither supervisory boards nor the government, internal or external stakeholders are involved in monitoring the implementation of university missions. Universities mostly position themselves as educational institutions, and occasionally as research centres. They almost never act as public platforms of expertise and hardly ever respond to social or technological challenges in the country. As a result, society in general, and the specific communities around universities, perceive them mainly as places to obtain an education (knowledge and skills), often without the demand for the formation of personality and values.

The COVID-19 pandemic forced HEIs to switch to distance learning, and most current senior-year students have only been on campus for one semester. This has negatively affected the quality of education and the level of social capital which, under normal conditions, can be obtained at a university. As a side effect, remote education has made some Ukrainian families more informed about the quality of Ukrainian universities.

Most often school graduates choose a university and a major (one should choose this before entering a university) without proper consideration. First, career guidance is not included in the school curriculum but takes place mainly through individual interest or within sporadic non-governmental projects. Second, universities rarely provide information about themselves or their programmes in an accessible form. Third, for many students, entering university at the age of 17 is not a deliberate individual step but rather the desire of parents to choose the safest path for their children. Under such conditions, the demand for 'diploma mills' persists.

Previous reforms and policies

Ukrainian universities received wide academic autonomy after 2014. The new standards of higher education mostly describe the broad learning outcomes, without in any way regulating how these outcomes should be achieved. In such conditions, active HEIs began to open new and update existing programmes, composing them at their own discretion. Less courageous HEIs have continued to operate according to the old state standards, despite them no longer being in force.

To enter the market a HEI needs a license, and to issue a diploma each programme should have a valid accreditation. The licensing mechanism for most majors was significantly simplified in 2019–2020, when it was transformed into licensing of the whole higher education level (BA, MA and PhD). Universities can decide for themselves which majors to offer within the obtained level license. Only 28 majors (out of more than 100) are under stricter government regulation (medicine, law, energy, etc.); for these, the list of licensing requirements remains quite detailed and strict.

The National Agency for the Quality of Assurance of Higher Education (QA Agency) now accredits university programmes instead of the MoES. The QA Agency is formed by an independent commission, which selects the 25 members following an open call among representatives of various stakeholders (universities, students, employers, academies of sciences). In 2019, the QA Agency launched a new accreditation mechanism in which experts pay more attention to the internal quality assurance processes at universities than to formal compliance with external requirements. Experts (among them, representatives of students) are constantly trained, and the register of experts and the entire accreditation process are made public, and an online database containing accreditation documents for all cases.³³

External testing (ZNO) for admission to bachelor's programmes was introduced in 2008. This ensures transparency in university admissions. Passing an external test in a foreign language (most often, English) became a mandatory requirement for admission to a master's program in 2020. Aside from increasing transparency, this encourages universities to improve the English proficiency of their students.

The automated distribution of state-funded places (vouchers to study for free) was introduced in 2016–2018. Budget-funded places at the bachelor's level are assigned to applicants rather than to universities, so a university receives more state-funded places if it attracts more high-quality applicants. For admission to master's programs, places are allocated among universities by the MoES and other government agencies based on objective criteria (publications, research income, world rankings, etc.).

Until 2020, public funds were distributed among HEIs according to the number of students. The more students that were studying at an institution, the more funds it could receive. HEIs became more interested in the quantity of students than in the quality of education. In order to incentivise universities to prioritise quality over quantity, the government introduced performance-based funding in 2020, whereby the allocation of public funds takes into account not only the number of students but also international rankings, international grants, revenues from commercial research and employment rates of graduates.

In 2020, the government set minimum tuition fees so that universities have to start increasing tuition fees and reducing their dependence on public funding. This will help good-quality universities compete with the dumping fees of 'diploma mills'.

Also in 2020, the government introduced a new format of contracts between rectors and the Ministry, setting KPIs for rectors and deadlines for their achievement. If a rector does not implement KPIs, he or she is in breach of the contract, which could lead to its termination (if the employee conference of a university supports this).

33 <https://public.naqa.gov.ua/>

In 2022, Ukraine signed a \$200 million loan agreement with the World Bank intended to cover infrastructure projects, university management training and support for further reforms. However, because of the full-scale war and reduction of budget revenues, this loan was used to pay faculty salaries.

4.2 Impact of the war

Estimates of physical damage

Information about the losses in higher education is still quite limited and rather general. The MoES has conducted a survey among HEIs, but its detailed results have not been published yet. As Russian bombing and shelling continues, HEIs are facing destruction on a weekly basis, especially in Kharkiv and Mykolaiv.

According to a report by the MoES Institute of Educational Analytics, seven HEIs had been destroyed and 46 were damaged as of 1 August 2022. These are mostly located in Kharkiv (where 48% of local HEIs were damaged), Mykolaiv (38%), Chernihiv (67%), Zhytomyr, Vinnytsia, Donetsk oblast (33%) and Zaporizhia oblast (21%). In addition, 29 HEIs and more than 60 of their branches were relocated from territories occupied by Russia (Institute of Educational Analytics 2022).³⁴ These HEIs renewed their activities at facilities of other universities in safer regions. In most cases, a relocation implies a change of legal address and partial relocation of faculty and management, while practically all equipment remains under occupation. In the new locations, HEIs were provided with offices and classrooms and some general office equipment. Most relocated HEIs deployed administrative processes to support distance learning and complete the academic year, and to conduct admission campaigns.

Lack of funding

Following the Russian full-scale attack, Ukraine had to cut all budgetary support for HEIs except for the financing of salaries and stipends. The aforementioned loan from the World Bank, with the World Bank's consent, was used by Ukraine to pay faculty salaries. According to the results of a survey of HEIs conducted by the MoES, more than 20% of HEIs are experiencing delays in the payment of salaries and stipends. Over 30% of HEIs report a significant or partial drop in tuition fee revenues and a similar share report having students who cannot continue their studies due to the need to earn a living.

Universities are therefore trying to cut spending wherever they can. For example, some HEIs started the new academic year in August to reduce heating costs later in the year.

The 2023 State Budget Draft Law proposed by the government decreases higher education funding by 19% compared to 2022; this cut will be higher in real terms due to inflation of around 30% inflation.

34 https://iea.gov.ua/wp-content/uploads/2022/08/education-of-ukraine_2022.pdf

Faculty members displaced

According to the results of the above-mentioned MoES survey, up to 30% of students and teachers of most HEIs have been forced to go abroad or become internally displaced. The MoES is working on a monitoring system that will regularly update data on students' status.

Lack of secured facilities

Most universities do not have bomb shelters to accommodate all students, although only a minority of students will study on their university campuses in the 2022–2023 academic year. The majority of students continue to study remotely.

The 2022 admissions campaign

Despite wartime obstacles, Ukraine was able to conduct external testing for the 2022 admission campaign and ensure its transparency. The Ukrainian Center for Educational Quality Assessment developed a special testing software in a short time and deployed it in thousands of testing centres in Ukraine, as well as in over 20 other countries to which Ukrainian schoolchildren and students have fled from the Russian aggression. During the admissions campaign, entrants used authorised e-cabinets to submit documents to universities. As of September 2022, the admissions campaign was still ongoing without any disruptions.

Suspension of reforms

Following the Russian invasion, the MoES suspended the performance-based funding model, replacing it with the pre-2020 model based on the number of students, as well as an obligation to raise tuition fees.

4.3 Reconstruction

The general philosophy of reconstruction should be based on several 'reorientations':

- Reorient from quantity to quality (performance).
- Reorient from rapid half steps to consistent and foreseeable long run policies.
- Reorient from control and overregulation to know-how transition, advice and training.
- Reorient from subordination of HEIs to different government agencies (MoES, Ministry of Healthcare, Ministry of Culture and Information Policy or local municipalities) to one unified system of higher education.
- Reorient from limited access to public funding to equal access to public resources regardless of private or public status of HEI.

New policies will change the system of incentives for students, faculty and management of educational institutions so that quality of knowledge rather than a diploma becomes the priority for everyone. Several sets of policies can be employed to achieve these objectives.

Quality control and informed choice

- Introduce mandatory external ability testing (readiness and ability to obtain higher education) in addition to external subject-oriented testing (ZNO) for admissions to bachelor's programmes in order to give access only to those who are able to obtain higher education.
- Launch early career orientation before and during the high school period, which will help to identify talents, clarify the relationship of certain school disciplines with their professional applications, overcome gender stereotypes and popularise STEM.
- Allow students to choose a major during their first or second year of study rather than before joining an HEI.
- Increase the scope and availability of data on the state of higher education in general, and on each HEI in particular, informing entrants and their parents about the prospects after graduation from different HEIs and majors.

More financial autonomy and better financial management; focus on quality

- Transform state and municipal HEIs into public entities; provide them with broad financial and organisational autonomy, including the ability to manage funds without ministerial approval, to shape their own system of remuneration and to manage property (i.e. become full owners of property).
- Ensure equal and competitive access to various sources of funding, regardless of the ownership of HEIs (public or private).
- Reduce the impact of the number of students on the funding of HEIs and increase the impact of performance, especially mission fulfillment, academic mobility, involvement of Western faculty members and researchers, and level of digitalisation. Research-oriented HEIs (see below for different types of HEIs) should be incentivised and rewarded more for research impact (e.g. place in international rankings, publications in internationally renowned high-impact journals,³⁵ success in international research grants, etc.), while other types of HEIs should be rewarded more for quality of teaching, social impact and employability of graduates. Where possible, performance should be measured by data provided by third-party sources (international agencies, national registers, etc.) and, for some monitoring and evaluation tasks, internationally renowned experts should be involved. University funding should be based on results of monitoring and evaluation of their performance.

35 At the same time, publishing in predatory outlets and vanity press should be penalised rather than rewarded.

- Pay special attention to the development of disciplines in STEM, security and cyber security, defence and pedagogy, since these have a multiplier impact on the capacity of the state (innovation, national security and human capital development).
- Support good-quality universities in their competition with diploma mills by setting a minimum level of tuition fees.
- Ensure accountability of HEIs to public interest. Ukraine should continue the ‘KPIs for rectors’ reform by granting powers to supervisory boards of public universities to terminate rectors’ contracts if KPIs or other clauses are breached. The MoES should launch a public online dashboard with the progress on KPIs.
- Provide designated state-funded places for direct government needs (teachers, healthcare, military and critical infrastructure) and state-funded places as a right to free or partially free higher education. Gradually decrease the number of students who are studying for free (i.e. with the state covering all of their education expenses) while increasing the number of cost-sharing options.
- Launch public loans for higher education and legalise income-share agreements to cover the costs of students who pay tuition in part or in full.
- Allocate social stipends among students based on the level of their income and on the need for a dormitory in order to target talents from low-income families.

Optimal university network to improve cost efficiency

- Diversify HEIs according to their profiles and missions (on which HEIs should decide by themselves), classifying them into research universities, applied universities and liberal arts academies. Shape public policies (funding principles, licensing, accreditation, university governance, etc.) according to the profiles/missions of the HEIs.
- Modernise the network of public HEIs through short-term (1–2 years) merging instruments that provide technical assistance, transition management and additional funding. Diversify merging targets – whereas in some fields the number of institutions offering programmes should be cut 3–5 times (e.g. social sciences, business, law), in other fields (e.g. natural sciences and mathematics) mergers should be less widespread. Decrease the number of public HEIs from 5.4 to at most 3 per million population.
- Additional funding for newly merged HEIs should cover campus renovation, with a special emphasis on bomb shelters (especially for lab-intensive programmes).

Addressing COVID-19 and war learning gaps and post-war demand for retraining and upskilling

- Abolish admission priorities for certain categories of applicants (children with disadvantaged backgrounds, veterans, etc.) and replace them with free learning courses to close the learning gap and prepare such applicants to participate in the general admission competition.
- Increase the flexibility of learning trajectories in higher education without committing to a fixed number of years of study. For instance, provide the possibility to achieve the necessary amount of ECTS credits for a bachelor's degree in more or less than four years (fast track and slow track).
- Promote short-cycle programmes (120 ECTS credits, junior bachelor's) for quick access to the labour market (especially in IT) or for liberal arts education (interdisciplinary programmes for a broad profile with the aim of further studies).
- Financially stimulate (i.e. subsidise) mobility of international and internal credits and degrees; simplify recognition of credits earned at qualifying universities abroad.
- Promote the recognition of learning outcomes obtained through non-formal learning and during professional experience as part of higher education programmes.
- Support mental health offices at universities with technical assistance particularly targeting war trauma.

Improving policymaking

- Make the MoES and other ministries founders of HEIs rather than their managing agencies. This implies that parliament and the MoES should provide the regulatory framework, monitoring, well-designed funding and so on, but decentralise decision making and encourage self-governance of HEIs.
- Specific control functions should remain only in certain areas, in particular for majors with increased regulation (medicine, law, energy, etc.). Here, the emphasis should be on the external certification of graduates rather than on control of formal criteria.
- Increase the analytical, monitoring, communication and service capacities of the MoES and other government agencies (including QA Agency) in charge of higher education and at the same time reduce the scope of their control and approval functions.
- Activate public communication, constantly explaining changes in the system and making them expectable and foreseeable.

- Develop best practice guidelines for HEI managers and launch training in transformation and in good governance for current and future managers.
- Make central digital services of the MoES attractive and useful for HEIs, students, applicants and employees.
- Continue the accreditation reform, with a focus on transparency and public trust in accreditation, gradual progress towards quality support (not external quality control) and self-regulation and reputation pressure.

Implementation of these policies should result in the following:

- Ukrainian HEIs are environments for intellectual development of personalities, study and explanation of the surrounding world; they are drivers of innovation and the basis for economic growth of Ukraine and Europe. At least 20% of students participate in credit or degree mobility.
- The academic community is dominated by the desire to achieve high results rather than formal compliance with quality criteria. The guiding principles are academic freedom, university autonomy, integrity and inclusiveness.
- Ukrainian HEIs are crucial platforms for professional discussion of important social issues, issues of technological development, the development of solutions and support for democratic processes in Ukraine.
- HEIs have clearly defined missions that are shared and valued both by the communities within HEIs and by their external stakeholders and communities. These missions determine the activities of HEIs, and the success of their achievement affects the amount of resources of each institution.
- HEIs enjoy a high level of public trust, which is confirmed by (1) the results of public opinion surveys; (2) the level of funding from business and international partners (which is at least 15% of the total funding of HEIs); and (3) a high share of foreign students (at least 10% of the total number of students, including 5% citizens of EU countries).
- Ukrainian HEIs are integrated into the European higher education area. At least two Ukrainian HEIs are ranked in the top 200 world rankings (QS, THE). Most master's and PhD programmes are taught in English, with a significant part of them created in partnership with universities in EU countries, the UK, the United States and Canada. Ukrainian military HEIs are particularly prestigious; their graduates are highly qualified officers for the Armed Forces of Ukraine and the armies of allied countries.
- Entry rates, according to the OECD methodology, are less than 55% for bachelor's and less than 30% for master's programmes (the OECD averages).

5 HISTORICAL AND CURRENT EXAMPLES, PARALLELS AND LESSONS

There are a number of cases – current and historical – that can inform the present analysis and policy implications drawn for education reforms in Ukraine. Some of these relate to governance of the education sector during conflict and threats of military aggression and post-conflict reconstruction, while others provide lessons from reforming education after a regime change from a dictatorship or an authoritarian regime to democracy.

Many countries affected by conflict (or similarly destructive events) have developed post-conflict reconstruction and resilience plans. The role of education in enabling and empowering nations to address this challenge is typically recognised in these plans. This is clearly desirable, as education is the cornerstone of a country's productivity, competitiveness and innovation, but also state-building and peace-building. Bird (2009) reviews the reconstruction plans of Afghanistan, Cambodia, Ethiopia, Kenya, Liberia, Nepal, Nigeria, Sierra Leone, Sri Lanka and Uganda. The author argues that reconstruction programmes should be properly evaluated, including the role of the reconstruction of education; that they should provide guidance to the key actors in the educational sector in order to fully enable them to analyse the educational system “with a conflict sensitive lens and devising strategies to address potential tensions”; and that they should review the prospective use of technology in conflict or post-conflict situations for teaching and learning, data collection and analysis for education policymaking, and monitoring indicators relating to conflict.

Besides a general educational reform plan, it is less common that countries affected by conflict fully acknowledge and elaborate on the role of education in providing for peace (IIEP-UNESCO 2009). However, several plans, including the Nepal Three Year Interim Plan (2007-2010) and the Afghan National Education Strategic Plan (2017-2021), called for the inclusion of disadvantaged groups in education, non-discrimination, community participation and an emphasis on human rights as a way to avoid cleavages and tensions in society and ensure commitment of the citizenry to state-building and rebuilding efforts (Bird 2009, Ministry of Education of Islamic Republic of Afghanistan 2016). This role of education should not be underestimated in post-war reconstruction efforts.

The accession of Eastern European countries to the EU offers several parallels with the situation in Ukraine. First, some of these countries were part of the former Soviet Union (e.g. the Baltic states), while the educational systems of the others were similar to the Soviet system in many ways (e.g. the Visegrad Four, Romania, Bulgaria, but also the Western Balkans).

The successor states of the former Yugoslavia share with Ukraine a history of conflict in the 1990s. Although the degree of destruction of the educational infrastructure was considerably less than in the occupied areas of Ukraine, the displacement of the population offers an interesting case to learn from. Kahanec and Yuksel (2010) look at intergenerational transmission of human capital under post-war distress in former

Yugoslavia, comparing refugees and internally displaced persons (RIDPs), Roma and majority populations. The authors find similarly strong transmission of human capital over generations for members of each of the two vulnerable groups – RIDPs and Roma. These findings indicate that in the context of Ukraine, it will be important not only to address the vulnerability of some, but also to tackle the human capital spillover effects over generations of vulnerable populations.

Specific recommendations for Ukraine based on these lessons are as follows:

- Implement a proper evaluation, monitoring and review system for reconstruction plans.
- Ensure the inclusion of all groups in education, including those with vulnerabilities, IDPs and return migrants, to avoid cleavages and ensure commitment of the citizenry to state-building and rebuilding efforts.
- Tackle human capital spillover effects over generations of vulnerable populations (for example, by providing life-long learning opportunities to compensate conflict-related human capital loss of adults)

More generally, the experience of transition economies highlights the challenges of transforming the systems of education. For example, Kahanec and Kahancova (2019) study economic research in the Visegrad Four countries. Their main thesis is that the institutions and regulations inherited from the Soviet-type higher educational system, together with initial reforms increasing universities' autonomy, resulted in a vicious circle of reproduction of a low-productivity equilibrium. Specifically, even though after 1989 universities lost their best faculty to better-paying business sectors or foreign universities, they were able to provide rents (financial and status) to the remaining insiders. Given the negative selection out of universities, the majority of them produced little internationally recognised research output. Given the high degree of autonomy, low-productivity researchers could elect representatives (rectors, deans, academic senate members) who protected their rents and the low-productivity standards. Although the regulators (accreditation agencies, Ministry of Education) could in principle push for higher productivity, in practice these efforts were mitigated by the broad alliance of these elected representatives.

Breaking such a vicious cycle requires opening up the system to internal and foreign competition, fostering academic mobility, a structural reform whereby universities are made more accountable to the public interest, and reforms providing for a more efficient allocation of financial resources such that high-performing academics are attracted and competitively rewarded.

Some of the specific measures needed to break the vicious circle include the following:

- Recognition of foreign qualifications and academic titles and ranks.
- Opening up of the process of appointment of faculty.

- Opening up of the process of appointment of rectors and deans and international search for candidates (including increasing the role of the governing board in selection of the rector).
- A proper incentive mechanism (e.g. performance contracts between the ministry and the rector stipulating transparent KPIs for the rector; then the rector setting KPIs for deans) whereby resources, pay and promotion are allocated based on internationally recognised productivity standards.
- Decentralisation supporting innovation and experimenting (e.g. provide for self-determined internal structure of HEIs according to their needs).
- Proper monitoring and evaluation system for teaching and research productivity (linked to KPIs). The appointment of the governing boards should (1) be strictly non-partisan, ensuring universities' academic freedom; and (2) strengthen accountability of the rector to public interest.³⁶
- It will be important not only to measure performance, but also to provide the necessary resources to support quality enhancement. Such resources should be provided not only to top performers but also those who experiment and innovate, and take justifiable risks in that process. Positive islands of productivity need to be nurtured in cooperation with relevant units/faculty. Cooperation and enhancement of synergies is preferred to fierce competition.
- School administration needs to be enhanced (e.g. automation of simple processes, simplification of complex processes, reduction of red tape).
- Finally, lessons from the new EU member states suggest that integration into the European Education Area (EEA) and European Research Area (ERA) – including various funding schemes, cross-border collaboration opportunities and peer effects, and data collection and enhanced transparency – has benefited education and research in those countries. We suggest that Ukraine seeks integration into the EEA and ERA to enable such benefits for its reconstruction.

36 One possibility is for the governing board members to be appointed by the president (3 members), the Education Committee of the parliament (2), the Ministry of Education (2), the national student union (2), the supreme court (1), the prosecutor general (1), the mayor of the city where the main campus is located (1), an ombudsperson (1), the employer confederation (1) the trade union confederation (1). The roles of the board and the senate need to be clearly stipulated.

6 CONCLUSIONS

The Ukrainian education system will be the basis for Ukraine's reconstruction. It should therefore be reformed to provide high-quality human capital – not only in terms of skills and knowledge but also in terms of integrity, values and active citizenship. Since 2014, Ukraine's education system has implemented a number of steps to move from quantity to quality, but without a clear vision these steps have been sporadic and did not lead to comprehensive changes.

In the upcoming years, the education of Ukraine will have to (1) overcome the challenges of war damage; (2) rethink and develop a new vision of the system as a whole to ensure its comprehensive development; (3) create positive conditions for the transformation of the network of educational institutions to meet the social and economic needs of the country; (4) improve the quality of education; (5) ensure an innovative learning and researching environment; and (6) partner with stakeholders of different levels and scope of interventions to ensure inclusion of and positive outcomes for all students and stakeholders.

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The health system

Yuriy Dzhygyr,^a Kateryna Maynzyuk,^b Adrianna Murphy^c and Carol Propper^{d,e,f}

^a*Former Deputy Minister of Finance of Ukraine;* ^b*Former Advisor to the Minister of Finance of Ukraine;* ^c*London School of Hygiene and Tropical Medicine;* ^d*Imperial College London;* ^e*Monash University;* ^f*CEPR*

EXECUTIVE SUMMARY

Russia's full-scale invasion has had a devastating impact on Ukraine's health system. Our overall recommendation is that international aid and resources devoted to Ukraine's recovery should be used to help the system to 'leapfrog' – to modernise the healthcare system so that it can deliver care more efficiently to meet the goal of universal access to affordable and high-quality care. To this end, we offer a set of key recommendations. These are presented according to the corresponding WHO Health System Building Block framework.

In terms of financing, we recommend that international aid be channelled through a single independent agency and aligned with Ukraine's objectives, and that formal cost-sharing should be avoided as it may exacerbate the existing problem of informal out of pocket payments and is unlikely to generate significant revenue. For healthcare delivery, we suggest (1) explicitly defining the basic healthcare benefit package (the Programme of Medical Guarantees, or PMG) now, to avoid implicit rationing through refusal of care or use of informal out-of-pocket payments, and to improve efficiency; and (2) introducing a mix of public and private provision in the short and longer term, with one central agency responsible for contracts.

Managing healthcare workforce should focus on (1) careful use of task-sharing to nurses, initially in primary care, supported by training and supervision; and (2) increased efforts to retrain staff in line with European standards and the changing health needs of the population. This should be complemented with investments in staff retention, by means of better working practices and higher salaries. There should be strong investment in health information systems to address issues of security and interoperability between different healthcare providers.

Governance and leadership should aim to achieve two objectives: (1) developing the current purchasing agency, the National Health Service of Ukraine (NHSU), into an autonomous central strategic purchaser with clear objectives and clear targets; and (2) introducing publicly available performance indicators at the national health agency and provider levels.

1 INTRODUCTION

Russia's full-scale invasion has had a devastating impact on Ukraine's health system. Our overall recommendation is that international aid and resources devoted to Ukraine's recovery should be used to help the system to 'leapfrog', to modernise the healthcare system so that it can deliver care more efficiently to meet the goal of universal access to affordable and high-quality care. To this end, we offer a set of key recommendations. These are presented according to the corresponding WHO Health System Building Block framework and are the following:

Financing

1. **Increased outside sources of financing:** international aid should be channelled through a single independent agency and aligned with Ukraine's objectives.
2. **Less reliance on private finance:** avoid formal cost-sharing as it may exacerbate the existing problem of informal out-of-pocket payments and is unlikely to generate significant revenue.

Healthcare delivery

3. **What to provide – the basic package of healthcare benefits:** explicitly define the basic healthcare benefit package (the Programme of Medical Guarantees, or PMG) now, to avoid implicit rationing through refusal of care or use of informal out-of-pocket payments, and to improve efficiency.
4. **How to provide – the role of the private sector:** introduce a mix of public and private provision in the short and longer term, with one central agency responsible for contracts.

Healthcare workforce

5. **Increased task-sharing:** careful use of task-sharing to nurses, initially in primary care, supported by training and supervision.
6. **Retain and retrain:** increase efforts to retrain staff in line with European standards and the changing health needs of the population. Complement these with investments in staff retention, by means of better working practices and higher salaries.

Health information systems

7. **Investment in electronic health records (EHRs) and IT:** there should be strong investment in health information systems that addresses issues of security and interoperability between different healthcare providers.

Leadership and governance

8. **Central strategic purchaser:** develop the current purchasing agency, the National Health Service of Ukraine (NHSU), into an autonomous central strategic purchaser with clear objectives and clear targets.
9. **Performance indicators:** introduce publicly available performance indicators at the national health agency and provider levels.

The rationale for these recommendations is based on the analysis that follows in this chapter. It is divided into five sections. In Sections 1 and 2, we briefly describe the key challenges that Ukraine's health system faced prior to a major reform in 2017, the main elements of the 2017 reform, and progress made before the full-scale Russian invasion. We identify important gaps in the 2017 reform that need to be addressed: (1) lack of an explicit and transparent strategy for reducing the incidence and severity of informal out-of-pocket (OOP) payments; (2) lack of a clear plan for how to achieve a right-sized hospital network to match the new financing system; (3) failure to address the pay and conditions of the healthcare labour force; (4) failure to develop a modern human resources (HR) management information system; (5) incomplete reform of medical education system; and (6) omission of quality assurance and improvement plans.

In Section 3, we discuss the effect the crisis has had thus far, specifically in relation to major population displacement, new and exacerbated risks to public health, damaged and destroyed infrastructure, threats to financial protection, and governance challenges. In Section 4, we review lessons from other conflict settings and advocate that Ukraine follows the United Nations' 'new way of working' in humanitarian responses. This emphasises joint coordination and planning between all actors in any response, prioritising support for national objectives and strengthening of the health system from the outset of the response. The final section contains our recommendations.

2 HISTORICAL CONTEXT

Russia's invasion of Ukraine has coincided with the early stages of a major health system reform in Ukraine, launched in 2017. Like other countries of the former Soviet Union, Ukraine inherited the Semashko health system (named after the first People's Commissioner of Health in the USSR in 1918, Nikolai Semashko), which guaranteed universal free access to medical care. Under the USSR, the system was centrally planned, hierarchical and under-resourced. Care was largely hospital-based, leaving primary

care poorly developed. Despite these weaknesses, Ukraine made progress in health indicators in the period after World War II, largely due to reductions in infant mortality and improved control of communicable diseases. However, the epidemiological shift in the 1960s towards non-communicable diseases led to an increased demand for specialist care and an uncontrolled process of specialisation of the system. General practitioners (GPs) became dispatchers and demand for specialist care increasingly outstripped supply (WHO 2004, Rechel and McKee 2009).

Without an explicit mechanism to align the commitment to universal free health care with available resources, rationing by service providers became widespread, including through high informal private payments for care. Informal payments were exacerbated by a lack of public trust in the system to purchase services effectively, and the use of these payments as a means of exerting consumer choice. By 2000, out-of-pocket (OOP) spending, a large part of which is informal, made up half of Ukraine's total health spending. The prevalence of catastrophic health spending (where a household spends more than 10% of their expenditure on health care) grew from 6.9% in 2010 to 7.8% in 2019 (Bredenkamp et al. 2022), with the poorest households most affected. The biggest share of OOP spending was on pharmaceuticals, both for outpatient and inpatient care. Fear of impoverishment in the event of illness undermined financial protection and equity and had a negative impact on Ukraine's growth potential and entrepreneurial behaviour by distorting individual savings.

Ukraine's health system was also extremely fragmented. The tax-funded pool of resources allocated to health was decentralised to thousands of sub-national budgets, some with populations of fewer than 45,000 people. This made it impossible for the local budgets to spread risk sufficiently to cover health care costs. There was also a conflict of interest created by the fact that most hospitals were operating as service delivery units of the local administrations, funded as an extension of their budgets, without any split between the purchaser and provider functions. Funding was based on strict input-based norms such as number of beds or square metres, incentivising an ever-growing and inefficient provider network beset with duplications and redundancies (Belli et al. 2013). In addition, the Semashko system had promoted equal geographic access to facilities which did not account for changes in the actual population living in the catchment area, particularly in rural parts of Ukraine.

As a consequence, by the start of the 2017 reform, Ukraine's health system had a disproportionate network of facilities, relying excessively on expensive hospital care, with primary and preventive care remaining underfunded and underdeveloped. The dependence of medical professionals on informal OOP and opaque hiring procedures centred on patronage rather than professional merit meant that the workforce was poorly trained and highly immobile (Belli et al. 2013). Even though doctors and nurses were

hired through collective labour agreements with hospital managers, the role of the unions was ceremonial and opened no possibilities for professional representation or collective bargaining. In reality, the healthcare job market was highly opaque, with recruitment and promotion decisions depending exclusively on hospital management.

These dysfunctionalities in Ukraine's health system have had a dramatic impact on the length and quality of lives in the country. After a sharp decrease in life expectancy resulting from the shock of the break-up of the Soviet Union in the early 1990s, life expectancy in Ukraine has improved at a much slower rate compared to other post-socialist countries and has never caught up with its European neighbours (as was achieved, for example, by Estonia). By the start of the 2017 reform, Ukraine had one of the highest age-standardised death rates in the world and a much higher burden of disease compared to its EU neighbours.¹ While some of this mortality was induced by environmental and lifestyle risks, Ukrainians were more likely to die from risky behaviours such as smoking or drinking even compared to countries where the prevalence of such behaviours was higher. A leading cause of mortality in Ukraine is self-harm, particularly among people aged 70 plus – a symptom of significant failures in the system of long-term and palliative care.

3 THE 2017 HEALTH SYSTEM REFORM

Ukraine's health system reform was initiated in 2015 and launched in 2017. Several elements of the reform significantly alter the system's financing and governance architecture.

3.1 National strategic purchaser and output-based financing

Most importantly, the 2017 reform established a new healthcare purchasing approach to make spending more efficient. It created a national strategic purchasing agency, the National Health Service of Ukraine (NHSU), with pooling of resources at the national level. It also mandated autonomisation of service providers, which helped prevent the conflict of interest in service financing that was inherited from the Soviet era. Health service providers, which previously operated as implementation units of local administrations, were transformed into communal non-profit enterprises. Still owned by sub-national authorities, these facilities have become arm's-length entities, and their financing should no longer be provided by the local budgets; it now must be earned through contracts with the national purchaser (though in practice, local budgets still do provide some financing). Autonomous legal status has also liberated hospital managers providing them with a significant degree of financial and managerial flexibility.

1 Sources: World Bank World Development Indicators, WHO mortality database and The Lancet Global Burden of Disease 2019.

A central ambition of the reform was to replace input-based financing of health care with output-based contracts. Financing had previously been based on capacity – for example, the number of patient beds or square metres of hospital rooms. Following the reform, funds are used by the NHSU to strategically purchase services based on contracts with healthcare providers. Primary health providers are paid by capitation, i.e. fixed payments based on how many patients choose to enrol with each facility. Hospitals are paid by a mix of methods including global budget, case-based rates and fee-for-service.

3.2 Defined benefit package

A key element of the reform was the introduction of a defined benefit package (the Program of Medical Guarantees, or PMG). The PMG is defined by the government and purchased by the NHSU, which receives a corresponding budget allocation through a single central budget programme. This new package was established as very broad (covering most types of care and all of the population) and left significant leeway for implicit rationing. However, including it in the reform policy as a demarcated list tied to the fiscal plan has established a more responsible approach to benefit entitlement. The government decided to keep the PMG funded through general taxation rather than via alternative options such as payroll-based insurance. This was done to safeguard equity and to protect revenues in the face of high labour informality. This choice was also informed by the experience of earlier reformers of Central and Eastern Europe such as Poland, Hungary, and Lithuania, which have opted for a payroll-based insurance solution but have since gradually expanded the share of budget-funded subsidies of insurance funds. At the same time, a debate was left open regarding a possibility of formal private co-payments for health care, where individuals could directly share the cost of the PMG with the state. Rejected by the parliament in 2017 and strongly opposed by international development organisations because of risks to equity and financial protection, this idea was still popular among government and in public opinion polls² prior to the full-scale war.

3.3 Primary health care and eHealth

Finally, the reform modernised care delivery around the central role of primary health care (PHC) and the general physician (GP) as gatekeeper, supported by a new national eHealth system (an electronic system of keeping medical records). The new financing approach created an integrated nationwide pool of public and private PHC providers, with the NHSU purchasing PHC services from both types of providers based on a universal capitation rate. A substantial increase in state financing of PHC helped to achieve a competitive rate to enable capital investment and attract private facilities. Many of these were small-scale: by 2021, 35% of the providers were privately owned

2 See, for example, a Rating group poll at https://ratinggroup.ua/research/ukraine/ocenska_medicinskoy_sfery.html (in Ukrainian).

clinics and doctors operating as solo practices. Patient enrolment and payments were linked to the new national eHealth system, with over 75% of the population enrolled by 2020. Simple digitised enrolment procedures and the right to choose and change any provider across Ukraine boosted competition and created a strong promise for labour mobility, departing from the previous system of strict geographical assignment by place of residence.

Critically, PHC has also started to play a gatekeeping role through managing the system of specialist referrals and medical prescriptions, both organised through eHealth. In support of this reform, PHC providers have received extensive upskilling in clinical and organisational activities, including patient-centred service provision. This included training through the NHSU, which started to offer intensive education opportunities for contracted facilities. In addition to eHealth, PHC has also started embracing new digital solutions such as electronic patient records and telemedicine.

3.4 Review of progress by 2021

The overall design of the reform has proved to be ambitious but appropriate. Its focus on universal health coverage – including a tax-funded model, a broad and inclusive benefit entitlement, and central pooling – was well matched to known healthcare gaps and Ukraine’s European aspirations. In particular, the reform package approach was an opportunity to address excess mortality and morbidity among vulnerable population groups and economically isolated communities. The reform also targeted a key problem of the previous system – poor value for money – offering tools to dramatically improve spending efficiency via centralised strategic purchasing based on output-oriented contracts.

The reformed system has generally performed well in the face of government change and the successive crises of the COVID-19 pandemic and now the full-scale war. Flexible strategic purchasing of health care via the central agency and the nationwide electronic healthcare information system has kept the system functional and responsive to the changing environment. Innovations in the PHC system have enabled it to respond well to the pandemic, including PHC coordination of testing and nationwide vaccine administration organised as an add-on to the PHC benefit package. Following the full-scale Russian invasion in 2022, new financing rules helped to ensure access to primary and specialised care despite massive internal migration and changing care needs, and continued funding for healthcare facilities across the country, including in occupied territories where this remained possible.

Despite progress, implementation of the 2017 reform has highlighted some gaps and risks in the original reform plan that need to be addressed.

- **No explicit and transparent strategy for reducing the incidence and severity of informal OOP payments.** More efficient financing mechanisms were necessary but not sufficient to address the drivers of informal OOP payments made to doctors. The reform was presented to the population as a major tool to eliminate such payments, but it was unrealistic to expect that this would be achieved in the short term. Although reports of bribery declined from 2017 to 2018 (World Bank 2020), OOP payments remained a barrier to care and cause of financial hardship for many. For example, in 2018 almost 50% of outpatient care users reported difficulty covering costs (Stepurko et al. 2019).
- **No clear plan for how to achieve an appropriately sized hospital network to match the new financing system.** The pre-reform input-based financing approach created an excessive and inefficient network of healthcare facilities. With the introduction of new, output-based payment methods, this network was expected to shrink and reshape, responding to the reformed financial incentives. However, this reconfiguration required a governance choice about who would design the new masterplan(s) for the provider architecture and who would make the difficult decisions on facility closures, mergers or re-profiling. The government intended to leave hospital owners (i.e. subnational governments) with a high degree of discretion over their adjustment choices. This turned out to be overoptimistic, resulting in sluggish change and continued bailing-out of inefficient facilities. As a result, a reliable blueprint for an efficient, right-sized provider network has not yet materialized.
- **Insufficient progress in changing the pay and conditions of the health labour force.** Doctors and nurses continue to work under collective labour agreements with their hospitals, hired via highly opaque procedures, with no individual professional licenses, minimal opportunities for change of employer or professional development, and surviving on informal OOP payments. Health workers expected that financing reforms would result in an increase of their salaries (Stepurko and Belli 2018). However, their immobility and hence dependence on their employers and slow improvement in quality of services prevented salary increases. A 2019 report showed that inefficient (or non-existent) facility-level salary policies were a barrier to task delegation as staff were afraid of losing income in case of task shifting (Bohdan et al. 2019).
- **Lack of a modern HR management information system.** The system for HR accounting that existed prior to 2017 enabled facilities to generate standardised reports to the Ministry of Healthcare (MoH) on their cadre. However, data aggregation was not automatic and thus, using the information to support facility-level information needs for planning was impossible. The government planned to replace this system with a new national-level HR Management Information System to be added as an eHealth module, but this plan was not prioritised and was not completed.

- **Incomplete reform to the medical education system.** The government made the first steps to reform the system of medical education, including updating training plans and introducing elements of an independent international test. It also started to introduce a new system for continuous professional development, liberalising the training provider market and incentivising individual development choices of doctors. This new system was designed to form the basis of individual professional licensing for the medical profession. However, this reform was not completed. The government hasn't reformed financing and governance rules in higher medical education either, with medical universities funding based on baseline requirements regardless of their performance.
- **Omission of quality assurance and improvement plans.** By intention, the task of reforming Ukraine's healthcare quality assurance and improvement architecture was left for the future. Even though new financing tools did incentivise some quality improvement, including through provider competition and improved contract specifications, no major institutional changes took place to modernise medical education, standards, guidelines or medical technologies. Nor was there strong emphasis on quality as an output.

4 IMPACT OF RUSSIA'S FULL-SCALE INVASION ON HEALTH AND HEALTH CARE IN UKRAINE

Russia's escalation of the war in Ukraine has and will have significant impacts on a system already weakened by ongoing conflict in the East and the COVID-19 pandemic. While these impacts threaten the gains made through recent reforms, they also highlight where recovery efforts should be directed to build a more resilient, efficient and equitable health system.

4.1 Displacement of individuals and health workers

As of 9 September 2022, roughly 7 million people in Ukraine have been displaced within the country, coming primarily from the East and South regions. Another 7 million have fled to other countries as refugees (UNHCR 2022). As some refugees return and more are displaced by continuing violence, it is impossible to predict how these numbers will fluctuate. This extreme level of displacement has a significant impact on healthcare workforce availability and capacity. Before the full-scale war, there was already regional inequality in distribution of healthcare workers relative to population. The ratio of primary healthcare physicians to the population was low, at approximately 5 per 100,000 (Bohdan et al. 2019), and 83%³ of the healthcare workforce were women. As women and people from the East and South make up the majority of those fleeing the country, this is likely to further exacerbate workforce shortages.

3 www.ohchr.org/en/stories/2021/08/we-are-devoted-work-because-health-and-lives-people-are-stake

4.2 Public health

Many in Ukraine, and in particular those displaced from their homes, have been exposed to traumatic events or ongoing severe stress. One in five people affected by conflict are likely to develop mental disorders, covering the whole spectrum of disorders and severity (Charlson et al. 2019).⁴ Those providing care to this population will need the training and skills to manage a wide range of mental health needs. However, despite a political commitment to improving mental health care in Ukraine, it remains highly specialised and focused on a biological versus community model of care. There is low awareness and stigmatisation of mental health in the population.⁵

The full-scale war has exacerbated other common chronic diseases, due to disrupted medicines and commodities supply chains, reduced access to health care facilities, and displacement. Chronic non-communicable diseases (NCDs), including cardiovascular disease, diabetes, cancer and chronic respiratory disease, were already the biggest contributor to disease burden among Ukrainian adults before the war. About a third had hypertension (World Bank 2018) and 7% had diabetes.⁶ Smoking, heavy drinking and other risk factors for NCDs were common – for example, half of men in Ukraine smoke (WHO 2020) – and these may have increased during the war (Lo et al. 2016, Ramachandran et al. 2019). Ukraine also had one of the highest burdens of chronic infectious diseases in Europe, especially HIV⁷ and tuberculosis (WHO 2022c). Disruption in access to preventive services (e.g. mother-to-child HIV transmission prevention), diagnostic testing, medicines and other essential care has undermined efforts to prevent, detect, and manage these diseases, leading to a likely increase in their incidence and severity in coming years.

Damage to water and sanitation infrastructure, overcrowding of internally displaced people, low vaccination rates prior to the war, and disruption to routine vaccination efforts have increased the risk of infectious diseases that were previously uncommon, including measles, diphtheria and cholera (Murphy et al. 2022a). The decreasing trend in COVID-19 cases seen prior to the war has likely been reversed, but surveillance is limited (WHO 2022a).

4.3 Infrastructure

At the end of July 2022, Ukraine's Ministry of Health claimed that 123 health care facilities had been destroyed in the war and at least 746 needed restoration. As of September, WHO verified reports of 425 attacks affecting health facilities.⁸ Before the full-scale war, 75% of pharmaceuticals in Ukraine were supplied by domestic manufacturers,

4 See also www.who.int/news-room/fact-sheets/detail/mental-health-in-emergencies.

5 www.who.int/docs/default-source/mental-health/special-initiative/who-special-initiative-country-brief-report---ukraine---2020---brief.pdf?sfvrsn=f9ee4cf_4

6 <https://idf.org/our-network/regions-members/europe/members/164-ukraine.html>.

7 www.unaids.org/en/regionscountries/countries/ukraine

8 <https://reliefweb.int/report/ukraine/500-reported-attacks-health-care-ukraine-colossal-tragedy-calls-accountability-phr>

but production was greatly impacted in the first months of Russia's escalation. This was due to destruction of manufacturing facilities, material supply chains, and energy supplies; displacement of manufacturing staff (mostly women); and challenges faced by pharmaceutical companies in paying their suppliers. As of September, supply has recovered, largely due to the humanitarian response and donations from governments, NGOs and international pharmaceutical companies (WHO 2022b).

4.4 Financial protection

As discussed, the 2017 reform did not address OOP payments in a concrete way and a year later health care remained unaffordable for many people in Ukraine. The war has likely exacerbated this situation. Incomes in Ukraine were projected to fall 35–45% this year. The most recent estimates by the International Labour Organization also suggest that nearly 5 million jobs, or 30% of employment, have been lost since 24 February 2022, and that this number will increase as the conflict continues.⁹ On top of this, there has been a substantial (over 25%) devaluation of the Ukrainian hryvnia, making imported medicines and other health care-related supplies more costly.

4.5 Governance

In many conflict-affected settings, there is no legitimate government. In Ukraine, the president and his cabinet were democratically elected and their legitimacy is recognised globally. The Ministry of Health and NHSU remain the central authorities responsible for health care. Nevertheless, the war has dominated the attention of the Ukrainian government and compromised its capacity to organise and deliver care. At least 149 actors (likely many more, but this is the number registered with WHO), including NGOs, UN agencies and donors, are currently active in the health response in Ukraine, many focused on single diseases (WHO 2022a). Without appropriate coordination, oversight and engagement on the part of the Ministry of Health, there is a risk of creating parallel and unsustainable systems of health care delivery. Historical challenges with corruption and delays in project implementation in Ukraine may also influence the behaviour of donors and their confidence in channelling funds through the government.

5 LESSONS FROM HEALTH SYSTEM RECOVERY IN OTHER CONFLICT-AFFECTED SETTINGS

Rebuilding health systems in conflict-affected settings is complicated by the fact that the health needs of the population are greater than before, there are various national and international actors involved, and the resources available are hard to predict (Sondorp 2016). There are some important lessons that have been learned regarding how to approach health care delivery and financing in these contexts in a way that strengthens

9 www.ilo.org/budapest/whats-new/WCMS_856665/lang--en/index.htm

health systems and encourages sustainability of programmes and resilience to future crises. In particular, the United Nations' 'new way of working' (OCHA 2017) recognises that crises are often protracted, with no distinct moment when humanitarian aid ceases and development begins. As such, rather than focusing solely on crisis management, actors must work together at the 'humanitarian-development-peace nexus' (WHO 2021a), addressing health system strengthening from the beginning of the humanitarian response. In practice this means that donor, NGO and MoH activities should be centrally coordinated, with all analysis and planning done jointly with the government in support of their agreed health objectives. Afghanistan provides a recent example of this new way of working. The Afghan government created the Afghanistan National Peace and Development Framework 2017–2021, and a recent update covering 2021–2025. The framework sets out government objectives of peacebuilding, state building and market building and provides a focus for all development aid. In line with this, all humanitarian support is coordinated through the Health Cluster, chaired by the Ministry of Public Health (MoPH) and WHO and comprising UN agencies, MoPH and health NGOs. The One UN – One Programme sets out close collaboration of UN agencies with Afghanistan MoPH for programme planning, implementation, monitoring and evaluation (WHO 2021b).

Contracting out the delivery of an agreed package of health services to NGOs can improve service provision and equity. Contracted services should consider the suitability and sustainability of programmes in light of national priorities, practices and resources, and contracts should include an element of health workforce capacity strengthening. For NCDs and mental health, two health priorities for the population in Ukraine, evidence on approaches to care in conflict-affected settings is limited but growing. It suggests that decentralised and 'people-centred' approaches can be feasible and effective, and may be more resilient to health system shocks. These include task-sharing with non-physician health workers (Ratnayake et al, 2021); patient education and self-management, including access to tools for self-monitoring (Jaung et al. 2021); simplified treatment protocols (Murphy et al. 2022b); and community-based mental health treatment (Purgato et al. 2018).

6 THE PATH TO RECOVERY

In light of past reforms and the impact of the war, we outline our recommendations for Ukraine's health system recovery. We support the general principles outlined in Ukraine's MoH Draft Recovery Plan,¹⁰ but offer recommendations that focus on areas which were not concretely addressed in that plan. The MoH document gives indicative funds to meet projected health care needs, but these appear to all be met either from the public purse or from international loans or donations (the latter not clearly spelt out

10 https://moz.gov.ua/uploads/ckeditor/%D0%9D%D0%BE%D0%B2%D0%B8%D0%BD%D0%B8/21-07-2022-Draft-Ukraine%20HC%20System%20Recovery%20Plan-2022-2032_UKR.pdf (in Ukrainian).

except for some specific areas, such as enhancing the research base). The MoH plan is almost silent on the most difficult questions of what proportion of public funds should be spent on health care, why health care should be prioritised over other public services, and how programmes within the health sector would be prioritised or revised to save costs if funding becomes scarce. And there is no reference to private financing, except for some indication that private finance will be increased by the use of private health insurance.

The longer the war continues, the higher the risk that public trust in the government will decline from its current high level. These factors will threaten the fundamental objectives of the 2017 reform. To protect these, we believe several issues need to be addressed now. We have grouped our recommendations according to the corresponding WHO Health System Building Blocks (WHO 2010a).

6.1 Financing

The question of the extent to which health care should be prioritised over other sectors is a political one and we do not address this here. However, we recognise that health care is not the only (and perhaps not even the most important) input into health. We strongly support the MoH's stated commitment to rebuilding the urban environment to maximise opportunities for physical activity and minimise harms from pollution and natural disasters and recommend a focus on health promotion from the beginning of the recovery phase in all sectors.

Despite this commitment, there will be a shortage of funds for health care caused by the economic impact of the war and the combination of pre-existing unmet health care needs and increased needs due to war. Even if Ukraine spends the same amount of GDP on health care as pre-war, GDP has fallen dramatically¹¹ because of Russian aggression. So at least for the next few years, health care expenditure will fall unless supplemented by international funds. As demand has increased, this means that there is a danger that OOP expenditure, and with it inequality in access to health care, will increase.

Increased outside sources of financing

We recommend that international aid should be channelled through a single independent agency that is aligned with Ukraine's objectives.

Donor funding to Ukraine has increased exponentially since Russia's escalation of the war. In 2020, total development funding for Ukraine was \$1.8 billion (of which \$168 million was humanitarian aid); this year that number is \$17.6 billion. A portion of these grants are targeted specifically at health. For example, USAID has given \$15.5 million in total to WHO initiatives in Ukraine, most recently providing \$1.8 million to improve communicable disease surveillance in response to increased risk of COVID-19 and other infectious diseases.

11 By 35% in 2022, according to the IMF projection.

The negative impact of the war on Ukraine's economy, and thus the public resources available for health, means that a substantial proportion of funds and other resources for health system reconstruction will have to come from international aid. We endorse the principles outlined in CEPR's *Blueprint for the Reconstruction of Ukraine* (Becker et al. 2022) to ensure aid efficiency and apply them here to the health system. These are that aid should be rapid but with reasonable conditionality to ensure accountability; that aid should be provided in the form of grants rather than loans; that aid should be channelled through a single agency that is independent but accountable to donors and acts as an interlocutor to the Ukrainian government; and that aid should be aligned with objectives set by Ukraine itself to promote ownership and sustainability of projects. Experiences from other conflict-affected settings supports the importance of these principles (WHO 2021a).

Less reliance on private finance

We recommend avoiding formal cost-sharing as it may exacerbate the existing problem of informal OOP payments and is unlikely to generate significant revenue.

One theoretical possibility to attract more private funds is to explicitly limit price coverage of health services by the state and to introduce mandatory cost-sharing by patients. We do not advocate more cost-sharing through payments at point of use.

Around a half of the health spending in Ukraine is already paid through OOP payments, a large proportion of which are informal. The informality of these payments and their high incidence among the poor creates catastrophic consequences for vulnerable households and disempowers the patients. The argument has been made that formal cost-sharing could increase the funds available for health care and at the same time reduce illegal under-the-counter payments. In practice, however, it is not likely to generate significant additional revenue or eliminate informal under-the-table payments, but it is likely to increase households' risk of catastrophic health care costs (Dzhygyr et al. 2022). Eradicating informal OOP spending requires complex governance reforms and a substantial increase in public spending on health to ensure full coverage of essential services with reasonable quality and accountability (Dzhygyr et al. 2022). Without fundamental shifts in system governance, quality assurance, and a substantial increase in public spending on evidence-based services, the introduction of formal co-payments may exacerbate financial burden on the increasing number of vulnerable people, including war veterans and displaced persons.

Neither does it seem practical to introduce co-payments to influence patient behaviours, for example, to divert patients from using expensive inpatient care. Evidence on the impact of cost-sharing on service utilisation is mixed (Dzhygyr et al. 2022). Moreover, the architecture of Ukraine's health system assumes a strong gatekeeper role for primary care physicians and a possibility for the strategic purchaser to use financial incentives to influence patient behaviours through provider practices. These possibilities would be safer and more sustainable alternatives to the use of cost-sharing.

Formal cost-sharing is also not likely to raise large amounts of revenue for the health budget. This is because a conventional, low-risk design of formal co-payments would require keeping them small, universal, flat, and applied with generous exemptions for the poor and frequent users. The need to provide exemptions, in particular, would require a matching increase in the government spending on the services in question, leading to an even higher need for funding.

The only scenario where formal cost-sharing would theoretically generate substantial new revenue is a high-risk option of introducing high-level co-insurance for health care similar to the models used in Slovenia and Croatia. This option would still require the state to pay a considerable additional amount for exemptions, but new private revenue may appear sufficient to support the benefit package costs. However, on top of the matching funds required to attempt this option, it would also demand an immense effort to build the governance foundation approximating the unique Slovenian and Croatian contexts. In particular, this would require creating reliable access for any citizen to purchase voluntary health insurance with the main statutory insurer and, most importantly, parallel systemic reforms to eradicate informal payments and income inequality, both of which are very low in these countries. At present this is not an option in Ukraine, and any such major changes need to happen after the healthcare reforms have been embedded, otherwise there is the danger of people exiting from the public system and the development of a two-track healthcare system, with private system for the wealthier and a (poorer) public system for the poor.

6.2 Healthcare delivery

We divide this section into what is to be provided by the state and how it is to be provided.

What to provide: The basic package of healthcare benefits

We recommend explicitly defining the Program of Medical Guarantees (PMG) now, to avoid implicit rationing through refusal of care or informal OOP payments, and to improve efficiency.

Despite fiscal pressures, we do not advocate for trying to save costs by reducing the healthcare benefit package. Doing so would threaten population health and financial protection. However, the war is an opportunity to accelerate the agenda for defining the package more explicitly, thereby facilitating more efficient and accountable provision.

Poorly defined benefits lead to implicit rationing of services: when the benefit package is opaque, providers ration services by refusing care or charging informal payments. The 2017 reform made a leap in addressing this problem by requiring the government to use transparent criteria to define the PMG and by starting to break it down into output-based elements (sub-packages). However, as of early 2022, large portions of the PMG, especially pertaining to specialised care, were not defined explicitly, creating debates about their costing, pricings and rationing. The government worked on gradually unbundling the broader packages (for example, the general package of outpatient care

was steadily broken down into better defined components such as antenatal care), but progress has been slow. A major barrier in this process is the need to agree on service costing and pricing, both of which are technically and politically challenging. Prioritising the completion of this process will help boost purchasing efficiency. Unbundling and regrouping broad packages around health conditions would help the NHSU set more reasonable prices for each service and stimulate providers to offer more effective services. Better definition of the package needs to be matched with further work on the Ukrainian system for case-based payments.

How to provide: The role of the private sector

We recommend a mix of public and private provision in the short and longer term, including engagement of international private providers, but with all PMG services purchased exclusively via the NHSU.

In the short term, the role of international private providers will be crucial in supporting Ukraine's health system to recover and 'leapfrog' to advanced stages of development, injecting not only funding but also international expertise. Contracts with private providers can include responsibility for strengthening the capacity of the Ukrainian healthcare workforce across all sectors including GPs, hospitals, mental healthcare, pharmaceutical procurement and sales. It is likely that such contracts will require some form of public-private partnerships. They may also need to be incentivised or mediated via reputable international lenders, especially where this would require investment in design and infrastructure. It will be important to ensure that in all such contracts NHSU remains the single purchaser of PMG services from providers of all types of ownership on a level playing field.

In the longer term, a substantial entry of private providers will remain important for leapfrogging. Ukraine's health system already has a mixture of public (local government level) and private provision. The 2017 reforms and the level of payment set for PHC encouraged the entry of private PHC providers. These were often in the form of 'solo' or 'single' practices (providers that employ only one doctor) as opposed to 'group' or 'team-based' practices. We do not endorse the solo practice PHC provision model and encourage a transition to teams-based provision through multiple professionals coordinated via digital technologies, which proactively focus on preventive care (OECD 2020).

We do support a mix of private and public provision at all levels of care, including the PHC. This mix can stimulate competition between providers, leading to improvements in services delivered, and may strengthen the motivation of health workers to stay in Ukraine. However, the key to successfully managing the role of the private sector in healthcare provision is to strengthen the role of the NHSU as central strategic purchaser, so that it is not merely paying the bills, but also setting the terms of contracts with private providers and determining their location and type of services, ensuring the playing field is level for private and public providers.

6.3 Healthcare workforce

Investment is needed to modernise Ukraine's older system of medical education and training and to modernise the labour force within healthcare. However, we do not want to lose existing staff, as the war has put great strain on practitioners, some of whom may leave Ukraine after the war. There is also a worldwide shortage of nursing staff. We recommend the following approaches to modernise the labour force.

Increased task-sharing

We recommend careful task-sharing with nurses, initially in primary care, accompanied by supportive training and supervision.

Recent decades worldwide have seen the demand for health care outstrip supply, leading to the development of licensing of nurses to perform doctors' roles and the use of non-professional healthcare workers to deliver routine care. The former is most common in the United States, the latter model has been tried in many low- and middle-income settings.

Task-sharing offers the potential for better use of scarce medical staff. The literature on this is still emerging. Studies in the US healthcare context reveal mixed findings (Chan and Chen 2022). A recent meta-analysis (Anand et al. 2019) of task-sharing from nurses to less-skilled healthcare workers for the management of blood pressure in the context of low- and middle-income countries suggests that task-sharing interventions are effective in reducing average blood pressure in these settings. However, the authors also concluded that the positive impact of task-sharing interventions is greater in countries with higher ratios of doctors to the population, and that interventions are more effective if targeted to high-risk individuals than to the general population. A review of implementation of task-sharing strategies for NCD management in low- and middle-income countries concluded that while literature on this topic is limited, what exists suggests that task-shifting to non-physician health workers is a feasible, scalable model for addressing the NCD burden where human resources for health are limited (Joshi and Peiris 2019). However, challenges faced included system-level barriers such as inability to prescribe medicines, varying skill sets of non-physician health workers, high workload and staff turnover.

Ukraine has a strong potential for task-sharing (or task-shifting) from doctors to nurses. Although the nurse-to-doctor ratio has declined in the past decades (2.04 in 2019, counting only the MoH system and excluding dental, public health, and administrative posts), it remained higher than the EU13 average (1.73). Many Western European countries, such as Finland, France, Belgium and Slovenia, have an advanced level of skill delegation to nursing professionals.

There are good examples of task-sharing from other post-communist countries. Slovenia, in particular, is one of the most recent successful examples of enhancing the role of nurses. This was done by creating an additional 0.5 full-time equivalent nurse position at the primary healthcare level to take up a large range of tasks in management and

prevention of chronic conditions and NCDs (European Commission 2019). European countries which managed to introduce more flexible distribution of roles were found to do so through gradual upskilling, reskilling and proactive change of professional culture and attitudes within the existing workforce (European Commission 2019).

However, experience in other healthcare systems makes it clear that further task-sharing without health system strengthening, restructuring, and healthcare regulation will not yield any desirable results. To successfully implement these measures across a healthcare system, in-service training, supportive supervision and expansion of job descriptions are needed. This is likely to be particularly relevant in Ukraine, as while nurses can obtain higher education qualifications, only short practical training is required at present to work as a nurse.

Retain and retrain

We recommend that efforts to retrain staff in line with European standards and the changing health needs of the population are complemented by investment to retain staff through opportunities for capacity strengthening and higher salaries.

The war and changes in healthcare delivery will mean that health professionals are faced with new responsibilities. It will be important that efforts to retrain staff are accompanied by investment to retain them, through opportunities for advancement and increased salaries. International input can be used to help with retraining, with a view to 'Europeanisation' of the medical training curriculum. This can include schemes for medical practitioners to train abroad for short periods of time. An independent body should be created to certify and ensure appropriate training, with certification a criterion for higher salaries. In the short-term certification can be done by NGOs from outside Ukraine to avoid corruption and introduce international standards. Attention should also be paid to training of hospital managers given the important role that improved management practices can have on hospital performance (e.g. Bloom et al. 2015).

6.4 Health information systems

We recommend strong investment in the use of electronic health records and IT

Ukraine has already achieved a step change in the use of electronic health records (EHRs) and this has stood it in good stead during the conflict. More generally, increasing digital delivery (mainly via telephone consultations rather than video) has been a widespread response to COVID-19 in many healthcare systems and has allowed populations who have no local healthcare resources to access these.

Whilst extensions of use of health information systems offer many promises, recent reviews of experience have highlighted issues in adoption. A recent review of the use of IT in healthcare drawing heavily on the experience from the United States concluded that dramatic improvements in information technology have the potential to transform healthcare delivery (Bronsoler et al., 2020). However, it takes time for these

positive effects to materialise and there is much variation in the impact, with many organisations seeing no benefits. In terms of drivers of adoption, the role of workers is critical, especially physicians' attitudes and skills. Fragmentation and weak competition are also causes of slow adoption. Bronsoler et al. (2020) found very little quantitative literature that investigates the direct impact of new technology on jobs, skills and wages of healthcare workers, but what there is suggests no substantial negative effects. These findings are consistent with studies outside of healthcare, which stress the importance of complementary factors (such as management practices and skills) in determining the success of IT. A review of EHRs in low-income settings concluded that highly reliable data handling methods, human resources and effective project management, as well as technical architecture and infrastructure, are all key factors for successful EHR implementation (Fritz et al. 2015).

This evidence suggests that for Ukraine's efforts in health information systems to be successful, they must address from the beginning the issues of interoperability between different healthcare providers, security issues and initiatives to support staff in making changes. Management initiatives to increase the skills of workers will be required if the healthcare workforce and society more generally are to substantially benefit from the adoption of these powerful tools. International funding and expertise can be used to build on the efforts already undertaken by the Ukrainian healthcare system in this area.

6.5 Leadership and governance

Good leadership and governance and the mechanisms to bring these about are central to the operation of an efficient and fair healthcare system. As discussed above, in the short term, we recommend that international funding and other resources should be channelled through a central agency that is independent of the donor. To ensure that this arrangement supports Ukraine's objectives, the independent agency must be strongly linked to the central national agency – probably both the central government and, in the case of healthcare, the Ministry of Health. The independent agency would gradually hand over its responsibilities, or 'sunset', if and when Ukraine joins the EU. Evidence from other settings highlights the importance of collaboration between all stakeholders and a clear long-term vision in supporting good governance in crises (Lokot et al. 2022).

Central strategic purchaser

We recommend developing the NHSU into an autonomous central strategic purchaser.

In the long term, the presence of a strong central strategic purchaser will be crucial to ensuring accountability and good governance of the health system. Unlike passive purchasing, when providers are reimbursed for their services and allocations decided by historical patterns, active or strategic purchasing requires the health financing agency to use its tools and levers to achieve policy objectives, such as improved population health, high-quality care, or equitable access (WHO 2010). This requires a governance

arrangement which (i) sets clear roles in decision making, (ii) clearly defines objectives for the purchaser, (iii) gives the purchaser sufficient autonomy and authority, (iv) subjects it to effective oversight, (v) ensures merit-based selection of the agency head, (vi) ensures meaningful stakeholder participation, transparency and accountability, and (vii) establishes credible budget constraints (WHO 2019). Autonomy, in particular, is critical. The agency needs enough flexibility and discretion to determine benefit and service specifications and payment mechanisms, and to use selective contracting if needed, for example, to incentivise formation of provider networks in services with less scope for competition (WHO 2019). However, increased discretion needs to be matched with stronger oversight and accountability to manage risks.

The aim to develop Ukraine's single payer agency, the NHSU, into a strategic agency was included in the 2017 reform. In 2021, a joint assessment by the World Bank and WHO concluded that while the NHSU was autonomous in law, ensuring that it functions as such required further adaptation of the NHSU, Ministry of Health, and the Ministry of Finance to their new roles. The ministries needed to "transition to arm's-length stewardship" of the NHSU rather than trespass into its technical and operational matters, while the NHSU must rise to the challenge of its new role, becoming more transparent, accountable and technically adept (Bredenkamp et al. 2022). Continuing to strengthen the NHSU's functions of pooling funds and financing health care will be particularly important after the war to ensure equitable healthcare among geographic regions of Ukraine, some of which have been much harder hit than others.

To achieve this, the government should define clear objectives for the NHSU (which are currently absent) and provide it with meaningful discretion in finding technical ways to implement these policy choices. The technical capacity of the NHSU must also increase. In particular, Ukraine must resume and accelerate the development of the system of payments for care. We recognise that developing costing and payment systems is a long-term project, but the pace of this needs to be faster. A key priority should be to speed up the move towards output-based payments across the entire benefit package with gradual introduction of performance-based incentives, which requires better understanding of cost drivers at the hospital level. This needs to be done to prevent disputes between providers and the purchaser over the budget needed to provide care. Making the basic benefit package explicit will support these efforts.

Performance indicators

We recommend introducing publicly available performance indicators at the national health agency and provider level.

Performance indicators at the agency level: Developing performance indicators at the NHSU level will strengthen the public belief in the viability of the agency, which in turn will further engender support for its strengthening. It would also allow comparisons of NHSU's performance with that of other government spending agencies and inform allocation of tax revenues to different services. Examples of high-level performance

indicators and their use in the allocation of public budgets across different areas of government activity are provided by Taiwan (Cheng 2020). The Taiwanese health budget has five sectors (dentistry, Chinese medicine, primary care clinics, hospitals and dialysis) and each year there is a review and grading of each sectoral global budget in terms of service delivery, quality, public satisfaction, appropriate use of resources and other criteria. The annual increase for each budget is based on the grade given.

Performance indicators at the provider level: At the provider level, public performance indicators offer information to the funders, buyers and users of care about the performance of the organisations. In Ukraine they can act as a means of empowering individuals to make informed choices and encouraging competition between providers. Monitoring healthcare providers' performance is relevant worldwide, especially in settings such as hospitals, given their particular impact on both health and economics. Development of appropriate indicators is a highly technical exercise. There is a significant body of literature that documents and assesses the measures used by regulators to monitor quality of healthcare services (e.g. WHO 2018) and thus we do not recommend specific indicators here. However, we advocate that the use of such measures should be accelerated and that lessons can be learned from efforts in other systems to develop measures appropriate to the Ukrainian context.

7 CONCLUDING REMARKS

The reforms that the Ukrainian healthcare system has been implementing since 2017 began a path towards greater efficiency and helped its resilience during the full-scale invasion. However, to be able to cope with the scale of the challenges of reduced financing, worsened population health and a potential outflow of personnel, further reforms are needed, as well as the financial and technical support of the international community. To cope with the destruction of the war, to 'build back better' and enable the system to leapfrog forward, the Ukrainian healthcare system needs first and foremost a clear and strong governance architecture. Within this, priorities include more training of medical staff and hospital management, better incentives and higher responsibility for care delivery of healthcare staff, a clearly defined benefit package of services and strategic purchasing of those, and a set of meaningful quality measures with which to assess performance at all levels.

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Transforming Ukraine's research and development to become a driving force of reconstruction

Yuliia Bezvershenko^a and Oleksiy Kolezhuk^b

^aStanford University; ^bTaras Shevchenko National University of Kyiv

EXECUTIVE SUMMARY

The full-scale Russian invasion of Ukraine has heavily affected country's research and development (R&D) sector. In particular, it has caused considerable damage to research infrastructure and forced researchers to leave their homes, ruined many research teams and paralysed their work, and stopped funding and implementation of many research projects. All these devastating consequences of the full-scale war have piled on top of the existing problems and challenges of Ukrainian science and deepened its long-term crisis.

Recognition and analysis of these systemic challenges implies that the reconstruction of the Ukrainian R&D sector cannot be seen simply as physical rebuilding of the damaged research infrastructure. It is essential to transform the R&D sphere itself and build ways for science to benefit the economy and society. To enable the 'build back better' principle of Ukraine's reconstruction, science, technology and innovation should be the cornerstone of the national reconstruction strategy, and their transformation should be seen as an essential part of the EU accession. This implies that, first, the agency responsible for Ukraine's reconstruction should have a dedicated unit supervising the R&D sector. And second, Ukraine's R&D sector should be reformed as early as possible. At the same time, its reforms need to be systemic, accurately designed and appropriately supported. If supported by appropriate resources, the National Council on Science and Technology can start designing these reforms right away.

A crucial and urgent task is helping researchers (who have mostly stayed in Ukraine) remain researchers, that is, ensuring that they do not leave for other sectors. To this end, we suggest that the government, together with international donors, provides stipends to researchers selected on merit-based principles. Furthermore, it is important to support the development of networks and partnerships at different levels - among Ukrainian researchers; among Ukrainian and foreign researchers; among researchers, businesses and local governments. These networks and partnerships will be essential for the future reconstruction of Ukraine.

For the long-term transformation of the science sphere, we suggest the introduction of performance-based funding; the gradual transition of the most capable research teams under the new research societies (created in parallel with existing academies of sciences) with a simultaneous increase in their funding; intensifying European integration of Ukrainian science, including integration of research infrastructure; and data-driven R&D policy development, the foundation for which has been already laid. Closing the gap between education and research is also one of our key recommendations.

1 INTRODUCTION

To achieve sustainable recovery and development, Ukraine needs to prioritise its research and development (R&D) sector,¹ which implies both substantial investment and a fundamental policy shift.

This is a formidable task, as the sector is plagued by the Soviet legacy of weak links between research, education and business, mistrust among principal stakeholders, insufficient state capacity and a lack of coherent strategy. Before the war, Ukraine had been neglecting R&D, focusing instead on its strong but aged and carbon-intensive industry. The war has caused an acute threat to key human capital, driven by the drastic reduction of research funding, paused international collaborations and growing damage to research infrastructure. Post-war recovery, along with the EU accession, which implies green and digital transformation, will pose modernisation challenges, leaving no other way but to embrace R&D as the driving force of the transformation. This chapter provides an overview of the pre-existing problems in this sector and Ukrainian science policy (Section 2) and the impact of the war (Section 3). It also outlines key actions necessary to ensure its survival in a short-term perspective and to lay down the seeds of the large-scale transformation in the long run. Finally, Section 5 concludes.

1 In this chapter we use the terminology following OECD (2015), so that research and experimental development (R&D) comprises creative and systematic work undertaken in order to increase the stock of knowledge - including knowledge of humankind, culture and society - and to devise new applications of available knowledge. It contains basic research, applied research, and experimental development.

2 PRE-WAR STATE OF R&D IN UKRAINE

2.1 Statistics and trends

Ukraine's gross domestic expenditure on R&D (GERD),² a key indicator in the analysis of R&D, decreased from 1.19% of GDP in 1997 to 1.07% of GDP in 2003 and to 0.41% in 2020, according to the UNESCO Institute of Statistics.³ This significant drop in the GERD-to-GDP ratio caused, among other things, a decline in the total number of researchers – from 1,475 per million people in 2006 to 846 in 2020. The number of young researchers⁴ is also decreasing rapidly (at the National Academy of Sciences of Ukraine, it dropped by 27% by 2020 compared to 2017).⁵

In the 2022 Global Innovation Index (GII),⁶ Ukraine ranks 57th out of 132 economies, which is a decline compared to its 49th place in 2021, 45th place in 2020 and 47th place in 2019, although there is some variation across categories of this index (see Figure 2). In particular, Ukraine ranks 49th in “Human capital and research” (44th in 2021), 59th in “R&D” (58th in 2021), 36th in “Knowledge and technology outputs” (33th in 2021) and 27th in “Knowledge creation” (29th in 2021). Ukraine ranks 4th among the 34 lower middle-income group economies and 34th among the 39 European economies in the index. However, according to the GII analysis, relative to GDP, Ukraine's performance is above expectations for its level of development.⁷ This illustrates that, despite insufficient R&D funding and weak incentives from the state, Ukraine has considerable potential in the innovation sphere.

In comparison to its peers, Ukraine's scientific resources have declined significantly over the last 20 years. In 2003, Ukraine's GERD as a share of GDP was higher than average for upper-middle-income economies (Figure 1). In particular, it was much higher than the GERD of Poland and Bulgaria. Since then, the situation has changed dramatically, and Poland (since 2011) and Bulgaria (since 2014) now have significantly higher GERD-to-GDP ratios. In 2017, the average GERD/GDP for the upper-middle-income economies was 1.57% and for low-income economies it was 0.53%; for Ukraine it was 0.45%. In 2020, the average GERD/GDP for the upper-middle-income economies was five times higher than in Ukraine.⁸

2 As defined in the OECD's *Frascati Manual* (OECD 2015).

3 uis.unesco.org

4 According to the Law on Science and Technology, a young researcher is defined as a researcher younger than 35 with at least a master's degree, or younger than 40 with a Doctor of Sciences degree. The Ukrainian system has two levels of scientific degrees: Candidate of Sciences and Doctor of Sciences. Attaining Candidate status usually takes at least three years, while a Doctoral degree can take much longer.

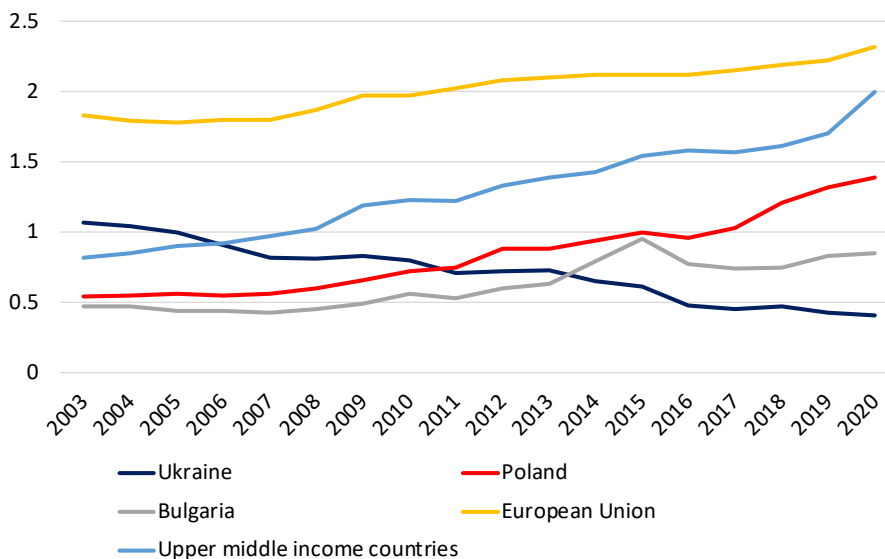
5 https://files.nas.gov.ua/text/YoungMessage/Komisiya/Komisiya_Zvit.pdf (in Ukrainian).

6 www.wipo.int/global_innovation_index/en/2022/. The 2022 Index uses data from 2021 or earlier.

7 www.wipo.int/edocs/pubdocs/en/wipo_pub_2000_2022/ua.pdf

8 According to the UNESCO Institute of Statistics.

FIGURE 1 RESEARCH AND DEVELOPMENT EXPENDITURES (% OF GDP)



Source: World Bank

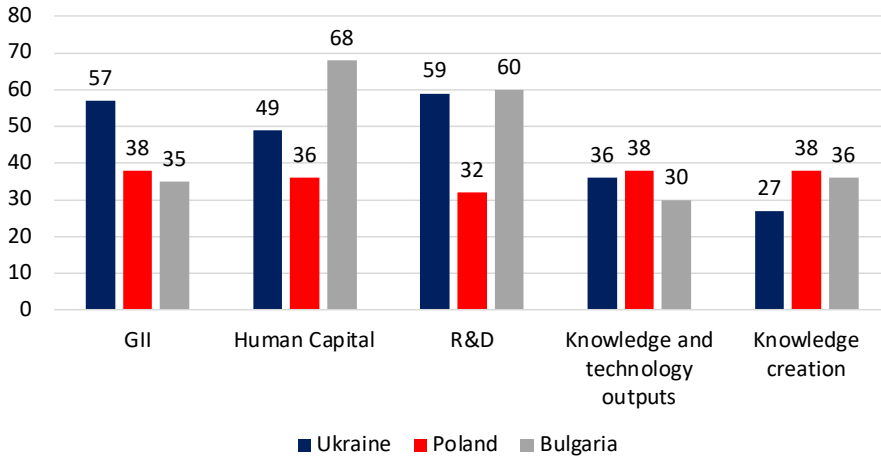
Other indicators paint a similar picture. In absolute numbers, Poland was 20th in the world in terms of R&D spending in 2020 (US\$18.1 billion in current PPP dollars), according to the Congressional Research Service (2022).

In 2006, the numbers of researchers per million people in Ukraine, Poland, and Bulgaria were comparable – 1,475, 1,553 and 1,354, respectively – and almost half the EU average (2,691). By 2020, Ukraine’s number had nearly halved (846), while those of its peers had almost doubled (3,288, 2,402, and 4,257 for Poland, Bulgaria and the EU average, respectively).⁹ As mentioned above, in the Global Innovation Index 2022 Ukraine ranked 57th out of 132 economies, while Poland ranked 38th and Bulgaria 35th (GII-2022: Ukraine, Poland, Bulgaria). According to the European Innovation Scoreboard 2022, Ukraine, Poland and Bulgaria belong in the lowest category of “Emerging Innovators”, with scores at 31.0%, 60.5% and 45.2% of the EU average, respectively.¹⁰

⁹ Ibid.

¹⁰ https://ec.europa.eu/assets/rtd/eis/2022/ec_rtd_eis-country-profile-ua.pdf; https://ec.europa.eu/assets/rtd/eis/2022/ec_rtd_eis-country-profile-ua.pdf; and https://ec.europa.eu/assets/rtd/eis/2022/ec_rtd_eis-country-profile-bg.pdf

FIGURE 2 GLOBAL INNOVATION INDEX 2022: UKRAINE, POLAND AND BULGARIA



Source: Global Innovation Index 2022.

There has been certain progress in linking Ukraine's R&D sector to global research. For example, since 2016 Ukraine has participated in the EU Horizon 2020 and EURATOM Research & Training (2014–2020) programmes as an associated country. Under Horizon 2020, Ukrainian researchers have participated in 230 projects involving 323 participants for a total funding request of €45.5 million. In EURATOM R&T (2014–2020), Ukrainian entities received approximately €4.9 million for fusion and fission activities.¹¹ Among 16 associated countries, Ukraine was in the top seven by amount of money received and project winners. Foreign-funded R&D as a share of GERD in Ukraine was 20.7% in 2012–2014 and 21.6% 2015–2017 (UNESCO 2021, Chapter 12).

A summary of governance and organisation of the R&D sphere in Ukraine is presented in Table 1. An acute problem with the governance in the sector is the limited capacity of the Ministry of Education and Science (MoES) to develop and implement data-driven policy in the sphere. Limitations are present in all stages of this process, from data collection (very poor quality R&D data), to data analysis (poor analytical capacity within the MoES, strained capacity within the National Council on Science and Technology), to development of strategy and policy solutions (no clear vision, widely distributed responsibility, a large number of stakeholders for whom R&D is not a priority).

11 https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/europe-world/international-cooperation/ukraine_en

TABLE 1 RESPONSIBILITIES, POWERS AND CONSTRAINTS FOR MAIN STAKEHOLDERS

Stakeholder	Responsibilities/powers	Constraints
Ministry of Education and Science (MoES)	<ul style="list-style-type: none"> • Develops and implements policies in the R&D sphere, forms budgetary requests, makes decisions on the distribution of institutional funding to state-owned higher educational institutions and appoints their rectors. • Runs its own system of project-based funding aimed exclusively at universities. 	<ul style="list-style-type: none"> • Does not have a strategy for the development of science. • Has very limited capacity for analytics and policy development. • Has no political power and capacity to coordinate the development and implementation of horizontal policies.
Other ministries and state agencies	<ul style="list-style-type: none"> • Many ministries (including the Ministry of Health, Ministry of Internal Affairs and Ministry of Energy) have their own 'branch' research institutions. 	<ul style="list-style-type: none"> • R&D is a low priority for the respective ministries, and many of the 'branch' research institutions are not capable of producing high-quality research.
National Council on Science and Technology of Ukraine (NCST)	<ul style="list-style-type: none"> • Advisory body on science and technology policy to the Cabinet of Ministers created to provide effective interaction between researchers, government, and the real economy sector for the development and implementation of national science and technology policy; headed by the Prime Minister. • Has an Administrative Committee with 24 members (minister of education and science, deputy ministers, presidents of the national academies of sciences, etc.) and a Scientific Committee with 24 independently elected top-level researchers working on a voluntary basis. 	<ul style="list-style-type: none"> • Should, but does not, have regular (quarterly) meetings and is not operational without them. • The government has not really used it as an instrument for getting advice and horizontal coordination. • Does not have a proper back-office to support its activities.
National Academy of Sciences of Ukraine (NASU) and five 'branch' National Academies of Sciences (medical, agricultural, pedagogical, law, arts)	<ul style="list-style-type: none"> • Each academy is self-governed, controls its own system of research institutes, approves their research programs, makes decisions on the distribution of funds inside its research institutions network, and appoints their directors and key personnel (starting from the level of department heads). 	<ul style="list-style-type: none"> • Strong vertical hierarchy, research groups have very limited autonomy, strict financial control within their research institutions. • Mechanisms of fund distribution between research institutions and departments are not transparent.

Stakeholder	Responsibilities/powers	Constraints
National Research Foundation (NRFU)	<ul style="list-style-type: none"> • Provides grants for research projects irrespective of the affiliation of the scientists involved in the team. • Has generous pay scale caps that enable decent salary levels for grantees. • Implements bottom-up funding as well as topical calls. • Foreign experts are involved in the evaluation of project applications. 	<ul style="list-style-type: none"> • Legislation limits the scope of projects that can be funded (currently, no individual grants and no institutional grants can be awarded). • The share of funds distributed by NRFU is still low (less than 10% of the total R&D funding). • Budgetary restrictions limit development of its organisational capacity, not allowing it to modernise its digital infrastructure and compete for the best staff.
Other state funding agencies: Ukrainian Startup Fund and the Fund of the President of Ukraine for the support of Education, Science, and Sports.	<ul style="list-style-type: none"> • Ukrainian Startup Fund provides grants to small-scale innovation projects that can be completed within a short period (1-2 years). • The Fund of the President of Ukraine is focused on providing individual mobility and study grants (e.g. for study abroad), but can provide grants for research projects as well. • These organisations have high political support and flexibility. 	<ul style="list-style-type: none"> • Ukrainian Startup Fund had not been focused on science-based startups and deep tech innovations, therefore researchers who had an idea for a startup were unlikely to get funding. During the war, some programmes of this type were launched. • The Fund of the President was established in 2019 but has not completed its organisational phase and has not yet funded anything. Despite that, during 2020-2021 it had a planned budget of more than 1 billion hryvnia that could have been allocated to operating R&D organisations such as the NRFU.
Research institutions	<ul style="list-style-type: none"> • Conduct research. • Nearly all research institutions are state-owned, the absolute majority belong to NASU. • Some research institutions do not conduct research but rather perform analytical or organisational duties for the ministries and national academies of sciences. 	<ul style="list-style-type: none"> • Lack of financial autonomy. • The infrastructure is very aged, its maintenance is energy- and cost-consuming. • Fixed state-prescribed pay scales for researchers' jobs make them non-competitive.
Higher education institutions (HEIs)	<ul style="list-style-type: none"> • Provide education and conduct research. • Have wide autonomy rights (self-government) but rectors of state-owned institutions are appointed by the MoES. • Nearly all HEIs are state-owned. 	<ul style="list-style-type: none"> • Education remains the primary task of HEIs; research still plays a minor role in their evaluation and funding. • The legacy distribution of employees into teaching personnel (faculty) and scientific personnel (pure research) is limiting the integration of research. • Funding for research personnel is exclusively project-based (no institutional funding) and thus unstable.

Source: Compiled by authors.

2.2 Challenges

R&D in Ukraine has faced numerous systemic challenges that are briefly outlined below. Most of these problems existed long before the Russian full-scale invasion, and therefore represent perennial impediments to R&D development. The war has not only exacerbated these challenges but also created new ones, such as severe funding cuts, destruction of research facilities and outflow of researchers.

General problems of state policy in the R&D sphere

One of the basic challenges is the absence of a coherent state strategy for the development of science. There is practically no continuity of state policy in the field. Science is viewed as a heritage rather than an integral part of the general economic strategy. Thus, the resources provided for science development are very limited, as they are considered expenses or losses rather than investments. Consequently, there are few to no incentives for science to solve specific problems of the economy and society. On the other hand, while the government cannot design and implement mission-oriented policies based on R&D, it expects to obtain ‘useful’ research products. As a result, the legislation does not provide incentives for investment in science or R&D, and state support for innovative activities is insignificant.

Problems of governance and policymaking in R&D

The legal framework in general is outdated and contradictory, having suffered from scattered, inconsistent revisions. It needs to be rewritten from scratch, but the lack of strategy prevents this. There is little effective coordination inside the government (between ministries and the National Council on Science and Technology Development). At the same time, the functions of forming and implementing government policy in the R&D sphere are not clearly delineated between the Ministry of Education and Science, other ministries, the national academies of sciences, the National Research Foundation (NRFU) and the central executive authorities.

The MoES is mainly responsible for policy development, but lacks qualified personnel or the ability to recruit/train such personnel. Thus, its ability to formulate policy goals, develop policies and estimate their effect is limited. Faulty data-collection procedures and very few digital instruments for this do not allow for the implementation of evidence-based policymaking.

The legacy system of so-called ‘branch science’ (nearly every ministry has some scientific institutions or departments belonging to its administrative domain) cannot generate high-quality research.

The scientific community has weak self-organisation and is unable to maintain high standards of research and academic integrity. The management of scientific organisations is inefficient – it is a mixture of hierarchical and collegial management bodies, with no clear division of duties and responsibilities and neither incentives nor

opportunities for training of quality scientific managers. There are conflicting criteria for evaluating scientists and administrators and lack of transparent accountability tools. Faulty promotion mechanisms result in age and gender imbalances in management of research organisations.

Challenges involving the connection between science and the economy

The low-tech structure of the economy implies a limited need for R&D, which results in low innovative activity of businesses. Instead of forming demand for research products, businesses prefer to purchase ready-made solutions from abroad. Consequently, research funding by the private sector is low. However, even if the private sector were willing to invest into R&D, legal and financial limitations imposed by the status of a 'budgetary institution'¹² (shared by nearly all research institutions) makes this cooperation rather complicated. Communication between the R&D sphere and industry is insufficient and results in low levels of mutual trust and cooperation.

The share of applied research (including defence- and security-related research) is disproportionately low because it requires a lot of resources, which the government does not provide.

Problems with funding instruments

The existing management and funding instruments are not tailored to the specific needs of different types of research. Defence-related, applied, commercial and basic research each require different financial instruments and the involvement of different players and organisations in their management. Existing budgetary legislation and the way it has been implemented, as well as the the legacy system of the national academies of sciences, are not up to this task.

There are no effective and transparent procedures ensuring and stimulating the quality of research. There is neither performance-based research funding nor an underlying system of research evaluation. Instead, the 'historical' block funding is preserved, and salary supplements for researchers are based on formal titles rather than real research achievements. Consequently, there are few incentives to improve research quality. The share of competition-based funding and the absolute amount of this funding are low. As a result, many research competitions are just a substitute for basic funding. Only a small part of the public research funding is spent on research needs (equipment, materials, etc.), with the main part covering salaries and utilities.

The NRFU has limited financial flexibility and cannot provide the full spectrum of funding opportunities. Its opportunities for capacity building are highly limited by legislation and its budget.

12 The status of a budget institution does not allow financial flexibility for scientific institutions (for example, changes in pre-planned purchases of equipment, personnel changes and transfers between expenditure items are problematic).

Problems with human capital and education

Currently, careers in research are based on scientific titles (mostly inherited from Soviet times) and set false priorities that stimulate imitation of science and violations of academic integrity, which have become a systemic and mass phenomenon in some fields. Low salaries for researchers prevent academic mobility within Ukraine and internationally, making the Ukrainian academic job market very local and fragmented. This results in low social prestige for the profession of scientist, which makes it unattractive to ambitious young people. As a result, researchers quit for other fields or move abroad, which constantly decreases the number of scientists and the share of young scientists.

The higher education system has been losing the capability to train researchers to the appropriate, globally competitive level. Brain drain during bachelor's and master's studies decreases the number of students and competition at the next levels of education. Insufficient numbers of talented students willing to pursue an academic career decreases training quality at the PhD level.

The connection between higher education and research in many disciplines is weak. Many universities have failed to build research-oriented educational programmes because they did not have qualified personnel or sufficient funding. There are no state programmes supporting cooperation between research institutions and universities. Therefore, existing initiatives are bottom-up and rarely sustained.

Research institutions do not have the resources to attract professional staff who could provide additional necessary services, such as public communication, partnership development, interaction with business, international cooperation, fundraising or training scientists in additional skills.

Research infrastructure problems

The country's outdated and insufficient research infrastructure (from buildings to equipment) requires significant funds for modernisation, which has been very sporadic over the last 30 years. There is neither detailed data on the state of existing research infrastructure nor an infrastructure development strategy supported by the necessary resources or mechanisms for collective use and management of the research infrastructure. In our view, research infrastructure should be based on regional development (i.e. smart specialisation) strategies. Digital research infrastructure is also underdeveloped and lacks tools, resources and qualified personnel for its development.

Problems of international cooperation and integration into the global and European research space

The government has neither the resources nor the capacity to implement the “Roadmap for Ukraine’s Integration into the European Research Area”, which has still not been adopted as the government-level document. Nor does it have a nationwide strategy for the internationalisation of Ukrainian R&D that would foresee systematic work to attract foreign research funds and build partnerships or involve the Ukrainian scientific diaspora in domestic research projects.

Ukrainian researchers have a low level of English language proficiency, and thus English is not the primary language for obtaining and spreading knowledge among the majority of researchers. Many research areas are detached from the global scientific process and thus do not have the appropriate level of quality to interest international partners.

The incompatibility of the regulatory framework, as well as bureaucratic and financial restrictions, repel international partners or deter Ukrainian research institutions from developing institutional-level international cooperation. Moreover, there are no resources for implementing research using foreign research infrastructure.

2.3 Previous reforms/policies

Establishing new policy and funding instruments

The new Law on Scientific and Technological Activity (hereafter, ‘the Law’), which came into effect in 2016, tried to address the problems outlined above. One of the main goals of the first stage of the reform was establishing evidence-based policymaking in the R&D sector.

However, implementation of the Law was a challenge. The Law promised to increase GERD to 1.7% of GDP from 2020, which was never implemented, and stipulated the possibility to provide funding to higher education institutions and research institutions based on their performance (state attestation), which was never implemented either.¹³ The Law created two new institutions: the National Council on Science and Technology (an advisory body to the Cabinet of Ministers headed by the Prime Minister) and the National Research Foundation of Ukraine. The former was meant to provide the government with first-hand advice on R&D policies, and the aim of the latter was to introduce some competition among researchers and support the best ones, who would then become agents of change in the next iteration of science reform. However, due to the limited state capacity and the absence of political leadership for this reform, these institutions were established with a large delay and their impact was limited.

¹³ Thus, research institutions get ‘historical’ funding, while universities until 2021 had no institutional research funding at all (only project-based). The NASU applies its own methodology of research evaluation since 2016 (it is based on German best practices), while the government adopted two distinct methodologies for state attestation of research activity of universities (2018) and state research institutions (2017) that are problematic to implement. Upon results of “state attestation” universities in 2021 received an opportunity to get additional funding, but it was again project-based rather than institutional funding.

The Council was intended to be a platform for dialogue between the research community and government officials, to bring scientific advice and an evidence-based approach to policymaking, and to enable horizontal coordination and evaluation of science and technology policies. Due to limited administrative capacity and political ignorance, the Council convened for the first time only in 2018 and until 2022 it met annually rather than quarterly as prescribed by the Law. Despite that, the Scientific Committee of the Council has been providing its opinion on drafts of all government acts on science and innovation policy.

The NRFU was established to provide individual, team and institutional grants for fundamental and applied R&D projects.¹⁴ It has a multi-level governance model, ensuring transparent decision making. The NCST acts as its Supervisory Board; it also has an elected Scientific Council (academic board) and a Directorate headed by the executive director (elected by the Scientific Council, approved by the Supervisory Board and appointed by the prime minister). The NRFU's procedures are transparent, minimise conflict of interests and utilise independent expertise. However, it has insufficient funding for its institutional development, which limits its impact. The NRFU issued its first call for proposals in 2020 and awarded some grants in 2021. With the start of the full-scale invasion its budget for grants was entirely cut, so those projects are now at risk. On the other hand, since February 2022 it has significantly increased its international cooperation, becoming a member of Science Europe, and it remains in active dialogue with decision-makers worldwide.

Integrating into the European Research Area

The ERA represents the ambition to create a single, borderless market for research, innovation and technology across the EU that was articulated in 2000 and has been developing since then.¹⁵ The ERA Roadmap 2015-2020 became a basis for a coordinated effort of member states to demonstrate visible progress on ERA priorities: (1) effective national research systems; (2a) jointly addressing grand challenges; (2b) making optimal use of public investments in research infrastructures; (3) an open labour market for researchers; (4) gender equality and gender mainstreaming in research; (5) optimal circulation and transfer of scientific knowledge; and (6) international cooperation.¹⁶

As an associated country, Ukraine was supposed to actively integrate into the ERA. However, the “Roadmap for Ukraine’s Integration into the European Research Area” was only adopted by the MoES in 2021. There is neither a commitment to implement it at the Cabinet of Ministers level nor the necessary resources. In 2021, the European Commission presented a new ERA Policy Agenda for 2022-2024, but Ukraine has not

14 Even though the Law allows supporting infrastructure development, academic mobility, and science popularization, bylaws currently enable only support of research projects.

15 https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/european-research-area_en#what

16 <https://era.gv.at/era/era-2000-2021/era-roadmap/european-era-roadmap-2015-2020/>

yet reacted to this. However, in October 2022 the government adopted the National Plan for Implementing Open Science (an approach to the scientific process that focuses on spreading knowledge as soon as it is available using digital and collaborative technology which is embedded into the ERA Policy Agenda).¹⁷

In 2016-2020 Ukraine was fully associated with Horizon 2020, the EU's research and innovation EU funding programme. Unfortunately, the country did not fully exploit the opportunities of this programme. In 2016, the Ukrainian government established a Coordination Centre for Horizon 2020, but the panel for the centre was only approved in 2018 and the centre held its only meeting in the same year. The Ukrainian government showed very little involvement in the programme; it provided very few resources to the network of National Contact Points of Horizon 2020, and ministries (including the MoES) showed little willingness to solve bureaucratic problems. This undermined the efficiency of Ukraine's participation in program and its integration into the ERA (EU-Ukraine Civil Society Platform 2017). Ukraine is now an associated country in the follow-up programme, Horizon Europe (2021-2027), but the problems with engagement and resource provision remain. Integration into the ERA is not seen as a priority by the government and is permanently absent in communications with the EU.

One tangible result from this cooperation was that the Horizon 2020 Policy Support Facility implemented peer review of Ukrainian R&D in 2016 (European Commission 2016). This provided 30 recommendations and three key messages: (1) raise the quality and relevance of the science base;¹⁸ (2) open up the research and innovation system to the world and enhance international collaboration, (3) build a conducive framework for an innovation-driven economy in Ukraine. These recommendations were partly implemented by R&D stakeholders, but the national plan for their implementation was never adopted. Therefore, the majority of recommendations remain valid.

In July 2020, the Ukrainian government announced the country's readiness to contribute to the European Green Deal (Holovko 2021). As research and innovation play a crucial role in achieving the Green Deal goals, the European Commission has been using framework programmes¹⁹ on research and innovation as tools to empower green transition. Thus, under Horizon 2020, the Green Deal call²⁰ – the largest research grant call for €1 billion – was launched. Under Horizon Europe, over 35% of funds are allocated to addressing climate change. At the moment, the Ukrainian government does not envisage R&D as a crucial part of Ukraine's green transition, so there is no national programme to support dedicated research projects.

17 https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science_en

18 This implies, among other things, raising the quality and relevance of science and technology through competitive funding, developing talent and capacity, and increasing the efficiency of research organizations.

19 https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/environment-and-climate/european-green-deal_en

20 https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/environment-and-climate/european-green-deal_en

Cooperation with local governments as an opportunity

The decentralisation reform launched in 2014 lays much more responsibility for the wellbeing of people on local governments. Local governments should draft regional development strategies ('roadmaps') for the development of infrastructure for people and businesses.

In 2017, some Ukrainian regions started developing their 'smart specialisation strategies' (S3s).²¹ Smart specialisation is an industrial and innovation framework that shows how, taking into account the initial conditions of a region, public policies – especially R&D and innovation policies – can influence the economic, scientific and technological specialisation of a region and consequently its productivity, competitiveness and economic growth path (OECD 2013). S3s are based on an analysis of the strengths and potential of a regional economy and on an 'entrepreneurial discovery process' with a wide stakeholder involvement, including research organisations, universities, and science parks. During the entrepreneurial discovery process, stakeholders find out what is feasible based on their combined capabilities and agree upon their joint priorities. Thus, research and higher educational institutions find their place in the specialisation and knowledge-based development of a region by (1) performing research that is later utilised by local businesses, the government and the community, (2) preparing proper human capital and (3) providing expertise. Since 2021, smart specialisation is a mandatory part of regional development strategies (S3Ua)²² and it can be used for sustainable reconstruction of Ukraine.²³

Smart specialisation was recognised as one of the global methodologies in the Science, Technology, and Innovation (STI) for Sustainable Development Goals Roadmaps (United Nations 2021). Ukraine joined the UN Global Pilot Program on STI for SDGs Roadmaps in March 2021 (Matusiak et al. 2022).

3 IMPACT OF THE WAR

3.1 Estimates of damage

Estimation of damages to research infrastructure is complicated because of the need to assess it case-by-case (for example, equipment, types of specialised buildings and rooms and supplies all have different value). Furthermore, as a national database of research infrastructure items is absent, all estimates are preliminary and based on the information provided by damaged research institutions and universities.

21 Today the European Commission is already discussing with stakeholders a possible transformation of S3 into smart specialisation strategies for sustainability (S4) (Nakicenovic et al. 2021).

22 <https://s3platform.jrc.ec.europa.eu/ukraine>

23 <https://s3platform.jrc.ec.europa.eu>

The MoES reported that 15% of the research infrastructure of higher educational institutions has been damaged. According to the NASU, damages to research institutions amounted to around 0.5 billion hryvnia (nearly \$13 million) as of 25 October 2022. However, the damage to unique infrastructure makes any assessment very imprecise. For example, Russian shelling damaged the buildings of the National Science Centre of the Kharkiv Institute of Physics and Technology (NSC KIPT), where a ‘neutron source’ subcritical nuclear reactor is located.²⁴

3.2 Human capital

Following the onset of the full-scale war, 73% of respondents to a survey on “Ukrainian Researchers in Times of War”²⁵ said they have been unable to perform research activities as before the war. Among these are people who live in heavily affected (Kharkiv, Sumy) and occupied (Kherson) regions, internally displaced persons, and those who have lost their teams. Other reasons for inability to work are destroyed or damaged infrastructure, problems with Internet connection, lack of supplies, and psychological or medical issues.

Budget cuts are also affecting researchers significantly: in April–May 2022, 84% of respondents to the same survey said their financial situation had worsened compared to pre-war times. In particular, recipients of NRFU grants – i.e. the teams conducting excellent science research – had lost their funding. International cooperation is at risk as Ukrainian researchers cannot implement research as planned under existing grants and can hardly guarantee the fulfillment of their obligations under prospective ones. Competitive international instruments such as the Horizon Europe calls were only available to a minority of Ukrainian researchers even before the war. Most opportunities for scholars are available only for researchers who can flee the country, which is problematic as men in the 18–60 age bracket are generally not allowed to cross the border. Due to the dire economic situation, investments in R&D from businesses will probably decrease dramatically, and joint projects of business and research institutions/ universities will be terminated or frozen. Thus, direct results of the full-scale war are the deteriorating financial situation of individual researchers, a growing tendency for disintegration of teams, and the termination of project-based collaborations between different organisations within and outside Ukraine.

On the other hand, teams and institutions with relevant organisational capacity or international collaborations established before the full-scale invasion have managed to extend their interactions. For example, the NRFU became a member of Science Europe, the organisation representing major public institutions that fund or perform ground-breaking research in Europe.²⁶

24 As reported by the State Nuclear Regulatory Inspectorate of Ukraine on 25 June 2022.

25 www.uascience-reload.org/2022/07/05/ukrainian-researchers-in-times-of-war-results-of-survey/

26 www.scienceeurope.org/news/nrfu-and-mta-new-members-of-science-europe/

3.3 War-related challenges

Wartime budget cuts have led to a large-scale termination of funding for existing projects and to significant job cuts among the researchers and staff of scientific institutions and universities. This pushes more people out of the R&D sphere, aggravating the already dire situation. The government is prioritising war-related research, but many researchers cannot switch quickly to a completely different topic.

The growing damage to research infrastructure and loss of data, collections, archives, assets and so on has forced many research projects to stop. A large number of displaced scientists cannot continue their research at their new place of work. Many senior researchers have decided to stay abroad, and it will be difficult to get them back.

Suspension of joint international research projects and international academic mobility due to travel restrictions, as well as suspension of financial contributions to international scientific organisations, threaten to increase the isolation of Ukrainian science (although the European Commission has waived around €20 million in financial contributions for participation in Horizon Europe that would have been due in 2021 and 2022).

The war has caused many enterprises to shut down, significantly reducing the funds available for investing in high-risk projects and thus further weakening the already weak ties between science and business.

Low prioritisation of security-related R&D in previous years significantly hampered the development of modern weapons and military technologies in Ukraine, which has become a critical problem since the full-scale Russian invasion. The war laid bare that the organisational structure of defence-related R&D (limited flexibility and speed of reaction, insufficient scientific and technological level, non-compliance with EU/NATO standards) does not meet the needs and challenges of the sphere, which prevents scientific support for the implementation of modern military technologies, including those provided to Ukraine by partners.

4 RECONSTRUCTION

Reconstruction of the Ukrainian R&D sector cannot be seen simply as physical rebuilding of damaged research infrastructure; it should include policies to transform the sector and make science the foundation for a thriving economy and society. Development and utilisation of R&D for achieving high-level strategic goals such as the green and digital transitions should be seen as a part of integration into the EU, strengthening Ukraine's national security and enabling sustainable development and modernisation, as well as the reconstruction of Ukraine.

Timing is crucial. Starting reconstruction of Ukraine's R&D cannot wait until after the war ends. Ensuring the survival and development of human capital, building networks and enabling the transfer of expertise, building the capacity of R&D sector stakeholders, and helping them to maintain the dialogue with businesses, local authorities, and the state are among the key interventions that should enable survival, perseverance and development both during the war as well as in the after-war transformation of the R&D sector.

We suggest three basic reconstruction principles with respect to R&D:

1. Science, technology and innovation are essential to the Ukrainian future, so they need to have a proper place in the national reconstruction strategy, supported by appropriate resources. In particular, the reconstruction agency should have a dedicated unit supervising the R&D sector.
2. Systemic reforms in the R&D sector are crucial for its recovery. These reforms should be accurately designed, appropriately supported and implemented in time. Any urgent actions and partial solutions should fit the overall architecture of changes.
3. Preserving, developing and engaging human capital is the most urgent short-term goal, but is also critical for long-term recovery. The development of networks and partnerships should be enabled, encouraged and supported.

In the next two sections, we suggest short-term and long-term policies based on these principles. Implementation of these policies will ensure not only the preservation but, more importantly, the transformation of Ukraine's R&D sphere.

4.1 Short-term actions

In designing the short-term instruments of support, it is crucial to take into account differences in the Ukrainian situation compared to other recent situations of science at risk. Specifically, the majority of Ukrainian researchers are still in Ukraine – only 15% of the 2,173 respondents to the “Ukrainian Researchers in Times of War” survey have fled the country.²⁷ However, 38% of respondents have changed their place of residence within Ukraine, which limits their ability to implement research if they have lost access to materials or equipment. Thus, the emergency response should ensure that funding and opportunities are available on the needed scale for Ukrainian researchers who are still in Ukraine. In some sense, this can be seen as an extension of the experience gained by governments during the COVID-19 pandemic, when remote positions and

27 www.uascience-reload.org/2022/07/05/ukrainian-researchers-in-times-of-war-results-of-survey/

international cooperation became possible. To mitigate the brain drain, any instruments focused on Ukrainian researchers who have left the country should include opportunities to cooperate with Ukrainian teams in order to preserve research groups and funding and to increase the chances of their return after the war.

In other words, support should focus on **preserving and developing human capital in science**. Instruments should focus on enabling researchers (selected by merit) to remain as researchers, even if they are highly limited in their ability to perform research as usual. Equally important is project-based support of capable research teams that would allow to preserve collective expertise.

The war has provided Ukrainian researchers with more opportunities to collaborate globally and build networks of expertise. The government should encourage these networks, the most successful of which can be institutionalised and become ‘agents of change’ in Ukrainian science. We suggest developing the following instruments for implementation of these ideas.

- **A national system of researcher fellowships.** Ukraine should establish a programme of merit-based individual support for researchers to help them through the hardships of the war and thus prevent brain drain to other sectors. The NRFU could provide fellowships based on researchers’ track records for the last 5–10 years, regardless of their current ability to carry out research. The criteria for track record performance should be developed by international expert panels and tailored to broadly defined fields (natural sciences, life sciences, social sciences, etc.). Fellowships can differ by experience levels and should be awarded for 1–2 years, with the possibility of renewal. Total programme duration should be no less than three years. The estimated annual cost for supporting 10,000 researchers (about 10% of all researchers, including those in universities) is €34.8 million.²⁸ International donors and the Ukrainian state could decide on the distribution of this sum among them. These fellows could form the core pool of personnel for the new research establishments discussed further.
- **Support for competitive project funding via the NRFU.** Ukraine should ensure that the NRFU remains an active funding channel supporting excellent science and mission-oriented projects. The aim is to preserve existing research teams and ‘scientific schools’, to provide meaningful career development paths (especially for young researchers) and to support and develop the NRFU as an institution and funding instrument. The estimated total annual cost for this is €25 million (based on the pre-war 2022 NRFU budget) with an initial commitment for two years.

28 For example, 2,000 researchers could receive €400/month, 5,000 researchers €300/month, or and 3,000 researchers €200/month

- **A special EU programme to integrate Ukrainian science into the European Research Area.** The first stage of this programme, which could start immediately, could focus on (1) founding *research networks* that foster information exchange, organising online and hybrid workshops, seminar and lecture series, mutual short visits; and (2) embedding Ukrainian research groups within existing research projects ('outsourcing' certain research tasks, preparation of joint research proposals). The programme should provide the possibility to fund research physically conducted in Ukraine ('*non-residential fellowships*' or '*remote work*') whenever this is compatible with the nature of the performed research. The second stage, designed for a longer-term impact (but which could start already during the war) could help institutionalise these networks (e.g. establishing *joint doctoral schools*).

Research networks and joint doctoral schools will form 'seeds' for future centres of excellence. The establishment of such centres can be modelled on the German initiative "Establishing German-Ukrainian Excellence Centers (CoE) in Ukraine",²⁹ which unfortunately was not completed before start of the full-scale war. Centres of excellence should be established as joint labs of European and Ukrainian institutions based on the most successful research teams and networks. The preparatory and organisational phases can be launched during the war, but the actual launch of the centres will involve substantial investment into infrastructure and will have to wait until after the war.

The programme can be implemented jointly by one of the European funding bodies (e.g. the European Research Executive Agency, or the European Research Council) and the NRFU, as well as by special instruments of Horizon Europe. Wider formats involving other countries/funders would bring additional benefits. The estimated total annual cost for the first stage is €500,000 (supporting around 20 research networks), with an initial commitment for a two-year funding cycle; for the second stage the estimated annual cost is €1 million (supporting around five doctoral schools), with an initial commitment for a four-year cycle.

- **Informational support and matchmaking for the international transfer of expertise** could create many decentralised opportunities and cover those interested in finding experts and colleagues worldwide. International donors can support the implementation of the corresponding module in the National Electronic System of Scientific and Research Information URIS.³⁰ This online platform has been in development since 2019. When fully developed, it will contain information on all institutions, research groups and researchers, as well as metadata on publications.

29 www.bmbf.de/bmbf/shareddocs/bekanntmachungen/de/2019/12/2743_bekanntmachung (in German).

30 <https://nauka.gov.ua>

For now, it includes useful information for Ukrainian researchers, such as FAQs on publications, opportunities for fellowships, conferences, and so on. When the system is finalised, it will become the main source of R&D data in Ukraine and an instrument for developing networks both within Ukraine and internationally.

Unfortunately, current budget restrictions do not allow for developing the URIS system to its full potential, so it must rely on donor support. An investment of as little as €100,000 would allow a module to be launched for providing support to Ukrainian scientists, which is currently offered by many research institutions worldwide.

- **Programmes supporting the utilisation of science for national security, reconstruction, economy, and policymaking.** Engaging researchers in helping the country during the war and in its recovery is crucial. As many needs and efforts are bottom-up and local, it will be more efficient to support networks and partnerships between researchers, businesses and local authorities who are prepared to build smart solutions for urgent war-related and reconstruction problems. The NFRU, with the help of international donors, could fund joint R&D-intensive projects implemented by businesses, NGOs and local authorities in cooperation with research organisations. The estimated cost is up to €3 million annually (two-year cycle), and it could be launched as early as 2023. After the war, these instruments could be transformed into co-funding schemes, supporting the smart specialisation approach to the regional development of Ukraine. At that time, the EU instrument for pre-accession assistance can be used. The NFRU should be provided with sufficient resources not only to provide grants but also to strengthen its organisational capacity so that it can manage various R&D support programmes, including those discussed here.
- Finally, **capacity building for developing reforms in the R&D sector should be supported immediately.** Limited government capacity in the R&D sphere has been a long-term constraint on its reform and evolution, integration to ERA, and on providing value to the economy and society. Today, poor governance threatens the survival of the R&D sphere and crisis response by it, and it will definitely limit reconstruction. The actions proposed here will require a lot of effort for their implementation, and there are few resources to do it.

The optimal way to address this problem is to establish a Science and Technology Policy Office as a support team for the National Council on Science and Technology.³¹ This office, working with the Scientific Committee of the Council, could develop comprehensive and well-aligned evidence-based policy proposals and drafts of the legislation needed for the transformation and reconstruction of Ukraine's R&D sector.

4.2 Long-term actions: Policy for science

Ukraine needs a major policy shift to embrace R&D as an economic driver of, and a key factor in, sustainable recovery. Before this becomes possible, the R&D sector itself has to transform. Here, we outline our vision of this transformation, being fully conscious that there is no consensus between the key stakeholders on the desired architecture.

Our key recommendations are as follows:

1. Introduction of a performance-based research funding system (PBRFS).³²
2. Implementing dual-track replacement of academies of sciences by two new research societies managing basic and applied science.
3. Integrating education and research.
4. Strengthening the integration of Ukrainian research into the European Research Area (ERA).
5. Transforming governance and policymaking in the R&D sphere (in particular, strengthening the National Council on Science and Technology and National Research Fund, creating a DARPA-like agency that would provide project-based funding, and creating an Evaluation Office that would evaluate research institutions and help distribute institutional funding).

Below, we develop these recommendations in turn.

The introduction of a performance-based research funding system requires the creation of a transparent and effective quality assurance and evaluation system for the R&D sector based on international best practices and expertise. Instead of the MoES, evaluation of the scientific activity of research institutions and universities should be performed by a dedicated independent institution – an Evaluation Office. The evaluation should be tailored to the type of research (basic, fundamental, development) the research area and the type of institution, and it should take into account the

31 This would require an investment of about €100,000, which is not a large sum in the context of Ukraine's reconstruction but could be a game-changer for Ukrainian R&D.

32 A good description of performance-based research funding systems in different countries can be found in Jonkers and Zacharewicz (2016).

evaluated organisations' missions. Digitalising this process is important to make it more transparent and less time-consuming; compliance should not be a burden. Evaluation should be done at the research unit level (research group, laboratory, department) to be useful for further organisational transformations.

The evaluation would aim to select research groups that either (1) produce high-quality scientific output and are competitive globally, or (2) engage in research areas that are strategic priorities for Ukraine and are competitive nationally. The evaluation would need to be performed with the help of independent experts, of which no fewer than 80% should be international experts. It will be important to involve a sufficient number of high-profile international scientists as evaluators to ensure that the selection process is transparent and is perceived as fair by the research community.

Funding instruments should be quality-based and support different types of missions. There should be different complementary funding types:

- Basic funding allocated directly to research institutions and higher educational institutions according to a formula based on the evaluation results, with re-evaluation every five years. The share of basic funding should not be a goal or KPI, but it should be compatible with the specific profile of each organisation.
- Competitive funding provided via different channels: bottom-up (provided to any research topic, with the only criterion being excellence), priority areas (provided within state priority programmes³³ and key laboratories) and individual (provided via the national system of researchers, scholarships/awards for researchers at various career stages). Competitive funding should be distributed via grants by NRFU or other funding agencies.
- State contracts (defence, security, critical technologies, healthcare, other strategic issues) issued by a DARPA-like state agency; research groups engaged in those tasks would remain affiliated with their societies.
- Co-funding by business.
- International funding, in particular for the development of joint research infrastructure.

Performance-based basic funding should be available for any state-owned research institution or HEI, and all other channels should be open to any research groups irrespective of their affiliation, including private non-profit organisations. Every research group should have an opportunity to draw on several funding sources.

33 The establishment of state priority programmes for R&D, which has been blocked for the last eight years, should be re-installed and equipped with proper independent expertise and transparent governance models.

Besides establishing the multichannel funding scheme, the government should encourage 'scientific outsourcing', first of all by removing administrative barriers to research institutions implementing commercial R&D projects. Ideally, an office providing legal support and consulting for joint projects between research institutions and business should be established, while the initial matching of research groups and businesses can be realised via a dedicated module on the URIS digital platform.

The changes outlined above will require a significant overhaul of the current legislation, redefining nearly all existing financial regulations governing the R&D sector, including (1) the salary grid (for state-owned research institutions, a new salary scale should be introduced with the upper limit competitive at the European level to allow these institutions to attract and retain talent), (2) the legal status of research institutions (which should change from state budgetary organisations to a new, more flexible status that would better fit the missions of research institutions, would make attracting external funding easier and would allow for the introduction of multi-year budget planning and allocations), and (3) the R&D reporting and data collection system. Given the sheer scale of this task, work must begin as soon as possible.

These changes in the funding instruments should be accompanied by a significant overall increase in the funding amount. Right after the war ends, the state should commit to gradually increasing GERD within its R&D strategy. Past attempts to introduce new competitive funding instruments simply by reducing basic funding turned out to be counterproductive since academies of sciences proportionately reduced funding to all research institutions rather than supporting the best ones. Therefore, our next recommendation is the transformation of the research system. We suggest a dual-track approach for this.

Transformation of the organisational structure of the research system

The existing system should be gradually (over five or so years) transformed into two smaller excellence-based research societies based on the most capable research groups of the national academies of sciences. One of the new research societies/academies – modelled on the Max-Planck Society – would host world-class groups focused on basic science, while the other – modelled on the Fraunhofer Society – would unite groups engaged in applied research. Each of the two new societies should have a lean umbrella management structure consisting of a board of directors (executive level) and an internationally composed advisory board (policy-setting level). The only priority for the academy of basic research should be excellent science, while the priorities for the academy of applied research will be formed in close interaction with its donors from the private sector. These two new research academies will be able to incorporate internationally funded centres of excellence to ensure a high-quality research environment.

The organisational and legal form of the new research societies should provide much greater financial flexibility than is the case now for a standard budget institution. The academy of applied science needs to become a convenient partner for cooperation with business; its long-term goal should be funding a substantial share (up to 70%) of relevant research projects from non-public sources.

The proposed new structure should be created in parallel to the existing academies of sciences. The research groups that pass the selection process outlined above will be offered the opportunity to join the new structures and will receive additional resources (increased salaries, extra hiring power, modern office and lab space, some equipment, etc.). Over a certain transition time interval (say, 2–3 years), all research groups capable of producing high-level scientific output and/or pursuing research along strategically important lines will be accumulated inside the new research societies, which will implement administrative functions with respect to these research groups.

The remaining groups or institutions will be either transformed into new institutions according to their activity type (e.g. analytical centres, technical units, state-owned enterprises) or dissolved. The existing national academies of sciences may remain active as high-level professional associations of individuals, funded by membership fees and grants, involved in advisory and expert roles at the state level, but will be relieved of their management and fund distribution roles.

Such a structural reform should only be done after a proper evaluation of research groups to ensure that highly qualified human capital, capable networks and research infrastructure are preserved. Similarly, the transformation of ‘branch’ research institutions that are currently under the ministries should be done after their proper evaluation. When performing this structural transformation, Ukraine can take into account both positive and negative experiences of states that have undergone similar processes, such as eastern European countries or eastern Germany.

Supporting integration of research and education

From the very beginning, the new research societies should be mutually affiliated with universities. Contracts of key personnel (group leaders and senior-level researchers) should include an obligation to teach (up to a comfortable amount) at a specific university/department, and research groups should be involved in PhD programmes of affiliated universities. Rectors of affiliated universities should be included on the boards directors of the new research societies, and directors of affiliated institutes should reciprocally be included on the executive boards of universities. Existing integration initiatives such as the Kyiv Academic University³⁴, built on the basis of the National Academy of Sciences should be supported and scaled up.

34 <https://kau.org.ua/>

At the same time, higher education institutions themselves will obtain access to performance-based research funding as described above, which will allow and motivate them to have resources for establishing permanent research units and engaging professors in research. All the funding instruments which we propose are quality-based, thus universities will have incentives to open research-intensive positions on a competitive basis, increase academic mobility, and pursue academic integrity. As a result, capable HEIs will get resources, staff, and infrastructure to integrate research and education and become research universities.

At the level of secondary education, it will be crucial to develop and implement a strategy for engaging enough well-trained STEM³⁵ teachers in schools and for providing access to needed equipment and interaction with active researchers and innovators as a part of school STEM curricula. School teachers of all specialties should undergo professional training to familiarise themselves with the scientific mindset, the latest developments in science and methodologies for teaching science-related issues and scientific methods at schools. At the same time, curricula for researchers should include soft skills, communication and project management components adapted for R&D.

As a part of efforts to engage youth in science, we suggest supporting grass-roots initiatives that work with school-level initiatives, engaging children in science, implementing science in school education, and popularisation of science. Talented research-oriented youth should be supported nationwide by different instruments, from school to the PhD level.

European integration and internationalisation are an essential part of the transformation

An ERA Roadmap should be adopted as a government-level document and backed up by sufficient funding. Its implementation should be treated as part of Ukraine's EU accession path, with a view to developing Ukrainian research infrastructure as a part of European research infrastructure. There should be serious efforts towards science diplomacy on the Ukrainian side, sending to the ERA-related and Horizon Europe committees representatives capable of communicating and promoting the state-level position. To that end, the needed capacity should be provided by developing a dedicated sub-unit in the MoES and a working group in the National Council on Science and Technology, and establishing a well-trained and supported Horizon Europe national infrastructure (points of contact, support office, e-portal, communication strategy).

A general strategy for internationalisation should be developed, which would include: (1) engagement of the Ukrainian science diaspora in research programmes, projects, institutions building, and transformation of the sector; (2) providing incentives for reintegration of outstanding diaspora researchers; (3) turning 'brain drain' into 'brain circulation' using various instruments; (4) establishing remote international partnerships

35 Science, technology, engineering and mathematics.

so that Ukrainian researchers can use research infrastructure worldwide; (5) consistent promotion of English as the basic working language for researchers (e.g. introducing English-language education programs at HEIs and stimulating the influx of foreign students); and (7) removing legal barriers to international cooperation.

As Ukraine is now a candidate country to the EU, instruments available from the European Commission should be actively used for supporting R&D during and after the war and reconstruction of research infrastructure. Instruments of pre-accession assistance, which were effectively used by Turkey for innovation development support, could be used for this purpose.³⁶

For the reconstruction of research infrastructure, European Structural Funds would appear to be the preferable instrument if it is possible to use them at the stage of Ukraine's candidacy. For example, in 2007–2013 European Structural Funds accounted for 51% of Poland's GERD. The second largest amount of EU funding for 2014–2020 in Poland was allocated to the Operational Programme Smart Growth.³⁷ This was the largest programme funding research, development and innovation in the EU, with a budget of €10.5 billion for 2014–2020 (76% spent) including €8 billion aimed at R&D support (European Commission, 2017).³⁸ Enterprises (in particular SMEs), research units, consortia of enterprises and research units, as well as business environment institutions were eligible to apply for this programme.

To ensure the proposed massive changes, policymaking capacity within the Ukrainian government should be strengthened considerably, and functions and interactions of different government agencies should be clearly defined and implemented.

Transformation of governance and policymaking in the R&D sphere

The role of the MoES should be limited to policy development, while implementation functions should be distributed between other actors. In particular, the Ministry should not distribute funding. Appropriate training and technical assistance should be provided to the Ministry staff responsible for policy development. Enabling data-driven policy development requires high-quality data on the R&D sector. Currently, research-related data are collected by the Ukrainian Institute on Scientific and Technical Information, which is a Soviet-era legacy institution that de facto accumulates only formal 'research reports' and other meaningless data. It should be transformed into a new institution capable of efficient data collection and providing meaningful analytics. As noted above, the national electronic system of scientific and research information, URIS, if properly developed, can be used both for policymaking and establishing communication between different stakeholders.

36 www.avrupa.info.tr/en/regional-competitiveness-262

37 See www.poir.gov.pl/en and https://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/poland/2014pl16rfop001

38 <https://cohesiondata.ec.europa.eu>

The NRFU (and other similar funding agencies) and the advisory boards of research societies should be responsible for the allocation of funding and evaluation of the progress of projects. The institutional evaluation role should be delegated to a separate independent entity – an Evaluation Office.

The National Council on Science and Technology should be allocated enough resources (including a capable back-office) to implement its functions of horizontal policy coordination, providing scientific advice and setting priorities for the science and technology policy at the governmental level. Organisational changes to the NCST are also needed. The current setup, with the Council headed by the prime minister and the Administrative Committee filled by officials whose primary responsibilities lie elsewhere, leads to highly formal and inefficient operation. We recommend introducing the position of vice-prime minister (VPM) responsible for science, technology and innovation policy, who will coordinate the efforts of all ministries with respective responsibilities and programmes. The dedicated VPM should head the Council (instead of the prime minister) and ensure its dynamic and effective work and enforcement of its recommendations and decisions. We recommend the introduction of dedicated deputy ministers and units at least in those ministries that coordinate R&D activities in their sectors. These will become meaningful members of the Administrative Committee of the Council. Other stakeholder representatives that enter the Administrative Committee should also be directly responsible for policy development or coordination.

One of the functions of the NCST will be to design the strategy (masterplan) for research infrastructure development, as discussed next.

Strategic approach to the development of research infrastructure

The National Council on Science and Technology will design the strategy of research infrastructure development. Strategy design should be based on verified data on the existing capacity (both equipment and human capital), its geographical distribution, regional development strategies and smart specialisations. It should take into account international collaborations and be viewed as a part of integration into ERA, with joint utilisation of European research infrastructure and developing Ukrainian research infrastructure as a part of it.³⁹ The government should adopt this strategy and oversee its implementation. The development of research infrastructure should be viewed as both complementing and driven by the development of human capital. Therefore, the primary targets for research infrastructure development projects should be the newly established centres of excellence (concentrating the best personnel and providing intensive international cooperation). The infrastructure development projects can be implemented at the third stage of the programme for integration of Ukrainian science in the ERA, after supporting networks and doctoral schools as discussed above.

39 The strategy should take into account the European Research Infrastructure Roadmap (<https://roadmap2021.esfri.eu/>) and experience of other countries such as Poland (www.gov.pl/web/science/polish-roadmap-for-research-infrastructures) or Estonia (<https://etag.ee/en/funding/infrastructure-funding/estonian-research-infrastructures-roadmap/>).

4.3 Long-term actions: Science for policy

Strengthening the role of scientific expertise in government workflow and decision-making processes

The Scientific Committee of the NCST, if provided with suitable resources, can become an effective platform to deliver professional scientific advice to the government (the model of the US Office for Science and Technology Policy⁴⁰ can be used here). The organisational transformations of the Ukrainian research landscape envisioned in Section 4.2. will strengthen research institutions and their associations and provide them with the capacity to develop policy advice for the government or technologies for industries. Special programmes for training professionals in science communication, analytics and government relations should be established to ensure that needed talent is available.

The government should provide grant support to *professional organisations of researchers* to develop their capacity to produce scientific advice for policymakers and establish professional standards within their sectors. Similarly, grants should be available for grass-roots initiatives, NGOs and think tanks focusing on R&D to create a market of well-developed ideas, products, and projects.

5 CONCLUSIONS

Ukraine needs a major policy shift to embrace R&D as an economic driver of, and key factor in, its sustainable recovery. Reconstruction offers a unique opportunity to initiate long-term sectoral transformation by ‘seeding’ new and supporting existing structures and instruments that will define the direction and become the driving force of future changes, at relatively low investment cost. International support in the R&D sphere during the active war phase should be primarily aimed at protection and development of human capital, as well as supporting capable teams and networks. A considerable increase in R&D funding should be accompanied by reforms based on the following principles:

1. Make funding more competitive and predictable so that scarce resources flow to the most productive uses and teams (e.g. fund merit-based individual stipends to help researchers stay in the academy; basic funding should be distributed transparently according to past performance over a 5–10 year period; introduction of a multi-layer funding scheme with different layers targeting different types of research and career stages, creating clear promotion paths and opportunities; establish/fund joint centres of excellence, operating virtually during the war).

2. Give more autonomy – financial and managerial – to research organisations and encourage growth of new institutions or mergers of research organisations to overcome the Soviet legacy (e.g. research organisations should be more free to raise external funding, including from businesses; organisations' boards, rather than state auditors, should review financial results; the National Research Foundation, with the help of international donors, should be allowed to provide grants to research projects implemented by research institutions together with businesses, NGOs or local authorities).
3. Integrate Ukrainian science into global science (e.g. establish non-residential fellowships, exchange lectures, workshops etc.; fund research networks and joint doctoral schools; evaluation of Ukrainian research organisations should heavily involve international experts and scientists; instruction in English should become standard).
4. Integration of research and education is a key objective to ensure that cutting edge technology and expertise are transferred to new generations of researchers (e.g. universities should be not only teaching institutions but also research organisations; joint appointments across research institutes and universities should become the norm).
5. Strengthen the role of scientific expertise in government workflow and decision-making.

The war and reconstruction offers a once-in-a-lifetime opportunity to radically and systemically reform Ukraine's science sector. These reforms should commence immediately.

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CHAPTER 14

How to organise aid

415

Barry Eichengreen^{a,b} and Vladyslav Rashkovan^c

^a*University of California, Berkeley*; ^b*CEPR*; ^c*International Monetary Fund*

EXECUTIVE SUMMARY

Post-war Ukraine's reconstruction will require huge resources. Estimates range from US\$349 billion according to the World Bank to \$1.1 trillion mentioned by the European Investment Bank. Given these financial requirements, funds will have to be raised from multiple sources, and donors will insist on mechanisms to ensure that this large amount of money is well spent.

Mobilising this reconstruction finance will require multiple funding vehicles. These will include bonds issued against long-term commitments of donors, bilateral grants, loans from development institutions and agencies, support from international organizations, EU structural fund transfers, private donations and possibly seized Russian assets. Activating some of these instruments will require legislative action by allied governments and changes in procedures at international organisations. Aid should be provided primarily in the form of grants rather than loans to avoid precipitating a debt crisis. Relatedly, debt relief will be an important factor in Ukraine's reconstruction.

We suggest creating a specialised, self-standing agency led by the European Commission but with majority of its staff in Ukraine, and with management representation from each non-European G7 country. This agency should have clear lines of command and independence in operations. Oversight by donors and civil society should be provided by a supervisory board and by publication of detailed information on reconstruction initiatives and projects. The agency should communicate regularly with donors, local governments, NGOs, businesses and other stakeholders to ensure that the reconstruction takes into account multiple stakeholder interests. At the end of the day, however, the reconstruction must be owned by Ukraine.

1 INTRODUCTION

Post-war Ukraine will need extensive resources for reconstruction. According to the *Rapid Damage and Needs Assessment Report* of the World Bank, the value of physical damage to Ukraine's housing, transport, industry and other infrastructure as of 1 June 2022 stood at US\$97 billion (World Bank 2022a). Since then, there has been considerable additional damage to infrastructure, notably to the power generation and distribution. The World Bank projects total reconstruction costs at \$349 billion, or roughly 175% of Ukraine's 2021 GDP.¹

While these figures are lower than the \$750 billion of needs described by the Ukrainian government at the Lugano Conference in July 2022,² they are in line with the estimates in CEPR's *Blueprint for the Reconstruction of Ukraine* of April 2022 (Becker et al. 2022). Using three different approaches, the CEPR Blueprint suggests that reconstruction costs will range from €200 billion to €500 billion. However, since the war may continue into 2023, damage is likely to be greater – the estimate of \$1.1 trillion provided by the president of the European Investment Bank may be closer to the final tally.³

Raising such sums will be a test for the international community. Whoever is going to oversee reconstruction will need to deal with multiple projects in a short period, take into account the interests of multiple stakeholders, monitor the use of funds and apply the 'build back better' principle (in the hope that Ukraine can leap forward a generation economically and financially).

In this chapter, we review other recovery efforts and develop recommendations for the Ukrainian case. To this end, we discuss principles and objectives underlying the reconstruction effort. We then review how aid has been provided to Ukraine to date (up to October 2022) to identify problems that may persist into the reconstruction stage. We discuss the experience of reconstruction in other countries and draw conclusions for the design of the reconstruction agency. We propose a fundraising framework to facilitate the participation of different types of donors and investors. Given that no single donor can foot the bill, we discuss pros and cons of various funding sources and suggest a framework for fundraising. After that we provide some concluding remarks.

- 1 Another way to assess the required need is to look at the amount of aid received by countries after major disasters. For example, in the three years following its devastating January 2010 earthquake, Haiti received \$6.4 billion from multilaterals and bilaterals, and an additional \$3.1 billion from private donors (foundations, companies and individuals) that was channeled through UN agencies and NGOs (see www.lessonsfromhaiti.org/lessons-from-haiti/key-statistics/). This \$9.5 billion was three times the total revenues of the Haitian government over this three-year period. The Ukrainian government's revenue in 2020 was \$42 billion. Multiplying by three to cover a three-year period and by three more to capture the 'three times' effect suggests that equivalent aid for Ukraine would be in the neighborhood of \$380 billion, which is not much different from the Rapid Damage and Needs Assessment prepared by the World Bank.
- 2 www.nytimes.com/2022/07/05/world/europe/ukraines-prime-minister-says-rebuilding-will-cost-750-billion.html
- 3 www.bloomberg.com/news/articles/2022-06-21/ukraine-reconstruction-may-cost-1-1-trillion-eib-head-says

2 PRINCIPLES

Principles for reconstruction are discussed in multiple papers, including Becker et al. (2022), German Marshall Fund (2022) and Ukrainian Recovery Council (2022). These analyses highlight the importance of partnership, coordination, transparency, rule of law, democratic participation, multi-stakeholder engagement, inclusion, sustainability, alignment of goals and accountability.

In a sense, these principles apply to all cases of post-war and post-natural-disaster reconstruction (OECD 2008, O’Driscoll 2018). For example, the World Bank (2018) describes the ‘build back better’ principle in detail: reconstruction on the one hand, and reforms designed to enhance efficiency and growth on the other, should go hand in hand. Even while addressing urgent tasks of rebuilding, the government and donors should work to advance Ukraine’s structural reform agenda. Following the precedent of the post-World War II Marshall Plan (under which productivity missions were mounted to transfer advanced technologies to Europe from the United States; see below), reconstruction is an opportunity for Ukraine to leapfrog a generation of technologies. Reconstruction can and should facilitate significant economic and institutional modernisation. The goal should be a post-war Ukraine that is greener, more inclusive and more dynamic.

Institutional reform should be guided by and consistent with Western values, given that EU membership is the economic and political endpoint for Ukraine. The EU integration process can provide an anchor for Ukraine’s efforts to become a modern, democratic, prosperous country by aligning the country’s incentives with those of Europe and not incidentally ensuring sustained external support.

Grants rather than loans is another important principle. It is unlikely that a country devastated by war will be able to service and repay additional debts. Reliance on loans will increase the risk of a debt crisis. It is relevant in this connection that grants accounted for the vast majority of Marshall Plan disbursements (Becker et al. 2022).

For investments to be undertaken efficiently and for reforms to stick, there must be Ukrainian ownership. Only in this case will reforms and investments be viewed as legitimate by the citizenry and, consequently, endure. Only Ukraine can determine its future. Ukraine will utilise aid most effectively when the disposition of aid is seen as consistent with Ukraine’s own interests. The Marshall Plan’s architects similarly recognized the need for ownership on the part of aid recipients, while still proceeding on the basis of ‘trust but verify’ (Eichengreen 1995, 2022). Ownership should rest on broad domestic support achieved through inclusive public consultation with local authorities, civil society and business. To this end, it is important to solicit and build on information about how civil society views the future of Ukraine (e.g. Center for Economic Strategy 2022).

No single institutional balance sheet can absorb Ukraine's financing needs, which are in the hundreds of billions of dollars, as noted above. Reconstruction will therefore require a strong, coordinated, sustained, large-scale effort led by the Ukrainian government, and supported by bilateral and multilateral donors and international organisations. Multi-year planning and budgeting as well as operational independence of the reconstruction agency are essential. In particular, the reconstruction effort must be insulated from political cycles.

Moreover, reconstruction cannot rely on funds of governments and international organisations alone. The participation of private capital, for example in the form of inward foreign direct investment and public-private partnerships, is essential. Such partnerships will convey not only money but also technologies and managerial expertise.

While everyone hopes for a lasting peace, war casts a long shadow. Reconstruction efforts have to countenance the possibility that Russia will remain a threat. To be clear, the argument is not that Ukraine and its supporters should until the war is over to rebuild the country. The first stage in reconstruction is planning and institutional building, which do not require the elimination of missiles and drones. Even while the war continues, Ukraine can strengthen market mechanisms, promote competitive market structures and foster market development. The major players can start now in putting in place the prerequisites for a comprehensive reconstruction.

3 LESSONS OF ECONOMIC AID TO DATE

Given a difficult macroeconomic situation and massive spending on defence (e.g. Becker et al. 2022b), Ukraine needs external aid of roughly \$4 billion per month to support the war effort and sustain essential public services. The Ukrainian government has put the need for budgetary support for 2023 at \$38 billion.⁴ The international community has mobilised to start providing the necessary funding. This experience can provide important insights into the ability of current mechanisms and institutions to organise and finance the post-war reconstruction phase.

3.1 Funding

Immediately after the start of Russia's full-scale invasion on 24 February, the international community focused on providing emergency funding. In early March the EU approved €1.2 billion of macrofinancial assistance (MFA), which was disbursed by end-May. In May, the EU pledged an additional €9 billion of MFA,⁵ of which €3 billion was delivered as of end-October (see Table A1 in the Appendix for the full list of loans).

4 www.reuters.com/world/europe/ukraine-budget-deficit-seen-38-bln-2023-interfax-quotes-pm-2022-09-14/

5 In May, US Treasury Secretary Janet Yellen observed that support announced to that point would not suffice to meet Ukraine's needs even in the short term, and indicated that Europe needed to step up its support.

Additional financial support came from the World Bank and the IMF. On 7 March 2022, the World Bank approved a supplemental budget support package – Financing of Recovery from Economic Emergency in Ukraine (FREE Ukraine) – of \$489 million.⁶ On 9 March 2022, the IMF Executive Board approved an unconditional disbursement of \$1.4 billion under the Rapid Financing Instrument (RFI) to help meet urgent financing needs and mitigate the impact of the war. In October 2022, the IMF provided a second tranche of emergency financing, bringing its total support to \$2.7 billion.

Official development assistance (ODA) came to Ukraine via the European Investment Bank (EIB), the lending arm of the EU. On 4 March 2022, an “EIB Ukraine Solidarity Urgent Response” of €668 million was approved to help the government to purchase food, medical supplies and fuel. Initial payments were disbursed within six days after the decision.

On 30 March 2022, US President Biden announced that the United States intended to provide the Ukrainian government with \$500 million in direct budgetary aid. The United States was thus the first country to provide a grant instead of a loan.

This and subsequent war-time financial aid provide three key lessons. First, although financial support was rapid, the composition of aid was uneven. Figure 1 shows that nearly all aid from the EU institutions and governments was in the form of loans. In contrast, the aid from the United States was almost exclusively in grants (see Table A2 in the Appendix). EU governments find it easier, for procedural reasons, to provide loans instead of grants, but what is convenient for them is dangerous for Ukraine, whose debt sustainability stands to be jeopardised. Loans are not transfers to Ukraine and thus the funds are expected to be returned so that they are more palatable politically when budgets are tight. Consensus-based decision-making processes make loans easier to agree upon. But given that much of Ukraine’s economy is destroyed, reliance on loans is likely to be incompatible with debt sustainability.

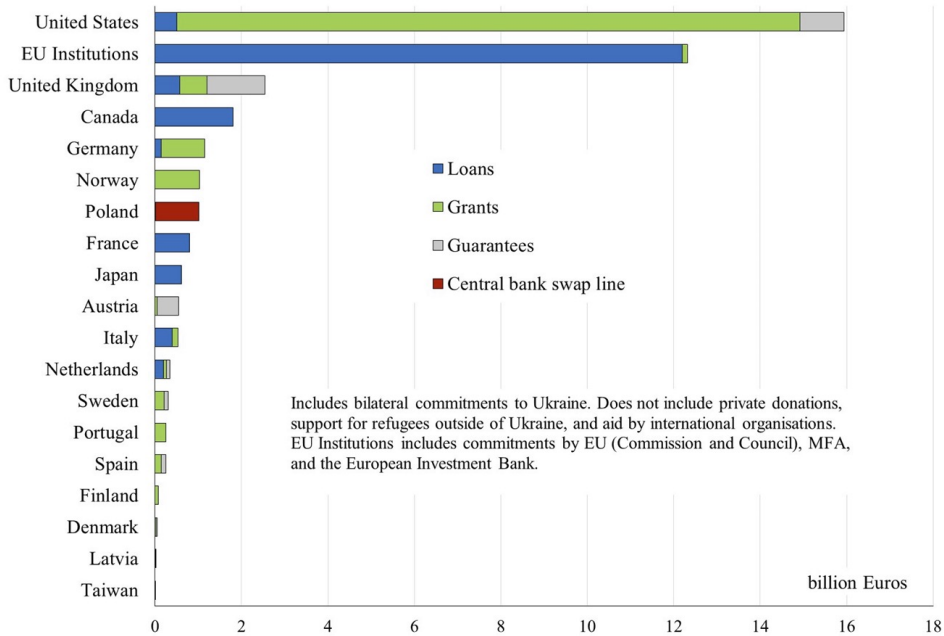
On the bright side, there has been some subsequent adjustment in the composition of aid. In other words, donors started switching to grants. As of end-October, Ukraine had received \$13.6 billion in loans (almost half of which were provided before July 2022), while receiving \$10.5 billion in grants (75% of grants were provided in July–September, and over 80% were provided by the United States).

Second, donors generally used existing programmes to support Ukraine. While this approach can yield faster disbursement of aid, it also limits what can be done, because aid to Ukraine must be fit into programmes that were designed for other goals. For example, the World Bank provided additional loans to Ukraine under existing COVID-

6 In April 2022, the World Bank approved a roadmap (World Bank 2022c) to address the global spillovers from Russia’s invasion of Ukraine.

19-related programmes. Tables A1 and A2 in the Appendix document that support came via a wide variety of different instruments, which increased administrative cost, limited planning horizons, and reduced the fungibility of funds (i.e. the way in which Ukraine can spend it).

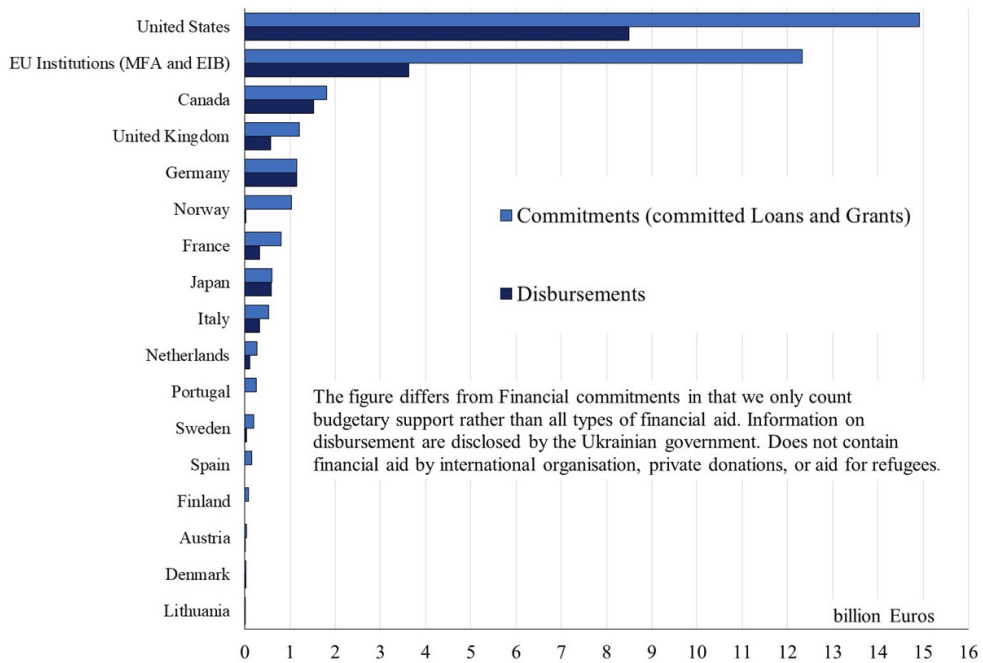
FIGURE 1 FINANCIAL AID (TOP 20 DONORS, IN € BILLION)



Source: Kiel Institute for World Economy, Ukraine Support Tracker Data, Updated 11 October 2022 (available at www.ifw-kiel.de/topics/war-against-ukraine/ukraine-support-tracker/).

Third, there remains a gap between pledges and disbursements. As Figure 2 shows, disbursements lag commitments significantly. This gap is particularly large for EU institutions, where only a third of aid committed was actually delivered. While national governments also display delays in disbursements, these are less extreme. Moreover, when the war is over, the pressure to act will be even less. This suggests that the current framework for disbursements – especially for EU institutions – is ill equipped to provide timely and adequate results.

FIGURE 2 FOREIGN BUDGETARY SUPPORT: COMMITMENTS VERSUS DISBURSEMENTS (TOP 17 DONORS, IN € BILLION)



Source: Kiel Institute for World Economy, Ukraine Support Tracker Data, Updated 11 October 2022 (available at www.ifw-kiel.de/topics/war-against-ukraine/ukraine-support-tracker/).

EU institutions also helped member countries accepting refugees from Ukraine. On 27 February, three days after full-scale war started, an extraordinary meeting of the EU Justice and Home Affairs Council proposed establishing a temporary protection mechanism for refugees; on 4 March the scheme was activated by the European Council.⁷ This involved giving Ukrainian refugees residency rights, access to the labour market, housing, social welfare, medical assistance and means of subsistence. To pay for all this, on 8 March the European Commission adopted the Cohesion's Action for Refugees in Europe (CARE) Act,⁸ authorising member states to provide emergency support to individuals fleeing Ukraine, and €10 billion of the Recovery Assistance for Cohesion

7 The basis for these decisions was developed earlier. An EU temporary protection scheme was adopted in 2001 in the aftermath of the Yugoslav wars to provide immediate temporary protection for displaced people from outside the EU. It was intended for use in circumstances when the regular EU asylum system would have been unable to handle a mass influx of refugees, but apparently was never activated prior to 2022.

8 CARE introduced the necessary flexibility in the legal framework governing the European Structural and Investment Funds (ESIF) and the Fund for European Aid for the Most Deprived (FEAD) to allow swift reallocation of part of available EU funding to emergency support of refugees.

and the Territories of Europe (REACT-EU) were permitted to be used to address the war-related challenges of Ukraine's neighbours. On 28 April, the Commission made €3.5 billion in advance payments to member states to help them support Ukrainian refugees. Other funding followed from European institutions, IFIs and private donors.⁹

While this response to support Ukrainian refugees is admirable, most of the aforementioned funds have not been directed towards support of the Ukrainian state, but rather have been used to help other countries manage the arrival of refugees from the war. Note that disbursement of these funds was faster, because many of these programmes had been designed in response to previous refugee crises, permitting them to be activated quickly.

3.2 Coordination

Current funding of economic aid for Ukraine is also informative on how various donors could coordinate their support.

In March 2022, leaders of the IMF, World Bank, European Commission, EBRD, EIB, and Council of Europe Development Bank established a temporary EU-IFI coordination platform for supporting Ukraine (World Bank 2022b). At fortnightly meetings, country representatives of these organisations discuss Ukrainian short-term financing needs. But although these meetings are useful for sharing information and coordinating operational work, they don't extend to formulation of an overall reconstruction strategy. In a similar spirit, G7 finance ministers meet periodically to discuss financial aid to Ukraine, but those discussions are not institutionalised and do not entail binding financial commitments.

The international financial institutions also act as coordination mechanisms. For example, the US government used the World Bank's multi-donor fund (discussed further below) to route the support to Ukraine. The multi-donor fund also channelled aid from the United Kingdom, Denmark, Latvia, Lithuania and Iceland in the amount of \$134 million. By June 2022 the World Bank had managed to consolidate from donors and to disburse to Ukraine nearly \$2 billion of support. In August 2022, the World Bank announced that additional financing of \$4.5 billion would be provided by a grant by the United States for its designed Public Expenditures for Administrative Capacity Endurance in Ukraine (PEACE) Project, which aims to help the Ukrainian government meet urgent needs created by the ongoing war.

Still other MDTF arrangements were made available to Ukraine during the war. For example, the Administrative Account opened by the IMF in early April 2022 is effectively an MDTF. The European Council agreed on 24-25 March to set up a Ukraine Solidarity Trust Fund. Intended to provide three types of support (humanitarian, liquidity and

⁹ For example, the European Bank for Reconstruction and Development also approved a "War on Ukraine - EBRD Resilience Package" of €2 billion, to meet the immediate needs of people affected by the war. The EBRD's package comprised an immediate Resilience and Livelihoods Program covering energy security, nuclear safety, municipal services, trade finance support and liquidity for SMEs, mostly in countries neighbouring Ukraine.

reconstruction), this MDTF is managed by the European Commission and uses EU budget guarantees to provide funds. During the Lugano Conference in July, the EIB offered to create a new EU–Ukraine Gateway Trust Fund to support both immediate and long-term investment in Ukraine’s reconstruction and the Ukraine National Recovery Plan, specifically the parts focusing on sustainable and smart infrastructure. This MDTF should allow for contributions from EU member states and other countries and partners, further facilitating cooperation among donors and ensuring efficient and effective fund management.

Since the 1990s, MDTFs have been widely used, by the World Bank and others, for channelling concessional finance to fragile states. The World Bank favours this structure because it pools diverse sources of finance and allows the Bank to press for improvements in recipient country transparency and governance. The typical MDTF has a deliberative body of local and multilateral members that sets policy priorities, a separate funding body of donor representatives and national authorities that authorises funding for specific projects, and a project review body that monitors those projects.

Benefits of this structure include flexibility and predictability of funding, visibility, alignment of donors in a common strategic approach, and reduction of information, coordination and administrative costs through the appointment of a single administrator (Scanteam 2007 provides an overview). Implementation can be complex, however. Dominance by donors of the deliberative and review bodies can weaken local political ownership. When the strategic and developmental priorities of donors and the recipient diverge, the donors are likely to win out. Barakat (2009) and others argue that the Afghanistan Reconstruction Trust Fund created in 2002 displayed many of these weaknesses.

In sum, this approach, of channelling aid through a multilateral such as the World Bank, can be convenient for donor countries, insofar as they do not have to administer their aid directly. But other countries pursue different strategies, such as administering their aid themselves. As a result, channelling aid through a multilateral may not provide a consolidated, coordinated channel for disbursements.

3.3 Recap

Funding of economic aid to Ukraine to date is problematic in several respects. Donor coordination is not sufficient. The flow of aid is unstable and falls short of needs. Because donor promises are not always met, aid cannot be treated as a reliable source of finance for government spending. As the number of donors increases, the number of new aid projects will rise, and their average size will, more likely than not, shrink. Such fragmentation could create inefficiencies and a heavy administrative burden.

4 PREVIOUS RECONSTRUCTION PROGRAMMES

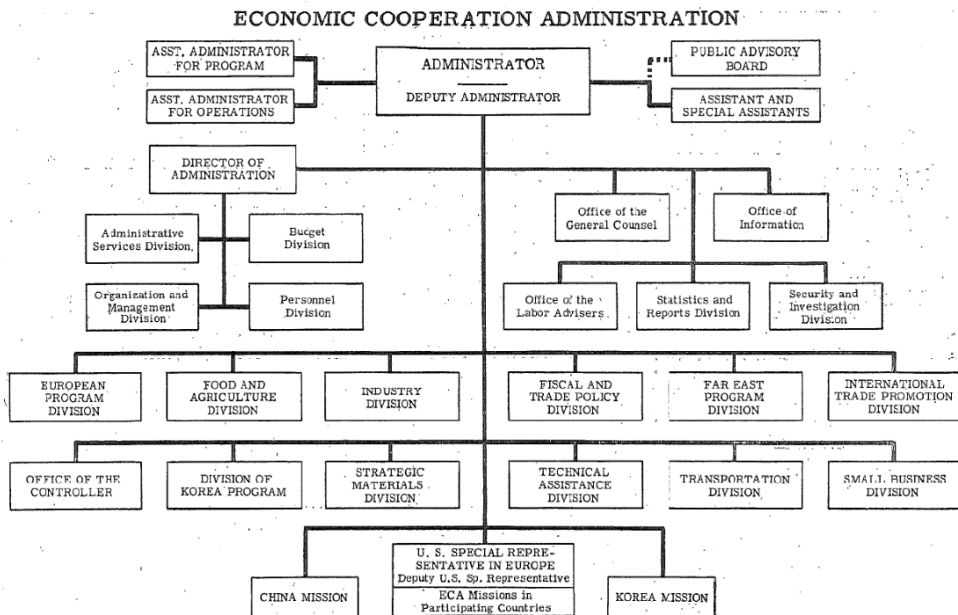
Invariably, public discussions of Ukraine's post-war reconstruction refer to the role of the Marshall Plan in rebuilding Western Europe after World War II. To administer the Marshall Plan, the US government created a self-standing agency, the Economic Cooperation Administration (ECA). The ECA consulted with other branches of government (specifically, the US State and Treasury Departments) but was *not* embedded in them. This design allowed the ECA to limit bureaucratic complications (it was effectively exempt from a variety of government regulations that would have limited its flexibility), which allowed it to ramp up quickly. In addition, separating the ECA from existing departments of the Truman administration insulated it from political interference while at the same time reassuring Republican members of Congress. Although the budget for the ECA was approved annually, the plan for the ECA presumed that this agency would oversee a multi-year effort.

The ECA tapped private-sector expertise, starting with its head, Paul Hoffman, president of Studebaker, who was known as a talented administrator. It had a 600-employee regional office in Paris and missions of American government officials to advise and observe in each country receiving aid. It avoided the United Nations (UN), where the Soviet Union's membership would have created complications. To ensure that the ECA did not suffer from mission drift, enabling legislation included sunset provisions.

This structure contrasted with other post-World War II efforts to rebuild Europe – for example, the UN Relief and Rehabilitation Administration (UNRRA) had been established in 1945 to provide economic assistance and address the refugee crisis. Although the US government funded more than a half of UNRRA's \$3.7 billion budget, bickering over who would fund and run the programme, and to what end, started almost immediately. Lack of personnel and leadership as well as uncertain budgets plagued the program. UNRRA's engagement with local governments was not well structured, in part because UNRRA controlled resources unilaterally and ignored local input. UNRRA did not have a clear mandate for dealing with local governments, and local governments were themselves in disarray after the war. Only gradually did UNRRA ramp up coordination with other organisations providing relief. Its sternist critics dismiss UNRRA as an amateurish failed effort at international cooperation (Hitchcock 2009). The administration's shortcomings were apparent to contemporaries. In the context of discussing the Marshall Plan, Will Clayton of the US State Department observed that "... we must avoid getting into another UNRRA".

In contrast to UNRRA, for the Marshall Plan the US government developed a hierarchical structure to ensure that the responsibility and authority were delineated clearly (Figure 3). The administrator of the ECA was the ultimate decision maker, situated at the top of a well-defined chain of command. This army-style line-and-staff design reflected not only the views of George Marshall, a long-time military man himself, but also lessons learned from UNRRA.

FIGURE 3 ORGANISATIONAL CHART FOR THE ECONOMIC RECOVERY ADMINISTRATION (MARSHALL PLAN)



Source: <https://library.marshallfoundation.org/>

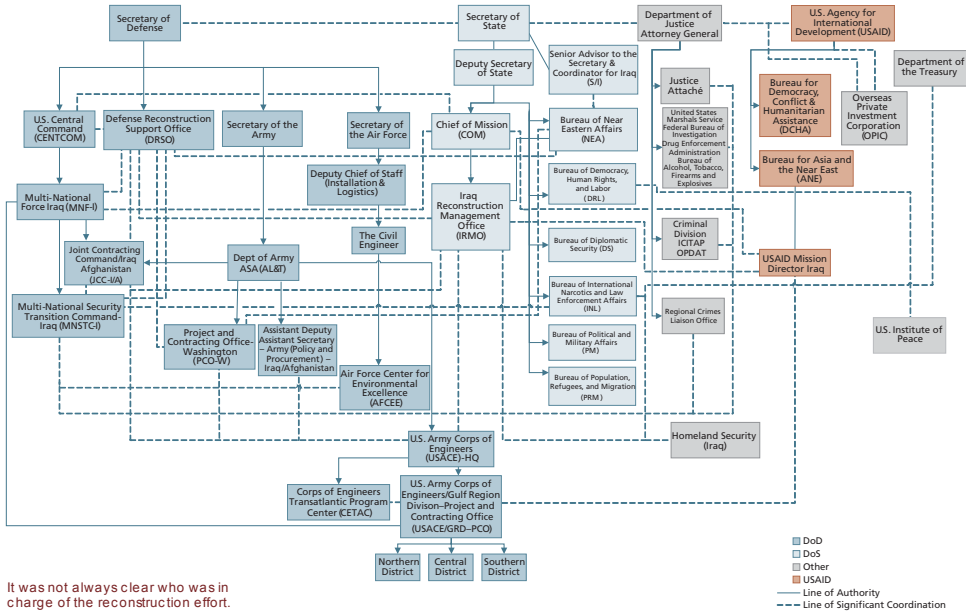
Interestingly, this design contrasts with designs used for subsequent US reconstruction efforts. For example, Figure 4 illustrates how authority and funding were dispersed in the post-2003 reconstruction of Iraq. While a variety of departments and agencies contributed to running the show, there was no explicit platform for coordination. There was no single administrator with the power to resolve interdepartmental disputes. Furthermore, the choice of who played a leading role in the recovery effort was not geared toward agencies specialised in reconstructing economies: the US Department of Defense directed programmes covering more than 75% of US funds, while USAID directed not more than 15%. Three successive organisations bore responsibility for providing the US reconstruction programme with strategic oversight and tactical direction. Finally, note that this organisational chart does not include other countries or international agencies. As a result, reconstruction in Iraq was plagued by poor planning, weak oversight, poor coordination (if not rivalries) across agencies, weak security, poor involvement of locals, low capacity to absorb aid and understaffing.

Similar problems afflicted the recovery of Puerto Rico after Hurricane Maria in 2017. Four years after the hurricane, Puerto Rico still lacked electricity and many homes and buildings still had only temporary roof covers in place. As of the summer 2021, only \$18.6 billion of an allocated \$64 billion had been spent.¹⁰ Among the reasons were red tape

10 <https://grupocne.org/2021/09/15/the-threefold-challenge-to-the-puerto-rican-economy/#hurricane-maria>

(specifically, extensive bureaucracy at the Federal Emergency Mitigation Agency (FEMA) responsible for reconstruction), a debt overhang that discouraged new investment, non-transparent use of funds and the fact that Puerto Rico’s government had little say in the process.¹¹

FIGURE 4 ORGANISATIONAL CHART FOR THE RECONSTRUCTION OF IRAQ AFTER 2003



It was not always clear who was in charge of the reconstruction effort.

Source: SIGIR (2013).

The experience of Pakistan’s reconstruction after its earthquake in 2005 is more positive (World Bank 2014). The scale of the natural disaster was such that line ministries and local authorities lacked the capacity to effectively organise a comprehensive reconstruction effort. That effort required extensive coordination and a considerable degree of centralisation if it was to deliver the key objectives of mobilising funding and external aid, building back better (especially in terms of seismic safety), achieving a rapid recovery, allocating funding efficiently, enhancing sustainability and achieving inclusivity.

11 www.hispanicfederation.org/media/press_releases/almost_two_years_after_hurricane_maria_devastated_puerto_rico_funds_and_support_needed_from_congress_and_the_federal_government_are_still_lacking_while_government_drowns_in_debt_repayment/

The government therefore established a special authority: the Earthquake Reconstruction and Rehabilitation Agency (ERRA). This new body had a number of desirable features (Figure 5 provides ERRA's organisational chart). First, it was headed by the prime minister, which provided strong political backing and a clear sense of ownership. ERRA had the necessary centralisation to achieve uniform policies and standards, and a sustained flow of funding. At the same time, it involved the international community in a variety of roles (providing technical expertise, oversight, etc.).

Second, the government developed a plan for reconstruction to be undertaken quickly (ERRA itself was launched only three weeks after the earthquake). This was instrumental in securing external funding and laying the groundwork by, for example, providing early and credible damage assessment. ERRA developed a set of sectoral policies and priorities to concentrate resources on key programmes. Early planning at the national level was instrumental in achieving a holistic approach and the prioritisation necessary for cluster projects and sustainable recovery.

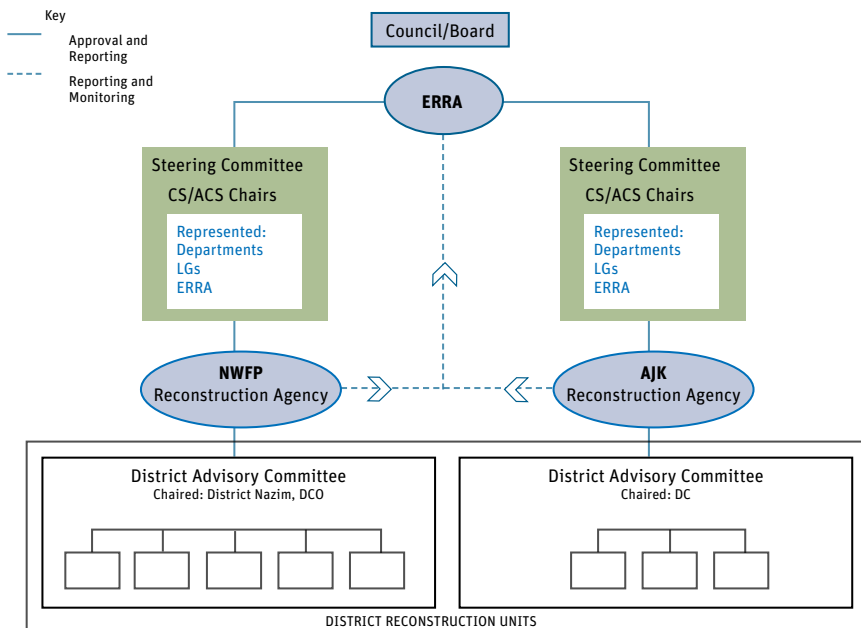
Third, although a centralised agency oversaw and coordinated aid, implementation was decentralised, employing the subsidiarity principle. Local authorities could approve and implement projects up to a specified price tag. Larger projects involved regional governments, while the largest projects were determined by the central authorities. This tiered approach enhanced ownership by, inter alia, local governments and improved information sharing and coordination. To ensure that funds were not diverted, project results were reported to the relevant steering committees, and funding was provided in tranches. ERRA's organisational structure emphasised horizontal linkages to provide forums for dialogue between stakeholders.

Fourth, to ensure sustained support of donors, ERRA allocated projects (or sectors) to specific donors. This attached donors to specific responsibilities and provided an opportunity for donors to report achievements to their stakeholders. ERRA ran monthly meetings of donors to cultivate relationships and prevent donor fatigue. Overall, ERRA attracted \$2.5 billion in grants and \$4 billion in loans. Although Saudi Arabia, the United States, China, Iran, the United Arab Emirates and development banks accounted for the bulk of these funds, ERRA established a dedicated 'Donor and Sponsor Wing' to coordinate funding from smaller donors. This approach provided a single interlocutor for potential donors, lightening the burden of attracting and managing aid.

Fifth, ERRA had a strong legal mandate and sunset provisions. The former was necessary to overcome inertia and bureaucratic bottlenecks, while the latter were needed to ensure that ERRA did not turn into a new bureaucracy substituting for line ministries and other authorities. ERRA also provided much needed data gathering and data processing to evaluate progress and strengthen accountability.

Finally, ERRA financed construction of only seismically safe houses, consistent with the 'build back better' principle.

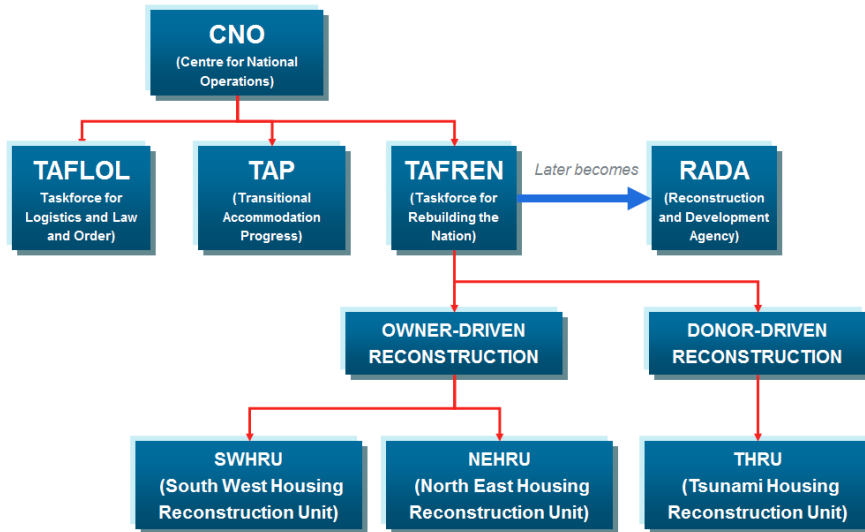
FIGURE 5 ORGANISATIONAL CHART FOR THE RECOVERY AFTER THE 2005 EARTHQUAKE IN PAKISTAN



Source: World Bank (2014).

Reconstruction of Sri Lanka after the 2004 tsunami provides similar lessons. Sri Lanka established a dedicated reconstruction agency with a clear structure (Figure 6). Its Taskforce for Rebuilding the Nation was composed of high-level officials and businessmen, and was structured to minimise red tape and ramp up quickly. Sri Lanka pursued policies consistent with the 'build back better' principle: new houses were built according to higher standards; new regulations on construction, fishing and tourism in coastal areas were introduced; education programmes were developed on what to do in the event of disasters. However, a lack of well-planned land use policy and construction guidance resulted in a somewhat chaotic process of land allocation and varying quality of construction. Over-reliance on local governments created disparities between regions. The reconstruction agency was dismantled too early, which prevented institutionalisation of its experience and knowledge transfer.

FIGURE 6 ORGANISATIONAL CHART FOR THE RECOVERY AFTER THE 2004 TSUNAMI IN SRI LANKA



Source: Franco et al. (2013).

5 LESSONS AND SUGGESTIONS FOR UKRAINE

A successful recovery must align the interests of the country and its donors. This means organising reconstruction round the following principles:

- Ukraine must own the process of reconstruction, i.e. it must be responsible for developing a reconstruction plan that prioritises projects and ensures accountability. This plan should be developed with the participation of business and other stakeholders with financial skin in the game.
- Although donors must allow the country to set priorities, they can provide a source of oversight and offer technical assistance, especially where the country lacks institutional capacity.
- The reconstruction agency, in which the Ukrainian authorities and donors participate, should have autonomy and decision-making authority.
- The aid organisation should be as streamlined as possible, with clearly delineated project definition, selection management responsibilities.

Ukraine’s reconstruction plan must provide incentives for transparency and accountability. Procurement rules should be designed to deter ‘gold diggers’ seeking to exploit and redirect foreign aid. The current digital system, ProZorro, where bids and contracts are available for all to see, simplifies the procurement process, but cannot on its own entirely solve the corruption problem, since corruption can afflict more than just

procurement (more on this in the chapter in this book on anti-corruption by Torbjörn Becker and co-authors). Hence, Ukraine's reconstruction plan must also include additional oversight mechanisms, analogous to the Marshall Plan's country missions, to monitor procurement and other expenditures.

Data and information will be key for civil society and donors to monitor reconstruction spending. Ukraine has a considerable level of digitalisation. Locally created digital systems of e-governance can be leveraged for reconstruction. Data on reconstruction spending and project completion can be disseminated through an integrated, continuously updated digital platform. Accompanying commentary will help people to understand these data and see how the reconstruction effort enhances their communities.

The reconstruction agency will require high-level political support from the leaders of the EU, G7 and allied countries. Effective functioning of the agency will require not only inclusive representation of key multilateral and bilateral donors, but also strong political backing for coordination, technical expertise and local knowledge via on-the-ground representation in Ukraine (via embassies and local offices of international financial institutions). Technical assistance should be organised as a permanent task force consisting of high-level experts (perhaps seconded from participating institutions). Given that EU membership is Ukraine's endgame, the European Commission should play a particularly important leadership role.

This discussion suggests that the reconstruction agency should be designed along the following lines:

- Since the endgame for Ukraine is membership of the EU, the agency should be headquartered in Brussels and draw on human and other resources of the European Commission. However, the agency should have a strong presence in Kyiv to ensure Ukrainian ownership.
- The agency should establish an MDTF to pool donor funds. The agency should be led by a managing director selected on a competitive basis with experience of working closely with the European Commission. The management team will be comprised of the managing director and a set of deputy managing directors representing each non-European G7 country. This will prevent the agency from being seen as a European captive and Ukrainian reconstruction from being reduced to a European endeavour.
- The agency should be independent, including of the EU organs. Staff, including staff seconded from the EU agencies, will be hired via a merit-based selection process.

- A supervisory board of representatives of governments (including contributing governments not part of the G7), representatives of international organisations and representatives of leading NGOs will meet periodically to monitor and approve the broad parameters of funds allocation as proposed by the agency's management team.
- The agency should have a hierarchical structure with clear lines of responsibility (ERRA or ECA can serve as examples). Middle management should be empowered to make decisions within their areas of responsibility (the delegation or subsidiary principle). Staff responsible for operations and project implementation should be based in Ukraine whenever possible.
- The priority list of projects should be generated by the Ukrainian government, which has local knowledge and must assume ownership of the reconstruction, but vetted by the agency.
- The agency should have subdivisions structured by sector (infrastructure, education, construction, etc.) rather than by region, since its primary responsibility will be country-wide projects. The agency will consult mainly with Ukraine's national government, which will in turn liaise with regional and local governments, although there should also be opportunities for its local representatives to consult directly with regional governments.
- The agency should have units responsible for: (1) regular donor conferences; (2) communication and coordination with stakeholders (most importantly the Ukrainian government at multiple levels, but also businesses and civil society) both before and after projects are implemented;¹² and (3) collection and dissemination of pertinent data on reconstruction projects (including 'small' projects financed by individual countries, cities or philanthropists).
- Reconstruction spending and results should be audited by one or more international recognised auditing/accounting firms.

5.1 Matching donors and projects

A key task (discussed above and in the chapter on governance by Tymofiy Mylovanov and Gerard Roland) will be prioritising projects and matching them with funding. Building on the experience of previous reconstruction efforts, the reconstruction agency could offer a menu of financeable projects to donors, investors and philanthropists. Projects would be pre-approved and coordinated to avoid waste and duplication. A blueprint for how this might work is in Table 1. After creating a catalogue of funding opportunities, the agency would develop a searchable electronic system akin to a 'public budge'.¹³ Each

¹² More suggestions on the operations of the agency can be found in the chapter in this book on governance.

¹³ <https://budget.e-dem.ua/landing>

project would have a detailed description, budget and listing of funds already secured by central or local governments. Public-private partnership projects would include cash flow forecasts and other documents needed for informed investment decisions. Private philanthropists would receive recognition (for example, they might have a building named after them). For-profit investment in Ukrainian enterprises and greenfield sites can be further encouraged by the adoption of supportive institutional reforms (discussed in the chapter on business environment by Yegor Grygorenko and Monika Schnitzer and the chapter on governance).

TABLE 1 DONORS VERSUS PROJECTS

Project donor/ investor ↓ \ Project owner →	Central government (approved by Agency)	Local governments (approved by Agency)	Private enterprises; communal enterprises (coordinated by Agency)
IFIs, EU: grants, technical assistance (TA)	Institutional development at the central level**	Institutional development at the local level**	Small grants; implementers of TA or reconstruction projects
IFIs, governments: grants, loans; TA	Large infrastructure (rails, energy, roads)**	Housing districts; heating plants, sewage systems, etc.**	Hospitals, schools, universities, etc.**
Private investors (PPP projects)*	Parts of infrastructure (ports, airports, parts of roads etc)	City infrastructure such as public transport	-
Private sector: philanthropists	-	Hospitals, schools, universities, etc. (these can bear their names)	Provision of training, expertise, small grants
Private investors*: direct for-profit investment	-	Greenfields/ brownfields for enterprises (privileges only on local taxes can be allowed)	Buying a share in an enterprise or establishing a joint enterprise

Notes: Blue cells show project developers and donors, other cells show examples of projects. Although we divide here projects by owners (central, local governments or private entities), other divisions are possible (for example, by size of a project). * for these projects, insurance of war risks will be needed. ** for these projects, the reconstruction agency should provide audit and reporting. For other projects, audit is ensured by investors.

6 FUNDING

Ukraine's post-war needs will be enormous. No single institution can provide the necessary finance. Multiple instruments will have to be employed, and multiple entities will have to coordinate their efforts.

6.1 Debt relief

Debt sustainability is a major concern. The Ukrainian government serviced its debt in the first months of the war,¹⁴ at which point it became clear that continuing to service public debt under wartime circumstances simply was not feasible. On 20 July 2022, official creditors from G7 countries and the Paris Club announced their intention of suspending principal and interest payments on Ukraine's bilateral debts from 1 August 2022 until the end of 2023, with the possibility of extending the suspension for an additional year. Private creditors agreed to a similar deal on 14 September 2022. Repayments on Eurobonds and other debt instruments of some \$20 billion were shifted forward by two years.

It remains to be seen how this programme will fare when the war is over. But it is hard to imagine a scenario in which Ukraine receives large amounts of aid from one set of countries and uses it to pay off its pre-war debts to others. Similarly, using an injection of public funds to pay off existing private creditors is neither economically nor politically viable. The alternative is to restructure and reduce the existing debt overhang, which will help to put Ukraine on a sustainable trajectory towards recovery and provide access to global capital markets, facilitating private investment inflows.

There are precedents. In 2015, after Russia occupied a part of Ukraine's territory, Ukraine reached an agreement with its bondholders (IMF 2016): they agreed on the 20% haircut, deferral of interest payment and a replacement of part of the debt by GDP warrants, interest on which was tied to the GDP growth.

As part of its debt restructuring, Ukraine and its donors should consider issuing Brady bonds, i.e. bonds backed by zero-coupon US Treasury securities and their equivalent, where the Treasury backing is provided by official donors. (In the case of the Brady Plan, countries used their own resources for collateral as well as funds from international donors, the IMF and the World Bank. Given Ukraine's extenuating circumstances, it would be logical for the collateral to come from donors.) These bonds will bear some risk, given the inevitable uncertainty about Ukraine's post-war economic prospects. But it should be possible to induce investors to buy them, since in the event of default those investors would still receive some compensation in the form of US Treasury bonds or other safe assets serving as collateral. The merit of such a scheme is that it would allow Ukraine to return to international financial markets. Recall how Brady bonds jumpstarted Latin America's return to international capital markets in the 1990s by whetting the appetite of international investors and helping to create liquid markets in the securities of the countries in question.

14 The financial markets were surprised on 1 March 2022, a week after the war started, when the government made a coupon payment on Eurobonds maturing in September 2022. Furthermore, the government insisted that it would service its debt.

Under the Brady Plan, the average haircut was 35%, which is also typical for haircuts in recent decades (Edwards 2015). But exact levels of forgiveness varied with country circumstances, from 20% for Venezuela to 80% for African countries (Cline 1995). The debt of post-conflict countries typically receives haircuts approximately 20 percentage points larger than in other restructurings (Edwards 2015).

Perhaps the closest comparison is Iraq's debt restructuring after 2003. Unlike in typical debt restructurings, Iraq's creditors were allies interested in setting the country on a sustainable growth trajectory. With strong political backing and tools to encourage creditors to accept deep discounts (see below), the pre-war debt of \$130 billion was reduced by nearly 90%.

The assets of the Central Bank of Iraq, held both domestically and abroad, were protected from attachment by transferring them to a Development Fund for Iraq (DFI) set up following a United Nations Resolution (Hinrichsen nd). The DFI also received future petroleum revenues and received immunity under UN privileges. Other Iraqi assets were immunised by countries individually; in the US case, George W. Bush issued an Executive Order to this effect in 2003.

In a different context but to the same effect, the UK Parliament passed a law in 2010 limiting the enforcement of debt contracts by private creditors for countries participating in the IMF and World Bank's Heavily Indebted Poor Countries (HIPC) Initiative. The law was designed to prevent creditors from using the UK courts to extract harsh and inequitable payments from poor countries for their debts. Specifically, the law limited the amount of debt recoverable by a creditor in the UK courts by the amount set by the HIPC Initiative (see IMF 2010 for more details).

Following this precedent, the United Kingdom can provide substantial protection from creditors who may attempt to seize Ukraine's international assets, since Ukraine's Eurobonds are issued under English law. Similarly, the US can limit the ability of creditors to attach Ukraine's assets in US courts. President Biden could issue an executive order shielding Ukrainian property from its creditors in US courts, as President George Bush did for Iraq in 2003. These policies reduce the value of holding out and encourage broader participation in debt restructuring, delivering a larger haircut.¹⁵

6.2 Funding instruments

As discussed above, Ukraine will need mainly grants rather than loans if its post-war reconstruction is to be sustainable. To provide such grants (ideally with minimal administrative burden and maximum donor coordination), we suggest developing a facility expressly tailored for supporting Ukraine during and after the war. This

¹⁵ Yet another option would be a UN Security Council Resolution instructing national governments to shield Ukrainian assets from judicial attachment, although Russia's participation in the Security Council may render this approach problematic. See Obstfeld et al. (2022), on which the preceding paragraph draws.

instrument could be similar to the International Finance Facility for Immunization (IFFI), established in 2006 to address the global threat of infectious diseases by establishing vaccination programmes in countries with limited funds and/or limited capacity to establish such facilities themselves.¹⁶

The IFFI reduces uncertainty around fund inflows by having donor countries provide legally binding commitments to supply specified funds over a horizon of 20 or more years.¹⁷ IFFI bonds are issued against these pledges and sold on markets through the World Bank. Bonds are redeemed over time as donors provide monies pledged. This arrangement spreads the burden on donor countries while providing the recipient with money up front. Pooling administration through the World Bank limits overhead costs.¹⁸

Besides raising money, this mechanism can be used to speed the initiation of reconstruction, in a manner similar to the COVAX mechanism¹⁹ used to speed vaccine production and distribution during the pandemic. Money raised via bond issuance can be used to pre-order materials and equipment needed for reconstruction (e.g. construction materials, electric power equipment), and thereby mitigate potential shortages when reconstruction actually starts.

Such funding arrangements may require legislation and new procedures on the side of the donors.²⁰ However, the cost of this legislative work will probably be lower than the administrative cost of attempting to finance Ukraine with existing instruments.

6.3 Funding

The chapter in this book on the business environment and the chapter on international trade and FDI by Veronika Movchan and Kenneth Rogoff discuss ways of attracting private capital. While attracting inflows of FDI and portfolio investment are critically important, they will have to be supplemented by official and philanthropic funding, on which we focus here.

Bilateral aid

US government grants provide an example for direct bilateral support. Unlike EU governments and financial institutions (e.g. the European Investment Bank or Macrofinancial Assistance), the US uses budgetary resources to issue grants to Ukraine.

16 See Fedder (2022) for details.

17 <https://iffim.org/donors>

18 GAVI (Global Vaccine Alliance, of which IFFI is a subsidiary) collects money from governments and private investors, such as Bill and Melinda Gates foundation and Visa. There are additional fundraising instruments: Matching Funds (donors promise to donate the same amount as private individuals or companies contribute); the Pneumococcal Advanced Market Commitment (a centralized procurement agency that pools demand from countries for Pneumococcal vaccines and thus allows them to purchase vaccines at lower prices; some of these vaccines are financed by countries themselves and some by donors); Loan Buydowns (this program entails loans guaranteed by donors taken by the poorest countries of Sahel region for their immunization programs).

19 www.gavi.org/vaccineswork/gavi-covax-amc-explained

20 For example, the EU commission needs new legislation to provide Ukraine with €18 billion in 2023 (https://ec.europa.eu/commission/presscorner/detail/en/ip_22_6699). In 2022, the US government provided a portion of its support via the USAID and the World Bank to avoid violating its existing budget rules; other countries can have similar restrictions on bilateral aid.

This is similar to budgetary funding of the Marshall Plan. While this approach is beneficial in many ways (high transparency, low debt burden for Ukraine, etc.), it also creates complications. Political pressures make multi-year commitments difficult to meet, given how priorities can shift over time. Bilateral support can encourage free riders, whereby some governments attempt to minimise their commitments while hoping that other governments fill in the gap. This problem is already on display insofar as the EU institutions have failed to match funding provided by the US government to date.²¹

Thus, bilateral aid must be complemented by strong coordination. Furthermore, bilateral funding is conducive to the problem of uncoordinated donor-driven reconstruction, a situation where the donor selects projects in order to ‘put a flag’ on them (choose contractors from the donor country, build facilities that can carry the name of the donor, etc.).

EU pre-accession and structural funds

The EU can provide significant aid to Ukraine, now a candidate for membership, via its Instrument for Pre-Accession Assistance (IPA). Although the IPA budget envelope for 2021–2027 is only €14 billion, IPA can pay for expenditures that may be hard to cover with other funding (e.g. reforms of the judicial branch and civil service consistent with the EU’s *Acquis Communautaire*). European Structural and Investment Funds (€274 billion for 2021–2027) may be unavailable to Ukraine until it formally joins the EU, but it should be possible for an IFFI-like fund to borrow against future allocations of these monies.

Recognising the limited firepower of existing instruments for the reconstruction of Ukraine, the European Commission (2022) proposed to set up the ‘RebuildUkraine’ Facility as the main legal instrument for the EU’s support. This facility would be embedded in the EU budget and issue aid through a mix of grants and loans. As a result, it would not only give budget support but also require Ukraine to follow EU’s standards for transparency, accountability, financial management, and so on.

Russian assets

Many governments froze Russian assets ranging from the reserves of the Russian central bank to yachts of businessmen associated with President Vladimir Putin. Although it is not clear how much money will have been frozen by the end of the war, amounts will surely be in the hundreds of billions of dollars. Popular discussions often centre on using these assets to pay for Ukraine’s reconstruction.

Another potential source could be reparations from Russia to Ukraine. We do not have enough information at this point to evaluate the feasibility of this funding source, but one can point to several historical precedents.

21 Partly, the delays in the EU support are caused by the EU decision-making mechanism (unanimous voting), which allows certain EU members to block decisions.

During World War II, the US government vested (i.e. took control of) and eventually seized Japanese and German assets in the US. It also vested (but did not seize) assets owned by countries occupied by Germany.²² After the war, German and Japanese assets were sold and the proceeds directed to cover war claims and compensate victims. The Office of Alien Property in the Justice Department oversaw this process.²³

The United Nations Security Council (UNSC) mandated Iraq to pay reparations to Kuwait (population of 2.1 million in 1990) after the Iraqi invasion in 1990. Proceeds from sales of Iraqi oil were put in an escrow account controlled by the UNSC. Part of this revenue was directed to Kuwait as compensation for war damages. A multinational military interception force was created to inspect and, if necessary, impound vessels suspected of violating the sanctions imposed on Iraq. Total reparations were \$52 billion.²⁴

When the Taliban took over Afghanistan in 2021, President Biden issued an executive order to seize \$7 billion in Afghan central bank assets on deposit at the Federal Reserve Bank of New York. Roughly half of this sum was committed to claims filed by the victims of the September 11th attack. The rest was directed to a trust fund to help the Afghan people without benefiting the Taliban.

A lasting peace can be achieved only when a potential aggressor knows that it will be forced to pay compensation to the victim. At the same time, we recognise that reparations can have unintended consequences. After World War I, the reparations burden imposed on Germany helped to destabilise its economy and policies, with negative implications for its neighbours. Reparations hardened its antagonism towards the allies, which did not help in establishing a lasting peace. Thus, we neither endorse nor reject the idea of using vested Russian assets and other Russian funds to pay reparations, but only echo the United Nations General Assembly decision on 14 November²⁵ suggesting that this possibility should continue to be explored.

International Monetary Fund

The IMF will be able to contribute only limited funding for the reconstruction of Ukraine, since it provides loans while Ukraine needs grants. The IMF can still play a number of useful roles, however. It can provide expertise to the Ukrainian government and the reconstruction agency. It can provide bridge loans prior to the materialisation of grant funding from other sources. Specifically, post-war Ukraine may require loans to deal with short-term balance-of-payment or fiscal needs if that grant funding is slow to materialise.

22 The Census of Foreign-Owned Assets in the United States was instrumental in identifying Nazi (or Nazi-controlled) and Japanese assets (US Treasury Department 1945).

23 More details are available in the report compiled by the Presidential Advisory Commission on Holocaust Assets in the United States (PCHA 2000).

24 When G7 countries introduce the price cap on Russian oil, part of the proceeds from this scheme can be used to support Ukraine's budget during the war.

25 UN Resolution # A/ES-11/L.6 (<https://documents-dds-ny.un.org/doc/UNDOC/LTD/N22/679/12/PDF/N2267912.pdf?OpenElement>).

In addition, the IMF could establish a trust fund, resembling the Resilience and Sustainability Trust (see IMF 2022 for details), that would collect donations of SDRs or money from developed countries and issue loans or (preferably) grants to Ukraine. For this, the IMF will need to design a framework establishing (1) terms of loans (interest rates, duration, etc.); (2) conditionality (e.g. implementation of specific reforms); (3) the purpose of the fund (e.g. raising energy efficiency of Ukraine, although we would recommend a broader purpose of reconstruction). Some time will be required for drafting the legal framework for this trust fund and for fundraising, thus this work can start early, while specific loans or grants will be issued when the hostilities cease and it becomes possible to assess the macroeconomic framework and make at least some projections.

World Bank and other development banks

The World Bank is able to offer grants to countries recovering from natural disasters, wars and other calamities (for example, through its Global Shield Financing Facility). Apart from these programmes, the Bank can provide funding for military-risk insurance through its Multilateral Investment Guarantee Agency (MIGA). Such insurance will be critical for attracting private investment (see more in the chapters on business environment and trade and FDI).

The European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB),²⁶ national development agencies²⁷ and other development banks should play an active role. For example, for five years following adoption of the Dayton Accords, Japan's International Cooperation Agency for Development Policy (JICA) provided support for reconstruction in Bosnia-Herzegovina, which was recovering from a civil war. In the spring and summer of 2022, JICA provided Ukraine with \$500 million in loans on concessional terms (with an interest rate of 1%) for emergency economic recovery, particularly to ensure priority social and humanitarian expenditures, health expenditures, support for internally displaced persons and other priority expenditures.

Although development banks offer loans on concessional terms, these being loans rather than grants, they may still contribute to debt sustainability concerns.

26 In the first six months of the war, the EIB disbursed some €1.7 billion to help Ukraine repair infrastructure and provide essential social support. These loans were backed by a guarantee from the EU. This was part of a broader initiative known as the EFSD+ Guarantee Agreement for EIB sovereign lending, under which the EU covers the risk of EIB loans to entities outside the EU, principally to fund public sector investments in railways, roads, schools, hospitals, and water and sanitation projects. In addition, the EIB made €4 billion in credit lines available to EU member states for mitigating the costs of hosting Ukrainian refugees.

27 At the end of March, the Ministry of Finance of Ukraine inked an agreement with the French Development Agency to obtain a loan of €300 million on concessional terms.

Internal resources

To ensure that Ukraine utilises funds effectively, the government will need to have ‘skin in the game’. It will have an incentive to select projects carefully insofar as it pays a portion of the cost out of its own resources. There is no magic number for the optimal share of these matching funds. The higher the recipient government contribution, the stronger will be ownership and efficiency of project selection, other things equal. But the higher that contribution, the more tightly financial constraints will bite. Under the Marshall Plan, domestic counterpart funds matched Marshall Plan grants 50/50.

Private donations

Fundraising platforms have not been entirely effective in mobilising private donations. A special account set up by the National Bank of Ukraine in the first days of war collected approximately \$550 million as of end-October, while the government-led platform United24 collected \$200 million. By comparison, an Ukrainian NGO, Come Back Alive, a private fundraiser that provides army supplies, collected \$128 million over the same period. While crowdfunding is valuable for mobilising resources and raising the international visibility of Ukraine and its needs, it alone is unlikely to attract the sums necessary to meet reconstruction needs. ‘Big money’ donors (namely, governments) require accountability and conditionality that crowdfunding platforms cannot provide.

Equity

As emphasised in other chapters, reconstruction will require effective public–private partnerships to achieve more efficient allocation of resources and insure high multipliers for public funds. But given post-war uncertainties and lingering security concerns, private investors may hesitate to put money into Ukraine. Public funds can be instrumental in closing this gap. This model was used by the EBRD in the 1990s and 2000s, when investment in the post-Soviet bloc was highly risky. A typical sequence is as follows: the EBRD purchases a share of a Ukrainian company, provides it with capital and managerial expertise, and then after a period of years sells its stake to private investors. The model resembles venture capital investment with a social twist. Energy (e.g. solar panels, biogas equipment), information technology and military technology (e.g. drones) are examples of sectors that could be attractive for this kind of investment. It may be possible to scale up this model using the European Development Finance Institutions Coordination Group (EDFI), consisting of institutions established in the EU or in a country of the European Free Trade Association (EFTA), to provide finance for the private sector in countries outside the EU.²⁸

²⁸ Members include the EBRD, British International Investment, IFU (the Danish Development Finance Institution), Finnfund (the Finnish Fund for Industrial Cooperation) and Proparco (the French Development Finance Institution).

7 CONCLUDING REMARKS

Post-war reconstruction will be a herculean task. Existing institutions and funding instruments are inadequate to meet the scale and complexity of this endeavour. The extraordinary challenges created by Russia's invasion must be met with extraordinary policies. The architects of Ukraine's reconstruction would be wise to draw on lessons from previous recovery programs.

We recommend creating a dedicated European Commission-led agency for the reconstruction of Ukraine. This agency should be headquartered in Brussels but have most of its staff on the ground in Ukraine. It should have a managing director experienced in dealing with the European Commission, but a management team of deputy managing directors from non-EU G7 countries, to avoid the impression that Ukrainian reconstruction is a European endeavour. It should have a Supervisory Board on which other donor governments, multilaterals and NGOs are also represented. While drawing on Commission staff and expertise, the agency should be independent of the Commission and its regulations, enabling it to ramp up quickly. It should have a simple, streamlined structure similar to that of the Marshall Plan and Pakistan's Earthquake Reconstruction and Rehabilitation Agency.

The priority list of projects should be generated by the Ukrainian government, which has local knowledge and must assume ownership of the reconstruction, but vetted by the agency. A further task of the agency will be to match donors to projects, while assuring donors that their money is efficiently spent. The agency will need to develop, in conjunction with the Ukrainian government, high-quality data and digital systems for systematising, controlling and reporting on projects. Note that spending and control of funds are discussed at length in the chapters on governance and anti-corruption in this volume, while the provision of war insurance to facilitate inflow of private funds is discussed in the chapters on trade and business environment.

Vast reconstruction needs call for raising funds from a broad range of sources. The reconstruction agency will have to mobilise funding from bilateral grants, development organisations (the World Bank, regional development banks and other development agencies), the IMF (for bridge loans and SDRs donated by other countries to Ukraine), EU pre-accession and structural funds, private donations, equity and other portfolio investment, and possibly seized Russian assets. Because adequate funding may be slow to materialise, there is a need for an arrangement similar to the International Finance Facility for Immunization, whereby donors pledge to provide a certain amount of money over a long period and the facility issues bonds against these future donations. Some of these funding mechanisms will require new legislation at the national level and new procedures at international organisations. It is important to start now in laying these legal foundations.

Ukraine will need debt relief. While the size of haircuts and the specifics of restructuring remain to be seen, historically haircuts have ranged from 20% (Ukraine's debt restructuring after the Russian aggression in 2014) to 90% (Iraq's debt relief after 2003). To ease access to international capital markets, Ukraine and its donors could issue bonds backed by collateral provided by the donors (analogous to the zero-coupon US Treasury bonds that backed Brady bonds).

Ukraine cannot climb this mountain alone. Nor can Ukraine and the international community waste this chance. Ukraine has been creative in turning challenges into opportunities. The world should be equally creative in taking risks and searching for opportunities. The success of Ukrainian reconstruction will do much to shape the future of Europe and prospects for global security.

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APPENDIX

TABLE A1 SUPPORT LOANS PROVIDED TO UKRAINE BETWEEN 24 FEBRUARY AND 31 OCTOBER 2022

Organisation	Instrument	Amount (US\$ million)
IMF	Rapid Financing Instrument (RFI)	2,693
EU	Macrofinancial assistance	4,219
European Investment Bank	Main loan for agriculture program	432
European Investment Bank	Loan for SMEs and companies with medium APEX	288
European Investment Bank	Loan for Ukraine's reconstruction	1,000
Canada government	Loan	392
Canada government	Loan	1,128
Italy government	Loan	206
French development agency	Loan	332
Japan development agency	Loan for reconstruction	581
German development agency (KfW)	Loan for SMEs - Covid financing	162
German development agency (KfW)	Extraordinary economic program for Ukraine	162
IBRD and International Development Association (IDA)	Sustainable governance support in Ukraine	566
IBRD (World Bank)	Third additional financing for sustainable governance support in Ukraine	503
IBRD (World Bank)	Additional loan for economic renewal	404
IBRD (World Bank)	Improving higher education in Ukraine	120
IBRD (World Bank)	Second additional financing for rapid reaction to Covid-19 and vaccination	111.6
IBRD (World Bank)	Eastern Ukraine: rejoining, recovery, renovation	99
IBRD (World Bank)	Modernisation of social support system in Ukraine	54.6
IBRD (World Bank)	Second additional financing for overcoming Covid-19 consequences	40
IBRD (World Bank)	Acceleration of investment to agriculture in Ukraine	34.5
IBRD (World Bank)	additional financing for rapid reaction to Covid-19 and vaccination	15
IBRD (World Bank)	Additional financing of "Healthcare for people" project	7
IBRD (World Bank)	Financing for rapid reaction to Covid and vaccination	4.9
<i>Total</i>		<i>13,555</i>

Source: Ministry of Finance of Ukraine; Centre for Public Finance, Kyiv School of Economics.

Notes: some of the World Bank loans totaling nearly \$1 billion were provided or guaranteed by governments of Great Britain, Netherlands, Sweden, and Lithuania.

TABLE A2 GRANTS PROVIDED TO UKRAINE BETWEEN 24 FEBRUARY AND 31 OCTOBER 2022

Organisation	Instrument	Amount (US\$ million)
United States via the World Bank	Targeted fund for support of sustainable governance in Ukraine	3,000
United States via the World Bank	Targeted fund for support of sustainable governance in Ukraine	1,500
United States	Grant	1,300
Multidonor fund created by the World Bank and USAID	Grant by the United States	1,700
Multidonor trust fund organized by the World Bank and IDA	Targeted fund for support of sustainable governance in Ukraine (contributions by the United States, the United Kingdom, Denmark, Latvia and Lithuania)	1,151
German government via the special IMF account	Grant	1,151
European Union	Contract for state development and resilience - III	505
European Union	Extraordinary support package	121
Government of Italy	Grant	125
Norwegian government via the World Bank	Grant	22
Austrian government via the World Bank		11
Albanian government	Grant	1
Government of Iceland	Grant	0.5
<i>Total</i>		<i>10,485.5</i>

Source: Ministry of Finance of Ukraine; Centre for Public Finance, Kyiv School of Economics.

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This book offers a comprehensive analysis of what Ukraine should become after the war and what tools policymakers can use to fulfill these goals. It provides perspectives from leading scholars and practitioners. While each chapter of the book covers a specific sector, there is a natural overlap across the chapters because Ukraine's reconstruction should involve a comprehensive transformation of the country.

The leitmotif of this book is clear: reconstruction is not about rebuilding Ukraine to its pre-war state; it is about a deep modernisation of the country on its path to European Union accession. All critical elements of the economy and society will have to leapfrog and undergo reforms to help Ukraine escape its post-Soviet legacy and become a full-fledged democracy with a modern economy, strong institutions and a powerful defence sector. Ukraine's ownership of the reconstruction will be key to its success.

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33 Great Sutton Street | LONDON EC1V 0DX | UK
187 boulevard Saint-Germain | 75007 Paris | France
TEL: +44 (0)20 7183 8801 | FAX: +44 (0)20 7183 8820
EMAIL: CEPR@CEPR.ORG
WWW.CEPR.ORG