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Public Expenditure and Tax Policy for the Post-War Reconstruction of Ukraine

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Abstract

Public spending will play the decisive role in the reconstruction of Ukraine, in rendering aid to the population, providing emergency services, reconstructing infrastructure and driving industrial development in the coming years. For economic recovery and sustainable development in the post-war period, defining the volume and structure of the main public expenditure categories in the medium run are essential. The report outlines priorities and timelines for public funds allocation in the areas of transport and electric power networks, the recovery of agricultural farms, restoration of social infrastructure, reconnecting people to educational and health care services, rebuilding destroyed housing stock and development of the modern defence sector.

The role of foreign aid in the post-war recovery is highlighted and efficient mechanisms for coordination and reconciliation of Ukrainian public expenditure with external donor funding are suggested. Moreover, the authors propose tax reform measures with a focus on personal income taxation, social security contributions and improving tax collections that are targeted at financing Ukraine's reconstruction needs.

A debt sustainability analysis (DSA) for the period 2023-2026 is undertaken with probabilistic judgments regarding the trajectory of public debt and the availability of financing. The results indicate that raising the share of foreign grants (vs. loans) plus substantial haircuts to the nominal values of debt will be necessary for supporting Ukraine's debt sustainability.

Keywords: Ukraine, public expenditure, tax reform, post-war reconstruction, debt sustainability.

JEL classification: H56, H20, H41, H63.

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Public Expenditure and Tax Policy for the Post-War Reconstruction of Ukraine

INTRODUCTION

Although over time Ukraine will increasingly be able to rely on an inflow of private capital to support its economic development goals and complete its reconstruction, in the next two to three years public spending will play the decisive role in rendering aid to the population, providing emergency services and securing the initial reconstruction of infrastructure, as well as driving industrial development. Tackling the destructive consequences of the war and creating conditions for Ukraine's sustainable social and economic development in the post-war period should therefore rely on a balanced and well-justified public expenditure policy that would become an integral part of Ukraine's reconstruction programme. International experience of addressing the numerous problems in war-torn countries highlights the strong and indispensable role of public finances in the restoration and modernisation of the public sector, as well as in the recovery of damaged or destroyed private assets.

The World Bank has estimated that in Ukraine the financing of about 80% of the short-term economic and humanitarian needs (in the next 18-36 months) **would need to come from public financing.** This includes obligations related to the recovery and reconstruction of assets owned by the public sector (such as schools, hospitals and roads), anticipated implicit support of private assets to cover humanitarian needs (such as housing and energy), and the necessary support to kick-start recovery in industry, trade and agriculture.[1]

In the macroeconomic context, markets are unable to function smoothly in a time of war and the first years after the war has ended. Many economists agree that, with scarce resources and dysfunctional markets, government will need to intervene in the allocation of resources through 'co-ordinated capitalism', at least in the early stages of post-war reconstruction in Ukraine.[2] Thereafter, in the medium to long term, government interventions may be reduced and the ratio of public expenditure to GDP will be declining, while the structure of expenditure should correspond to the chosen priorities of Ukraine's economic development.

Post-war reconstruction will significantly increase the share of public investment in GDP. An investment recovery would be led in the initial stages by the government and official foreign donors, and later by the private sector (once the security situation improves). To respond to the numerous challenges and to recover infrastructure and destroyed public assets while also running basic government services

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1 'Ukraine Rapid Damage and Needs Assessment (RDNA-1)', Report jointly prepared by the World Bank, the Government of Ukraine, and the European Commission, August 2022. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099445209072239810/p17884304837910630b9c6040ac12428d5c

2 Becker T., B. Eichengreen, Y. Gorodnichenko, S. Guriev, S. Johnson, K. Rogoff, M. Obstfeld, T. Mylovanov and B. Weder di Mauro, 'Macroeconomic Policies for Wartime Ukraine', CEPR, Rapid Response Economics, August 2022.

and maintaining the social safety net, public expenditures would have to be carefully calibrated and spent in the most efficient way.

1. THE ROLE OF UKRAINE'S PUBLIC SECTOR FINANCING IN POST-WAR RECONSTRUCTION AND ITS INTERACTION WITH FOREIGN ASSISTANCE

1.1. The priority spending areas in the next few years

In the first post-war years, public policy should focus on supporting the recovery and broad-based rehabilitation of infrastructure, production assets and human capital, restoring social infrastructure, reconnecting people to educational and healthcare services, and rebuilding the housing stock destroyed during the war. In the medium to long run, these goals have to be supplemented by building sustainable infrastructure in a way that is in line with social and environmental goals and is financially responsible; stimulating the growth of dynamic, competitive, technologically sophisticated industry and the entrepreneurial sector in general; and reforming social and educational services to provide reliable protection to the most vulnerable and to improve human capital. Priorities should include:

- recovery and upgrading of physical infrastructure, in particular transport infrastructure and the energy distribution network;
- restoration of social infrastructure and social services to the population, including the social rehabilitation of war victims;
- repairing and rebuilding the housing stock;
- rebuilding the network of education and healthcare facilities, optimised and directed towards new needs, thereby resuming reforms in the education and healthcare systems;
- recovery and modernisation of industrial facilities, support for small and medium-sized enterprises (SMEs) and the generation of new employment opportunities;
- rebuilding damaged agricultural assets, land de-mining and recultivation;
- strengthening institutional capacity of state administration and increasing the quality of state governance;
- revitalising and modernising production capacities of the military-industrial complex.

Across all these sectors, a general guiding principle for reconstruction should be 'building back better', which would prioritise investments in a green, resilient, inclusive and sustainable recovery.

1.2. The role of foreign aid and how to combine with Ukrainian public spending

Given the deficit of domestic resources in the war-devastated economy, adequate foreign aid is of vital importance for successful reconstruction in Ukraine. There is a high probability that foreign aid will be allocated to Ukraine's economy via three main channels:

i. augmenting Ukraine's own budgetary capacity for financing the national reconstruction programme (which should include foreign funds to be directly disbursed to the budget);

ii. supplementing Ukraine's budget-financed programmes with other projects and schemes, funded and monitored by external donors;

iii. providing investment support and guarantees for private-sector investments in Ukraine.

There is a critical need to align the design of the assistance to Ukraine by international donors – including the EU, the US, and international financial institutions (IFIs), along with others – with the National Recovery Plan (elaborated by the Ukrainian government) and the scope for its financing out of Ukrainian budgets. Numerous organisational and financial issues related to Ukraine's recovery and reconstruction are not yet decided as the war continues and the timeline and final outcome of the struggle are still not clear. However, even now some priorities of Ukraine's post-war reconstruction are evident from the EU side. Currently the EU institutions and EU member countries are willing to provide financial support for major pillars of reconstruction such as: [3]

› Rebuilding infrastructure, health services, housing and schools, as well as digital and energy resilience, in line with the most recent European policies and standards;

› Modernising the state and its institutions to ensure good governance and respect for the rule of law, by providing administrative capacity support and technical assistance;

› Promoting sustainable and inclusive economic competitiveness, sustainable trade, and private-sector development, contributing to the green and digital transition of the country.

The EU and other donors should align the components of their assistance with the Ukrainian reconstruction programme and its budgetary financing. In addition, Ukraine's external partners should closely co-ordinate their priorities and resources in support of the following aims: (i) to augment Ukraine's own budgetary capacity for financing the national reconstruction programme, (ii) to supplement Ukraine's budget-financed programmes with projects funded and monitored by external donors.

A significant part of donor financing has, by implication, to be directed toward Ukraine in the form of sectoral budget support and general budget support (in line with EU programmes that were implemented in Ukraine earlier on a minor scale).[4] In this way, priorities of Ukraine's post-war

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[3] 'Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions – Welcoming those fleeing war in Ukraine: Readying Europe to meet the needs', March 2022. https://reliefweb.int/report/world/communication-commission-european-parliament-european-council-council-european-economic

[4] EU budget support is a means of delivering effective aid and generating fast, tangible and durable results in support of EU partners' reform efforts and the sustainable development goals. It was at the core of the new Neighbourhood, Development and International Cooperation Instrument – Global Europe. EU budget support covers a wide variety of sectors, with 228 contracts implemented in 95 countries in 2020. On average, for the EU it accounts for about 40 % of national co-operation programmes with partner countries.

reconstruction would be financed through the national budget under the direct responsibility of national institutions.

International experience suggests that external donors and international organisations should work through national institutions to the greatest extent possible, reinforce internal abilities and avoid trying to replace existing administrative capacities (see Box 1). Foreign donors working with national institutions and cultivating national ownership would ensure the best outcomes and optimise the sustainability of the reconstruction effort.

BOX 1 / IRAQ'S RECONSTRUCTION: DANGER OF DETACHMENT OF THE FOREIGN DONORS FROM NATIONAL INSTITUTIONS AND THE STATE'S BUDGET

Reconstruction experience in Iraq illustrates that the bypassing of national institutions by international donors might be dangerous even if early results were satisfactory. In Iraq, donor funds were provided through bilateral aid, international organisations and trust funds (with the United States providing the largest share), while budgetary support to the Iraq government was not substantial.

Foreign donor funding was mostly off-budget, reflecting donor concerns that the Iraqi government lacked the necessary political and administrative capacity to allocate and use funds effectively and transparently.[5] This meant, however, that actual project financing was largely opaque to Iraqi officials.

The World Bank's MENA Development Report states: 'The impact of reconstruction remains disappointingly inconspicuous considering the amount of money spent. While repeated insurgent attacks on infrastructure were a major hindrance to the recovery, other factors were to blame as well, including a lack of engagement with and from Iraqi institutions and insufficient or ineffective efforts to build institutional capacity.'

Physical infrastructure put in place in Iraq by the United States was operational only under direct management and financing by foreign donors, but was breaking down within a few years of the suspension of such financing because Iraqi institutions were not fully engaged. Roles of national institutions in operating and maintaining infrastructure were not sufficiently considered.[6]

The US-led occupation authority, the Coalition Provisional Authority, tried to establish a parallel system for reconstruction by using its own experts and bringing in Iraqi exiles. However, this undermined the country's existing institutions and human resources.

in addition, the overwhelming practice among donors and international organisations to be accountable primarily to their domestic constituencies and stakeholders rather than to those of recipient states in many cases reduced the effectiveness of donor-funded projects and made delivering results to the direct beneficiaries infeasible.

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5 Savage, J.D. (2013), *Reconstructing Iraq's Budgetary Institutions: Coalition Statebuilding After Saddam*, Potomac Books, Sterling, Virginia, p. 7.

6 International Bank for Reconstruction and Development (2019), 'The Reconstruction of Iraq after 2003: Learning from Its Successes and Failures', MENA Development Report.

Thus, foreign donors and international organisations' participation in the reconstruction process need to reinforce the internal capabilities within national institutions and avoid trying to bypass national institutions or replace existing administrative capacity. Under such conditions, bypassing national institutions is justifiable only when the rapid provision of emergency humanitarian assistance is needed for saving lives. However, when it comes to medium- and longer-term recovery and reconstruction, outcomes delivered by external actors should fall under the 'jurisdiction' of national institutions.

The reconstruction efforts should be led by the Ukrainian authorities in close partnership with the EU, the US, and G7 and G20 partners, as well as international financial institutions. For this purpose, the Multi-agency Donor Coordination Platform was established on 26 January 2023. Its aim is to support Ukraine's repair, recovery and reconstruction process via enhanced co-ordination among all key players to provide short-term financial support and also longer-term assistance for the reconstruction phase.

The Multi-agency Donor Coordination Platform builds on the results of the conferences in Lugano, Berlin and Paris, and is tasked with bridging the gap between Ukraine's needs and resources mobilised. The platform brings together the supporting partners and organisations, including EU member states, IFIs and bilateral partners, and puts under one roof the EU support and other initiatives, such as the World Bank Trust Fund, the IMF's administered account, the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB) and others. The EU is determined to continue playing a major role in support of a recovery and reconstruction process in Ukraine that is firmly anchored in its EU path, ensuring that investments go hand in hand with reforms.[7]

According to the European Commission, the framework for the EU's contribution to the reconstruction of Ukraine would consist of the following strands:

› The 'Rebuild Ukraine' facility, a new EU-funded instrument dedicated to finance the reconstruction efforts and the alignment of Ukraine's economy to the EU (through approximation to EU climate and environmental standards);

› Support from existing EU programmes, including guarantees under the Neighbourhood, Development and International Cooperation Instrument.[8]

Implementing the 'Ukraine reconstruction platform' with weak participation of Ukrainian beneficiaries would entail a risk of duplication and poor co-ordination among donors as well as inadequate implementation of the donor-funded project on the ground. Experience of post-war reconstruction in Bosnia and Herzegovina (BiH) emphasises the main problems associated with unbalanced international community presence in that country: duplication and lack of communication; unco-ordinated leadership; lack of strategic vision; personality clashes; and cross-cutting institutional interests.[9]

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7 European Commission, 'Ukraine: Multi-agency Donor Coordination Platform for Ukraine kick-starts work'. https://ec.europa.eu/commission/presscorner/detail/en/read_23_383

8 'Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions – Welcoming those fleeing war in Ukraine: Readying Europe to meet the needs'. https://reliefweb.int/report/world/communication-commission-european-parliament-european-council-council-european-economic

9 International Crisis Group (2001), 'Bosnia: Reshaping the International Machinery', ICG Balkans report, No. 121.

In order to minimise such kinds of risk, an Agency for Management of International Aid (AMIA) is to be founded as a bridge from donors to national government. It could have an autonomous status, but a dual accountability – to foreign donors and to one of the supreme bodies in Ukraine.

The main functions of AMIA will encompass:

- interactions with foreign donors and reconciliation of timelines and amounts of foreign funding disbursements to Ukrainian beneficiaries;
- co-ordination and harmonisation of the activities of different donors, assessing the comparative advantages of specific donors for covering Ukraine's needs;
- transfers of the foreign funds to authorised Ukrainian state entities and contractors with observance of qualifying criteria and terms of fund allocations;
- monitoring of the use of foreign funds within public and private sectors in Ukraine and disclosure of the obtained results to the foreign donors.

AMIA and its sub-divisions will monitor the use of foreign funds, while Ukrainian beneficiaries from public and private sectors will comply with transparency standards. A core of the monitoring system is to be the functional evaluation system, comprising quantitative or identifiable qualitative benchmarks as the means of tracking the progress of reconstruction efforts and reform implementation.

As suggested by Becker et al. (2022), such an agency could operate on the basis of collection and approval of funding requests from Ukrainian state institutions or national recipients of foreign funds.[10] Ukrainian institutions for implementation of the National Recovery Plan would formulate requests for funding, and AMIA would consider these requests and approve them or suggest changes in line with the donor requirements and rules. After approval of the funding request by AMIA, recipients of donor funds are to be flexible in selecting suppliers of the demanded goods or services.

For better co-ordination of demands for foreign financing from the recipient side, Ukraine's government created a State Agency for Restoration and Infrastructure Development in January 2023. A new agency is established on the basis of the State Agency for Automobile Roads and the Agency of Infrastructure Projects; it is supposed to use both domestic financial resources and loans/grants from foreign donors for organising construction, repairs, restoration, reconstruction and modernisation of the transport infrastructure, housing, social entities and other public facilities, energy infrastructure, defence and environment protection buildings.

Because local communities and local governments in many cases have better understanding than central government of their own needs and priorities, AMIA could assemble the requests from the local governments directly. Such an approach would enable it to accelerate the recovery of local roads, kindergartens, schools, hospitals etc. and allocate foreign funds to secure the highest economic and social benefits.

[10] Becker T., B. Eichengreen, Y. Gorodnichenko, S. Guriev, S. Johnson, K. Rogoff, T. Mylovanov and B. Weder di Mauro (2022), 'A Blueprint for the Reconstruction of Ukraine'. https://voxeu.org/article/blueprint-reconstruction-ukraine

Reasonable conditionality is advisable in the process of releasing foreign funds for some projects and reform areas. Such conditionality will ensure that foreign aid is spent efficiently and that Ukraine makes progress in fulfilling agreed tasks. Conditionality should be based on measurable, verifiable outcomes. As conditionality is being enforced, preferences should be given to positive rather than negative conditionality.

An anti-corruption component of AMIA's activity is essential for the success of reconstruction efforts. Kyiv School of Economics elaborated a set of well-founded technical and policy proposals for the creation of a digital system of co-ordination and ensuring transparency of the whole recovery and reconstruction process with a focus on efficiency gains and fighting corruption.[11] In a broader context, effective implementation of the reconstruction programme and durable support of donors with minimum risks of corruption should rely on third-party verification (during the project implementation and after its completion), on-site visits, insulation from political influences, and measurable results that are incorporated in planning and performance stages, as well as periodic evaluations of the attained results and implemented programmes.

2. HOW SHOULD FISCAL SPENDING BE PLANNED AND PRIORITISED BETWEEN HOUSING, INFRASTRUCTURE, TRAINING/RETRAINING, BUSINESS SUPPORT AND OTHER KEY AREAS?

Clearly the war has dramatically changed the Ukrainian budget, and planning future spending must start from this new reality. The Russian invasion of Ukraine caused consolidated budget expenditure to go up from 33.8% of GDP in 2021 to 58.6% of GDP in 2022 (Table 1). However, this rise in expenditure was almost entirely due to the increased funding of defence, public order and security. Along with the dramatic decline in real GDP, these state functions accounted for more than half of the total budget expenditure and were equivalent to 30.8% of GDP in 2022. The remaining expenditure categories were broadly steady as a percentage of GDP and plummeted by 30.6% in real terms.

This general picture provides us with a starting position for projecting the future path of public expenditure developments during post-war reconstruction. Our projections of budgetary expenditure by function of government in 2023-2025 are shown in Table 2 and are based on assumptions related to the priorities of post-war recovery and reconstruction in Ukraine, assignments of some responsibilities for financing to foreign donors and the overall financing constraints of the government.

[11] Шаповал Н., М. Федосеєнко, О. Грибановський, О. Терещенко, Дослідження: Повоєнне відновлення України. Нові ринки та цифрові рішення. https://kse.ua/ua/about-the-school/news/povoyenne- vidnovlennya-ukrayini-novi-rinki-ta-tsifrovi-rishennya/

Table 1 / Evolution of consolidated budget expenditure across functions of government, % of GDP

Categories of expenditure	2018	2019	2020	2021	2022
Total expenditure	**35.1**	**34.5**	**37.8**	**33.8**	**58.6**
General state functions (excl. debt service)	2.1	2.1	2.0	1.7	1.7
Public debt service and GDP warrants	3.3	3.0	2.9	2.9	3.1
Defence	2.7	2.7	2.9	2.3	22.0
Public order, safety and judiciary	3.3	3.6	3.8	3.2	8.8
Economic activity	4.0	3.9	6.2	5.4	3.0
Environment protection	0.2	0.2	0.2	0.2	0.1
Housing and communal amenities	0.9	0.9	0.8	1.0	0.8
Health care	3.3	3.2	4.2	3.7	4.1
Culture, arts and sports	0.8	0.8	0.8	0.8	0.6
Education	5.9	6.0	6.0	5.7	5.6
Social protection and social provision	8.7	8.1	8.2	6.7	8.8
of which: transfer to pension fund	4.2	4.6	4.8	3.7	4.5
other social protection expenditure	4.5	3.5	3.4	3.0	4.3

Source: authors' calculations, based on Ministry of Finance and State Statistics Committee data.

Thus, the following trends underlie our projections of public spending in 2023-2025:

› Budget expenditure as a share of GDP will decline marginally in 2024 (by 4.1 percentage points (pp) to 54.6% of GDP) and more significantly in 2025 (by 9 pp. to 45.6% of GDP), but will remain well above pre-war levels (33.8% of GDP);

› Defence spending will be very high as long as war continues (17.8 - 22% of GDP) and will go down to 9.7% of GDP in 2025;

› Public debt service will be much higher than pre-war, driven by rapid public debt accumulation (Appendix contains a detailed debt sustainability analysis);

› Public spending on economic activity will increase considerably in 2024 and 2025 (up to 5% of GDP), boosted by transport infrastructure financing and meeting the needs of the energy companies;

› Expenditure on housing and communal amenities will go up from 1% of GDP in 2021 to 2.7% of GDP at the end of the forecast horizon because of active government involvement in the repair and reconstruction of damaged housing;

› Social protection expenditure will be maintained at a high level during the war and in the post-war period (at 8.2-8.8% of GDP), owing to the needs of the newly impoverished, internally displaced persons (IDPs), war veterans and people with disabilities.

Table 2 / Projection of consolidated budget expenditure across functions of government, % of GDP

Categories of expenditure	2021 actual	2022 actual	2023 proj.	2024 proj.	2025 proj.
Total expenditure	**33.8**	**58.6**	**58.7**	**54.6**	**45.6**
General state functions (excl. debt service)	1.7	1.7	1.9	1.9	1.8
Public debt service and GDP warrants	2.9	3.1	5.4	5.8	4.3
Defence	2.3	22.0	20.7	17.8	9.7
Public order, safety and judiciary	3.2	8.8	7.5	4.7	4.2
Economic activity	5.4	3.0	3.7	4.2	5.0
Environment protection	0.2	0.1	0.1	0.1	0.1
Housing and communal amenities	1.0	0.8	2.0	2.5	2.7
Health care	3.7	4.1	3.5	3.6	3.6
Culture, arts and sports	0.8	0.6	0.6	0.5	0.5
Education	5.7	5.6	5.1	5.1	5.2
Social protection and social provision	6.7	8.8	8.2	8.4	8.5
of which: transfer to pension fund	3.7	4.5	4.5	4.0	4.0
other social protection expenditure	3.0	4.3	3.7	4.4	4.5

Sources: authors' projections; Ministry of Finance data.

2.1. Social protection and employment promotion

The main components of transforming social protection and livelihood systems in Ukraine during the war and in the post-war period would be:

› growth in payments to vulnerable categories such as the newly impoverished and IDPs;

› launching the programmes of benefits for families who lost a relative in combat, as well as war veterans' pensions;

› war payments such as benefits related to disability;

› funding temporary employment and economic reintegration programmes for demobilised soldiers, returning refugees, war victims and the disabled;

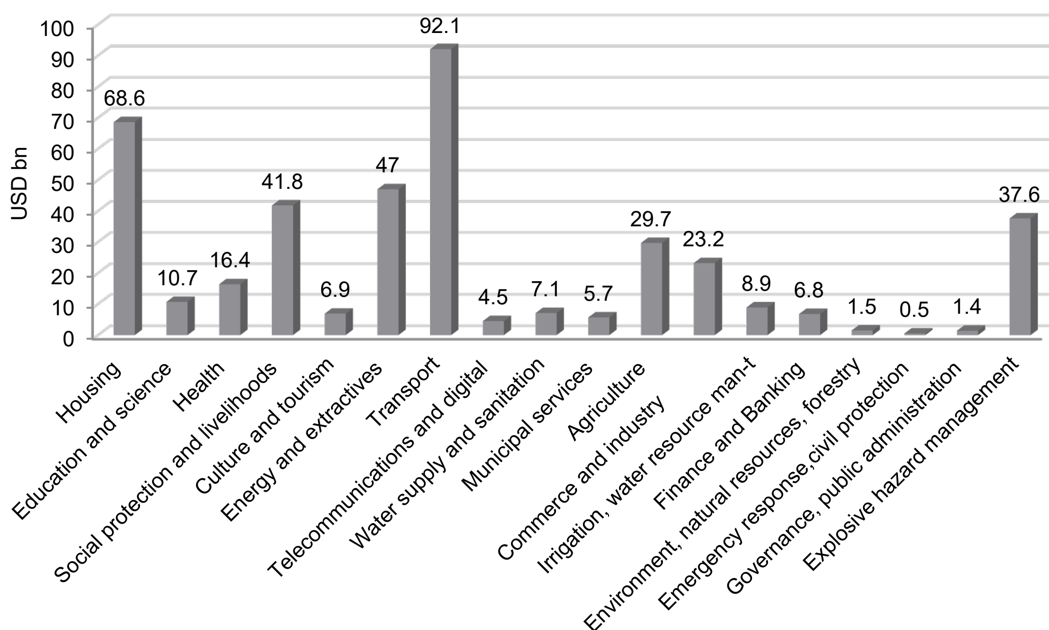
› special incentives for restoration of lost jobs, such as mobility grants, settling-in grants, and wage subsidies for employers.

Before 2022 the Ukrainian government financed the social protection system out of state and local budgets in a range of 6.7-8.7% of GDP (without pension and social security funds expenditure, but including budget transfers to these funds). Rising unemployment and millions of IDPs put upward pressure on social expenditure in 2022, pushing it up to 8.8% of GDP. In 2023-2025 social spending will remain high, at around 8.2% - 8.5% of GDP. Social expenditure excluding transfers to the pension fund will fluctuate during the projection period (3.7-4.5% of GDP).

World Bank and European Commission experts estimated damage to the social assistance infrastructure (residential care units, social centres and social services providers) at USD 240m as of February 2023.[12] The World Bank and European Commission also reported social protection and jobs sector needs in the amount of USD 41.8bn over 10 years (20.9% of pre-war Ukraine's GDP). Of this amount, substantial funding would be required for restoration of lost jobs. Owing to the massive reduction in employment, even the modest estimate of the job restoration cost by the World Bank experts stands at USD 14.4bn, which is likely to be spread over the 10-year period.

Figure 1 **below summarises the estimated financing needs for Ukraine's recovery and reconstruction across the main sectors as suggested by the World Bank, Ukraine's government and the European Commission in their recent RDNA-2 report.** In the following sections, we will refer to the data from Figure 1 to explain the government's role in reconstruction and support for different sectors.

Figure 1 / Reconstruction and recovery needs, USD bn, as of 24 February 2023



Source: World Bank, European Commission and Ukraine government data (RDNA-2).

The National Recovery Plan of Ukraine's government specifies quite broad priority areas for social policy: increasing the level of pension provision, social support for the poor and people who have found themselves in difficult life circumstances, the barrier-free integration of all members of society, in particular people with disabilities and other low-mobility groups, into the socioeconomic community, and digital transformation of the social sphere.

[12] 'Updated Ukraine Recovery and Reconstruction Needs Assessment', Report jointly prepared by the World Bank, the Government of Ukraine, and the European Commission, February 2023. https://www.worldbank.org/en/news/press-release/2023/03/23/updated-ukraine-recovery-and-reconstruction-needs-assessment

The Recovery Plan also envisages the introduction of universal social assistance as the main lever for overcoming poverty and responding to difficult life circumstances, taking into account property and material stance (means testing). In addition, a special support programme for returning migrants is included in the Recovery Plan; this programme is projected to cover access of migrants to housing, financial compensation and social services.

Post-conflict experiences in other countries suggest that needs for financing military and war veterans' pension expenditures may be significant. In addition, benefits to members of the military and families who lost a relative in combat, together with loss-of-life compensation for civilian deaths, would make up a significant share of social expenditures.

In a longer-term perspective, rehabilitation of war-affected groups, such as orphans, IDPs and persons with disabilities would constitute a substantial part of the social care system. This element would be crucial for reintegration of war veterans into society. It could include the design of a system of benefits and pensions to veterans combined with social and labour activation services.

In a post-war period, re-employing the Ukrainian labour force would require budget expenditures on job restoration, including wage subsidies for employers, mobility grants, lump-sum grants to stimulate self-employment and similar measures. In addition, labour-intensive, small-scale public works projects could be financed at the municipality level by local governments and foreign donors. These projects should be designed in such a way to rehabilitate small-scale public infrastructure and clean up war-damaged public assets and simultaneously to create rapid employment for those unemployed as a result of the war.

The reintegration of demobilised soldiers, returning refugees, and other vulnerable groups into productive jobs would be an important component of Ukraine's reconstruction programme. To validate this component, the capacity of the State Employment Service would have to be enhanced and additional public funding provided. Counselling and job-finding services as well as education and retraining services targeted primarily at demobilised soldiers and returning refugees need to be provided at an adequate scale and to be of high quality.

Foreign assistance may be essential for carrying out such kinds of programmes. In BiH, foreign donors supported the Employment and Training Foundations of BiH with technical and financial assistance in the framework of the Emergency Demobilization and Reintegration Project. Overall, programmes such as rehabilitation of war victims, emergency demobilisation and reintegration, public works, and employment promotion accounted for 5.1% of the total development assistance to BiH in the post-war period.

Social programmes for protection and rehabilitation of the victims of war (newly impoverished and IDPs, war veterans, people with disabilities and households that lost a relative in combat) as well as employment creation programmes should be of high priority for the government and foreign donors. As the experience in the Balkans indicates, foreign donors may take on some types of social programmes and fund them from their own resources. However, a major part of social programmes will have to be funded out of Ukraine's central and local budgets. In view of available financial constraints, the government will have to calibrate carefully a broad range of social assistance programmes and, in parts, replace those existing before the war.

2.2. Housing

According to the World Bank and European Commission Report, housing recovery and reconstruction needs amounted to USD 68.6bn in February 2023 (34.4% of GDP in 2021), while total damage to the housing sector stood at USD 50.4bn (25.2% of GDP in 2021). Some 1.4m residential units were reported damaged or destroyed; an estimated 135,000 single-family houses have been damaged, together with 39,040 dormitory units. In peacetime, budgetary appropriations for these purposes were missing, but in a time of war and in the post-war period special budgetary funds and donor-funded programmes must be established to take responsibility for fulfilling these functions.

International practice distinguishes four main kinds of activities aimed at recovery of the housing sector:

- repair support for damaged housing units;
- provision of temporary housing to IDPs and people who lost their homes;
- rental subsidies for vulnerable households;
- reconstruction of fully destroyed housing units (this can take up to five years and will require full demolition, redesign, and construction).

Modalities of financing partial repairs include providing cash or material grants for simple repairs (along with technical assistance and inspections) directly to homeowners or undertaking larger municipal-level rehabilitation projects for superblock repairs. Rental subsidies are entitled for provision with access to sustainable rental housing of vulnerable households affected by the war in order to minimise the risks of insecurity and displacement. Subsidies can help prolong hosting arrangements and keep the displaced in regular housing while repairs of damaged residential buildings are under way. These subsidies can be in the form of cash support to allow renting directly on the market and support to host communities and families for absorbing displaced families.[13]

The Ukrainian government has already started to rebuild some housing units in Kyiv region, using charitable contributions from abroad. In January 2023 the government disbursed UAH 465m (raised via United24 platform) for rebuilding 18 blocks of flats, damaged by Russian occupants in Irpin, Borodyanka and Hostomel. In 2022 the Polish government funded and supplied 24 modular cities in central and western parts of Ukraine for temporary housing of IDPs.

The National Recovery Plan, devised by the Ukrainian government, envisages the extension of subsidies for rent of temporary accommodation to citizens with children who temporarily moved abroad and who lease housing in Ukraine because of military activity or whose housing requires major overhaul. The Plan also incorporates a special programme for carrying out current repairs of buildings that were damaged as a result of the aggression. Government is obliged to establish the maximum amount of compensation per object. Upon receipt of compensation by the household, the right to claim against Russia for compensation of damages is transferred to the Ukrainian state. For

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[13] Ukraine Rapid Damage and Needs Assessment (RDNA-1)’, Report jointly prepared by the World Bank, the Government of Ukraine, and the European Commission, August 2022. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099445209072239810/p1788430483791063 0b9c6040ac12428d5c

significantly damaged housing, capital repairs and reconstruction of buildings must be carried out. In such cases the government is to offer the maximum amount of compensation; the right to claim against Russia is transferred to the Ukrainian state after receiving compensation by the household.

The National Recovery Plan also empowers local government entities to carry out:

- repairs, reconstruction and conversion of non-residential premises for temporary residence/stay of IDPs whose homes have been destroyed;
- buyouts of existing residential apartments to offer social and temporary housing for citizens whose housing was destroyed or damaged as a result of the armed aggression, as well as IDPs.

Thus, the Ukrainian government intends to adopt a universal approach for subsidising current repairs and reconstruction of housing, targeting all affected households. However, the World Bank and European Commission experts emphasise that in view of limited public resources (including donor funds) and extensive recovery needs, it is necessary to define a set of prioritisation criteria for investments in housing and government subsidies. Such a selective approach would allow targeting of the worst affected of the population and prioritising vulnerable communities and households. We agree with the suggestions of the World Bank experts and are in favour of a selective approach.

In 2023 and onwards there will be an extensive need to provide temporary housing to IDPs and people who lost their homes and to carry out repairs of partially damaged residential buildings. A selective approach is actually applied in these areas, as scarce public financing and very modest opportunities offered by the government or municipalities enables only badly affected households to seek public support/subsidies. Under the current conditions, it is essential to ensure safety and adequate housing services to address the primary needs of these people.

It is critical to ensure that governmental and donor funding of the subsidies for rent will target the most vulnerable through the application of objective criteria. Potential vulnerable groups would include low-income owners of damaged units, and owners of obsolete and small apartment units, that were most affected by the fighting. Other vulnerable groups would be IDPs, represented by families with children (or the elderly) and unemployed adults. Subsidies for these groups could be replaced or accompanied by temporary shelter provision. Cash compensation for destroyed housing could be linked, mostly, to the welfare status of a recipient household. Thus, in the first years of the reconstruction process the government programmes in the housing sector should target predominantly the poor, the elderly, people with disabilities, impoverished IDPs and poor refugees. Subsequently, if reparations from the aggressor country are imposed and legal procedures are validated, all other categories of affected Ukrainian households will get opportunities to sue for compensation.

Addressing housing recovery needs during the post-conflict period would require an integrated green, resilient and inclusive approach, with a focus on restoring livelihoods. Long-term efficiencies, in particular energy-efficient reconstruction, are essential for the sustainability of Ukraine's economy as a whole.

We expect that foreign donors would take the major part of responsibilities for funding reconstruction of fully destroyed housing units and, to some extent, for funding repairs of partially damaged housing units, with involvement of both international and local contractors. In the reconstruction of BiH, foreign donors allocated 3.2% of total external assistance for the programme for 'repairs of housing stock'.

With regard to rental subsidies for vulnerable households and provision of temporary housing/shelters in Ukraine, this would be the responsibility of the local governments in most cases. Appropriate spending would be included into the 'housing and communal amenities' functional category, as well as 'social protection and social provision'. We project that budgetary financing of the function 'housing and communal amenities' will rise from 1% of GDP in 2021 to 2-2.7% of GDP in 2023-2025 and will be close to 2% of GDP thereafter.

2.3. Transport infrastructure

The challenging goals for recovery and transforming transport infrastructure in Ukraine over the medium term are the following:

› performance of works related to rehabilitation of roads (including those that have been destroyed as a result of hostilities), restoration of road, rail and air network functionality;

› extension of basic infrastructure network to support the broader reconstruction efforts across sectors that rely on transport services;

› enhancement of westward road and rail linkages to the EU in order to promote integration with the EU market and provide resilience to possible disruptions of sea access;

› transformation of the infrastructure networks towards EU standards for safety and service quality as a component of Ukraine's policy objectives toward EU accession.

In 2017-2019 government financed road construction and maintenance in a range of 1.4-1.7% of GDP. In 2020-2021 budget expenditure on this function increased dramatically: to **3.2-3.4%** of GDP. In 2022 the relative volume of public expenditure on road construction and maintenance declined again. At the reconstruction stage, additional financing needs for this sector would be sustained, and we project the level of its budgetary financing at **3%** of GDP approximately (included in the category 'economic activity' in Table 1 and Table 2) in 2023-2025.

According to the World Bank and European Commission assessments, damage in Ukraine's transport sector is significant (USD 35.7bn). The largest concentrations of damage are (i) local oblast, village and communal roads combined (32%); (ii) motorways, highways and other national roads (21%); and (iii) railway infrastructure, rolling stock, equipment and other assets combined (19%).

Transport sector reconstruction is estimated by the World Bank experts to require USD 92.1bn (46% of pre-war GDP). During 2023 an estimated USD 3.5bn is needed for urgent expansion of westward logistics chains, high-priority emergency repairs and restoration of services. However, the nature and level of demands on that network may affect the economic viability of building back to a given set of standards. These experts suggest that under assumptions where Ukraine may not build back road and rail infrastructure to EU standards, needs could be USD 2.1bn to USD 13.2bn lower than initial projections.

The National Recovery Plan of Ukraine's government sets out the following targets until 2032: construction, reconstruction and modernisation of rail tracks; renewal of railcars and locomotives; construction, reconstruction and modernisation of 24,900 km of roads and 1,750 bridges; electrification of railway tracks; construction of public green charging power stations; and construction of a high-speed rail line between Kyiv and Warsaw.

Important aspects of the transport infrastructure development reflected in the National Recovery Plan include action to address logistics bottlenecks and to enhance integration with the EU. It envisages strengthening the interconnectivity of Ukraine by developing gauge, rebuilding roads and bridges, expanding the corridor to the EU, and conducting negotiations on the opening of new checkpoints for road transport.

Ukraine's economic infrastructure requires modernisation and alignment with broader sustainability goals and climate neutrality, as the country's basic infrastructure was built during the Soviet era and has suffered decades of depreciation and underinvestment.

Correctly addressing these challenges, the National Recovery Plan includes some actions for modernisation of road infrastructure: development and implementation of a smart roads concept that involves intelligent design of road infrastructure and traffic management; improvement of digital control systems, measurement of indicators of transport and operational conditions of roads; and construction of new logistics multimodal terminals in western and southern regions of Ukraine with the functions of integrated transport and logistics centres and customs services.

The scope required for Ukraine's infrastructure reconstruction is certainly beyond the budgetary capacity of central and local governments. Foreign assistance is anticipated to augment the country's financial capacity. EBRD and EIB loans have been substantial foreign sources of funding for Ukraine's infrastructure in recent decades: the total Ukraine investment portfolio for the EBRD stands at EUR 14.6bn, and for the EIB it exceeds EUR 7bn. Moreover, the role of these institutions has increased further since the outbreak of war.

Foreign financial assistance in the forms of grants, loans and guarantees for Ukraine's transport infrastructure recovery and modernisation may be substantial in a post-war period. BiH experience suggests that reconstruction of transport routes was a priority area for foreign donors and lenders, which released 18% of total development assistance for this purpose during the reconstruction period.

In addition to external sources, user charges should support investment and long-term sustainability of transport infrastructure services. The new economic model of the infrastructure sector is to be financially, environmentally and socially responsible. Large-scale investments in infrastructure will also require extension of public-private partnerships (PPPs). According to the World Bank, a key prerequisite for PPPs will be streamlining legislation and simplifying the selection and approval procedures for the PPP projects that will become part of the reconstruction programme. However, in addition to this, a proper division of risks between public and private partners and strict responsibility of the public entity for fulfilment of the assumed obligations are essential for viable PPP projects.

Ukraine's National Recovery Plan correctly addresses the tasks of simplification of mechanisms for attracting investments (PPPs and others) into infrastructure development, construction, reconstruction and modernisation projects, and digitalisation of procedures. If these mechanisms are put into force and the security situation improves, private capital may gain a significant role in extension and modernisation of the Ukrainian transport infrastructure.

2.4. Healthcare

The challenging goals for recovering and transforming the healthcare sector in Ukraine over the medium term are as follows:

› to rebuild a healthcare facilities network in a way that is compatible with a new model of medical services provision and returning to healthcare financing reforms;

› to address forgone medical care needs and rehabilitation of the direct and indirect victims of war;

› to rebuild and repair healthcare entities in an efficient, climate-neutral and digitally enhanced manner.

According to the World Bank and European Commission, as of 24 February 2023 damage or destruction was reported at 15.9% of public health facilities (1,574 facilities). Of the damaged facilities, 596 were pharmacies (37.9% of the affected facilities), 436 were general or mono-profile hospitals (27.7% of affected facilities and equivalent to 23.4% of all hospitals registered), and 297 were primary health care centres (18.9% of affected facilities and equivalent to 4.3% of centres registered). Additionally, 650 ambulances (20.8% of the total) had been damaged or stolen.

Before the Russian invasion, the Ukrainian government financed the healthcare sector in a range of 3.2-4.2% of GDP. Warfare and the consequent large number of injured people increased the needs in public funds for this sector in 2022, although public expenditure on health care stood at only 4.1% of GDP in 2022. At the reconstruction stage, additional financing needs for this sector would be sustained, although financial constraints and a reduction in the incidence of injured people would lead the government slightly to reduce the ratio of health expenditure. We project the level of budgetary financing of this sector at **3.5-3.6%** of GDP in 2023-2025. Thus, urgent needs for recovery of the housing stock, rebuilding infrastructure and protecting vulnerable households will force the government to limit funds for health care in this period. On the other hand, the long-term pressure in this sector will persist and in the 2030s the scale of public financing for health care may change considerably.

Traditionally, health care in Ukraine suffers from chronic public underfunding, which has an impact on the quality of human capital and life expectancy. The critical state of the sector was manifested during the Covid-19 pandemic, when the majority of sick citizens did not receive any medical care, and Ukraine was in the first quartile globally in terms of mortality from the coronavirus. The author's cross-country study reveals an insufficient level of financial provision for national health care, in comparison with both advanced and emerging-market countries.[14] Average budget expenditures on

[14] For details, see: Bogdan T. and V. Lomakovych (2021), 'Transforming Public Finances under the Impact of COVID-19', *Public and Municipal Finance,* Vol. 10(1), pp. 67-81. https://www.businessperspectives.org/index.php/journals/public-and-municipal-finance/issue-378/transforming-public-finance-under-the-impact-of-covid-19. http://dx.doi.org/10.21511/pmf.10(1).2021.06

medical services in Ukraine before the pandemic (3.3% of GDP) were significantly lower than the average for both emerging-market and advanced countries (4% and 6.4% of GDP, respectively).

As of 24 February 2023, the needs of the health sector are estimated by World Bank experts at USD 16.4bn (8.2% of pre-war GDP). This includes the necessary investments to rebuild missing or damaged infrastructure, to build new infrastructure to address new or significantly increased health needs, and to upgrade existing facilities. It also covers the cost of building new medical infrastructure using a 'building back better' approach and the immediate recovery of partially damaged facilities. Moreover, this sum includes the additional resources needed to address forgone care needs, as well as needs related to mental health and rehabilitation of the direct and indirect victims of war.

Regarding the rebuilding of the health sector, Ukraine's government declared its intentions in the National Recovery Plan: (i) to develop a healthcare facility network, in the form of regional facilities with a focus on primary care, heart disease and cancer hospitals; (ii) to advance on financing reform across the whole sector; (iii) to develop and promote digital health by expanding healthcare data, creating specialised modules, setting up a medicines register and developing new IT infrastructure.

In the structure of total financing needs of the healthcare sector, replacement of hospitals is considered to be the most expensive element, as many of the existing hospitals are dilapidated and significant investments will be necessary to modernise hospital services. According to World Bank data, of the fully destroyed hospitals, 80% are planned to be rebuilt as general profile (cluster) hospitals, with an average capacity of 350 beds.

Experience of post-conflict reconstructions in other countries shows that foreign donors do not tend to disburse large amounts of funds for the healthcare sector (except for emergency assistance and rapid response actions). Therefore, the major part of post-war recovery and reconstruction of the sector is likely to fall on the central and local budgets of Ukraine. For instance, in BiH only 1.8% of the total foreign development assistance was directed towards the health care sector (the 'essential hospital services' project).

The government should provide financing for the restoration of medical services delivery. Under the conditions of warfare, provision of basic care has been discontinued for many citizens, and some efforts are required to reconnect people with healthcare providers and to enable them to catch up on missed medical care. This would undoubtedly require additional financing from Ukraine's state and local budgets.

However, transforming Ukraine's healthcare sector in an efficient, climate-neutral and digitally enhanced manner should rely on technical assistance and funding by foreign donors. On the basis of their own expertise and financial facilities, donors could assist the Ukrainian government with the introduction of a new efficient healthcare system and with enhancing environmental sustainability through energy-efficient building work and repairs.

2.5. Education

The challenging goals for recovery and reforming the education system in Ukraine over the medium-term are as follows:

› to rebuild the network of education facilities, optimised for current student needs, efficiency gains and sustainability;

› to purchase education materials to replace those lost or damaged during the war;

› to resume reforms in the education system, targeted at raising quality and efficiency of education.

The war has accelerated Ukraine's move towards EU membership, and the country has received 'candidate' status. This step is expected to encourage implementation of European approaches and practices in rebuilding and transforming the education sector.

Before the war, the Ukrainian government financed education in a range of 5.7-6% of GDP. In 2022 declining real GDP and shrinking financing of education coincided, keeping this ratio at 5.6% of GDP. In the post-war period, with its numerous challenges and emergency needs, the education system is unlikely to be at the top of the government's priority list. Therefore, allocations of the budgetary funds for educational purposes will be moderate. We forecast the level of its budgetary financing at 5.1-5.2% of GDP in 2023-2025, that will comprise a combined effect of rebuilding of destroyed educational institutions and declining real wages of teachers/ lecturers.

In February 2023 the World Bank and European Commission experts estimated damage to education sector at USD 4.4bn, while recovery and reconstruction needs were almost three times higher at USD 10.7bn or 5.3% of 2021 GDP (this amount includes costs of reconstruction, to follow new safety, sustainability and quality standards). According to their estimates, at least 2,772 education institutions were partially damaged and 454 were destroyed, amounting to around 10% of all education institutions (across all levels of education) in Ukraine. The most affected facilities are in Donetsk Oblast, where 64% of all education institutions are either damaged or destroyed, and in Kharkiv Oblast (38%).

Ukrainian official plans for reconstruction of the education sector are very ambitious and may be advanced only in the long term. The National Recovery Plan contains a provision related to improving the education system with focus on key competencies and innovations: 'New Ukrainian School' reform, harmonisation of university standards with those in the EU, enhancing R&D at universities, reform of vocational education, and improvement of IT education.

The more immediate task for Ukraine in the first years of reconstruction is observance of the new safety and sustainability standards in the sector. This means that all affected or vulnerable institutions would be equipped with bomb shelters and would be supplied with improved educational equipment (electronic devices).

An important task in rebuilding and reconstruction of the education sector is optimisation of the network of educational institutions. In locations that have been severely affected by the war, rebuilding an educational network has to take into account long-term trends in population movements and displacements induced by the war, so that critical public investment will be based on the 'new' needs of specific locations.

The education network must adjust to the new distribution of people's residence and take into consideration significant migration flows. This implies that, depending on changes in the number of students, not all damaged buildings will have to be reconstructed. Conversely, new institutions must be built in areas hosting large numbers of IDPs. The related challenge in the course of reconstruction is matching teachers/lecturers to the new distribution of students.

Reconstruction and recovery of the sector must also incorporate reforms to increase quality and efficiency in education. Reforms that had been initiated before the war and that were associated with improving the quality of education must remain a priority. During the reconstruction process, it will be essential for Ukraine to have a skilled labour force, with both hard and soft skills. The World Bank experts argue that Ukraine will need to invest in the continued rollout of the 'New Ukrainian School' reform programme[15] by publishing textbooks and further introducing the new curriculum, which should stimulate critical thinking and problem-solving skills.

In order to improve educational outcomes, especially in areas that suffered tremendous damages, modern educational materials are required, first of all for science, technology, mathematics and engineering. Recovery of the educational system will also require educational catch-up programmes (interrupted by the war), particularly in areas and institutions where studying has been paused for a long time.

Finally, because school, kindergarten, university and college buildings are, in most cases, outdated, they require modernisation in order to become energy efficient. In line with previous government efforts, and given the situation in the European energy markets, energy efficiency must be one of the priorities during implementation of the reconstruction programme in the education sector.

Experience of post-conflict reconstruction in BiH suggests that foreign donors allocated non-negligible funds for the recovery and reconstruction of the education sector. In BiH the whole reconstruction programme included foreign financing of the sector (under the 'emergency recovery of education' and 'reconstruction of the education sector-II' projects) at 5% of the total development assistance. In the Ukrainian case, foreign aid is likely to be essential for carrying out energy-saving measures and observance of modern safety, sustainability and quality standards in educational institutions. Nevertheless, post-war reconstruction needs in the education system would also be a significant obligation for the central government and local governments in Ukraine.

[15] New Ukrainian School is a key reform of the Ministry of Education and Science of Ukraine in the secondary education system. The aim of this reform is to transform the learning process and intellectual environment in Ukrainian schools in such a way to give the students capabilities to think critically, to express their ideas, to experiment, to implement the acquired knowledge in everyday life and to be responsible citizens.

2.6. Government support for the energy and extractive sector

The challenging goals for recovery and transforming the energy sector in Ukraine over the medium term (that would require budgetary funding or various mechanisms of state aid) are represented by:

› repairs of damaged equipment and financial support for the purchases of fuel, spare parts and tools, that are necessary for the production of electricity, gas and heating services;

› rebuilding of destroyed energy generating plants and district heating infrastructure with application of modern and more efficient standards;

› diversifying gas supply and integration with European gas markets, modernising gas transmission and distribution networks;

› increasing capacity and security of nuclear energy (prolongation, new blocks at nuclear power plants, new safety standards, sustainable uranium mining, establishing a company for fuel production and waste storage).

In the 2015-2021 period budgetary financing of the energy sector in Ukraine was around 0.1% of GDP, with a major share of this financing consumed by subsidies to the coal industry. According to our estimates, at the recovery and reconstruction stage the level of budgetary financing of the energy sector may increase to **0.4%** of GDP.

The World Bank and European Commission assessments suggest that damage to power, gas, and heating infrastructure and coal mining, as of 24 February 2023, exceeded USD 10bn, compared with the USD 2bn estimated by 1 June 2022. The total reconstruction and recovery needs in the public sector are estimated at almost **USD 47bn** (23.5% of pre-war GDP), including about USD 5.7bn for immediate and short-term needs in 2023-2026. During the war phase and the first recovery years companies in the energy sector will have to rely on government and foreign donors support for emergency repairs of equipment and to address shortages of fuel, spare parts and tools in order to secure the provision of electricity, gas and heating services to the population.

As a part of the reconstruction process, a significant proportion of the district heating infrastructure in war-affected areas will need to be rebuilt on a 'building back better' principle, with application of modern and more efficient standards. For resilient reconstruction of the energy and extractive sector the government should implement measures in accordance with European security and climate priorities.

The National Recovery Plan, developed by the Ukrainian government for the 2022-2032 period, envisages the following measures:

› modernising gas transmission and distribution networks, and rebuilding damaged energy installations;

› increasing nuclear capacity (prolongation, safety, new blocks at Khmelnytskyi nuclear power plant) and localising the nuclear value chain (uranium mining, plant for fuel production, waste storage);

› expanding oil refining capacity and construction of the 'Brody-Adamova Zastava' oil pipeline, expanding oil products infrastructure linked to the EU, and constructing an oil products storage hub in western Ukraine;

- developing hydrogen transport infrastructure to connect its production with consumers in Ukraine and abroad.

The National Recovery Plan also prescribes the task of inclusion into the EU's zero-carbon energy transition, in particular: developing zero-carbon power generation: nuclear and renewable energy sources, building electrolyser capacities and smart grids, increasing biofuels production, and developing a hydrogen ecosystem linked with the EU.

Energy sector reconstruction would require not only budgetary financing, but also extensive support from foreign donors in the form of grants, loans, equity and guarantees. In BiH, recovery of the energy sector was a considerable component of the aid-driven reconstruction programme. Foreign donors allocated 13.3% of total financing for the emergency recovery of electric power generation and for the reconstruction of the gas distribution network.

Apart from this, the attraction of private capital and introduction of some PPP schemes would also be necessary for reconstruction. The priority areas for private capital injections could be:

- maximising energy security, meeting climate commitments and approximation to modern standards via the development of various renewables, their storage and hydrogen deployment (it would also support Ukrainian decarbonisation efforts);
- promoting climate-smart mining (minerals and metals essential for low-carbon technologies).

2.7. Industry and commerce

Before the war, the Ukrainian government released budgetary funds equivalent to 3.9-6.2% of GDP for supporting economic activity. However, more than half of these funds were used for road construction and maintenance. Budgetary allocations for economic activity, excluding support for agriculture and road construction (directed mainly towards industry and commerce), amounted to 2.7% of GDP in 2020 and 1.9% in 2021. In 2022 budgetary appropriations for economic activity went down to **3%** of GDP, with industry and commerce financing at **0.8%** of GDP.

In a post-war context, government would play a non-negligible role in the restoration of public-sector industrial assets and in providing support to the private owners of destroyed and damaged industrial assets. However, given the severe financial constraints for government, this role will not be too large in view of the challenging needs in infrastructure, social protection and health care. On the other hand, IFIs (the World Bank, the EBRD and the EIB) that specialise in providing credits to business, and foreign donors, which can provide technical assistance to enterprises, may contribute significantly to rehabilitation and modernisation of Ukrainian industry.

The World Bank and European Commission experts identified that industry and commerce are among the most war-affected sectors. As of 24 February 2023, approximately USD 10.9 bn of damage is estimated to have been sustained in the sector. In conflict-affected areas, both privately and publicly owned enterprises have been destroyed or damaged. Total reconstruction and recovery needs are estimated by experts at USD 23.2 bn (11.6% of pre-war GDP), more than 80% of which cover the costs of rebuilding and modernising equipment, buildings and inventories.

The 'Ukraine Rapid Damage and Needs Assessment' report puts forward the following recommendations for supporting industry and commerce in the short term:

› provide financial support to the enterprises and small business in the form of loans, grants, and guarantees to allow viable firms to survive and reconstruct/modernise assets, and to allow new entrants to emerge;

› establish trade finance instruments for assisting firms with access to new markets;

› rebuild the logistics infrastructure needed for access to inputs and markets;

› streamline business regulations to make it easier to start businesses and to enter new product lines and delivery models.

In the medium and long run, efforts to build back better are necessary, with a focus on green and digital technologies.

In line with these recommendations, the National Recovery Plan, drafted by the Ukrainian government, stipulates a set of financial measures for restoration of production assets and revival of business activity:

› provision of a state portfolio guarantee for 100% reimbursement of the bank loans for the restoration of fixed assets (the company restoring its assets shall be entitled to obtain an unsecured loan for this purpose);

› a leasing programme for production equipment, targeted at financing leasing of production equipment at 5% of its costs for seven years;

› expansion of the '5-7-9%' loan programme for small and medium-sized enterprises (SMEs), with improvements of mechanisms for granting state guarantees and with coverage of the key sectors of the post-war economy;

› launching a programme for banking institutions to finance exporters through the mechanism of an export credit agency, which is supposed to provide financing through the mechanism of a quasi-state guarantee;

› extension of grants and loans for the introduction of digital technologies in production and business processes;

› preferential crediting for procurement of critical engineering products (construction equipment, agricultural, transport engineering, etc.).

However, the selection of the priority sectors in the National Recovery Plan is, to some extent, backward-looking and relies on current business structures: the list of priority or value-adding sectors is headed by steel production, machine building (including for defence needs), agricultural and wood processing, construction and IT. In contrast, foreign investors assess positively the potential of the renewable energy (hydrogen production, wind and solar energy generation) and the digital sector (e-trade and e-commerce, e-governance and e-health, digital transport corridors and smart cities).[16] Among high value-adding sectors, the machine-building industries – production of

[16] Dadabaev, T., R. Grieveson, M. Holzner et al. (2021), 'EU Japan Joint Study on Connectivity Cooperation in the Western Balkans, Eastern Partnership Countries and Central Asia', Support Facility for the Implementation of the EU-Japan Strategic Partnership Agreement (SPA).

equipment for the energy sector, military machines and equipment, transport vehicles, etc. – also have some comparative advantages.

Proper implementation of the full range of planned instruments is likely to be a costly undertaking for the government. Therefore, part of these programmes may be transferred to foreign donors/creditors, including IFIs and specialised agencies. The government's limited fiscal capacity for support and modernisation of industry and commerce highlights the role of foreign donors and lenders in this area, unless the national financial sector can recover and strengthen, overcoming the consequences of war.

In Ukraine's reconstruction process, evident mistakes made in BiH's reconstruction must be avoided. Neglect of industrial policy by international donors (less than 3% of development assistance was committed to the industrial sector) and the low-quality institutional environment in BiH resulted in stagnant industrial production. In its turn, this brought about persistent high unemployment, weak economic activity, a growing informal sector and large external imbalances.[17] To avoid such an adverse scenario in Ukraine, technical and financial aid for restructuring of large companies will have to be provided by international institutions and donors, as well as credit lines for the modernisation of the production process. In addition, various financial tools should be extended for the development of manufacturing and related services industries, as described above.

2.8. The military-industrial complex and armed forces development

In 2015-2021 the Ukrainian government spent the equivalent of 2.3-2.9% of GDP on defence. Since the start of the Russian invasion, budget expenditure on defence has increased sharply and reached 22% of GDP in 2022. In addition, as of 7 December 2022, Western partners had committed EUR 41bn military aid to Ukraine, equivalent to 35% of the country's 2022 GDP. In the 2023 budget, appropriations for defence and security needs amount to more that UAH 1.7trn, which constitutes about 30.8% of GDP.

After the war ends, a realistic forecast of budgetary allocations for defence and the development of the military-industrial complex would amount to 9.7% of GDP in 2025 and about 6% of GDP thereafter. International experience suggests that war-torn countries, countries under the threat of military attacks and those involved in military operations spend 4.2-7.6% of GDP from the state budget for defence purposes (see Table 3).

[17] For details, see: Bogdan T., M. Landesmann and R. Grieveson (2022), 'Evaluation of Ukraine's National Recovery Draft Plan', wiiw Policy Note No. 61, The Vienna Institute for International Economic Studies (wiiw), Vienna, November.

Table 3 / Countries with highest ratios of budget expenditures on defence since 2000 (10 subsequent years) and comparison with pre-war Ukraine, % of GDP

Country	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year	Average
Israel (2000-2009)	7.7	7.9	8.8	8.3	7.5	7.5	7.7	7.0	6.8	6.4	7.6
Yemen (2002-2011)	6.8	6.4	5.3	4.9	5.6	6.3	5.5	5.7	4.7	3.6	5.5
Singapore (2000-2009)	3.3	5.1	8.6	7.9	5.7	3.1	2.8	2.6	2.2	2.1	4.3
Georgia (2005-2014)	3.3	5.1	8.6	7.9	5.7	3.1	2.8	2.6	2.2	2.1	4.3
US (2003-2012)	3.8	3.9	3.9	3.9	4.0	4.3	4.6	4.7	4.5	4.2	4.2
Ukraine (2011-2020)	1.0	1.0	1.0	1.7	2.6	2.5	2.5	2.7	2.7	2.9	2.1

Source: composed by authors, based on IMF's COFOG database.

For the strengthening and development of the defence industry, the National Recovery Plan prescribes the design and implementation of state-targeted programmes of weapons development and military-industrial complex modernisation, including production or development of:

› armoured vehicles;

› high-precision weapons;

› aircraft production and repairs;

› radio location, radio communication and special instrument building;

› artillery, anti-tank and anti-ship weapons;

› radar systems, ammunition and special chemicals;

› aerospace programme;

› missile weapons.

An important area is the establishment of production of ammunition and cartridges compatible with NATO calibres, including licensed ones.

In addition to the state targeted programmes for the fulfilment of these tasks, the government has to extend significantly state procurements for covering defence needs. In comparison with the pre-war period, the scale of state procurements for military purposes has to be increased by several times.

PPPs and private investor participation in the build-up of a modern military-industrial complex are also important. The Ukrainian government correctly identifies key measures for modernisation of the military-industrial complex and improving the provision for national armed forces:

› establishment of the legal instruments for efficient operation of PPPs and joint ventures in the interests of national security and defence;

› lifting restrictions for the establishment of joint ventures with foreign companies and conducting joint business with them;

› improving legislation to attract and protect domestic and foreign investments, ensuring the accessibility of risk insurance instruments (including military risks) for investment purposes;

› extending the scope of the Law of Ukraine 'On Industrial Parks' and application of other instruments of state support and targeted incentives for the development of the military-industrial complex.

2.9. Agriculture

In 2017-2021 the government allocated the equivalent of 0.4% of GDP from the budget for subsidising agriculture, forestry and fisheries (excluding the programme of privileged credit provision through Ukrainian banks). In 2023-2025 budgetary allocations of this type could reach 0.5% of GDP annually. In addition, the programme of bank concessional lending to SMEs, subsidised by the Ukrainian government, encompasses farmers and other agricultural producers to a large extent.

Government responsibilities in the agricultural sector, first of all, would consist of funding public institutions for delivery of agricultural services, including land monitoring and registration, soil testing for precision agriculture, sanitary and phytosanitary measures, food safety rules, agricultural research and extension services, and training of farmers and staff of other agribusinesses. Efficient institutions of this type could support the post-war recovery and development of the agricultural sector.

To drive economic recovery in agriculture and to attract private capital into the sector, the easing of financial constraints for producers and provision of some kind of grant supports are advisable. Stimulating banks to new agricultural lending and provision of direct support to farmers through a combination of grants and soft-term credit lines to relaunch production are essential in the framework of a comprehensive reconstruction plan.

A programme of recovery for Ukraine's agriculture should be harmonised with a programme of industrial development, as a higher degree of processing of agricultural products is a prerequisite for generating more value added and enhancing the country's welfare. The National Recovery Plan correctly addresses the priorities of increasing meat and milk production, and developing agro-processing to achieve production of starch, corn syrup, gluten, lecithin and protein. Improving the business climate and rebuilding infrastructure for agricultural production and the food industry are essential in this regard.

According to World Bank and European Commission estimates, as of February 2023 the war has resulted in USD 8.7bn of damage to the agriculture sector. Damage to or total destruction of machinery and equipment accounted for 53% of the total, followed by stolen inputs and outputs (23%) and damaged/destroyed storage facilities (15%). The damage includes destruction or theft of livestock and crops, as well as damage to agricultural land that is now in need of recultivation.

The financing need from the public sector for recovery of Ukrainian agriculture is estimated to reach USD 29.7bn (14.8% of pre-war GDP). The most important public investments will include rebuilding of damaged assets, addressing liquidity and other constraints, and restoring agricultural public institutions to effectively support recovery and reconstruction.

3. WHAT SHOULD POST-WAR FISCAL AND TAX POLICY LOOK LIKE, AND WHAT CAN UKRAINE LEARN FROM ELSEWHERE IN CESEE IN THIS REGARD?

3.1. Improving public finance management

For effective post-war reconstruction, not only prudent public expenditure policy is needed, but effective reforms of the public finance management system too. The last aspect is particularly important in the context of achieving strategic development goals and enhancing Ukraine's integration into the EU.

Public finance management reforms should be aimed at improving strategic allocation of budgetary funds, effective delivery of public services, strengthening performance budgeting and establishing a modern audit system for public expenditure. Strategy for reforming the public finance management system for 2022-2025, which was approved by the Cabinet of Ministers in December 2021, requires amendment in view of new fundamental challenges and the European integration agenda for Ukraine.

The National Recovery Plan, announced by the Ukrainian government in July 2022, formulates some tasks for public finance management reform in 2023-2025:

› carrying out the holistic assessment of the efficiency of public finance management system in order to reveal gaps and inconsistencies with EU practices and recommendations;

› reconciliation of Ukraine's external financial audit (control) system with international standards and improving the control/audit of public funds utilisation, in particular, of local budget funds, funds of the social security system, and assets of the state-owned enterprises, including municipal enterprises;

› alignment of the strategic planning system with medium-term budgetary planning, extension of the scope of performance budgeting and using its reported results for managerial and financial decisions at the level of main distributors of budgetary funds and at Ministry of Finance level.

All these measures are well justified and needed for improving allocations of the budgetary funds and enhancing the social and economic impact of the budgetary programmes. But, in addition to these, the strengthening of external and internal evaluations of the budgetary programmes is urgently needed, as well as their inclusion into the system of budgetary decision-making.

Appropriate monitoring and evaluation of the budgetary programmes as integral components of performance budgeting must include the following undertakings:

1) Incorporation of indispensable stages into the evaluation process, such as: (i) analysis of the possibility of attainment of every resulting indicator of the budgetary programme and, based on this, identifying the likelihood and degree of reaching the target and of executing the tasks of the programme; (ii) evaluation of the sustainability and duration of the positive outcomes of budgetary programmes after suspension of its financing; (iii) elaboration of the proposals related to the methods and mechanisms of increasing effectiveness of the budgetary programme;

2) Imposing rules related to obligatory external evaluation of significant budgetary programmes by the Accounting Chamber of Ukraine or State Audit Service; such evaluation is considered as the most objective and unbiased by international standards, and raising the issue of 'value for money' for the budgetary programme in a proper way (for details, see Curristine and Flynn (2013)).[18]

The above-mentioned reforms are intended to increase the efficiency of public funds allocations for reconstruction purposes and pursue the agenda for EU member state-building for Ukraine.

3.2. Reconstructing the Ukrainian tax system

To finance part of the reconstruction needs outlined earlier, but also to ensure the implementation of a sustainable economic development strategy over the medium term, Ukraine must increase its public revenues during the post-war period. Achieving this goal requires implementing tax system reforms and improving tax collection. In this section, we will present several possibilities for doing this. First, we will discuss the current state of affairs in the Ukrainian tax and revenue system. Given this, we will outline the general direction in which the changes should go, and we will explore some options for tax reform.

The need to mobilise domestic revenues was well acknowledged in the Program Monitoring with Board involvement (PMB) that Ukraine agreed with the IMF in November 2022,[19] and in the Extended Fund Facility (EFF) arrangement approved in March 2023[20]. The PBM stated that Ukrainian authorities need to take measures to boost tax revenues, in order to create fiscal space, specifying three changes that should be submitted to parliament by the end of January 2023:
(i) cancelling the moratoriums on tax audits; (ii) restoring the pre-war regime for taxpayers eligible for the 2% simplified tax regime; (iii) ensuring full-scale enforcement of the usage of cash registers in retail outlets. Over the longer-term horizon, the PBM stressed that the tendency should be to restore tax policy and administration to the pre-war set-up, as well as to work on 'broader design of tax policies' and modernising revenue administration. Despite acknowledging the need for improving public revenues, the IMF stayed silent even on the direction of this, as well as on the specific actions through which this should be achieved.

Before the invasion, Ukraine's general government revenues were among the lower ones in the wider region of Central, East and Southeast Europe (CESEE). General government revenues in 2021 were around 37% of GDP, which was higher than in nine CESEE countries, and lower than in 12 (Figure 2). Because of its relatively low revenues, the country was repeatedly incurring deficits in the government budget. These averaged 3.1% of GDP in the period 2017-2021, which was above the Maastricht criterion of 3% of GDP, and was among the higher in the CESEE region (Figure 3).

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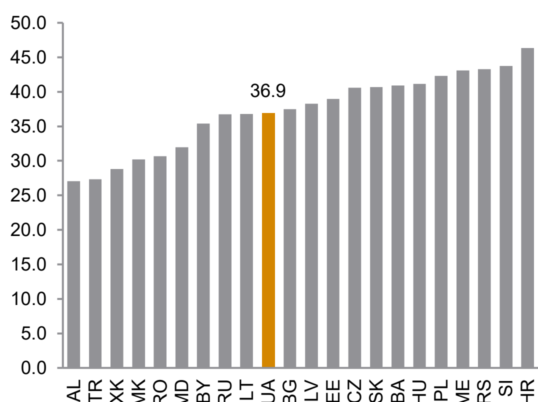
18 Curristine, T. and S. Flynn (2013), 'In Search of Results: Strengthening Public Sector Performance' in: M. Cangiano, T. Curristine and M. Lazare (eds), *Public Financial Management and its Emerging Architecture*, International Monetary Fund, pp. 225-258.

19 IMF (2022), IMF and Ukrainian Authorities Reach Staff Level Agreement on Program Monitoring with Board Involvement, available at: https://www.imf.org/en/News/Articles/2022/11/23/pr22407-imf-and-ukraine-reach-staff-level-agreement

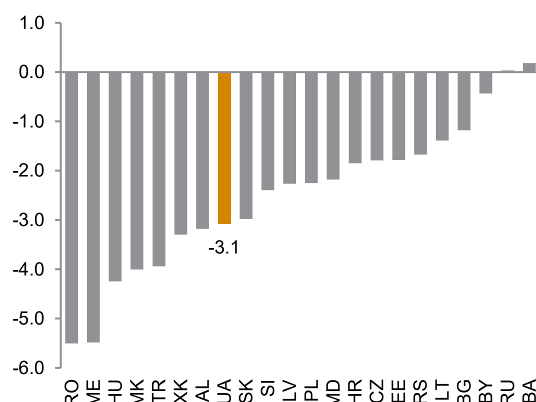
20 IMF (2023), IMF and Ukrainian Authorities Reach Staff Level Agreement on a US$15.6 Billion Extended Fund Facility (EFF) Arrangement, available at: https://www.imf.org/en/News/Articles/2023/03/21/pr2388-ukraine-imf-and-authorities-reach-staff-level-agreement-eff-arrangement

Figure 2 / General government revenues in 2021, % of GDP



Source: IMF World Economic Outlook database, October 2022.

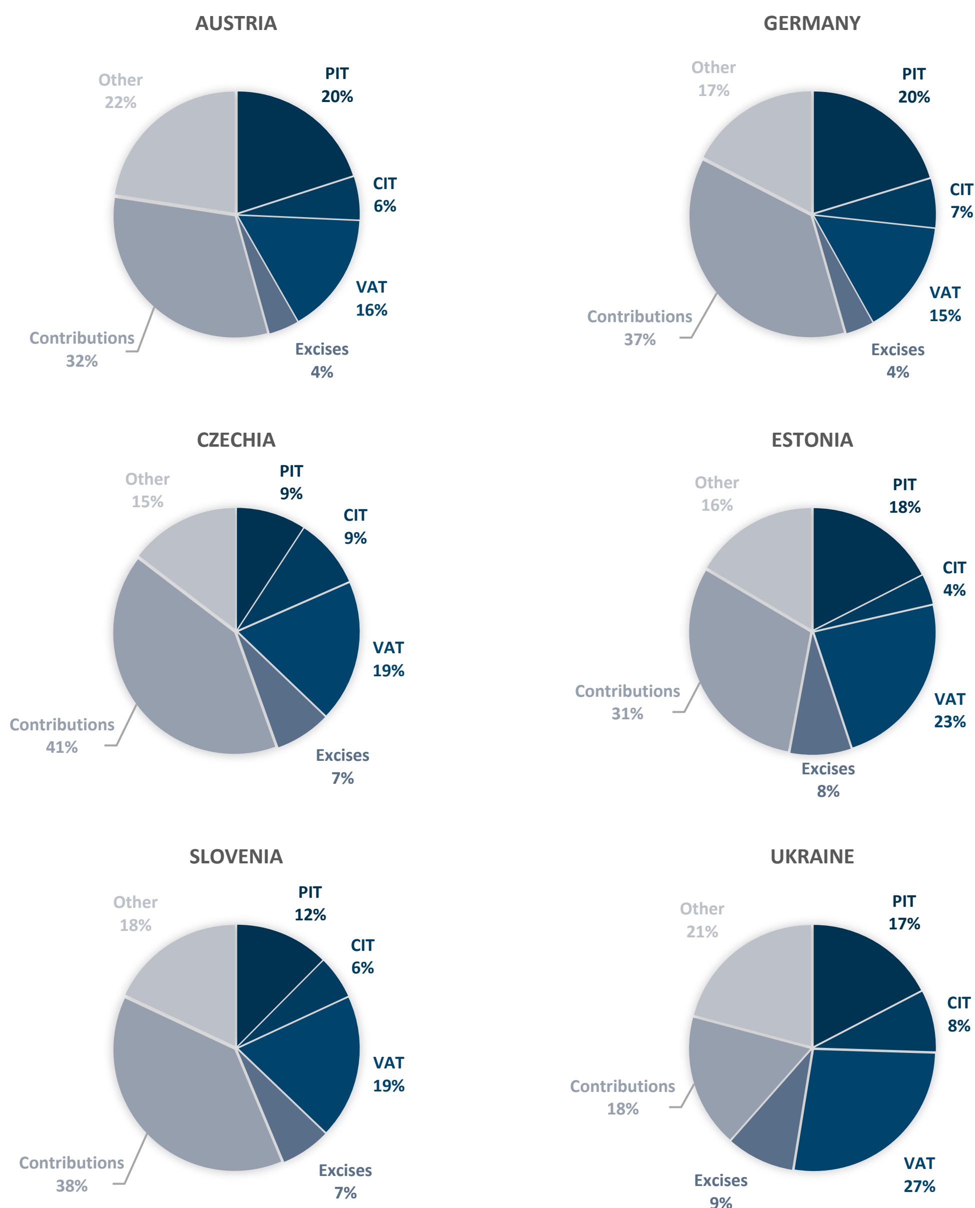
Figure 3 / General government budget deficit in 2017-2021, % of GDP



Source: IMF World Economic Outlook database, October 2022.

The structure of public revenues in Ukraine was considerably different from the more developed EU countries. Comparing the shares of the main taxes in the total revenues in Ukraine against the shares in Austria and Germany, as examples of developed EU countries, and Czechia, Estonia and Slovenia, as the three most developed CESEE economies (Figure 4), one can see that Ukraine collects considerably less revenues through social security contributions (SSC) – their share in Ukraine was 18%, while in all the other five countries, it was more than 30%. On the other hand, Ukraine collects more through value-added tax (VAT) – 27% of the total revenues, much more than any of the five other countries, and through excise duties – 9%, again more than any of the other five countries. Ukraine also collects a relatively large amount from corporate income tax (CIT) – 8% of the total revenues, with only Czechia collecting more. When it comes to personal income tax (PIT), Ukraine is in the middle – 17% of its public revenues come from PIT, which is less than in Austria, Germany and Estonia, but more than in Czechia and Slovenia. Thus, in general, the Ukrainian tax system was relying more on taxing goods and services (VAT and excise duties) than on taxing income (SSC and PIT).

Figure 4 / Structure of the public revenues in Ukraine and other countries in 2021, % of total revenues



Source: IMF Government Finance Statistics

Ukraine's current income tax system operates on a 'flat' tax rate of 18%, which applies to both personal and corporate income, irrespective of the level of earnings. Although the 'flat' tax system remains prevalent in the CESEE region, several countries – Czechia, Slovakia, Montenegro, Albania, Latvia, Lithuania and Russia – have recently abandoned it, introducing progressive tax systems (Jovanović, 2020).[21] Ukraine itself has had a complicated relationship with the flat tax – it introduced it for the first time in 2004, abandoned it in 2011, but restored it in 2016.

[21] Jovanović, B. (2020), 'Return of the progressive tax', Monthly Report No. 11/2020, wiiw Monthly Report, No. 11, Vienna, November 2020, pp. 23-28, available at: https://wiiw.ac.at/monthly-report-no-11-2020-dlp-5474.pdf

Ukraine's flat tax rate is higher than that of most other CESEE countries, such as North Macedonia, Bosnia and Herzegovina, Bulgaria, Hungary and Romania, which maintain a 10% rate, and is close to Estonia's 20% rate. However, it is in general lower than the rates in countries with a progressive tax system, both in the CESEE region, such as Slovakia, Croatia, Latvia, Lithuania and Slovenia, and in Western Europe, such as Austria and Germany (see Table 4).

Table 4 / PIT rates in selected countries in 2023

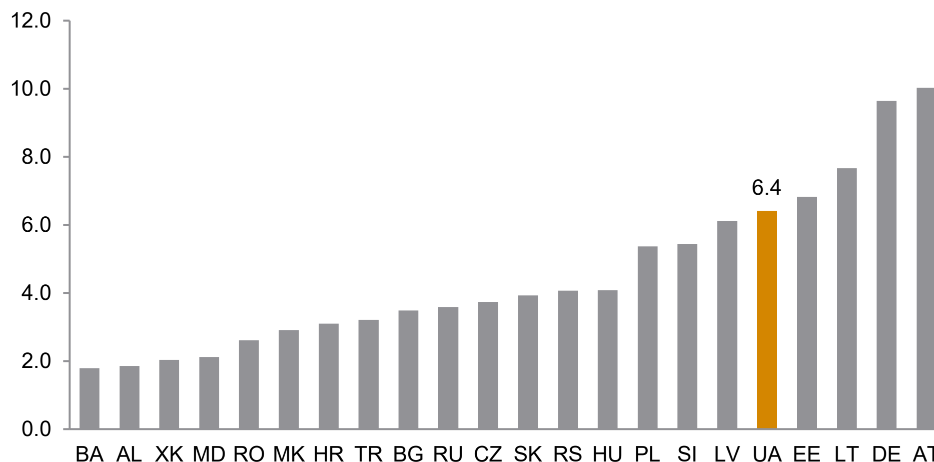
Country	PIT rates
Kosovo	4-10%
North Macedonia	10%
Bosnia and Herzegovina	10%
Bulgaria	10%
Hungary	10%
Romania	10%
Montenegro	9-15%
Moldova	6-18%
Ukraine	**18%**
Serbia	10-20%
Estonia	20%
Albania	13-23%
Czechia	15-23%
Slovakia	19-25%
Croatia	20-30%
Latvia	20-31%
Poland	12-32%
Lithuania	20-32%
Germany	14-45%
Slovenia	16-50%
Austria	20-55%

Source: PwC Worldwide Tax Summaries.

Prior to the implementation of the current ‘flat’ tax in Ukraine in 2016, the PIT was slightly progressive. It featured a rate of 15% for income up to 10 times the minimum wage level, and 20% for income exceeding that threshold. Ukraine's first ‘flat’ tax was introduced in 2004 with a proportional rate of 13% for all income levels. This first ‘flat’ tax lasted until 2011. Before this, Ukraine had a highly progressive PIT structure, with tax rates of 10%, 15%, 20%, 30% and 40%.

Although Ukraine's PIT is ‘flat’, its revenue collection is high compared with other CESEE countries. PIT revenues in Ukraine amounted to 6.4% of GDP in 2021, with only Estonia and Latvia in CESEE having higher revenues. This is because of the relatively high PIT rate in Ukraine of 18%. However, compared with developed EU countries such as Austria and Germany, which have more progressive PIT schedules, Ukraine's PIT revenues are still low (Table 5).
Social security contributions (SSCs) in Ukraine are very low, among the lowest in Europe. The total rate of SSC is 22% of gross wages, which is the third lowest in CESEE, with only Kosovo and Montenegro having lower contributions. Most of the other countries have SSC rates in the range of 30-40% of gross wages, and some exceed 40% (Table 5).

Figure 5 / PIT revenues in 2021, % of GDP



Source: IMF, Government Finance Statistics.

Table 5 / Total SSC rates in 2023, % of gross wages

Country	Total SSC rate
Kosovo	10.00%
Montenegro	21.50%
Ukraine	**22%**
Moldova	24-32%
Albania	27.90%
North Macedonia	28%
Hungary	31.50%
Bosnia and Herzegovina	32.80-41.50%
Poland	32.92-36.12%
Estonia	33%
Bulgaria	33%
Latvia	34%
Germany	34.60%
Serbia	35.05%
Croatia	36.50%
Slovenia	38.20%
Austria	39.15%
Romania	41.25%
Czechia	44.80%
Slovakia	47.80%

Source: PwC, Worldwide Tax Summaries.

The taxable base subject to SSC in Ukraine is capped at 15 times the minimum wage level. This cap limits the maximum amount of contributions that can be paid, and hence the SSC schedule is regressive, as top income earners pay much lower effective rates of SSC than people with lower incomes. Compared with other countries that have such caps, the Ukrainian cap is among the higher (Table 6). However, around half of the countries that are considered in this comparative analysis do not have such a cap.

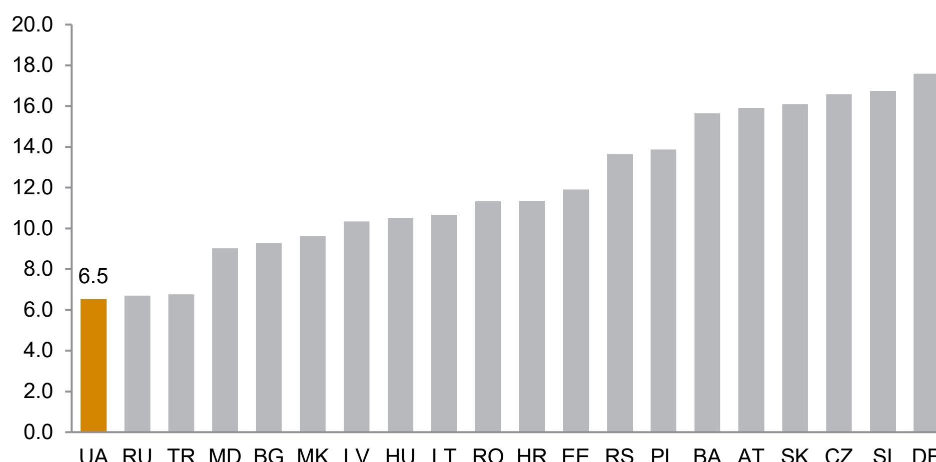
Table 6 / Caps on social security contributions in 2023

Country	Social Security Contributions cap
Austria	EUR 5,850 (around 4 minimum wages)
Albania	4.5 minimum wages (EUR 1,300)
Poland	4.5 minimum wages (EUR 3,200)
Czechia	4 average wages
Bulgaria	9 minimum wages (BGN 3,400)
Serbia	5 average salaries
Latvia	10.5 minimum wages (EUR 6,500)
Slovakia	12 minimum wages (EUR 8,000)
Croatia	12 minimum wages (EUR 8,200)
Ukraine	**15 minimum wages**
North Macedonia	16 average wages
Bosnia and Herzegovina	No cap
Kosovo	No cap
Estonia	No cap
Hungary	No cap
Lithuania	No cap
Moldova	No cap
Romania	No cap
Germany	No cap
Slovenia	No cap

Source: PwC, Worldwide Tax Summaries.

Because of the low SSC rates, as well as the cap on the maximum amount of contributions that can be paid, Ukraine has very low revenues stemming from these contributions. In 2021 they amounted to just 6.5% of GDP, which was the lowest of all the countries with available data (Kosovo and Montenegro do not have data for 2021 in the IMF database). Only Russia and Turkey had similarly low SSC revenues (around 7% of GDP), while almost all the other countries were in the range of 9-16% of GDP. In Germany, SSC revenues amounted to nearly 18% of GDP.

Figure 6 / SSC revenues in 2021, % of GDP



Source: IMF, Government Finance Statistics.

On the other hand, the VAT rate in Ukraine is close to the level applied in most other countries. The general VAT rate is 20%, which is the same as in seven other CESEE countries, higher than in five, and lower than in eight (Table 7). Ukraine also has two preferential VAT rates, of 14% and 7%, which are also in the middle of the range. The 14% rate applies to certain agricultural products, and the 7% rate to medical products, cultural and sporting events, and transportation. Surprisingly, food – unlike in most other countries – is not subject to a reduced rate, but to the standard one.

Table 7 / VAT rates in 2023, %

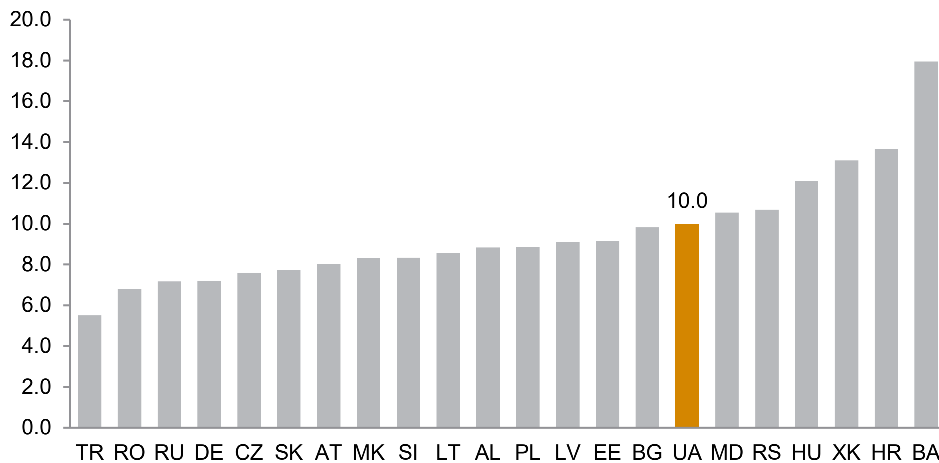
Country	General VAT rate	Reduced VAT rates
Bosnia and Herzegovina	17%	None
North Macedonia	18%	5%
Kosovo	18%	8%
Germany	19%	7%
Romania	19%	9%
Ukraine	**20%**	**7% and 14%**
Austria	20%	10% and 13%
Slovakia	20%	10%
Estonia	20%	9%
Bulgaria	20%	9%
Serbia	20%	10%
Albania	20%	6%
Moldova	20%	8% and 12%
Czechia	21%	10% and 15%
Latvia	21%	5% and 12%
Lithuania	21%	9%
Montenegro	21%	7%
Slovenia	22%	9.5%
Poland	23%	5% and 8%
Croatia	25%	5% and 13%
Hungary	27%	5% and 18%

Sources: Ministries of finance of respective countries.

When comparing VAT revenues in Ukraine with other countries, it becomes apparent that Ukraine collects a relatively higher amount. In 2021 VAT revenues accounted for 10% of Ukraine's GDP, which was one of the highest levels among the countries analysed (see Figure 7). This can be attributed to Ukraine's practice of applying the general rate of VAT to food items, whereas most other countries use a reduced rate for taxing food products.

Ukraine currently applies a 'flat' CIT rate of 18% to all companies, regardless of their profits. This places Ukraine's CIT rate among the higher ones in the region. Twelve 12 CESEE countries have lower rates and six have higher rates. Among EU countries, Germany has a lower CIT rate than Ukraine, while Austria has a higher one. Although some countries have progressive CIT systems with lower tax rates for lower levels of corporate income and higher rates for higher levels of income, such countries are in the minority in the CESEE region (Table 8).

Figure 7 / VAT revenues in 2021, % of GDP



Source: IMF, Government Finance Statistics.

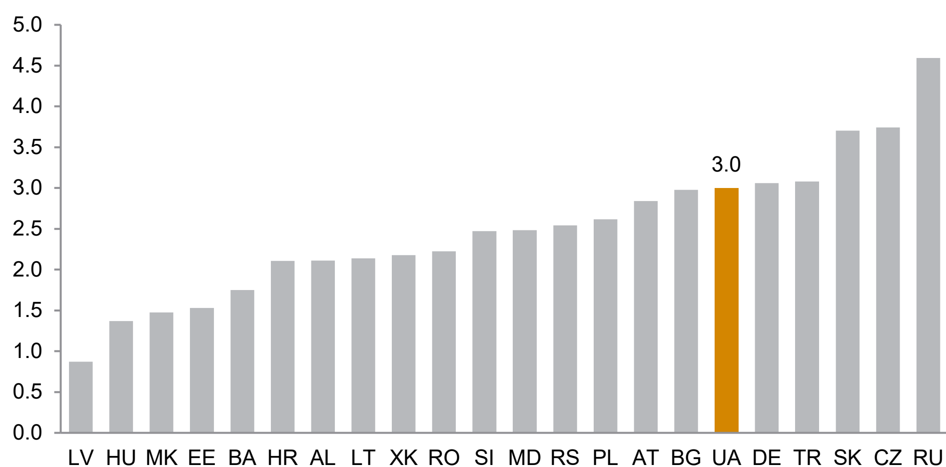
Table 8 / CIT rates in 2023

Country	CIT rate
Hungary	9%
Bosnia and Herzegovina	10%
North Macedonia	10%
Kosovo	10%
Bulgaria	10%
Montenegro	9%, 12%, 15%
Moldova	12% and 15%
Serbia	15%
Albania	15%
Lithuania	15%
Germany	15.825%
Romania	16%
Croatia	10% and 18%
Ukraine	**18%**
Poland	9% and 19%
Czechia	19%
Slovenia	19%
Estonia	20%
Slovakia	15% and 21%
Austria	25%
Latvia	25%

Sources: Ministries of finance of respective countries.

Owing to the relatively high CIT rate of 18%, Ukraine's revenues from this source are among the higher in the region. They amounted to 3% of GDP in 2021, the sixth highest in the sample of analysed countries (Figure 8).

Figure 8 / PIT revenues in 2021, % of GDP

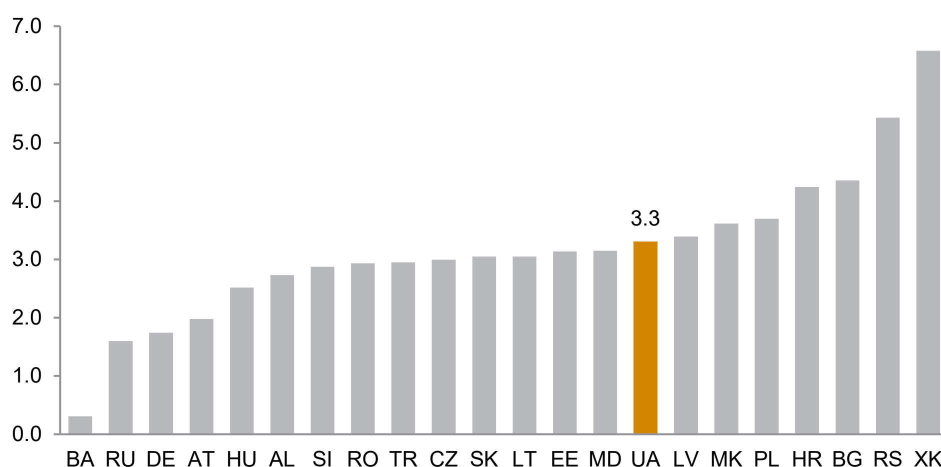


Source: IMF, Government Finance Statistics.

The excise duty tax system in Ukraine is similar to that of other countries in the CESEE region. It applies to both imported and domestically produced goods and covers a wide range of product categories, such as ethyl alcohol, alcoholic beverages, beer, tobacco and tobacco products, e-cigarette liquids, cars, motorbikes, liquefied gas, petrol, diesel fuel, other fuels and electric power. Regarding tobacco products, there is a pre-announced calendar in place that mandates excise increases of 20% annually until 2025. Although pre-announced calendars of future excise increases are common and considered best practice, the rate of increase in Ukraine may be comparatively high.

Ukraine's excise duty revenues are relatively high compared with other countries in the region. In 2021, these revenues amounted to 3.3% of the country's GDP. This figure was higher than in 14 countries for which corresponding data was available, but lower than in seven others.

Figure 9 / Excise duty revenues in 2021, % of GDP



Source: IMF, Government Finance Statistics.

The main direction for the post-war changes in the Ukrainian tax system should be towards increasing revenues. As shown in the previous section, the Ukrainian public finance system required revenue improvements even prior to the invasion. Government revenues in Ukraine amounted to approximately 37% of GDP, which was among the lower shares in the wider CESEE region, was inadequate for providing top-quality public services, and led to constant public deficits and debt build-up. This issue will be compounded during the reconstruction period, as public expenditure needs will increase by around 10% of GDP, as elaborated previously in this chapter.

Although the primary goal of tax reform should be to increase revenues, it is not advisable to implement drastic changes immediately. In the early years of the reconstruction phase, a significant portion of the financing needs will be met by international donors. Therefore, domestic revenues need not necessarily be raised in the immediate post-war period. Additionally, it will take some time for the economy to recover from the devastating effects of the war, as many private firms and public corporations' assets have been destroyed, and many people have left the country. However, international donor funding is not a sustainable long-term solution, and when it starts to decline, mobilising domestic revenues will be necessary.

The first option to consider for increasing domestic revenues should be to raise social security contributions. In Ukraine, SSCs are among the lowest in the CESEE region, at only 22% of gross wages. As a result, the country is not collecting enough money from this source, with revenues amounting to only 6.5% of GDP, which is lower than everywhere else in the region (and far lower than for most countries within it). If the general rate of SSCs is increased from the current 22% to 28%, which is the rate in Albania and North Macedonia, income from this source will increase by approximately 30%, or around 2% of GDP. Despite the increase, Ukraine would still have one of the lowest SSC rates in the CESEE region.

Policy makers should also consider eliminating the SSC cap. Currently, the cap is set at 15 times the minimum wage, which is, admittedly, among the higher caps in the CESEE region. However, as elaborated above, some countries in the region tax the entire income without a cap, which is also the practice in many EU countries. Although it is difficult to assess how much revenue would be generated from the removal or increase of the cap, given the lack of individual income data in Ukraine, the additional revenue raised would come from higher-income earners, making it a form of progressive taxation and strengthening the argument in favour of such a move.

A second option to consider is the introduction of a progressive personal income tax. Currently, Ukraine's revenues from PIT are generally lower than those of advanced EU countries. This is mainly due to Ukraine's ‘flat’ PIT, which has a proportional rate of 18%. Although this rate is not particularly low compared with other countries in the region with ‘flat’ taxes (where the rate is typically 10%), it is lower than the rates in countries with progressive PIT. Therefore, introducing a progressive PIT could potentially increase Ukraine's revenue collection and align its tax system with those of advanced EU countries.

One possible way of implementing a progressive PIT is by introducing an additional rate for the top 1-5% of earners. Many countries that have moved away from a ‘flat’ PIT have adopted this approach. To ensure its effectiveness, it is important that the top rate applies to at least the top 2% earners (preferably the top 5%), and that it is significantly higher than the standard rate of 18% (for example, 25%). If the additional rate only applies to a small fraction of top earners (e.g. just the top 1%) and is only marginally higher than the standard rate (e.g. 22%), it will have virtually no impact on revenue or income distribution.

Another possibility would be to introduce at least two additional PIT rates. The second marginal rate could apply to the top 5% income earners, while the third marginal rate could apply to the top 1%. The second marginal rate could be set at 25-30%, with the third rate at 30-40%. This would result in increased revenue collection and have a more significant impact on reducing income inequality. It would also bring the Ukrainian tax system closer to the systems in advanced EU countries, although, admittedly, it would be more difficult to implement, from a political point of view.

The additional revenues generated by a progressive PIT are difficult to estimate precisely, but they are likely to be significant. Data on individual income distribution in Ukraine are incomplete, but the World Inequality Database provides some rough estimates. According to these estimates, the top 1% income earners in Ukraine earn approximately 9% of the country's total pre-tax income, while the top 10% earn around one-third of the total income. Therefore, it is reasonable to assume that the top 5% income earners make at least 20% of the total income. Doubling the effective rate on this group could generate additional revenues equal to around 20% of PIT revenues, or approximately 1.3% of GDP.

When combined with the proposed SSC increase, the total additional revenue generated would be around 3.3% of GDP per year, which is more than the average annual pre-war deficit in the country. These changes would also push Ukrainian budget revenues to more than 40% of GDP, close to the level in Czechia, Slovakia and Hungary.

While major changes to CIT and VAT may not be necessary, there may be room to optimise these tax systems. Raising the CIT rate may not be advisable, as it is already relatively high at 18%, which is among the higher rates in the region and generates significant revenues. Also, Ukraine's VAT rate is similar to that of other countries in the region, and revenue collection is relatively strong. However, there may be potential to improve compliance by closing loopholes, expanding the tax base and removing inefficient exemptions. By making minor tweaks to these tax systems, Ukraine may be able to enhance revenue collection while maintaining a competitive business environment.

One option to consider would be to reduce the VAT rate on food products. Currently, food in Ukraine is taxed at the standard VAT rate of 20%, which is different from most of the countries analysed here, in which food is usually taxed at a reduced rate. Although this would reduce revenues, it would have positive social impacts, given the surge in poverty in Ukraine during the war - the World Bank estimates that an additional 8m Ukrainians fell into poverty in 2022, which represents a 15-year setback in poverty reduction goals.[22]

No major changes in excise duties are needed, as the system in place is in general compatible with the systems from the region, and the revenues collected are comparatively high. Efforts here should be directed towards improving compliance, i.e. fighting illicit trade, as outlined in Shvabii et al. (2021).[23]

In addition to the suggested changes in tax policies, improving tax compliance and strengthening the capacity of the tax administration are also crucial for maximising revenue collection. Simplification and digitalisation of tax compliance can reduce the burden on taxpayers and improve their compliance behaviour. Tax administration procedures must also be streamlined and made more efficient to reduce bureaucracy and unnecessary delays. To achieve these goals, significant improvements in the capacity and technology of the tax administration are required. Implementing modern IT systems and investing in the training and development of tax administration staff will enable them to better manage taxpayer data, identify non-compliance and implement effective enforcement actions. Additionally, improving transparency in tax administration by publishing tax data can increase accountability and public trust.

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[22] World Bank (2023), 'The World Bank In Ukraine – Overview', available at: https://www.worldbank.org/en/country/ukraine/overview

[23] Shvabii, Kostiantyn, Volodymyr Makarenko, Nadiua Novytska, Mykola Pasichnyi, Inna Khliebnikova (2021), 'Improvement of the policy on excise taxation of cigarettes and combating their illicit production and turnover in Ukraine', available at: https://www.growford.org.ua/en/research/improvement-of-the-policy-on-excise-taxation-of-cigarettes-and-combating-their-illicit-production-and-turnover-in-ukraine/

4. HOW WILL UKRAINE'S PUBLIC DEBT SUSTAINABILITY EVOLVE UNDER DIFFERENT MEDIUM-TERM SCENARIOS? WHAT WOULD BE THE BEST MODE OF EXTERNAL FINANCING?

For projecting public debt levels, detecting the risks of debt dynamics and searching for an adequate policy response to forthcoming debt difficulties, we conducted debt sustainability analysis (DSA) for Ukraine. The debt sustainability framework contains projections of public debt indicators and indicators of gross financing needs in the context of medium-term scenarios (covering 2023-2026); and assessments, on the basis of these, of the major risks and the scope for policy adjustments.

Detailed methodology, assumptions, obtained debt indicators and policy implications of DSA are described in Appendix. Our baseline scenario relies on a core assumption: finalisation of the war at the beginning of 2024. We also assume that the ratio of foreign grants to foreign official financing will decrease from 46% in 2022 to 28% in 2023 and to 16% in 2024-2026, as foreseen by the IMF in the framework of the EFF programme.

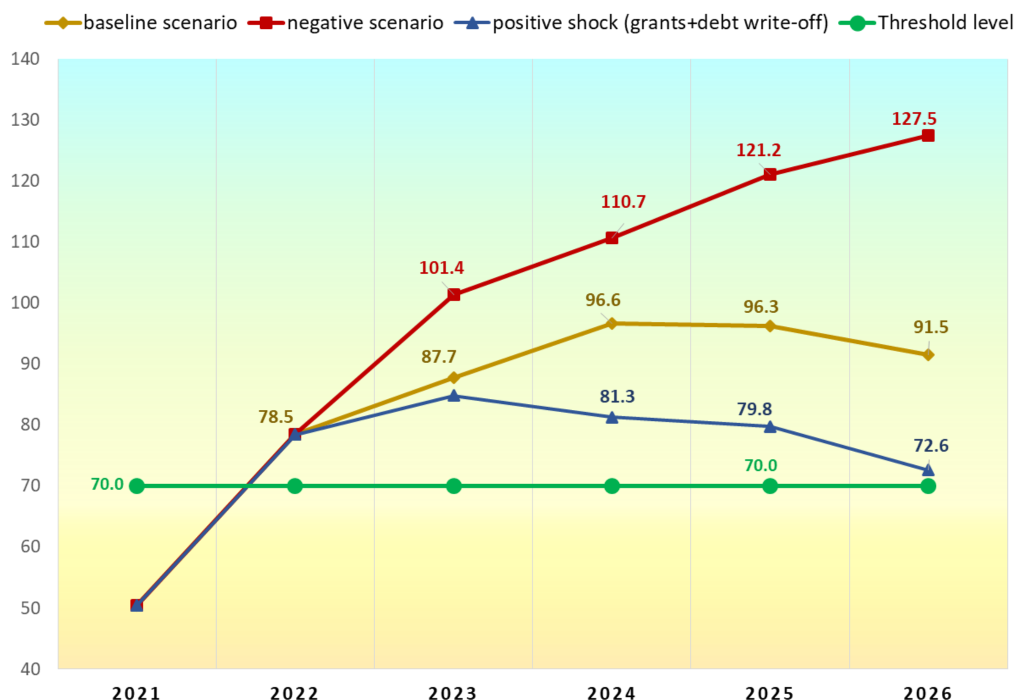
Under the baseline projections, Ukraine will see its debt-to-GDP ratio shoot up, reaching a peak of 96.6% of GDP in 2024 (a well-known key threshold for the public debt level is 60-70% of GDP) and remaining very high in 2025. Both indicators of debt level and gross financing needs in our baseline scenario signal the high probability of debt distress.

The second DSA scenario ('negative stress-test') assumes a continuation of the war until 2025, which inevitably results in deeper GDP decline, higher inflation and a bigger budget deficit. Under this scenario, public debt is projected to witness an explosive dynamic and to reach a peak of 127.5% of GDP in 2026. This peak is higher by 30.9% of GDP than the debt peak in the baseline scenario. Estimated public debt at the end of the forecast horizon would be almost twice as high as the commonly accepted key threshold.

Thus, our baseline and negative stress-test scenarios yield significantly higher public debt levels than the defined threshold. Excessive public debt poses a serious problem, as high debt increases the vulnerability of an economy to shocks. High debt also leaves less room for countercyclical fiscal policy, which may amplify adverse effects during deep economic recession. Moreover, high debt exposes a country to higher rollover risks, which may generate a liquidity crisis. There is also evidence that high public debt stock is detrimental to economic growth. Finally, maintaining large primary budget surpluses (required to service high debt) can provoke social unrest.

In view of these implications, we devised a positive shock scenario, that relies on a growing share of grants in foreign financing and implementing external debt restructuring. More specifically, the positive shock scenario is based upon increasing the share of foreign grants up to 40% in 2024 (compared with 16.4% projected by the IMF) and 50% in 2025 and 2026 (16% according to the IMF). We also estimated the effects of a two-stage approach for public debt restructuring, as advised by the IMF: (i) debt exchange with haircuts to Ukrainian eurobond holders in 2024, (ii) debt reduction to official bilateral creditors in 2026.

Figure 10 / Projected public debt dynamics across DSA scenarios in 2023-2026, % of GDP



Source: authors' projections.

Figure 10 shows the trajectory of Ukraine's public debt under the baseline scenario, negative and positive stress-test scenarios, while the green line reflects the oft-quoted threshold level of 70% of GDP.

If we assume a haircut of 60% to the nominal value of eurobonds at the first stage of debt restructuring, then the public debt stock will decline by 8.9% of GDP in a one-off action. Comparability of treatment of different creditors requires the same discount to be applied to the nominal value of Paris Club debt. A 60% discount to the value of official bilateral debts implies debt write-off equivalent to 3.7% of GDP.

Our computations suggest that the above-mentioned positive shocks will generate a favourable public debt trajectory with a declining debt ratio: 84.9% of GDP in 2023, 81.3% at the end of 2024 and 72.6% at the end of 2026. The same will hold for the gross financing needs indicator: it will be reduced from 25.1% of GDP in 2022 to 14.1% in 2026.

These results indicate that only the extension of foreign grants and partial foreign debt write-off to private and official creditors will ensure gradual restoration of Ukraine's public debt sustainability and provide the opportunity for successful post-war reconstruction.

The EU role in these processes is double-sided. On the one side, the EU should provide more grants to support Ukraine's budget and public services provision in a time of war and for post-war reconstruction purposes. The EU's Recovery and Resilience Facility, introduced as a temporary counter-crisis mechanism, is a good example in this regard. On the other side, EU member countries should participate in the Paris Club activities related to Ukraine's debt restructuring (owed to the bilateral creditors) and setting an agenda for forthcoming restructuring of Ukrainian government debt to eurobond holders.

Summing up, materialisation of the key assumptions of the baseline scenario and of the negative shock scenario would move Ukraine towards a debt crisis, as public debt is assessed to be unsustainable over 2023-2026 without corrective policy actions. Such policy actions involve: (i) raising the share of foreign grants up to 50% in the structure of official foreign financing, (ii) attracting sufficient external financing on the concessional terms, (iii) pursuing external debt restructuring to eurobond holders and to the official bilateral creditors, focusing on the significant discounts (not lower than 60%) to the nominal value of debts.

5. POLICY RECOMMENDATIONS

The government should prioritise public spending (out of the national budget) towards the following functions:

1. Recovery and upgrading physical infrastructure, in particular, transport infrastructure (budgetary financing of this function is projected at 3% of GDP in 2023-2025);
2. Social rehabilitation of war's victims, restoration of social infrastructure and providing social services to the population (social budgetary spending is projected at 8.4-8.5% of GDP);
3. Repairing and rebuilding the housing stocks (budgetary funding for 'housing and communal amenities' is foreseen to be 2-2.7% of GDP in the course of 2023-2025);
4. Rebuilding the network of education and healthcare facilities, resuming reforms in the education and healthcare systems (financing of education is predicted at 5.1-5.2% of GDP and health care at 3.5-3.6% of GDP in 2023-2025);
5. Recovery and modernisation of industrial facilities, state support to SMEs, rebuilding damaged agricultural assets, land de-mining and recultivation;
6. Extension of production capacities for the military-industrial complex and proper financing of national armed forces (after the war ends, budgetary allocations for defence may amount to 6-9.7% of GDP).

Given the deficit of domestic resources in a post-war economy, adequate foreign aid is essential for successful reconstruction. For proper co-ordination of Ukraine's budgetary programmes and external funding, we suggest establishing an Agency for Management of International Aid (AMIA), which would interact with foreign donors and reconcile timelines and amounts of foreign fund disbursements, co-ordinate the activities of different donors, using their comparative advantages, select the funding requests from beneficiaries and monitor the allocations of foreign funds within Ukraine's public and private sectors.

When planning and prioritising public spending, Ukraine's government is advised to take into account the following considerations:

- Social programmes for protection and rehabilitation of the victims of war (newly impoverished and IDPs, war veterans, people with disabilities and households that lost a relative in combat) and employment creation programmes should assume a high priority. However, in view of financial constraints, there is a need to calibrate carefully a broad range of social assistance programmes and replace part of these by new programmes.
- In 2023 and onwards there will be an extensive need for financing the reconstruction of fully destroyed housing units, repairs of partially damaged units and temporary housing for IDPs and people who lost

their homes. Given limited public resources, it is necessary to define a set of prioritisation criteria for eligible households. A selective approach, rather than a universal one, would allow targeting the most-affected population.

- Rehabilitation of roads, restoration of rail and air network functionality, and enhancement of westward road and rail linkages to the EU should be the priority spending areas for transport infrastructure. However, in view of the giant financing needs for this sector (USD 92.1bn as of February 2023) extension of public-private partnerships and foreign assistance in the forms of grants, loans and guarantees are required for Ukraine's infrastructure recovery and modernisation.
- Rebuilding educational and healthcare networks has to take into account the long-term trends in population movements induced by the war, so that public investment in these facilities will be optimised for the new needs of consumers. The related challenge is matching teachers and medical staff to the new distribution of students and patients. It will also be necessary to advance on reforms in the education and healthcare sectors with an emphasis on efficiency gains and improving the quality of public services.
- To boost Ukrainian industrial development as a pillar for constant income generation and sustainable economic development, international donors should provide technical and financial aid for restructuring of large companies in manufacturing and related industries. Credit lines for the modernisation of the production process are also essential. The Ukrainian government should focus on establishing trade finance instruments for assisting companies with access to the external markets and on providing financial support to SMEs (loans, grants, guarantees) to allow them to reconstruct/modernise their assets.

For restoration of public debt sustainability and providing an opportunity for successful post-war reconstruction of Ukraine's economy, we suggest:

- Increasing the share of foreign grants from about 20% to 40-50% in 2024-2026 within a structure of foreign official financing of Ukraine's government.
- Pursuing external public debt restructuring owed to official bilateral creditors and to eurobond holders with considerable haircuts to the nominal values of bonds and loans (that is, not lower than 60%).

In order to increase public revenues, which will be needed in the post-war period, especially after support from international donors fades away, authorities should consider the following options:

- Raising the rate of social security contributions, from the current 22% of the gross wage, to at least 28%, as well as removing the cap on the maximum amount of contributions. In this way, additional revenues of at least 2% of GDP can be collected.
- Introduction of a progressive personal income tax, with one or two additional rates in the range of 25-40%. In this way, additional revenues of 1-1.5% of GDP can be collected.
- Closing loopholes in the current tax system, expanding the tax base, eliminating unnecessary tax exemptions and breaks.
- Improving tax compliance, strengthening the capacity of the tax administration, digitalisation and simplification of procedures.

6. APPENDIX - UKRAINE'S PUBLIC DEBT SUSTAINABILITY ANALYSIS FOR 2023-2026 AND ITS POLICY IMPLICATIONS

6.1. Debt sustainability analysis – the framework

Debt sustainability analysis (DSA) is a framework developed by the IMF as a tool to detect, prevent and resolve potential financial crises in borrowing countries. In general, DSA asks whether, under current policies and macroeconomic assumptions, a country or a government will be able to service its debts in the medium and long run without defaulting and undertaking policy adjustments that are implausibly large in economic or political terms. DSA also involves probabilistic judgments about the trajectory of the public or external debt and the availability of financing, as well as evaluating the risks and uncertainty surrounding the forecasts.

The debt sustainability framework requires projection of public or external debt indicators and indicators of financing needs in the context of medium- (or long-) term scenarios. Judgments in these numerical evaluations are focused on the major risks and the scope for policy adjustments.

Standard DSA consists of assessing and interpreting a country's current and prospective debt-related indicators under the baseline and in the event of probable shocks. A purpose of these exercises is to investigate the implications of current policies and possible shocks that could bring debt to risky levels.

Forecasting results are interpreted in a manner such that a country's public debt outlook should be robust and remain below its respective thresholds both under the baseline and in the face of probable shocks.

The debt dynamics equation plays the central role for DSA:

$$d_t = \beta d_{t-1} - pb_t \quad (1)$$

where: d_t – public debt level at the end of *t* period, as a % of GDP;
d_{t-1} - public debt level at the end of *t-1* period, as a % of GDP;
β_t - coefficient of public debt growth in *t* period or automatic debt dynamics;
pb_t - budgetary primary balance, as a % of GDP.

Extending equation (1) and taking g_t as growth rate of real GDP and π_t as GDP deflator in period *t*, we arrive at:

$$d_t = \frac{\left[1+i_t^w + \alpha_{t-1}\,\varepsilon_t(1+i_t^f)\right]}{(1+g_t)(1+\pi_t)} d_{t-1} - pb_t \quad (2)$$

i^w – weighted average of domestic and foreign nominal interest rates;
i^f - nominal interest rates in foreign-currency-denominated debt;
$\mathcal{E}$ - change in the exchange rate (local currency per US dollar);
α - share of foreign-currency-denominated public debt.

After employing these equations, the standard DSA framework presupposes that projected debt burden and debt flow indicators (across different scenarios) are compared with given benchmarks or thresholds. When debt and debt-related indicators are above the thresholds, careful interpretation is required in order to draw a balanced conclusion about sustainability of the debt outlook.

The IMF argues that the quantitative benchmarks are based on econometric estimates from a class of models called ‘early warning models’. These models identify the level of the indicators that best predict the occurrence of a crisis, in a sense that they minimise two types of errors: false alarms and failing to detect a crisis.

Table 9 / Debt Burden Benchmarks for Risk Assessment, %

Debt profile indicators	Debt-to-GDP	GFN-to-GDP
EMs	70	15
AEs	85	20

Note: EMs – emerging markets; AEs – advanced economies; GFN – gross financing needs, consisting of primary balance, debt amortisation and interest payments for the relevant year.
Source: IMF. https://www.edx.org/course/debt-sustainability-analysis-2

In cases in which most projected debt indicators are above the empirical benchmarks (either under the stress tests or even in the baseline), a country’s debt stance is considered a matter of concern. The appropriate policy response to the debt problems would generally involve a combination of policy adjustment to reduce the overall level of borrowing, and the mobilisation of grant supports. In many cases, the appropriate policy response will also depend on the specific country circumstances.

To summarise the obtained results at the final stage of DSA, a special analytical and representative tool is used, namely a ‘heat map’. It recaps the risks to debt sustainability from the various modules in a standardised way. Heat map colours are determined by comparing debt levels and gross financing needs against various benchmarks. They aim to classify risks in three levels. Green means low, yellow moderate and red corresponds to high risk.

In what follows, building on the pillars of the IMF’s DSA, we will modify the standardised methodology and carry out medium-term scenarios for Ukraine’s public debt. We will start with the assumption that key shock factors for Ukraine’s economy and public finance are in force already, since the outbreak of war. Within our baseline scenario we will make realistic projections on the future developments of the primary deficit, exchange rate, interest rate, inflation and real GDP growth rates.

Our DSA for Ukraine will cover the period 2022-2026, i.e. wartime and the first years of recovery. The aim of this analysis will be to forecast public debt levels and gross borrowing needs for the consolidated budget, detecting the risks of explosive debt dynamics, assessing the government’s gross financing needs and searching for an adequate policy response for forthcoming debt difficulties.

DSA captures public (general government) debt and publicly guaranteed debt. It does not include non-guaranteed domestic and external liabilities of state-owned enterprises. The coverage of public debt encompasses: (a) central government direct debt; (b) government-guaranteed debt from both domestic

and external sources; (c) debt of the local governments; (d) liabilities to the IMF that are not included in central government direct debt.

6.2. Applying the DSA framework to Ukraine – 2022-2026

Table 10 / Ukraine: Decomposition of Public Debt by Creditor Type, 2020-2022, % of GDP

Indicators	2020	2021	2022
Nominal gross public debt	**61.2**	**50.5**	**78.5**
of which: guarantees	7.1	5.8	6.9
Domestic public debt	***25.0***	***21.7***	***28.2***
- held by commercial creditors	16.5	15.0	13.2
- held by National Bank	7.7	5.7	13.6
- guaranteed loans and bonds	0.8	0.9	1.4
External public debt	***36.3***	***28.8***	***50.3***
- official multilateral and bilateral creditors	11.5	9.2	24.7
- bonds	15.6	11.5	16.0
- other creditors	2.8	3.2	4.1
- guaranteed loans and bonds	6.3	4.9	5.5
Gross financing needs	**14.5**	**11.6**	**29.4**
Primary deficit	2.4	0.6	16.0
Amortisation payments	9.2	8.2	10.0
Interest payments	2.9	2.8	3.4

Source: author presentation, based on Ministry of Finance and Statistics Committee data.

The shift towards the war economy of 2022 changed the composition of Ukraine's public debt considerably. The share of official multilateral and bilateral creditors in the structure of public external debt went up from 32% to 49.1% during 2022. At the same time, the share of commercial creditors saw an ongoing decline, because of Ukraine's lost access to international capital markets.

The rapidly accumulating budget deficit pushed the government towards heavy borrowing, both from domestic and external sources. However, bond flotation on the domestic market appeared to be quite a modest source of government financing, not least because the National Bank offered high-yielding deposit certificates to banks (which crowded out banks' lending to government) and inflation eroded the real yield of government bonds. To cover the evolving fiscal gaps, the government has resorted to monetary financing of the budget deficit since February. At the end of 2022 monetary financing amounted to UAH 400bn or 7.7% of GDP. In 2023 the government and the National Bank announced that they were stopping monetary financing and switching to commercial borrowing on the domestic market.

Moving on to the medium-term scenarios as the components of DSA, we start with a **baseline scenario**. In building this scenario, we rely on a core assumption – an end to the war at the beginning of 2024. Next, on the basis of this assumption, we forecast the paths of macroeconomic variables: real GDP growth, inflation, exchange rate, nominal effective interest rates, consolidated budget revenue and primary deficits. We assume that the ratio of foreign grants to foreign official financing will decrease from 46% in 2022 to 28% in 2023 and to 16% in 2024-2026, as foreseen by the IMF in the framework of the newly approved EFF programme. As a result, the amount of foreign grants stood at 8.7% of GDP in 2022 and is projected at 7.2% in 2023 and 2-3.5% of GDP in 2024-2025.

Based on the relationships represented by equation (2) and employing the forecast of macroeconomic variables, our template produces the projections of public debt indicators and gross financing needs during 2023-2026.

The **macroeconomic framework underlying the baseline scenario** is built upon the following assumptions:

1) Real GDP in 2023 is assumed to grow by 0.7%. This rate is explained by the partial destruction of the production and infrastructure facilities, contracting domestic demand and the blockade of marine exports from Ukraine. On the other hand, warfare will be more focused in some regions and the rest of the economy will adjust to new conditions. In 2024, if the war is over, real GDP is projected to recover slightly: real GDP growth of 3.5% seems a reasonable assumption for that year. Jumping from a low base, the resumption of domestic demand and the inflow of foreign funds for reconstruction will drive up real GDP growth to 7% and 6.2% in 2025 and 2026, respectively.
2) Inflation (based upon the GDP deflator) is projected at 26.5% in 2023 – quite a high level, pushed up by high global food and energy prices, ravaged domestic production and transportation routes, a high fiscal deficit and conversion of significant foreign aid into hryvnias for budgetary purposes. Post-war recovery is expected to bring about a decline in the inflation rate, which we forecast at 17.4% in 2024, 10% in 2025 and 8.3% in 2026.
3) Nominal exchange-rate devaluation in 2022 exceeded the rate of domestic inflation, owing to the huge deficit of the capital account of the balance of payments and a lack of confidence in the stability of the national currency. The same trends will prevail in 2023-2024. In 2025-2026 the hryvnia exchange rate will depreciate marginally less than domestic price growth. Economic recovery and the inflow of foreign funding would support the nominal exchange rate and gradually strengthen the real exchange rate. However, nominal devaluation will persist, owing to switching from the fixed exchange rate regime to a more flexible regime after the end of the Russian war.
4) The primary fiscal balance is forecast to worsen from -0.6% of GDP in 2021 to about -13% of GDP in 2022-2023. An end to the war and a revival of budget revenue will bring about a significant reduction of the primary deficit to 11.5% of GDP in 2024, 6% of GDP in 2025 and 1.8% of GDP in 2026. The overall budget deficit (including interest payments on debt) is projected at 18.4% and 17.3% of GDP, respectively, in 2023 and 2024. Ending the war will eliminate the pressure of military expenditure and the budget deficit will decline significantly, to 10.3% of GDP in 2024 and 5.8% of GDP in 2025.
5) Nominal effective interest rates (defined as interest payments divided by the debt stock, without guaranteed debt, at the end of the previous year) are projected to fluctuate in the range of 5.2-6.7% in 2023-2026. Only in 2024 will the effective interest rate be higher, owing to significant domestic financing of the budget deficit from private creditors and falling due deferred payments. Projected interest rates in 2024-2026 are generally higher than those in tranquil times. According to our assumption, higher nominal rates on domestic debt will be partly offset by cheap loans from official foreign donors, which substitute a significant part of private borrowings within the structure of external debt.

Table 11 / Ukraine's DSA Baseline Scenario, % of GDP (unless otherwise indicated)

	2021	2022	2023 proj.	2024 proj.	2025 proj.	2026 proj.
Gross public debt	**50.5**	**78.5**	**87.7**	**96.6**	**96.3**	**91.5**
of which: guarantees	5.8	6.9	7.0	7.2	7.1	7.0
Domestic public debt	***21.7***	***28.2***	***29.8***	***33.8***	***34.7***	***32.9***
- held by commercial creditors	15.0	13.2	…	…	…	…
- held by National Bank	5.7	13.6	…	…	…	…
- guaranteed loans and bonds	0.9	1.4	1.7	1.5	1.6	1.8
External public debt	***28.8***	***50.3***	***57.9***	***62.8***	***61.6***	***58.6***
- official multilateral and bilateral creditors	9.2	24.7	…	…	…	…
- bonds	11.5	16.0	…	…	…	…
- other creditors	3.2	4.1	…	…	…	…
- guaranteed loans and bonds	4.9	5.5	5.3	5.7	5.5	5.2
Gross financing needs	**11.6**	**25.1**	**24.8**	**27.3**	**17.8**	**14.3**
Primary deficit	0.6	13.2	13.0	11.5	6.0	1.8
Amortisation payments	8.2	8.8	6.4	10.0	7.5	8.5
Interest payments	2.8	3.1	5.4	5.8	4.3	4.0
Macroeconomic assumptions						
Nominal GDP (UAH bn)	5,451	5,191	6,613	8,035	9,457	10,877
Real GDP growth (%)	3.4	-29.1	0.7	3.5	7.0	6.2
Inflation (GDP deflator)	25.1	34.3	26.5	17.4	10.0	8.3
Consolidated **budget revenue,** including grants	30.5	42.3	40.3	37.3	35.3	35.4
o/w Tax and non-tax budget revenue	30.5	33.6	33.1	33.8	33.2	34.1
o/w **Foreign grants**	0.0	8.7	7.2	3.5	2.1	1.3
Consolidated **budget non-interest expenditure**	31.1	55.5	53.3	48.8	41.3	37.2
Primary budget balance	**-0.6**	**-13.2**	**-13**	**-11.5**	**-6.0**	**-1.8**
Interest payments on debt	2.8	3.1	5.4	5.8	4.3	4.0
Consolidated **total budget expenditure**	33.9	58.6	58.7	54.6	45.6	41.2
Overall budget balance	**-3.4**	**-16.3**	**-18.4**	**-17.3**	**-10.3**	**-5.8**
Effective **nominal interest rate (%)***	6.8	6.6	6.7	7.6	5.3	5.2
Nominal exchange rate (UAH to USD, end-period	27.3	36.6	45.2	52.1	55.6	57.2
Nominal exchange rate (UAH to USD), yearly average	27.3	32.3	40.9	48.7	53.9	56.4
Nominal exchange rate depreciation (% per year)	-3.6	29.4	21.1	14.2	6.5	2.8

* Defined as interest payments divided by debt stock without guarantees at the end of previous year.
Source: authors′ calculations and projections.

As regards total ***external official financing*** in the framework of the baseline scenario, we assume that it will reach USD 40.9bn in 2023, before slipping back to USD 34.7bn in 2024, USD 22.8bn in 2025 and USD 15.7bn in 2026 (as projected by the IMF for the EFF programme). Out of these amounts, a grant component as direct financial assistance to the state budget would amount to USD 11.6bn in 2023, USD 5.7bn in 2024 and USD 2.5bn-3.7bn in the subsequent two years. Evidently, these allocations from foreign donors and creditors are not supposed to encompass the entire reconstruction plan for Ukraine's economy; instead, they would cover a part of the general budget deficit and would be disbursed for specific programmes, implemented by Ukrainian ministries in co-ordination with foreign donors. The purpose of such type of assistance would be to ensure government solvency, supporting critical government functions in wartime and fostering institutional changes in the post-conflict period.

DSA's baseline yields quite a pessimistic dynamic of government gross financing needs (calculated as the sum of primary budget deficit, interest payments on debt and amortisation payments). According to our estimates, ***gross financing needs will jump from 11.6% of GDP in 2021 and 25.1% in 2022 to 27.3% in 2024.*** In the post-war phase (2025 and 2026) Ukraine's gross financing needs may go down to 14.3%-17.8% of GDP.

As mentioned above, the standard threshold level of this indicator for emerging markets equals 15% of GDP. However, IMF experts conclude that in Ukraine's case, according to illustrative modelling results medium-term external viability can be achieved if the government's average gross financing needs are contained to 8-9% of GDP in 2028-2033 and the public debt-to-GDP ratio declines to 60-65% of GDP.

Under our baseline projections, Ukraine will see its debt-to-GDP ratio shoot up. Starting with a modest debt ratio prior to the war (50.5% of GDP), the government has been forced into heavy borrowing since February 2022. According to our estimates, the ***public debt level will reach a peak of 96.6% of GDP in 2024,*** which would represent an increase of 27.9 pp of GDP in the course of 2022, by 9.3 pp of GDP in 2023 and by 8.9 pp of GDP in the course of 2024.

Thus, in the framework of our baseline scenario, forecast dynamics of the public debt level and the government's gross financing in 2023-2026 will exceed the indicative benchmarks by a large margin. Such dynamics would certainly endanger public debt sustainability.

To reveal the main determinants of public debt build-up in 2022-2025 in relative terms, the debt dynamics equation (2) suggests a decomposition of the increase of the public debt ratio into the contribution of real GDP, of the effective interest rate, of exchange-rate depreciation and of the primary balance.

Contribution of real GDP growth
Contribution of the primary balance

$$\Delta d_t = \left\{ \frac{i_t^w - \pi_t(1+g_t)}{(1+g_t)(1+\pi_t)} - \frac{g_t}{(1+g_t)(1+\pi_t)} + \frac{\varepsilon_t \alpha_{t-1}(1+i_t^f)}{(1+g_t)(1+\pi_t)} \right\} d_{t-1} - pb_t + \dots$$

Contribution of effective real interest rate
Contribution of exchange rate depreciation

Source: IMF. https://www.edx.org/course/debt-sustainability-analysis-2

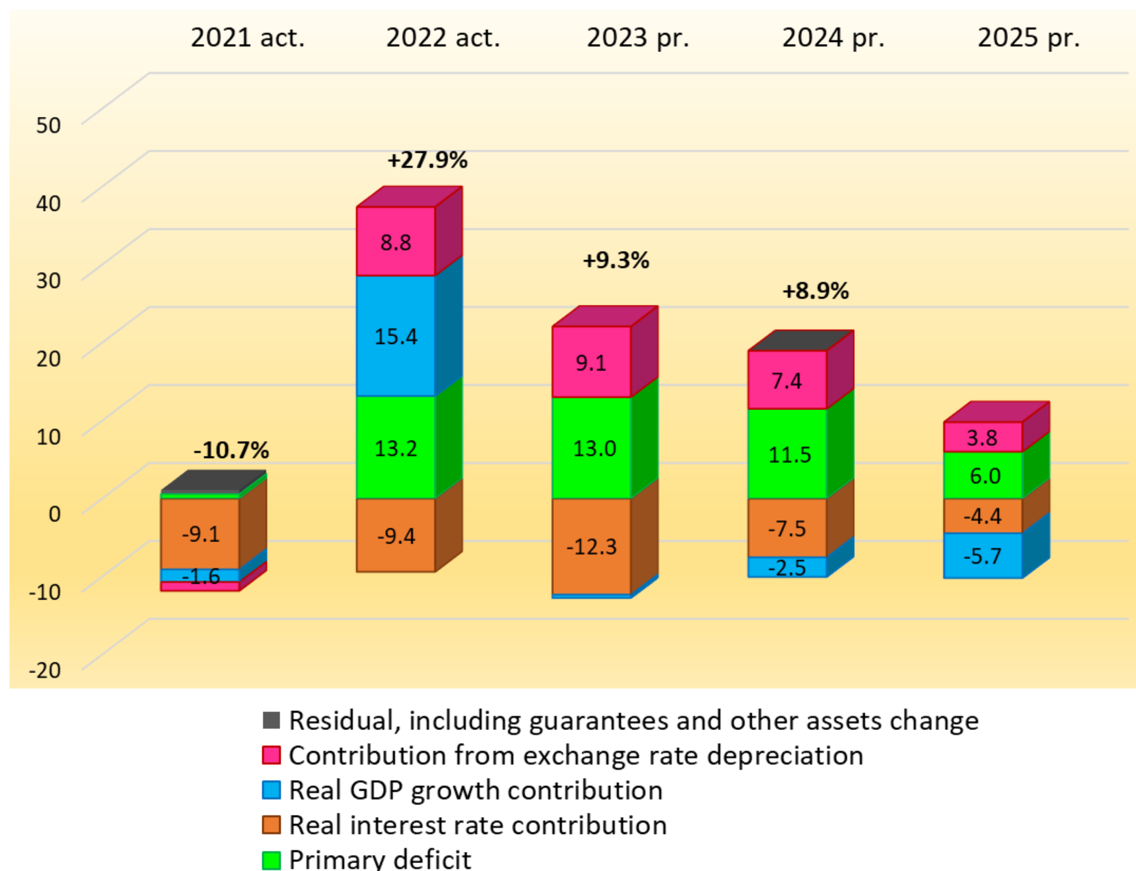
Derived figures for the contributing factors of Ukraine's public debt build-up are shown in Figure 11. We can see that the most dramatic debt increase (+27.9 pp of GDP in 2022) is attributable to real GDP decline, primary budget deficit and exchange-rate devaluation. These factors account respectively for +15.4 pp of GDP, +13.2 pp and +8.8 pp of public debt growth during 2022.

In 2023 the debt ratio is projected to rise again by 9.3 pp of GDP, which would be explained by the primary deficit and by exchange-rate depreciation (these will add +13 pp of GDP and +9.1 pp to the debt volume, respectively). Contributions from interest-rate and economic growth developments are computed to be negative.

In 2024 the public debt ratio is predicted to grow by 8.9 pp of GDP, to reach 96.6% of GDP. In 2025 the debt ratio is forecast to stabilise, with its volume remaining substantial, at 96.3% of GDP. The most significant contributor to debt growth in these years will be the primary budget balance and exchange-rate devaluation, while developments in the real interest rate will play a diminishing role (see Figure 11).

Comparison of the projected debt burden indicators with the indicative thresholds enables us to interpret the debt dynamics and assess the associated risks. The general presumption of DSA is that debt-burden indicators should remain below the thresholds in both the baseline and the stress scenarios.

Figure 11 / Components of public debt dynamics in 2021-2025 (actual data and baseline projections), % of GDP



Source: authors' calculations, based on baseline scenario assumptions and estimates.

However, our calculations suggest that debt sustainability is endangered both in the baseline scenario and in a negative shock scenario. ***The public debt level is projected to surpass the indicative threshold (60-70% of GDP) over the whole forecast horizon and the debt peak of 96.6% of GDP in the baseline deviates considerably from a safe debt level.***

In March 2023 the IMF undertook a DSA for Ukraine, applying a new analytical tool – Sovereign Risk and Debt Sustainability Framework for Market Access Countries (SRDSF), which helps to assess sovereign stress risks and debt sustainability (IMF Country Report, No. 2023/132).[24] The simulations in the SRDSF framework were based on a baseline central scenario and a downside scenario.

The IMF experts come up with a more explosive public debt dynamic than our DSA baseline scenario. According to their estimates, the debt level will be close to 105% of GDP in 2024-2025 and will reach 102% of GDP in 2026. Their more pessimistic result stems mainly from the higher primary balance projections and the sharper hryvnia exchange-rate devaluation. The IMF assumes that the primary balance will worsen from -13.2 % of GDP in 2022 to -15.8% of GDP in 2023 and -11.7% of GDP in 2024. Our assessment indicates that the deficit will be slightly lower than the IMF presumes (see Table 11, primary budget balance row).

Finally, the IMF's experts conclude: 'Ukraine's debt is assessed to be unsustainable in both the baseline and downside scenarios. The pre-restructuring baseline DSA sees debt increase to over 105% of GDP by 2024... As a result, the medium-term modules signal high sovereign stress risks, notably a very high uncertainty around this forecast, and the gross financing needs stress tests that find persistently high financing needs, especially in the near term. Under the downside DSA, the debt trajectory deteriorates substantially relative to the baseline, and the vulnerabilities captured by the fan-chart and GFN tools are further amplified.'

The IMF suggests that Ukraine's debt sustainability is to be restored via (i) official bilateral creditors' commitment to extend the debt service standstill with a commitment to restructure to amounts needed in the baseline and a definitive debt restructuring based on updated data when the high uncertainty ends; (ii) the Ukrainian authorities' commitment to seek an agreement on comparable terms with private external commercial creditors; and (iii) the credible and specific assurances from donors about support on adequate financial terms, in both the baseline and downside scenarios.

Our baseline and negative stress-test scenarios were computed on the basis of the debt dynamics equation before applying debt reduction as a result of debt-restructuring agreements with commercial and official bilateral creditors (the negative stress-test scenario is described below). In order to assess how the debt reduction will affect Ukraine's debt profile and debt-service capacity, we will run a third positive shock scenario as a component of our comprehensive DSA, which will employ assumptions about higher grant shares and partial debt write-offs.

[24] International Monetary Fund (2023), 'Ukraine: Request for an Extended Arrangement Under the Extended Fund Facility and Review of Program Monitoring with Board Involvement – Press Release; Staff Report; and Statement by the Executive Director for Ukraine'. https://www.imf.org/en/Publications/CR/Issues/2023/03/31/Ukraine-Request-for-an-Extended-Arrangement-Under-the-Extended-Fund-Facility-and-Review-of-531687

6.3. Stress-test scenarios and policy implications

We now move on to a stress-test scenario within a standardised DSA framework, that is called a **negative stress-test**. This second scenario is built on the assumption of a continuation of the Russian-Ukrainian war until 2025, which inevitably results in a deeper decline in GDP, higher inflation rates, a larger devaluation of the national currency, and a more burdensome public debt service and a prolonged high budget deficit.

The following macroeconomic assumptions underlie the negative stress-test scenario:

1) Real GDP contraction is predicted at 9.5% in 2023 and at 1.7% in 2024, attributable to further destruction of the production sector and of physical infrastructure, declining domestic demand and damaged logistics for exports and domestic supplies. On the other hand, the end of the war and the start of the reconstruction process in 2025 would put the economy on an upward trajectory; as a result, GDP would grow by 0.2% in 2025 and 3% in 2026.

2) Inflation (proxied by GDP deflator) is projected to move to 31% in 2023, 25.8% in 2024 and 14.2% in 2025. Only in 2026 will inflation go below 10%, reaching 9.5% that year. The same factors are likely to be at play as in the baseline scenario, although deeper recession and higher exchange-rate devaluation will amplify the effects of restrained domestic production and of the pass-through effect of the exchange rate on inflation.

3) Nominal exchange-rate devaluation would be impacted by private capital flight (both domestic and foreign), domestic inflation hikes and undermined domestic competitiveness. The strong devaluations of 2022 and 2023 (by rates of 29.4% and 32.6%) will be smoothed in subsequent years (16% in 2024, 9.8% in 2025 and 4.6% in 2026).

4) The nominal effective interest rate is projected to increase from 6.8% in 2021 and 6.6% in 2022 to 7.7% in 2024 and is likely to decline in 2025-2026. The average interest rate on domestic debt is likely to increase in 2023, but declining inflation will push nominal interest rates down. Growing share of concessional foreign loans in the structure of public debt will put downward pressure on the effective interest rates.

5) The huge budget deficit will be driven by military-related expenditure and real GDP contraction, with inevitable effects on budget revenue. We project primary budget deficits to worsen from -0.6% of GDP in 2021 to -13.2% in 2022 and -15.5% in 2023 and to level off at -13.0% of GDP in 2024. Protracted war and its detrimental effect on public finance would sustain the relatively high primary balance in 2025 and 2026, at 12.3% and 11% of GDP, respectively.

Table 12 / Ukraine's DSA Negative Stress-Test, % of GDP (unless otherwise indicated)

	2021	2022	2023 proj.	2024 proj.	2025 proj.	2026 proj.
Gross public debt	**61.2**	**78.5**	**101.4**	**110.7**	**121.2**	**127.5**
of which: guarantees	7.1	6.9	7.1	7.3	7.4	7.5
Domestic public debt	***25.0***	***28.2***	***34.5***	***36.5***	***41.2***	***43.3***
- held by commercial creditors	16.5	13.2	…	…	…	…
- held by National Bank	7.7	13.6	…	…	…	…
- guaranteed loans and bonds	0.8	1.4	1.8	1.7	1.9	2.0
External public debt	***36.3***	***50.3***	***66.9***	***74.2***	***80.0***	***84.0***
- official multilateral and bilateral creditors	11.5	24.7	…	…	…	…
- bonds	15.6	16.0	…	…	…	…
- guaranteed loans and bonds	6.3	5.5	5.3	5.6	5.5	5.5
Gross financing needs	**14.5**	**25.1**	**28.7**	**30.4**	**27.7**	**34.0**
Primary deficit	2.4	13.2	15.5	13.0	12.3	11.0
Amortisation payments	9.2	8.8	8.3	10.4	9.8	17.1
Interest payments	2.9	3.1	4.9	7.0	5.6	5.9
Macroeconomic assumptions						
Nominal GDP (UAH bn)	4 222	5 191	6 154	7 610	8 709	9 849
Real GDP growth (%)	-3.8	-29.1	-9.5	-1.7	0.2	3.0
Inflation (GDP deflator)	10.3	34.3	31.0	25.8	14.2	9.8
Consolidated **budget revenue,** including grants	32.6	42.3	43.0	40.9	38.4	36.8
o/w Tax and non-tax budget revenue	32.6	33.6	33.1	32.2	32.3	32.7
o/w **Foreign grants**	0.0	8.7	9.9	8.7	6.1	4.1
Consolidated **budget non-interest expenditure**	35.0	55.5	58.5	53.9	50.7	47.8
Primary budget balance	**-2.4**	**-13.2**	**-15.5**	**-13.0**	**-12.3**	**-11.0**
Interest payments on debt	2.9	3.1	4.9	7.0	5.6	5.9
Consolidated **total budget expenditure**	37.9	58.6	63.4	60.9	56.3	53.7
Overall budget balance	**-5.3**	**-16.3**	**-20.4**	**-20.0**	**-17.9**	**-16.9**
Effective **nominal interest rate** (%)*	6.8	6.6	6.8	7.7	5.5	5.4
Nominal exchange rate, end-period (UAH to USD)	28.3	36.6	50.7	59.5	65.6	68.7
Nominal exchange rate, yearly average	27.0	32.3	43.7	55.1	62.6	67.2
Nominal exchange-rate depreciation (% per year)	17.7	29.4	32.6	16.0	9.8	4.6

* Defined as interest payments divided by debt stock without guarantees at the end of previous year.
Source: authors′ calculations and projections.

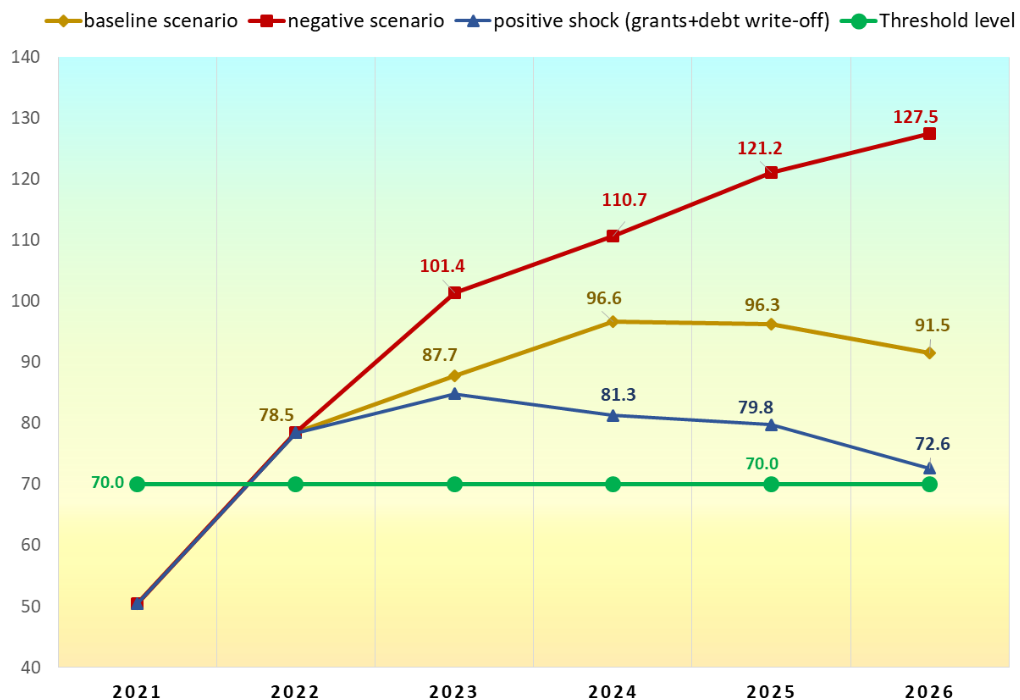
The negative stress test signals that debt dynamics is vulnerable to bigger shocks to economic growth, the exchange rate, the budget balance and the effective interest rate. All of these shocks have readily predictable adverse impacts on the public debt ratios and gross financing needs. ***Gross public debt is projected to have an explosive dynamic and to reach a peak of 127.5% of GDP in 2026. This debt peak is 30.9% of GDP higher than the debt peak in the baseline scenario***. Estimated public debt at the end of the forecast horizon would exceed the indicative benchmark by almost twofold.

Already large public gross financing needs in the baseline scenario (with a peak of 27.3% of GDP in 2024) would rocket under the shocks of the negative stress-test. ***Gross financing needs are projected to go up from 11.6% of GDP in 2021 to 30.4% in 2024 and 34% of GDP in 2026.*** The high primary deficit would be combined with expanding debt redemption.

The combined macroeconomic shock (incorporated into the baseline scenario and amplified in the negative stress-test scenario) has significant adverse impact on the near-term debt sustainability for Ukraine. Key indicators of debt sustainability – the public debt stock and gross financing needs – signal the solvency and liquidity problems attributable to Ukraine's public finances over the medium term.

Figure 12 depicts the trajectory of Ukraine's public debt under the baseline scenario, negative and positive stress-test scenarios, the last of which is presented in more detail below. The green line reflects the threshold level of 70% of GDP.

Figure 12 / Projected public debt dynamics across DSA scenarios in 2023-2026, % of GDP

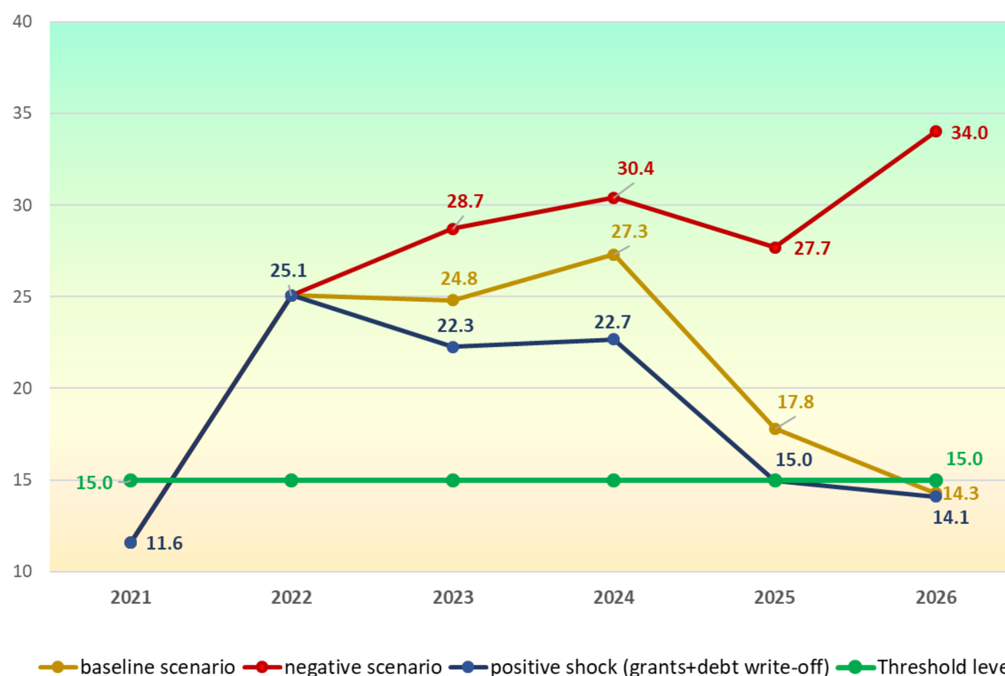


Source: authors' projections.

We can see that all our scenarios yield a higher public debt level than the defined threshold. Why is excessive public debt a serious problem even before crisis occurs? One reason is that high public debt increases the vulnerability of an economy to shocks. It also leaves less room for countercyclical fiscal policy, which may induce deeper economic recessions. Moreover, high debt exposes a country to higher rollover risks, which increases its government's vulnerability to market risk. There is also evidence that high public debt stock may be detrimental to economic growth. Finally, maintaining large primary budget surpluses (required to service high debt) can be difficult and can provoke social unrest.

Figure 13 depicts the trajectory of gross financing needs under the baseline scenario, and negative and positive stress-test scenarios. The green line corresponds to the threshold level of 15% of GDP, suggested by the IMF experts for the standard DSA. In addition to Figure 12, Figure 13 also presents evidence that huge government financing needs endanger public debt sustainability and require an effective policy response.

Figure 13 / Projected gross financing needs across DSA scenarios in 2023-2026, % of GDP



Source: authors' projections.

Now we expand on the third medium-term scenario, the **positive shock scenario**. This includes a rising share of grants in foreign financing and the implementation of external debt restructurings in 2024 and 2026, as recently advised by the IMF. More specifically, the positive shock scenario is based upon increasing the share of foreign grants up to 40% in 2024 (16.4% projected by the IMF) and 50% in 2025 and 2026 (16% projected by the IMF in the framework of the EFF programme). In terms of costs of such a policy for donors, a growing share of grants will be offset by narrowing official financing needs. The size of foreign grants relative to GDP (6.6% and 4.2% of GDP in 2025 and 2026) is expected to be considerably lower than in 2022-2024 (8.5-8.7% of GDP).

As to international experience supporting a more grant-oriented approach, Bosnia and Herzegovina received external official development assistance for post-war rehabilitation with an 82% grant component. In case of the post-WWII Marshall Plan, the share of grants and other non-refundable aid from the US to Europe exceeded 90%.

It is worth remembering the valuable messages of the US Presidential Committee on Foreign Aid, formulated in November 1947 (the report of this Committee laid the foundations for the Marshall Plan): '*Western Europe probably cannot survive the next four years and certainly cannot recover unless large dollar resources are made available to European governments in the form of public loans or grants, in addition to any such funds as may be secured through the private capital market.. To be realistic we must admit that many of the countries of Europe with their other burdens are unlikely to be able to repay in dollars additional loans which might be made for the purpose of providing them with food, coal, and*

fertilizer… The Committee therefore believes that appropriations for these purposes should in many cases be grants in aid, and not loans.' [25]

With regard to total ***external official financing*** of Ukraine's economy in the positive shock scenario, it would approach USD 40.7bn in 2023, 34.5bn in 2024, 22.8bn in 2025 and USD 16bn in 2026; out of this sum the grant component as direct financial assistance to the budget would amount to USD 14.3bn in 2023, 13.9bn in 2024 and 11.4 bn in 2025, followed by USD 7.9 bn in 2026. As mentioned above, such allocations from foreign donors and creditors are not supposed to cover the cost of the whole reconstruction plan for Ukraine's economy; rather, they would cover a part of the general budget deficit and would be targeted at specific programmes, implemented by Ukrainian ministries.

Table 13 / Ukraine's DSA Positive Shock Scenario, % of GDP (unless otherwise indicated)

	2021	2022	2023 proj.	2024 proj.	2025 proj.	2026 proj.
Gross public debt	**50.5**	**78.5**	**84.9**	**81.3**	**79.8**	**72.6**
of which: guarantees	5.8	6.9	7.0	7.2	7.1	7.0
Domestic public debt	***21.7***	***28.2***	***29.7***	***29.3***	***29.5***	***27.6***
- held by commercial creditors	15.0	13.2	…	…	…	…
- held by National Bank	5.7	13.6	…	…	…	…
- guaranteed loans and bonds	0.9	1.4	1.7	1.5	1.6	1.8
External public debt	***28.8***	***50.3***	***55.2***	***52.0***	***50.2***	***45.0***
- official multilateral and bilateral creditors	9.2	24.7	…	…	…	…
- bonds	11.5	16.0	…	…	…	…
- other creditors	3.2	4.1	…	…	…	…
- guaranteed loans and bonds	4.9	5.5	5.3	5.7	5.5	5.2
Gross financing needs	**11.6**	**25.1**	**22.3**	**22.7**	**15.0**	**14.1**
Primary deficit	0.6	13.2	10.7	7.1	3.5	1.8
Amortisation payments	8.2	8.8	6.4	10.0	7.5	8.5
Interest payments	2.8	3.1	5.2	5.6	4.0	3.8
Macroeconomic assumptions						
Nominal GDP (UAH bn)	5,451	5,191	6,611	7,942	9,272	10,605
Real GDP growth (%)	3.4	-29.1	1.8	4.2	6.9	6.4
Inflation (GDP deflator)	25.1	34.3	25.1	15.3	9.2	7.5
Consolidated **budget revenue,** including grants	30.5	42.3	42.3	41.9	40.0	37.7
o/w Tax and non-tax budget revenue	30.5	33.6	33.5	33.4	33.4	33.5
o/w **Foreign grants**	0.0	8.7	8.8	8.5	6.6	4.2
Consolidated **budget non-interest expenditure**	31.1	55.5	53.0	49.0	43.5	39.5
Primary budget balance	**-0.6**	**-13.2**	**-10.7**	**-7.1**	**-3.5**	**-1.8**
Interest payments on debt	2.8	3.1	5.2	5.6	4.0	3.8
Consolidated **total budget expenditure**	33.9	58.6	58.2	54.6	47.5	43.3
Overall budget balance	**-3.4**	**-16.3**	**-15.9**	**-12.7**	**-7.5**	**-5.6**
Effective **nominal interest rate** (%)*	6.8	6.6	5.8	7.6	5.1	5.0
Nominal exchange rate, end-period (UAH to USD)	27.3	36.6	45.2	52.1	55.6	57.2
Nominal exchange rate, yearly average	27.3	32.3	40.9	48.7	53.9	56.4
Nominal exchange rate depreciation (% per year)	-3.6	29.4	21.1	14.2	6.5	2.8

* Defined as interest payments divided by debt stock without guarantees at the end of previous year.
Source: authors' calculations and projections.

[25] 'European Recovery and American Aid' (1947). https://www.marshallfoundation.org/wp-content/uploads/2014/04/European_Recovery_and_American_Aid_13_01_1947.pdf

The macroeconomic framework underlying the positive shock scenario is built upon the assumptions of higher economic growth rates in 2023-2026, slower devaluation rates, lower inflation rates and smaller budget deficits, compared with the baseline and negative shock scenarios. Macroeconomic variables underlying the positive shock scenario, as well as projected fiscal and debt-related indicators, are shown in Table 13.

Because more optimistic macroeconomic developments and a growing share of grants in the structure of official financing does not provide a basis for debt sustainability, ***we extend a positive shock scenario by incorporating a debt reduction component***. We apply a two-stage approach for public debt restructuring, i.e. (i) debt exchange and reduction owed to Ukrainian eurobond holders in 2024, and (ii) debt reduction to official bilateral creditors in 2026.

The EFF programme of the IMF for Ukraine sets such overarching goals as sustaining macroeconomic and financial stability, restoring debt sustainability, and supporting Ukraine's recovery in the post-war period. For achieving the appropriate sustainability targets on debt levels and average gross financing needs, the EFF clearly requires safeguards to ensure that Ukraine's debt is sustainable – in particular, a sufficient debt treatment.

The relevant part of the memorandum stipulates that overall strategy aims to reduce gross financing needs and the public debt stock to levels consistent with debt sustainability. Key elements of this strategy are:

1) 'discussions with commercial creditors in early 2024, with a goal to complete the needed debt operation no later than mid-2024 on terms consistent with the most up-to-date IMF macro framework and the parameters of the debt sustainability assessment';
2) commitment by the Paris Club of creditors 'to deliver a final debt treatment sufficient to restore debt sustainability before the final review of the prospective IMF-supported programme' in 2026.

Experiences of several countries ravaged by war in the second half of the twentieth or the beginning of the twenty-first century suggest that debt reductions or debt restructurings in the form of partial debt write-offs were an essential pillar of post-conflict rehabilitation (Iraq, Afghanistan, Egypt).

In the Ukrainian context, the two-step debt treatment should start with the eurobond debt restructuring. Public direct and guaranteed debt to eurobond holders at the end of 2022 amounted to USD 24.2bn. If we assume that a haircut of 60% to the nominal value of bonds will be applied as part of a restructuring agreement, the public debt stock would decline by 8.9 pp of GDP in a one-off action (probably to be implemented in mid-2024). However, such a debt reduction imposed on the commercial creditors would not be sufficient to restore Ukraine's debt sustainability.

Meanwhile, the Paris Club must be also involved in Ukraine's debt treatment, considering the Club's commitments and the patterns of the EFF programme. Comparability of treatment of different creditors requires the same discount to be applied to the nominal value of Paris Club debt as in the case of eurobond holders.

If we assume that debt owed to the Paris Club will approach USD 11.5 bn prior to restructuring, the discount of 60% to the value of official bilateral debts implies a debt write-off equivalent to 3.7% of GDP. Thus, our DSA template for the positive shock scenario incorporates both a growing share of grants in new financing (approaching 50% in 2025-2026) and a two-step debt treatment with haircuts of 60% for both types of creditors (official bilateral creditors and eurobond holders).

Our computations suggest that such positive shocks will generate a favourable Ukrainian public debt trajectory with a declining debt ratio: 84.9% of GDP in 2023, 81.3% of GDP at the end of 2024 and 72.6% at the end of 2026. The same will hold for the gross financing needs indicator: it will be reduced from 25.1% of GDP in 2022 to 14.1% in 2026.

Eichengreen and Rashkovan also justify a debt relief approach to Ukraine's debt problem in the CEPR report 'Rebuilding Ukraine: principles and policies'.[26] To implement a debt restructuring agreement with Ukrainian bondholders, they recommend issuing a type of 'Brady bond' with haircuts to the face value; these were bonds backed by zero-coupon US Treasury securities and their equivalent, where the Treasury backing was provided by official donors. Under the actual Brady Plan, the average haircut was 35%, but exact levels of forgiveness varied with country circumstances, from 20% for Venezuela to 80% for African countries. With regard to Ukraine, historical experiences suggest public debt of post-conflict countries typically receive haircuts approximately 20 percentage points larger than in other restructurings.

The author of the current study in June 2022 also suggested a restructuring of external debt as a way out of Ukraine's potential debt distress. One of the policy options considered was eurobond debt securitisation for Brady bonds' equivalent – new Ukrainian government bonds with a lower value in NPV terms, but highly reliable for investors, due to backing by the US Treasury. The author justified the application of a meaningful haircut to the value of new bonds and argued that this step is indispensable for the reduction of huge debt payments out of Ukraine's budget and hence for freeing up resources for post-war recovery, rehabilitation of infrastructure and the social sector, as well as implementation of the developmental programmes.[27]

Turning back to our DSA, the final outcomes of the positive shock scenario (foreign grants and external public debt restructuring) are represented in Figure 12 and Figure 13 – blue lines. Table 13 also contains DSA calculation results for the positive shock scenario. After comparing to the previous baseline and stress-test results, we can draw the following conclusion***: only the extension of foreign grants and a partial foreign debt write-off to private and official bilateral creditors will ensure gradual restoration of Ukraine's public debt sustainability and provide the opportunity for successful post-war reconstruction.***

[26] Eichengreen, B. and V. Rashkovan (2022), 'How to organize aid', in: Y. Gorodnichenko, I. Sologoub and B. Weder di Mauro (eds), 'Rebuilding Ukraine: principles and policies', CEPR Paris Report No. 1. https://cepr.org/system/files/publication-files/178114-paris_report_1_rebuilding_ukraine_principles_and_policies.pdf

[27] Т. Богдан (2022), 'Реструктуризація зовнішнього боргу: міжнародна практика та можливості для України'. URL: https://www.epravda.com.ua/columns/2022/06/20/688356/
Т. Богдан (2022), Державний борг і позики під час війни та методи їх поствоєнного врегулювання // Фінанси України, 2022. No. 4. c.27-45. https://doi.org/10.33763/finukr2022.04.027

Figure 14 / Heat Map of Risk Assessments

Public debt level	baseline scenario	negative shock scenario	positive shock of grant financing and debt write-off
Gross financing needs	baseline scenario	negative shock scenario	positive shock of grant financing and debt write-off

Source: author presentation.

General risk assessments for all medium-term scenarios are summarised in Figure 14 – a so-called 'heat map'. This signals that vulnerabilities are significant, both in terms of the public debt stock and government financing needs. We see a major part of the heat map coloured in red, and only the positive shock scenario (combined higher grant financing and debt write-off) yields a moderate degree of risks (yellow cells of the heat map). It implies that **unchanged policy setting and materialisation of the key assumptions of the baseline scenario and of the negative shock scenario move the country towards a debt crisis over the medium term**. On the other hand, **validation of the extended positive shock scenario (grant financing and debt write-off) will, with a high probability, secure Ukraine's macro-financial stability and public debt sustainability.**

Summing up, Ukraine's public debt is assessed in this DSA-based analysis as unsustainable over the period 2023-2026 without the suggested corrective policy actions. In particular, the risks of deep economic recession, exchange-rate devaluation and substantial primary deficits are very significant and are associated with steep public debt growth that may lead eventually to a solvency crisis or would require politically unsustainable policy moves towards a primary surplus. *The logical response to such dangers is raising the share of foreign grants up to 50%, attracting sufficient external financing on concessional terms and external debt restructuring for eurobond holders in 2024 and for official bilateral creditors in 2026, with significant discounts to the nominal value of debts*.

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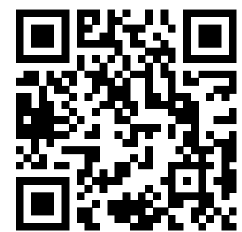

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