

RESILIENCE OF UKRAINE: LESSONS FROM 2022



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The publication was issued within the framework of the Initiative for the Development of Analytical Centres in Ukraine, which is carried out by the International Renaissance Foundation with the financial support of the Embassy of Sweden in Ukraine. The opinions and positions expressed in this publication/infographic/video/ are the position of the author and do not necessarily reflect the position of the Embassy of Sweden in Ukraine and the International Renaissance Foundation.

Date:

December 1, 2022

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The **Centre for Economic Strategy** (CES) is an independent research agency on public policy issues. The mission of the CES is to support reforms in Ukraine to achieve sustainable economic growth. The Centre contributes to the development of Ukraine's economic growth strategy, performs an independent analysis of the most critical aspects of national policy, and works on strengthening public support for reforms. It was established in May 2015.

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1. WHAT IS RESILIENCE

Resilience is a concept that came to the economic and social systems management not so long ago. This is the result of the financial crises that have become more frequent due to the complexity of financial systems, global cataclysms that have become more frequent due to climate change, and the growth of the world population, which means that natural resources are scarce, plus each crisis affects a large number of people at the same time.

This concept was first introduced into business literature by Professor of the Massachusetts Institute of Technology (MIT) Yossi Sheffi. In his book "The resilient enterprise. Overcoming vulnerability for competitive advantage", published in 2005, he argues that the survival and prosperity of the company depends more on what it does before the crisis, not after. Using the example of a number of large companies and organizations, the professor explores events that had a low probability of occurrence but a very strong impact, and concludes that investing in resilience can become a competitive advantage

There are different levels of resilience, depending on the type of entity that is in crisis. These are micro (individual or household), meso (group or organization) and macro (national or inter-organizational level). The following report describes mainly the national and market level. But it is important to keep in mind that the levels are interconnected, as each subsequent level includes the previous one.

Therefore, conditionally, when thinking about the energy sustainability of the state, we need to think not only about national electricity transmission systems, etc., but also about companies and households - and, accordingly, about the state's measures that can be implemented at these levels. A good example is the recent waiver of customs duties and VAT on imports of generators, power banks and similar equipment. The measure solves a national problem by supporting individual players.

An important aspect of resilience is the speed and reason for decision-making. People, companies and states naturally change under the influence of circumstances. But often it takes years and even decades (in the case of markets and countries) and is rather evolutionary. This approach is considered more qualitative, but long and insufficient. Adjusting processes to a crisis in no way protects against a new crisis. Therefore, risk analysis, forecasting changes and changing processes in advance should become a regular activity. Although, of course, doing something after the fact is still better than doing nothing.

At the level of the state and organization, changes in processes that are designed to make the system more sustainable can be centralized, imposed from above. But this approach carries the risk that a wrong decision will be made, which for various reasons (trust in the leader, incomplete information, already spent resources, etc.) will still be implemented. Therefore, if possible, it is considered more sustainable to transfer powers lower - from the state to communities (decentralization), from the state to companies (self-regulation), from top management to middle managers (delegation) and from the state to citizens (self-organization).

And if the first three concepts have long been studied and applied in practice, including in Ukraine, the self-organization of Ukrainians during the two revolutions and especially during the war was a surprise for observers, many of whom considered Ukraine a paternalistic society. Moreover, the state has almost nothing to do here - just not to interfere and, if necessary, to support. Especially revealing was the complete lack of understanding of self-organization on the part of the aggressor - when there were calls to strike at Ukrainian self-organization centres (which do not exist) or, on the contrary, to deliberately create self-organization in the Russian Federation (it does not work that way).

Conceptually related, but organizationally different notion is diversification. You cannot depend on one market, one product and, conversely, one supplier, it is too risky. At one time, Ukraine was too dependent on imports of ferrous metals - and paid the price when prices on world markets fell. Many enterprises, especially in the East, were too dependent on the aggressor, and since 2014 they have had problems. We used to buy crude oil products in Russia and Belarus, therefore we experienced a fuel crisis for several months. We had only one large refinery of our own, and now it is no longer operational. But in the past, it used to be more convenient (cheaper, easier, etc.).

Most measures aimed at improving the system reliability will simultaneously reduce its efficiency in the short term. Technically, you can hide electrical substations underground - but it is more expensive. You can put generators on each house - but it is more expensive. You can buy electricity storage devices - but it is more expensive.

The current system was invented for a reason - it somehow performed its functions and certainly was not designed for missile strikes. Actually, the energy system of only few countries is designed for such attacks. The same applies to other spheres. Grain was exported mainly by sea, because it is cheaper, and this is a raw material product, the market of which is dominated by price competition.

To compensate the economy for the temporary loss of efficiency, the state should consider at least a temporary deregulation. According to our calculations, the implementation of thousands of regulatory documents costs about 2% of GDP for business alone, plus a certain amount (although less) for the state.

Perhaps we should recognise that they are more suitable for peacetime. Now the point for comparing risks should be taken not in peacetime, but at the front. Therefore, the effect of at least less critical regulations (and there will be many of them) can be suspended. In the worst case - then restored, in the best case it may turn out that such regulation is not needed at all (or in the process a more effective way to solve the relevant social problem will be invented). Existing wartime regulations might also be optimized.

What kind of resilience measures should be implemented, what is the best way to organize this process - we have tried to answer these questions about the main sectors of the economy in the subsequent sections. Some of the advice is borrowed from international practice, some is not, but all of them take into account local specifics. Complex systems are non-linear, which often leads to the so-called path dependence - when the choice of further steps is limited by the previous ones.

Although such a dependence in our case is not usual, which is a sad but positive thing. Destroyed factories, broken value chains, etc. - the level of damage to assets and distortion of activities in some places is such that in some cases it will require not repair, but rebuilding. And then you can build something new, taking into account any requirements - environmental, social, etc. And also, of course, resilience requirements.

2. ENERGY

By Oleksandr Kharchenko, Director of the Energy Research Center

Russia's full-scale invasion and ongoing military actions have caused significant damage to all sectors of Ukraine's economy. The energy sector is not an exception - numerous energy infrastructure facilities have been destroyed or are on the temporarily occupied territory, generation enterprises are priority targets for Russian missile attacks, electricity and heat supply networks have been damaged, and it is impossible to extract energy resources at certain fields.

The development of the energy sector is an essential condition for the efficient operation of almost all industries and ensuring normal living conditions for the population. Therefore, measures to increase the energy resilience in wartime conditions and its rapid recovery in the post-war period are one of the state policy priorities. Restoration of the industry in the post-war period should be based on the principles of energy saving, energy efficiency, substitution of fossil fuels at generation enterprises and in accordance with the requirements of the European energy legislation, in particular, in terms of the implementation of the Green Deal concept.

The main measures to restore the energy sector are:

1. Creation of favourable conditions after the end of the war for attracting a significant amount of capital to the energy sector of Ukraine, both from international financial institutions and the private sector;
2. Further expansion of technical and legal capabilities to enhance cooperation with European countries. Integration of the Ukrainian energy system into the European one is a basic prerequisite for energy development and achieving an acceptable level of energy security;
3. Substitution of natural gas at thermal generation enterprises by increasing the use of biofuels and biogas;
4. Substitution of coal in power generation through the construction of new, restoration of damaged wind and solar generation capacities, meeting the needs for manoeuvring capacities through comprehensive measures to increase the use of biofuels, energy storage, hydrogen production, etc;
5. Increase of the domestic production of natural gas, at least to the level of meeting own needs and refusal from imports. The implementation of measures aimed at intensifying the work of gas production enterprises should create an opportunity to increase natural gas production to 22-24 billion cubic meters per year. This, in the context of a significant reduction in consumption as a result of hostilities, will lead to full self-sufficiency and in the future to gas exports;
6. In the coming 2-7 years, during the transition period, stabilization and increase of domestic coal production. Despite the implementation of the Just Transformation concept, which provides for the gradual abandonment of coal over the next 10-12 years, Ukraine has significant coal generation capacities. Its utilization significantly increases the stability of the country's energy system, especially in the context of damage to a large number of RES capacities;
7. Transition from powerful units of energy infrastructure to an extensive network of individual facilities, which in modern conditions will strengthen the stability of the energy system and increase the ability to protect it;
8. Increasing electricity exports, which will ensure export revenues and support the financial stability of the state. It will also reduce the dependence of European countries on external energy resources, will contribute to Ukrainian integration processes.

The achievement of the above goals by the energy sector will not only ensure the energy security of the state and the smooth operation of all sectors of the economy, but also create additional export opportunities.

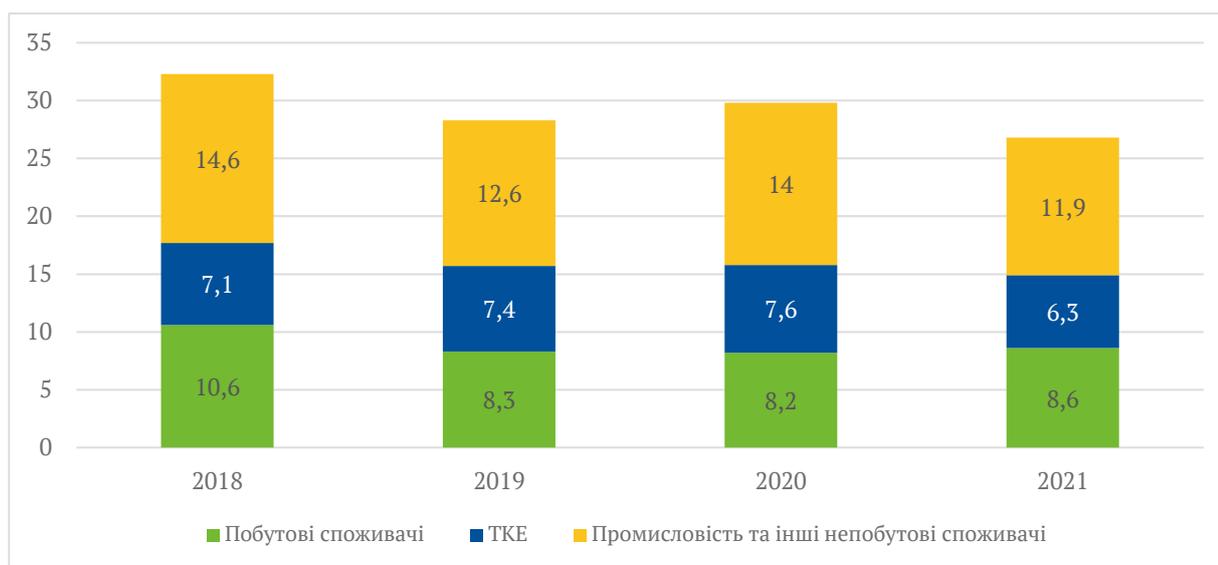
2.1. GAS SECTOR

The strategic direction for the development of the sector is to meet the needs of the Ukrainian economy at the expense of domestic gas production. For this purpose, it is necessary to develop a set of measures in three areas - energy saving, substitution of natural gas with other energy carriers and increase of domestic production.

Energy saving

Actual natural gas consumption in 2021 amounted to 26.8 bcm, which is 6.6% less than in 2020. Residential consumption amounted to 8.6 bcm of gas (31.9% of total consumption), which is 5% more than in 2020. Heat producers consumed 6.3 bcm (23.5% of the total volume consumed), which is 24% less than last year. Industry, budget organizations and other non-household consumers used 11.9 bcm of gas (44.6%), almost 3% less than in 2020.

Figure 1. Structure of natural gas consumption in Ukraine, 2021.



(Industries and other non-domestic consumers, Heat and power enterprise, Household consumers)

In recent years, Ukraine has been experiencing a downward trend in natural gas consumption, with total gas consumption decreasing from 32.3 bcm to 26.8 bcm between 2018 and 2021. However, this reduction is primarily due to lower production volumes and higher gas prices rather than energy saving measures. The exception was 2020, when due to the low cost of gas, its consumption by heat and power enterprises and industry increased.

The consumption volumes in Ukraine in January 2022 amounted to 3.7 billion cubic meters of gas, in February - 2.8 billion cubic meters. After the beginning of the full-scale invasion due to damage to energy infrastructure, shutdown of industrial enterprises in the occupied territories and in the combat zones and significant destruction of the housing stock, natural gas consumption decreased by 30-40% compared to last year.

The restoration of gas consumption for the needs of district heating companies will be gradual, depending on the possibility of restoring the heat supply infrastructure. In the regions most affected by the hostilities, as well as in most of the newly liberated territories, the 2022/2023 heating season will not start or will start with a significant delay due to the inability to quickly restore damaged heat generating capacities, heating networks and housing stock.

According to the forecast of the Ministry of Energy of Ukraine, gas consumption during the heating season 2022/2023 will be about 11.7 billion cubic meters, which is almost 40% lower than last year. Total consumption in 2022 is expected to reach 18.5 bcm or 30% lower than in 2021.

However, due to high gas prices, reduction of gas supplies from Russia to European countries and a drop in domestic production, energy saving concepts remain relevant, even against the background of a significant reduction in consumption. If implemented within 3-5 years, it is possible to reduce natural gas consumption by up to 10%.

Currently, it is necessary to develop comprehensive measures for the introduction of energy-saving technologies in the industrial sector and heat and power enterprises in order to reduce natural gas consumption. This will make it possible to reduce the consumption of natural gas, the cost of which is critically high, to reduce CO₂ emissions into the atmosphere and, accordingly, to reduce the cost of environmental payments, as well as to increase the energy security of the state as a whole.

The most common energy saving measures and technologies that should be implemented at the energy and power enterprises, water supply and sewerage facilities, as well as by consumers are the following.

Energy production:

- Introduction of new high-efficiency boiler units with ultra-low emissions of toxic substances into the atmosphere, with high technical and economic indicators, bringing the efficiency of boilers to a value not lower than 94-95%, which will simultaneously improve the environmental performance of boilers;
- Replacement of existing burners with highly efficient ones, with a payback period of the installed equipment within 2 - 3 years;
- Increasing the energy efficiency of units and devices by optimizing technological processes, using modern heat exchange equipment, plate heat exchangers;
- Use of technologies of waste heat utilization of boiler units. Due to deep cooling of flue gases, the boiler efficiency increases by 3 - 8% when using the utilized heat in the heating system and by 5 - 10% - in the hot water supply system;
- Combined heat and power production (cogeneration) at CHP plants. The use of a cogeneration unit has a significant economic effect due to the rejection of expensive grid electricity for own consumption and reduced fuel requirements for heat production compared to the separate production of heat and electricity. Also, cogeneration provides an opportunity to sell the generated electricity to the grid;
- Electricity use for heat supply needs (it is advisable to use electricity for heating water for hot water supply and heating at night, which is 50% of the daytime tariff). Today there are technical solutions for the use of accumulating devices for these purposes. And in the case of using heat pumps as heaters, electricity savings can reach 70-80% compared to other electric heating devices.

Thermal energy transportation:

Losses during transportation and distribution of thermal energy are on average about 11% in Ukraine. They can be significantly reduced by implementing the following measures:

- optimization of heat network schemes, reduction of hydraulic resistance, bringing it in line with actual and forecast indicators of heat demand;
- replacement or modernization of pumping equipment, ensuring smooth start-up and speed control of the units' engines;
- replacement of worn-out pipes and valves with products of improved quality, with internal protection and external insulation that meets modern requirements for thermal and hydraulic resistance;
- draining of heating trays (when using mineral wool insulation, this is the primary measure to reduce heat loss);
- installation of coolant pressure controllers.

Thermal energy consumption:

- optimization of building heating systems (using combined systems, e.g. solar collectors, heat pumps and district heating), which will reduce the consumption of fossil fuels, and in some cases completely switch houses to alternative energy sources;
- improving the thermal insulation of building envelopes using advanced technologies (the most effective are external insulation with polyurethane foam or polystyrene foam boards, innovative thin (1-2 mm) heat-protective coatings, etc. that allow to reduce heat loss through walls and ceilings by 30-50%);
- installation of house units of commercial metering for heat energy consumption, automatic temperature and pressure regulators (the best energy saving effect can be obtained by regulating the heat energy consumption on each radiator);
- thermal insulation of hot water supply and heating pipes (using polyurethane foam products);
- replacement of windows with advanced ones with increased coefficient of thermal resistance (equipped with energy-saving double-glazed windows);
- sealing of windows and doors of buildings in order to reduce infiltration (to supply fresh air to rooms, recuperators can be used, which allow to save 60-80% of energy during ventilation);
- development and implementation of mechanisms for incentive tariff setting in the fields of heat supply and utilities;
- raising awareness of consumers on energy efficiency issues.

Water supply and sewerage:

- optimizing the distribution scheme of the water supply network, bringing it in line with the actual and projected development of public and residential buildings, the needs of industrial consumers, reconstruction or replacement of obsolete pumping equipment;

- construction of new or replacement of existing pipelines on worn-out sections of networks, shut-off and control valves, installation of pressure controllers, maintenance of pressure in pipelines at the minimum required level;
- installation of automatic control of the rotation speed of water supply pump motors depending on the intensity of water consumption, or to regulate the water supply by switching on the pumps in stages;
- legislative stimulation of investment programs aimed at improving the energy efficiency of district heating, water supply and sewerage systems.

Substitution

To replace the consumption of natural gas, it is necessary to optimize the energy balance of the enterprise by improving the structure and reasonable choice of fuels (priority is given to the use of alternative and renewable fuels and energy sources).

Integrated use of energy of secondary technological waste thermal energy resources and renewable energy sources (atmospheric air, solar radiation, groundwater, soil) to solve the problems of heat supply will allow the installation of heat pumps with a unit capacity of up to several tens of MW. The payback period of the equipment is from 3 to 7 years. It is also possible to consider the retrofitting of existing boiler houses with heat pump units that fully provide the load of hot water supply with a conversion factor of up to 5-6. Equipping sewage pumping stations with typical heat pump units for hot water supply will significantly reduce the heat load on boiler units that consume fossil fuels and reduce environmental pressure on the environment.

The most affordable is the replacement of natural gas with cheaper and more common fuels, in particular, in the production of heat, such fuel can be waste from woodworking or agricultural industry.

Taking into account the geographical location and building density, it is potentially possible to re-equip about 75% of generating capacities to replace natural gas with biofuels. According to preliminary estimates, this will reduce annual natural gas consumption by 3.7 billion cubic meters.

It is also possible to carry out partial re-equipment to replace natural gas at large powerful CHPs. With partial substitution of gas use at large CHPs in the amount of up to 5-10%, the savings will be 125-250 million cubic meters. The total volume of natural gas substitution will thus be up to 4.0 billion cubic meters per year, which is 63.5% of the total consumption of heat and power plants and 14.9% of the total consumption of natural gas.

Taking into account that it takes some time to re-equip the capacities of CHPs and boiler houses, it is necessary to initiate the maximum number of re-equipment projects now. This will allow the use of biofuels at some small heat generation enterprises in six months and significantly reduce the consumption of natural gas by CHPs and boiler houses over the next five years.

Taking into account that the vast majority of small CHPs and boiler houses are privately owned, it is also necessary to develop mechanisms of state incentives for such re-equipment - providing interest-free loans for equipment replacement, subsidies for the purchase of biofuels, abolition or reduction of CO₂ tax for biomass energy producers, etc.

Production increase

According to Ukrainian experts, gas reserves in the country amount to about 1.3 trillion cubic meters of gas. The largest reserves of blue fuel are concentrated in the Dnipro-Donetsk depression in Kharkiv and Poltava

regions. There are also gas deposits in the Carpathians and on the Black Sea shelf. The ratio of reserves to annual production in Ukraine is the highest among European countries and almost four times higher than the European average. This indicates insufficient use of the resource potential and significant opportunities for increasing production.

Since 2019, gas production in Ukraine has been declining, despite the development of goals and priorities aimed at increasing domestic production. According to the results of 2021, total gas production decreased by 2.2% (440 million cubic meters) and amounted to 19.8 billion cubic meters, the decrease was due to state-owned companies.

Table 1: Structure of natural gas production by Ukrainian enterprises, bcm

Enterprise	2015	2016	2017	2018	2019	2020	2021
JSC UGV	14,5	14,6	15,3	15,5	14,9	14,2	13,7
PJSC Ukrnafta	1,5	1,3	1,1	1,1	1,2	1,1	1,1
Private companies	3,9	4,2	4,1	4,4	4,6	4,9	5,0
Total	19,9	20,1	20,5	21	20,7	20,2	19,8

Since the beginning of the war, active hostilities and the proximity of some gas production companies to the contact line have led to a reduction in gas production. In 2021, the average daily gas production was about 54.3 million cubic meters, in January 2022 it exceeded 55.0 million cubic meters, and in the first months after the full-scale invasion it decreased by 10-12%. The largest fields did not fall directly into the combat zone, but the fighting took place in the immediate proximity to them. This applies primarily to Kharkiv, and to a lesser extent Poltava, Sumy and Chernihiv regions.

In June 2022, gas production managed to stabilize, the volume of production amounted to about 1.5 billion cubic meters of natural gas, which is 7% less than in June last year. The average daily production during July - September was approximately 49.5 - 50.0 million cubic meters. During the first half of 2022, total production amounted to more than 9.3 billion cubic meters of natural gas, which is 4.5% less than in the same period last year. According to the Ministry of Energy, the volume of production in 2022 will amount to 18.5 billion cubic meters of natural gas, which is 6.6% or 1.3 billion cubic meters less than in 2021. The work of gas production companies is complicated by the fact that in war conditions they cannot fully carry out new drilling and workover of wells, but only support the maintenance of the existing well stock. This is due to the use of special equipment that may look like military from the air.

At the same time, taking into account the potential of the explored fields and if a number of measures are implemented, within 2-3 years after the end of the war, it is possible to increase natural gas production to 25-26 billion cubic meters per year. This is almost equal to the total gas consumption in 2021. After the end of hostilities, if it is possible to develop the fields of the Yuzivska gas-bearing area and the shelf zone, we can expect a further increase in domestic production, which will create conditions for the export of natural gas to European countries.

The most promising areas for further development are the Yuzivska gas-bearing plane and the Black Sea shelf, but the full development of these areas is impossible due to the occupation of Crimea and the full-scale war of Russia against Ukraine.

In Ukraine, particularly in the Carpathians, Poltava and Kharkiv regions, there are a large number of suspended wells with proven gas reserves. However, at the time of drilling, commercial production was deemed inexpedient, and now, with the help of new technologies and equipment, work on such wells can be resumed.

The problem of so-called "dormant" licenses for subsoil use, which has been raised at various levels for several years, also remains relevant. Since 2021, this issue has been resolved at the legislative level. According to the decisions of the National Security and Defence Council, an audit of all entities that did not start mining within two years from the date of receipt of the relevant permits was carried out, as a result of which more than 300 licenses were revoked, under which no production was carried out. However, there are still a large number of unresolved issues with licenses that hinder the industry development.

Thus, the following priorities can be identified to increase production:

- development of mining in the Carpathians as the safest region of Ukraine. The development of mining in the Carpathians is also very important from the socio-economic perspective of the region, it will create new jobs with competitive wages, which in turn will limit the outflow of labour to central Ukraine and abroad.
- development of tight gas production. Tight gas is natural gas characterized by higher methane content trapped inside rock with extremely low permeability, usually limestone or sandstone. Tight gas is much more difficult to extract, it is found at great depths, beneath existing deposits. Despite the fact that ultra-deep drilling is expensive and risky, Tight gas is quite possible to produce if modern technologies and internationally renowned specialists are involved. The first tight gas field Svyatohirske, which is located in the centre of Yuzivska area, was launched in January 2021;
- in the long term, after the de-occupation of eastern Ukraine and Crimea, the development of the Black Sea shelf and the Yuzivska gas-bearing field is necessary to increase domestic production;
- introducing an open and transparent market of special permits for subsoil development;
- improving and stabilizing the rent policy for extractive enterprises.

2.2. COAL INDUSTRY

Most European countries are working to abandon Russian fossil fuels, in particular, from August 10, 2022, imports of Russian coal to the EU are banned under sanctions restrictions. This may be an impetus for the medium-term development of the Ukrainian coal industry.

Ukraine has substantial explored coal reserves, it is the only energy carrier, the needs of which the country can satisfy at the expense of its own production. Despite the implementation of measures for the fair transformation of coal regions and the course towards the gradual abandonment of coal, a significant number of coal mining enterprises operate in Ukraine. According to the results of 2021, total coal production in Ukraine amounted to 29.4 million tons, which is 2.0% or 0.6 million tons more than in 2020.

In January 2022, the average daily coal production by coal mining enterprises of Ukraine amounted to 80.6 thousand tons, after the start of the full-scale invasion, production decreased, primarily due to the fact that

a significant number of mines were in the temporarily occupied territory or in the combat zone. As of the beginning of 2022, there were 18 legal entities (including 13 state-owned ones) engaged in coal mining in Ukraine, which include 45 coal mining enterprises (including 33 state-owned ones). As of September 15, 2022, 25% of state-owned coal mining enterprises and a number of private ones are located in the temporarily occupied territory.

Due to active hostilities and the lack of power supply, there is uncontrolled flooding of mines of SE Pervomayskvuhillya (4 mines), JSC Lisichanskvuhillya (4 mines), SE Surgai Mine and SE Pivdenodonbaska Mine No. 1. The condition of the remaining mines can be determined after the de-occupation of the territories.

Daily coal production by enterprises of all forms of ownership in July 2022 amounted to about 55-56 thousand tons per day. Information on production in August - September 2022 is currently classified as information for official use. According to the Ministry of Energy, the decrease in coal production by the end of 2022 is expected to be 30%.

Coal consumption in 2021 amounted to 39.2 million tons, which is almost equal to the same indicator in 2020. After the start of the full-scale invasion, consumption has decreased significantly, but information on its volumes is not yet publicly available. The dynamics of coal consumption is primarily due to a reduction in electricity generation, in particular, production at thermal power plants, as well as a significant decrease in industrial production.

With Zaporizhzhia NPP shut down and a significant number of renewable energy facilities damaged or located in the temporarily occupied territory, the importance of coal generation is increasing. Therefore, increasing coal production during the transition period is a necessary component of stabilization and recovery of the energy sector of Ukraine after the end of hostilities.

In the medium term (up to 7 years), moderate modernization of prospective mines will support the Ukrainian energy sector in the process of recovery after the end of hostilities and provide electricity and heat generation enterprises with relatively cheap and affordable energy.

With relatively small capital investments in the modernization of prospective mines to open new longwalls, it is possible to reduce the cost of Ukrainian coal and increase its competitiveness in the European market. Due to a significant decrease in coal consumption in Ukraine as a result of a decrease in industrial production, damage to infrastructure, residential and industrial facilities, with an increase in production, it is possible to export coal to the EU countries. This will provide additional budget revenues and increase the energy security of importing countries.

Additional reserves to increase production will be possible after the de-occupation of eastern Ukraine. Only small private mines, so-called "kopanky", will be able to provide additional production of about 10 million tons per year. After de-occupation, it will be possible to assess the potential and condition of large mines, as well as to identify mines, the restoration or modernization of which will be expedient.

2.3. ELECTRICITY SECTOR

In 2021, the structure of electricity production saw a significant increase in NPP electricity generation to a record 86.2 million MWh. This became possible due to the revision of the repair program of NPP power units. It was revised so that the main period of repairs falls on the period when electricity consumption is lower.

Table 2. Structure of electricity production in Ukraine

Indicator	2019		2020		2021	
	Million MWh per year	%	Million MWh per year	%	Million MWh per year	%
Nuclear power plants	83,0	53,9	76,2	51,2	86,21	55,1
TPP	44,9	29,2	39,56	26,6	37,22	23,8
CHP	10,9	7,1	12,8	8,6	8,61	5,5
Hydropower plants	7,9	5,1	7,58	5,1	10,45	6,7
Renewable energy sources	5,5	3,6	10,86	7,3	12,52	8,0
Block station	1,7	1,1	1,85	1,2	1,57	1,0
Electricity in total	153,9	100	148,8	100	156,6	100

The share of renewable energy sources in the electricity generation structure has been increasing over the last three years. With the outbreak of hostilities, as a result of significant damage to infrastructure, reduced production and destruction of housing stock, electricity consumption decreased by an average of 30%.

With the rising cost of fossil fuels, the main priority should be to further increase the use of RES. Taking into account that 11% of RES capacities were destroyed as a result of military operations, and 34% of capacities are located in the temporarily occupied territory or in the combat zones, it is necessary to build RES capacities in the central and western regions of Ukraine.

Heat generation capacities should be modernized to use biofuels to replace coal and natural gas. Regionally widespread types of biofuels should be used instead of coal and natural gas. For example, for southern and eastern regions it can be straw and other agricultural waste. In the western regions, wood waste can also be added to them.

Given the rapid decline in domestic consumption due to Russian aggression, Ukraine is interested in increasing electricity exports to the EU, which will also help reduce the consumption of Russian energy by the EU countries. Exports can take place both through existing interstate lines and through the construction of new ones.

In order to realize the export potential of Ukraine, a number of measures should be implemented:

- synchronization of the electricity markets of Ukraine and the EU countries, including the creation of legal and technical opportunities for joint auctions for the allocation of interstate crossing capacity;
- regulation of cross-border taxation of electricity trade transactions;

- introducing technical measures in the integrated power system of Ukraine, defined by ENTSO-E, aimed at strengthening the damping of low-frequency intersystem oscillations in parallel operation with the power system of continental Europe. Their implementation will provide technical opportunities to increase the export potential of the IPS of Ukraine. This is primarily the reconfiguration of excitation systems of NPP power units, installation of stabilizers at TPP power units and HPP units, installation of additional equipment in the Ukrainian power system (so-called STATCOM - static synchronous compensators) in the amount of 4 units of 50 MVA each, or energy storage systems.

The key areas for the development of electricity generation should be an increase in RES, primarily wind generation, as well as further development of nuclear generation, in particular participation in pilot projects for the construction of small modular reactors. The relevant agreement between Energoatom and NuScale Power was signed in September 2021, but due to Russia's military aggression, the implementation of such projects in Ukraine is currently not taking place.

Oil refining industry

As a result of the military aggression of Russia, almost all oil refining capacities of Ukraine have been destroyed, oil refining in extreme conditions does not actually work, so the most urgent issue is the import of oil products from the EU countries. At the same time, the issue of substitution of oil products, primarily in the transport sector, is becoming increasingly important. This will be possible through the implementation of the following measures:

- increasing the share of electric transport in the public transport structure;
- creating a legal framework to increase the number of electric vehicles and charging infrastructure (customs and tax incentives, regulating the electricity cost for charging electric vehicles).

3. LOGISTICS

By Iryna Kosse, Senior Research Fellow at the Institute for Economic Research and Policy Consulting

The resilience of a country is determined by its ability to respond to external challenges and continue to function despite losses and damage. Logistics plays a crucial role in this. The Ukrainian economy depends on the interconnectedness of the regions and on the connectivity with the outside world.

There are very few enterprises in Ukraine that operate exclusively within their region. Usually, the enterprise receives raw materials for production from outside the region and supplies its products also outside the region. There are entire industries in Ukraine that produce most of their products for consumers in other countries, such as metallurgy and agriculture.

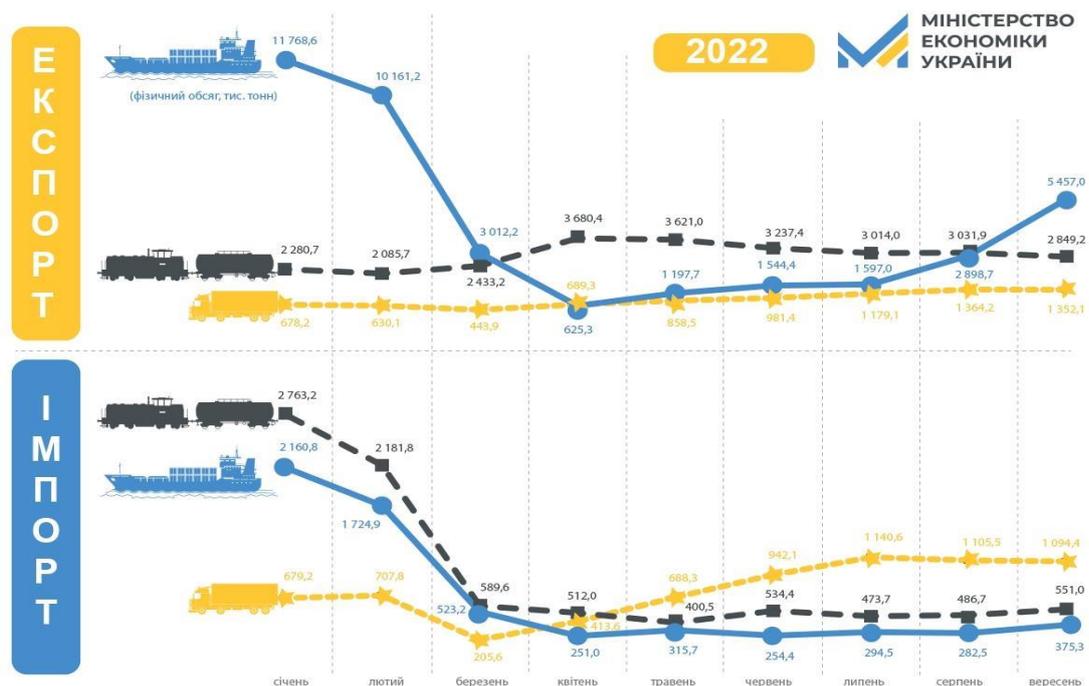
Sea and rail transport are the most important for international trade. The war and the blocking of seaports not only affected the physical volumes of exports, but also the percentage of transportation by a particular mode of transport (see Figure 1).

Thus, if in January 2022 80% of all exports were exported by sea, in April this share fell to 13%. Rail transport came out on top. The signing of an agreement with Turkey and the UN on the introduction of a maritime corridor in the Black Sea for the export of Ukrainian grain allowed to return the primacy to maritime transport. In October 2022, 5.4 million tons of cargo were exported by sea, which is 58% of the total export volume.

The situation with imports is different. Since the "grain agreement" concerns only grain exports, its signing did not improve the import of goods to Ukraine. Before the war, the largest volumes of imports were delivered by rail. In January 2022, the railway delivered 2.8 million tons of cargo, which accounted for 49% of total imports.

Russia's attack and the application of sanctions against Russian and Belarusian companies and goods zeroed out imports from these countries, which were mostly delivered by rail. "Ukrzaliznytsia was unable to significantly increase the volume of imports from the EU countries and road transport came to the first place in terms of traffic. In October 2022, 1.2 million tons of cargo was imported to Ukraine by road, which is 59% of total imports.

Figure 2. Exports and imports by transport types in 2022, thousand tons



Source: Ministry of Economy of Ukraine

(import, export)

It should also be noted that more expensive goods are transported by road. According to the calculations of the Ministry of Infrastructure, 1 ton of goods exported by road cost USD 1,005 in October 2022 compared to USD 303 for sea transport and USD 258 for rail transport (see Fig. 2).

Figure 3. Export structure of goods in September 2022 by transport types



Source: Ministry of Economy of Ukraine

(Export structure, The cost of 1 ton of goods exported by different transport types, sea transport, rail transport, motor transport)

Imports of goods to Ukraine since the beginning of active hostilities depend even more on the stable operation of road transport than exports (see Fig. 4). Thus, in October this year, 539% of the total volume of freight traffic worth USD 3.6 billion was brought to the country by trucks. The second place is occupied by the railroad with 21% of traffic worth USD 431 million.

Figure 4. Import structure of goods in September 2022 by transport types



Source: Ministry of Economy of Ukraine

(import structure by transport types, sea transport, rail transport, motor transport, other)

The transport sector is also important for the movement of people within and outside the country. The war has caused massive waves of evacuations and relocations from the east to the west of the country. Volunteers, aid workers and Western leaders travel in the other direction to meet with the leadership of our country. In addition, the transport system delivers mail, salaries and pensions.

But a flexible transport network and logistics are important not only for the functioning of the economy, but also for the successful conduct of hostilities and coping with their consequences. The supply of foreign military equipment, the delivery of ammunition and military personnel, the evacuation of civilians, the delivery of humanitarian aid - all this is done with the help of transport.

All of the above suggests that the transport system should be flexible to respond to possible damage, quickly recover and be able to instantly switch to alternative ways and means of transportation. That is why railway stations are almost the first institutions to start working in the liberated cities.

3.1. MAIN RISKS

The first risk for logistics in the conditions of a prolonged military confrontation with a strong external aggressor is the blocking of entire directions and transport sectors. This is exactly what happened during the Russian-Ukrainian war, when the threat of air attacks "grounded" the entire air transport of Ukraine, and the presence of Russian warships in the Black Sea made it virtually impossible to operate Ukrainian seaports. In addition, the occupation of Kherson and part of Zaporizhzhya regions, as well as the seizure of the Kakhovka lock stopped the movement of river transport on the Dnipro.

Another risk is the destruction of transport infrastructure due to hostilities and rocket attacks. As of September 1, 2022, Russia has destroyed 25 thousand kilometers of roads and damaged 315 bridges and overpasses¹. In addition, 19 civil aviation airports were damaged or destroyed, and runways were destroyed at 12 airports. According to CSE estimates, airport infrastructure and navigation equipment was damaged by USD 2.1 billion. The total volume of damaged railway track is up to 500 km, 111 stations and stations, direct losses on the railway are estimated at USD 4.3 billion. Port infrastructure lost 496 million USD. This includes both seaport infrastructure and inland waterway transport facilities that were destroyed as a result of the war

3.2. RESILIENCE FACTORS

Flexibility. To overcome the risks caused by the war, Ukraine's transport system must be flexible and able to withstand possible destruction. All damage should be repaired quickly, and bottlenecks (e.g. the railway bridge connecting the port of Izmail to the rest of the country) should have alternative routes.

Reconstruction of the railway infrastructure should include electrification of the railway network, which will stimulate the development of high-speed passenger and freight rail transport.

Multimodality. During post-war reconstruction, Ukraine should develop multimodal transport so that goods can be quickly transferred from one mode of transport to another (e.g. in containers). Such an approach requires the construction of multimodal terminals in the west and south of the country, which will serve as integrated transport and logistics centers and customs points. Such terminals should provide an easy transition from rail to water transport to stimulate the development of river transport and reorientation of part of the cargo flow from roads to water transport.

Multimodal transport should also be introduced in passenger transport. Multimodal stations should offer passengers convenient transfers between different modes of transport.

Redefining the transport network. The destructed railway infrastructure needs to be rebuilt to take into account possible changes in the location of major industrial enterprises and sources of cargo flows. After the war, seaports will continue to play an important role in Ukraine's international trade. However, they will require significant investments in demining, dredging, clearing, repair and modernization of port infrastructure and will not immediately be able to reach pre-war cargo handling volumes. Accordingly, the importance of road and rail transportation in the western direction will remain.

In addition, Ukraine should further rethink its transport network development plans and pay more attention to western routes. Before the war, the most developed rail and road network was in the direction of seaports, with cargo moving in the north-south direction. After the war, the focus should be shifted to the development

¹ https://kse.ua/wp-content/uploads/2022/10/Sep22_FINAL_Sep1_Damages-Report.pdf

of the capacity of logistics centers within the border crossing points with the EU countries, taking into account the requirements of interoperability and efficient use of the railway infrastructure of 1435 mm and 1520 mm gauge.

Refusal from non-core activities. During the crisis and lack of working capital, companies will start to get rid of non-core activities, including their own logistics departments. If during the war the own fleet of vehicles allowed to guarantee the export of products, then after the war the issues of efficiency and expediency will come to the fore. According to experts, it will become unprofitable to have own logistics due to high fixed costs of fleet maintenance.² The growth of the transport services market can be expected.

Deepening cooperation with neighbouring countries. Ukraine should continue to enhance cooperation and coordination in the field of transport with neighbouring countries - Poland, Hungary, Romania, Slovakia and Moldova - on joint customs control, unification of information systems of cargo movement, paperless technologies, introduction of round-the-clock operation, modernization and increase of the capacity of the railways of the respective countries to accept the entire volume of cargo offered by Ukraine. In the long term, Ukraine should also build railways with European gauge (1435 mm) to the largest cities of Ukraine.

Compliance with European standards. Ukraine aspires to become a member of the European Union. Accordingly, it must apply EU standards when rebuilding and modernizing its infrastructure. For example, it should provide access to passenger infrastructure for people with disabilities and other low-mobility groups, meet environmental and sanitary safety requirements for debris removal and restoration of buildings and engineering structures, produce European-sized freight cars, and consider switching to alternative energy sources.

Digitalization. The transition from paper to digital documents, simplification of procedures will result in businesses looking for ways to reduce costs and increase efficiency. The experience of working remotely during the pandemic has also created a demand for tools that allow you to monitor logistics processes online and look for optimization opportunities.

3.3. RECOMMENDATIONS

Recommendations on state policy to strengthen the resilience of logistics in the context of a prolonged military confrontation with a strong external aggressor are divided into short-term and medium-term.

In the near future, in order to eliminate transport delays and improve connectivity of Ukraine, it is necessary to:

- Agree with EU countries on the allocation of additional freight rolling stock for the transportation of goods to/from Ukraine
- Increase the capacity of transport networks and transshipment terminals
- Optimize customs operations and other checks with neighbouring countries - Poland, Hungary, Romania, Slovakia and Moldova
- Provide additional storage capacities for goods at the border
- Increase the capacity of export corridors

² <https://biz.nv.ua/ukr/amp/dostavka-i-logistika-pid-chas-viyini-shcho-zminilosya-zaraz-ostanni-novini-50273044.html>

- Create conditions for the use of paperless technologies in transportation
- Solve the problem of war risk insurance for freight and passenger transportation

In order to accelerate the implementation of these recommendations and improve coordination between Ukraine and the EU countries, a high-level political steering body is needed, which would include representatives of transport, border, customs and other authorities involved. The experts recommend creating such a body for the implementation of the "Solidarity Roads" initiative.³

In the mid-term, it is necessary to:

- Develop alternative routes to the main transport corridors in case of their stoppage, special attention should be paid to finding bottlenecks
- Electrify the main railway corridors, introduce high-speed passenger and freight transportation
- Build multimodal terminals in the west and south of the country for easy transition between different modes of transport
- Restore the capacity of Ukrainian seaports, invest in their demining, dredging, clearing, repair and modernization of port infrastructure
- Increase the capacity of river ports of Ukraine
- Increase the capacity of the transport network in the direction of European countries
- Create conditions for fair competition in the transportation market, for example, reform Ukrzaliznytsia, allow private locomotive traction on the railway network
- Build railways with European gauge (1435 mm) to the largest cities of Ukraine
- Apply EU standards for infrastructure reconstruction and modernization (access to passenger infrastructure for people with disabilities and other low-mobility groups, environmental and sanitary safety requirements for debris removal and restoration of buildings and engineering structures, use of alternative energy sources, etc.)

³ Квартал «Шляхів солідарності». ГО «Європа без бар'єрів» https://europewb.org.ua/wp-content/uploads/2022/10/shlyahy_solidarnosti.pdf

4. FISCAL POLICY

Fiscal policy is one of the fundamental factors of a country's resilience. In time of war, the ability of the state to timely finance expenditures on the army and law and order, social support for citizens, healthcare, as well as to maintain and restore infrastructure that is critical for security and functioning of the economy, in particular - energy and logistics networks, comes to the fore.

At the same time, fiscal policy affects economic activity through the withdrawal of part of GDP by taxes and fees, government expenditures, fiscal stimulus through deficits and economic incentives caused by changes in tax rates and the tax base.

Fiscal policy in the first nine months of the war was forcedly very soft and stimulative. Due to the economic downturn and tax exemptions on imports in April-July, tax revenues for the first 10 months of 2022 amounted to UAH 769 billion compared to UAH 856 billion for the corresponding period of 2021. At the same time, cash expenditures of the state budget exceeded revenues by 2.5 times and for 10 months amounted to UAH 1,979 billion against UAH 1,070 billion a year earlier.

Due to external grants, loans and emissions, government spending significantly exceeded tax revenues, stimulating domestic demand and supporting households and businesses. This mitigated the economic shocks caused by the war, but also added pressure to the trade balance and increased inflation.

The adopted budget for 2023 with a deficit of up to 20% of GDP and expectations of international aid inflows suggest that fiscal policy will remain highly stimulative in the future.

4.1. MAIN RISKS

Foreign aid.

Taking into account the budget deficit for 2023 of UAH 1.279 trillion (USD 30 billion at the average macroeconomic forecast rate of the Ministry of Economy for 2023), which is almost equal to the revenue share, the key risk for fiscal policy is the insufficiency and unevenness of international financial assistance. It is the insufficient inflows of external loans and grants in April-June 2022 (see Figure 5), combined with the lack of access to external borrowing markets and a sharp increase in public spending that led to large-scale emission financing of the budget deficit.

Figure 5. Foreign inflows and financing needs, 10 months of 2022, USD billion



(Budget deficit, credit refund, foreign aid)

Due to the critical importance of this factor, we analyse it separately in Section 6 of this policy paper.

Economic activity.

Revenues and expenditures of the budget for the next year are based on the macroeconomic forecast of the Ministry of Economy, which envisages 3.2% real GDP growth. However, the recent (and potentially future) power outages caused by the shelling of energy infrastructure will negatively affect both industrial production and consumption, so we can expect significantly worse than forecast economic dynamics. Thus, analysts of the investment company Dragon capital expect that, taking into account the consequences of the damage caused to the energy sector and potential further attacks, GDP in 2023 will decrease by another 5%.⁴

The economic contraction, if it occurs, will also affect the tax revenues to the budget, so there is a possibility of an increase in the actual deficit compared to the one envisaged in the law.

At the same time, the more conservative approach used in its development adds to the budget resilience. In particular, the expected share of general budget revenues in relation to GDP should have been 20.6%, which is 3.1 pp less than the actual figure for 2021. Therefore, a moderate deviation of the real state of the economy for the worse from the macroeconomic forecast will not pose a threat to the fiscal resilience of the state, provided that timely and sufficient foreign aid is received.

Tax administration.

Today, value added tax brings more than half of all tax revenues. In October, VAT revenues amounted to UAH 40.2 billion or 57% of all tax revenues. Therefore, the revenues from this tax are important for fiscal resilience.

The system of value added tax administration provides for accounting and coordination of the tax credit, i.e. VAT amounts in the cost of intermediate goods and services purchased by entrepreneurs in the course of their

⁴ Dragon Capital Macro Research, Ukrainian Economy, November 21, 2022

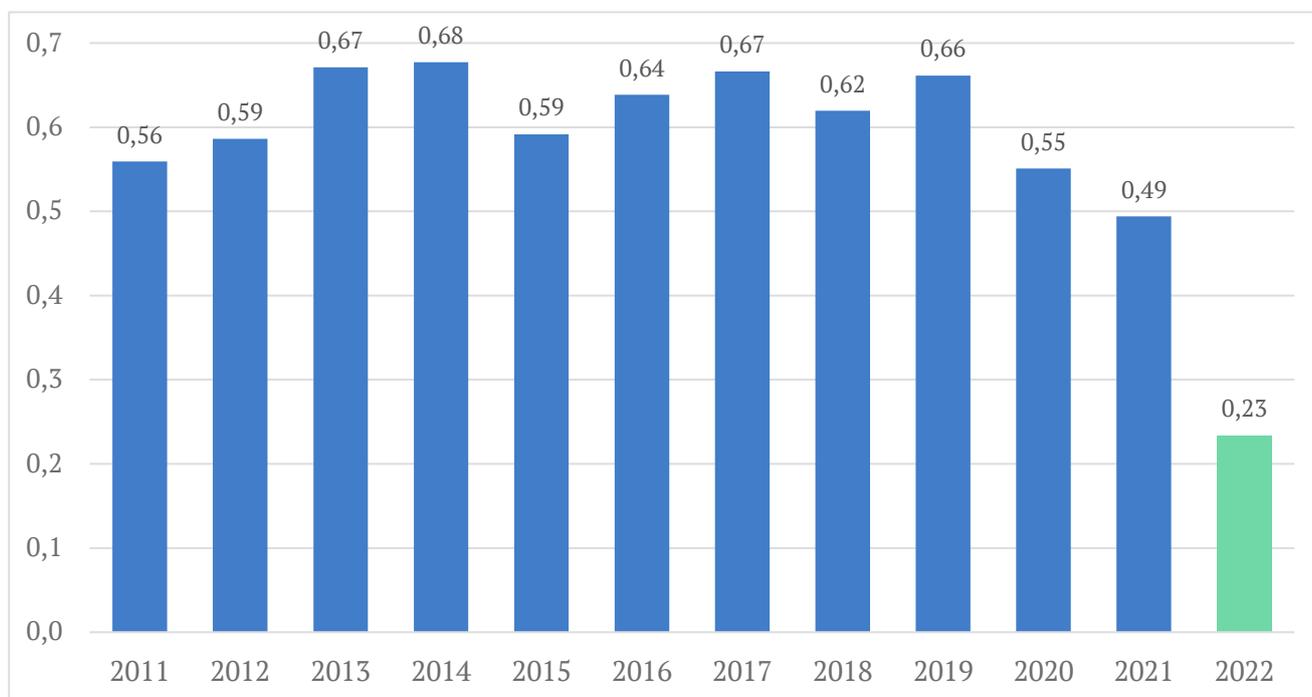
activities, by the taxpayers of this tax with the tax authorities. Tax credit reduces tax liabilities of taxpayers, and in case of excess of tax credit over liabilities, the respective amount is subject to refund to the taxpayer.

Timely VAT refunds are critical for the financial resilience of export-oriented businesses, directly affecting the availability of working capital and encouraging entrepreneurs to stay in the "white" sector of the economy.

However, due to the restrictions that do not allow foreign financial aid to be used to finance defence expenditures, VAT refunds actually compete with the need to finance the army, and it loses this competition.

CES analysis shows that for 10 months of 2022, VAT refunds amounted to only 23% of VAT revenues from goods and services produced (provided) in Ukraine, which is significantly lower than historical values (see Figure 6). In absolute terms, the volume of VAT refunds in 2022 was UAH 59 billion lower with almost the same revenues. This is a significant amount for the budget, exceeding the average monthly revenues from VAT and excise taxes. But it is also a tangible amount withdrawn from the working capital of Ukrainian entrepreneurs.

Figure 6. Ratio of budget VAT refunds to VAT revenues from goods and services produced (provided) in Ukraine for 10 months of the respective year



Source: open data, CES calculations

We also observe a significant increase in the VAT refund timeframe - the weighted average time between the submission of an application and the receipt of funds on the account in October was 114 days, the median - more than 100 days, while historically the median refund timeframe was 30-39 days (see Figure 8).

Therefore, the state de facto uses VAT refund liabilities for short-term interest-free lending of its own expenditures for 2 months or more, collecting additional inflation tax.

Figure 7. Number of days between submission of VAT refund application and receipt of funds on the bank account

	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	>60 днів	Відшкодовано, грн
2016	0%	2%	0%	25%	29%	8%	8%	11%	2%	6%	9%	36%	72 200 613 932
2017	0%	1%	6%	57%	21%	3%	5%	2%	0%	1%	5%	13%	119 437 795 604
2018	0%	2%	9%	58%	13%	5%	10%	4%	0%	0%	0%	14%	131 547 126 583
2019	1%	3%	4%	38%	15%	9%	22%	5%	1%	0%	1%	30%	151 432 679 926
2020	0%	7%	7%	38%	19%	4%	15%	6%	2%	1%	1%	25%	142 634 729 903
2021	1%	8%	9%	48%	18%	1%	9%	4%	0%	0%	1%	15%	158 801 625 112
Січ	7%	14%	0%	41%	31%	1%	5%	0%	0%	0%	0%	6%	12 929 913 358
Лют	0%	2%	7%	55%	8%	2%	15%	11%	0%	0%	0%	27%	12 442 147 220
Бер	0%	6%	10%	34%	27%	3%	18%	0%	0%	0%	1%	20%	11 804 396 123
Кві	0%	1%	7%	50%	23%	2%	9%	6%	0%	0%	2%	17%	12 413 979 919
Тра	0%	4%	8%	56%	9%	1%	3%	18%	0%	0%	0%	22%	12 907 389 442
Чер	0%	2%	10%	40%	29%	1%	4%	10%	0%	0%	4%	19%	11 846 426 610
Лип	1%	17%	11%	31%	23%	1%	12%	1%	0%	0%	1%	15%	11 115 321 291
Сер	0%	14%	9%	38%	12%	1%	18%	6%	0%	0%	2%	26%	10 755 298 304
Вер	0%	11%	14%	64%	2%	1%	5%	2%	0%	0%	1%	8%	14 154 296 413
Жов	2%	4%	7%	65%	8%	1%	10%	0%	0%	0%	2%	13%	13 552 287 703
Лис	1%	10%	14%	62%	6%	1%	5%	1%	0%	0%	0%	7%	17 645 896 337
Гру	0%	10%	11%	32%	37%	1%	7%	0%	0%	0%	1%	8%	17 234 272 392
2022	0%	7%	2%	26%	13%	1%	3%	5%	0%	3%	40%	51%	62 721 929 653
Січ	0%	22%	1%	54%	19%	1%	3%	0%	0%	0%	0%	4%	18 424 344 253
Лют	0%	0%	8%	37%	32%	2%	2%	17%	1%	0%	0%	20%	12 061 949 865
Бер	0%	0%	0%	0%	91%	0%	0%	7%	0%	0%	3%	9%	803 595 869
Чер	0%	3%	0%	0%	1%	0%	0%	0%	0%	0%	96%	96%	9 471 377 035
Сер	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	9 463 786 909
Вер	0%	0%	0%	0%	0%	0%	0%	2%	0%	1%	97%	100%	1 583 439 363
Жов	0%	0%	0%	15%	1%	3%	11%	10%	1%	14%	45%	81%	10 913 436 359

Source: open data, CES calculations

Finally, in recent months, businesses have widely reported a much stricter VAT administration, reflected in difficulties in registering tax invoices and obtaining the tax credit.

Tougher administration may be explained by the government's desire to maximize net VAT revenues by reducing fraud, but also by depriving honest businesses of part of the tax credit.

Such a policy of administering the tax, which is the key own source of budget revenues, gives the government room to mitigate acute short-term liquidity problems, but cannot be sustainable in the medium and long term. It suppresses entrepreneurial activity due to higher administrative burden and leakage of working capital, undermines confidence in the tax system and pushes businesses (especially export businesses) into the shadow economy.

Tax incentives.

In the first month of the war, two packages of tax changes aimed at simplifying imports and reducing the tax and administrative burden on business were adopted.

All subjects of the simplified taxation system were exempted from VAT, as well as the turnover limit for staying in the 3rd group of the simplified taxation system was removed.

Such changes created an incentive to switch to the simplified taxation system for many entrepreneurs, primarily those who have a low share of expenditures on goods and services subject to VAT, and hence low relative volumes of tax credit.

Also, at the time of the abolition of VAT on imports, the extended simplified system was attractive for importers, and, accordingly, for retailers with a significant share of imported goods.

The simplified taxation system does not provide for reliable means of control over the reported turnover and compliance with tax legislation, except for fiscal registrars. At the same time, lawmakers abolished the mandatory use of registrars for trade, services and catering during martial law.

Combined with the inefficient work of the customs, such a wide preferential regime encourages the shadow economy by concealing the real turnover of entrepreneurs, expanding sales channels for illegal imports and domestic production. The consequence of this narrowing of the tax base is a decrease in budget revenues, uneven distribution of the tax burden between entrepreneurs and sectors of the economy, and accumulation of imbalances.

Also, such a broad simplified taxation regime is not compatible with integration into the European Union tax system (which provides for the possibility of VAT exemption or simplified VAT accounting for small businesses within the annual turnover limits of EUR 10,000 - 47,000, depending on the country and type of simplification).

Customs.

According to the fifth monthly survey of Ukrainian enterprises conducted by the Institute for Economic Research, business representatives named the unsatisfactory work of the State Customs Service as one of the critical limiting factors on the side of the state. 40% of exporters mentioned customs formalities among the obstacles, 16% - corruption at customs⁵.

Beyond the general threats to national security, inefficient customs serves as a bottle neck for fiscal policy. It enables tax-free imports, which compete with domestic producers and "white" imports, reducing tax revenues, and renders fiscal regulation of imports ineffective due to the possibility of bypassing import duties/excises. Also, inefficient customs operation facilitates export of shadow sector products, such as grain purchased by traders for cash from agricultural producers.

4.2. RESILIENCE FACTORS AND RECOMMENDATIONS

Consistency and timely foreign aid. In order to avoid significant emission financing of the budget deficit and further devaluation of the hryvnia, it is necessary to ensure that key external donors understand the critical importance of timely and steady inflow of financial assistance sufficient to cover the budget deficit.

Adaptability to the state of the economy. The Government needs to have a plan in place to address short-term liquidity gaps due to possible technical delays in tax payments to the budget, as well as tax revenue shortfalls in the first quarter of 2023 due to the negative impact of power outages on economic activity.

Proper and transparent VAT administration. To reduce medium- and long-term risks of business suppression, the Government should reduce administrative pressure on VAT payers and minimize the practice of delayed VAT refunds. As of the date of preparation of this report, the working group at the Ministry of Finance has developed amendments to the monitoring system of risk assessment criteria, which, if properly implemented, should reduce administrative pressure on taxpayers - extension of the business day, expansion of the signs of unconditional registration for tax invoices with small volumes (up to UAH 5 thousand), etc.

⁵ П'яте щомісячне опитування підприємств України, <http://www.ier.com.ua/ua/institute/news?pid=7008>

However, it is also crucial to ensure the VAT administration transparency by publishing at least monthly detailed statistics on the registration of tax invoices and restore public access to the VAT refund register.

Phasing out temporary benefits and broadening the tax base. It is necessary to wind down the "extended simplified taxation", returning to the simplified system, effective until 24.02.2022, at the latest from the 2nd half of 2023, communicating changes in advance to comply with the principles of stability and predictability of tax policy.

Limiting threats to fiscal resilience from the customs service. It is necessary to carry out a fundamental reform of the State Customs Service in order to reduce the frequency of corruption risks and their impact on budget revenues.

5. FINANCIAL SECTOR

The financial sector is a prerequisite for the economy as a whole. Its resilience determines the resilience of the country as a whole; and in times of war, it is crucial for ensuring the ability to fight and win. In this section, we consider the main risks and resilience factors that are implemented in the financial system - first of all, at the level of the National Bank and the banking sector.

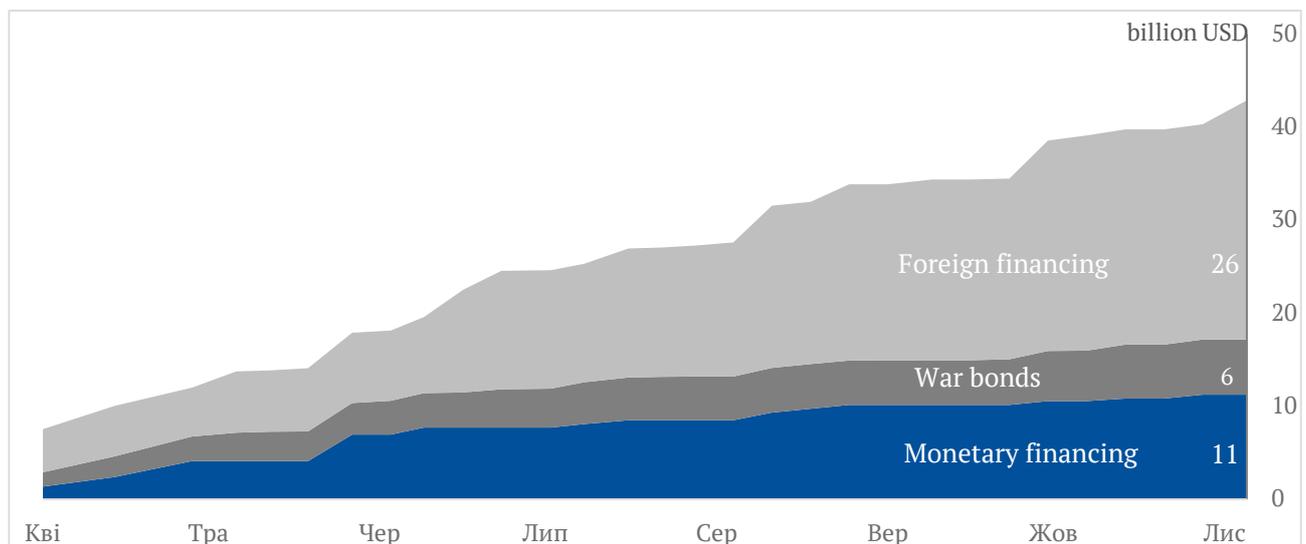
5.1. OVERVIEW OF THE FINANCIAL SECTOR

Monetary financing of the budget, i.e., issuing currency to cover government expenditures, is highly undesirable in peacetime. In time of war, the very possibility of such monetary financing becomes a "safety cushion" for the country, allowing to finance critical expenditures immediately, shifting all the costs to later - in the form of future inflation (inflation tax).

The total amount of monetary financing as of November 16 reached UAH 355 billion, the first redemption of domestic government bonds for UAH 20 billion occurred on March 8, the week after the invasion. The largest volumes of monetary financing were in May and June against the background of low inflows of foreign financial assistance. However, the intensification of donor funding allowed to further limit hryvnia printing to UAH 30 billion per month. According to Deputy Governor of the NBU Sergiy Nikolaychuk, monetary financing of the budget in 2022 will not exceed the pre-established limit of UAH 400 billion.⁶

Monetary financing remains necessary, its volumes closely depend on fiscal policy and international assistance (see Figure 8).

Figure 8. Sources of additional financing of the state budget of Ukraine during the war, cumulative, billion USD



Source: Ministry of Finance

On the first day of the Russian invasion, February 24, the National Bank of Ukraine fixed the official hryvnia to dollar exchange rate at 29.25 UAH per dollar. This decision, as well as the restriction of cash withdrawals, avoided a panic collapse of the hryvnia and a raid on banks. The speed of the implementation of the well-

⁶ Сергій Ніколайчук: Потреби України у коштах для швидкого відновлення на 2023 рік зросли — РБК-Україна — [Link](#)

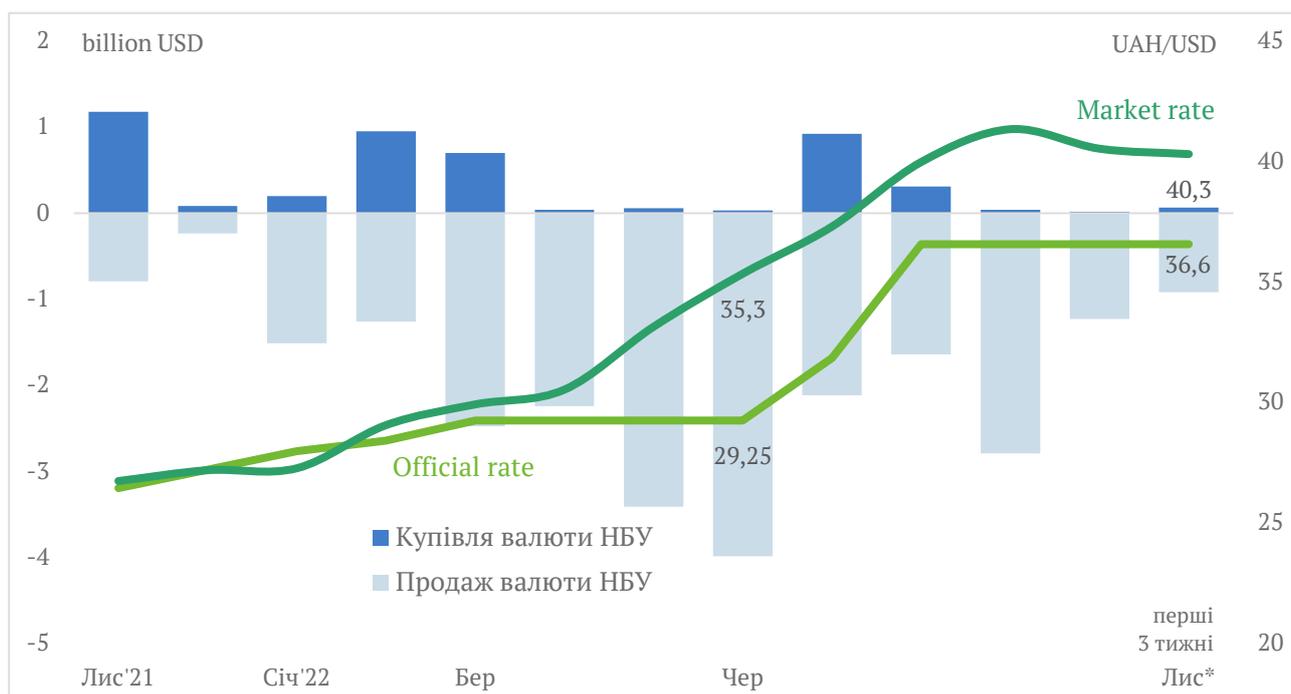
thought-out restrictions, which were introduced just a few hours after the first Russian missiles began to fall on Kyiv, shows that the NBU is ready for military challenges and has various scenarios of response worked out.

However, the discrepancy between the official and market exchange rates soon became apparent, reaching its peak in June, when the dollar exchange rate on the "black market" was 6 hryvnias higher than the fixed official rate. Along with the need to "sterilize" huge volumes of monetary financing of the budget, the need to maintain a fixed exchange rate forced the NBU to spend billions of dollars from its foreign exchange reserves: in June, the NBU sold almost USD 4 billion and bought only USD 3 million.

This situation was absolutely unsustainable, so on July 21 the NBU adjusted the exchange rate, raising it to 36.6 UAH/USD. The convergence of the official and market rates eased the pressure on the need for foreign exchange interventions. However, as of the end of November, the gap between the new official and the new market exchange rate still persists, and the dual exchange rate situation (and the corresponding hidden tax on exporters) is not sustainable.

The gap between the fixed official and market exchange rate makes the NBU intervene in the foreign exchange market more often

Figure 9. NBU foreign exchange interventions, USD billion, and weighted average official and market exchange rates, UAH/USD (right scale).



(Purchase of currency NBU, Sale of currency NBU)

Source: NBU

The banking system in general has shown its resilience since the beginning of the full-scale war. Only 4 banks left the market, two of which were Russian and two more were declared insolvent by the NBU. The remaining 67 banks continue to operate. Net assets of banks during 2022 did not fall, but increased by 5%. However, lending remains depressed, and the interest rate transmission mechanism is not working. Consumer loans were issued only for the current needs of customers, and mortgage and car lending almost stopped. Corporate lending has been growing for some time, but only at the expense of loans from state-owned banks. In

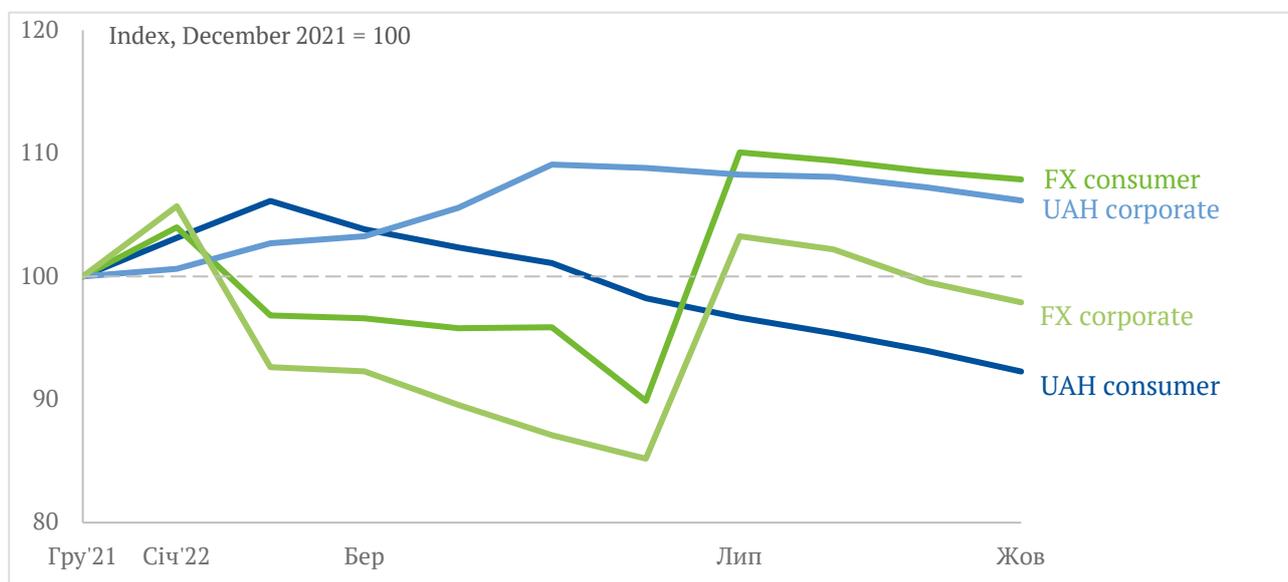
particular, the program "5-7-9" helped, since February 24, businesses have been granted loans worth UAH 60 billion.

During the 8 months of the full-scale war, banks formed reserves of UAH 93.3 billion for incurred and expected losses, which reduced the return on equity of banks by 27.8 percentage points over the year, to 4.3% (for 9 months of 2022).

Banks have accumulated record amounts on their correspondent bank accounts and NBU certificates of deposit - about UAH 450 billion as of November 24 (including UAH 366 billion on certificates of deposit). The extraordinary volumes of excess liquidity are caused, in particular, by the issue of money through the redemption of military bonds by the National Bank.

The growth in foreign currency loans in July was caused by changes in the exchange rate. The volumes of consumer and corporate loans tend to decrease (see Figure 10)

Figure 10. Loans to residents by sector and currency, index, December 2021 = 100.



Source: NBU

The NBU did not change the key policy rate during the first weeks of the full-scale war due to the absolute ineffectiveness of the transmission mechanism. Along with a certain clarification of the security situation, the first inflationary effects of the war began to appear. During its regular meeting on June 2, 2022, the NBU Monetary Policy Board rapidly raised the key policy rate to 25%. The goal was to increase the attractiveness of hryvnia assets and reduce pressure on the foreign exchange market.

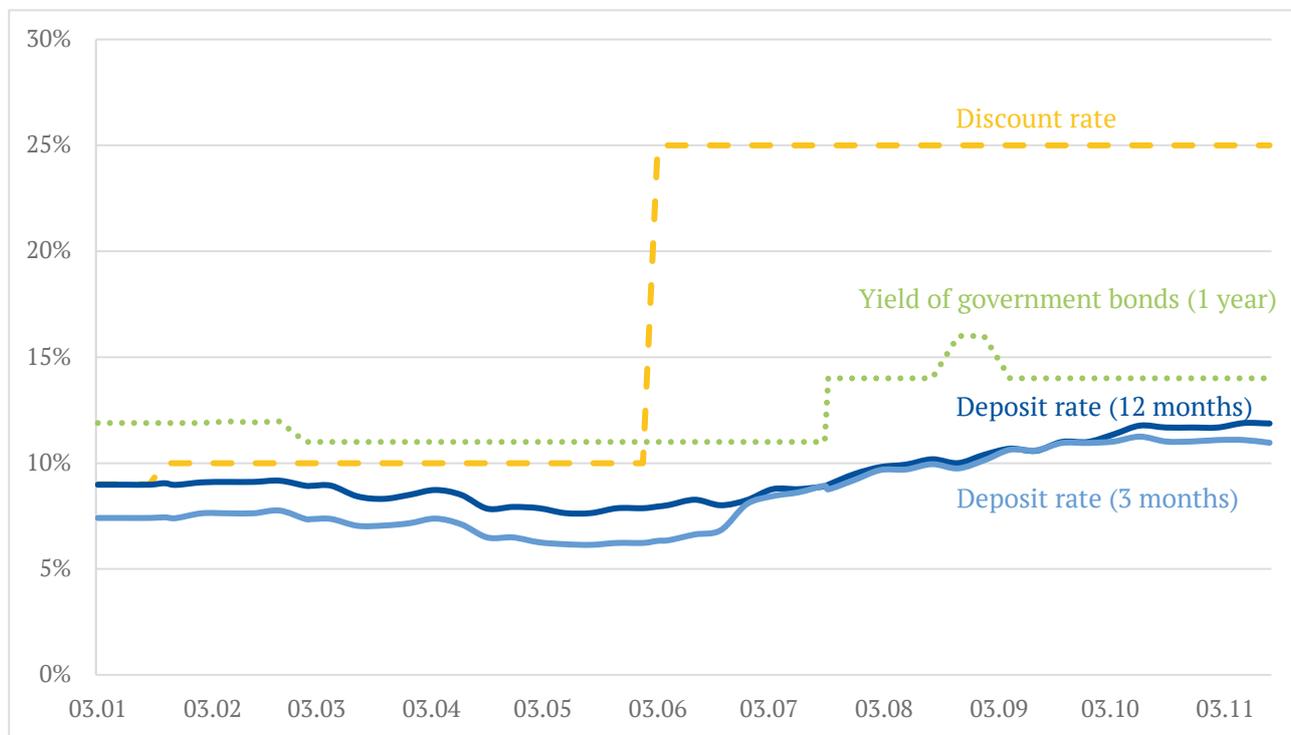
This decision of the NBU caused some misunderstanding on the part of the Ministry of Finance. The increase in the key policy rate, in addition to a formal response to the inflation situation, also reduced the attractiveness of war bonds, which have a much lower yield (18.5% per annum on one-year securities) than, for example, the NBU deposit certificates (23% p.a. overnight). An increase in the yield of government bonds will certainly lead to an increase in public spending on their repayment in the future.

However, the expected effect of the key policy rate hike did not fully meet expectations. Over the past 5 months, deposit rates increased by 4 p.p. on average, approaching 12% for annual deposits. In the conditions of depressed lending, banks are not interested in a significant increase in deposit yields. The dynamics of

lending is most affected by the persistence of security risks - and the lack of a working risk insurance mechanism.

Contrary to expectations, deposit rates did not increase in line with the key policy rate.

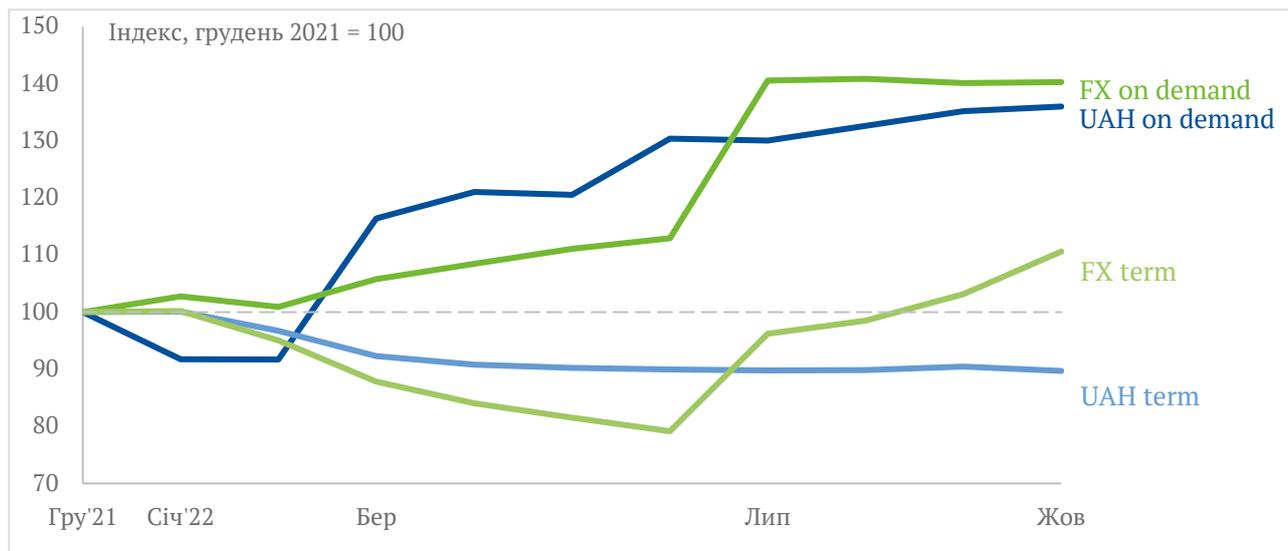
Figure 11. Level of the NBU key policy rate, consumer deposit rates in hryvnia (12 months and 3 months) and weighted average yield of hryvnia domestic government bonds, %



Source: NBU, UIRD

The NBU's successful steps at the beginning of the full-scale war prevented a large-scale outflow of deposits from banks, and overall the situation with deposits is more buoyant than with loans, despite relatively low yields. Hryvnia demand deposits have shown steady growth, and hryvnia term deposits are at 90% of their December 2021 level. This growth is partly due to the high salaries of the military - they are paid to bank cards. After the NBU introduced a new type of short-term foreign currency deposits in July, the volume of foreign currency term deposits also started to grow. The growth of foreign currency deposits in July was caused by changes in the exchange rate (Figure 12).

Figure 12. Household deposits by type of currency and maturity, index, December 2021 = 100.



Source: NBU

Therefore, in general, the banking sector is holding on, but in fact, banks act purely as payment intermediaries, as well as creditors of companies, in particular farmers, under state guarantees or under guarantees of IFIs. Banks keep a large excess liquidity on deposit certificates of the NBU, and other operations, even the purchase of government bonds, are almost inactive now.

5.2. CHALLENGES IN THE SECTOR AND WAY TO OVERCOME THEM

We highlight four main areas of challenges for the sector that require attention:

- **Monetary policy challenges.** In particular, the potential need for monetary financing of the budget deficit to cover basic public expenditures. The NBU also faces exchange rate and discount rate issues.
- **Challenges of deteriorating credit quality and capitalization.** The problem of NPLs that have been accumulating since the beginning of the war needs to be addressed systematically.
- **Challenges in restoring the core business - lending.** Lending is important for both economic recovery and normalization of the banking sector.
- **Challenges from the energy sector** - how banks can work in blackout conditions.

5.2.1. MONETARY POLICY AND THE NEED FOR MONETARY FINANCING

Monetary policy challenges should be considered in the context of three main aspects: exchange rate, discount rate and monetary financing of the budget.

The National Bank has repeatedly confirmed its intention to return to a floating exchange rate as soon as the macroeconomic situation allows. According to the deputy governor of the NBU, Serhiy Nikolaychuk, the NBU hopes to avoid the need for another fixed exchange rate adjustment before gradually moving to a floating exchange rate, but it is not clear when this will happen. Theoretically, one can ask whether it makes sense to wait for the end of the war, accumulating imbalances, or whether a loose exchange rate policy can become a partial dampener of the crisis. In our view, exports are currently limited not so much by exchange rate as by logistical factors, and the weakening of the exchange rate will not lead to its revival. It will have a negative

impact on imports (they will become more expensive), but it should be understood that many vulnerable groups in Ukraine have reduced their consumption to critically necessary goods due to the war, and if the prices rise, it will lead to an even greater increase in poverty. Accordingly, as long as the National Bank is able to keep the exchange rate thanks to reserves and donor funds, this is likely to happen.

The NBU has repeatedly announced that the key policy rate will remain at 25% at least until the second quarter of 2024. At the same time, the NBU notes that it may increase the key policy rate if necessary. In making these decisions, the regulator must take into account the delicate balance between influencing inflation in the future and further depressing lending now, as well as the ability of the government to borrow funds on the domestic market in competition with certificates of deposit.

However, the NBU's ability to effectively control inflation is significantly influenced by factors beyond its control. This is primarily a matter of supply chains and shortages of certain commodities in certain regions, as well as fiscal policy decisions - the budget deficit covered by the hryvnia issue is pushing up prices in the medium term, and the hryvnia printing of the first half of 2022 will soon be felt. If international financial assistance does not materialize or is irregular, and the Ministry of Finance is unable to borrow hryvnia from banks, the excessive issuance could lead to uncontrolled inflation - a risk that has been avoided so far, but will remain a possibility until the end of the war.

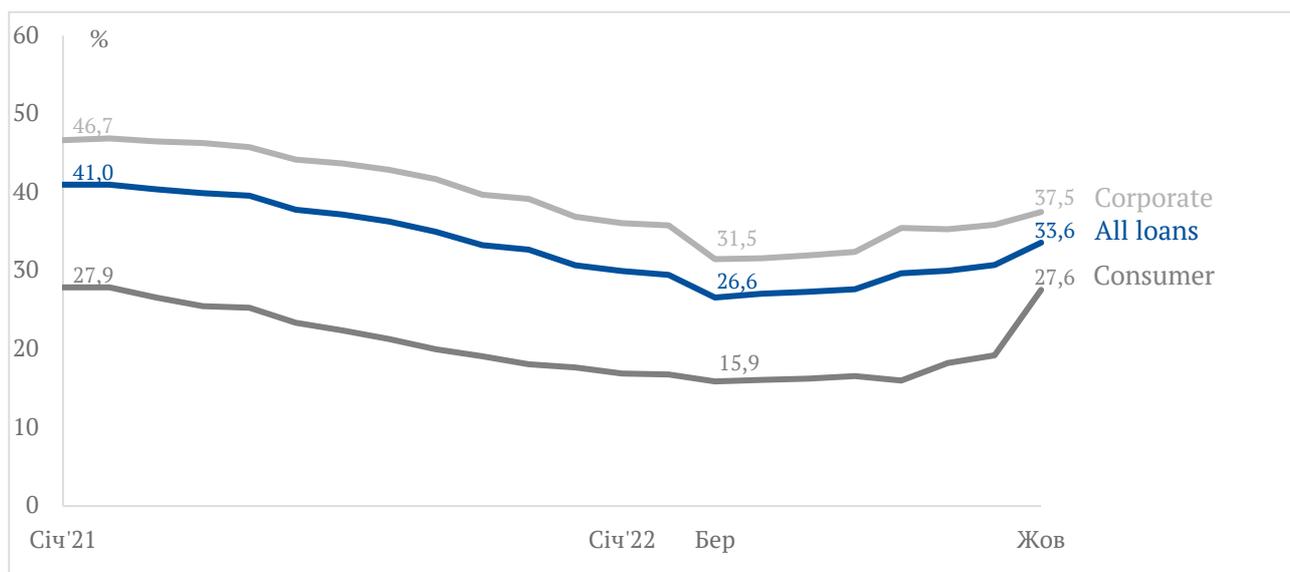
5.2.2. INCREASE IN THE SHARE OF NON-PERFORMING LOANS AND DETERIORATION OF ASSET QUALITY

Before the full-scale invasion, the National Bank of Ukraine, together with commercial banks, actively worked to reduce the share of non-performing loans (NPLs). In 2020, the NPL of Ukrainian banks decreased from 48.4% to 41%; the decrease continued in 2021.

With the outbreak of a full-scale war, the trend towards a reduction in the share of NPLs reversed. This has significantly reduced the NPL ratio of the banking system, which as of March 1 reached 31.5% for consumer loans, 15.9% for corporate loans, and 26.6% for all loans - the lowest levels since 2015. However, the share of NPLs has been steadily increasing since March, as borrowers' solvency was expected to deteriorate.

As of October 1, 2022, the NPL ratio increased to 33.6% of all loans, or by 7 pp since March. The National Bank notes that the growth could have been higher, but banks are now allowed to restructure borrowers' debts quite flexibly. This restrains the growth of the share of non-performing loans within moderate limits. Currently, the missing cash flow on NPLs for banks is partially replaced by interest on deposit certificates and the banking system's earnings have not deteriorated significantly. Over the last four months (until October 2022), the system as a whole has reported a net profit. The share of NPLs has been growing since the beginning of the full-scale war, but not as fast as it could have been under other conditions (see Figure 13).

Figure 13. Share of non-performing loans among loans to the corporate sector, individuals (including private entrepreneurs) and all loans, %..



Source: NBU, Data as of the beginning of the respective month.

At the end of the war, banks will face a delayed shock of deteriorating asset quality and increasing share of insolvent debtors. Currently, the NBU does not impose sanctions for violations of capital, liquidity, and credit risk ratios; sooner or later, these restrictions will return, as compliance with these ratios is an important element of banking system stability.

The practice of searching for a systemic solution after the banking crisis of 2014-2015 in Ukraine showed that the "system", even in the absence of a full-scale war, managed to get a return of 1-2 hryvnias per 100 hryvnias of the nominal value of loans. Therefore, it is unrealistic to hope that a centralized decision after the war will be able to provide a significant recovery on the portfolio.

However, a systemic solution will eliminate the problem from the banks' balance sheets. This will make it easier to privatize state-owned banks, while for private banks it all depends on how (and which) centralized solution will affect the capitalization of a particular bank. For a full analysis of the situation, it will be necessary to conduct stress tests at the level of the banking system - similar to those conducted in 2014. International technical assistance, for example, from the IMF, the World Bank or the EBRD, will be helpful here. Banks are also likely to need additional capitalization; depending on the security situation, financial support from international financial institutions may be more accessible than private capital.

5.2.3. THE NEED TO ACTIVATE LENDING

As with NPLs, work on reviving lending needs to start now. It will probably not be possible to get rid of the two factors that depress lending the most - high interest rates and high military risks - until the end of the war. However, lending is needed to ensure that the economy does not wither away completely - so it is necessary to look for ways to minimize the impact of negative factors.

According to Prime Minister Denys Shmyhal, since February 24, businesses have received UAH 60 billion in preferential loans under the "5-7-9" program.⁷ However, it is impossible to cover all the needs for lending by the government programs themselves. Moreover, excessive concentration of lending in the hands of the state is not sustainable.

To increase private lending in Ukraine, war risk insurance is essential. It becomes especially relevant when Russia terrorizes civilian infrastructure with missile attacks, and any agreements with it are unreliable and fragile. We need an insurance mechanism that will allow attracting investments and obtaining loans secured by objects that can be destroyed. The existence of such a mechanism will ensure the flow of investment and lending in case the security situation in Ukraine remains uncertain.

The Ukrainian government is actively working on the insurance of military risks; the participation of international financial organizations is extremely important here, which will provide funding for such a mechanism and increase its reputation among potential investors and creditors.⁸

5.2.4. BANKING SYSTEM AND BLACKOUTS

Regular Russian missile attacks on energy infrastructure, which began on October 10, have affected all Ukrainians. With each new missile attack, the situation has worsened, and there is a threat of a complete shutdown of the energy system for a long period of time. It is critical to ensure the continuity of the banking system in the event of such a blackout.

The first blackouts did not cause significant problems in the banking system. Online banking mostly continued to work as usual. Payment using POS-terminals was not available everywhere, but vendors continued to work with cash and, in some cases, accepted card transfers.

However, withdrawing cash from ATMs became impossible in places where electricity was cut off. There were often long queues at working ATMs. Only some bank branches are autonomously powered by generators, so this dependence of the physical network of branches and ATMs on the power grid will become a problem during a larger and longer blackout.

According to the head of the NBU Andriy Pyshny, the National Bank together with commercial banks is working to create a backbone network of 1000 branches that will have power supply reserves. The NBU expects that 35% of the banking network will function even in critical situations.⁹

Even earlier, on March 8, 2022, the National Bank allowed banks to use cloud services to provide banking services. PrivatBank, the largest bank in Ukraine, moved its data centers to Europe at the end of April. Other banks, including Raiffeisen, have also moved their critical infrastructure to the cloud. So, the blackout should not affect the actual processing of transactions.

As the duration of outages and communication disruptions increases, the role of cash in payments will grow. This will increase the burden on the physical network of bank branches and ATMs. In order to pass the next

⁷ Уряд продовжуватиме та розширюватиме підтримку українського бізнесу у 2023 році, — Денис Шмигаль — Урядовий Портал — [Link](#)

⁸ Уряд працює над Фондом приватних інвестицій і страхуванням військових ризиків — Свириденко — Економічна Правда — [Link](#)

⁹ НБУ хоче створити мережу із 1000 банківських відділень, які точно працюватимуть у блекаут — Пишний — Forbes Україна — [Link](#)

blackouts smoothly, the NBU and banks need to accelerate their work to ensure uninterrupted power supply in the core network of branches.

6. FOREIGN AID

By Serhiy Sydorenko, editor-in-chief of European Pravda

Ukraine was heavily dependent on foreign aid even before the full-scale invasion of Russia.

This dependence has been formed over many years, and no government has declared even a long-term goal to overcome it. And although the current President Volodymyr Zelenskyy has repeatedly said that Ukraine needs to "stop being used to walking with an outstretched hand" - but there were no further statements, because in practice, our state, which since 2014 has been combining resistance to Russian aggression and attempts to carry out reforms, had no chance to continue effective state-building without external assistance.

However, **with the beginning of the full-scale aggression of the Russian Federation, the need for external assistance has increased to unprecedented levels.**

There was also a radical change in the donors' perception of aid. Perhaps for the first time, Kyiv's persistent requests for more aid did not elicit a reaction in the West with references to bad governance or corruption, as it was clear that Ukraine's needs were driven by a war that from its first days had reached a scale not seen on the continent for more than 75 years.

Because of this, all external donors were sympathetic to Ukrainian requests.

And although the aid they promised does not always arrive on time, its volumes are still unprecedented. The structure of the aid is also fundamentally different from the times before the Russian invasion. All this has helped Ukraine to survive in the most difficult times and to start moving towards victory - although **everyone agrees that the need for external support will continue for a long time and will only increase after the victory.**

However, the state's sustained dependence on external funding also has a potential negative impact, as it lays a time bomb under the state's resilience, or at least the resilience of its individual elements, if they "get used" to external funding.

First, prolonged external financing can create a stable dependence on it, when the government relies on external sources (which are not permanent!) and loses interest in finding domestic.

Second, it may lead to the fact that Ukrainian state and non-state actors will start to take external funding "for granted". This will not coincide with the vision of Western partners, who expect reforms from Ukraine, although they do not demand them during a major war.

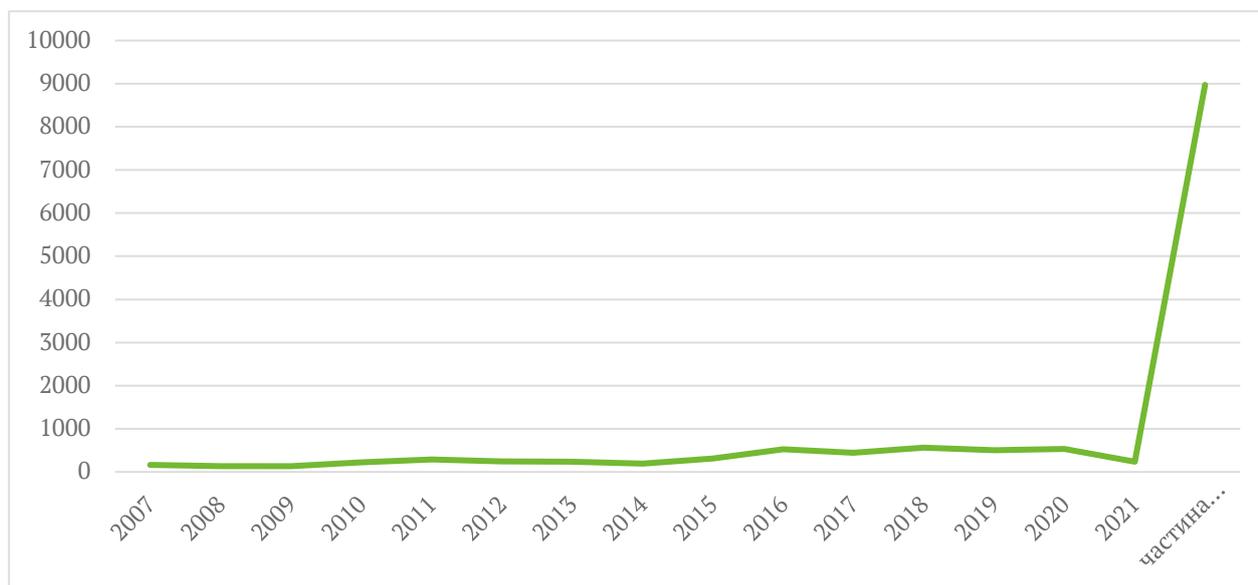
This analysis aims to systematize the assistance to Ukraine and find the components that require special attention. A separate goal is to help determine which financing instruments should be targeted in the future, when absorbing large-scale assistance for the reconstruction of Ukraine.

6.1. KEY CHANGES IN WARTIME

Since February 24, the structure of assistance received by Ukraine has changed radically in many respects. Fundamentally new financial assistance streams have emerged; others have increased or decreased.

But the main change of the wartime year was the exponential growth of aid from Western partners. The easiest way to show these changes is to look at the dynamics of US aid in recent years. 2022 is shown in this graph with incomplete data, approximately as of summer.

Figure 14. Total assistance of US government agencies during the year, USD million



Data from foreignassistance.gov

There is no consolidated data from all donors for the previous years, but such a multiple growth is typical for each foreign partner of Ukraine, emphasized the participants of the panel discussion "How the world supported us", held by the CES on December 1

Meanwhile, this study gives grounds to believe that in 2023 the amount of aid that Ukraine will receive will be even higher - in total from all donors and sources that are part of this study, the volume of aid will probably exceed USD 80 billion and under certain conditions may well reach USD 100 billion - however, it depends on improvements on the frontline.

Radical changes concern not only the amount but also the structure of foreign aid. **In-kind assistance** to Ukraine (including material) has also significantly increased and diversified; **military aid** has become the leader among all areas by net value.

There is such a fundamentally new line as **non-repayable direct budget support**, which reaches huge amounts. Also, the amount of repayable assistance (**in the form of loans**) that Ukraine receives from Western donors has increased, and its provision, which was always conditioned on the implementation of specific reforms, has now become mostly unconditional. In fact, Western donors have pledged to provide Ukraine with at least USD 3 billion per month to cover the budget deficit; some of these funds are provided in the form of loans, some - as non-repayable support.

Targeted support (budget revenues burdened with obligations to direct them to specific goals/areas), which was one of the key areas before, is also growing now. However, if earlier the funds were provided for reforming Ukraine, now they are used primarily to support the sustainability of key sectors (such as energy) and for post-war recovery, which is already underway.

Also, in comparison with the period before February 24, the flows of humanitarian support have changed significantly - for example, international humanitarian organizations began to provide financial support to Ukrainian citizens affected by the aggression, without spending these funds through public budget accounts.

And finally, the key and largest change is that despite the unprecedented amount of support already now, **Ukraine expects an increase in funding immediately after the victory** - due to possible contributions from the Russian Federation, expropriation of the sovereign funds of the Russian Federation frozen in the West and funds of sanctioned Russian citizens. The Western partners support these expectations.

6.2. TYPES OF EXTERNAL ASSISTANCE DURING THE WAR

To correctly identify possible problems, it is important to consider foreign aid to Ukraine in a comprehensive manner, not limited to a narrow definition of this term (*purely financial inflows to the accounts of the state and state institutions*).

For the purposes of the study, we divided all foreign aid to Ukraine into 4 blocks according to the type of its receipt in Ukraine, which almost do not overlap: **general budget support, targeted budget support, military aid, extra-budgetary support.**

1) General or non-targeted budget support for the public budgets

This block includes grant or credit support aimed at eliminating the deficit of the state budget or other public budgets or to the accounts of the Central Bank, without targeted restrictions on its use (or with very broad limits).

Some of this aid is subject to conditionality, but in times of war these conditions do not include the implementation of difficult reforms. Examples: IMF loans and EU macro-financial assistance.

2) Targeted non-military financial support to public budgets

Financial assistance received by budgets of different levels with restrictions on the purpose of use/spending of funds. As a rule, it is provided in the form of grants.

Previously, it was almost always accompanied by conditions of receipt (for example, requirements for reforming the sector that is financed). Now it is more often directed to specific infrastructure projects. In this case, aid may not have conditions on structural reforms. Such targeted aid for the reconstruction of destroyed infrastructure is expected to increase.

This block does not take into account assistance aimed at supporting the security and defence forces.

3) Military aid

This block includes:

- material assistance - weapons and other goods for use in the security and defence sector provided to Ukraine on a non-repayable or repayable basis;
- targeted financial support aimed at covering the costs of the security and defence sector or procurement for these agencies;

- intangible military assistance such as training, exercises, intelligence, etc. aimed at strengthening the security and defence sector;

4) Non-military non-monetary assistance to Ukraine, as well as non-repayable financial assistance that does not go to public budgets

This block combines non-repayable aid addressed to Ukraine and does not fall under the items above. Because of this, it combines very different types of aid, such as

- tangible assets provided for civilian purposes (examples - humanitarian aid or equipment for infrastructure rehabilitation),
- projects with the status of international technical assistance (hereinafter - ITA),
- monetary assistance to citizens affected by the aggression that passes through the budget,
- transfer of migrant workers

It should be emphasized that in this review we have not considered such inflows to Ukraine as Western investments or foreign exchange earnings of exporters, as they cannot be called "foreign aid" even in the broad sense of the term - they are part of normal business activities, although these sources of funds are also important for the state's resilience.

Instead, financial transfers of economic migrants to their relatives in Ukraine, in our opinion, should be taken into account, as this is one of the classic examples of off-budget foreign aid.

The four types we have chosen above, into which we divide foreign aid, are uneven in scale. Types 1 and 3 are the main ones in times of active war; type 2 is underutilized now but may explode in volume after victory.

Each type includes different mechanisms of assistance, but they should be considered together.

In particular, the non-targeted aid that goes to the budgets of different levels now includes **both grants and loans**, which under normal conditions are fundamentally different types of foreign support and are associated with different risks. However, both Ukrainian and Western sources talk about the expected cancellation of the accumulated debt, which - if it happens - will equate borrowing with grant revenues.

Also, in this study we **do not separate revenues to the state budget and local budgets**, as they are associated with similar risks and overcome the same problems at the state level.

In the block of military aid, it is advisable **to consider material resources and financial assistance to the Armed Forces of Ukraine together**. The fact is that almost 100% of financial receipts from donors with "military" purpose are used to pay for the purchase of Western weapons, i.e. they turn into material assistance.

The last block (non-military assistance outside public budgets) could be divided, but it is the smallest in volume, the most fragmented, and at the same time the least predictable. Therefore, in this study, a detailed analysis of its components can be neglected.

6.3. PARTICULARITIES AND CHALLENGES, ASSOCIATED WITH DIFFERENT TYPES OF ASSISTANCE

1) Non-targeted budget support for the public budgets

General description

Non-targeted support is loans or grants provided to replenish the general fund budget, without conditions set by the donor for further spending of these funds. Because of this specificity, non-targeted support usually comes at the sovereign level - to the state budget or to the reserves of the Central Bank (there are also exceptions, such as the EBRD loan for the city of Lviv for 25 million EUR, but in total they can be neglected).

The purpose of such support is to increase the sustainability of the recipient, i.e. to pay off the budget deficit or to increase the NBU reserves.

This assistance is of key importance for maintaining financial and economic, and ultimately social and political stability in Ukraine, as non-targeted financial support is used to finance protected budget items for which the government lacks funds due to the financing of efforts to resist Russian aggression. We also included US grant aid, which formally has a targeted use framework, but it is very broad (US funds are used only for social benefits, but this is a very broad category)

Main donors

US Government, European Commission, governments of other partner countries, IMF.

Expected volume of assistance for 2023: USD 38-52 billion

The U.S. and EU pledged together in the spring to jointly provide Ukraine with USD 3 billion/EUR 3 billion per month, according to numerous sources and statements by Western officials. Together with the help of other players, Ukraine expected to raise about USD 20 billion in the second half of the year. The US has fulfilled this commitment in full, the EU – no (the amount and date of the last tranche is to be determined).

In total, the NBU forecasted¹⁰ USD 30 billions of budget support in 2022. For 2023, the expectations of government officials are even more ambitious.

In 2023, the United States declares its intention to finance USD 13 billion as a grant, the United States - EUR 18 billion as a loan, with the EU emphasizing that this is the minimum requirement. "Ukraine needs from 3 to 5 billion per month," EC President Ursula von der Leyen said at the Ukraine Recovery Conference in Berlin on October 25. The government speaks about more moderate needs. "We have reached a deficit of USD 3-3.5 billion per month," Olga Zykova said at a CES panel discussion on December 1.

At the same time, the IMF program is also expected to be approved in 2023. The Government forecasts USD 12 billions of revenues from the Fund.

Prime Minister Denys Shmyhal earlier announced plans to receive USD 38 billion from partners for the year, which is equal to the sum of expectations from the US, EU and IMF. However, at the same time, other sources and schemes for financing such needs are being sought. For example, Canada is issuing five-year Ukrainian bonds to mobilize funds for Ukraine.

¹⁰ https://bank.gov.ua/admin_uploads/article/FSR_2022-H1.pdf?v=4

Risks

- 1) Long-term coverage by foreign donors of a significant part of regular budget expenditures is a new type of support not only for Ukraine, but also globally. Neither the US nor the EU have ever provided such volumes of irrevocable budget support to any country.

This complicates the process of making the necessary decisions. The risk of untimely receipt of funds from the EU due to the lack of consensus on the financing scheme proposed by the European Commission is already clear

- 2) Another risk is related to the fact that part of the funds (financing from the EU, IMF, Canada, etc.) are provided to Ukraine in the form of loans, a small part - in the form of short-term loans. In theory, a large-scale increase in external debt due to such lending, in theory, means an imbalance of future budgets for debt servicing, a drop in credit ratings, going beyond the IMF structural beacons, etc.

However, a considerable number of interlocutors, both Ukrainian and foreign, say that they expect such credit support to be written off or at least deeply restructured. Therefore, both Ukrainian authorities and Western creditors and donors of Ukraine consider untargeted credit support to Ukraine in the same basket with grant funds.

However, the risks associated with the debt nature of this assistance remain. Debt relief will require political decisions that are difficult to make, which is why they have simply been pushed into the future.

Recommendations to overcome the challenge

Unfortunately, there is no recommendation that would allow to overcome this risk, except for the recommendation to negotiate with partners. This assistance currently seems to be the only way to preserve the stability of the Ukrainian economy.

- 3) The problem of Ukraine's "addiction" to aid.

The steady inflow of "free" money to the budget creates an addictive effect, when the government counts on these revenues and is not very interested in finding alternatives. However, despite the fact that currently none of Ukraine's partners question the need to maintain this support, this will change someday, especially if Kyiv is in no hurry to implement reforms after the victory.

Recommendations to overcome the challenge

Ukraine should prepare for the reduction of funding over time and agree with its partners that as Ukraine's economy recovers, external assistance will be reduced gradually. This position should also be voiced publicly, fixing in Ukraine the idea of the need to find internal reserves, which will ultimately help in the post-war recovery.

- 4) The likelihood of accusations of misuse of funds is growing due to the fact that donors do not control the use of funds under this program, as well as due to the fact that the funds do not go to any specific budget line but are merged into the general budget. Ukraine needs to prepare for the fact that any

scandals regarding the inefficient use of budget money may have an impact on further budget support.

Recommendations to overcome the challenge

There is no alternative way to overcome this challenge - a working system of preventing and fighting corruption. Transparent and fair competitive selection of the new head of NABU is a prerequisite for the trust of Western donors.

In case of escalation of the problem by one of the donors, it may be necessary to create a mechanism for monitoring the distribution of the general budget fund.

2) Targeted non-military financial support to public budgets

General description

Funds from donors or creditors go to the state or local budgets but are reserved for expenditures under a specific budget line. This type of aid was typical for the pre-war period. Now its active use has been suspended - however, it is expected to become popular again in the near future, as it is convenient for financing reconstruction.

However, if earlier targeted budget support was often conditioned on the fulfilment of certain terms by Ukraine or local authorities (such as the implementation of reforms), now these will be softened or removed.

Private business support programs do not count as foreign aid, but certain programs for state/utility enterprises can be considered as examples of such support (illustrative example below).

Main expected donors

European Commission, partner governments, EBRD/EIB

Expected volume

Clear planning of this component for 2023 is not possible, as most post-war reconstruction programs currently exist at the level of statements of intent. However, the few available examples indicate that significant funding may be forthcoming. Thus, at the end of November, the EBRD approved an urgent decision on a loan of EUR 300 million to finance Ukrenergo's expenses for the restoration of damaged power system facilities.

A separate component of this area of assistance is budgetary sectoral assistance (mainly from the EU and its member states), which until February 24 was related to the implementation of reforms, and now is largely reoriented to the needs of wartime.

Risks

Possible unreadiness of local authorities to apply for donor funding may become an obstacle to the effective use of available funds.

Recommendations to overcome the challenge

The government, as well as representatives of donor organisations (EBRD/EIB), should create a training and assistance infrastructure for capable communities to help them apply for funding. Also, the central government should be prepared that some communities/territories will not use the available opportunities due

to the inability and unprofessionalism of the authorities. In this case, the central government should take care of post-war recovery in these territories.

3) Military aid

General description

Partner states provide security assistance, which is one of the key components of the success of the Ukrainian Armed Forces. Some of the elements of support to Ukraine (such as intelligence, training of the Ukrainian military, etc.) do not have a clear monetary analogue, while the provided weapons have their own value.

Decisions on the provision of weapons and financial assistance for their procurement are made by partner states independently, significantly depend on the situation at the front, so they are not subject to clear financial forecasting. However, an approximate estimate based on the cost of security assistance provided in 2022 is reasonable.

Main donors

USA, EU countries, UK, Canada, Norway, a number of other partner countries

Volume

The United States is a key donor of weapons, its contribution is many times higher than other partners. The Pentagon declares¹¹ that in 8.5 months since the beginning of the full-scale invasion, the United States has allocated **USD 18.6 billion** worth of weapons to Ukraine.

The EU member states carry out most of the supplies through the European Peace Facility program, which compensates part of the costs of member states. According to Brussels¹², as of mid-November, military aid from EU member states exceeded **EUR 8 billion**.

Among sovereign donors, the UK¹³ is in second place with supplies worth about **USD 2.8 billion** over the same period. The UK has also publicly pledged to supply arms for the same amount in 2023.

Canada allocated USD 750 million for security supplies in 2022.

Ukraine also received a certain amount of weapons for free from non-EU countries, such as Norway and Turkey, but the volume of their supplies is much lower

If the current pace of supplies is maintained, in 2023 the cost of material assistance to the Armed Forces of Ukraine should **reach USD 40 billion per year**, but this estimate will be subject to adjustments, including depending on the situation at the front and the willingness of partners to supply expensive new weapons.

The easiest way to estimate the scale of growth is to use the example of the United States, whose deliveries by the end of the year of full-scale war will exceed USD 20 billion. Over the previous year, the United States allocated USD 0.7 billion in weapons, and this was a record figure due to active supplies at the turn of 2021/22. Over the previous 7 years, security assistance totalled only USD 2 billion.

¹¹ <https://www.defense.gov/News/Releases/Release/Article/3216287/400-million-in-additional-assistance-for-ukraine/>

¹² <https://www.eurointegration.com.ua/news/2022/11/14/7150629/>

¹³ <https://researchbriefings.files.parliament.uk/documents/CBP-9477/CBP-9477.pdf>

Risks:

- 1) Attempts by certain foreign players to slow down or stop the supply.

There are discussions in both the EU and the US calling for a review of arms supplies to Ukraine, allegedly due to a lack of accountability and the need for peace talks with Russia "to prevent escalation".

Recommendations to overcome the challenge

Ukraine's leadership should continue to convince its external partners that Russia's military defeat is the only alternative scenario for security and stability in Europe. At the same time, the Ministry of Defence should be open to donors' requests to guarantee transparency and accountability of security supplies.

- 2) Exhaustion of resources for military assistance

Already now, donor states have largely exhausted stocks (reserves) of the types of weapons supplied to Ukraine

Recommendations to overcome the challenge

Continue persistent negotiations on expanding the range of products for supply to Ukraine. Focus on supplying new equipment from manufacturers.

- 3) Decline in supplies after Ukraine's victory

In case of military defeat of the Russian Federation or stabilization of the front line, donor states may lose their appetite for continuing supplies.

Recommendations to overcome the challenge

Ukraine at the level of all players should continue explanatory work among partners, explaining the need to build a strong army with modern weapons to prevent a new Russian attack.

4) Non-military assistance outside public budgets

General description

This block consists of a number of components united by the fact that this aid reaches the final recipient in Ukraine (civilians or NGOs) bypassing public budgets.

One of the priorities of Western donors is the supply of humanitarian aid, including direct funding (cash distribution) for vulnerable groups from international charities, as well as non-monetary (material) assistance for the reconstruction of Ukraine from Western governments.

The second area is International Technical Assistance (ITA). These are projects financed or co-financed by foreign donors (usually EU and US organizations) aimed at improving the quality of governance, assisting in reforms, etc.

The third area is remittances from Ukrainians working abroad. These funds are not classical international aid, but are a very similar instrument in many respects, and it should be taken into account, given the scale of this phenomenon.

Volume

Humanitarian aid delivered by EU countries under the Joint Civil Protection Operation currently stands at around EUR 500 million.

Another significant provider of humanitarian assistance, the International Committee of the Red Cross (ICRC), reports having distributed over USD 300 million in aid to Ukraine since February 2022. Many other Western donors prefer ICRC-mediated aid, despite Kyiv's doubts about its cost-effectiveness.

The volume of income from ITA projects is close to USD 1 billion per year. In 2022, the amount may slightly decrease due to the freezing of some activities.

The largest component in this block is assistance to citizens from their relatives who have gone abroad. In 2021, labor migrants transferred USD 15 billion to Ukraine.

Risks

- 1) Inefficiency of ITA.

This format of assistance provides support to certain Ukrainian state structures ("beneficiaries"), but does not provide for funding to their accounts. In many ITA projects, the main item of expenditure is consulting services for foreign contractors and experts, i.e. ITA funds come from Ukraine.

Recommendations to overcome the challenge

2022 allowed to start solving the main problem of most ITA projects, transforming. A number of ITA projects changed the purpose of their activities and began to provide practical assistance to Ukraine. The Government should analyse these lessons learned this year in order to further raise the issue of better design of ITA projects in future negotiations with partners.

- 2) Decline in migrant remittances

Currently, there are no statistics for 2022, but it can be expected that the situation will be distorted, including due to the significant volumes of remittances from Ukraine abroad. However, it should be borne in mind that after Ukraine's victory this flow may resume.

Therefore, the return to Ukraine of those fleeing the war is necessary not only to restart the economy, but also to restore the flow of remittances, which will balance the inflow of currency to Ukraine.

6.4. ATTRIBUTION FROM THE RUSSIAN FEDERATION AND SEIZED RUSSIAN ASSETS

This is the least predictable potential source of funding, which does not fall under any of the types described above. However, there is a consensus in the G7 countries that the Russian assets seized by them should be withdrawn and spent on the reconstruction of Ukraine.

The volume of reserves of the Russian central bank abroad is estimated at about USD 350 billion, but it is unclear how much of them are in jurisdictions where the withdrawal will be possible. Also open is the question of the assets of Russian state-owned companies and Russian oligarchs, as well as the possibility of Russia's classic reparations to Ukraine.

In addition, the work on the confiscation of Russian funds in favour of Ukraine should be a priority for both the Ukrainian government and the governments of partner states, which are constantly requested by the Ukrainian side.