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DANUBE REGION strategy
Competitiveness

Study on the Current Economic Situation of Ukraine

Radiating Innovation Potential through Pioneer Leadership Empowerment (RIPPLE-d2) – Towards Flagship Project Development in the EUSDR PA 8

Baden-Württemberg
Ministry of Economic Affairs,
Labour and Tourism

Interreg
Danube Region

Co-funded by
the European Union

2025

Confidentiality Regulations

Note*. Given the situation that has arisen in connection with the Russian Federation's military aggression against Ukraine, statistical information on population size, natural and migration movements, taking into account interregional administrative data exchange, starting from February 2022, is incomplete and therefore not subject to dissemination.

Note.** In accordance with the Law of Ukraine "On the Protection of the Interests of Entities Submitting Reports and Other Documents During Martial Law or a State of War" dated March 3, 2022, No. 2115-IX, starting in March 2022, state statistics agencies have suspended population (households) surveys in all regions of the country, therefore, statistical information is not published during wartime.

Note*.** In accordance with the Law of Ukraine "On the Protection of the Interests of Entities Submitting Reports and Other Documents during Martial Law or a State of War" dated March 3, 2022, No. 2115-IX, respondents have the right not to submit statistical and financial reports to state statistics authorities until martial law is lifted. Some respondents have exercised this right, making it impossible for state statistics authorities to compile complete and objective statistical information on business activities. Therefore, in most cases, the analysis is based on the results of surveys conducted by professional national or international specialized organizations, often with the participation of the Ministry of Economy.

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Priority Area 8 of the Danube Region Strategy

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Oktober 2025

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Introduction

1.1 Key Objectives of the Study

EUSDR and Priority Area 8

Priority Area 8 (PA8) of the EU Strategy for the Danube Region, which is dedicated to strengthening the competitiveness of enterprises, has a direct interest in a comprehensive analysis of Ukraine's current economic situation. As a Danube Region country, Ukraine's economic development not only shapes its own prospects but also has significant implications for regional competitiveness, trade, and cooperation. For PA8, a clearer understanding of Ukraine's strengths, challenges, and structural transformations provides an essential knowledge base for shaping initiatives that foster business collaboration across borders.

The focus of PA8 lies particularly on supporting small and medium-sized enterprises (SMEs), promoting innovation, and enhancing entrepreneurial ecosystems. In this context, a study of Ukraine's economy can shed light on the conditions faced by SMEs, identify sectors that remain resilient despite the ongoing war, and highlight areas where targeted support could be most impactful. Such insights are especially relevant at a time when Ukraine is preparing for post-war recovery and reconstruction, processes in which SMEs and innovation-driven businesses will play a crucial role.

Assessing the Status Quo

Beyond Ukraine itself, the country's economic trajectory also affects neighboring states in the Danube Region, influencing trade flows, labor migration, and regional economic stability. A structured analysis can therefore help PA8 anticipate these wider effects and adapt its strategies accordingly. Finally, an up-to-date overview of Ukraine's economy provides an evidence base for decision-making, ensuring that policies, funding initiatives, and support measures are well-aligned with actual needs and opportunities.

For these reasons, PA8 has a clear interest in examining Ukraine's current economic situation, as such a study can directly inform its efforts to enhance competitiveness, foster cross-border cooperation, and support sustainable economic recovery in the Danube Region.

The following aspects are key objectives of the study:

- To assess the current economic situation in Ukraine, including macroeconomic trends, political stability, and the business environment.
- To identify strengths, weaknesses, opportunities, and threats (SWOT analysis) impacting project-based cooperation.
- To overview existing support programs for SMEs and businesses available in Ukraine, including national, regional, and EU-funded initiatives.
- To map and analyze the cluster landscape in Ukraine, identifying key sectors and regional concentrations.
- To evaluate the role of innovation and R&D in regional economic development, including expenditures and participation in programs like Horizon Europe.
- To identify potential areas for cooperation based on regional specializations and national innovation priorities.
- To provide recommendations for future collaboration projects that leverage Ukraine's strengths and address its gaps.

In essence, the study aims to provide a comprehensive overview of Ukraine's economic and innovation ecosystem to facilitate effective project-based cooperation and support its recovery and development.

1.2 Methodology

To capture the complexity of Ukraine's economic landscape, the study employs a diverse mix of analytical approaches. These methodologies combine quantitative and qualitative techniques, allowing for both statistical rigor and contextual depth. Together, they provide insights into macroeconomic performance, sectoral structures, innovation potential, and the policy environment, while also benchmarking Ukraine against international standards and engaging with key stakeholders. The applied methods include:

- Literature Review & Data Analysis: The report extensively references and analyzes existing data on Ukraine's economy, including GDP, inflation, employment, and R&D expenditures. It cites sources like the World Bank, IMF, and Ukrainian state statistics.
- SWOT Analysis: A structured SWOT analysis was conducted to identify the internal strengths and weaknesses, as well as external opportunities and threats, related to project-based cooperation.
- Sectoral Mapping & Cluster Analysis: The study involved mapping key sectors and identifying existing clusters to understand regional concentrations and potential for collaboration. This also includes Smart Specialization strategies in the regions and entrepreneurial discovery processes (EDP).
- Review of Support Programs: An overview and analysis of existing support programs for SMEs and businesses was undertaken, including national, regional, and EU-funded initiatives.
- Data Compilation & Presentation: The report utilizes tables and figures to present data and findings in a clear and concise manner.
- Quantitative and Qualitative Analysis: Using both numerical data and descriptive insights to assess the economic landscape and identify areas for improvement.
- Comparative Analysis: The report compares Ukraine's situation to international benchmarks and best practices, particularly within the EU context.
- Policy Analysis (in selected areas of interest): Reviewing existing policies and regulations to identify gaps and opportunities for improvement.
- Stakeholder Engagement: Collaboratively discovering niche opportunities and validating strategic priorities through discussions with businesses, universities, and government.
- Monitoring and Evaluation: Tracking performance indicators and adjusting strategies based on evolving market conditions and technological advancements.

It is important to note that, given the difficult overall working conditions in Ukraine, the data analysis mostly relied on compiling and analyzing existing data from various sources – governmental statistics, international organizations (World Bank, IMF, EU), and existing reports, rather than on collecting primary data through surveys or interviews. This more detailed primary research can follow as soon as the general situation in Ukraine allows for more direct access to stakeholders and physical presence in the regions.

2

Overview of the Current Economic Situation in Ukraine

2.1 General economic trends: GDP, inflation, employment

Gross Domestic Product

Despite the ongoing challenges of war, Ukraine has managed to maintain relative macroeconomic and price stability, overcome difficulties in production, and mitigate the negative consequences of business losses, capital outflows, and workforce shortages. The greatest negative impact on the economy has come from the destruction of businesses and infrastructure, job losses, mass population displacement, disruptions to supply chains, logistical challenges, and the blockade of exports — especially grain and other agricultural products — as well as changes in the structure of imports (purchases of military equipment and electricity). Altogether, this resulted in a loss of around 30% of real GDP.

Relative Stability

However, the situation remained under control. Ukraine did not descend into chaos — government policy and international assistance helped stabilize the economy. Both the banking system and the population demonstrated resilience, and inflation in Ukraine rose even less than in some neighboring countries. The country adapted to new challenges. By 2023, the economy began to gradually recover, with GDP showing growth. Still, the economy became increasingly based on war-adapted sectors and significantly dependent on external financial support. The macroeconomic situation appeared relatively stable, but GDP growth rates began to slow in 2024. Pre-war levels of GDP have not been restored. Economic recovery is hindered by the difficult security situation, shortages of qualified labor, Russian shelling, and the destruction of infrastructure.

Figure 1 GDP and Inflation in Ukraine (2018–2024)

Year	Nominal GDP (million EUR)**	Increase compared to the previous year according to data in UAH	Inflation index, to the previous year	Basic inflation index*, to the previous year	Real GDP (in base year prices, million UAH)	Nominal GDP (millon US dollar)	Increase compared to the previous year according to data in US dollars	Real GDP index, in %
2018	110,844	19.3%	109.8%	107.7%	3083409	130832	+16.7%	+3.5%
2019	137,600	11.7%	104.1%	103.9%	3675728	153781	+17.5%	+3.2%
2020	136,200	5.5%	105.0%	104.5%	3818456	155582	+1.2%	–3,7%
2021	170,600	30.2%	110.0%	107.9%	4363582	199770	+28.4%	+3,4%
2022	153,200	- 4.9%	126.6%	112.6%	3865780	161990	-18.9%	–29,0%
2023	163,900	25.9%	104.%	104.%	5518062	181220	+11.9%	+5,3%
2024	186,800	17.1%	112.0%	110.7%	6821088	190740	+ 5.3%	+2,9%

*Core Inflation Index (Core Consumer Price Index) — an indicator that reflects the level of inflation driven by monetary factors. It is a component of the overall Consumer Price Index but excludes short-term, uneven price changes caused by administrative, random, or seasonal factors.

**The exchange rates in EUR are taken average by years of the data, as the official data is prepared in Ukrainian Hryvnia.

Unlikely return to pre-war level

According to data from the Ministry of Finance and the World Bank, official real GDP[1] indices in the pre-war years of 2018–2019 were stable and grew by about 3%–3.5%. In 2020, due to COVID-19 and the global crisis, real GDP indices fell

[1]Unfortunately, no reliable data can be provided on real GDP per capita. Since the beginning of the war, there have been no precise statistics on population displacement. Official data from different institutions vary but they confirm that more than 8 million Ukrainians (over 20% of the pre-war population) have left the country. A source of information on the current number of residents in Ukraine can be data from mobile operators who, based on calculations of SIM card usage, estimate that no more than 33.8 million citizens currently reside within the country, which aligns with reports that 20% of the population has left to live abroad.

by 3.7%. In 2021, the revival of international activity improved the situation, and the real GDP index grew by 3.4%. In the year of the full-scale invasion, nominal GDP declined by 4%. However, due to inflationary pressures, price effects (prices supported the nominal figure), and the devaluation of the hryvnia, real GDP differed significantly from nominal GDP. In 2022, the official real GDP index fell by 29% compared to the previous year. In 2023 and 2024, the situation stabilized, with official real GDP indices continuing to grow, although the growth rate has been slowing down. In 2023, the real GDP index was +5.3% compared to 2022, while in 2024 it reached +2.9%. Under the current conditions, Ukraine's GDP is unlikely to return to its pre-war level.

Hryvnia Devaluation

Before the war, in 2019, 2020, and 2021 (at the end of each year), the average exchange rate of the USD against the hryvnia stood at UAH 24.6, UAH 28.1, and UAH 27.3 per US dollar, respectively. For the euro, the average exchange rate at the end of those years was UAH 27.5, UAH 34.4, and UAH 30.97 per euro. In other words, before the war, exchange rates fluctuated within the 10–25% range, showing a tendency toward gradual appreciation.

With the onset of the full-scale invasion of Ukraine, the hryvnia sharply depreciated, losing 70–80% of its value. By the end of 2022, the average exchange rate reached UAH 40.8 per USD and UAH 42.85 per euro. In the following years, the hryvnia stabilized, with only minor year-to-year increases. By the end of 2023 and 2024, the average exchange rates were UAH 40.8 and UAH 39.9–42.1 per USD, respectively. A similar trend was observed for the euro: by the end of 2023 and 2024, the average rate rose to UAH 43 and UAH 43.9 per euro, respectively.

Inflation and Monetary Policy

Russia's invasion of Ukraine triggered a sharp rise in inflation. In the first year of the war, inflation spiked due to the collapse of production, hryvnia depreciation, soaring prices, and severe logistical disruptions. Factory destruction, business relocation, loss of resources, markets, and supply chains — all consequences of the war — pushed inflation to 26.6% in 2022 (compared to 10% in 2021 and 5% in 2020).

To curb inflation, the National Bank of Ukraine (NBU) effectively used its main monetary instrument — the key policy rate. This tool influences loan and deposit rates in the banking system, inflation dynamics, and the overall state of the economy. Thanks to currency restrictions, donor support, a restrained monetary policy, prudent management of the key policy rate, the decision not to finance the budget through printing hryvnias, and record harvests in 2023, inflation was successfully stabilized at 4%. However, in 2024, inflation began to accelerate again due to summer droughts, shelling, electricity shortages, and labor deficits, eventually catching up with the key rate. In 2025, inflationary pressures continue to build, prompting the NBU to keep raising the policy rate and deploy all available containment tools.

Overall, the NBU's monetary policy can be considered both professional and well-balanced. During an exceptionally difficult period, when Ukraine lost 20% of its territory, a quarter of its GDP, significant business capacity, and millions of people, it was precisely through competent management of monetary instruments that the NBU was able to tame inflation, stabilize the exchange rate, and align the cash and official (NBU) exchange rates of the hryvnia against the dollar and euro.

Labor Market, Employment, and Unemployment[2]

Ukraine has lost a significant share of its skilled workforce. Forced displacement due to the war also remains a serious challenge, as millions of Ukrainians are now living abroad. According to UN data, at the beginning of 2024 there were 6.34 million Ukrainian refugees worldwide; today, by various estimates, this number is closer to 8 million. This has had a substantial impact on Ukraine's labor market.

The labor market has been especially hard-hit by the war. The conflict has inflicted enormous damage on the Ukrainian economy. The initial shock caused a collapse in both labor demand and supply, massive business closures, job losses, population displacement, and firm relocations. The number of available jobs fell sharply, while unemployment rose to unprecedented levels. According to the International Labour Organization (ILO), around 4.8 million jobs were lost in Ukraine with the onset of Russian aggression.[3]

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[2] During wartime, official employment centers in Ukraine cannot fully capture the real state of the labor market. Therefore, the main source of labor statistics is not the employment services but rather the ILO (International Labour Organization) survey methodology, which is applied by the State Statistics Service of Ukraine, as well as surveys and studies from other official sources. It is important to keep in mind that these survey-based figures are conditional: millions of Ukrainians have moved abroad (their employment is now reflected in other countries' statistics), parts of the territory are temporarily occupied (making surveys impossible), and there is "hidden unemployment" (people are formally listed as employees but in practice are mobilized and not working).

[3] https://old.dcz.gov.ua/publikaciya/rynok-praci-pid-chas-viyny-chy-ye-u-ukrayinciv-shansy-znayty-sobi-novu-robotu

A sharp decline in employment, the departure of millions of Ukrainians abroad, and the shutdown of enterprises led to unemployment in 2022 being estimated at over 20%—and in some assessments even 30%. By comparison, before the war the unemployment rate stood at around 8%.

Legislative changes, business relocation, and regional differences

In response to the labor market shock, the state introduced a series of legislative changes. On April 21, 2022, the Verkhovna Rada adopted a law simplifying the procedure for obtaining unemployed status and receiving unemployment benefits during wartime. Another important initiative was the creation of a business relocation program, allowing enterprises to move from combat zones to safer regions, particularly to western Ukraine. Employers were also offered additional economic incentives to hire internally displaced persons (IDPs). Furthermore, the State Employment Service, in cooperation with the Ministry of Economy, signed an agreement with the country's largest job search platforms to enable real-time updates of vacancies.

Thus, in the following years the unemployment rate showed a steady decline from its peak in the first months of the war to around 18–13% in 2023–2024. The situation gradually stabilized. Many sectors – particularly construction, logistics, trade, and services – have recovered and adapted to the new conditions. According to various official sources, by July 2025 the unemployment rate had fallen to 11%, the lowest level since the beginning of the war, though still higher than in the pre-war period. The labor market also faces a regional imbalance in demand for workers: in Western regions there is structural unemployment, with shortages of certain professions, while in frontline areas there is a labor surplus due to the limited availability of jobs. Overall, there is a pronounced shortage of skilled workers. Mobilization, migration, and unfavorable demographic trends have reduced the size of the labor force by about 40% compared to 2021.[4]

Impact on the sectors

The war has had the most severe impact on the agricultural sector, industry, and construction. Agriculture was particularly hard hit: due to occupation, landmines, shortages of fertilizers, and mobilization, around 25% of Ukraine's arable land has lost productivity. Employment in this sector declined by 10–15%, although the shortage of workers here is greater than anywhere else, given its direct link to food security. The destruction of enterprises, damaged infrastructure, the energy crisis, and worker mobilization reduced employment in industry and construction by 20–30%. In trade and the HoReCa sector, declining purchasing power and widespread closures of businesses caused a 15–20% drop in jobs. Employment in transportation also decreased due to the destruction of bridges, roads, and railways. By contrast, in the IT sector, the possibility of remote work has led to growth in employment, estimated at 5–10%. There is also high demand for specialists in defense and technical fields, as well as for construction workers, technicians, and repair specialists.[5]

Gender in business

Traditionally male-dominated professions are now increasingly being filled by women — including train operators, crane operators, tractor drivers, construction workers, and even miners. At the same time, the number of women in leadership positions in business, politics, and academia has been growing. From a regional perspective, Kyiv, Dnipro, Lviv, and Odesa remain the main centers of labor demand. These regions lead in the number of job vacancies (for example, Kyiv and the Kyiv region account for about 34% of all vacancies). Western regions of Ukraine — Ivano-Frankivsk, Zakarpattia, Khmelnytskyi, and Lviv — have shown the highest vacancy growth (50–70%) due to less destruction and their proximity to EU borders, which made them hubs for relocated businesses and internal migrants. Vacancies have also increased in Zhytomyr, Kirovohrad, Rivne, Chernivtsi, and Mykolaiv regions (5–7%).

Poverty

At the same time, wage levels and overall poverty remain a significant problem. The official subsistence minimum stands at around USD 75 (3,000 UAH), which does not reflect the actual cost of living but is still used by the government as a benchmark for calculating social benefits. If we compare price-to-wage ratios between Ukraine and EU countries, the gap becomes clear: in Kyiv, nearly 6% of the average monthly salary is spent on a basic food basket, while in Berlin this figure is only 2.1%, in Warsaw 2.3%, and in Prague 2.6%. Even in Sofia and Bucharest – the EU capitals with the lowest wages – the price-to-income ratio is still more favorable than in Ukraine.

Flexibility as a response

Ukraine's labor legislation is also undergoing changes to adapt to new challenges. Flexible employment conditions have been introduced, remote work opportunities expanded, and new rules on labor rights protection during wartime

[4] https://voxukraine.org/en/labor-market-in-wartime-demographic-challenges-for-ukraine
[5] https://bizmag.com.ua/rynok-praczi-v-ukrayini

Figure 2 General Overview of the Impact of the War on the Labor Market Situation

Indicator content	What has changed	What influenced the change
Employment	Job losses, especially in industry, agriculture, construction and the service sector.	Destruction of enterprises, reduction of production, migration of population.
Unemployment	Reduction in average wages, especially in regions affected by hostilities.	Inflation, decreased demand for goods and services, devaluation of the hryvnia.
Salary	Decrease in real wages , especially in regions affected by hostilities.	Inflation, decreased demand for goods and services, devaluation of the hryvnia.
Employment structure	The need for an increase in the share of employment in agriculture and the service sector, a decrease in the share of employment in industry.	The need to ensure food security, increasing demand for services related to the restoration of life.
Migration	Mass internal and external migration of the working population.	Finding a safe place to live, employment, and family reunification.
Employees' skills	Growing demand for workers with certain specialties (construction workers, doctors, social workers, IT specialists).	Infrastructure restoration needs, humanitarian assistance, and digital economy development.

implemented. Labor law reforms also aim to support small and medium-sized enterprises, which play a key role in job creation. Government initiatives, along with programs by international organizations, are focused on retraining workers, especially in sectors hardest hit by the war. Examples of major state employment support programs include: unemployment benefits (payments to registered unemployed who meet specific criteria), grants for starting businesses, compensation to employers for hiring certain categories of workers (such as the unemployed and veterans), youth employment and career guidance programs, programs for persons with disabilities, programs for internally displaced persons (IDPs).

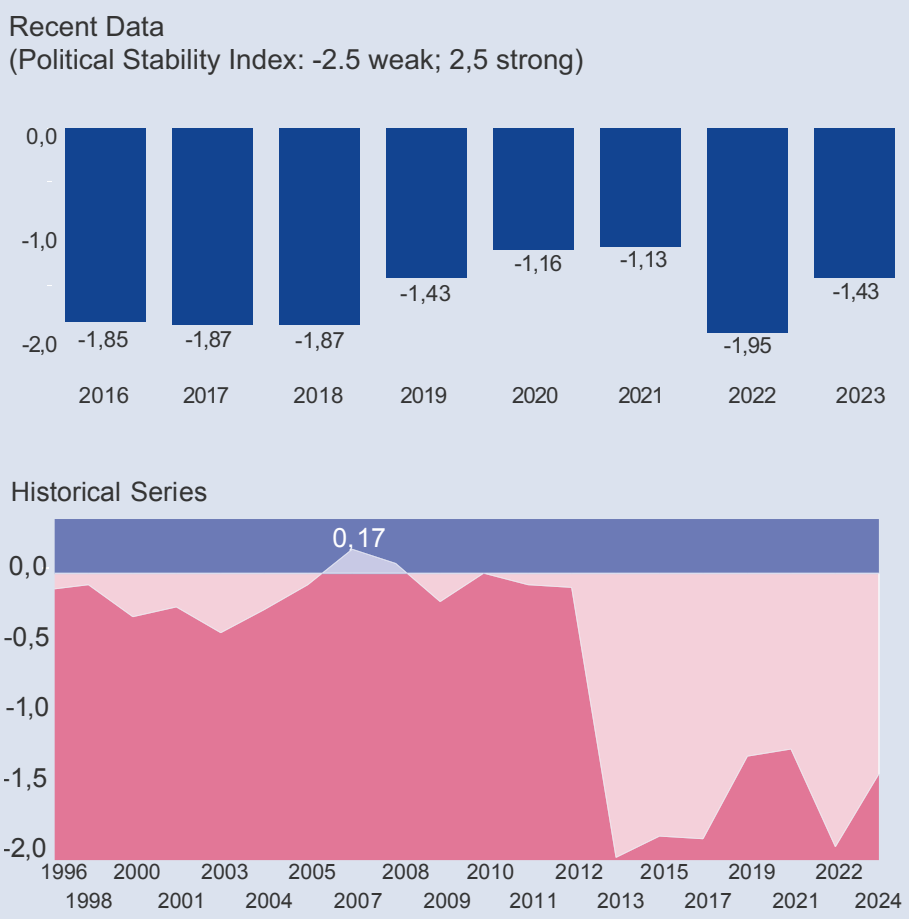
Main State Programs Supporting Employment: Unemployment benefits (payments to unemployed individuals registered with the employment center and meeting certain criteria), grants for starting a business, compensation to employers for hiring specific categories of citizens (e.g., unemployed persons and veterans), youth programs aimed at promoting employment and career guidance, programs for persons with disabilities, and programs for internally displaced persons.

2.2 Political stability and institutional resilience amid the ongoing war

During the full-scale war, Ukraine has demonstrated a relatively high level of political stability and institutional resilience, which is unusual for a country in such circumstances. This is most likely ensured by societal unity, strong civic awareness, the population's commitment to freedom and European values, support from international partners, and the gradual alignment with European institutional standards.

The minimum possible value is -2.5 and the maximum possible value is +2.5. In the pre-war years of 2020 and 2021, the index was -1.16 and -1.13, respectively. In 2022 and 2023, it was -1.95 and -1.43, respectively. (For comparison, the average global indicator is -0.06 points, based on data from 193 countries. Historically, the average for Ukraine from 1996 to 2023 is -0.79 points. The minimum value, -2.02 points, was reached in 2014, and the maximum, 0.17 points, in 2007. There is no data for 2024).

Figure 3 Political Stability Index[6]



Societal resilience

According to Freedom Houses findings, despite the war, the main reasons for maintaining political stability and avoiding deep political crises have been the high level of patriotism and the consolidation of citizens around the idea of independence; strong public support for the Armed Forces of Ukraine; trust in the president, government, and state institutions; the resilience of local self-government bodies that ensure the functioning of communities even under shelling; as well as the volunteer movement and the active role of civil society organizations. Under these conditions, the political leadership has demonstrated the ability to make swift decisions and remain flexible, even under martial law. Despite the state of war, there are no deep internal political divisions or mass protests in society that could paralyze the functioning of institutions. Until martial law is lifted, elections have been suspended—on the one hand, reducing the risks of instability, but on the other hand, raising potential concerns about democratic legitimacy.[7]

Government and digitalization: Diia

All state institutions continue to function steadily. The parliament, government, judiciary, and local self-government bodies carry out their work despite constant shelling, mobilization, and staff relocation. A high level of digitalization—particularly the "Diia" platform—helps ensure prompt access to public services and enables communities, businesses, and citizens to adapt to new conditions and risks. The widespread use of "Diia" guarantees continuity in the provision of nearly all personal administrative services to the population and businesses, regardless of location.

Relative macroeconomic stability and Freedom House Index

The National Bank and the Ministry of Finance continue to maintain macroeconomic stability through sound monetary policy, as well as donor and international financial institution support. Ukraine receives financial assistance from the IMF, the World Bank, and the EU, which stabilizes the budget and banking system, alongside political and military assistance from the EU, NATO, and other partners, which strengthens defense capabilities and helps protect cities from missile and drone strikes.

Ukraine also continues to gradually move toward EU standards, pursuing a clear strategy of integration into both the EU and NATO. As far as current conditions allow, work is ongoing to advance reforms aimed at strengthening the rule of law and combating corruption. According to the Freedom Index, in 2025 Ukraine scored 67 out of 100, placing it on the border between "partly free" and "free" countries. The main reason for the lower score is martial law, which blocks elections and restricts certain rights. Without the war, the score would have been above 70, and Ukraine could easily be classified as a free country.[8]

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[6] Own representation based on https://business.diia.gov.ua/analytics/research/rezultaty-doslidzhennia-stanu-biznesu-v-ukraini-v-berezni-2025-roku

[7] https://freedomhouse.org/country/ukraine/freedom-world/2025

[8] https://freedomhouse.org/country/ukraine/freedom-world/2025

2.3 Business environment: conditions for SMEs and cluster development – general trends

Micro, small, and medium-sized enterprises (MSMEs) form the backbone of Ukraine's economy, accounting for approximately 99% of all business entities, providing over 70% of jobs, and generating around 65% of added value. At the same time, it should be noted that in Ukraine the distinctions between micro, small, and medium businesses are often relative and blurred. Legally, companies are classified as "micro, small, or medium" based on the number of employees and turnover. Depending on their category, they may choose different taxation systems. As a result of various tax optimization schemes, a single company can function as a collection of several micro-enterprises, which under certain conditions can easily merge into one entity. Micro-enterprises are often registered as individual entrepreneurs to apply simpler tax accounting rules. Today, during the war, this approach has helped businesses maintain greater stability and survive more easily under the risks of military actions in Ukraine.

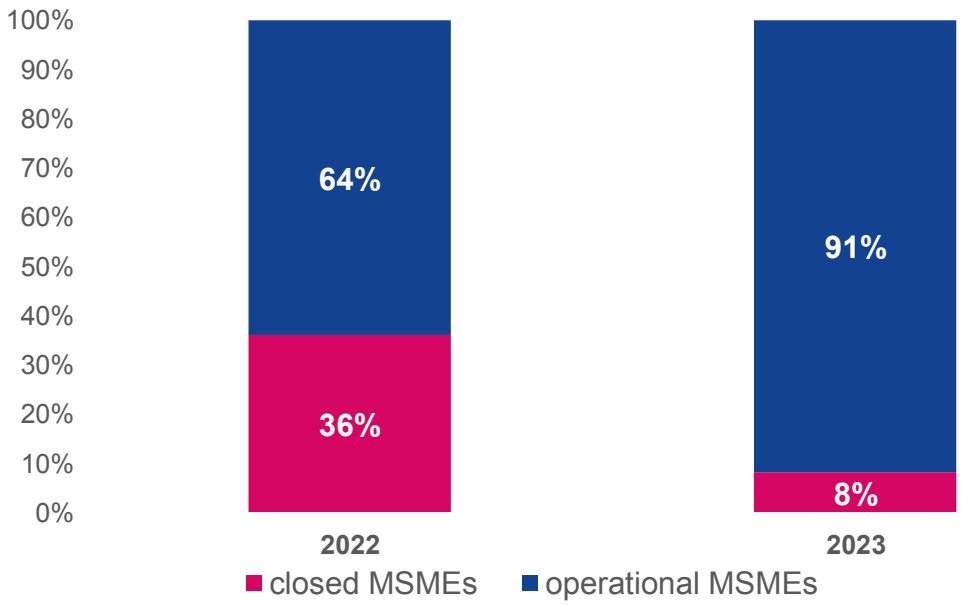
Individual Entrepreneurs (FOPs)

In Ukraine, there are two types of business entities: legal entities and individual entrepreneurs (FOPs). A legal entity is an organization (company or firm) that has the status of a legal subject and can acquire rights and obligations in its own name, acting as a separate subject of legal relations. An individual entrepreneur (FOP) is registered as a natural person conducting business activity and has rights and obligations under the law. FOPs are personally liable for their obligations with all their property, whereas a legal entity is liable only with the property belonging to the enterprise. Registration, operation, and liquidation of a FOP are **simpler and faster than for a legal entity**. A legal entity establishes management bodies according to its founding documents, while an FOP manages its activity independently.

Business operations and production levels

The war has significantly affected business operations and their capabilities. It is estimated that the volume of sold products has decreased by more than 40%. At the start of the war, all businesses faced similar challenges: hostilities and missile attacks, property protection, mobilization, mass migration, logistical difficulties, changes in demand and purchasing power, and shifts in consumer needs. Since the beginning of the full-scale invasion, 64% of MSMEs temporarily suspended or shut down their activities, but the vast majority later resumed operations, often relocating to safer western regions. According to UNDP (research by Advanter Group)[9], by the beginning of 2024, almost 91% of businesses had resumed their operations since the start of the war. Business activity continues. Despite difficult economic conditions and risks, people keep starting their own ventures, choosing the most in-demand sectors and safer regions. From the beginning of the war until the end of 2024, over 763,000 new individual entrepreneurs (FOPs) were registered in the Unified State Business Register. During this period, the number of individuals starting businesses consistently exceeded those closing them.

Figure 4 Dynamic of MSMEs[10]



According to a 2025 study conducted by the Office for Entrepreneurship and Export Development together with the national project Diia. Business and with the participation of the Ministry of Economy, the Ukrainian Business Index (UBI), which

[9] https://www.undp.org/sites/g/files/zskgke326/files/2024-04/undp-ua-smb-2024.pdf

[10] Own representation based on https://www.undp.org/sites/g/files/zskgke326/files/2024-02/undp-ua-assessment-war-impact-enterprises-ukraine2_0.pdf

Figure 5 Ukrainian Business Index

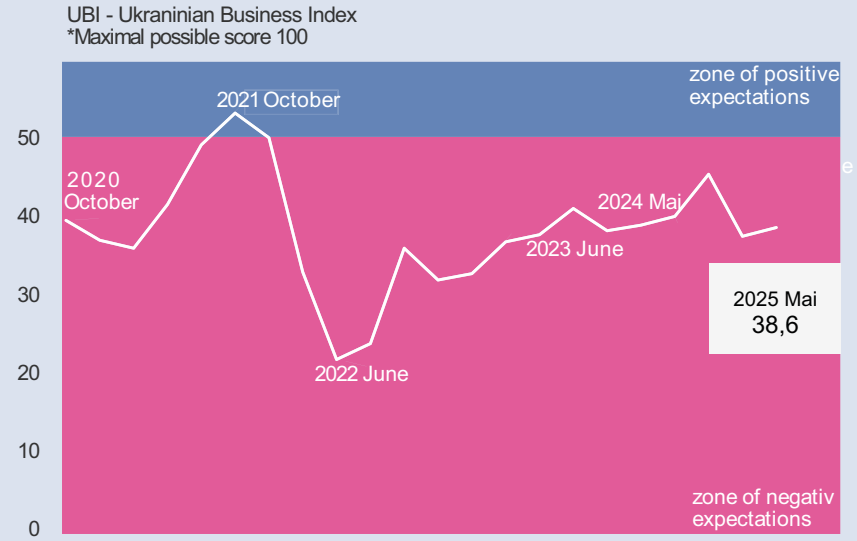


Figure 6 Financial and Economic Condition of Enterprises According to Survey Results

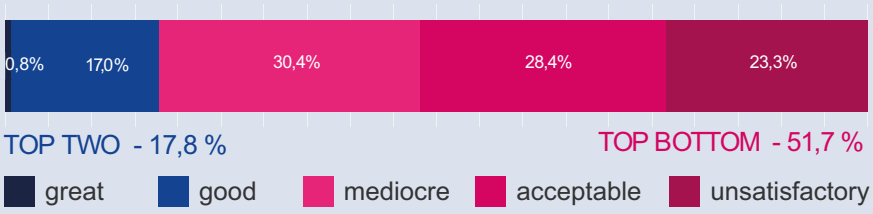
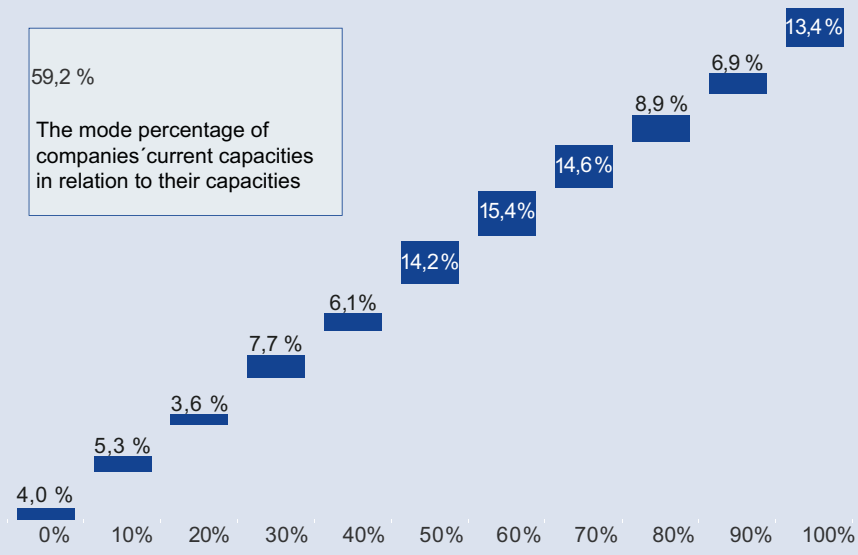


Figure 7 Average Capacity Utilization of Enterprises in 2025



reflects business activity, the capacity to increase turnover, and create jobs, fell to its lowest level—20 points out of 100—by early July 2022. After that, it gradually began to recover, with some fluctuations, reaching 38.6 points in March 2025. During this period, it did not exceed 50 points, indicating significant challenges in doing business.[11]

The financial and economic situation confirms this trend. According to the same research, just over half of businesses (51.7%) assess the financial and economic condition of their company as unsatisfactory or barely satisfactory. Another 30.4% of respondents describe it as average. Only 17.8% rated the financial and economic condition of their companies as good or excellent.

Challenges

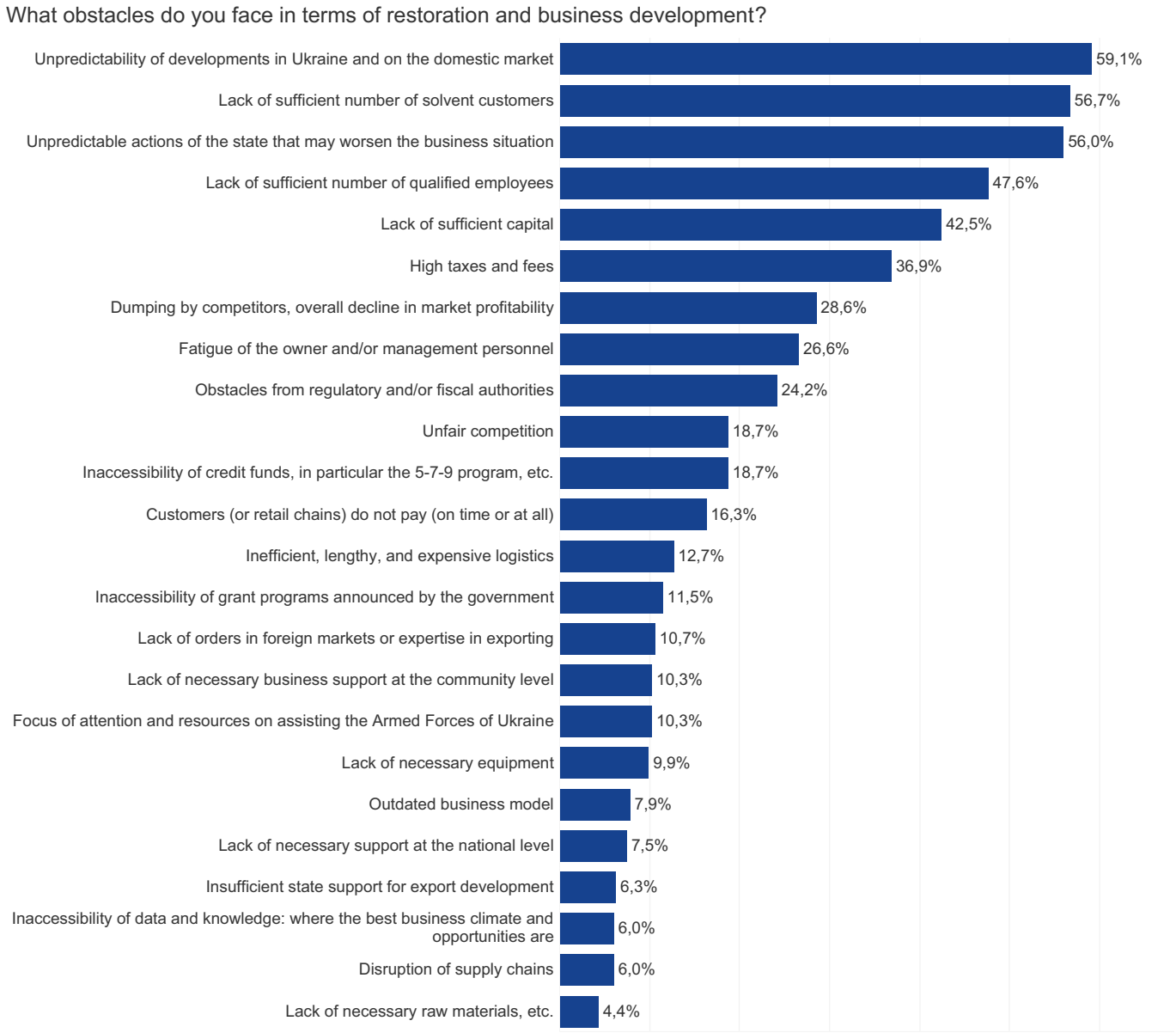
Most companies report that they have significant unused capacity during the war. According to the same 2025 study conducted by the Office for Entrepreneurship and Export Development together with the national project Diia.Business, the weighted average utilization of available company capacities is 59.2%. At the same time, enterprises are ready to increase their turnover by an average of 50%, but this requires a corresponding growth in demand for their products.[12]

The main challenges preventing companies from recovering and expanding their economic activities are: the unpredictability of the situation in Ukraine (59.1%), the lack of a sufficient number of solvent clients (56.7%), unpredictable government actions that could significantly worsen conditions for business (56.0%), insufficient numbers of qualified employees (47.6%), and inadequate capital (42.5%). Among the main issues in interactions with authorities, business owners and managers highlight: blocking of tax invoices (30.2%), refusal to reserve employees (18.7%), inspections and prepayment demands from tax authorities (12.7%), and delays in logistics at the border (12.3%).

[11] https://business.diia.gov.ua/analytics/research/rezultaty-doslidzhennia-stanu-biznesu-v-ukraini-v-berezni-2025-roku

[12] https://business.diia.gov.ua/analytics/research/rezultaty-doslidzhennia-stanu-biznesu-v-ukraini-v-berezni-2025-roku

Figure 8 Obstacles to Business Recovery and Development



Digital Business

Nevertheless, new types of business activities are emerging. SMEs are actively implementing digital technologies, enabling them to increase efficiency, reduce costs, and improve customer interaction. This is especially true for sectors related to information technology and e-commerce. Additionally, demand for environmentally friendly products and services is growing, stimulating the development of “green” businesses, while participation in international projects and programs promotes the integration of Ukrainian businesses into the global economy.

All research on general economic trends indicates that businesses are focusing on priorities linked to government policy, particularly those related to improving the regulatory framework, expanding access to finance and markets, harmonizing legislation and standards with the European Union (EU), and providing deeper, more extensive support for entrepreneurship development.

Taxation System

The business environment in large part is shaped by the taxation system, which in Ukraine is relatively flexible and allows certain business entities, under specific circumstances, to maintain simplified accounting. The taxation system for all business entities is defined by the Tax Code of Ukraine. However, taxation for legal entities is more complex, with a more detailed reporting system. FOPs more often use a simplified taxation system, while legal entities typically use the general system, although they can also opt for the simplified system.

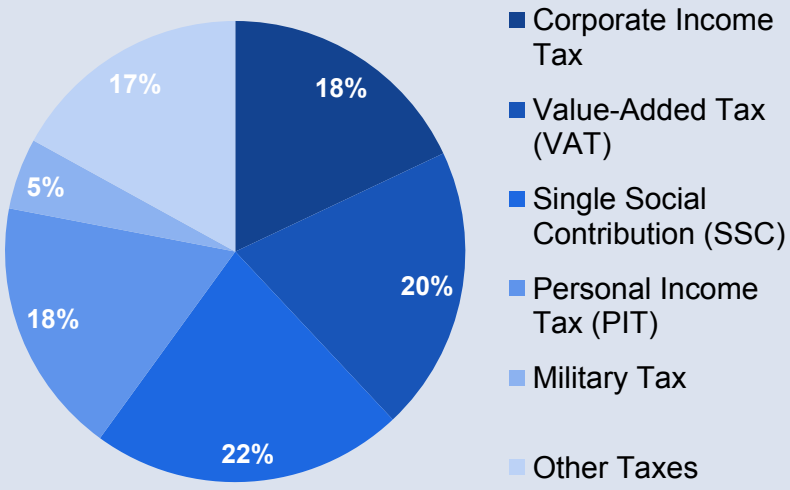
Characteristics of the General Taxation System

Under the general taxation system, full reporting, accounting, and personnel records are mandatory. Businesses under this system must submit a Corporate Income Tax Declaration and Financial Statement, as well as a Declaration of Property and Income. If the business is registered as a VAT payer, it must also submit a VAT Declaration. There are no restrictions on the number of employees, types of activities, income limits, or mandatory taxes under this system.

A business operating under the general taxation system pays:

- Corporate income tax at 18%;
- Value-added tax (VAT) at 20% (if business revenue exceeds UAH 1 million, the business must register as a VAT payer regardless of whether it uses the simplified or general system);
- Employee-related taxes: the single social contribution (SSC) – 22% of each employee's income (paid by the employer), personal income tax (PIT) – 18%, and military tax – 5% (the last two are withheld from the employee's salary);
- Land tax, property tax, and excise tax, depending on the specifics of the business activity.

Figure 9 Characteristics of the general taxation system[13]



Simplified taxation system

Characteristics of the Simplified Taxation System. The simplified taxation system is a special tax regime designed to reduce the tax burden on small businesses and encourage their development in Ukraine. This system primarily attracts entrepreneurs with its simple income accounting mechanism and relatively low tax rates. It allows businesses to pay a fixed amount of tax or a percentage of their income (Unified Tax) and, accordingly, maintain simplified reporting.[14]

The simplified taxation system can be chosen by both legal entities and individual entrepreneurs (FOPs), although for legal entities it is more selective and less accessible. However, the simplified system is not allowed for either legal entities or individual entrepreneurs (FOPs) if their activities are related to, for example, jewelry production, bookmaker businesses, currency exchange, financial intermediation, or trade in motor vehicles, among others. (The full list of activities prohibited under the simplified taxation system is provided in the Tax Code of Ukraine, Article 291.5).

Within the simplified system, there are four taxation groups, each with specific tax rates and business requirements. The choice of group depends on the type of activity, income level, number of employees, willingness to pay VAT, and convenience of reporting. Groups I and II of the simplified taxation system can only be chosen by individual entrepreneurs (FOPs); these groups do not apply to legal entities. Group III of the simplified taxation system can be chosen by both legal entities and individual entrepreneurs (FOPs). Group IV of the simplified taxation system is intended for FOPs running farming businesses, but under certain conditions, legal entities may also use this group.

[13] Own representation based on https://www.bdo.ua/en-gb/ukraine-recovery-1/information-guides-from-bdo-in-ukraine/investments-in-ukraine/taxation-in-ukraine?utm_source=chatgpt.com

[14] https://tax.gov.ua/nk/rozdil-xiv--spetsialni-podat/edynyi-podatok

Group I is only applicable to sole proprietors. These are entrepreneurs without employees who are engaged in retail trade in markets or the provision of services to the population. This group includes, in particular, hairdressers, photographers, anyone involved in the manufacture of goods to order (confectioners, tailors, carpenters), etc. They are prohibited from working with legal entities. They are not VAT payers and pay a monthly single tax set by rural, settlement, or city councils depending on the type of activity of the entrepreneur, but not more than 10% of the subsistence minimum. These sole proprietors also pay a single social contribution (22% of the minimum wage) and a military tax (10% of the minimum wage). Their cash turnover must not exceed 167 times the minimum wage.

Group II is also only suitable for sole proprietors, small businesses with expanded capabilities and slightly higher income than Group I. Entrepreneurs in this group can be involved in the production of food and non-food products, forestry and fisheries, animal husbandry, restaurant and hotel businesses, trade in markets and shops, provision of household services, production of goods, consulting and training services, freelancing, etc. The number of employees cannot exceed 10 people. They are also not VAT payers, but they are allowed to cooperate and enter into contracts with legal entities. They pay a fixed monthly amount of single tax (20% of the minimum wage), a single social contribution (22% of the minimum wage), and a military levy (10% of the minimum wage). The cash turnover for this group must not exceed 834 times the minimum wage.

Group III is available to individuals and legal entities and allows them to provide services to taxpayers operating under the general taxation system. A business entity in Group III pays a single tax (ST) of 5% of turnover if it is not a VAT payer or 3% if it is a VAT payer (paid under general conditions). They must also pay a 1% military tax (MT) on their total income and a single social contribution (SSC) of 22% of the minimum wage for themselves. The owner pays the same taxes for their employees as under the general system.

Group IV is intended only for agricultural producers and consists mainly of sole proprietors, individuals who are entrepreneurs operating exclusively within the framework of a farm, provided that they meet a set of specific requirements. However, legal entities whose share of agricultural production for the previous tax (reporting) year is equal to or exceeds 75% may also be single tax payers in Group IV. The tax rate is calculated by the business independently, based on 1 hectare of land area. If their income (turnover) does not exceed UAH 1 million, they do not pay VAT; if it exceeds this amount, they are required to register as VAT payers and pay VAT on general terms. The unified social tax (UST) — 22% of the minimum wage — and the military tax — 10% of the minimum wage — are also mandatory parts of the tax obligations of Group IV.

None of the listed groups of the simplified taxation system makes exceptions regarding the obligation to maintain accounting records, but they allow it to be done in a simplified manner. The main reporting for all participants in the simplified system includes the Single Tax Declaration and the annual financial statements, and, if necessary, consolidated reporting and the VAT Declaration.

For business registration, closure, and management, entrepreneurs can use the electronic application on the “Diia” platform. They can use the “Electronic Taxpayer Cabinet – Register of Single Tax Payers” service to remotely monitor their income and taxes online, as well as to prepare and submit reports.

(c) Ekaterina Siubarova - stock.adobe.com

2.4 Regional differences and concentration of economic activity in Ukraine during the war

The war has significantly affected the geography of economic activity and altered its geographic concentration. Eastern and southern regions (Donetsk, Luhansk, Kherson, Zaporizhzhia) experienced extensive destruction and partial occupation, leading to decreased production, business closures, and mass migration. Western and central regions (Ivano-Frankivsk, Lviv, Zakarpattia, Ternopil, Vinnytsia, Khmelnytskyi) became relatively safer areas, attracting residents from the east and relocated businesses. Cities such as Kyiv, Lviv, Dnipro, and Vinnytsia have practically become hubs for relocated businesses, people, and capital.

Figure 10 Regional Differences in Business Economic Activity During the War

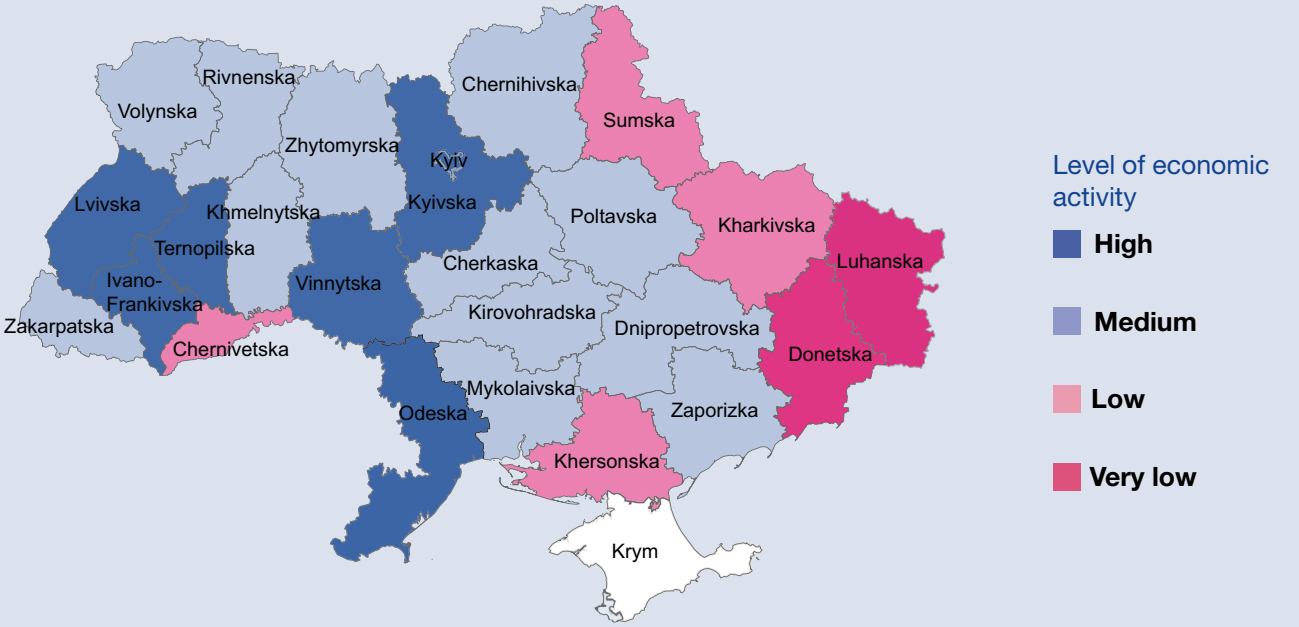


Figure 11 Regional Differences in Business Economic Activity During the War

Oblast	Main sectors of the economy	Level of economic activity	Changes in employment	Comments on business concentration
Kyiv	IT, finance, logistics, public sector	High	Growth in services and IT	Center of displaced business, core of the economy
Lviv	IT, logistics, education, agriculture	High	Stable, growth in jobs	Western hub for displaced persons and business
Ivano-Frankivsk	Logistics, small business, agriculture	High	Growth due to the inner migration	Companies relocated from the east and south
Ternopil	Agriculture, small business	High	Stable	Small business growth, logistics
Vinnytsya	Manufacturing, agriculture, IT	High	Stable	Relocation of businesses from the east
Chernivtsi	Agriculture, logistics	Medium	Partial growth	Support for business migrants

Oblast	Main sectors of the economy	Level of economic activity	Changes in employment	Comments on business concentration
Zakarpattya	Logistics, tourism, small business	Medium	Stable	Deepened integration with the EU, logistics hub
Volyn	Agriculture, small business	Medium	Stable	Local growth of small businesses
Rivne	Mechanical engineering, agriculture	Medium	Partial growth	Growth through business relocation
Zhytomyr	Agriculture, light industry	Medium	Stable	Relocation of some enterprises from the east
Khmelnytskiy	Manufacturing, agriculture	Medium	Stable	Support for local businesses
Cherkasy	Agro-industry, light industry	Medium	Stable	Local concentration of production
Kirovohrad	Agro-industry, light industry	Medium	Stable	Restoration of agricultural production
Poltava	Agro-industry, energy	Medium	Partial growth	Local concentration of industry
Sumy	Agriculture, light industry	Low	Cutback	Near the front line, partially paralysed
Chernihiv	Agro-industry, light industry	Low	Cutback	Significant destruction due to hostilities
Kharkiv	Heavy industry, mechanical engineering	Low	Massive cutback	Partially relocated business to the west
Luhansk	Coal, metallurgy	Very low	Massive migration, cutback	Combat operations, paralysed enterprises
Donetsk	Metallurgy, coal, heavy industry	Very low	Massive cutback	Most of the business has been relocated
Zaporizhzhia	Metallurgy, energy	Medium	Partial cutback	Some enterprises have been relocated
Kherson	Agriculture, ports	Low	Cutback	Partial occupation, ports not operating
Mykolaiv	Agriculture, ports, shipbuilding	Medium	Partial cutback	Loss of some logistical capabilities
Odesa	Ports, logistics, agriculture	High	Stable	Western export market, business consolidation
Dnipropetrovsk	Metallurgy, heavy industry, IT	Medium	Partial cutback	Production partially resumed

3

SWOT Analysis

S Strengths

Finances of the national economy

- Positive GDP dynamics after a sharp decline in the year of the full-scale invasion
- Successful work of the National Bank and the proper use of monetary policy tools, in particular the key policy rate to manage inflation
- Alignment of trends between the cash and the official (NBU) exchange rates
- Stabilization of exports after a sharp decline at the beginning of the war

Social economic aspects

- Public trust in the banking system and an increase in deposits
- Positive dynamics of labor demand (job vacancies) in the labor market despite the prolonged war
- Formal) decrease in the unemployment rate
- Considerable government attention to social issues (payment of pensions, social benefits, and assistance)

Research & Development

- Functioning of science parks in the fields of natural sciences, environmental disciplines, energy, and the gas transportation system

Business

- State support for the relocation of businesses to western Ukraine*
- Small and medium-sized businesses are recovering quickly after the sharp decline in the year of the full-scale war. The Business Activity Index (UBI – the ability to increase turnover and create jobs) shows positive trends – from 22.00 in 2022 to 38.6 in 2025
- Despite the war, enterprises have adapted to the situation and maintained financial stability
- Despite a generally optimistic outlook, companies take a cautious approach to attracting new investments due to the unpredictability of future developments
- Introduction by the Government of state grant programs for business ("Processing Grants" up to 184 000 EUR, "Own Business" up to 5 750 EUR, "Own Garden" up to 9 200 EUR per hectare, "Own Greenhouse," as well as grants for war veterans and their families under the "eRobota" program from 5 750 to 23 000 EUR; grant support for Ukrainian technology startups and SMEs under "Seeds of Bravery")
- Successful operation of the preferential loan program for business "Affordable Loans 5-7-9%" and a number of preferential loan programs for energy equipment (including 0% loans for the purchase of equipment for electricity production from renewable sources)
- High level of digitalization of business–government relations through the "Diia" platform (business registration, reporting, grants, business consultations, etc.)
- Speed and clarity in obtaining administrative services from the state through the "Diia" platform
- Numerous business grants from international donors

* The colored topics indicate that the given strength, weakness, opportunity, or threat is to a large extent related to the ongoing war situation.

W Weaknesses

Finances of the national economy

- A sharp GDP loss in the year of the full-scale invasion, which is difficult to recover
- A steep rise in the dollar and euro exchange rates / devaluation of the hryvnia (by half) after the start of the war
- Sharp devaluation of the hryvnia
- Half of all state budget expenditures go to defense, military assistance, and security
- A sharp decrease in exports of goods and services under the impact of the war
- Growing negative balance of foreign economic activity

Social economic aspects

- Decrease in the labor supply and in the number of people willing to seek employment
- Mobilization of men
- Outflow of the working-age labor force abroad due to war fatigue and the search for safe living conditions
- Insufficient government attention to stimulating economic development

Research & Development

- Insufficient level of integration of science into the real sector of the economy
- High cost of European patenting and limited recognition of Ukrainian patents restrict competitiveness at the international level
- Low salaries of scientists and researchers, lack of motivation to engage in scientific developments in research institutes and universities
- Low expenditures for R&D

Business

- Unpredictability of the situation in Ukraine and the inability to conduct strategic planning
- Loss of logistics chains (domestic and external)
- Decline in labor productivity due to constant air raid alerts and shelling
- Loss of sales markets, low demand for business products, and a small number of orders
- Most companies have significant unused capacity. The average capacity utilization rate is 50%–70%. If demand arises, enterprises are ready to increase turnover by about 50%
- Rising production costs or forced deterioration of product/service quality
- Increase in utility costs for businesses
- Little information on changes in the structure of the economy and commodity markets due to the war and business relocation
- High requirements for accounting reporting and business control from tax authorities blocking of tax invoices
- Increased difficulty of doing business
- Lack of trust of businesses in state institutions, especially in tax authorities
- Shortage of employees (on average, only about 70% of required positions are filled in companies)
- Inability to find highly specialized professionals
- Insufficient attention is paid to improving the regulatory and legal framework for business and supporting entrepreneurship during the war, expanding access to markets and finance, and harmonizing legislation and standards with the EU
- Delays in logistics, including delays at the border
- Difficulties in obtaining necessary equipment, raw materials, and supplies
- Insufficient capital for development, lack of orders in foreign markets, insufficient information, knowledge, and opportunities to find partners
- Difficulties in maintaining working capital
- Businesses relocated from regions where hostilities continue are cautious about planning for the future
- Power supply disruptions, including rising costs of energy such as gas and electricity

O Opportunities

Political factors

- Expansion of cooperation with the European Union as a candidate country, including access to EU structural funds, the Ukraine Facility program, and other mechanisms for financing infrastructure, social, and economic development
- Development of e-governance and increased transparency of government
- Engagement of international organizations' assistance for the modernization of public administration and implementation of reforms

Economic factors

- Implementation of a targeted policy to attract foreign investment and promote the development of domestic investors
- Cooperation with international programs for the development of small and medium-sized businesses, and support for startups
- Concentration of investments in innovative projects and technology transfer
- Facilitation of enterprise integration into global value chains
- Implementation of a consistent state policy to improve energy efficiency and promote the use of renewable energy sources

Social factors

- Increased use of AI to improve the efficiency of social and administrative services: automation of assistance delivery processes, monitoring of citizens' needs, and improving access to services

Research & Development

- Development of research centers and innovation hubs in close cooperation with local enterprises
- Active involvement of international research funds and programs (e.g., Horizon Europe) to finance projects aimed at addressing global challenges in climate, energy, transport, and healthcare
- Further integration into the European Research Area: cooperation with European research institutions, participation in international projects, and knowledge exchange
- Development of higher education institutions as educational centers
- Modernization of educational programs with a focus on digital skills and STEM
- Successful regional SMART specialization

Threats

Political factors

- Escalation and expansion of hostilities, which will exacerbate existing negative trends
- Rising corruption and non-transparent use of budget funds may lead to strengthening internal threats
- Instability in the banking sector, which may reduce access to financing for businesses and increase the cost of loans
- Corruption threats: despite anti-corruption measures, military procurement and international aid remain vulnerable to abuse
- Potential political escalations

Economic factors

- High inflation rates, declining purchasing power of the population, and financial instability of households and businesses
- Bureaucratic obstacles for businesses, high tax burden, and high interest rates on credit resources
- Shortage of external financing and reduced opportunities for access to international capital markets
- Threat of destruction of energy, transport, and state infrastructure facilities as a result of missile strikes
- Prolonged war creates risks of staff shortages and overburdening of the public administration system
- Loss of the simplified taxation system when moving from microbusiness (MB) status to the small business (SB) category
- Further complication of tax administration for businesses, which may lead to reluctance to grow in order not to exceed the limits of the simplified system

Social factors

- Deepening social poverty
- Reduction of social assistance
- Intensification of migration and outflow of highly qualified specialists abroad
- Impossibility of their return due to low competitiveness compared to EU countries

Research & Development

- Decline in research initiatives due to lack of stable funding, low salaries, and limited resources for purchasing high-tech equipment
- Lag in infrastructure development caused by the war and insufficient funding for research activities
- Instability of the situation creates barriers for the development of new technologies such as artificial intelligence and bioengineering
- Widening gap between science and real business
- Lack of government attention to creating a motivational system for scientists and researchers in research institutes and universities

4

Overview of the Support Programs for SMEs and Business

During the war, roughly a quarter of companies took advantage of state or international support to stimulate their business activity.

4.1 National programs

The Ukrainian government has developed a successful model of financial support for businesses through state credit initiatives, employment programs, grants for starting new businesses, and financial assistance for relocated companies.

Affordable Loans

As early as 2020, the Cabinet of Ministers of Ukraine approved the "Affordable Loans 5-7-9" Program (Resolution No. 28 of January 24, 2020). The program provides state support for small and medium-sized businesses by compensating part of the interest rate through authorized banks. It is implemented through the Entrepreneurship Development Fund (EDF), whose sole participant is the Government of Ukraine represented by the Ministry of Finance. The program is still active today and is adjusted according to the situation and conditions of martial law. It provides financing for working capital and investment needs for business development. The state compensates part of the interest rate, reducing it to 5%, 7%, or 9%, depending on lending conditions and the creation of new jobs. Currently, to support sectors crucial to Ukraine's economy, SME loans are provided in the following priority areas: 1) agricultural activities; 2) processing industry; 3) reconstruction of SME production facilities destroyed by military aggression, which as of February 24, 2022, were located in active combat zones; 4) financing SMEs engaged in energy efficiency and alternative energy, implementing energy services to improve facility efficiency, operating generation units producing electricity from renewable energy sources, and construction and installation of gas-turbine and biogas generation units.

"e-Job"

At the initiative of the Ministry of Economy, grant programs for businesses under the name "єРобота" (meaning — "e-Job") were launched in the first year of the war. The "єРобота" program includes several directions: 1) "Own Business" grants – microgrants from 50,000 to 250,000 UAH for business development, with the condition of creating jobs for amounts over 75,000 UAH; 2) grants for processing enterprises – up to 8 million UAH for companies, conditional on creating up to 25 jobs; 3) grants for horticulture – 400,000 UAH per hectare, but no more than 25 hectares; 4) grants for greenhouse farming – up to 7 million UAH for 2 hectares for enterprises with 14 jobs; 5) youth grants – individuals under 25 can receive up to 150,000 UAH to start a business without a mandatory job creation requirement. The "Affordable Loans 5-7-9" program allows businesses to obtain loans of up to 50 million UAH for terms of 3 to 5 years, with the possibility of reduced interest rates if new jobs are created.

Diia.Business (online)

To apply for a grant, it is necessary to prepare a business plan using the approved template, in accordance with the order of the Ministry of Economy of Ukraine. Grant applications are submitted electronically through the „Diia.Business" portal and, as a rule, must be implemented within the first six months. The conditions for receiving grants may change, which can be easily monitored on official resources such as the „Diia" portal and the Ministry of Economy website.

Diia.Business is a large-scale national digital project for the development of entrepreneurship and export, initiated by the Ministry of Digital Transformation of Ukraine in February 2020 and implemented jointly with the Office for Entrepreneurship and Export Development (a state institution responsible for the development and support of Ukrainian entrepreneurship in domestic and foreign markets). The project has two components: an online portal and an offline network of business support centers.

The online portal, Diia.Business, operates as a one-stop shop and is designed to provide entrepreneurs with all the necessary information for starting and developing a business in a single resource. The platform includes sections on starting and running a business, business development, export, and women's entrepreneurship. On the Diia.Business online portal, users can access: directories for entrepreneurs and exporters, over 160 business ideas, case studies, and success stories, current news, free consultations, educational courses and programs for entrepreneurs and exporters, an events and exhibitions calendar, self-assessment tools, export services, a financial opportunities marketplace for businesses, and analytics on the state of Ukrainian business, among other resources.

Diia.Business (offline)

The offline component of Diia.Business is represented by a network of business support centers—spaces where Ukrainians can receive free consultations, attend educational events for entrepreneurs, participate in networking, rent event halls, and

test their products at a special pop-up location. The centers host both free and commercial events (70% of services are free for businesses, while 30% help cover rent and salaries of the teams working at the centers). By the end of 2024, such centers had already opened in 15 regions: Kharkiv, Mykolaiv, Cherkasy, Odesa, Poltava, Uzhhorod, Bucha, Ternopil, Kryvyi Rih, Kremenchuk, Rivne, Lutsk, Ivano-Frankivsk, and even Warsaw—a consultation center for Ukrainians.

While the platform itself does not provide direct funding, it serves as a gateway to connect entrepreneurs with financial institutions and venture capitalists. It also offers subsidies for consultation and training services. Entrepreneurs engaged in digitization, e-commerce, and SME development are given precedence and are eligible to apply for support. As example, through Diia. Business, several small businesses, such as Craftory, a handmade goods e-commerce platform, have scaled their operations successfully. The platform also helped connect Ukrainian SMEs to international markets during challenging economic circumstances. Entrepreneurs can register on the Diia.Business website to access services. Consultations and connections to funding opportunities are facilitated through personalized mentoring sessions.

Ukraine has emerged as a vibrant hub for innovation, fostering creativity and technological advancements across various sectors. Recognizing the importance of innovation for economic growth and global competitiveness, several programs have been established to support entrepreneurs, researchers, and startups in their pursuit of groundbreaking ideas. This overview highlights the key innovation support programs currently available in Ukraine along with examples of their initiatives and achievements.

(c) Ekaterina Siubarova - stock.adobe.com

Regional good practice

Lviv pioneered a Regional Innovation Fund during the 2021, when the region passed through Entrepreneurial Discovery Process (EDP), providing targeted support to startups, SMEs, and research institutions in sectors aligned with the region's Smart Specialization priorities, including IT, biomedical technologies, industrial automation, and agro-tech. The fund financed around 15-20 projects, with grants of UAH 200,000-500,000, supporting initiatives such as IT solutions, biotech prototypes, and agro-tech innovations. These projects strengthened collaboration between businesses and universities and demonstrated the potential of regional innovation financing. The fund also served as a pilot for broader mechanisms, including venture co-investment, innovation-linked procurement, and technology infrastructure, that could enhance innovation ecosystems nationwide. Other regions of Ukraine could adopt similar small-scale funds to support projects aligned with their own S3 priorities.

4.2 Government-led programs

Startup Fund of Ukraine

The Startup Fund provides grants ranging from $25,000 to $50,000 to early-stage startups. Funding is typically offered in multiple rounds based on milestones achieved. Projects focusing on technology development, sustainable agriculture, healthcare innovations, renewable energy solutions, and digital transformation are prioritized. The Startup Fund supported the development of SolarGaps, a smart solar blinds company that has successfully expanded its operations globally. Another notable example is Esper Bionics, which created advanced bionic prosthetics and has gained recognition in international markets. To apply for support the applicants must submit a detailed business plan and pitch deck via the fund's online portal. Shortlisted candidates are invited to present their ideas before an expert panel for final approval.

Key USF working results:

- Over $9 million in grants awarded
- Supported over 220 startups, which received grants to participate in more than 50 international conferences
- Startups that received support from USF attracted over $50.9 million in external investments
- The Seeds of Bravery consortium financed 266 startups for a total of over €10 million
- USF was recognized as one of the most successful reform instruments of 2020–2024 (according to OECD estimates), and the fund's programs won the Access to Finance award at ESNA, where Ukraine ranked fourth among partner countries, receiving the highest score

Description of individual UFS programs

1. Grant Support - grants without equity requirements, covering projects at the pre-seed and seed stages, providing up to $25,000–50,000 with the support of WNISEF. In total, the fund has allocated approximately $2.5 million to finance startups in various industries, from agrotech to cybersecurity.

2. Innovative Vouchers - participation in international technology events: startups are provided with vouchers to present at the world's largest exhibitions; over 100 teams have represented Ukraine at VivaTech, Collision, Slush, TechCrunch Disrupt, etc.

3. Corporate Innovation - allows startup products to be integrated into the work of large Ukrainian corporations; it is implemented as part of the USF's overall portfolio.

4. Seeds of Bravery - support for technology SMEs and startups with grants of up to €60,000. Aims to develop businesses in critical areas, including defense and recovery.

5. Fast Track to Victory - accelerated approval of unmanned aerial vehicles through the Fund's web portal. Responds to military needs and ensures rapid deployment of innovations.

6. Sandbox for AI & Blockchain Startups - an experimental pilot until October 2026 (with possible extension) that allows testing products with blockchain and AI. Participants receive a free audit, legal, business, and technical advice, as well as support in implementing innovations in accordance with European standards.

7. 100 Million Learners - An international educational initiative in partnership with Thunderbird School (Arizona State University) aimed at developing startups through world-class educational programs.

Innovation Grant Programs

These grants typically range from $10,000 to $200,000 depending on the scope and sector of the project, designed to support research and development (R&D), high-tech product development, and dual-use technologies (serving both civilian and defense purposes). These programs are implemented in partnership with international donors, especially the European Union, and aim to strengthen Ukraine's innovation ecosystem in strategic sectors. Funds are allocated for research, development, and scaling of innovative solutions in the high-tech industries, artificial intelligence, cybersecurity, and biotechnology projects receive priority funding. As example, the Innovation Grant Programs have supported startups like Releaf Paper, which produces paper products from fallen leaves, and DeepTrait, a biotech company specializing in AI-driven plant breeding techniques. Researchers and businesses must submit proposals outlining their project objectives, expected outcomes, and budget breakdown. Applications are reviewed by a committee, and successful candidates are notified within 60 days.

4.3 EU-led programs

Horizon Europe

Horizon Europe provides substantial funding for research and innovation projects, with grants often exceeding €1 million for collaborative initiatives. Projects addressing climate change, sustainable development, digital innovation, and societal challenges are prioritized.

Horizon Europe emphasizes a wide range of focus areas, including:

- Health: Research in areas like cancer, infectious diseases, and healthcare digitization.
- Digital Transformation: Enhancing AI, robotics, and cybersecurity capabilities.
- Green Deal: Projects promoting renewable energy, circular economy, and biodiversity.
- Mobility: Innovations in connected and autonomous vehicles and sustainable transportation.
- Culture and Creativity: Supporting digital heritage preservation and creative industries.

Under Horizon Europe, Ukrainian universities collaborated with EU counterparts on renewable energy projects, including an initiative to develop efficient wind turbine models for rural use. Participants need to submit detailed proposals through the EU online portal. Proposals must align with the program's focus areas. Applications are highly competitive and require partnerships with international organizations.

EU Digital Europe Program

Ukraine's digital sector remains a critical driver of resilience and growth during the war. Yet, businesses and public institutions face limited resources to scale digital transformation, cybersecurity, and advanced technology adoption. By associating with the EU Digital Europe Programme (DIGITAL) in 2022, Ukraine gained access to a unique set of financial and technological opportunities that can accelerate both recovery and EU integration.

The Digital Europe Programme (2021–2027) targets five strategic areas. Ukraine is eligible for four of them:

- High-Performance Computing – access to infrastructure and cooperation in supercomputing.
- Artificial Intelligence, Data and Cloud – projects in AI-based services, open data, and interoperability.
- Cybersecurity – participation in initiatives to strengthen resilience, with some restrictions due to security clearance. This strategic area is limited for Ukrainian participation due to security requirements and restricted access to sensitive data and infrastructure. Ukrainian organisations can engage in certain components, such as training or demonstration projects, but access to core infrastructure-related parts of the program remains partially restricted.
- Advanced Digital Skills – training programs and upskilling of the workforce.
- Deployment of Digital Technologies – practical adoption in sectors like e-government, healthcare, green transition, and industry 4.0.

As of early 2025, 19 grant agreements signed with the participation of 75 Ukrainian institutions. Approx. €14.4 million mobilized for digital projects in Ukraine. Establishment of European Digital Innovation Hubs (EDIHs) in Kyiv, Polissia, Zaporizhzhia and other regions to support SMEs and public bodies in adopting digital solutions, EDIH also act as local gateways for EU-Ukraine cooperation in digital adoption. As well as, a d edicated €5 million EU call open to Ukraine for strengthening the European fact-checking network.

EEN (Enterprise Europe Network)

EEN does not directly provide funding but connects entrepreneurs to European funding opportunities and investors. Businesses looking to expand into international markets, forge cross-border partnerships, and adopt innovative technologies are prioritized. EEN facilitated cross-border collaborations, such as connecting Ukrainian IT firm SoftServe with EU businesses, leading to joint software development projects. Businesses can join the network by registering on the EEN website. Through this platform, they receive tailored advice and access to funding calls aligned with their interests.

4.4 Private and non-governmental initiatives

Tech Ecosystem Development

Accelerators such as UNIT.City and iHUB offer seed funding ranging between $10,000 and $100,000 alongside workspace and mentoring services. Startups focusing on software development, green technologies, and hardware innovations are prioritized. As example, UNIT.City has supported firms such as Petcube, a smart pet camera developer that now operates globally. Similarly, iHUB has incubated startups like Gravitec, a push notification service provider with global clients. Startups must apply directly to the respective accelerators with a comprehensive pitch deck. Selected applicants are enrolled into incubation or acceleration programs, which include access to funding and resources.

NGO-Led Programs

NGOs such as the Ukrainian Startup Association offer small grants and access to partner funding pools, which range from $5,000 to $50,000. Initiatives targeting social entrepreneurship, education technology, and community development are prioritized. The Ukrainian Startup Association has supported projects like TeachMe, an ed-tech platform providing online courses, and initiatives promoting women in technology through mentorship programs. Applicants are required to submit a project proposal outlining their goals and expected impact. Applications are reviewed by the NGO's committee, and results are typically announced within a month.

Corporate Innovation Programs

Corporate innovation programs often provide internal funding ranging from $10,000 to $500,000 for employee-led projects or external startups in partnership with the company. Projects that align with corporate goals, such as supply chain optimization, product innovations, and emerging technologies, are prioritized. Corporations like Naftogaz have funded projects on energy efficiency, while telecom company Kyivstar has supported digital transformation initiatives, such as

customer experience platforms. Employees and external innovators submit their ideas through internal platforms or open calls. Proposals undergo evaluation by a corporate panel, and selected projects receive funding and mentorship.

Ukraine‘s innovation support programs provide a vital foundation for individuals and organizations seeking to make a difference on the global stage. By leveraging these resources, the country aims to harness its creative potential and drive transformative change across industries.

While Ukraine‘s innovation support programs cover a broad range of sectors, there is a noticeable emphasis on IT and technology-driven solutions. This focus aligns with Ukraine’s reputation as a global IT outsourcing powerhouse. However, challenges such as limited access to funding, bureaucratic hurdles, and geopolitical instability remain significant barriers to the full realization of the country’s innovation potential.

In summary, Ukraine‘s innovation ecosystem is poised for remarkable growth, driven by strategic investments, global collaboration, and a resilient entrepreneurial spirit. With the right mix of policy support, infrastructure development, and talent cultivation, the country is on track to become a global leader in innovation, contributing transformative solutions to pressing global challenges.

4.5 Credit and guarantee tools

For many Ukrainian companies today, finding affordable finance is one of the toughest challenges. High risk perceptions among banks, the uncertainty caused by the war, and limited collateral often block access to credit. Strengthening credit and guarantee instruments is not just a financial necessity, it is a lifeline for SMEs, exporters, and reconstruction projects. With the right mix of state support and international partnerships, these tools can unlock capital and sustain business activity.

State Loan Guarantees - the Government of Ukraine has introduced portfolio and individual guarantees that cover part of the loan risk taken by banks. This mechanism makes credit more accessible for SMEs that often lack sufficient collateral. Ukreximbank plays a central role in delivering these programs.

Internationally Supported Credit Lines - Local banks increasingly work with credit facilities backed by international partners such as the EBRD, EIB, EU, or USAID. These lines typically come with better conditions like lower interest rates, longer repayment periods, and partial risk sharing. Initiatives like EU4Business already help thousands of SMEs maintain operations and invest in their future.

Export Credit Guarantees and Insurance - Exporters face a double layer of risks commercial and political. To keep trade flowing, guarantee and insurance schemes now cover risks ranging from buyer default to war-related disruptions. The Export Credit Guarantee Facility launched by the EU and EIF is one example of how Ukraine’s cross-border trade is being supported in practice.

Reconstruction-Focused Loan and Guarantee Schemes - Beyond immediate survival, Ukraine needs financing for reconstruction. Donor-backed loan and guarantee schemes are designed to finance housing, infrastructure, and industrial recovery with longer maturities and concessional terms. The Danish EIFO Loan and Guarantee Scheme is a flagship model showing how international partners can back Ukraine’s rebuilding.

5

Clusters and Business Associations

5.1 Features of cluster functioning in Ukraine

Clusters in Ukraine differ significantly from those in developed EU countries, particularly Germany, where they serve as an important tool of industrial development policies, act as drivers of overall economic growth, and have a substantial impact on the national economy. In Ukraine, clusters do not operate fully and cannot realize their full potential. In Europe, clusters are generally more mature, have a broader network of cooperation, and exert greater influence on the national economy than Ukrainian clusters. Although Ukrainian clusters show potential, they are still in the early stages of development and face a number of obstacles, primarily related to organization, coordination, government support, and financing. Despite the long-standing existence of the cluster movement, its growth in Ukraine has likely been more spontaneous. There are already around 65 clusters and cluster initiatives in Ukraine, but there is still no complete and detailed accounting of their presence, no agreed-upon quality assessment or verification criteria, and cluster development lacks dedicated government support. The country does not have responsible authorities or corresponding national policies or development programs. As a result, clusters contribute only minimally to the development of regional and national economies. The reasons for this are numerous and relate to a combination of legal, status-related, financial and economic, managerial, educational, cultural, and political factors.

Legal and status factors

The absence of a developed legal and regulatory framework for the creation and functioning of clusters in Ukraine's economy is a significant issue. This is largely due to insufficient theoretical approaches to understanding the concept of a cluster as a subject of economic and legal relations. Legislative uncertainty creates practical difficulties in applying the cluster concept. This is a foundational issue underlying many of the subsequent challenges.

Ukraine lacks a specific law defining the concept of a cluster, its types, and the rules for creating and operating clusters. Clusters in Ukraine are not a separate legal form and do not have a defined organizational-legal status in legislation. The term "cluster" is simply a general label for various models of cooperation among economic actors that have developed organically within the existing legal framework. They are established in one of the forms provided for by the Civil and Commercial Codes of Ukraine - such as an association of enterprises, a public union or organization, a cooperative (production or service), or an LLC (if joint economic activity with profit-sharing is required). Under Ukrainian law, clusters function as networks or associations of enterprises, businesses, educational or scientific institutions, government bodies, and other participants, organized under one of the existing legal forms and jointly developing a specific industry, sector, or region. The lack of a legal status "cluster" prevents the formation of a national cluster registry - a unified, systematized information database on existing and potential clusters - and the introduction of a cluster certification system, which has long existed in EU countries, including Germany.

Financial and economic factors

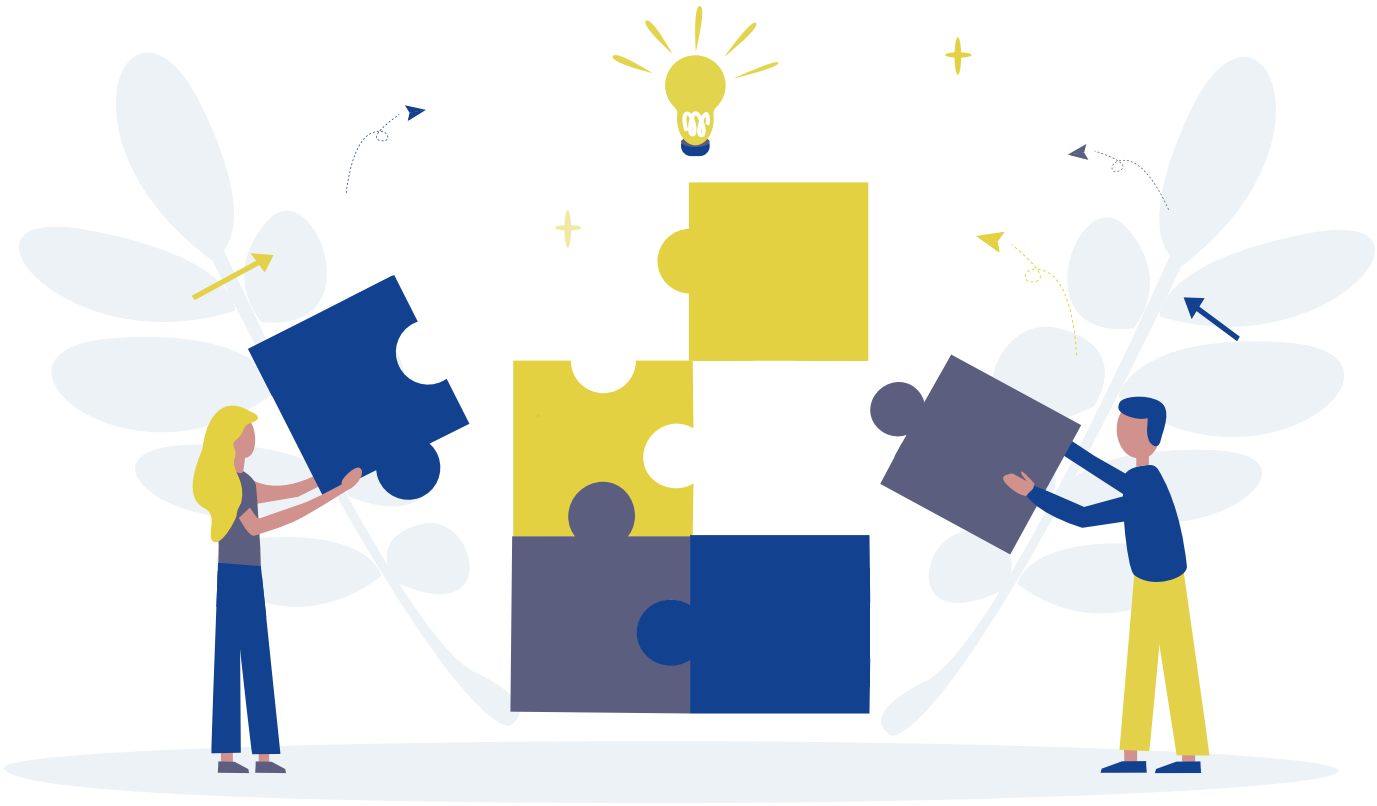
In Ukraine, there is no state support for clusters, and consequently no tax incentives. Clusters do not have access to credit resources due to the absence of guarantees and specialized programs for implementing joint projects among members. They often rely on membership fees, which are typically small because they come from institutions with limited financial capacity. In most cases, cluster activities in Ukraine have been supported by grants from international donors (USAID, GIZ, EU4Business, UNDP, etc.). War and economic challenges have almost completely restricted the possibility of long-term investments in cluster development. As a result, infrastructure typical for EU clusters - industrial parks, technoparks, innovation hubs, R&D centers and laboratories, business incubators - is virtually absent in Ukraine and exists mostly as idealized models.

Management and educational factors

Ukraine lacks systematic programs for training cluster management personnel, resulting in a shortage of professional managers skilled in cluster development and administration. There are insufficient specialists capable of ensuring sustainable partnership development, coordinating member activities, establishing international connections, and preparing joint commercial projects for groups of businesses or business-science collaborations at the cluster or regional level.

Mental factors

Mutual distrust between businesses, academia, and government, high individualism within companies, and reluctance to share information with potential competitors hinder cooperation for sustainable partnerships and joint projects. Participation in clusters is sometimes perceived as a "formality" rather than a tool for long-term development. Businesses, as a rule, are generally not inclined toward partnership or participation in cooperative strategies.



(c) Ekaterina Siubarova - stock.adobe.com

Political factors

Martial law, external and internal risks, political instability, limited budgets, changes in state programs, and high risks for foreign partners due to security concerns shift Ukraine's priorities away from clusters and amplify mental, managerial, and economic challenges.

Thus, Ukrainian clusters primarily operate as associations. Typically, a few companies pool their efforts to form a joint platform for cooperation. They may then invite other businesses, business associations, relevant NGOs, and universities to join. Clusters are most often registered as public unions or associations and only rarely as LLCs or cooperatives. Cluster management is carried out by a steering committee or a cluster manager who coordinates joint projects or organizes shared services. Participants pool resources for common tasks such as industry or regional marketing and promotion, specialized training, participation in exhibitions, market expansion, creation of joint services, advocacy for the industry, and sometimes collaborative research. Cluster activities are funded through membership fees and occasionally grants from international technical assistance programs, primarily from USAID previously, EU4Business, and GIZ.

5.2 A brief overview of the formation of Ukraine's legal framework regarding clusters

Clusters, as a more developed market form of cooperative movement - primitive forms of which existed even during the Soviet era—began to be actively discussed in Ukraine in the early 2000s. However, during this period, the state paid little attention to the issue, and clusters, as a tool for local economic development, developed mostly spontaneously and according to their own vision.

Legislative level

At the legislative level, clusters were first mentioned in 2012 in the Law of Ukraine dated 05.07.2012 No. 5067-VI "On Employment of the Population," which provided for the development of handicraft clusters. This reference did not define the concept of a cluster or the mechanism for its creation—it merely recognized clusters as an existing tool to be utilized.

Also in 2012, the Cabinet of Ministers of Ukraine Resolution "On the Approval of the State Program for the Development of Domestic Production" dated 12.09.2011 No. 1130 envisioned implementing measures to ensure effective cooperation based on clusters. The program's action plan included drafting proposals and improving the regulatory framework to stimulate innovation and support the functioning of innovative structures for cluster formation and development.

Regional development tool

In 2013, the creation of a network of maritime port clusters as an investment attraction tool was included in the Strategy for the Development of Ukraine's Maritime Ports until 2038 (Cabinet of Ministers of Ukraine Order dated 11.07.2013 No. 548-r). Cluster development as a tool to stimulate local economic growth was also included in the State Strategy for Regional Development until 2020 (Cabinet of Ministers of Ukraine Resolution dated 06.08.2014 No. 385). The development of specialized clusters, particularly energy clusters to enhance competitiveness, is part of the current State Strategy for Regional Development for 2020–2027 (Cabinet of Ministers of Ukraine Resolution dated 05.08.2020 No. 385). However, these are strategic documents without the force of law or binding regulatory acts.

SME development

The Concept of the National Program for the Development of Small and Medium Enterprises for 2014–2024 (Cabinet of Ministers of Ukraine Order dated 28.08.2013 No. 641-r) and the Concept of the National Targeted Economic Program for Industrial Development for 2014–2020 (Cabinet of Ministers of Ukraine Order dated 17.07.2013 No. 603-r) also envisaged the creation of scientific-innovation-production clusters and programs for integrating SMEs into national and international technological clusters. However, progress beyond these concepts and programs was minimal. Drafts of regulatory acts establishing the foundations of state policy on economic clustering - such as the "Concept for Creating Clusters in Ukraine" (Ministry of Economy, 2008) and the "National Strategy for Forming and Developing Cross-Border Clusters" (Ministry of Regional Development and Construction, 2009) - remained unapproved.

Industry 4 Ukraine

Despite this, the economic reality and the objective tendency of businesses to cooperate led to an increase in the number and strength of cluster associations starting in 2020. Within the framework of the Industry 4 Ukraine initiative[15], the cluster community developed the project "National Cluster Development Program until 2027." This was the first product created by the cluster community and is still under consideration by the Cabinet of Ministers of Ukraine. COVID-19, followed by the war, delayed government attention to this issue.

Ukrainian Cluster Alliance

In 2022, based on the Clusters 4 Ukraine initiative - which emerged from the cluster committee of the Industry 4 Ukraine platform for industrial and high-tech sectors - the "Ukrainian Cluster Alliance" (UCA) was established. It became the leading and largest formal association of the cluster movement. The Ukrainian Cluster Alliance, as the successor and continuer of Industry 4 Ukraine's development, arose from the expansion of cluster activities of the Association of Industrial Automation Enterprises of Ukraine during 2016–2022. It should be noted that in recent years, cluster communities have undergone significant transformation. Today, 48 clusters and cluster-type associations are members of the Ukrainian Cluster Alliance alone. Overall, their number has grown by 60%. The Ukrainian Cluster Alliance has prepared the White Paper "5 Roles of Clusters during the War," an internal "Roadmap for 2022–2023," a guide for clusters in the Industry 4.0 sector, as well as recommendations for the government, internal plans, and mechanisms for the functioning and support of clusters. The main goal of UCA is to focus on the institutionalization of cluster policy, international integration, leadership development, fundraising, and innovation initiatives within clusters.

It can be concluded that all previous efforts contributed to clusters beginning to develop independently despite existing circumstances. At the same time, at the national level, the process still lacks proper attention, and the potential impact of clustering on the country's economy remains limited. Ukraine still does not have a legislative framework for the creation and operation of clusters. Expert recommendations converge on the point that, for clusters to have a significant impact on the economy, this process must be guided. The priority measures include: 1) developing a legislative framework defining the concept of a cluster, its functions, and state support; 2) implementing financial and advisory support instruments for clusters; 3) adopting a "National Cluster Development Strategy" and developing an action plan; 4) establishing monitoring and evaluation mechanisms for clusters.

[15] https://www.industry4ukraine.net/

Overview of Clusters by Sector

According to the analytical document Cluster Ecosystem Analysis (Interreg Europe), as of January 2025, there are approximately 65 active clusters in Ukraine, encompassing around 3,000 participants (SMEs), with an average of about 30 companies per cluster.[16] Of these, approximately 37 clusters are active and associated members of the Ukrainian Cluster Alliance, representing over 55% of all clusters in Ukraine. The largest concentration of clusters is in Kyiv and Lviv, accounting for 33% of the total.

Clusters have been established in the following sectors: agro-industry, textiles and light industry, mechanical engineering and industrial design, IT and Digital & Cyber, defense and aerospace, healthcare and biotechnology, circular economy, woodworking and furniture, and the automotive sector.

Agriculture

The largest in terms of the number of businesses are agro-industrial clusters. There are six of them, located in Kyiv, Cherkasy, and Vinnytsia regions. The largest is Agrovin (Vinnytsia Agro-Industrial Cluster), which unites over 150 agro-companies and research institutions, with a focus on digital agriculture. Other notable clusters include the Association “U-Food” and the international agricultural cluster “Dnister”, among others

The largest industrial clusters in Ukraine include the mechanical engineering cluster “AgroBum”, the Lviv IT and Business Services Cluster, the Polissia Roknivshchyna Woodworking Cluster, the Poltava Eco-Friendly Baby Food Cluster, the Southern Gates of Ukraine Transport and Tourism Cluster, the “Suzirya” Tourism Cluster, the Oberig Eco-Agrotourism Cluster, as well as construction and textile clusters created by the Podillia Pershyi Association, among others.[17,18]

IT

The most dynamic clusters are in IT, operating in more than 22 cities across Ukraine. Leading IT clusters are located in Kyiv, Kharkiv, Lviv, Dnipro, and Odesa. These large cities offer strong infrastructure, educational institutions, and business ecosystems, creating ideal conditions for cluster development. Key examples include the Kharkiv IT Cluster with over 600 members, 60 partner universities, 35,000 students annually, and more than 1,000 instructors; the Lviv IT Cluster, which has united over 300 companies and 20,000 Ukrainian tech specialists in 10 years; as well as the Poltava IT Cluster and Vinnytsia IT Cluster. Most of these companies primarily operate on an outsourcing model for foreign clients.

Automotive

One of the emerging clusters is the Zakarpattia Automotive Cluster, developing since 2019 in close integration with global value chains. Other notable clusters include the Kyiv High-Tech Industrial Cluster, involving high-tech companies; the IAM Cluster (Engineering-Automation-Mechanical Engineering), active in Kyiv, Mykolaiv, Vinnytsia, Kharkiv, and Zaporizhzhia; and several national innovation clusters in Dnipropetrovsk region, such as “New Machines”, “Instrumentation”, and “Metallurgical Engineering”.

Other active clusters include: **the Furniture and Hospitality Cluster**, the Medical Equipment Manufacturers Cluster “ProMedVyr”, the Ukrainian Industrial Cluster, the Ukraine Thermal Energy Cluster, the Prykarpattia Industrial Cluster, the Podillia Fashion Cluster “Podilia Textile”, the Rivne Interregional Medical Cluster, the Lviv Medical Business Cluster, the Vinnytsia Instrumentation and Automation Cluster, the International Agrotourism Cluster “Dnister 1362”, and others.

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[16] https://www.interregeurope.eu/sites/default/files/2025-02/Ukrainian%20Cluster%20Ecosystem%20Analysis.pdf

[17] https://clusteratlas.org.ua/uk?utm

[18] https://www.clusters.org.ua/clusters-map

6

Innovation, Research & Development (R&D)

6.1 Role of universities and research institutes in regional economic development

Universities and research institutions in Ukraine strive to function not only as educational centers but also as scientific hubs and local drivers of economic development. Through education, innovation, and various partnerships, they aim to participate in regional development processes and directly influence the competitiveness of their territories. Many universities align closely with the specific economic profile of their region. For example, IT technologies are primarily associated with universities in Lviv, Kharkiv, and Kyiv; energy with Ivano-Frankivsk and Kyiv; maritime logistics with Odesa and Mykolaiv; and mechanical engineering with Dnipro and Kharkiv.

Universities in Ukraine are flexible in implementing new educational programs and often create specializations tailored to regional economic needs - for instance, energy programs are more concentrated in the western regions, agricultural programs in the central regions, and maritime logistics in the south. In terms of participation in European and international programs, Ukrainian universities are most actively involved in Horizon Europe, Erasmus+, and grant-funded research and regional projects through the COST program.

Figure 12 Activities of Universities and Research Centers in Regional Development in Ukraine

Region/city	University/Institute	Example of practical impact on the economy
Kyiv	KPI named after I. Sikorsky	Scientific Park “Kyiv Polytechnic Institute” – startups in IT, energy, and defense technologies; collaboration with Unit.City.
	Taras Shevchenko National University of Kyiv (KNU)	Economic and sociological research for the government and local authorities; training personnel for public administration and business.
Lviv	National University “Lviv Polytechnic”	Tech StartUp School, IT developments; Lviv IT Cluster – a consortium of universities and companies shaping the region’s IT economy.
	Ivan Franko National University of Lviv	Analytics for tourism development, cultural industries, business education for SMEs.
Kharkiv	Kharkiv National University of Radio Electronics (KhNURE)	Joint IT and telecom developments with businesses; training personnel for Kharkiv IT Cluster.
	National Technical University “Kharkiv Polytechnic Institute” (NTU “KhPI”)	Engineering startups; research centers in mechanical engineering and materials science.
Odesa	Odesa National Maritime University	Research in logistics, port infrastructure, and international transport corridors.
	I. Mechnikov Odesa National University (ONU)	Socio-economic research for regional development; environmental programs for the Black Sea basin.
Dnipro	O. Honchar Dnipro National University	Scientific developments for the aerospace industry; collaboration with Pivdenmash.
	Dnipro Polytechnic	Innovations in mining and energy sectors; applied research for industrial companies.
Ivano-Frankivsk	Vasyl Stefanyk Precarpathian National University	Entrepreneurship support centers; research in tourism and green energy.
	Ivano-Frankivsk National Technical University of Oil and Gas (IFNTUNG)	Developments in energy and extraction; creation of innovative projects in renewable energy.
Chernivtsi	Chernivtsi National University named after Y. Fedkovych	Projects in tourism and cultural heritage; support for cross-border cooperation with Romania and Moldova.
Kherson, Mykolaiv	P. Mohyla Black Sea National University (Mykolaiv)	Innovative research in shipbuilding and IT.
	Kherson State University	Scientific and practical research in agricultural economics, water management, and ecology.

Science Parks

The most prominent science parks established by universities include the Science Park of Kyiv Polytechnic Institute, Tech StartUp School at Lviv Polytechnic, and the UNIT.City Innovation Park in Kyiv. Universities in Ukraine foster entrepreneurship and collaboration with business and government. Many universities run acceleration programs for students and young researchers, as well as business incubators (e.g., in Kharkiv, Dnipro, Lviv, Ivano-Frankivsk), establish joint laboratories with businesses (for instance, in the IT sector in Lviv), and provide expert consultations for local authorities and strategic development assessments for communities.

In cities such as Lviv, Kharkiv, Kyiv, Dnipro, and Ivano-Frankivsk, universities serve as key economic centers, contributing significantly to the local economy through educational services, housing rentals, cultural events, and IT startups.

Proximity to EU-level research and education

It is believed that Ukrainian universities are practically on par with European ones in terms of training IT specialists (Lviv, Kyiv, Kharkiv), the fuel and energy sector (Ivano-Frankivsk), and their graduates hold competitive positions in Europe. The traditional Soviet school of fundamental sciences has preserved the academic potential for teaching mathematics, physics, and cybernetics. Universities in Ivano-Frankivsk, Chernivtsi, and Odesa participate in cross-border programs with Poland, Romania, Slovakia, and other European countries, thereby ensuring regional integration with Europe. During the war, universities quickly adapted to the needs of regional economies (courses for displaced persons, retraining of personnel) and switched to online learning.

However, Ukrainian universities also have a significant lag compared to European ones. This gap is particularly evident in the areas of science funding, commercialization of results, and development of innovation infrastructure.

Many issues are related to funding for science and education. Ukrainian universities, due to limited state orders, receive less than 0.5% of GDP, whereas European universities receive about 2–3% of GDP for R&D and are actively funded through Horizon Europe, as well as national and regional funds.

Tech and knowledge transfer

European universities have well-developed technology transfer offices, patent portfolios, and startup ecosystems within universities; in Ukraine, most universities are limited to publications, and only KPI, Lviv Polytechnic, and IFNTUNG have a narrow window of opportunity to replicate EU experience in specific niches. In Europe, there are hundreds of university tech parks, incubators, and spin-offs integrated into the urban economy, whereas in Ukraine, these are isolated cases (UNIT. City, Tech StartUp School).

Ukrainian universities lack applied and interdisciplinary programs, such as green tech, biomedicine, or AI. They are unable to commercialize their developments or fulfill applied orders for businesses, and businesses are accustomed to purchasing ready-made technologies abroad. Even highly skilled specialists trained in Ukraine usually work on outsourcing for foreign companies and are rarely in demand for the needs of Ukrainian industry.

6.2 Statistics: R&D expenditures, participation in Horizon Europe

Ukraine's gross domestic expenditure on R&D (GERD) remains critically low compared to European standards. In 2023, it was estimated at only 0.23-0.33% of GDP, while the EU average reached 2.22%. This creates a gap of almost tenfold between Ukraine and its European peers, limiting the country's capacity to generate breakthrough research and innovation. The structure of R&D expenditures is also problematic: business investment in research (BERD) is minimal, while cooperation between research institutions and industry remains weak. Indicators such as business R&D intensity and public–private co-publications consistently place Ukraine among the lowest performers in Europe.

Fiscal constraints and brain drain

The war has further aggravated this situation. Fiscal constraints and the prioritisation of defence spending have squeezed budgets for civilian research. At least 10% of Ukrainian researchers had left the country by the end of 2022, with some estimates closer to 20%. At the same time, infrastructure has suffered heavily: 1,443 buildings belonging to 177 research institutions were damaged, with total recovery needs estimated at more than $1.2 billion. This combination of human capital flight and destroyed facilities undermines the ability of Ukrainian science to maintain continuity and to link research with industrial applications.

Large-scale structural impact and access to EU funding

These structural weaknesses have direct consequences. Without a stronger role for business in R&D, Ukraine risks falling further behind in patents, deep-tech startups, and technology exports. The large gap with EU standards also limits the country's ability to participate effectively in Horizon Europe consortia, often relegating Ukrainian institutions to junior roles rather than leadership positions. There is also the risk of remaining locked into a service model economy, dependent on outsourcing rather than building proprietary intellectual property.

Policy action is therefore urgent. In the short term (6–24 months), Ukraine needs to create strong incentives for business R&D, such as an R&D super-deduction of 150–200% for SMEs and exporters, matched grants that combine state and private funding for projects at higher technology readiness levels, and the launch of pre-commercial and innovation-oriented procurement in infrastructure, health, and energy sectors. At the same time, it is vital to restore research capacity and retain talent. A dedicated "Lab Recovery Fund" could provide rapid-response grants for damaged laboratories, while diaspora vouchers and return fellowships could reconnect Ukrainian researchers abroad with their home institutions and offer competitive conditions for specialists to return.

Research-to-market pipeline

Building a proper research-to-market pipeline is equally important. Proof-of-concept and pilot grants should be introduced with clear technology readiness level requirements, accompanied by reforms of university IP policies and the inclusion of tech-transfer KPIs in state financing. Such measures would ensure that publicly funded research translates into spin-offs, licensing deals, and industrial applications.

Closer alignment with the European Union offers significant leverage. Co-financing national support lines for Horizon Europe and Digital Europe projects would reduce the entry barriers for Ukrainian institutions and SMEs. European Digital Innovation Hubs could act as gateways to guide companies and research teams through funding calls and international consortia.

Horizon Europe

Closer alignment with the European Union offers significant leverage. Association with Horizon Europe, the EU's flagship research and innovation program, allows Ukrainian universities, research institutions, SMEs, startups, and NGOs to participate on equal terms with EU member states. Ukrainian entities are eligible for direct EU grants covering research, innovation, digitalization, green transition, and societal challenges. By early 2024, more than 500 Ukrainian organisations had applied to Horizon Europe calls, securing over €25 million in signed projects. Priority areas include energy efficiency, digitalization, climate adaptation, health, and security-related research.

Horizon Europe participation directly complements domestic weaknesses in R&D. It offers Ukrainian organisations access to stable financing, international networks, and capacity-building opportunities that would otherwise be out of reach. It also helps Ukrainian actors integrate into the European Research Area and align with EU standards in research quality, data management, and innovation ecosystems. Synergies with other EU programs, such as Digital Europe, Erasmus+, and EU4Health, further multiply the impact and provide additional entry points for Ukrainian institutions.

Future efforts

By 2027, Ukraine should aim to raise GERD to 0.6-0.8% of GDP, with at least 40% of the increase coming from business R&D. Ambitious but realistic targets would include 150 project applications per year to Horizon Europe and Digital Europe with at least 30 successful grants, 200 public tenders using pre-commercial procurement in critical sectors, the return of at least 1,000 researchers annually, and the restoration of no fewer than 50 laboratories.

These reforms are not without risks. Fiscal pressure may limit the scope of new incentives, misuse of R&D tax deductions is possible, and talent shortages could persist. However, phased implementation of incentives, selective audits, and fast-track re-entry schemes for researchers can mitigate these risks. Strengthening R&D is not only about closing the gap with EU averages, it is about securing Ukraine's competitiveness, supporting its recovery, and laying the foundations for full integration into the European Research Area.

7

National Innovation Priorities and Support Infrastructure

7.1 Key support institutions

Ukraine has numerous bodies responsible for implementing innovations across various sectors. Although there is no single authority overseeing all innovation-related matters, multiple institutions are in charge of implementing innovation policies in their respective domains, and a certain degree of systematization does exist in this regard.

Innovation Development Council

First and foremost, the highest body in the innovation governance structure is the Innovation Development Council. It is the key advisory body to the Cabinet of Ministers of Ukraine, established to foster innovation and serve as a platform for collaboration among government entities, businesses, and the scientific community, aiming to create favorable conditions for innovative development. Its members include ministers from the Ministries of Economy, Digital Transformation, Education and Science, Finance, the Cabinet of Ministers and some of their deputies; representatives of relevant committees of the Verkhovna Rada; as well as experts in innovation, business, investment, science, and digital transformation.

Ministries

When looking into sectoral governance, ministries play a key role. More specifically, these ministries include units responsible for implementing innovations at different levels. The main ones are headed by Deputy Prime Ministers and report directly to the Cabinet of Ministers of Ukraine.

- One of the key actors in the field of innovation is Mykhailo Fedorov, **Deputy Prime Minister of Ukraine** for **Innovations, Education, Science, and Technology Development — and Minister of Digital Transformation of Ukraine**. Regarding the Ministry of Digital Transformation of Ukraine, its structure includes the Ukrainian Startup Fund — a state institution/initiative that supports tech startups and innovative projects by helping them attract early-stage funding and launch their developments. It provides grants for early-stage startups and innovation vouchers for developing products and solutions. Also under the direct authority of the Ministry are CDTOs (Chief Digital Transformation Officers) — managers of digital transformation and innovations development within the powers of their authorities (at the national, regional, or local level). As of April 2025, there are 61 CDTOs in Ukraine: 17 in ministries, 29 in central executive bodies, and 15 in regional military administrations.
- Several other ministries are also under the supervision of the Deputy Prime Minister in this area. For instance, the **Ministry for Strategic Industries of Ukraine** is responsible for formulating and implementing state policy in sectors of strategic importance to the country's economy, including the innovation development of these sectors, through the State Finance Institution for Innovations (SFII). This is a state institution, which provides financial support for the innovation activity in the form of loans, investments, and grants for tech start-ups and enterprises.
- The **Ministry of Education and Science of Ukraine** is also part of this list and has two bodies responsible for implementing innovation policy in its sector. The Science and Innovation Directorate is a unit within the Ministry, which fosters development of innovation activity and integration of the scientific research into the real sector of the economy. The National Research Foundation of Ukraine (NRFU) is a state-funded institution that finances scientific research and innovation projects on a competitive basis. In particular, this body plays an important role in integrating the Ukrainian research community into the global scientific landscape. Some NRFU competitions are financed by international partners. Moreover, the Foundation hosts the Horizon Europe Office in Ukraine.
- Another institution under the authority of the **Deputy Prime Minister for Innovations is the Ministry of Agrarian Policy and Food of Ukraine**. Although it currently does not have a dedicated body responsible for innovation policy in the agro-industrial sector, it carries this function and is the main body within the system of central executive authorities in this domain.
- The **Ministry of Economy of Ukraine**, headed by Yuliia Svyrydenko, First Deputy Prime Minister of Ukraine, also plays a significant role in innovation policy implementation. It has three relevant departments: the Department of Intellectual Property and Innovations, the Department of Industrial Parks and Investment Support, and the Department of Development of the Real Sector of Economy.
- The **Department of Intellectual Property and Innovations** promotes innovation, attracts investment, and ensures robust intellectual property (IP) protection as a means to create an environment conducive to economic growth.
- The **Department of Industrial Parks and Investment Support** develops industrial infrastructure to attract investment and stimulate innovation and economic development.
- The **Department of Development of the Real Sector of Economy** plays a supportive role by ensuring that innovation policies lead to measurable industrial modernization, technological renewal, and economic productivity across key sectors in Ukraine.
- At a lower level, the **Entrepreneurship and Export Promotion Office (EEPO)** operates as a state institution. It serves as a crucial link between innovation policy and market integration, ensuring that innovations lead not only to local development but also to global competitiveness and economic resilience.

- The **Ukrainian National Office for Intellectual Property and Innovations (UANIPIO)** also operates within the Ministry. It is a state body responsible for managing and protecting intellectual property rights and plays a key role in supporting innovations and aligning Ukraine's IP system with international standards. Subordinate to it is the National IP & Innovations Hub — an initiative of UANIPIO created to advise stakeholders on opportunities and resources for innovation development.
- Some role in innovation development is also played by the **Ministry for Communities and Territories Development of Ukraine**, headed by Oleksii Kuleba, Deputy Prime Minister for Ukraine's Recovery. Under the Ministry is the State Agency for Reconstruction and Infrastructure Development of Ukraine, a unit that conducts research and develops science and innovation policy in areas under the Agency's responsibility.

National Bank

Additionally, several other bodies also partially contribute to innovation implementation within their respective fields of competence. For example, the National Bank of Ukraine is a key institution among central executive authorities responsible for guiding technological and innovation development in the financial services market.

Moreover, the State Service of Ukraine for Food Safety and Consumer Protection takes part in implementing policy in the fields of science, technology, and innovation by introducing scientific and technical advancements and best practices in veterinary medicine, plant quarantine and protection, disease prevention, environmental protection, and other defined areas.

7.2 Innovation priorities

Digitalization

Digitalization in Ukraine is particularly important for providing high-quality medical, educational, social, administrative, and other public services, ensuring access to mobile networks and fixed internet—especially relevant in the context of the war—as well as improving cybersecurity and the functioning of critical infrastructure overall.

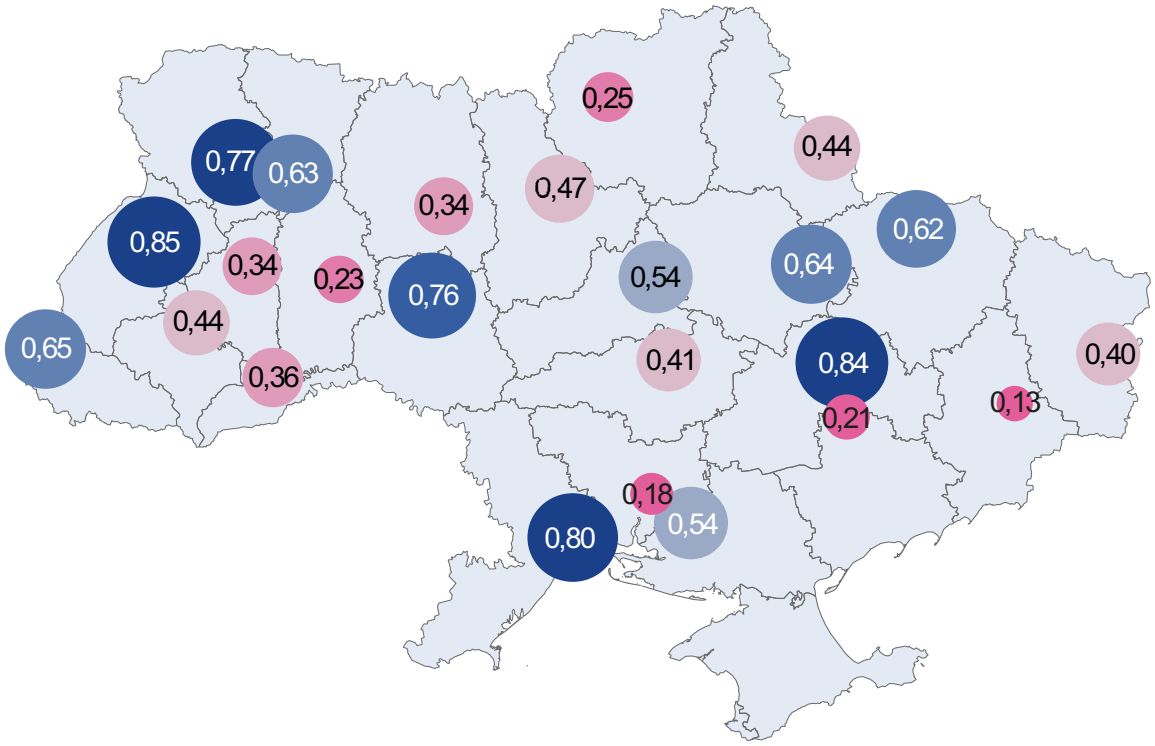
Digitalization of the regions is a key component of Ukraine's transformation. In 2022, the Ministry of Digital Transformation of Ukraine developed and publicly presented the **Regional Digital Transformation Index (RDTI)**. The Index is a tool for measuring the processes of informatization and digitalization in Ukraine's regions, assessing the level of digital literacy among citizens, and enabling the evaluation of local authorities' capacity to make digital decisions.

Regional Digital Transformation Index

The Regional Digital Transformation Index includes several sub-indices: **Institutional Capacity**: digital transformation strategy of the region, regional informatization program, digital transformation unit, auxiliary organizations outside the regional state administration (RSA) staff; **Internet Development**: internet connection for shelters and WiFi access organization, facilitation of infrastructure access; **Development of CNAP (Administrative Service Centers)**: establishment of CNAPs, number of services in CNAPs, quality of services, automation of CNAPs, staff training, accessibility, and modernization; **Implementation of "Paperless" Mode**: e-document flow, Diia.QR/sharing/API validation, digitization of registries within the RSA; **Digital Education**: engagement of the population in digital skills programs, e-journals in secondary education institutions; **Regional "Business Card"**: RSA website, geographic information system, Diia.Business; **Penetration of Basic e-Services**: eBaby, inventory of real estate objects, implementation of a unified social services information system; **Sectoral Digital Transformation**: information security, cybersecurity policy, healthcare, civil protection, e-democracy.[19]

[19] In 2023, the Index was supplemented with additional indicators that consider: provision of administrative services, healthcare, civil safety, and accessibility. The report on this research is available at the following link: https://thedigital.gov.ua/storage/uploads/files/page/community/reports/Індекс-цифрової-трансформації-регіонів-України-2023.pdf. In 2024, the Index was supplemented with a sub-index on individual regional projects. The report on the Regional Digital Transformation Index for 2024 is available at the following link: https://thedigital.gov.ua/storage/uploads/files/page/community/reports/%D0%86%D0%9D%D0%94%D0%95%D0%9A%D0%A1%202024%202%201.pdf

Figure 13 Map of Ukraine's Digital Transformation Indices by Region, 2024



Scores

In 2023, the average Digital Transformation Index score was 0.632 out of a possible 1. According to the 2024 study, the average Digital Transformation Index decreased to 0.497 out of 1. (However, this decline was not so much due to a deterioration of the situation but rather because an additional subindex — individual regional projects — was introduced.) The highest scores were observed in the subindices "Penetration of Basic e-Services" (0.759), "Institutional Capacity" (0.687), and "Internet Development" (0.686). The lowest score was in the subindex "Implementation of the Paperless Mode" (0.421).

Figure 14 Digital Transformation Indices by Region, 2024 and 2023

Region name	Index value (max 1 point)		Region name	Index value (max 1 point)	
	2024	2023		2024	2023
Lviv	0,85	0,891	Ivano–Frankivsk	0,436	0,685
Dnipropetrovsk	0,844	0,908	Sumy	0,435	0,178
Odesa	0,804	0,785	Kirovohrad	0,407	0,531
Vinnytsya	0,755	0,777	Luhansk*	0,404	0,404
Volyn	0,771	0,831	Chernihiv	0,362	0,553
Zakarpattya	0,647	0,732	Zhytomyr	0,343	0,56
Poltava	0,64	0,833	Ternopil	0,341	0,827
Rivne	0,632	0,727	Chernivtsi	0,254	0,546
Kharkiv	0,617	0,787	Khmelnytskiy	0,23	0,62
Kherson	0,582	0,316	Zaporizhzhya	0,209	0,289
Cherkasy	0,538	0,672	Mykolayiv	0,18	0,441
Kyiv	0,474	0,684	Donetsk*	0,129	0,359

* The Digital Transformation Index for Luhansk and Donetsk Oblast is indicated as of February 22, 2024.

Index and life conditions

The index covers the assessment of key areas of life. In conditions of power outages and blackouts caused by massive enemy missile strikes on energy infrastructure, one of the tasks of local executive authorities and local self-government bodies is to connect front offices or waiting areas in social infrastructure facilities to high-speed internet and organize Wi-Fi access to ensure residents have stable internet connectivity.

To ensure the provision of quality administrative services in territorial communities, networks of administrative service centers, remote workplaces, mobile administrators, connection to backup power, and barrier-free access to services are being developed under martial law conditions.

Digital public services

Thanks to the implementation of electronic document management and the system of electronic interaction between executive authorities, digitization of registries, and the creation and use of electronic documents in the Diia application, the “paperless mode” operates. This has ensured transparency in the activities of state authorities and local self-government and improved the quality of public service delivery.

The Diia.Education platform was launched — the first large-scale project in Ukraine aimed at increasing the digital literacy of Ukrainians, acquiring new professions, enhancing skills, and more.

Continuous improvement of digital public services enhances the quality of services for citizens and ensures accessibility anywhere in Ukraine and globally. A good example is the implementation of electronic case management in social protection authorities, which allows residents to submit online applications for social services and track the status of their requests.

Region’s Business Card

The subindex “Region’s Business Card” allows for assessing the region’s attractiveness, as well as the creation of information systems for presenting and visualizing data, including the activities of Diia.Business Support Centers.

Individual regional projects are also reflected in the index and can quickly scale thanks to digitalization. Some examples of such projects include: implementation of the Cisco Umbrella DNS cloud service (Vinnytsia, Volyn, Zakarpattia, Ivano-Frankivsk, Lviv, Poltava, Rivne, Kharkiv, Kherson, Cherkasy regions), air quality monitoring (Volyn, Dnipropetrovsk, Zhytomyr, Ivano-Frankivsk, Lviv, Odesa, Rivne regions), training centers for UAV operators (Zakarpattia, Kirovohrad, Cherkasy, Vinnytsia, Poltava, Kyiv regions), etc.

Women in the IT sector

Women play an increasingly important role in Ukraine's IT sector, though they are still underrepresented in many areas. Over the past decade, the number of women working in IT has **tripled**, and today they make up roughly a **quarter of the industry's workforce**.[20] Their presence is particularly strong in roles such as project management, quality assurance, product management, design, and analytics, where communication and organizational skills are highly valued. However, women remain a small minority in highly technical fields such as software engineering, DevOps, and cybersecurity, with only around **9% of developers being female**.[21]

At the leadership level, women are making visible strides. In recent years, there has been significant growth in the number of female directors and entrepreneurs in the technology sector, with women founding startups or taking on executive positions. For example, the share of female directors in new companies has grown by nearly **70% year-on-year**.[22] This development has become even more pronounced since the start of the war in 2022, as women have stepped in to fill gaps in the workforce, driven innovation, and kept companies resilient despite displacement and uncertainty. Ukrainian women have also established professional networks and communities such as **WTech**, which provide mentoring, training, and support both inside Ukraine and across the diaspora.[23]

Still, challenges persist. Gender stereotypes continue to shape career choices, with traditional expectations often steering women away from highly technical paths. The **gender pay gap** remains, and women are less likely to progress from junior to senior positions in technical specializations.[24] War and displacement have introduced additional barriers, including cultural and language difficulties, limited access to local networks, and difficulties balancing work with caregiving responsibilities.[25]

Despite these obstacles, the contribution of women to Ukraine's IT sector is increasingly significant. As one of the country's most important export-oriented industries, technology relies on diverse talent to remain innovative and resilient. With many men mobilized or displaced, women's involvement not only sustains business continuity but also shapes the sector's future direction. Expanding opportunities for women in IT—through education in STEM fields, mentorship, workplace policies that support work–life balance, and active measures to close pay and promotion gaps—will be vital for Ukraine's long-term recovery and global competitiveness.

(c) Ekaterina Siubarova - stock.adobe.com

[20] https://open4business.com.ua/en/share-of-women-in-ukrainian-it-has-tripled-in-10-years-globallogic/?utm_source=chatgpt.com
[21] https://beetroot.co/women-in-tech/women-in-technology-insights-from-ukraine-bulgaria-and-poland/?utm_source=chatgpt.com
[22] https://english.nv.ua/business/women-reshape-ukraine-s-economy-leading-a-third-of-new-companies-50495931.html
[23] https://therecursive.com/ukraine-s-special-force-women-in-tech-helping-the-industry-stay-resilient/?utm_source=chatgpt.com
[24] https://ukraine.unwomen.org/en/shcho-my-robymo/ekonomichne-posylennya-zhinok?utm_source=chatgpt.com
[25] https://www.intelligentcio.com/eu/2025/02/27/ukrainian-women-in-exile-remain-ambitious-despite-tech-industry-struggles/?utm_source=chatgpt.com

8

Potential Areas of Cooperation by Regions

8.1 Identified priority sectors (background: Smart Specialization)

Smart Specialisation Strategies ensures that public and private resources are concentrated on sectors where regions or countries can achieve global or European excellence, promoting evidence-based, innovation-driven development.

Smart Specialization (S3)

Smart specialization (S3) is a strategic approach developed by the European Commission Joint Research Centre (JRC) in 2014 and tested in the EU member countries and some candidate countries during the Multi-national Financial Framework 2014-2020, 2021-2027. The approach is a guided regional development and innovation investment. Its main goal is to maximize the economic impact of limited resources by focusing on sectors and technologies where a region has unique strengths, competitive advantages, and innovation potential. Unlike traditional sectoral policies, S3 emphasizes evidence-based and place-based approach of priority setting, stakeholder engagement, and innovation-driven growth.

S3 methodology

The methodology combines quantitative analysis of regional assets, such as R&D capacity, industrial clusters, and human capital, with qualitative insights gained through the Entrepreneurial Discovery Process (EDP). This participatory approach engages businesses, universities, research institutions, and government agencies to identify priority domains where innovation can thrive and create long-term economic impact.

Ukraine is developing S3 on the regional level. The key steps in the S3 methodology, approved by the Ministry of Economy, Environment and Agriculture of Ukraine in 2024 are:

1. Regional asset mapping of existing economic strengths of each region, business concentration, technological capabilities, and knowledge bases, potential sectors are identified and discussed with stakeholders;
2. Stakeholder engagement (Entrepreneurial Discovery Process) implies collaboratively discovery of the niche opportunities and validation of strategic priorities (concrete projects) by stakeholders from regional and local authorities, industry, academia, and civil society from each Ukrainian region;
3. Defined targeted economic domains, setting objectives, and alignment of investment priorities with available funding, including EU and national resources represents the strategy elaboration;
4. Implementation of the S3 is innovation-driven, it promotes R&D, innovation clusters, startups, and human capital development in priority domains selected by regions;
5. Monitoring and adaptation is done regularly to continuously track performance indicators and adjust strategies as markets and technologies evolve, qualitative and quantitative indicators are planned in each S3.

Example: Serbia

Short results of Serbia as a candidate country, which adopted a national-level smart specialization strategy to strengthen its innovation ecosystem and industrial competitiveness. Priority sectors included advanced manufacturing, ICT, agrifood technologies, and automotive components. Over €150 million Serbia attracted for S3 projects in 2014–2020 programming period, including national co-financing. Key instruments included EU IPA II and Horizon 2020 projects, supporting research infrastructure, cluster development, and SMEs. The main results: strengthened 5 innovation clusters at the national level, enabled 50+ high-tech SMEs to scale operations, increased international collaboration and R&D output in targeted sectors.

Cross-regional opportunities

For Ukraine, S3 provides a structured framework to identify and prioritize economic domains across regions, supporting smart allocation of resources, attracting investment, and fostering innovation-led growth. By applying S3, each region can focus on areas where it has comparative advantages, enabling more efficient and effective regional development policies. Implementing S3 in Ukrainian regions will focus innovation investment on sectors with the highest comparative advantage, attracting EU, national and regional funds and private investment while fostering economic growth and competitiveness.

8.2 Regional segmentation with justification for project relevance

Region	Regional Development Strategy	NACE codes
Vinnytsia Region	Modernization of transport and logistics infrastructure, considering internal, interregional, and international connections; Development of the treatment and wellness industry (medical tourism); Development of the agro-industrial sector.	(10.3) Processing and preserving of fruit and vegetables; (10.4) Manufacture of vegetable and animal oils and fats; (10.5) Manufacture of dairy products; (10.8) Manufacture of other food products.
Volyn Region		(10.3) Processing and preserving of fruit and vegetables; (10.7) Manufacture of bakery and flour-based products; (13.9) Manufacture of other textiles; (14.1) Manufacture of wearing apparel, except fur apparel; (16.1) Sawmilling and planing of wood.
Dnipropetrovsk Region	Development of the chemical complex potential; improvement of conditions for the development of the IT sector; improvement of conditions for the development of high-tech manufacturing, in particular mechanical engineering.	(7.1) Mining of iron ores; (10.9) Manufacture of prepared animal feeds; (24.1) Manufacture of pig iron, steel and ferro-alloys; (24.2) Manufacture of steel tubes, pipes, hollow profiles, and related fittings; (32.5) Manufacture of medical and dental instruments and supplies; (33.2) Installation of industrial machinery and equipment; (35.2) Manufacture of gas; distribution of gaseous fuels through mains.
Zhytomyr Region	Organic crop and livestock production, and manufacture of organic food products.	(10.5) Manufacture of dairy products; (10.7) Manufacture of bakery and flour-based products; (11) Manufacture of beverages; (13.9) Manufacture of other textiles; (16.2) Manufacture of products of wood, cork, straw, and plaiting materials; (21) Manufacture of basic pharmaceutical products and pharmaceutical preparations; (23.6) Manufacture of articles of concrete, plaster and cement; (25.1) Manufacture of structural metal products.
Zakarpattia Region	Support for innovative research and technologies in industry based on the “education-science-production” chain and a cluster approach; Development of regional innovation infrastructure; Support for the creation of unique innovative tourism and recreation products.	Sawmilling and planing of wood Manufacture of basic chemicals Manufacture of rubber and plastics products Manufacture of domestic appliances Manufacture of other products

Region	Regional Development Strategy	NACE codes
Zaporizhzhia Region	Manufacture of endoprostheses from molybdenum and titanium alloys; Manufacture of electrical equipment; Manufacture of machinery and equipment for agriculture and forestry; Manufacture of engines and spare parts for helicopters	(10.8) Manufacture of other food products; (19) Manufacture of coke and refined petroleum products; (20.5) Manufacture of other chemical products; (23.2) Manufacture of refractory products; (24.1) Manufacture of pig iron, steel, and ferro-alloys; (24.5) Casting of metals; (26.5) Manufacture of instruments and appliances for measuring, testing, and navigation; manufacture of watches and clocks; (27.3) Manufacture of wiring devices, cables, and electrical fittings; (28.3) Manufacture of machinery for agriculture and forestry; (30.3) Manufacture of air and spacecraft and related machinery.
Ivano-Frankivsk Region	Woodworking industry; chemical industry; agro-industrial complex; creative industries.	(13.9) Manufacture of other textiles; (16.2) Manufacture of products of wood, cork, straw, and plaiting materials; (20.1) Manufacture of basic chemicals, fertilizers, nitrogen compounds, plastics, and synthetic rubber in primary forms; (23.5) Manufacture of lime and gypsum mixtures.
Kyiv Region	Production of innovative food products with improved consumer qualities (functional food); development of energy-efficient solutions based on alternative energy sources; innovative products for construction, design, and household; bioactive substances and pharmaceuticals for human health.	(10.1) Manufacture of meat and meat products; (10.7) Manufacture of bakery and flour-based products; (17) Manufacture of paper and paper products; (20.5) Manufacture of other chemical products; (22.1) Manufacture of rubber products; (23.1) Manufacture of glass and glass products; (23.6) Manufacture of articles of concrete, plaster and cement; (35) Supply of electricity, gas, steam, and air conditioning.
City of Kyiv	IT and communications; pharmaceuticals and medical technologies; logistics center; commercial trading; engineering and precision mechanical engineering; culture and tourism.	(10.4) Manufacture of vegetable and animal oils and fats; (21.2) Manufacture of pharmaceutical preparations; (25.4) Manufacture of weapons and ammunition; (11) Manufacture of beverages; (25.6) Treatment and coating of metals; mechanical engineering; (27.1) Manufacture of electric motors, generators, transformers, distribution and control apparatus.
Kirovohrad Region	Agricultural machinery manufacturing; agro-industrial complex (oil production).	(10.4) Manufacture of vegetable and animal oils and fats; (14.1) Manufacture of wearing apparel, except fur apparel; (23.7) Cutting, shaping, and finishing of ornamental and building stone; (28.1) Manufacture of general-purpose machinery; (28.3) Manufacture of machinery for agriculture and forestry; (31) Manufacture of furniture; (36) Water collection, treatment, and supply.

Region	Regional Development Strategy	NACE codes
Lviv Region	High value-added industries (mechanical engineering and instrument-making; textile industry; pharmaceutical industry; food industry); bioeconomy (woodworking and furniture industry; printing; food industry; organic agriculture; bioenergy; biotechnology); creative industries.	(10.1) Manufacture of meat and meat products; (10.7) Manufacture of bakery and flour-based products; (10.8) Manufacture of other food products; (17.2) Manufacture of paper and cardboard products; (20.5) Manufacture of other chemical products; (23.5) Manufacture of lime and gypsum mixtures; (29.3) Manufacture of parts and accessories for motor vehicles; (31) Manufacture of furniture.
Mykolaiv Region	Processing and preserving of fruit and vegetables Manufacture of dairy products Manufacture of general-purpose machinery and equipment Repair and maintenance of fabricated metal products, machinery, and equipment Collection, treatment, and supply of water	(10.3) Processing and preserving of fruit and vegetables; (10.5) Manufacture of dairy products; (10.8) Manufacture of other food products; (28.1) Manufacture of general-purpose machinery; (32) Manufacture of other products.
Odesa Region	Innovation in export-oriented food industry	(10.3) Processing and preserving of fruit and vegetables; (20.1) Manufacture of basic chemicals, fertilizers, nitrogen compounds, plastics, and synthetic rubber in primary forms; (27.3) Manufacture of wiring devices, cables, and electrical fittings; (28.3) Manufacture of machinery for agriculture and forestry; (32.5) Manufacture of medical and dental instruments and supplies.

Horizontal focus: IT

The qualitative analysis conducted across Ukrainian regions has identified the IT sector as a cross-cutting, horizontal priority applicable to all regions. Since 2022, dual-use technologies and drone production have begun to develop rapidly across the country, emerging as high-potential domains for innovation, investment, and regional economic growth.

The regions, which are partially occupied should be mentioned. Till February 2022 Donetsk and Luhansk regions were actively holding the EDP and were ready to present their S3 in May 2022. The following funding priorities should be taken into consideration as soon as the **security situation** allows:

Region	Status quo	Funding Considerations
Donetsk	Large parts of the region are under active war; industrial base damaged; limited private investment	Funding could be directed to reconstruction, cluster redevelopment, and research for resilient industrial systems; short-term private investment limited
Luhansk	Most of the region is frontline; significant infrastructure damage	EU funds could support post-war recovery, modernization, and displaced R&D capacity
Zaporizhzhia	Southern areas affected by hostilities; some industrial zones remain operational	Funding should focus on resilient industrial infrastructure and green energy projects
Kherson	Occupied areas and active frontline restrict immediate business activity	Potential funding contingent on stabilization, reconstruction, and resumption of economic activity
Mykolaiv	Proximity to frontline; port operations partially affected	Funding could support port rehabilitation, logistics networks, and resilient agrifood chains
Kharkiv	Frontline in some districts; strong university and tech base remains	Funding can target defense-related innovation, ICT, and high-tech cluster resilience

9

Conclusions and Potential Pathways

Conclusion

The study finds that Ukraine possesses considerable economic potential, yet its development remains severely constrained by the ongoing war and its consequences, including the destruction of infrastructure, the displacement of people, and the loss of key markets. At the same time, the country demonstrates remarkable resilience and adaptability, most visibly in the IT sector and in the rapid relocation and adjustment of many businesses under extraordinary circumstances.

Ukraine's innovation ecosystem, while underdeveloped, holds promise, particularly in areas that align with regional strengths and European priorities. However, existing clusters are fragmented and lack robust institutional support, which limits their ability to act as effective drivers of growth. Similarly, the country's research and development capacity, though significant, is chronically underfunded and insufficiently connected to the real economy, reducing its impact on competitiveness and innovation. These shortcomings are further compounded by persistent gaps in funding, infrastructure, and regulatory frameworks.

Regional disparities also shape the picture, with western regions displaying stronger resilience and closer integration with European markets. Digitalization emerges as a key enabler for recovery and modernization, offering opportunities to improve efficiency, transparency, and access to services.

The study underlines that Ukraine's economic recovery will rely heavily on continued and coordinated international support in the form of financial assistance, technical expertise, and access to markets. Overall, a strategic and well-coordinated approach to innovation and economic development is essential. This requires leveraging Ukraine's existing strengths, addressing its weaknesses, and fostering closer collaboration between government, business, and research institutions. In this regard, the effective implementation of Smart Specialization strategies and deeper integration with the European Union represent critical pathways for sustainable future growth.

Key Findings at a Glance

- Ukraine possesses significant economic potential, but its development is severely hampered by the ongoing war and related challenges (destruction of infrastructure, displacement of population, loss of markets).
- Despite the war, Ukraine demonstrates remarkable resilience and adaptability, particularly in the IT sector and through the rapid relocation and adaptation of businesses.
- The country's innovation ecosystem is underdeveloped but has potential, particularly in sectors aligned with regional strengths and European priorities.
- Clusters exist but are fragmented and lack strong institutional support, hindering their ability to drive economic growth.
- Ukraine's R&D capacity is significant but underfunded and disconnected from the real economy, limiting its impact on innovation and competitiveness.
- Significant gaps exist in funding, infrastructure, and regulatory frameworks hindering innovation and business development.
- Regional disparities are pronounced, with western regions showing greater resilience and integration with European markets.
- Digitalization is a key enabler for recovery and development, offering opportunities to improve efficiency, transparency, and access to services.
- Women already play an important role in the tech scene and there is much potential to further mobilize (young) women's tech potential, especially given the country's demographic situation as a consequence of the war.
- Strong international support is crucial for Ukraine's economic recovery, including financial assistance, technical expertise, and market access.

Overall, the study concludes that Ukraine needs a coordinated and strategic approach to innovation and economic development, leveraging its strengths, addressing its weaknesses, and fostering collaboration between government, businesses, and research institutions. The successful implementation of Smart Specialization strategies and increased integration with the EU are seen as critical pathways for future growth.

9.1 Summary of Ukraine's strengths and gaps for project-based cooperation

Ukraine has demonstrated positive experience in developing cooperation, but still needs better coordination, institutional stability, and harmonized involvement of all regions, considering their assets and innovation potential.

Strengths

1. Dynamic startup ecosystem demonstrated by presence of the internationally recognized startups and growing venture capital interest in Ukraine's innovation scene
2. Clusters development and legal framework instalment in 2026, which gives the clear vision of the cluster's development in Ukraine in line with the EU rules. It gives clearer understanding of the institutions and opens wider possibilities for cooperation.
3. Smart specialization strategies development gives an understanding of the sectors which would innovate faster if supported by financial mechanisms designed for different stakeholders.
4. Support from international partners (the EU, GIZ, the World Bank, UNDP, previously USAID, and others that fund many programs in the areas of infrastructure, digitalization, regional development, energy, etc.).
5. Developed human capital (strong educational and scientific traditions, digitalization, IT sector, NGOs, high adaptability to conditions, etc.).
6. Institutional and legislative changes (the emergence of creative industries, digitalization, green energy, business cooperation, the adoption of a few legislative acts on European integration, decentralization, regional development, transparency, business support, etc.).
7. Cross-border cooperation (active projects within European programs such as Interreg, etc., development of partnerships between border regions of Poland, Slovakia, Romania, and Hungary).
8. Flexibility and creativity of project teams, adaptation of projects to wartime conditions (mobility of people and activities, rapid focus on current issues - reconstruction and humanitarian aid).

Gaps

1. Insufficient coordination of project themes among different donors (duplication of work, lack of continuity, loss of consistency, lack of coordination system, weak synergy between central authorities and local level).
2. Institutional instability (frequent personnel changes in agencies, weak capacity of some state structures to ensure sustainability of results, etc.).
3. Uneven regional development (western regions are more integrated into cross-border projects than the east and south, and there are differences in access to international programs).
4. Financial and bureaucratic complexity (cumbersome tender procurement procedures, insufficient project management in most communities, etc.).
5. Lack of R&D funding, as GERD remains only ~0.23–0.33% of GDP vs. EU average of 2.22%, with low business R&D expenditure.

9.2 Potential pathways to success for joint projects

No "one size fits all"

Project partnerships with Ukraine offer high impact, but they cannot follow a "one size fits all" approach. The scale of war-related disruption means that international partners need to design support mechanisms that are both flexible and targeted. Ukraine has clear strengths in human capital and innovation capacity, yet these are under pressure from underfunding, brain drain, and damaged infrastructure.

External cooperation works best when it directly plugs these gaps by providing stable funding mechanisms, recovering and modernising infrastructure, and creating incentives to keep talent engaged within the national innovation system. It actively strengthens Ukraine's resilience and its ability to contribute back to European and global research and innovation networks.

Combination of international collaboration and domestic reforms

The most sustainable results emerge when international programs are combined with domestic reforms by creating joint mechanisms. EU frameworks such as Horizon Europe, Digital Europe, and cross-border cooperation projects provide not only funding but also access to networks, standards, and best practices. However, these external resources can only be

fully leveraged if Ukraine complements them with internal measures — for example, introducing tax incentives for private R&D, establishing a dedicated fund for the recovery of damaged laboratories, and reforming technology-transfer practices in universities. Without such domestic anchoring, international projects risk remaining isolated success stories; with it, they can form part of a coherent, long-term strategy.

Within the RIPPLE project, a map with an interactive dashboard will be created to allow interested stakeholders in the EUSDR ecosystem to find potential collaboration partners across different focus sectors.

Leveraging needs and strategic potential

Project-based cooperation should concentrate on areas where Ukraine has both urgent needs and strategic potential. Digitalization, the green transition, healthcare innovations, and defence-related technologies are not only policy priorities, but also sectors where Ukrainian actors have proven capacity to innovate quickly. In addition to that, due to wide range of specific priorities by the regions, the potential partners should focus on the strengths of particular region to be involved in the more promising initiatives. At the same time, cooperation should invest in the "horizontal enablers" that underpin all innovation activity: developing advanced skills, restoring and upgrading R&D infrastructure, and expanding access to finance through credit and guarantee tools. By aligning niche projects with these systemic enablers, partners ensure that cooperation delivers not just individual outcomes but a broader, more durable transformation of Ukraine's economy and innovation ecosystem.

The role of clusters

Projects should focus on value chain strengthening, cluster collaboration, infrastructure development, innovation funding, and export promotion within these clusters. Universities and research institutions should provide tailored research and technology transfer, while government agencies must offer policy support and funding. Business associations can facilitate networking and advocacy, while clusters themselves benefit from investment and market access. The agri-food cluster needs projects supporting processing, logistics, and organic farming; IT requires cybersecurity and domestic product development; metalworking benefits from modernization and new product development; wood processing needs sustainable practices and modern facilities; and the chemical sector requires eco-friendly technologies and diversification. These projects will foster collaboration, innovation, and integration into the European market, ultimately building a resilient and competitive Ukrainian economy. A cluster-focused approach is crucial for sustainable economic recovery and maximizing the impact of investment.

Outlook – Towards flagship project design

The results of this study will serve as the basis of designing potential flagship projects in the Danube region. In order to bring together high-potential actors from across all PA 8 regions and equip them with the nescessary insights and tools to create maximum impact with their projects, the following steps will be implemented:

// Provision of an interactive actor map to facilitate the identification of project partners across regions and sectors

// Interactive workshops to develop focus areas of collaboration and realize matchmaking

// Individual consulting for project collaboration partners (e.g., data procurement, draft writing assistance)

Towards Flagship Projects

This study signals a strong need for projects focused on rebuilding, innovation, and integration within Ukraine's economy, particularly those aligning with the EU Strategy for the Danube Region. The study's findings suggest projects should prioritize resilience, sustainability, and collaboration given the ongoing challenges.

Suitable Project Types:

- Economic Recovery & SME Support: Projects offering financial assistance, training, and market access for SMEs are highly suitable. This includes initiatives focused on adapting businesses to the post-war environment, diversifying production, and accessing new export markets.
- Innovation & Tech Transfer: Projects fostering innovation, particularly in sectors with regional strengths (e.g., IT, agriculture, green technologies) are crucial. This includes supporting R&D, facilitating technology transfer between research institutions and businesses, and promoting digital transformation.
- Infrastructure Rehabilitation: Projects focused on rebuilding damaged infrastructure (transport, energy, digital) are essential. Emphasis should be on sustainable and resilient infrastructure solutions.
- Cluster Development & Networking: Projects strengthening existing clusters or establishing new ones, particularly those focused on cross-border collaboration and value chain integration.
- Skills Development & Workforce Training: Projects addressing skills gaps and providing training for the workforce, especially in emerging technologies and sectors.
- Regional Development & Smart Specialization: Projects aligning with regional Smart Specialization strategies, fostering innovation and competitiveness within specific regions.

Relevance to Institutions:

- Universities & Research Institutions: Projects offering opportunities for collaborative research, knowledge transfer, and training are highly relevant. They can contribute expertise and develop innovative solutions.
- Government Agencies: Projects supporting policy development, regulatory reform, and infrastructure development align with their mandates. They can also facilitate access to funding and resources.
- Business Associations & Chambers of Commerce: Projects focused on SME support, market access, and networking are highly relevant. They can provide valuable insights and facilitate connections between businesses.

Relevance to Economic Clusters:

- Agricultural Clusters: Projects focused on modernizing farming practices, improving processing facilities, developing new agricultural products, and accessing new export markets.
- IT Clusters: Projects supporting the development of new software and hardware, attracting foreign investment, and fostering collaboration between IT companies and other industries.
- Manufacturing Clusters: Projects focused on improving production processes, adopting new technologies, and developing new products for both domestic and export markets.
- Energy Clusters: Projects promoting the development of renewable energy sources, improving energy efficiency, and attracting investment in the energy sector.
- Logistics & Transportation Clusters: Projects improving transportation infrastructure, streamlining logistics processes, and facilitating trade.