

Productivity in Ukraine: wartime challenges and business response

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Date:

August 2026

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KEY FINDINGS

Labour productivity is a key and very simple indicator of economic efficiency. It measures output per unit of labour input, usually per worker or per hour worked. Higher productivity indicates that workers generate more value within the same time frame or with the same resources.

High-productivity countries have higher economic output and higher living standards for their citizens. Typically, productivity growth is boosted by a well-educated labour force, advanced technology, sustained infrastructure, strong innovation capacity, and robust investment.

According to World Bank data¹, even before Russia's full-scale invasion Ukraine's labour productivity was the third lowest in Europe — after Moldova and Albania — and 65% below the EU average, and it remained far below that of comparable countries such as Poland, Hungary, Czechia and Romania. One important reason for Ukraine's low productivity was the predominance in the economy of activities that generate less value added and use labour more intensively (agriculture, mining and the like), together with the sizeable role of a state sector that is not always efficient. Investment, moreover, has lagged well behind that of neighbouring countries over the past decades (around 15% of GDP in Ukraine, compared with an average of 19–25% in peer countries in 2014–2021).

During the first year of Russia's full-scale war against Ukraine, labour productivity fell sharply (to 80% of the 2021 level) as production facilities and infrastructure were destroyed, supply chains were disrupted and workers were lost to migration and mobilisation. Productivity has been recovering gradually since then (reaching 85% of the 2021 level in 2025), although the pace of recovery differs markedly across sectors: agriculture is heavily affected by weather conditions, while high productivity in the public sector is largely the result of structural shifts that have taken place under wartime conditions.

The full-scale war has substantially changed the environment in which Ukrainian businesses operate. A shrinking available workforce — the result of migration, mobilisation and demographic change — together with security risks and economic uncertainty is forcing companies to adapt how they organise work and plan further development. The question of how far a business can grow without a proportional increase in headcount — through process optimisation, technological change and staff skills development — is becoming ever more important. Productivity growth is therefore critical for Ukrainian companies, particularly given the labour shortage caused by the full-scale war: 5.6 million refugees in 2026 and annual losses from migration estimated at no less than 5.5% of pre-war GDP².

Productivity growth even during a full-scale war is a sign of how adaptable Ukrainian business is. This is borne out by a survey of 556 small and medium-sized enterprises across all sectors of the economy and all regions of Ukraine, conducted by CES in May–June 2026 under a grant from the Skills Alliance initiative. Businesses are not only adapting step by step to operating in wartime, but are also fairly optimistic about the near future. At the same time, more than half of enterprises expect their need for workers to grow over the next two to three years, while only half see any possibility of growing without

¹ World Bank, [GDP per person employed \(constant 2021 PPP \\$\)](#).

² CES, [Ukrainian refugees. Fifth wave of the study](#)

expanding their headcount. The traditional model of growth through additional hiring remains dominant.

Employers attribute the shortage of workers not only to migration and mobilisation, but also to demanding working conditions at some enterprises, high requirements placed on employees, and difficulties in finding candidates for physically demanding occupations.

The main routes to increasing output without additional hiring, as identified by companies, are optimising internal processes (19%), digitalisation (15%) and automation (14%). SMEs are already pursuing these measures: over the past 12 months, 30% of companies introduced digitalisation measures, 21% introduced automation and 33% trained their staff. These measures are often implemented in parallel. Companies report that automation and digitalisation help raise output volumes, while staff training improves the quality of products.

Automation partly offsets the shortage of workers by transferring particular physically demanding or routine operations to machines, reducing the need above all for skilled workers, equipment operators and support staff. At the same time, demand is rising for employees able to work with new equipment and to monitor and maintain it. Its effect therefore lies not only in reducing headcount, but also in changing the structure of employment and the skills required.

Digitalisation saves considerable time on document management, reporting, accounting and data analysis, reduces manual work and errors, and creates new opportunities for running a business. Managers gain faster access to data on sales, production, customers or delivery routes and can use it for operational control and planning. At the same time, changing software and established processes can be met with resistance from employees.

Companies that already have such experience are more likely to plan further measures for the coming year. This creates a risk of a widening gap between companies that have embarked on technological and organisational transformation and businesses that remain outside this process.

One reason companies give for not pursuing automation and digitalisation is that they see no need for such changes. This may reflect the genuinely limited applicability of technology to particular business processes or industries, a level of automation or digitalisation that has already been achieved, or insufficient awareness of the available solutions and of how they could be used.

Another key constraint is financing and the high cost of solutions. Such investment is made mainly from companies' own profits or from owners' funds, which makes easier access to external financing the single most important stimulus for raising labour productivity.

Automation and digitalisation often require new skills from employees: 69% and 76% of companies respectively have experienced this. Yet what businesses will require of their staff in future goes beyond occupational training to include strong sales and customer service skills, the ability to work with software, digital systems and AI, communication, problem-solving and teamwork skills, and the capacity to learn and adapt.

Staff training in SMEs depends heavily on the stance taken by company management. In 78% of companies training is initiated by managers or owners, compared with 38% where it is initiated by employees themselves. Training in SMEs most often takes place in-house. Employers see a lack of competences as a less acute problem than a lack of people: they are frequently willing to train a candidate directly on the job, primarily through mentoring. Among external providers, companies most often use private training centres, and they also learn from technology providers and equipment manufacturers.

The links between SMEs and vocational or higher education institutions on staff training remain weak. Only 12–13% of enterprises use training provided by these institutions. Among companies that do not train staff at all, 17% are unaware of institutions or courses relevant to their field, and 12% lack sufficient information about the training opportunities available. This points to insufficient communication between education institutions and SMEs.

SMEs see themselves primarily as partners of vocational education institutions in practical training and in hiring future employees, rather than as active participants in governing and reforming the system. This also means that practical formats – internships, dual education and direct work with students – may be the most natural entry point for deepening cooperation between business and education institutions.

RECOMMENDATIONS

The analysis of labour productivity trends in Ukraine during the full-scale war, together with the results of the enterprise surveys, allows the following recommendations to be made.

Investment in priority sectors is the most effective way to raise labour productivity

- **It is worth investing in sectors that will deliver rapid productivity growth.** Sectors that already play a significant role in the economy – such as agriculture, agri-food processing and other manufacturing industries – will be able to scale up quickly on the back of investment.
- **Given the scale of the destruction caused by Russia's war against Ukraine, it is critically important to raise productivity in sectors linked to reconstruction and recovery,** such as construction and the production of building materials.
- **Sectors that involve heavy physical labour also need to be modernised in view of the consequences of the full-scale war** – in particular by increasing the role of women, older people and persons with disabilities, including veterans, in the labour market.
- **Given the long-term security risks that will persist – not only for Ukraine but for Europe – the defence and military technology sectors should be treated as priorities.** Identifying the most promising sectors for investment aimed at raising productivity requires further research, in particular into the scale of the labour shortage and the potential of investment to close it.

Macro-financial stability and EU accession are key preconditions for higher private investment

- **Private sector innovation and investment require a growth-friendly environment** with appropriate institutions and policies, including macroeconomic stability and the rule of law. Productivity growth is also supported by experience in producing relatively complex, high-technology export goods, participation in global value chains and cross-border technology transfer.
- **In wartime, the government plays a decisive role in investing in the Ukrainian economy** by supporting the defence sector and rebuilding damaged energy and social infrastructure as well as the housing stock. For post-war recovery, however, the role of private capital must be strengthened and public-private partnership expanded, with the government's principal task being to create favourable conditions for investment and to meet EU accession requirements, rather than to finance the economy directly.
- **This approach, however, requires funding.** In this context, access to European cohesion funds and a substantial inflow of private capital are of decisive importance for Ukraine. Such investment can facilitate technology transfer and help address demographic challenges. What matters, though, is not only the volume of capital but also the country's ability to allocate it effectively through sound public policy, the rule of law, simpler business regulation, stronger competitiveness, better legislation and further reforms within the EU accession process.

Sound labour market forecasting and skills development aligned with employers' needs also do much to support productivity growth

- **Occupational training is an important issue.** The world is changing rapidly, and the skills that will be needed tomorrow are defined only in broad terms today. Before deciding what to teach and how to upskill people for more productive work, however, it is important to recognise that labour shortages in Ukraine will persist for a long time to come because of demographic and military trends. Training and upskilling alone are therefore not enough; enterprises need to modernise and re-equip their production and service facilities. Investment in physical capital, automation, digitalisation and process robotisation is central to raising productivity. It is also essential to train staff in the new skills required to work with the latest technologies and automated processes.
- **Amid structural economic change, it is important to sustain workers' readiness to keep updating their skills and, where necessary, to change occupation.** This requires both a positive public attitude towards lifelong learning and well-developed systems of adult education and retraining. At the same time, stronger career guidance for schoolchildren could support better-informed choices of education and occupation in line with labour market demand, ease a faster transition into employment and increase the returns on investment in education.
- **Measures of this kind require high-quality forecasts for the economy as a whole and for the labour market,** as well as forecasts of the most productive investments and of employers' staffing needs, including the hard and soft skills they expect from workers. This in turn informs the changes needed in education, particularly in retraining and upskilling.

Supporting productivity and the technological transformation of business

- **Shift the focus of some business support programmes from job creation to productivity growth.** Where labour is already scarce, business development need not mean a proportional increase in headcount. For programmes aimed at modernisation and technological renewal, the main performance indicators should be growth in the output of goods or services, in labour productivity and in value added, or a reduction in costs, rather than the mandatory creation of new jobs.
- **Encourage employers to widen the pool of potential workers and, where possible, to adapt workplaces and working conditions for groups that are currently less engaged in employment,** if job creation remains one of the criteria of business support programmes. Support for inclusive employment must work with employers and potential employees at the same time: helping companies to adapt workplaces and hiring practices, and helping people to overcome barriers to employment through career guidance, retraining, and support for mobility, care and accessibility.
- **Continue developing war risk insurance for investment in productive assets.** In agriculture and parts of industry, the risk of losing expensive equipment directly holds back investment. The mechanism already exists; what matters now is to extend the coverage and accessibility of insurance schemes for SMEs.
- **Extend access to financing for technological transformation to business segments that are currently not covered.** Overly narrow sectoral or regional eligibility criteria can leave projects with high productivity potential without support.
- **Create opportunities for technological diagnostics at enterprises.** Companies often see no need for automation and digitalisation, but this may reflect either genuinely limited applicability of the technology or an insufficient understanding of the solutions available. SMEs need help in answering very practical questions: what exactly can be automated or digitalised, what solutions exist, how much they will cost and what economic effect they will have.
- **Sell a clear business benefit rather than the equipment or software itself.** A large share of enterprises see no need for automation or digitalisation. To expand the market, suppliers therefore need to show through concrete examples which operations can be changed, how much working time or resources this saves, how output changes and what the payback period is. Sector-specific solutions are particularly needed: the automation needs of agriculture and industry differ substantially from those of trade, logistics or services.
- **Develop affordable standardised solutions for small and micro businesses, along with the option to “try before you buy”.** For small enterprises, a complex bespoke project will often be too expensive and too risky. Standard sector packages, pilot use, leasing or phased implementation may be more appropriate.
- **Differentiated programmes and offers for different industries and enterprise sizes.** Agriculture and industry need automation, expensive equipment, long-term financing and risk insurance. Logistics, trade and services need digital solutions and process optimisation. Micro businesses need simple standardised solutions and help in identifying whether transformation is possible at all. Medium-sized businesses need capital for scaling up and more advanced technical and digital skills.
- **Treat staff skills development as an integral part of automation and digitalisation programmes.** New competences were needed in 69% of companies after automation and in 76% after digitalisation; in the case of digitalisation, training and retraining staff is already a noticeable practical

barrier. The costs of training, retraining and managing organisational change should therefore be built into grants and loan programmes for technological renewal.

- **Assess support programmes by their actual impact on productivity.** Programme evaluation should look not only at the number of companies that received a grant or the number of jobs created, but also at the increase in output per worker, the reduction in time spent on operations, wage growth and similar measures.

Informing and engaging business

- **Provide business with information on available labour resources and labour market prospects.** More than half of enterprises expect their need for workers to grow, even though the scope for significantly expanding labour supply is limited. Businesses need accessible information on the regional supply of workers, occupations in short supply, demographic trends and the educational pathways of young people. This will help companies to judge earlier where further growth should rely not on additional hiring but on automation, digitalisation or a change in how work is organised.
- **Provide business with information on the opportunities offered by automation and digitalisation and on the support infrastructure available.** It is not enough for such instruments to exist. Companies need to know about them and to understand when it is worth using them.
- **Engage companies that have not yet begun technological transformation.** There is a risk that grants and support programmes will go mainly to companies that are already active and well prepared, while enterprises with no prior experience of automation, digitalisation or training remain outside the process. One possible solution is low-threshold instruments that require no experience or expertise to take part – free diagnostics, small vouchers, demonstrations of pilot solutions, advisory services and the like.
- **Separate tracks to reach small and micro businesses.** Larger businesses are often more active and readier to expand further, while small and micro firms are frequently excluded from these processes, even though they account for over 90% of businesses in Ukraine. They need simpler participation procedures, group services and active outreach, rather than an expectation that they will find a programme and apply for it on their own.

Links with business and the institutional capacity of education institutions

- **Vocational education institutions should be proactive in engaging with business.** Only 12–13% of companies that train their staff use training provided by vocational or higher education institutions, while 17% of enterprises that do not train staff are unaware of relevant institutions or courses. Every institution would benefit from a clearly defined function for working with employers: gathering information on their needs, offering appropriate programmes, and organising internships and graduate placement. Engagement with local employers should become one of the indicators of an institution's performance.
- **Strengthen the capacity of vocational education institutions to work with employers systematically.** Support should cover not only the modernisation of equipment but also the competences of the staff responsible for cooperation with business: analysing local labour market needs, attracting new employers and building long-term partnerships, jointly developing and updating programmes, organising internships and dual education, and designing short training and retraining courses for

company employees. This would turn cooperation with business into a systemic function of the institution rather than a collection of individual partnerships or projects.

- **Develop three-way partnerships between vocational education institutions, employers and technology manufacturers or suppliers.** Legislation and regulations mostly emphasise the importance of interaction between education institutions and business. Technological renewal, however, adds a third important participant – the manufacturer or supplier of the solution. Equipment manufacturers and suppliers are already an important source of employee training during technological renewal, and involving them systematically in cooperation between education institutions and businesses could make that cooperation more effective.
- **Start partnerships with business at the easiest entry point for employers: student internships and employment.** Enterprises are most willing to take students on internships and subsequently to employ them; their willingness to engage in more complex questions of governing the vocational education system is noticeably lower. It therefore makes sense to build long-term partnership step by step: from internships to involvement in developing programmes and standards and to participation in supervisory and regional boards.

Developing vocational and adult learning programmes

- **Develop a system of short retraining and upskilling courses for adults in direct connection with employers.** Companies expect short, flexible and practically oriented programmes that can be tailored to a specific enterprise. Amid demographic decline and falling student numbers in vocational education institutions, this could become a new line of work for these institutions.
- **Develop “train the trainer” programmes to prepare in-house trainers and mentors for enterprises.** Vocational education institutions can teach experienced company employees the methods of mentoring, transferring practical skills, adult learning and assessing learning outcomes. This would make it possible to reach far more workers by building on the in-house training that is already widespread in SMEs, while improving its quality and consistency. This is particularly important for industrial enterprises, which more often cited a lack of time as a barrier to training their employees properly at education institutions.
- **Broaden the content of vocational training beyond purely technical skills.** Future employer demand covers not only working with equipment, but also digital skills, the use of software and AI, the capacity to learn and adapt, communication, problem-solving, teamwork, sales and customer service. These competences should therefore be integrated into vocational programmes and short adult learning courses.