



# Employment and Social Developments in Europe

Addressing labour shortages and  
skills gaps in the EU

2023

Executive Summary

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## ADDRESSING LABOUR SHORTAGES AND SKILLS GAPS IN THE EU

### MAIN ECONOMIC, LABOUR MARKET AND SOCIAL DEVELOPMENTS

**The EU economy performed relatively well in 2022, despite Russia's war of aggression against Ukraine prompting skyrocketing energy prices, supply chain disruptions, and related increases in the cost of living.** The EU economy grew by 3.5% in real terms, exceeding previous expectations. After strong Gross Domestic Product (GDP) growth in the first half of 2022, economic expansion then slowed, with a smaller-than-projected contraction in the final quarter. Energy prices stabilised towards the end of the year, which, combined with a predicted decrease in 2023, improved the economic outlook for 2023 and 2024. Significant risks remain, notably linked to rapidly rising prices for food and services, potential new increases in gas prices, and tight labour markets.

**Inflationary pressures started in 2021 and reached 9.2% in 2022, with spikes in energy, food, and transport prices.** This is challenging for lower-income and, to a lesser extent, middle-income households, for which these necessity items account for a substantial share of overall consumption. Due to the drop in wholesale gas prices, inflation stabilised towards the end of the year and is projected to fall to 6.7% in 2023 and 3.1% in 2024.

**Overall, the EU labour market has remained remarkably resilient.** The number of people employed rose by 2.0% in 2022 and reached new record levels (213.7 million people). The record employment rate of 74.6% is an important step towards the 2030 Porto target of 78.0% employment for the population aged 20-64. The rise in employment was primarily driven by an increase in the number of permanent and full-time workers. Furthermore the employment rate of recent graduates recorded a sharp increase (2.8 percentage points (pp)). At the same time, the EU unemployment rate receded to 6.2%, the lowest ever recorded. Youth unemployment declined by 2.2 pp from 16.7% in 2021 to 14.5% in 2022, but remains a major challenge.

**Nevertheless, significant challenges persist:** the gender employment gap remains stable but high at 10.7 pp; people with lower educational attainment have higher unemployment rates, lower employment, and lower participation in adult learning activities; unemployment among young people remained more than two-and-a-half times higher than the rest of the population; and 11.7% of young people across the EU were neither in education, employment or training (NEET) in 2022, despite major shortages in the labour market.

**While high by historical standards, nominal wage growth remains far below inflation, leading to a contraction in real gross disposable household income (GDHI) growth, and posing challenges particularly for those at the lower end of the income scale.** In the second half of 2022, real GDHI growth per capita (quarterly, year-on-year) was negative for the first time in approximately two years, driven by a decrease in the compensation of employees and self-employed workers. Faced with economic pressures, more than one-quarter of lower-income households reported financial distress in December 2022, up from 23.3% in the previous year. Financial distress also increased for households in the second and third income quartiles in the same time period, but to a somewhat lesser extent. Pressures on households' purchasing power, coupled with surges in energy prices, led to increases the number of people unable to keep their home warm, from 6.9% in 2021 to 9.3% in 2022.

**In a challenging context, the at-risk-of poverty (AROP) rate and income inequality in the EU remained broadly constant in 2022.** The AROP rate and income inequality – measured by the ratio of total income received by the 20% of the population with the highest income compared to that received by the 20% of the population with the lowest income – decreased slightly in 2022 (2021 incomes), with Eurostat's flash estimates predicting stability (2022 incomes). After reaching unprecedented levels in 2021, the poverty reducing impact of social transfers remained elevated in 2022 (2021 incomes), reducing AROP by more than one third. However, the AROP indicator measures low income relative to the rest of the population and as such does not capture declines in real household incomes and loss of purchasing power resulting from inflationary pressures. Rather, this is better reflected in the increased share of the population living in severe material and social deprivation (SMSD) rate in 2022 (6.7%, compared to 6.3% in 2021), as well as the decrease in GDHI in the second half of the year.

**People with lower levels of education are at higher risk of poverty or social exclusion than the overall population (34.5% compared to 21.6% in 2022).**

**Education and training remain key to addressing poverty and social exclusion. People with higher levels of education are at lower risk of poverty or social exclusion:** in 2022, 10.5% of those with tertiary education were at risk, compared to 19.8% of those with medium-level qualifications and 34.5% of those with lower education. For in-work poverty, these shares were 4.1%, 8.7% and 18.4%, respectively.

## LABOUR SHORTAGES AND CHANGING SKILLS NEEDS IN THE EU

**Labour shortages occur when the demand for workers qualified in a particular area of the labour market exceeds the supply of those workers.** This can arise due to cyclical but also a number of structural reasons, such as a declining or inactive labour force, skills gaps and skills mismatches (including in the context of the twin transition), working conditions, and labour mobility and migration. In Q1 2023, labour shortages were reported as a factor limiting production by 28% of employers in manufacturing and 31% in both services and construction in the EU, ranging from below 10% in Cyprus and Spain to over 50% in Poland, Malta and Slovenia.

**With the employment rate at an all-time high of 74.6%, the job vacancy rate rose to 2.9% in 2022, compared to 1.3% in 2012.**

**Labour shortages rebounded sharply in 2022 as the economy and labour market recovered from the COVID-19 pandemic, coming back in line with previous occupational and sectoral patterns.** The job vacancy rate rose to 2.9%, the highest rate ever recorded, with labour shortage indicators showing increasing tightness in the labour market. While part of

these developments reflects a cyclical upturn in the economy following the substantial dip during the COVID-19 crisis, structural determinants remain crucial. Many of the current shortages (e.g. in science, technology, engineering and mathematics (STEM), including information and communications technology (ICT), construction, healthcare, hospitality) are long-standing and likely to have been further exacerbated by the green and digital transitions. Following demand interruptions during the COVID-19 crisis (except healthcare, which saw soaring demand during the pandemic), these shortages exceeded pre-pandemic levels by the end of 2021. For example, labour shortages in manufacturing and construction are now nearly three times the level observed 10 years ago, and have more than doubled in services.

**While labour shortages can be a sign of a dynamic economy and give workers some leverage, they can have negative effects on companies and the wider economy.** Shortages may increase the pressure on workers' work-life balance and impact their economic prospects in the long term, but they may also lead to workers demanding higher wages, better working conditions, or additional skills development, as well as providing opportunities for marginal workers to enter or remain in the labour market. Alongside this, however, labour shortages may reduce the economic activity of companies and public institutions, lower their innovation capacity, or force them to reduce the quality and quantity of their products and services. If not addressed, countries with labour shortages may become less attractive for innovation and investment in research and development, weakening their competitiveness, hindering their transformation towards a more digitised economy, and delaying the green transition. Given the prevalence of negative effects of labour shortages, it is particularly important to understand their underlying structural drivers.

**In light of the importance of skills for the EU economy and the 2023 European Year of Skills, this year's Employment and Social Developments in Europe (ESDE) report focuses on persistent labour shortages and changing skills needs in the EU.** It starts by identifying occupations and sectors facing persistent labour shortages over the last 10 years and then analyses their structural drivers: it considers the implications of evolving skills demands in the context of the green and digital transitions; it highlights certain labour market participation challenges, including demographic changes (notably ageing) and lower labour market participation among certain population groups, with a particular focus on women and migrant workers born outside the EU; it explores the structural barriers reducing the efficiency of matching labour supply and demand, with an emphasis on the role played by gender segregation; and it assesses the implications of certain working conditions for labour shortages. Finally, it presents and estimates the likely impacts of selected policy measures to address labour shortages.

**Persistent labour shortages are mainly found in healthcare, STEM (particularly ICT), construction, and some service occupations.**

**Persistent labour shortages are found in a diverse range of sectors and occupations across all skill levels.** While there is no agreed methodology to identify labour shortages in the EU, combining different approaches provides a comprehensive view of the demand for labour at sectoral and occupational level. Persistent labour shortages are particularly prevalent in healthcare, STEM (notably ICT), construction, and certain service

occupations. While this list includes some relatively high-skilled occupations, it also includes middle-skilled and low-skilled occupations.

**The importance of different structural drivers of labour shortages varies significantly by occupation and sector.** Overall, employers' difficulties in finding people with the right skills are often linked to their inability to attract and retain workers (e.g., due to poor working conditions or human resource management (HRM) practices) rather than a lack of skills among job applicants. However, a limited supply of skilled workers poses challenges for persistent labour shortages in fields such as STEM or healthcare. In

other occupations, especially those characterised by more manual skills and lower literacy, numeracy and digital skills requirements (e.g. cleaners, personal care workers), poor working conditions and challenges in attracting and retaining workers play a more significant role. Labour shortages in some occupations might be exacerbated by evolving skills and employment needs due to the green and digital transitions.

**Looking ahead, shortages in both high and low skilled occupations are projected to increase considerably.** STEM, ICT and healthcare professionals will be in particular demand. Future shortages will primarily be driven by employment growth in these occupations, followed by replacement needs as older cohorts retire. These may create significant bottlenecks given the educational credentials required.

### *Structural drivers of shortages*

**The green transition is projected to lead to employment growth in several sectors and occupations, where new vacancies may be difficult to fill.** It is estimated that the green transition could lead to creation of between 1 and 2.5 million additional jobs by 2030. This includes jobs in some sectors and occupations already experiencing persistent labour shortages (e.g., transportation and storage sector, drivers, building and related trades, electrical and electronic trades), as well as those likely to face labour shortages in the future (e.g. net-zero technologies, water supply, sewerage, waste management and remediation activities, and certain science and engineering professions). Significant expansion needs, severe underrepresentation of female workers, and increasing demand for medium-skilled and high-skilled workers with specific qualifications in sectors key to the green transition, combined with high replacement needs for older workers in some relevant sectors, might exacerbate labour shortages.

**One-third of ICT professionals' skills are digital, compared to less than one-tenth for most other occupations.**

**The digital transition contributes to persistent labour shortages among ICT professionals but does not seem to be a key driver of shortages in other occupations.** ICT occupations are the most digitally intensive form of work in the EU, by a considerable margin. In this context, lower average digital intensity of work among women, older people and those

with lower levels of educational achievement is largely explained by the underrepresentation of these groups in ICT occupations. The demand for ICT work doubled between 2011 and 2021, with more than 9 million ICT specialists now working in the EU. This number is projected to expand sharply, making current labour shortages even more pressing. As yet, the impact of the recent advancement of artificial intelligence (AI) on the labour market and labour shortages remains unclear. Recent evidence indicates that AI is already transforming the nature of work and skills needs in certain sectors and occupations. It could have a positive impact on productivity, but also raises concerns about job loss, stability, and wages, as well as trust in employers to make the right decisions about its use.

**Addressing labour shortages in specialist ICT positions will likely involve supporting more women to enter the field.** With women accounting for only 17% of all employment in ICT occupations in the EU, measures tackling their underrepresentation offer important opportunities to attract new workers. Around one-quarter of women's underrepresentation traces back to gender segregation in ICT education. Exposure to broader stereotypes around ICT work contributes to gender divides in aspiration from an early age: at 15 years of age, around 1 in 10 boys expect to work in ICT, compared to just 1 in 100 girls. Certain aspects of employment in ICT are also known to limit women's participation, including reliance on full-time work patterns that are difficult to reconcile with care responsibilities, and biases in recruitment practices, remuneration, and promotion ladders.

**The decreasing working-age population will likely drive up labour shortages in the coming decades.** This is because, once retired, people maintain the demand for products and services at a relatively high level, while the labour supply decreases due to the shrinking of the working-age population. Population ageing is a major challenge for the EU: in the 11 Member States analysed in detail, the share of the older population (aged 70+) is expected to increase gradually by 2030, then more sharply by 2050. In most Member States, these demographic trends are expected to weigh on capital and labour, and thus on GDP.

**Lower labour market participation among women, lower-educated people, people with a migrant background (especially migrant women), older workers and young people is one of the factors underlying labour shortages.** Since 2004, women are, on average, about 12 pp less likely to participate in the labour market than men, a difference that increases by another 10 pp with motherhood. The participation probability of people aged 55-64 is about 28 pp lower than among under-55s, partly due to early retirement schemes. However, for both older workers and women, those participation gaps have decreased over time. Education plays a fundamental role in the rate of labour market participation: those attaining at most lower secondary education are about 23 pp less likely to participate in the labour market than those with tertiary education. People born outside the EU are 2 pp less likely to be employed than natives, primarily due to particularly low employment rates among migrant women. Finally, other groups, such as persons with disabilities or people with a minority racial or ethnic background, including Roma, remain underrepresented in the labour market.

**Only 14% of occupations facing shortages are gender balanced, compared to around 25% of occupations in the EU labour market.**

**Gender segregation of the labour market contributes to shortages by reducing the efficiency of labour supply allocation.** Labour shortages are evident in occupations and sectors where men account for the majority of workers (e.g. STEM occupations, where men represent 80% of workers), as well as in some jobs where women comprise the majority of workers (e.g. healthcare occupations, where women represent 80% of workers).

Persistent gender segregation reduces the pool of people available to fill new vacancies, exacerbating difficulties in finding workers, especially in times of rising demand. Measures aimed at reducing gender segregation offer important opportunities to ensure that increased labour market participation of women alleviates labour shortages. Currently, women remain unlikely to progress into hard-to-fill vacancies in male-dominated occupations. At the same time, relying almost exclusively on women's work does not generate sufficient labour supply to satisfy the demand for specific services such as nursing, personal care, or cleaning. Improving working conditions and pay in these jobs is likely to play an important role in attracting additional workers.

**While the extent of gender segregation in STEM and healthcare work depends on a range of factors, a substantial proportion can be traced to unequal participation of women and men in certain fields of education.** This is because STEM and healthcare workers tend to be highly educated in specialist fields of study, in which either women or men are severely underrepresented. For example, gender differences in workers' most recent field of study account for about half of the underrepresentation of women in STEM occupations. Addressing gender segregation in education thus provides an important opportunity to expand the future talent pool available to fill vacancies in STEM and healthcare jobs. Among other measures, this will require challenging the gender stereotypes that contribute to stereotypical subject choices by labelling certain jobs and fields of study as male or female domains. By exaggerating (or inventing) gender differences in early educational outcomes in these study fields, such stereotypes

continue to shape children’s long-term aspirations and self-confidence, irrespective of their talents and abilities.

**Among people born outside the EU and working in occupations experiencing shortages, 9 out of 10 are employed in low-skilled occupations.**

**Migrant workers born outside the EU are more often employed in occupations facing persistent labour shortages.**

Compared to native workers with the same characteristics, being a migrant is associated with a higher probability (8.7 pp) of working in shortage occupations, especially in lower-skilled ones. However, their lower participation rate in the labour market – particularly among migrant women – results in some untapped

potential in tackling labour shortages. Migrant workers born outside the EU are 3.1 pp more likely to have difficulties in finding permanent or full-time employment, despite indicating their willingness to work more hours, especially in occupations with persistent labour shortages. The high share of migrants reporting discrimination when in employment (8.6%, compared to 5.4% for the native population) also suggests inefficiencies in matching labour supply with relevant job opportunities. Further obstacles to migrants getting a (suitable) job are the lack of skills in the host country language(s), difficulties in recognising their formal qualifications obtained abroad, and care responsibilities. These factors may hinder the potential of migrants to mitigate future labour shortages.

**Job strain was found to be substantially above the EU average (30%) for nurses (61%), carers (55%), drivers (44%), cooks and bartenders (43%), doctors (43%) and cleaners (36%).**

**More strenuous working conditions and lower pay might explain the persistence of labour shortages in some occupations and sectors.**

In terms of overall job quality, reported job strain is significantly higher than average for workers in the health, residential care, and transport sectors, especially among nurses, carers, and drivers. Around 75% of female-dominated occupations facing shortages report higher than average (30%) job strain. Workers in several shortage occupations with high job

strain also report difficulties in making ends meet more often than the EU average (26%). This includes cleaners (47%), cooks and bartenders (44%), and carers (43%). At the opposite end of the scale, computer programming and architectural and engineering activities stand out for their higher median hourly earnings, lower job strain and more frequent non-standard forms of employment than the EU average.

**In some jobs with more difficult working conditions, health and safety at work risks may be an additional factor contributing to labour shortages.**

In five out of six shortage occupations experiencing significantly higher levels of job strain, the proportion of workers reporting that their health and safety at work is at risk is also higher than the EU average. The highest levels of health and safety at work risk are reported by nurses (69%), drivers (53%), doctors (51%) and carers (50%).

## MEASURES TO ALLEVIATE PERSISTENT SHORTAGES

**Several key policies and reform measures can alleviate persistent labour shortages in the EU.** These include upskilling and reskilling, investing in adult learning, increasing financial incentives to work, alleviating the barriers to people entering the labour market, improving work and pay conditions and social protection coverage, and implementing policies to attract workers from abroad into jobs facing shortages. This report provides an in-depth analysis of selected topics linked to these measures, including the effects of vocational training programmes and measures to reduce skills mismatches, outcomes of several reforms of the tax and benefit system to improve work incentives, challenges to labour market participation posed by the cost and (geographical) availability of childcare, the impacts of targeted immigration policies, and the role of social partners.

**The 2023 European Year of Skills emphasises the challenges underpinning labour and skill shortages in the EU.** It contributes to a mindset where upskilling and reskilling throughout the working life is the norm for everyone. Proposed specifically to address skills and labour shortages, it will promote investment in skills, the labour market relevance of skills, good matching between individuals' aspirations and companies' needs, and good use of the skills of third-country nationals. It will also showcase skills development opportunities and activities across Europe.

**The 2023 European Year of Skills builds on the broader policy framework set out in the European Skills Agenda.** The Pact for Skills and the Blueprint Skills Alliances are important measures to foster the supply of skills to address labour shortages in health, STEM, and construction (among others). They also contribute to addressing the increasing demand for digital and green skills under the twin transition, alongside other EU initiatives, such as the Structured Dialogue on digital education and skills, the Recommendation on key enabling factors for successful digital education and training, the Recommendation on improving the provision of digital skills in education and training, the Recommendation on ensuring a fair transition towards climate neutrality, and the European Green Deal Industrial Plan. The Recommendations on individual learning accounts, micro-credentials, and vocational education and training will also support upskilling and reskilling. For example, more than half of the Member States are taking action towards developing individual learning account (ILA) schemes (already operational in France) to provide direct financial support to individuals for use in market-relevant training activities.

**A vocational training programme in Lithuania increases the probability of employment across a range of population groups.**

**Upskilling and reskilling, together with improvements in matching labour supply and demand, can have positive employment effects and help to address persistent shortages.** Modelling improvements in skills-matching at regional level shows positive macroeconomic effects for all regions covered, accompanied by positive spillovers into other regions. One way to improve skills-matching at regional level could be

to ensure that public employment service (PES) centres are geographically accessible to most people. While this is usually the case in city regions, it is less so in non-metropolitan regions, likely reflecting a combination of lower population density and less dense road networks in rural areas. Analysis of vocational training programmes in Lithuania and Finland found positive employment effects, particularly for some underrepresented groups in the labour market.

**Targeted tax reforms impact participation in the labour market up to eight times more than broader income tax cuts.**

**Reforming tax and benefit systems can help alleviate labour shortages by improving work incentives.** The impact of a personal income tax (PIT) cut, accounting for the interplay of taxes and benefits, depends on the specific details of the reform. In general, tax reforms targeting low-income earners have a significantly greater impact on people's labour supply than across-

the-board PIT cuts: targeted measures can have an impact eight times greater than an across-the-board PIT cut and as such promote active inclusion as also highlighted in the 2023 Council Recommendation on adequate minimum income. Moving towards individual taxation could also generate a significant increase in aggregate participation rates. The reform principally affects the labour supply of women, who are typically the secondary earner in the household.

**Increasing participation in formal early childhood education and care (ECEC) could significantly improve the labour market activity of mothers in low-income households.** Yet, accessible, affordable, and high-quality ECEC remains limited in a number of Member States. New data highlight that



while net childcare costs (NCC) faced by parents have decreased considerably, formal childcare remains expensive in several Member States (e.g. in Ireland and Czechia, NCC account for more than one-third of women's median earnings). Access to childcare can also be constrained by long travel times to reach providers. Analysis of several Member States shows that childcare providers are frequently inaccessible by a short walk, but can usually be reached with a short drive. The geographic accessibility of childcare facilities tends to be much higher in urban settings, likely reflecting higher demand and/or population density. Overall, increasing childcare participation among children aged 0-2 living in households below median income to the Barcelona target of 45% would increase labour market participation of mothers by 5 pp in Italy, 10 pp in Hungary and 17 pp in Austria. This could be achieved at relatively low cost, with net budgetary effects ranging from 0.006% of GDP in Italy to 0.025% in Austria and 0.015% in Hungary.

**In addition to skilling, activation, and tax reform measures, attracting some third-country nationals to the EU could help to address labour shortages.** The European Commission's Skills and Talent package aims to increase the effectiveness of EU legal migration policy. Smooth integration of newly arrived workers into the labour market and society requires the provision of language courses and upskilling/reskilling opportunities. As part of the 2023 European Year of Skills, the Commission will also adopt initiatives on the recognition of qualifications and validation of skills attained abroad, as well as a proposal on an EU Talent Pool to facilitate matching between employers and migrants.

**Social partners have an important role in tackling labour and skills shortages.** They are key actors in providing tailored training, improving working conditions, collaborating with PES, and facilitating adult learning opportunities. This can help to address labour shortages, particularly by improving matching of labour supply and demand, as well as increasing the attractiveness and quality of jobs in certain occupations and sectors facing shortages.

**Finally, some measures address other root causes of labour shortages.** The Recommendations on effective active support to employment and on ensuring a fair transition towards climate neutrality provide broader policy guidance on managing labour market transitions. The Directive on Adequate Minimum Wages has the potential to improve pay conditions generally, particularly in some shortage occupations. The Recommendation on access to social protection for workers and self-employed has important implications for ensuring quality employment opportunities. The Strategic Framework on Health and Safety at Work 2021-2027 defines the key priorities and actions for improving workers' health and safety at work. Lastly, the European Care Strategy and the Recommendation on early childhood education and care (Barcelona targets 2030) aim to improve the availability, adequacy, and quality of care, with a potential positive impact on the labour market participation of women.

**All of these initiatives contribute to the headline 2030 targets of 78% employment rate, at least 60% of adults attending training every year, and a reduction of people at risk of poverty or social exclusion by at least 15 million, as outlined in the European Pillar of Social Rights Action Plan.** These aims are underpinned by significant funding at EU level, including through the Recovery and Resilience Facility (RRF) and the European Social Fund Plus (ESF+). Member States' Recovery and Resilience Plans (RRPs) endorsed by the European Commission and the Council show that some 20% of social expenditure is dedicated to employment and skills. The ESF+ provides almost EUR 99.3 billion to support EU employment, social, education and skills policies, helping to address a number of structural drivers of labour shortages, such as skills shortages and working conditions. The European Regional Development Fund (ERDF) also provides support for education, training and skills with around EUR 8.2 billion in the 2021-2027 period.



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