



LABOUR SUPPLY IN A CHANGING WORLD: the effects of ageing, digitalisation, the green transition, and globalisation

Mikkel Barslund, Karolien Lenaerts, Laurène Thil
HIVA-KU Leuven

AT A GLANCE:

- ▶ Key sectors are facing labour shortages, even as overall labour supply has hit an all-time high. This offers an opportunity for policymakers to integrate underrepresented groups, such as non-EU migrants, individuals with low education, NEETs, and people with disabilities.
- ▶ Ageing populations, digitalisation, the green transition, and globalisation affect labour supply both directly and indirectly, influencing who can participate and the skills required.
- ▶ Targeted measures like childcare support, flexible work options, and inclusion initiatives are crucial if we are to bring marginalised groups into the workforce and sustain welfare systems.
- ▶ Upskilling and retraining are essential to address skill mismatches and prepare workers for evolving job demands in green and digital sectors.
- ▶ Employers, unions, and governments must work together to create supportive frameworks, balancing systemic initiatives with individual responsibility for learning and career adaptation.



► Summary

Many EU Member States are facing [critical shortages](#) in a range of occupations, with countless [unfilled vacancies](#), even as labour supply is at an all-time high. This is a clear call to action: policymakers at all levels should seize the opportunity to integrate more people fully into the job market. Now is the time to break down the barriers that are keeping large groups excluded from or [underrepresented in the workforce](#) — notably, [non-EU migrants](#), individuals with low educational attainment, NEETs (not in employment, education, or training), and people with disabilities.

In addition to the immediate benefit of plugging gaps in the market, increasing labour market participation is also fundamental to addressing Europe's biggest challenges: the megatrends of an [ageing population](#), [the green transition](#), [digitalisation](#), and [globalisation](#). More importantly, ensuring broader participation in the labour market is crucial for improving individual well-being. Bringing more people into the labour market, more fully, is essential for creating sustainable economies and more meaningful lives for the people of Europe.

The impact of those four megatrends on labour supply, both directly and indirectly, will only grow, as they enhance or hinder workers' opportunities to participate in the labour market. Prominent examples are the increasing need for informal care in ageing societies, which hampers the supply of labour from older women, and the supply-enhancing potential of digitalisation by facilitating [remote work](#). Of course, globalisation and associated migration directly affect labour supply. Indirect effects include, in particular, [labour reallocations stemming from the green and digital transitions](#), and [the changing nature of many jobs](#), which have the potential to lead to discouraged workers and a decrease in labour supply.

Given these dynamics and favourable labour market conditions, increasing labour supply should be a policy priority, with greater policy experimentation across member states. Policy options to ensure a sustainable labour supply include fostering education and skills development and encouraging [inclusive labour market policies](#) to integrate underrepresented groups. Additionally, [investments in retraining and upskilling](#) workers to navigate the digital and green transitions will be critical to addressing future labour market demands.

Acknowledgements

The authors would like to thank Wouter Zwysen, Sem Vandekerckhove, Ramón Peña-Casas and Ludivine Martin for their excellent comments.

Legal notice

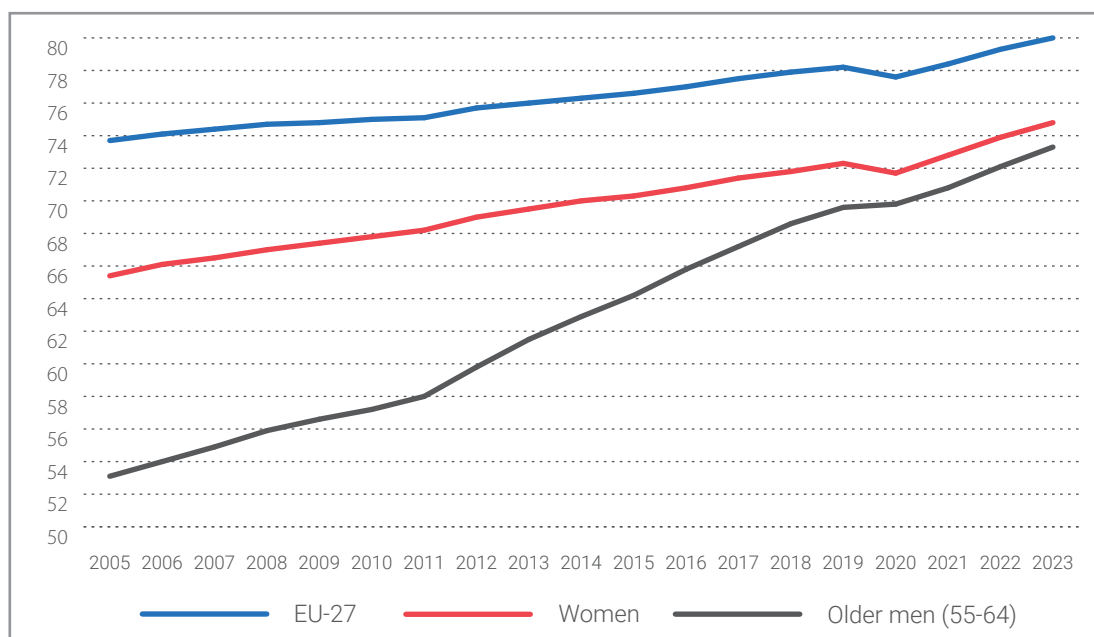
This project, WeLaR, has received funding under the Horizon Europe programme. Views and opinions expressed are, however, those of the authors only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

► Background

Over the past two decades, the European Union has experienced a significant increase in labour supply, with the activity rate rising from 73.7% in 2005 to an all-time high of 80% in 2023 (Figure 1). This growth has been primarily driven by [higher participation among older workers—especially men](#)—and prime-age women. Although the extent of these changes varies among Member States, the overall upward trend is consistent across the EU.

However, pressure to expand the labour supply even further is intensifying due to structural challenges driven by megatrends such as an ageing population, [the green transition](#), and [persistent labour shortages across key sectors](#). These shortages are particularly acute in areas like health and social care, hospitality, and construction, where demand is expected to grow even further. Moreover, the continued [digitalisation of work](#) and globalisation of the labour market are likely to impact labour supply in the coming decades.

Figure 1: Activity rate at EU-27 level and by gender (%), 2005-2023.

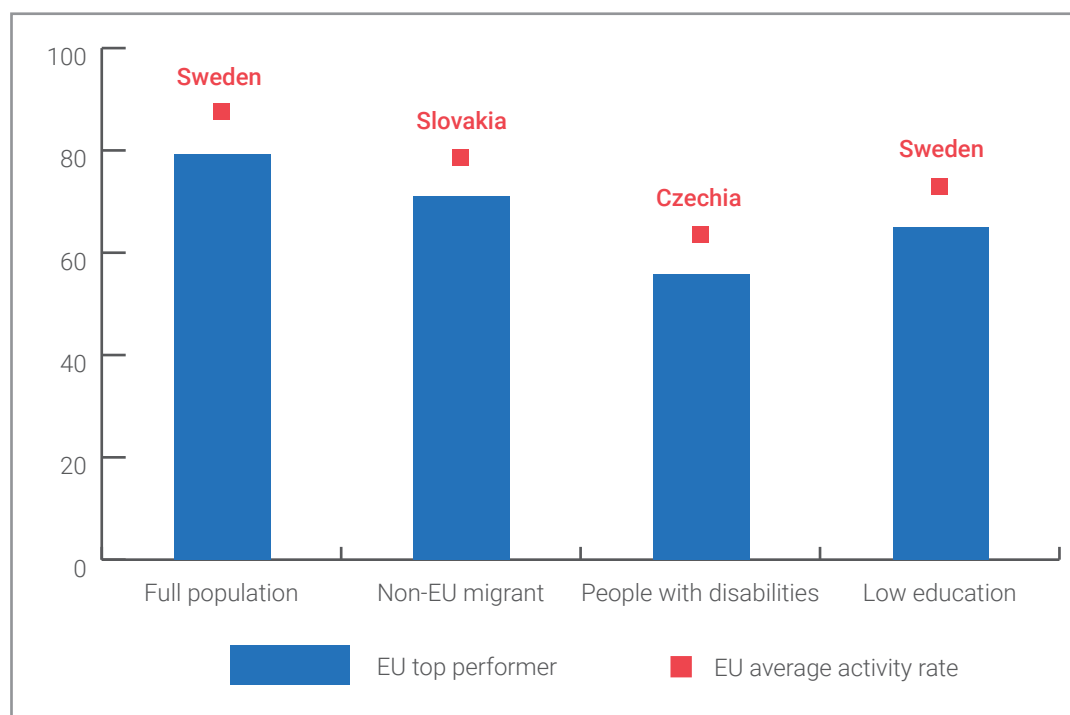


Source: Eurostat

Note: Data code: lfsq_argaed. Age class: 20 to 64 years.

These dynamics present significant challenges for expanding labour supply, and offer opportunities to foster more [inclusive labour markets](#). Despite the overall increase in labour market participation, certain groups remain underrepresented. Individuals with low educational attainment, non-EU migrants, NEETs, persons with disabilities, and women nearing retirement age are less likely to be active in the labour market. At the EU-27 level, considering all individuals aged 20 to 64, Sweden (SE) led with the highest activity rate of 87.6% in 2022 (Figure 2). People with disabilities have on average the lowest activity rate, with 55.8% in 2022. Addressing these participation gaps is important for sustaining welfare states and enhancing individual well-being. The [significant variation in labour market outcomes](#) within the EU indicates substantial potential for improving the labour supply of underrepresented groups.

Figure 2: Activity rate for various groups at EU-27 level and for EU top performer (%), 2022



Source: Eurostat.

Note: Data code: lfsq_argaed. Age class basis: 20 to 64 years.

People with disabilities: people who reported some or severe long-standing limitations in their usual activities due to health problems; Low education: Less than primary, primary and lower secondary education (levels 0-2); Non-EU migrant: Non-EU foreign country of birth.

► How megatrends affect labour supply

The four megatrends of population ageing, the green transition, digitalisation, and globalisation impact the potential labour supply in both *direct* and *indirect* ways. Direct effects occur when these trends alter the size or accessibility of the labour force itself. For example, demographic ageing directly reduces the available labour supply by increasing the proportion of older individuals exiting the workforce. Conversely, digitalisation can directly expand the labour force by enabling [remote work](#), allowing individuals who are unable to participate in traditional office environments—such as those with caregiving responsibilities or mobility limitations—to enter the workforce.

Indirect effects arise when megatrends influence the skills and competencies required for effective labour market participation, affecting the effective labour supply for a segment of the market. The green and digital transitions are reshaping labour demand by changing the set of needed skills. Workers whose [skills become obsolete](#) may find it challenging to secure employment without [additional training or upskilling](#). While they may be unemployed and looking for work and, therefore, technically part of the labour force, such "discouraged workers" are not effectively available to meet the market's new demands, thus indirectly reducing the effective labour supply.

► Impact of megatrends on labour supply

DEMOGRAPHIC CHANGE, particularly [population ageing](#), poses significant challenges to the EU's labour supply. Directly, as the proportion of older individuals in the population increases, [the \(relative\) stock of potential workers diminishes](#). In some Member States, the labour force is experiencing absolute decline due to (past) [low birth rates and increased life expectancy](#).

An ageing workforce also presents indirect impacts regarding skills development, job mobility, and geographic mobility. Older workers may require more targeted support to update their skills, especially as the demand for digital and green competencies grows. However, [they are less likely to participate in training and change jobs](#), hindering their ability to adapt to evolving labour market demands. Moreover, physical mobility—moving for job opportunities—tends to decline with age, exacerbating regional mismatches between job vacancies and available workers, particularly in rapidly changing sectors.

The ageing workforce also [faces higher risks of chronic health conditions](#), which can lead to reduced productivity and early retirement, further directly straining the labour supply. One particularly important issue is the increasing demand for informal care, which predominantly affects women in the later stages of their careers. As populations age, the need for care rises, and without sufficient high-quality formal care systems in place, much of this burden falls on women. This reduces their ability to remain active in the labour market or reduces the number of hours worked. The disproportionate [impact of informal care responsibilities on women exacerbates existing gender inequalities](#) in labour market participation and earnings.

DIGITALISATION is transforming the EU labour market by automating tasks, reshaping industries, and increasing demand for new skills. [Digitalisation has the potential to reshape Europe's labour supply](#) by altering how, where, and under what conditions people participate in the workforce. The impact on labour supply can work through several channels, some of which create new opportunities for participation while others pose challenges for certain groups.

Digitalisation directly enables increased labour market participation by offering [flexible and remote work options](#). Workers who may have been excluded from traditional office-based employment—such as [parents with caregiving responsibilities](#), people with disabilities, and individuals in remote or rural areas—can now engage in paid remote work. Remote work reduces the need for physical mobility, allowing individuals to participate in the labour market without relocating, thus broadening the geographic labour supply. This is especially beneficial for workers in regions with limited local job opportunities.

Additionally, digital labour platforms have facilitated the rise of the gig economy, [offering part-time or project-based employment](#). This allows people who may not be able to commit to full-time work—such as students, retirees, or those balancing family responsibilities—to flexibly participate in the labour market. However, while these [new forms of work](#) may expand the labour supply, they often lack traditional [employment's stability and social protections](#), potentially limiting long-term workforce engagement.

One indirect effect on labour supply comes through the increasing [barriers for those persons without the necessary digital skills](#), affecting the effective labour supply for a segment of the labour market. Workers increasingly need (advanced) digital literacy to remain employable. Those

lacking these skills—often older workers and individuals with low educational attainment—may struggle to adapt, leading to [early retirement](#) or [disengagement from the labour market](#). This “discouraged worker” effect reduces the effective labour supply.

Furthermore, digitalisation can indirectly impact labour supply through its [effect on health and well-being](#). Workers in fully remote or digitally intensive roles may face [social isolation, burnout, or digital fatigue](#). These issues can reduce productivity or lead to early exits from the workforce, indirectly diminishing the effective labour supply.

THE GREEN TRANSITION can indirectly affect labour supply through its impact on occupational composition. It creates [new job opportunities in sectors such as construction, renewable energy, energy efficiency, and environmental conservation](#), which often employ a higher share of people with low to medium educational attainment. Expanding these sectors may draw previously discouraged workers into the labour force, thus increasing the labour supply. On the other hand, the green transition reshapes labour demand by requiring new skills and competencies. [Job displacement in carbon-intensive industries](#), such as coal mining and heavy manufacturing, which are often highly localised, can result in workers exiting the labour force if they are unable to transition to new roles. This indirectly reduces the [effective labour supply](#).

GLOBALISATION shapes labour supply through [migration](#), talent mobility, and [international competition](#), directly and indirectly impacting it. Labour-market-related immigration directly increases the labour supply by bringing in workers who can help alleviate shortages in key sectors. Skilled migrants can fill gaps in industries facing acute shortages, such as healthcare, engineering, and [information technology](#). Globalisation also indirectly influences labour supply by affecting skills demand and employment stability. [The relocation of industries](#) changes the skills and competencies demanded, potentially reducing effective labour supply.

► What about other trends?

In addition to the four megatrends discussed above, other emerging factors can influence labour supply in the EU.

First, plans are underway to increase labour demand from [the armed forces in several EU countries in the coming years](#). This expansion – though small relative to the labour force – directly affects labour supply by reducing the pool of workers available to the civilian economy.

Second, declining fertility rates have had significant implications for the future labour supply. Providing incentives to increase fertility rates is now an objective in most EU countries. However, higher fertility can have short-term effects on labour supply by reducing the participation of (additional) parents—especially mothers—in the workforce. Both these trends reinforce the need to sustain an increase in labour supply.

Third, the increasing presence of robotisation and artificial intelligence (AI) raises [questions about whether we will need less—rather than more—labour in the future](#). While automation is expected to continue taking over repetitive and routine tasks, based on developments over the past two decades it seems unlikely that increased automation will reduce demand for labour. Rather, the nature of work will continuously evolve, with new roles emerging that require different skills and

competencies. It is too early to judge AI's longer-term impact on the labour market. However, in the face of this uncertainty, the appropriate policy response is to make workers more adaptable rather than plan for a future without work.

► Policy options to enhance labour supply

We focus on two core policy issues to enhance current and future labour supply. The first policy issue, which we argue should be pursued with urgency and high priority, addresses the opportunities that current (and lasting) labour shortages and tight labour markets offer for groups that are traditionally marginalised in the labour market. The second priority zooms in on improving lifelong learning to continuously upgrade the labour force, addressing changes in skills needs to improve labour supply in the longer run. Improving lifelong learning is a medium- to long-term strategy to keep the workforce well-skilled. The focus on lifelong learning must run in parallel to a sustained effort to get marginalised groups into employment.

Targeted policies should focus on skills development and retraining, particularly in vulnerable and underrepresented groups, to boost labour supply and address widespread shortages. The current labour market situation warrants a significant investment in upskilling and job placement for those groups. The long-term return on adding people to the active labour force is high, and the probability of success for marginalised groups is larger in a labour market with many unfilled vacancies.

[Promoting remote work and flexible hours can create inclusive workplaces](#) where individuals can balance personal responsibilities with professional demands. Additionally, [affordable childcare and family-friendly policies](#), such as shared parental leave and financial support, can encourage higher labour participation among women. However, it is important that these arrangements are thoughtfully chosen and implemented; otherwise, drawbacks may arise, such as feelings of isolation or difficulties in maintaining work-life balance. Encouraging remote work and flexible hours can create an inclusive environment, but without proper support and resources, employees may struggle with boundaries between personal and professional responsibilities. Supporting policies like affordable childcare, shared parental leave, and mental health programmes can help mitigate these challenges. By addressing the unique needs of various workers and ensuring that flexible options are managed well, the EU can enhance participation rates and build a more resilient labour supply in response to ongoing demographic and economic changes.

► Lifelong learning – working with social partners and emphasising personal responsibility

[Lifelong learning initiatives are needed for all age groups to ensure skills and competencies remain relevant in an evolving job market](#). Social partners—trade unions and employer organisations—play [a critical role in promoting lifelong learning](#) and fostering a culture of personal responsibility among workers. This is acknowledged [by the European Commission, ILO, and trade union and employer organisations](#).

Offering retraining opportunities can help people transition into sectors with higher demand, such as technology and green industries, bridging the skills gap and increasing their participation in the workforce. Supporting [micro-credential](#) frameworks to [help workers validate](#) and keep track of their skills and competencies can be an important tool, and the [EU is working in that direction](#).

[Individual learning accounts](#), though there is [little current evidence](#) to draw on, and training leaves are potentially important tools to facilitate lifelong learning. However, where short-term training leave is available—e.g. in Germany and France—only a [small share of workers](#) use it. Programmes can fail to reach [persons with low educational attainment](#).

Getting the framework of lifelong learning right, including tailoring it to workers' needs, is of central importance for the share of the workforce participating in training. However, common to all schemes to foster and improve lifelong learning is that even the best framework will be ineffective if important segments of the workforce are not participating. Hence, there is a need for social partners not only to negotiate good framework conditions for participation in lifelong learning but to emphasise personal responsibility in pursuing learning and training. Since trade unions represent workers, they must work to strengthen this aspect. This can be done through campaigns or other material already provided to workers. The other side of the bargain is that companies should allow space for the “life” part of lifelong learning and accept that not all training may be related to an employee's current job.

Getting more people on a lifelong learning track should be a priority for social partners.

► Further Reading

DIGITALISATION

EU-OSHA (2024), Digital technologies at work and psychosocial risks: evidence and implications for occupational safety and health, Publications Office of the European Union, Luxembourg. https://osha.europa.eu/sites/default/files/documents/Digitalisation-and-PSR_EN.pdf

Eurofound and European Commission Joint Research Centre (2024), Regional employment change and the geography of telework in Europe, Publications Office of the European Union, Luxembourg. <https://www.eurofound.europa.eu/en/publications/2024/regional-employment-change-and-geography-telework-europe>

Eurofound (2024), The changing structure of employment in the EU: Annual review 2023, Eurofound research paper, Publications Office of the European Union, Luxembourg. <https://www.eurofound.europa.eu/en/publications/2024/changing-structure-employment-eu-annual-review-2023>

European Commission (2024), Labour and skills shortages in the EU: an action plan, COM(2024) 131 final, Brussels. <https://data.consilium.europa.eu/doc/document/ST-8153-2024-INIT/en/pdf>

Piasna, A. (2024). Job quality and digitalisation. ETUI Research Paper-Working paper. https://www.etui.org/sites/default/files/2024-01/Job%20quality%20and%20digitalisation_2024.pdf

DEMOGRAPHIC CHANGES

Deuster, C., Kajander, N., Muench, S., Natale, F., Nedee, A., Scapolo, F., Ueffing, P. and Vesnic Alujevic, L., (2023) Demography and climate change, EUR 31512 EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-68-04047-8, doi:10.2760/82662, JRC133580. <https://publications.jrc.ec.europa.eu/repository/handle/JRC133580>

Eurofound (2024), Keeping older workers engaged: Policies, practices and mechanisms, Eurofound working paper, Publications Office of the European Union, Luxembourg. <https://www.eurofound.europa.eu/en/publications/eurofound-paper/2024/keeping-older-workers-engaged-policies-practices-and-mechanisms>

European Commission. (2021). Green paper on ageing – Public consultation – Synopsis report. Staff working document. Publications Office of the European Union, Luxembourg. https://commission.europa.eu/document/download/3a592ed6-acc9-446f-befc-ff68a556c5ed_en?filename=swd_2021_282_en.pdf

European Commission. (2023). The impact of demographic change – in a changing environment. Staff working document. Publications Office of the European Union, Luxembourg. https://commission.europa.eu/system/files/2023-01/the_impact_of_demographic_change_in_a_changing_environment_2023.PDF

CLIMATE CHANGE

Cedefop (2021). The green employment and skills transformation: insights from a European Green Deal skills forecast scenario. Luxembourg: Publications Office. <http://data.europa.eu/doi/10.2801/112540>

EIGE (2020), Beijing +25 policy brief: Area K - Women and the environment: climate change is gendered, Publications Office of the European Union, Luxembourg. <https://eige.europa.eu/publications-resources/publications/beijing-25-policy-brief-area-k-women-and-environment>

Eurofound (2023), Changing labour markets – How to prevent a mismatch between skills and jobs in times of transition – Background paper, Eurofound, Dublin. <https://www.eurofound.europa.eu/en/publications/2023/changing-labour-markets-how-prevent-mismatch-between-skills-and-jobs-times>

European Commission (2022), The possible implications of the green transition for the EU labour market, Discussion paper 176, Publications Office of the European Union, Luxembourg. https://economy-finance.ec.europa.eu/system/files/2022-12/dp176_en_green%20transition%20labour.pdf

European Parliament (2024), Social and labour market impact of the green transition. Briefing. Publications Office of the European Union, Luxembourg. [https://www.europarl.europa.eu/RegData/etudes/BRIE/2024/762329/EPRS_BRI\(2024\)762329_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2024/762329/EPRS_BRI(2024)762329_EN.pdf)

GLOBALISATION

Eurofound (2008), Restructuring and employment: The impact of globalisation in the EU - Résumé, Publications Office of the European Union, Luxembourg. <https://www.eurofound.europa.eu/en/publications/2008/restructuring-and-employment-impact-globalisation-eu-resume>

Eurofound (2022), Recovery from COVID-19: The changing structure of employment in the EU, Publications Office of the European Union, Luxembourg. <https://www.eurofound.europa.eu/en/publications/2022/recovery-covid-19-changing-structure-employment-eu>

European Parliament (2016), The impact of globalization – Winners and losers in the EU and the USA. Publications Office of the European Union, Luxembourg. [https://www.europarl.europa.eu/RegData/etudes/IDAN/2016/586601/EPRS_IDA\(2016\)586601_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2016/586601/EPRS_IDA(2016)586601_EN.pdf)

ILO (2011a) Globalization and Labour Market Outcomes - The Wage Response to Shocks: The Role of Inter-Occupational Labor Adjustment. Geneva. https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_emp/documents/genericdocument/wcms_158386.pdf

ILO (2011b) Globalization and Labour Market Outcomes - Capacity Constraining Labor Market Frictions in a Global Economy. Geneva. https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_emp/documents/genericdocument/wcms_158396.pdf

LABOUR MARKET AND INEQUALITIES

Brunetti, I., & Ricci, A. (2021). Evaluating the Youth Guarantee Incentive: Evidence from employer-employees data. INAPP working paper <https://oa.inapp.gov.it/server/api/core/bitstreams/25d4b18a-4bb7-4e77-a58e-5e6810a10273/content>

EIGE (2017), Gender, skills and precarious work in the EU: Research note, Publications Office of the European Union, Luxembourg. <https://eige.europa.eu/publications-resources/publications/gender-skills-and-precarious-work-eu-research-note>

Eurofound (2024), The changing structure of employment in the EU: Annual review 2023, Eurofound research paper, Publications Office of the European Union, Luxembourg. <https://www.eurofound.europa.eu/en/publications/2024/changing-structure-employment-eu-annual-review-2023>

European Commission: Directorate-General for Employment, Social Affairs and Inclusion (2023), Labour market and wage developments in Europe 2023, Publications Office of the European Union, <https://data.europa.eu/doi/10.2767/1277>

European Commission: Directorate-General for Employment, Social Affairs and Inclusion, (2024) Baiocco, S., Bontout, O., Horn, R. and Ligonnet, B., Economic inequalities in the EU – Key trends and policies, Publications Office of the European Union, <https://data.europa.eu/doi/10.2767/296636>