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COMMISSION STAFF WORKING DOCUMENT

EMPLOYMENT AND SOCIAL DEVELOPMENTS IN EUROPE 2022
Chapter 3

CHAPTER 3

Young people and the labour market: new and persisting challenges

1. INTRODUCTION ([1])

The COVID-19 crisis highlighted the pre-existing challenges faced by young people in the labour market. Young people were one of the groups most strongly affected by job loss during the pandemic, chiefly because they tended to have more fixed-term contracts than the average workforce and were concentrated in sectors that were badly affected by the crisis. Young people transitioning from education to the labour market faced additional difficulties in finding their first job, while the long-term trend of declining numbers of young NEETs reversed. However, labour market shortages have already been noted in the post-COVID-19 recovery, with further shortages expected to emerge in the context of the green and digital transitions, offering more opportunities for young people. Young working-age people need access to good quality jobs that fully develop their productivity while helping to meet the growing demand for labour and skills. Only then can the recovery and the green and digital transitions result in a sustainable and fair future for all.

There is a growing need to provide an adequate framework for changing labour market realities and ensuring that social protection systems remain fit for purpose in the face of new challenges. The ESDE report in 2017 provided insights into intergenerational fairness in the context of the challenges faced by younger generations in the labour market, and their social implications. ([2]) The analysis showed that such phenomena are likely to be persistent, as they stem from structural changes such as new skills requirements and ever-faster technological change.

([1]) This chapter was written by Jakub Caisl, Gabor Katay, Giuseppe Piroli and Joe Rieff, with contributions from the JRC.

([2]) The 2017 ESDE report discusses parenthood, access to housing, wealth accumulation and the acquisition of pension entitlements, among other things.

This chapter presents evidence on how young workers are faring in the labour market in the aftermath of the COVID-19 crisis. It analyses the determinants of the probability of being NEET, looks at the impacts of recessions on labour market outcomes for young people, examines the composition of the young workforce, and describes the extent to which young workers are prepared for the digital transition.

2. NEETs: STRUCTURAL DRIVERS AND CHALLENGES

The shocks experienced by Member States' economies in recent years have had a major impact on students and young workers. The youth unemployment rate in the EU-27 rose by more than 1 pp in 2020. For fully employed young people (age 14-29), the probability of remaining in full employment dropped by 13 pp in Q2 2020 compared to Q2 2019. ([3]) Given their importance in the current and future labour market the integration of young people remains an important research topic for both scholars and policy-makers. The literature suggests that those with a good education are better equipped to deal with the transition from education to work, and generally have a higher chance of succeeding in the labour market, particularly during times of economic turbulence and shock. ([4]) Several analyses found that education and training influence certain aspects of labour market performance, including wages, time to first stable job, productivity, type of work, and other outcomes. ([5])

The NEET rate is increasingly used to represent the labour market integration of young people ([6]) and as a reference indicator for several policy initiatives, such as the Reinforced Youth Guarantee ([7]) and the SDGs. ([8]) NEETs are young people who are not accumulating human capital through any formal channels. ([9]) According to Eurofound, the NEET concept aims to gain a better understanding of the vulnerable status of young people and to facilitate monitoring of their access to the labour market. ([10]) Linked to the risk of a 'lost generation', it allows analysis of the complex nature of disadvantage in youth, suggesting a different approach to better qualify labour market vulnerability among young people. ([11]) In 2017, the Council of the European Union underlined that NEETs are a heterogeneous group with diverse needs and that effective outreach requires strong and persistent efforts on the part of national authorities, as well as cross-sectoral cooperation. ([12]) The European Parliament subsequently welcomed the 2020 Reinforced Youth Guarantee as a means of implementing a more individualised and targeted approach to both temporary and longer-term NEETs. ([13])

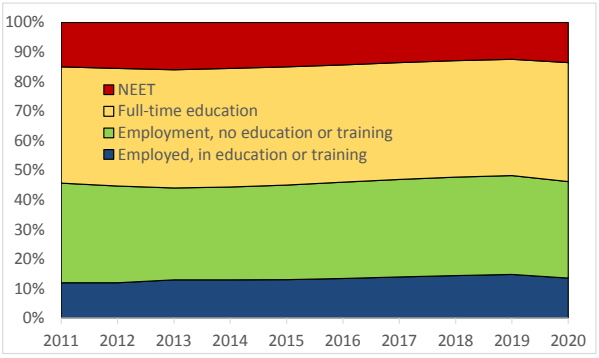
Young people's participation in education increased over the last 10 years. Between 2011 and 2020, the proportion of employed 15-29-year-olds involved in education or training in the EU-27 increased from 11.9% to 13.5%, while NEETs fell by almost 3 pp (to 12.6%) in 2019, just before the outbreak of COVID-19 (*Chart 3.1*).

([3]) ESDE Quarterly Review, December 2021 (European Commission, 2021a).
([4]) ESDE Quarterly Review, December 2021 (European Commission, 2021a); and ESDE Annual Review 2021 (European Commission, 2021b).
([5]) Ionescu and Cuza (2012) provide an analysis at macro level; see also ESDE (2018), Chapters 2 and 3.
([6]) Orfao et al. (2021).
([7]) Reinforced Youth Guarantee available here.
([8]) The NEET rate is the target indicator for SDG 8.2.
([9]) Eurofound (2012).
([10]) Eurofound summary of NEET concept available here.
([11]) Mascherini (2020).
([12]) Council Conclusions on the European Court of Auditors' Special Report No 5/2017, 'Youth unemployment - have EU policies made a difference? An assessment of the Youth Guarantee and the Youth Employment Initiative', available here.
([13]) European Parliament Resolution of 8 October 2020 on the Youth Guarantee, 2020/2764(RSP).

Chart 3.1

Young people are more involved in education

Participation rate (%) of 15-29-year-olds in education and training, EU-27, 2011-2020



Source: Eurostat, EU-LFS [edat_lfse_18].

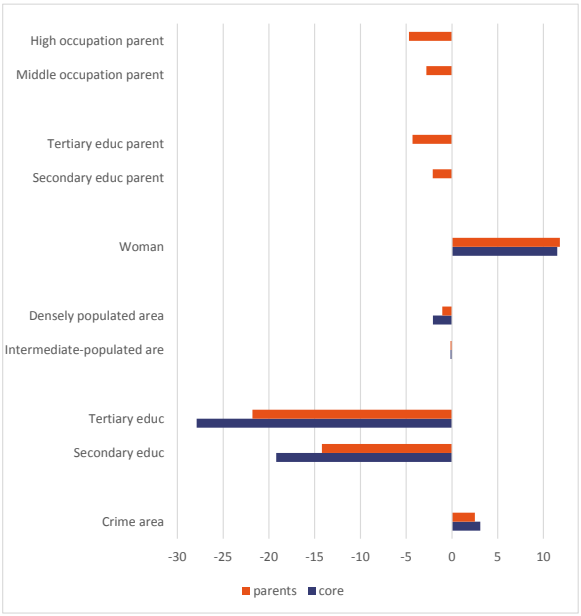
Click here to download chart.

The increase in educational activity is an important trend. In fact, own education level (together with other factors) strongly influences the probability of a young person being a NEET. The effects of individual, household and context characteristics on such probability are analysed through a probit model (*Chart 3.2*). ([14]) A first regression assesses the impact of personal characteristics (gender, own education ([15])) and social context (level of criminality in the area, density of urbanisation), while a second regression introduces parental background. Comparing the two estimates offers an insight into the impact of parental background, in particular.

Chart 3.2

Individual and household characteristics as key NEET factors

Factors connected to the probability of being a NEET, age 25-29 (pp), 2011, 2019



Note: Marginal effects (in pp) of probit regression with respect to the missing outcome of the variables. Model includes age and country dummies.

Source: DG EMPL estimates based on EU-SILC micro data, 2011 and 2019 UDB

Click here to download chart.

The core model (blue bars in *Chart 3.2*) confirms that young people with a lower education level are at greater risk of becoming trapped outside the labour market and education system. At the EU level, the probability of young people aged 25-29 becoming NEETs is approximately 19 pp lower for those in secondary education and 28 pp lower for those in tertiary education. ([16]) Furthermore, living in areas with high crime rates increases the likelihood of being a NEET by 3 pp. ([17]).

Taking socioeconomic background into account reduces the impact of personal education. This is evident from the second model, 'parents' vs 'core' (red bars in *Chart 3.2*), although the magnitude of that impact varies by country. The coefficients for own education decrease by around 20%, while

([14]) Information on parental background in the EU-27 is available for people aged 25-29 in EU-SILC ad hoc modules on 'Intergenerational transmission of disadvantages, household composition and evolution of income' (2019) and 'Intergenerational transmission of disadvantages' (2011). It is o

([15]) Three different levels of formal education (achieved level) are defined on the basis of the International Standard Classification of Education (ISCED) system: i) pre-primary, primary and lower secondary (ISCED 0-2); ii) upper secondary and post-secondary non-tertiary (ISCED 3-4) and iii) tertiary (ISCED 5-8).

([16]) Baseline represented by the lower level of education: pre-primary, primary and lower secondary (ISCED 0-2).

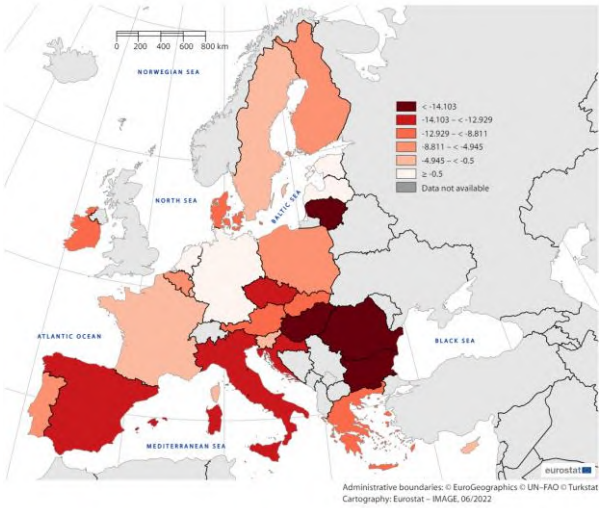
([17]) In EU-SILC, respondents assess whether they consider 'crime, violence or vandalism' in the local area to be a problem for the household (answer: yes/no).

those for parental education and occupation are highly significant. ([18]) For example, young people with high-educated parents in high occupations are almost 10 pp less likely to be NEET. ([19]). Own education remains the strongest driver, however. The magnitude of the country-specific impact of socioeconomic background is estimated by specific probit models, where the coefficients of parental occupation and education are combined into a single overall indicator of socioeconomic background (*Chart 3.3*). The impact of socioeconomic background decreases when moving from the south to the north of Europe ([20]) and southern Member States appear to be characterised by slow social mobility. The size of the impact ranges from -29 pp in Bulgaria to almost 0 pp in countries as Netherland and Germany.

Chart 3.3

Impact of socioeconomic background varies by Member State

Country impacts of socioeconomic background, high level vs low level



Note: Marginal effects from probit model.

Source: DG EMPL estimations, based on EU-SILC micro data, 2011 and 2019 UDB.

Click here to download chart.

Over the last two decades, Member States have encouraged young workers to participate in education and training. This has not necessarily had a strong impact on their performance, however, as education level is only one the drivers reducing the risk of being a NEET. Other factors such as socioeconomic context and background also play an important role.

Young workers' structural disadvantages translate into higher sensitivity to economic cycles and crises. Due to their shorter careers and weaker contractual positions, they are less adaptable to economic shocks than more experienced workers. The dynamics of previous recessions are therefore useful to understand labour market developments for young people during the COVID-19 crisis.

([18]) Earlier European Commission analysis had already shown the decisive impact of parental education on an individual's labour market performance (ESDE, 2018, Chapter 3). In the context of having a migration background, it was shown that a person's education plays less of a role in their success on the labour market if they are a migrant from third countries (see ESDE, 2015, p. 174).

([19]) Compared to those with low-educated parents in low occupations.

([20]) Cross-country differences do not preclude the existence of heterogeneity within countries. In Italy, for example, there is far more intergenerational income mobility in the north than in the south (Acciari et al., 2019).

3. YOUNG PEOPLE DURING BUSINESS CYCLES AND RECESSIONS: THE COVID-19 GENERATION

3.1. Sensitivity of the youth labour market to business cycles

Young people are disproportionately affected by cyclical variations in employment. During economic downturns, they are more likely to be laid off. Conversely, when the economy is booming, the demand for young workers typically increases more than that for older generations. The empirical literature corroborates the view that youth employment is significantly more sensitive to fluctuations in economic activity than that of prime-age workers. For example, there is evidence that between 1950 and 1976, US teenagers represented about 9% of the population but accounted for more than one-quarter of employment fluctuations. ([21]) More recent evidence also shows that both employment and unemployment are more volatile among young people than older people. ([22])

In line with the previous literature, the econometric analysis presented below suggests that the cost of business cycle fluctuations in the EU falls disproportionately on young people. Employment and unemployment rates for young people (aged 15-24) are significantly more sensitive to fluctuations in economic activity compared to the prime-age group (25-54) (*Table 3.1*). ([23]) Compared to the employment rate of prime-age individuals, youth employment reacts 1.8 to 2.4 times more strongly to negative or positive shocks to the economy. ([24]) Similar results emerge for unemployment among young people compared to prime-age workers, where the elasticity ranges between 2.3 and 2.5. *Box 3.1* presents some more technical details.

3.2. Impact of recession on the youth labour market

Recessions or economic crises have particularly adverse and long-lasting effects on young people's labour market prospects. Being exposed to a recession and the associated (and often extended) difficulties in finding a job in their very early career can affect longer-term labour market prospects. This 'scarring effect' is demonstrated in a large number of studies. ([25]) Possible explanations for the scarring effect include depreciation of human capital, ([26]) a poor match between employers and workers, ([27]) psychological discouragement or habituation effects, ([28]) or the negative signal of previous unemployment. ([29])

Recessions have prolonged effects on labour market outcomes for young people, with repercussions clearly visible for at least five years. ([30]) *Chart 3.4* shows the reaction of young people's labour market performance (activity rate, employment rate, etc.) relative to prime-age individuals, the latter being represented by the 0-line. Activity rates of young people deteriorate by about 1.5 pp compared to prime-age individuals in the first

([21]) Clark and Summers (1981).

([22]) Alba-Ramírez (1995); Jaimovich and Henry (2009).

([23]) In this section, 'the group of young people' refers to those aged 15-24.

([24]) For example, the coefficient of 'prime-age employment rate' in the 'young people's employment rate' equation is about 1.8 in the fixed-effects model and about 2.4 in the OLS equation. This means that whenever an aggregate shock hits the economy, young people's employment reacts between 1.8 and 2.4 times more than that of prime-age individuals. This corresponds to an 80-140% additional increase/decrease in employment for young people compared to prime-age workers.

([25]) See e.g. Brunner and Kuhn (2014); Cockx and Ghirelli (2016); Arellano-Bover (2020); Fernández-Kranz and Rodríguez-Planas (2018).

([26]) Becker (1994).

([27]) Pissarides (1994).

([28]) Clark et al. (2001).

([29]) Lockwood (1991).

([30]) For a detailed description of the estimation method used in this section, see Annex 1 'Local projections to estimate the impact of recession on labour market outcomes for young people'.

Table 3.1

Regression analyses of employment and unemployment among young people and prime-age individuals

Young people are significantly more exposed to fluctuations in economic activity

	Levels (fixed-effects model)		Differences (OLS)	
	Young people's employment rate	Young people's (1 - unemployment rate)	Young people's employment rate	Young people's (1 - unemployment rate)
Prime-age employment rate	1.769*** (0.090)		2.362*** (0.097)	
Prime-age (1 - unemployment rate)		2.291*** (0.035)		2.532*** (0.049)
Observations	957	957	957	957

Note: The table presents the regression results of the logarithm of young people's (15-24) employment rate (first and third columns) and the logarithm of (1-unemployment rate) (second and fourth columns) on the same statistics for prime-age individuals (25-54). The first two columns present the results from the fixed-effects model, while the last two columns show the results from the OLS model on differences. Additional controls include the ratio of young people to the prime-age population, as well as quadratic (fixed-effects model) or linear (OLS in differences) trends.

Source: DG EMPL calculations based on OECD data.

Click here to download table.

three years after a recession, with the labour supply of young people then starting to slowly recover. ([31]) Although the difference between the impacts of recessions on the activity rates of the two age groups is not statistically different after six years, full recovery can last much longer (the predicted impulse response returns to 0 only after 12 years (*Chart 3.4*, upper left graph). The impulse response for young people's employment rate is very similar to that of the activity rate (*Chart 3.4*, upper middle graph), while young people's unemployment rate (*Chart 3.4*, top right graph) peaks two years after the recession period.

The adjustment following a recession takes place partly at the intensive margin (hours worked per worker). As the bottom graphs of *Chart 3.4* show, both (involuntary) part-time employment and temporary contracts rise especially sharply among young people in the first three years after an economic downturn. Those aged 25-34 are also disproportionately affected by recession, albeit to a lesser extent than young people (see Annex 1).

Two years after the start of the COVID-19 crisis, the impact on young people is broadly consistent with previous recessions in Europe. As the initial shock to GDP was particularly large, it is unsurprising that employment among young people fell even more in 2020 (first red dot from the left in *Chart 3.4*(b)) than during the early phases of past recessions (blue line). At the same time, the loss of employment opportunities during the pandemic brought a larger share of young people out of the workforce rather than into unemployment.

([31]) Recessions are defined as negative yearly GDP growth (data from the OECD).

Box 3.1: Employment and unemployment variation among young people over the business cycle

The empirical model used here is similar to that of Alba-Ramírez (1995). It uses annual labour force statistics collected by the OECD for all EU Member States, disaggregated by age group. Data cover the years 1961-2021, with the start date varying by country. Data for 2021 are taken from Eurostat.

Using country fixed-effects models, the logarithm of young people's (15-24) employment rate and the logarithm of (1 - unemployment rate) are regressed on the same statistics for prime-age individuals (25-54). The comparison statistics for prime-age individuals are used as a proxy for demand fluctuations. To control for the labour supply of young people relative to prime-age individuals, the regressions include the ratio of young people to the prime-age population as a control variable. ([1]) Finally, quadratic trends are also included in the regressions to control for differences between generations in structural, social and other trended variables omitted from the equations,. An alternative specification is presented in the last two columns of *Table 3.1*, where the first difference of all variables is considered and an OLS regression is performed. In this alternative specification, the quadratic term of the trend is excluded from the regressions.

([1]) See e.g. Korenman and Neumark (2000) for an empirical study on the impact of relative demographic shocks on employment and unemployment.

Deeper and longer recessions naturally place a higher burden on young people than milder and shorter recessions. For each of the labour market indicators, the bottom graphs reveal that deeper recessions have a greater impact on young people relative to other age groups than mild recessions (graphs c vs d in the first rows of *Chart 3.5, Chart 3.6* and *Chart 3.7*). Similarly, longer recessions have a stronger adverse effect on young people than on prime-age individuals (graphs a vs b in the first rows of the same charts).

Mild and long recessions have a more dramatic impact on young workers than deep and short recessions (graphs g and h in *Chart 3.5*, *Chart 3.6* and *Chart 3.7*). This suggests that the length of the crisis matters more than the size of the GDP loss. In fact, the adverse effect of deep and short recessions on young people is detectable only in respect of unemployment rates. Even for unemployment, results confirm the larger impact of mild and long recessions compared to deep and short recessions. In the former, the unemployment rate of young people relative to the prime-age group peaks at 4.78 pp three years after the recession, while in the latter, it peaks at 3.79 pp in the year following the recession.

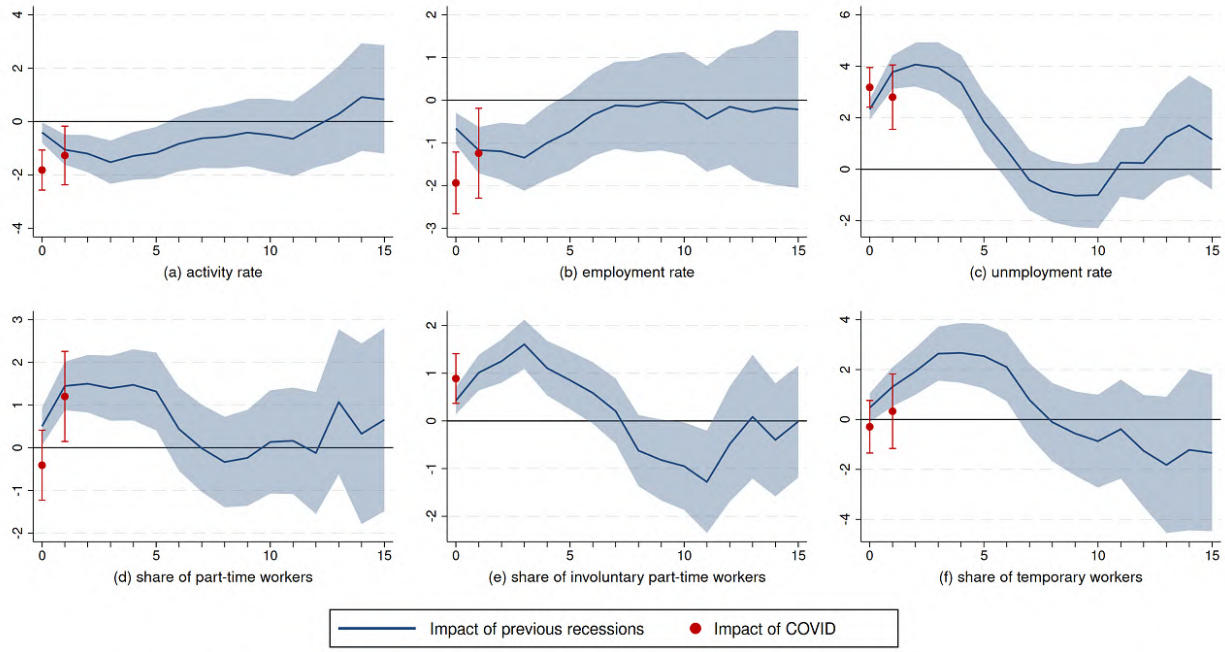
The historically deep COVID-19 recession appears to have been followed by rapid recovery in most Member States. Despite ongoing uncertainty surrounding the economic outlook – future economic conditions are closely tied to the pandemic trajectory and recent geopolitical upheaval – most (if not all) leading economic institutions expect the global economy to keep expanding in the coming years. The path of economic activity during and after the COVID-19 crisis is therefore closest to the deep and short recession scenario.

The longer the current subdued economic conditions last, the more severe their impact on young people's labour market prospects. Tentative lessons from past recessions suggest that the gap between young people's and prime-age workers' labour market dynamics will continue to narrow and eventually disappear in the medium term. However, should the crisis persist for longer than expected labour market conditions for young people entering the labour market during or shortly after the economic downturn may remain subdued for a far longer period. Youth-related policies will then play a strategic role in the medium-long term.

Chart 3.4

Impact of recession on labour market outcomes of young people (aged 15-24)

Evolution (impulse response) of six relative labour market indicators, starting from the period of recession (point 0 on the X-axis) and continuing up to 15 years after the recession (final point on the X-axis)



Note: Blue lines show how the selected labour market statistics for young people evolve relative to the same indicator for prime-age individuals. For example, the upper-left graph reveals that one year after an average recession in the EU, young people's labour force participation decreases 1 pp more than that of prime-age people. The light blue bands around the estimated impulse responses represent the corresponding 95% confidence intervals. The red dots and surrounding bars show the same impulse responses and confidence intervals as before, but evaluated specifically for the COVID-19 crisis. The graphs thus allow a direct comparison of the impact of the current crisis with that of previous recessions. The lack of sufficient data for the period during and following the COVID-19 crisis hinders a precise estimate of the impact of the crisis on young people and the estimated impact should therefore be interpreted with extreme caution.

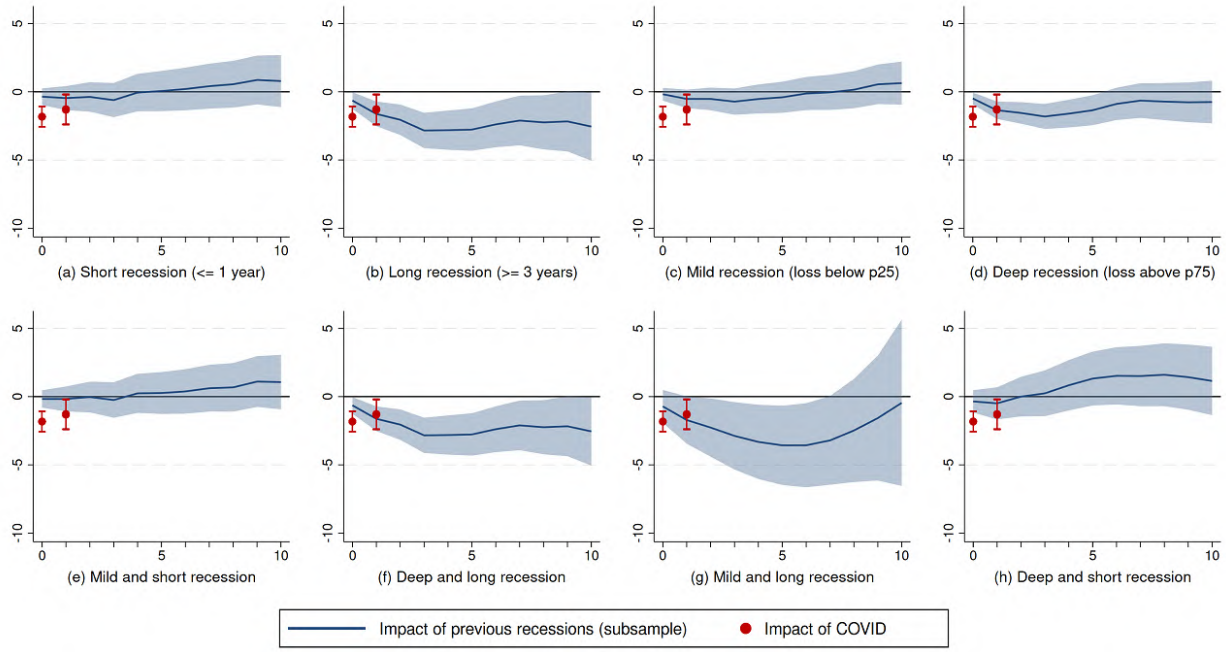
Source: Source: DG EMPL estimates based on OECD data.

Click here to download chart.

Chart 3.5

Activity rate, by length and depth of recession

Estimated impulse responses of young people's activity rate compared to prime-age individuals, across recession types



Note: Impulse responses shown separately for short recessions (only one year, about 25% of recessions in the sample); long recessions (more than two years, about 25% of the sample); mild recessions (maximum loss in GDP is below the first quartile); and deep recession (maximum loss in GDP is above the third quartile). The bottom graphs in each chart assess the heterogeneity of the impulse responses according to combined recession criteria: i) mild and short; ii) deep and long; iii) mild and long; and iv) deep and short.

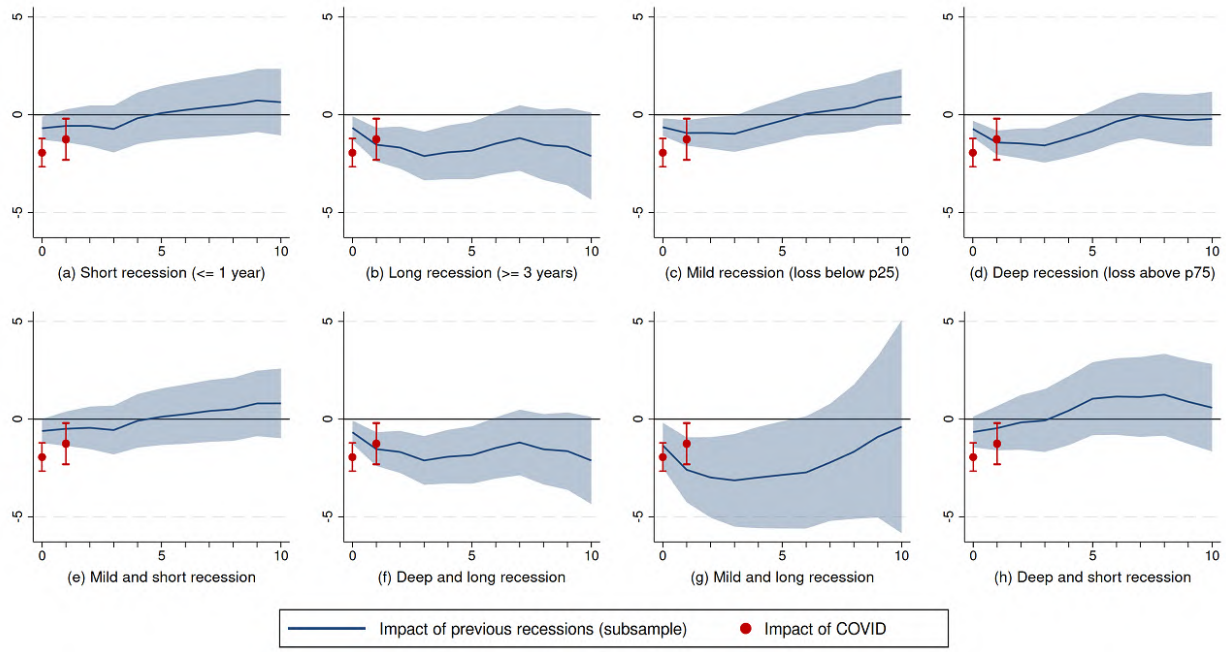
Source: DG EMPL estimates based on OECD data.

Click here to download chart.

Chart 3.6

Employment rate, by length and depth of recession

Estimated impulse responses of young people's employment rate compared to prime-age individuals, across recession types



Note: Impulse responses shown separately for short recessions (only one year, about 25% of recessions in the sample); long recessions (more than two years, about 25% of the sample); mild recessions (maximum loss in GDP is below the first quartile); and deep recession (maximum loss in GDP is above the third quartile). The bottom graphs in each chart assess the heterogeneity of the impulse responses according to combined recession criteria: i) mild and short; ii) deep and long; iii) mild and long; and iv) deep and short.

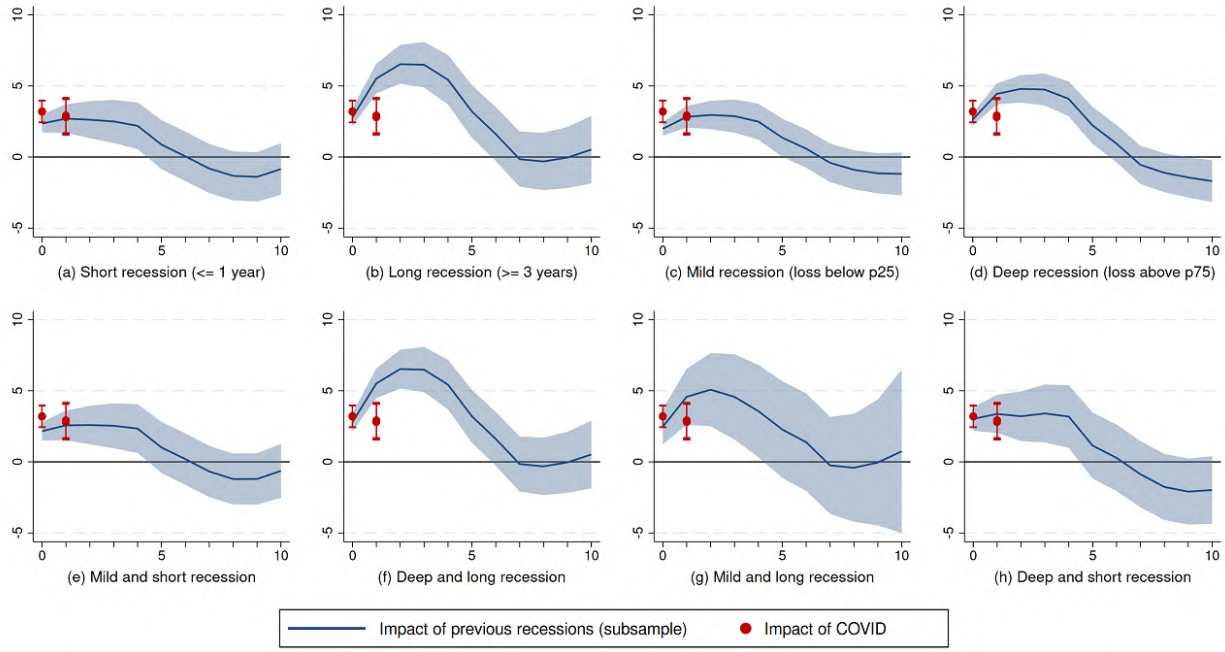
Source: DG EMPL estimates, based on OECD data.

Click here to download chart.

Chart 3.7

Unemployment rate, by length and depth of recession

Estimated impulse responses of young people's unemployment rate compared to prime-age individuals, across recession types



Note: Impulse responses shown separately for short recessions (only one year, about 25% of recessions in the sample); long recessions (more than two years, about 25% of the sample); mild recessions (maximum loss in GDP is below the first quartile); and deep recession (maximum loss in GDP is above the third quartile). The bottom graphs in each chart assess the heterogeneity of the impulse responses according to combined recession criteria: i) mild and short; ii) deep and long; iii) mild and long; and iv) deep and short.

Source: DG EMPL estimates, based on OECD data.

Click here to download chart.

4. POLICIES SUPPORTING YOUNG PEOPLE: THE RECOVERY AND RESILIENCE FACILITY ([32])

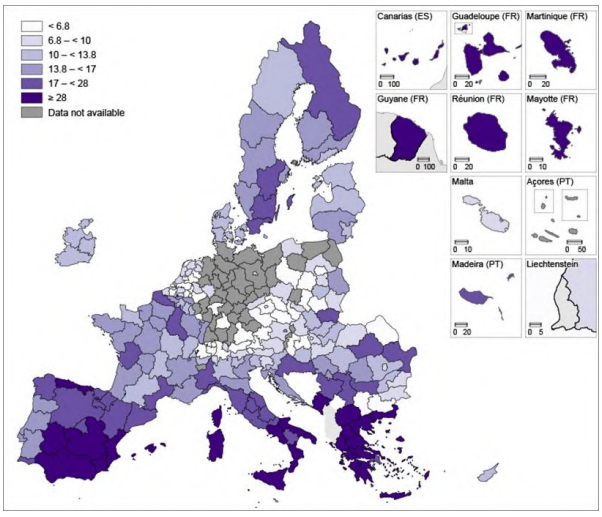
Government measures to stop the spread of COVID-19 in Europe in early 2020 generated a slowdown in economic activity, with associated effects on the labour market. Young people were impacted most severely, as relatively large proportions of workers in this age group had low to medium skills and were employed on temporary or part-time contracts. The maps in *Chart 3.8* and *Chart 3.9* show data on youth unemployment and NEETs in 2020, with many European regions exhibiting substantially high rates. Using data from the Recovery and Resilience Plans (RRP) on policy measures carried out in the context of the COVID-19 crisis, the RHOMOLO Spatial Dynamic General Equilibrium model was used to assess the potential macroeconomic impact of youth-related measures included in the Recovery and Resilience Facility (RRF).

([32]) This section is provided by the European Commission's Joint Research Centre (JRC), Knowledge for Finance, Innovation and Growth Unit - Territorial Data Analysis and Modelling (TEDAM) team, on the basis of Lazarou et al. (forthcoming).

Chart 3.8

Distribution of youth unemployment rates across EU regions

Youth unemployment rates – NUTS-2 (2020, 15-29 years old)



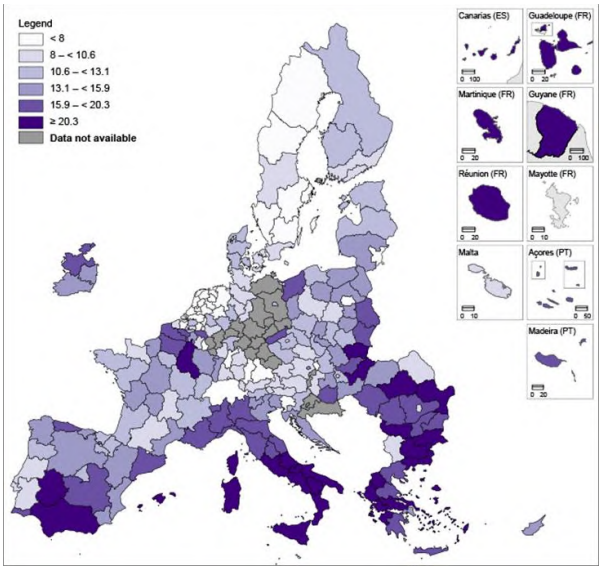
Source: Eurostat (LFST_R_LFU3RT).

Click here to download chart.

Chart 3.9

Distribution of NEET rates across EU regions

NEET rates – NUTS-2 (2020, 15-29 years old)



Source: Eurostat (EDAT_LFSE_22).

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The RRF was adopted at the beginning of 2021 ([33]) as part of NextGeneration EU. It sought to support the post-COVID-19 crisis recovery and to improve Member States' resilience to crises in general. Funds under the RRF (EUR 723.8 billion) assumed the form of grants (EUR 338 billion) and/or loans (EUR 385.8 billion). The maximum grant allocation to each Member State was based on their unemployment rate, inverse GDP per capita, and population. To access RRF funds, Member States were required to submit an RRP, which describes the actions (investments and reforms) to be funded.

The RRF youth-related measures were identified via text analysis, combining information from different official sources. ([34])

For modelling purposes, the measures were re-classified according to three categories:

- **Education and training**: Expenditure related to improving the functioning of schools and universities, modernising education programmes, scholarships for education access, actions to raise school attendance, and improving learning.
- **Employment support to job creation**: Grants to companies, public administrations' hiring unemployed people or PhDs, young people, PhD career opportunities, scholarships and fellowships for researchers, grants to companies.
- **Education infrastructure and equipment:** Expenditure for renovation or construction of buildings and/or equipment associated with schools, education or vocational education and training (VET) infrastructure, expenditure for student housing or accommodation, renovation and construction.

Youth-related actions were identified in 20 of the 22 RRPs analysed (except Denmark and Luxembourg). There was strong heterogeneity in the share of youth-related measures over the total estimated cost of the RRPs (*Chart 3.10*) and in the typologies of measures selected by Member States in their plans (*Chart 3.11*). For example, France and Malta registered the highest share of estimated costs for youth-related measures in their RRPs, with Estonia and Finland reporting the lowest shares.

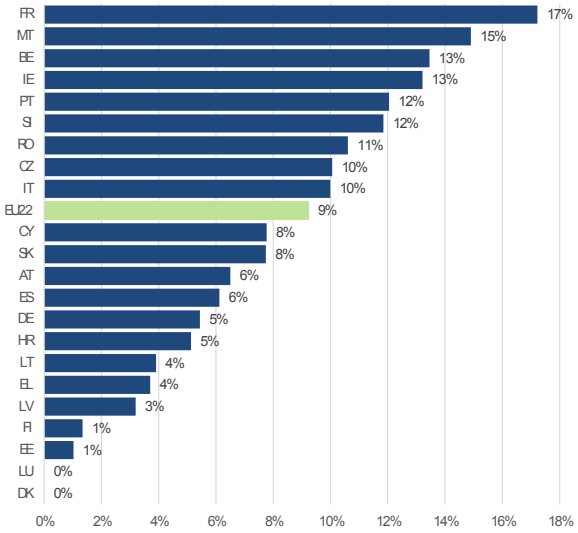
([33]) Regulation (EU) 2021/241 of the European Parliament and of the Council of 12 February 2021 establishing the Recovery and Resilience Facility.

([34]) The definition of youth-related measures is based on Commission Delegated Regulation (EU) 2021/2105, complemented by further text mining of official documents (staff working documents, Council implementing decisions and their annexes, RRPs, and the RRF Scoreboard) in order to distinguish measures dedicated to young people from those targeting children within the tagging 'children & youth' in the FENIX dashboard (DG ECFIN).

Chart 3.10

Intensity of RRPs' youth-related actions varies across Member States

Youth-related measures, % of RRP



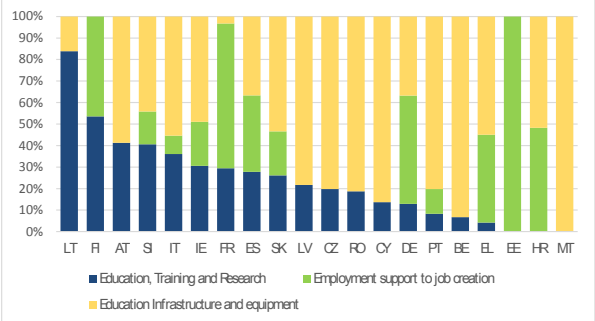
Source: JRC TEDAM calculations.

Click here to download chart.

Chart 3.11

Mix of measures' categories varies across Member States

Youth-related measures categories



Note: Classifications adopted for RHOMOLO modelling purposes.

Source: JRC TEDAM calculations.

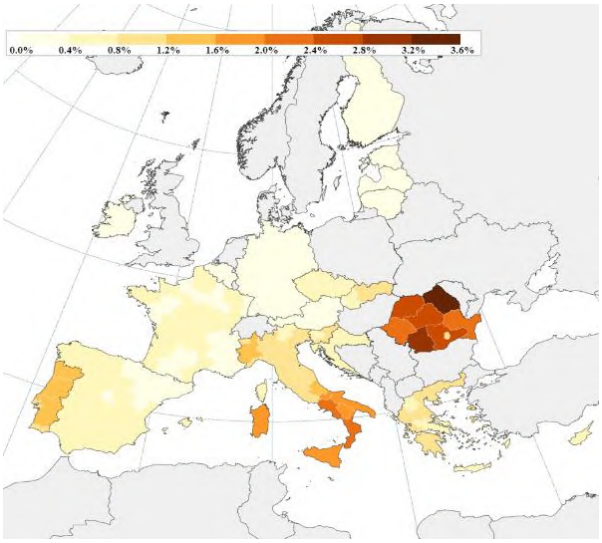
Click here to download chart.

Southern and eastern Member States reported the highest proportion of youth-related measures associated with tangible investments (education infrastructure and equipment). Lithuania expects to concentrate much of its support in education and training, while Germany, Estonia and France plan to focus on job creation. *Chart 3.12* illustrates an indicative regional allocation of youth-related RRF measures as a share of regional GDP. Although the RRPs are national plans and contain little information on the regional allocation of funds, the analysis considers the distribution of the funds proportional to the regional population. Countries/regions with higher unemployment rates among young people are expected to receive higher amounts of funding (*Chart 3.13*). Southern Italian regions rank at the top of fund distribution, followed by Romanian, Portuguese, Greek and southern Spanish regions. The RHOMOLO model simulates the potential effects on GDP and employment in the EU regions for 2026 (*Chart 3.14* and *Chart 3.15*).

Chart 3.12

Eastern and southern regions allocate large resources through RRF youth-related measures

RRF youth-related measures as % of regional GDP, 2021-2026



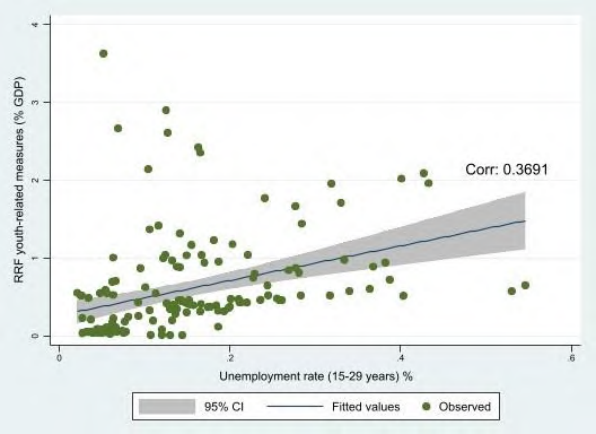
Source: JRC TEDAM calculations.

Click here to download chart.

Chart 3.13

Higher RRF youth-related investment is associated with higher youth unemployment rates

Relationship between potential regional allocation of RRF youth-related investments and youth unemployment rate



Note: Values of unemployment refer to 2019.

Source: JRC TEDAM calculations, based on Map A data and Eurostat [lfst_r_lfu3rt].

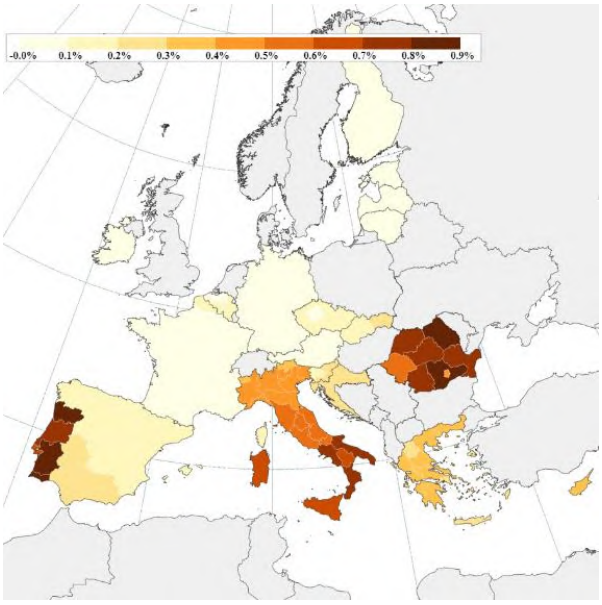
Click here to download chart.

On average, by 2026, youth-related RRF measures have the potential to increase regional GDP and employment by more than 0.6% and 0.1%, respectively. At the same time, in Portugal, Romania and certain southern Italian regions, the GDP and employment impact could reach 0.9% and 0.5%, respectively. Sizeable increases – in the order of 0.3% in terms of both GDP and employment – could be observed in Croatia, Cyprus, Greece, southern Spain (Andalucía, Extremadura) and eastern Slovakia. The effects mirror the indicative regional allocation of funds and support the regions most in need of positive labour market outcomes for young people. There is a 0.40 and 0.50 correlation, respectively, between 2026 GDP and employment impacts and the youth unemployment rate (*Chart 3.16* and *Chart 3.17*).

Chart 3.14

Major GDP impact of RRPs expected in eastern and southern regions

GDP impact of youth-related RRF measures in 2026



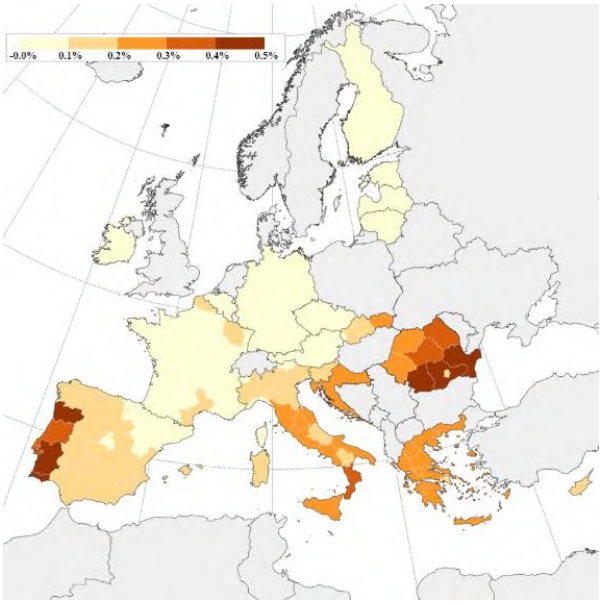
Source: JRC TEDAM RHOMOLO simulations.

Click here to download chart.

Chart 3.15

RRPs will support employment in Eastern and Southern regions

Employment impact of youth-related RRF measures in 2026



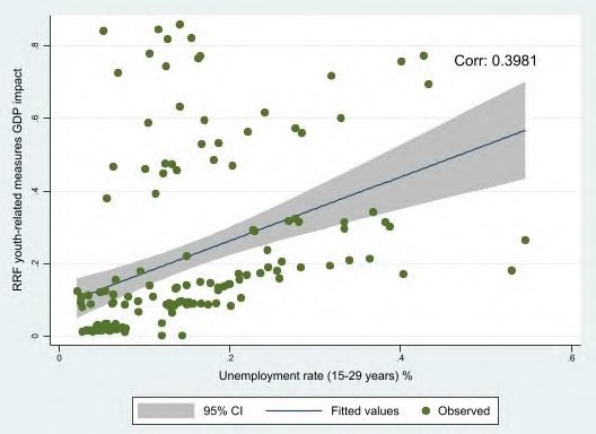
Source: JRC TEDAM RHOMOLO simulations.

Click here to download chart.

Chart 3.16

Correlation of 0.4 between 2026 GDP and employment impacts

Relationship between estimated RRF GDP effect and youth unemployment rate



Note: Values of unemployment refer to 2019.

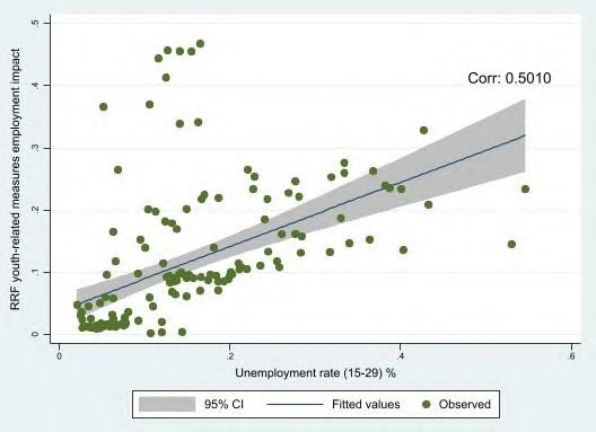
Source: JRC TEDAM calculations, based on Chart 3.14 data and Eurostat [lfst_r_lfu3rt].

Click here to download chart.

Chart 3.17

Correlation of 0.5 between 2026 GDP and youth unemployment rate

Relationship between estimated RRF employment effect and youth unemployment rate



Note: Values of unemployment refer to 2019.

Source: JRC TEDAM calculations, based on Chart 3.15 data and Eurostat [lfst_r_lfu3rt].

Click here to download chart.

5. OCCUPATIONAL PROFILES AND WORKING CONDITIONS OF YOUNG WORKERS ([35])

The impact of the COVID-19 crisis on the labour market varied considerably across age groups and occupations. ([36]) After the widespread drop in employment in 2020, a clear recovery in employment levels in 26 Member States ([37]) in 2021 was found for only a few occupational groups, defined at International Standard Classification of Occupations (ISCO) 1-digit level. *Chart 3.18* shows that professionals saw an increase of around 9% between 2019 and 2021, far higher than in 2019-2020. In 2021, employment as clerical support workers increased by 3.8% in Q2 and 6.1% in Q4 compared to the same quarters in 2019, recovering from a small reduction in 2020. There was also a small increase for managers in Q4. ([38]) For the other groups, employment in 2021 remained below pre-crisis levels, most notably in blue-collar occupations.

In many occupations, younger workers were disproportionally affected by employment drops. For service and sales workers, the highest reductions in employment in 2020 and in 2021 were found among young people, especially in Q2 2021 (-12.6%) (*Chart 3.18*). Among blue-collar workers (ISCO occupational groups 6-9), the decline in employment between 2019 and 2021 was higher for those aged 20-34 for craft and related trades workers, as well as plant and machine operators, and assemblers. Prime-age workers registered the sharpest drop in elementary occupations, at -9.2% in Q2 2021 compared to

([35]) This section was written by Sara Flisi and Giulia Santangelo (JRC).

([36]) The range 20-64 years is used in order to follow the employment rate headline target of the Europe 2020 Strategy, while the range for young workers (20-34) is chosen to include tertiary graduates.

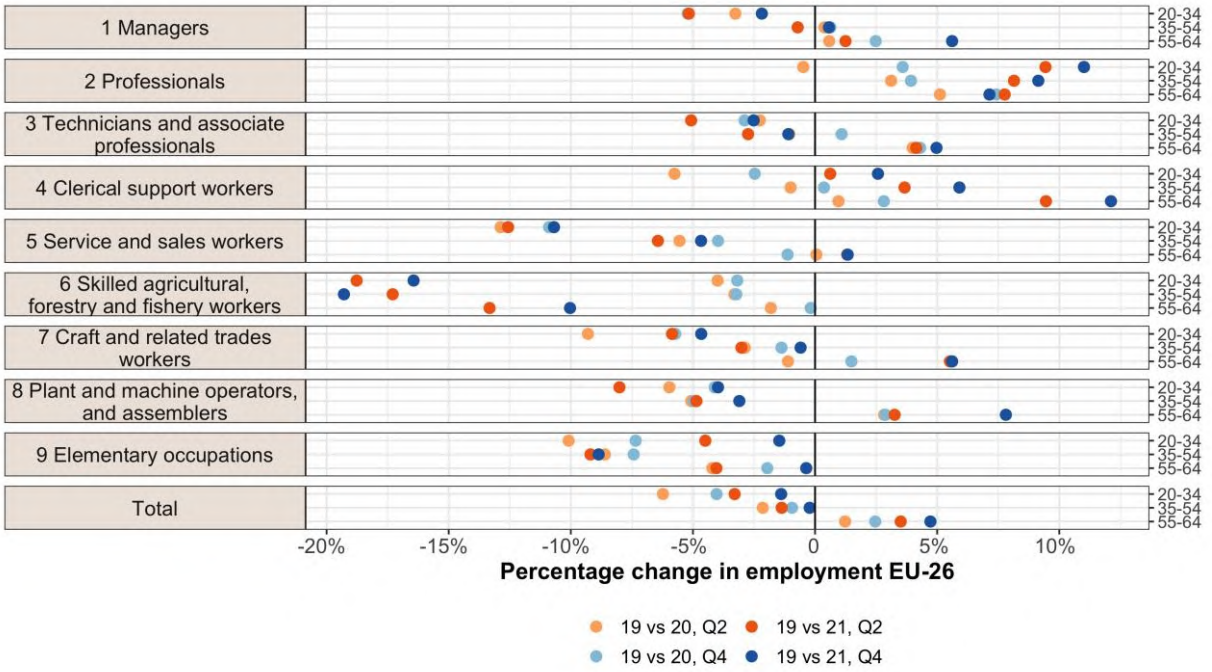
([37]) Changes in the design scheme in 2020 created a break in time series for Germany's EU-LFS data. As a result, the EU-LFS 2020 EU-27 average is unreliable when disaggregated data are presented, and the average for 26 Member States (excluding Germany) is used for the analysis here.

([38]) As Q2 2020 was the most severely hit by the pandemic, the analysis presents data on employment changes between Q2 2019, 2020 and 2021 so as to show both the immediate impact from Q2 2019 to Q2 2020, and the possible recovery from the initial losses that took place in 2021, comparing Q2 2019 with Q2 2021. The analysis includes data on the changes between the respective Q4s, as Q4 2021 is the most recent quarter for which data are available. Q2 values are shown in orange, while Q4 values are shown in blue. For both quarters, light colours indicate the changes over the period 2019-2020, while darker colours refer to the longer period 2019-2021.

Chart 3.18

Few occupational groups showed signs of recovery in 2021

Employment growth, by age and occupational group, Q2/Q4 2020 and 2021 compared to Q2/Q4 2019, all EU Member States excluding Germany



Note: Critical occupations identified based on the categorisation provided by the European Commission's 2020 Communication on guidelines concerning the exercise of the free movement of workers during the COVID-19 outbreak. Data refer to the age group 20-64. Armed forces are not taken into account in the analysis. Excludes Germany due to a break in time series.

Source: Calculations by the European Commission's Joint Research Centre, based on a Eurostat special extraction on EU-LFS data, the classification presented in Flisi and Santangelo (2022), and indices produced in Sostero et al. (2020).

Click here to download chart.

Q2 2019, double the decline experienced by younger people.

For some occupations, the impact of the crisis on employment depends on job characteristics. The ESDE report in 2021 showed that three main characteristics of jobs were relevant to identify those at higher risk of disruption during the COVID-19 pandemic: 1) whether occupations are critical ([39]) vs non-critical, 2) their level of technical teleworkability, and 3) the level of social interaction ([40]) required. These characteristics were analysed through indices built for detailed occupational groups (ISCO 3-digit level). The remainder of this section shows changes in employment between 2019 and 2020 – in line with the analysis presented in the ESDE report in 2021 – as well as between 2019 and 2021, for both Q2 and Q4 of each year, for the eight categories identified on the basis of the classification described in Annex 2. ([41])

Before the COVID-19 pandemic, young workers were more concentrated in non-critical jobs than older workers. In 2019, an average 40% of workers aged 20-34 were in critical occupations, while those aged 55-64 were almost equally distributed between critical (47%) and non-critical (53%) jobs. The distribution of jobs by level of teleworkability and social interaction was broadly similar across age groups. ([42])

The employment trends registered between 2019 and 2020 continued in 2021, with more

([39]) Critical occupations are those performing the delivery of essential services, such as health services or services related to the supply of food.

([40]) See Annex 2 'Methodology for the analysis by categorisation of workers'.

([41]) See European Commission (2021c) for an analysis of the evolution of employment in occupations with different degrees of contact intensity and teleworkability, using an alternative classification of jobs.

([42]) Prime-age workers were between the other two groups, with 42% of individuals in critical jobs.

favourable trends evident in teleworkable occupations. Teleworkable jobs in critical occupations even increased, especially those requiring limited social interaction. This pattern continued in 2021, with employment in this latter category increasing by around 20% compared to pre-pandemic levels. This growth was driven by a surge in the number of information and communications technology (ICT) professionals (software and applications developers and analysts, database and network professionals) engaging in occupations that were not only able to continue operating throughout containment measures, but were likely in high demand to facilitate increased telework during the pandemic. By contrast, job losses in 2020 were mostly concentrated in non-critical jobs, especially those that were not teleworkable and that required high social interaction (e.g. waiters and bartenders). This category saw a further drop in 2021. Among non-teleworkable jobs, critical jobs requiring low social interaction also saw a sharper fall in 2021 than in 2020, reaching as low as -7% in Q2 2021, compared to Q2 2019.

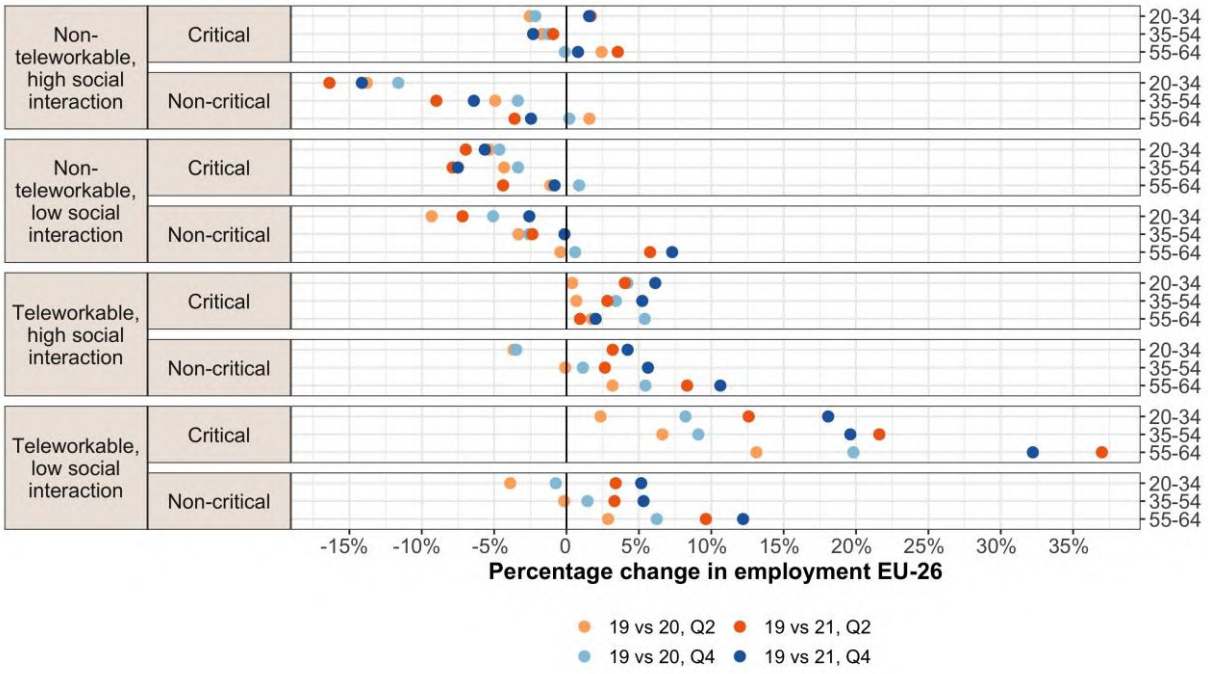
The younger age group again showed the strongest decreases in employment in the most severely hit categories. *Chart 3.19* shows that among non-critical, non-teleworkable jobs requiring high social interaction, the highest drop in employment was registered among those aged 20-34. This group reached a -16.4% employment level in Q2 2021, compared to Q2 2019 (with a 9% drop among prime-age workers, and 3.6% among older workers). That drop was still evident in Q4 2021, with a -14.1% reduction compared to Q4 2019 for the younger group, as opposed to -6.4 and -2.5% for prime-age and older workers, respectively. For critical, non-teleworkable jobs requiring low social interaction, the negative employment changes in 2021 affected both young workers and prime-age workers, with a slightly higher decrease for those aged 35-54 (close to 8%) in both Q2 and Q4, compared to 2019. Older workers also showed a reduction, albeit not as significant as the other groups.

Among the categories of jobs that saw an increase in employment, young workers often registered the lowest growth. Between 2019 and 2021, critical teleworkable jobs requiring low social interaction saw an increase of over 30% in Q2 and Q4 for older workers, and an increase of around 20% for prime-age workers, compared to a far lower increase for young workers (12.6% in Q2 and 18.1% in Q4). Employment in non-critical jobs in the same category was around 10% higher in 2021 than in 2019 among older workers, while that increase was between 3% (Q2) and 5% (Q4) in the younger age group.

Chart 3.19

Younger age groups showed the strongest decreases in employment in the most severely hit categories in 2021

Employment growth, by age and occupational category, Q2/Q4 2020 and 2021 compared to Q2/Q4 2019, all EU Member States excluding Germany



Note: Critical occupations identified based on the categorisation provided by the European Commission's 2020 Communication on guidelines concerning the exercise of the free movement of workers during the COVID-19 outbreak. Data refer to the age group 20-64. Armed forces are not taken into account in the analysis. Excludes Germany due to a break in time series.

Source: Calculations by the European Commission's Joint Research Centre, based on a Eurostat special extraction on EU-LFS data, the classification presented in Flisi and Santangelo (2022), and indices produced in Sostero et al. (2020).

Click here to download chart.

Young people experienced no particular advantage as a result of the widespread use of teleworking, despite their typically high digital skills. This reflects the typology of their jobs and contracts and the intrinsic characteristics of the labour market (which penalises young people during negative fluctuations), as well as the fact that teleworking does not require advanced digital skills. At the same time, the process of digitalisation is deeply affecting society and the economy and requiring a careful look at the evolution of employment in terms of the necessary digital skills.

6. DIGITAL SKILLS OF YOUNG WOMEN AND MEN AT WORK

Digitalisation has rapidly changed the world of work in recent years, ([43]) necessitating a careful look at the evolution digital skills of workers. Certain occupations have become largely obsolete through automation (e.g. much of assembly line work), others have seen their nature, organisation and content transformed (e.g. bank tellers), and entirely new jobs have been created (e.g. artificial intelligence (AI) programmers, Airbnb hosts). ([44]) While the exact balance between job creation and job destruction continues to generate much discussion, it is clear that digital technologies are increasingly used in most occupations, creating growing demand for a range of digital skills. ([45])

As digitalisation progresses, basic digital skills are becoming an everyday necessity within and outside the workplace. This is reflected in the European Commission's aim to ensure that 70% of adults have basic digital skills by

([43]) ESDE (2018).

([44]) Eurofound (2021); OECD (2019); European Commission (2019a).

([45]) JRC (2019).

2025 ([46]) and 80% by 2030. ([47]) The process of digitalisation sped up during the COVID-19 pandemic, with rapid adoption of new digital solutions to organise work, leading to a momentous shift in where and how people work. ([48]) In 2022, the European Parliament invited the Commission and the Member States to consider developing permanent, certified, free access for young people to online and offline courses for digital skills and literacy in all EU languages. ([49])

There is growing evidence that digitalisation may polarise the EU labour market and widen existing inequalities. ([50]) Digitalisation fosters demand for high-skilled workers, especially those equipped with a mix of digital, problem-solving and socio-emotional skills, a mix that is also linked to considerable wage premiums. ([51]) The consequences for low to medium-skilled workers are much more ambiguous because their work is considered more likely to be automated or de-skilled in the future, similar to past developments in mid-skilled jobs such as assembly, maintenance or monitoring, or mid-level administrative and service functions. ([52])

Overall, young workers seem relatively well-placed to benefit from the digital transition, compared to older workers. It is usually workers over 50 years of age who are considered vulnerable to the risks of digitalisation, given their lower access to, use of and exposure to digital technologies. ([53])

Young workers are a diverse group, with some far more likely to benefit from the digital transition than others. The risks of digitalisation are usually highlighted for certain groups of vulnerable workers, including those with lower educational attainment and those in lower income brackets. ([54]) Digitalisation may also widen labour market inequalities between young women and men, ([55]) as young men dominate employment in some of the best-paid digitally intensive occupations, such as ICT specialists. ([56])

The remainder of this section explores the diversity in the digital skills intensity of work among young people, using a newly developed digital intensity skills index (*Box 3.2*). It examines the digital intensity of young people's work compared to the rest of the population and explores variations across different groups of young people.

([46]) Target set by the Skills Agenda for Europe, available here.
([47]) European Pillar of Social Rights action plan, available here.
([48]) Eurofound (2021).
([49]) European Parliament Resolution of 17 February 2022 on empowering European youth: post-pandemic employment and social recovery (2021/2952(RSP)), p. 12, available here.
([50]) For example, Eurofound (2021a).
([51]) JRC (2020); OECD (2019); Grundke et al. (2018).
([52]) European Commission (2019b); OECD (2019).
([53]) For example, Vasilescu (2020); European Centre for the Development of Vocational Training (Cedefop) (2016).
([54]) For example, Vasilescu (2020); Cruz-Jesus et al. (2016); Cedefop (2016).
([55]) European Institute for Gender Equality (EIGE) (2020).
([56]) EIGE (2018); OECD (2017); Matysiak et al. (2021).

Box 3.2: Digital skills intensity index

The digital skills intensity index is a useful measure of work digitalisation at occupational level. It measures the average share of all necessary digital work-related skills for each occupational group at ISCO 3-digit level (e.g. if an occupation has 10 necessary skills and one of those skills is digital, the value of the index is 0.1). It was constructed by mapping digital skills identified from the European Skills/Competences, Qualifications and Occupations (ESCO) and Digital Competence (DigComp) frameworks for each of the ISCO 4-digit level occupational groups. ([1]) Weighted averages across ISCO 4-digit level occupational groups were then used to arrive at an index value at ISCO 3-digit level (the most detailed level available in EU-LFS micro data). Weights of the 4-digit level occupational groups were set equal to the number of people employed in each of these groups at national level, obtained from special EU-LFS data extraction provided by Eurostat. This means that values of the digital skills intensity index are country-specific at ISCO 3-digit level, reflecting national differences in representation of ISCO 4-digit level occupational groups.

The index sheds light on the digital intensity of work, but has several important limitations. It adopts a rather broad definition of digital skills, including all skills from the DigComp framework and skills linked to working with computers. While this may overestimate the digital intensity of some occupations, it avoids issues with selective approaches that rely on arbitrary selection of the skills considered digital. The index is a rather coarse measure of digital intensity – it does not specify how important digital skills are to overall job performance, for example, nor how often they are used, nor whether they are basic or advanced. This means that national variations – for example, in the frequency of use of certain digital skills at work - are not considered by the index.

([1]) More details on the methodology for constructing the digital skills intensity index can be found in Barslund (forthcoming).

6.1. Digital intensity of young people's work is slightly above average, with substantial gender and educational divides

In the EU, the digital intensity of work among young people (aged 15-29) reaches around 103% of the digital work intensity for the total working population. ([57]) An average young worker works in an occupation where around 4.5% of all necessary skills are digital. This is similar to the digital intensity for workers aged 30-49 (105%), but higher than workers aged 50-64 (about 92%). Young people's work is more digitally intensive than that of workers aged 50+ in 21 Member States. This is in line with findings from broader literature on the age divide in digital skills, which show that over-50s tend to access and use digital technologies less often and also tend to be less exposed to digital technologies at work. ([58]) The growth in digital intensity of work since 2011 was slightly higher for workers aged 25-29 (by 11%) than for older workers (by about 8%).

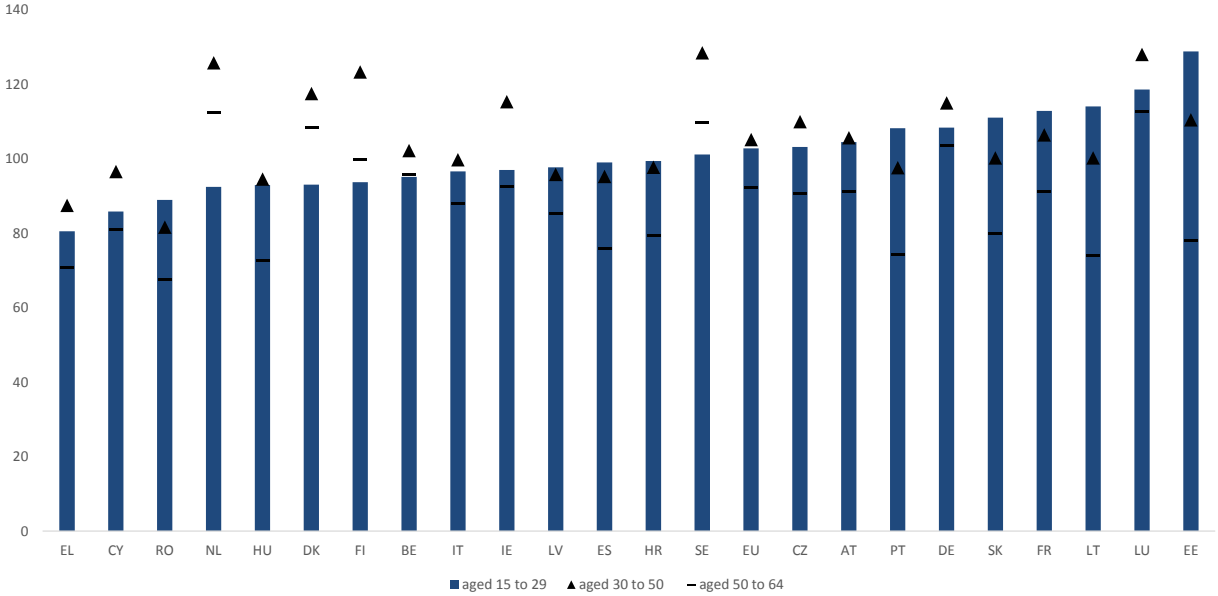
([57]) However, it is widely recognised that young people in rural and remote areas experienced particular difficulties during the pandemic due to the lack of sufficient broadband infrastructure.

([58]) For example, Vasilescu (2020); Cedefop (2016).

Chart 3.20

Higher digital intensity of work for younger workers compared to older workers

Digital skills intensity index (as percentage of the average across 23 Member States (= 100%)), by age group, 2019



Note: Digital intensity values reported as a percentage of the average across 23 Member States for the whole working population (=100%). It was not possible to calculate the digital skills intensity index for Bulgaria, Malta, Poland and Slovenia, as EU-LFS micro data do not include ISCO 3-digit codes for these four Member States.

Source: DG EMPL calculations based on EU-LFS micro data, UDB.

Click here to download chart.

There are considerable differences in the digital intensity of young people's work across the Member States. Young workers reach less than 90% of the EU average digital intensity in Cyprus, Greece and Romania, compared to more than 120% in Estonia. In practice, this means that in Greece, around 3.5% of the necessary skills in an average occupation are digital, compared to 5.5% in Estonia. While Nordic countries tend to have the highest digital intensity of work overall, this is largely due to a very high intensity among workers over 30 years of age. The geographical variation in digital intensity of work reflects broader variations in the progress of digitalisation across EU countries, as illustrated by the Digital Economy and Society Index (DESI) developed by the European Commission. ([59])

Work tends to be more digitally intensive for people with tertiary education, especially among younger workers. The digital skills intensity index reaches 150% of the EU average among workers aged 15-29 with tertiary education. By comparison, the index reaches only around 60% of the EU average for those without upper secondary education, suggesting that those with low educational attainment may struggle with the rising demand for digital skills. Similar patterns are evident among older workers, although the digital intensity of work declines with age, irrespective of level of educational attainment. These patterns reflect the findings from broader research, which highlight educational attainment as one of the key divides in digital skills. ([60]) This is partly because individuals with tertiary education are usually better equipped to cope with the complexity of new technologies (including digital) and partly because occupations that require tertiary qualifications are likely to be more information-intensive and thus to require more frequent use of digital technologies.

([59]) DESI available here.

([60]) For example, Cruz-Jesus et al. (2016).

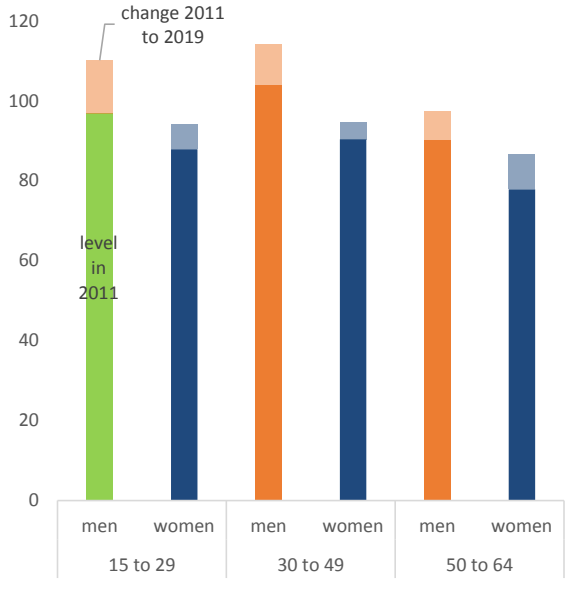
The average digital intensity of work is higher among young men than young women. The digital intensity of work among men aged 15-29 reaches 110%, compared to 94% among women in that age group. These differences vary considerably from country to country. In Belgium, the Netherlands, Portugal and Slovakia, young women's work is much less digitally intensive than men's (by more than 30%). By contrast, in Croatia, Latvia and Romania, young women's work is comparably (or somewhat more) digitally intensive to that of men.

The growth in digital intensity of work since 2011 was stronger for men aged 15-29 than for women in the same age group, with young men entering digitally intensive jobs more frequently. If this trend continues, the gap in digital intensity of work between young men and young women will widen by about 1 pp per year.

Chart 3.21

A gender gap is evident in the average digital intensity of work across all age groups

Digital skills intensity of work in 23 Member States (as percentage of overall cross-country average), by age group and gender, 2019



Note: Digital intensity values reported as a percentage of the average across 23 Member States for the whole working population (= 100%). It was not possible to calculate the digital skills intensity index for Bulgaria, Malta, Poland and Slovenia, as EU-LFS micro data do not include ISCO 3-digit codes for these four Member States.

Source: DG EMPL calculations based on EU-LFS micro data, UDB.

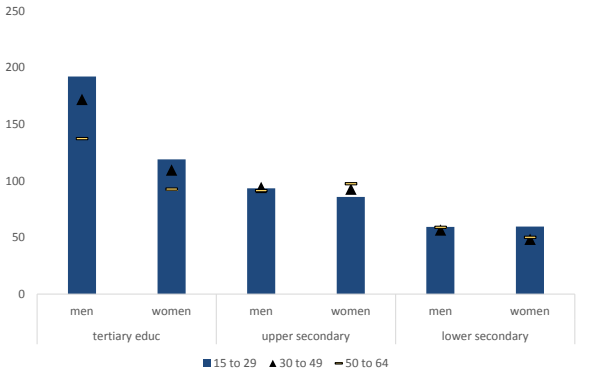
Click here to download chart.

Higher education alone will not reduce the gender gap in the digital intensity of work. In fact, the gap tends to be concentrated among men and women with tertiary education. The digital intensity of work for men aged 15-29 with tertiary education reaches more than 190% of the EU average, compared to only about 120% for women in the same age group. Higher overall achievement rates of tertiary education among young women ([61]) therefore do not translate into higher digital intensity of work. In fact, much of the gender gap in digital intensity of work stems from gender segregation in the EU labour market, particularly the lower representation of women in some high-skilled, digitally intensive occupations in science, technology, engineering, and mathematics (STEM).

Chart 3.22

Young men with tertiary education work in jobs with the highest digital

Digital skills intensity of work in 23 Member States (as percentage of overall cross-country average), by age group, educational attainment, and gender, 2019



Note: Digital intensity values reported as a percentage of the average across 23 Member States for the whole working population (which equals 100%). It was not possible to calculate the digital skills intensity index for Bulgaria, Malta, Poland and Slovenia, as EU-LFS micro data do not include ISCO 3-digit codes for these four Member States.

Source: DG EMPL calculations based on EU-LFS micro data, UDB.

Click here to download chart.

6.2. Gender and educational divides in digital intensity of work linked to participation in STEM occupations

The digital intensity of work is far higher, on average, for young workers in STEM than in other occupations. Work in an average STEM

([61]) In 2019, 45% of all women aged 25-34 achieved tertiary education, compared to 34% of men (Eurostat (dataset edat_lfse_03)).

occupation ([62]) is almost four times more digitally intensive than the average digital intensity of work in the EU, while the digital intensity of non-STEM occupations falls somewhat below the average. In other words, about 17% of necessary skills in an average STEM occupation are digital, compared to around 3% in other occupations. The top four most digitally intensive occupations in the EU are STEM occupations closely linked to work with ICT technologies – ICT operations and user support technicians, database and network professionals, software and applications developers/analysts, and telecoms and broadcasting technicians.

Table 3.2

High proportion of young men and workers with tertiary qualifications in STEM occupations

Digital intensity and selected worker characteristics for STEM occupations (ISCO codes 21, 25, 31, 35) in 23 Member States, 2019

	STEM occupations		Non-STEM occupations	
	All ages	*15 to 29*	*All ages*	*15 to 29*
Digital intensity (women)	322	340	81	80
Digital intensity (men)	335	397	68	66
Share of women	21%	26%	49%	48%
Share of high-educated	62%	62%	31%	26%

Note: Digital intensity values reported as a percentage of the average across 23 Member States for the whole working population (= 100%). The proportion of women and high-educated workers is calculated as an average across 23 Member States. It was not possible to identify the most digitally intensive jobs for Bulgaria, Malta, Poland and Slovenia, as EU-LFS micro data do not include ISCO 3-digit codes for these four Member States.

Source: DG EMPL calculations based on EU-LFS micro data, UDB.

Click here to download table.

Male dominance in STEM occupations is a key factor in the gender gap in the digital intensity of work among young people. Women aged 15-29 account for around only one in four STEM workers in this age category, and around one in four workers in the top four most digitally intensive occupations in the EU. When focusing on non-STEM occupations, gender gaps in the digital intensity of work disappear – in fact, young women's work tends to be somewhat more digitally intensive (80% of EU average) than that of young men (66% of EU average) in non-STEM occupations. This is linked to a higher proportion of young women with tertiary qualifications (who tend to hold more digitally intense jobs) among non-STEM workers.

Table 3.3

Young men dominate the top four most digitally intensive occupations

Proportion of women among all young workers in the top 10 most digitally intensive occupations in 23 Member States

Occupation	2011	2019	(pp)
ICT operations and user support technicians	13%	16%	2.9
Database and network professionals	8%	16%	7.8
Software and applications developers/analysts	17%	21%	3.4
Telecomms and broadcasting technicians	22%	21%	-0.6
Librarians, archivists and curators	74%	58%	-15.9
Mathematicians, actuaries and statisticians	30%	38%	7.7
Numerical clerks	71%	68%	-3.5
Electrotechnology engineers	17%	22%	4.2
ICT service managers	37%	18%	-19.2
Keyboard operators	54%	55%	0.8

Male dominated

Female dominated

Note: The proportion of women is calculated as an average across 23 Member States. It was not possible to identify the most digitally intensive jobs for Bulgaria, Malta, Poland and Slovenia, as EU-LFS micro data do not include ISCO 3-digit codes for these four Member States.

Source: DG EMPL calculations based on EU-LFS micro data, UDB.

Click here to download table.

Underrepresentation of women in STEM occupations is closely linked to gender segregation in relevant educational fields. ([63]) In 2019, for example, women accounted for about one in four tertiary education graduates in engineering, manufacturing and construction, and one in five graduates in ICT, proportions that have remained largely unchanged in recent years. ([64]) Other factors also contribute to this underrepresentation, such as broader gender stereotyping in the labour market, the gender divide in advanced digital skills, masculine organisational cultures in some workplaces, and a lack of work-life balance options and role models in certain STEM fields. ([65])

Much of the educational divide in the digital intensity of work of young people is linked to the participation divide in STEM occupations. Almost two-thirds of workers aged 15-29 in STEM occupations hold a tertiary qualification, compared to about one in four workers in non-STEM occupations. This is in line with expectations from previous research, which

([62]) Defined as occupations classified under ISCO codes 21, 25, 31, 35.

([63]) McNally (2020); EIGE (2020).

([64]) Based on Eurostat figures (educ_uoe_grad02).

([65]) EIGE (2020).

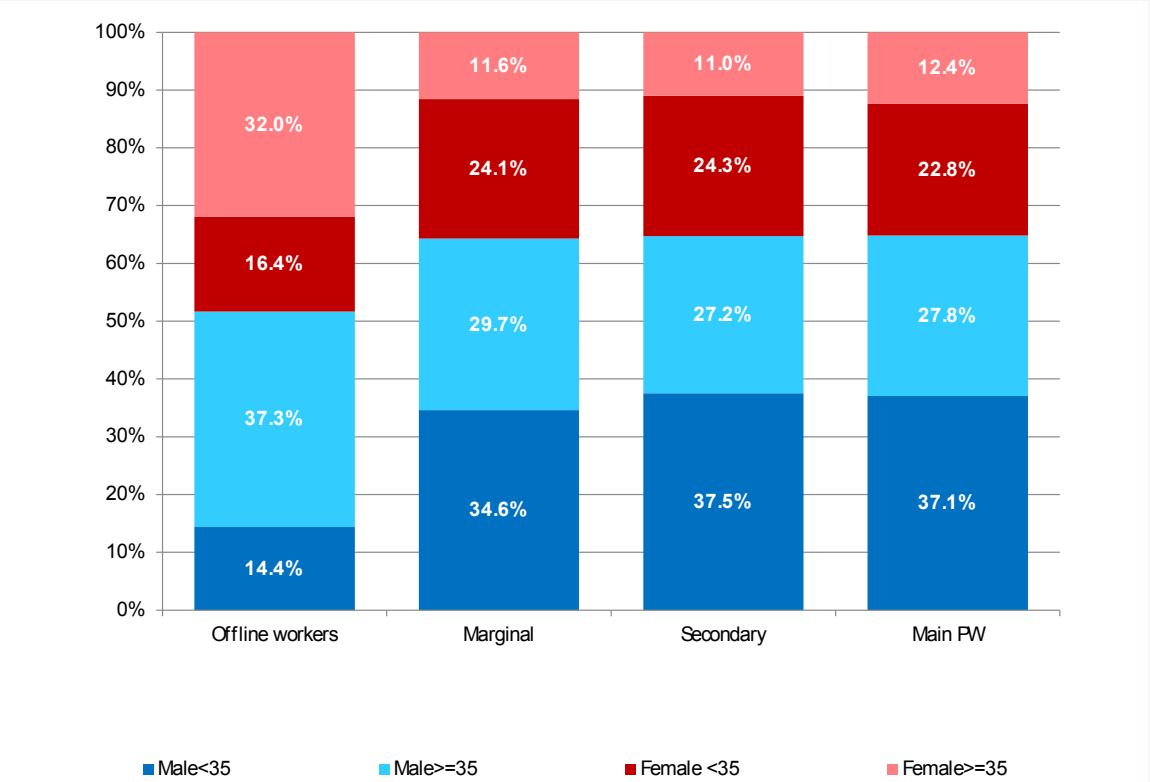
found that the highest digital intensity of work is most often found in high-skilled occupations, which require advanced digital skills, accompanied by good management, communication, self-organisation, and/or numeracy skills. ([66]) The educational divide in digital intensity of non-STEM work is much smaller than in employment overall – the digital intensity of non-STEM work reaches about 90% of the EU average for young workers with tertiary education, compared to about 50% for young workers without upper secondary education.

([66]) OECD (2019); OECD (2018); JRC (2020).

Box 3.3: Young workers in digital labour platforms

In recent years, digital labour platforms (DLPs) have emerged as a new form of coordinating the provision of labour services, enabled by the latest technological revolution. These DLPs are internet-based companies that intermediate and organise the work provided by workers or self-employed people to third-party clients. They share features that are typical of labour market intermediaries, such as temporary agencies. Unlike temporary agencies, however, DLPs tend to mediate single tasks or services rather than entire jobs. Importantly, they not only mediate, but actually coordinate, monitor and evaluate service provision, thereby carrying out functions that are typical of employers. Platform work is still a small, but significant phenomenon in European markets. According to the JRC 2018 COLLEEM survey, between 1% and 2% of European workers have platform work as their main source of income. ([1])

Chart 1
Digital platform workers, by age and gender, 2018 COLLEEM survey



Note: Offline workers are those who do not work on DLPs; Sporadic platform workers are those who rarely work on DLPs; Secondary workers are those who work regularly on DLPs, but as a source of secondary income; Main workers are those who work regularly on DLPs and for whom they are the main source of income.
Source: Urzí-Brancati et al. (2020).

As the chart shows, young people are much more likely to work on DLPs, and to have DLPs as an important source of income. According to the COLLEEM survey, the average age of European platform workers was 33.9, compared to 42.6 for the non-platform working population. Platform workers are also much more likely to be male than female. Among those that have platform work as their main source of income, 37% are young men (compared to 14% for regular workers). In addition, although the proportion of young women who are mainly platform workers is higher than in the regular workforce (23% compared to 16%), women are in general much less likely to work through DLPs than men.

([1]) Urzí-Brancati et al. (2020)

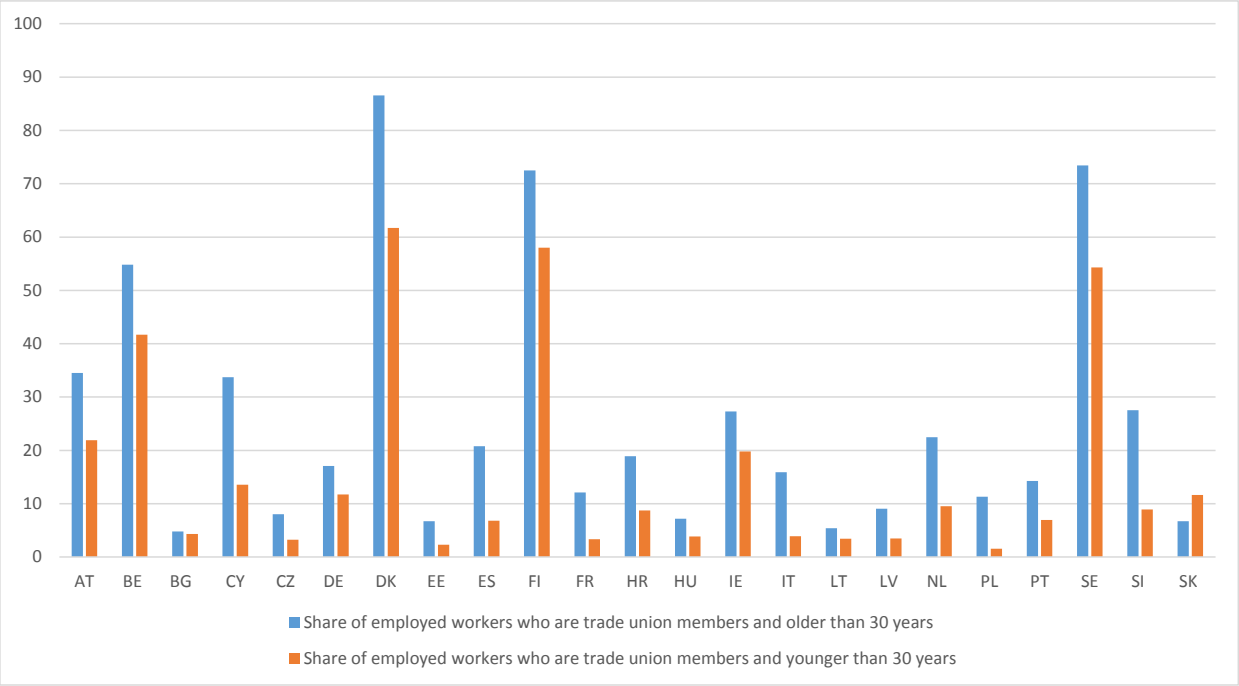
7. SOCIAL DIALOGUE FOR YOUNG WORKERS – SUPPORT FOR THE CHALLENGES AHEAD

Across the EU, collective bargaining is taking place in a changing socioeconomic context. Recent decades have seen a continuous decline in the number of workers organised in

Chart 3.23

Trade union coverage is correlated with age

Trade union density (%), by age group



Note: Calculations based on European Social Survey 2018, weighted to account for country size, and only including employed workers. Data not available for all Member States.

Source: European Social Survey 2018.

Click here to download chart.

trade unions. In 1995, the average trade union density ([67]) was about 42.9% in the EU-15, falling to 31.4% in 2018. Similarly the EU-15 average collective bargaining coverage ([68]) decreased from 82% in 1995 to 71% in 2018. ([69]) Reasons underpinning this trend include changing business models and structural changes. For example, economic activity declined in sectors in which workers were previously highly unionised, such as manufacturing. ([70]) An increase in the share of qualified workers, as well as a growing share of fixed-term contracts, have also contributed to decreasing collective bargaining coverage. ([71])

There are marked differences in trade union membership between younger (<30 years) and older (>30 years) workers. Chart 3.22 shows that, in almost all of the 23 Member States for which data were available, the share of workers who are members of a trade union is higher in the >30 age group than in the <30 age group. Workers under the age of 30 are only half as likely to join a trade union compared to workers aged 30+. This finding holds across sectors and groups with similar educational levels and is independent of gender or migration background. It is unlikely that these differences are due to changes in preferences for trade unions between one generation and the next. In many Member States, younger workers tend to be very supportive of collective bargaining and to have a high degree of trust in trade unions. ([72]) Rather, it is likely that other socioeconomic factors impact young workers' willingness to join trade unions.

([67]) Share of workers who are members of a trade union.

([68]) Share of workers covered by a collective bargaining agreement.

([69]) Averages are unweighted averages of trade union density and collective bargaining coverage rates, respectively. For reasons of comparability and data availability, averages are based on the EU-15.

([70]) Schnabel (2020).

([71]) Ellguth and Kohaut (2019).

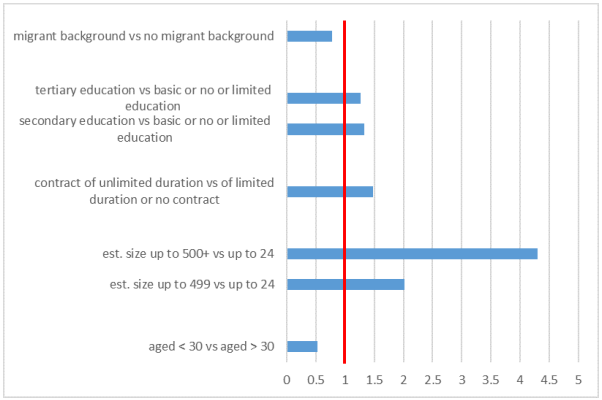
([72]) Cazes et al. (2019).

Despite the marked differences between age groups in trade union membership, many socioeconomic factors other than age are likely to have a stronger effect on workers' decisions to join trade unions. The growing prevalence of non-standard work is having an impact on trade union membership, with the duration of employment contracts proving particularly significant. Workers with contracts of unlimited duration are more likely to be trade union members than those with contracts of limited duration. Workers with limited duration contracts have weaker ties to companies and trade union membership is therefore less beneficial, reducing their motivation to join. ([73]) Workers with secondary or tertiary education are more disposed to join trade unions than those with lower levels of education (Chart 3.23). However, the existing literature is less conclusive on the impact of education. It may be that the skillsets of highly educated workers place them in a stronger individual bargaining position with their employers. ([74]) There is also evidence that the presence of trade unions or company works councils appears to motivate workers to join trade unions and to enhance companies' engagement in collective bargaining. ([75]) Evidence from Germany suggests that the presence of a works council within a company increases the likelihood for company-level and industry-level agreement by 9 pp. ([76]) The presence of company-level workers' representation increases the likelihood of a worker joining a trade union by up to 18%, compared to workers working in companies without such representation. ([77])

Chart 3.24

Certain groups are more likely to join a trade union

Odds rates of trade union membership, by education, ISCO, age, gender, migrant background, employment contract, size of company, company effects



Note: Logit regression; reported odds ratios are significant at 5% level. The odds rates are the ratios of the odds of joining a trade union. Values larger than 1 indicate a higher likelihood of joining the trade union if a characteristic is given.

Source: DG EMPL calculations based on European Social Survey 2018.

Click here to download chart.

Beyond individual socioeconomic characteristics, structural changes can explain much of the changing landscape of national collective bargaining systems and could be a reason for lower involvement of young workers in trade unions. Technological developments and new models of production and work affect national collective bargaining systems. Differences in unionisation are evident across sectors and different age groups, yet generational change (changes in views and ideological perceptions across generations) does not appear to drive the decrease in trade union density. Rather, the type of employment relationship, company size, and factors such as company-level workers' representation tend to impact trade union membership. In recent decades, changes in these areas have favoured a decrease in unionisation. In turn, a lower number of trade union members at the workplace limits unions' potential to recruit

([73]) Also highlighted by Schnabel (2020).

([74]) Ebbinghaus et al. (2011)

([75]) Cazes et al. (2020).

([76]) Jirjahn (2021) estimates the likelihood of collective bargaining coverage and employer organisation membership based on a dataset collected in the research project, 'Profit Sharing and Share Ownership of Employees in Germany'.

([77]) Ebbinghaus et al. (2011) explained trade union membership based on European Social Survey data from 19 Member States, using a logit regression. They corrected for several individual socioeconomic variables, as well as macroeconomic variables.

new members among the next generation of workers and may have a snowball effect, further decreasing trade union density. ([78]) Trade union representation at the workplace increases companies' engagement with collective bargaining, as do works councils. That representation is important in maintaining and increasing sufficient trade union membership and closing the gap between younger and older workers.

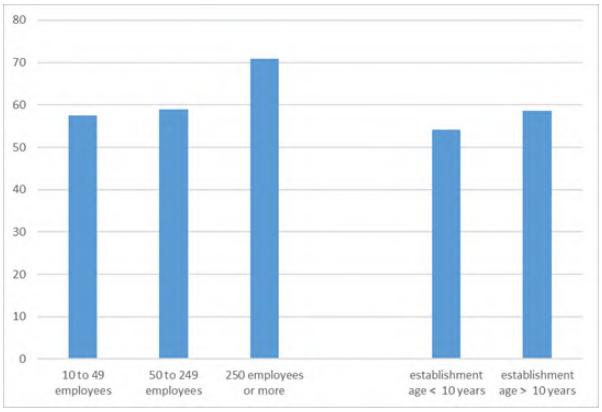
Company size appears to have a stronger impact on trade union density and collective bargaining coverage than the age of the workforce. Workers employed in larger companies are more likely to join trade unions than those employed in smaller establishments (Chart 3.23). A comparison between small companies (<24 employees), companies with up to 500 employees, and those with 500+ employees shows that the likelihood of joining a trade union increases with size of the company. Company size is also related to collective bargaining coverage (Chart 3.24). Across the EU, workers in larger companies are more often covered by collective bargaining agreements. This difference is particularly pronounced between companies with fewer than 250 employees and those with 250+ employees. In smaller companies, the absence of national or sectoral multi-employer agreements reduces the likelihood that workers are covered by a collective agreement, as smaller firms are less likely to negotiate company-level agreements. ([79]) Larger companies tend to benefit most from multi-employer agreements, due to high transaction cost savings, which may increase their support for such sectoral agreements. Overall, lower trade union density among younger cohorts is not necessarily a generational issue but is linked to other factors, such as the costs of unionising. In larger companies, the cost of unionising the workforce may be comparatively lower, as a larger group of workers is concentrated in one location.

Company maturity may impact the likelihood of engagement in collective bargaining. A small difference in collective bargaining coverage is evident between longer-standing companies and those established less than 10 years ago (Chart 3.24). Recent findings for Germany suggest that newer companies are less likely to engage in collective bargaining, perhaps because they need greater flexibility while organising and setting up their economic activity and perceive collective bargaining agreements as limiting their organisational flexibility. ([80])

Chart 3.25

Collective bargaining is more likely in larger and more established companies

Collective bargaining, by number of employees and duration of business



Note: Percentages weighted for country size. Differences in means of collective bargaining coverage by age group are statistically significantly.

Source: DG EMPL calculations based on European Company Survey 2019.

Click here to download chart.

([78]) Blanchflower and Bryson (2020).

([79]) OECD (2019).

([80]) Jirjahn (2021).

Chart 3.26

Worker representatives use social media to a very limited extent

Use of social media accounts

Note: The first question received a total of 3 073 responses. The second question had 556 responses.

Source: DG EMPL calculations based on European Company Survey, 2019.

Click here to download chart.

By adapting new modes of organisation, trade unions can increase their outreach to new potential members. Considering that exposure to trade unionism and collective bargaining has decreased at the workplace, unions need to make use of modern and inclusive campaigns, using all channels, including social media. Trade unions can make use of dedicated youth representations and committees to increase their responsiveness to the issues that are important to young workers. ([81]) Evidence from the US shows that by organising programmes for newly recruited workers, trade unions can positively affect workers' views of unions. ([82]) Workers who had a positive experience with these types of membership programmes tended to participate more often in the work of trade unions. IndustriALL Europe encourages national trade unions to organise high-quality orientation programmes and to engage new employees. ([83])

EU-level social partners have dedicated campaigns for issues of particular relevance for young workers. For example, the Uni Global Youth campaign 'Uni Yeah!' shares young workers' initiatives and activities, promoting mutual learning and providing information on key topics. ([84]) The EU-level social partners from the paper and pulp sector developed guidelines and a best practice toolkit on attracting and retaining young people, and on boosting and enhancing perceptions of the sector among that cohort. ([85])

Social partners at national and EU level are creating strategies and tools to identify and develop skills. A joint project saw four social partner organisations from Belgium, France, Luxembourg and the Netherlands create 'Testyourselfie'. ([86]) This online tool allows young high-school graduates (or their career guidance teachers) to assess their soft skills. This should increase their awareness of their soft skills and help to improve and develop those skills accordingly. ([87]) In the framework of a joint project, EU social partners from the textile, clothing, leather and footwear sector, together with national affiliated organisations, developed upskilling and reskilling strategies. ([88]) The project identifies actions and tools to anticipate skills needs and enhance matching in the labour market. It also aims to create an EU network of VET providers and to update training and education curricula in the sectors. Taking a more holistic approach, the EU social partners from the furniture sector are investigating the transition of their sector towards a circular economy. Their SAWYER ([89]) project assesses

([81]) Vandaele (2019).

([82]) Clark (2021).

([83]) IndustriALL Europe website available here.

([84]) Uni Yeah! campaign available here.

([85]) Guidelines and toolkit available here.

([86]) Training Fund for Temporary Agency Workers for Belgium (Travi), Temporary Work Training Insurance Fund for France (FAF.TT), Foundation for Training and Development Flexbranche (STOOF) in the Netherlands, and the Sectoral Training Fund for Temporary Work for Luxembourg (FSI).

([87]) See Baiocco et al. (2020) for more on trade union activities to improve training and working conditions of temporary workers.

([88]) Skills4Smart TCLF Industries 2030 available here.

([89]) Holistic approach for the identification of Skills and sAfety needs towards a groWing sustainability and circularitY of furniturE sector (SAWYER) project available here.

the potential impacts of the circular economy and the green and digital transitions on the furniture sector. It identifies new skills needs and emerging occupational safety and health challenges.

EU social partners are organising training for young workers and young employers. Business Europe, in collaboration with the International Training Centre of the ILO, organised the Young Professionals' Academy in 2020. The aim was to strengthen capacity among the young staff of employers' and business organisations to promote a better understanding of EU industrial relations and the functioning of business organisations. It also aimed to support the creation of networks among young professionals in these organisations. ([90]) In September 2021, IndustriALL Europe launched its Digital Youth Academy, a training programme for young trade unionists on the green transition, the future of trade unions, and the involvement of young workers in trade unions. ([91]) Since 2010, UNI Europa Youth has held its annual summer school to train young trade unionists in communication, leadership, teamwork and negotiation. As an EU social partner organisation, UNI Europa Youth draws on the experiences of its national member organisations, including certified trainers and experienced negotiators. The summer school serves as a means of training young trade unionists, as well as training trainers.

EU-level social partners aim to increase the attractiveness of their sectors. With financial support from the European Commission, trade unions and employer organisations from the footwear sector implemented a project in 2016 to identify issues in attracting young people to their sector and to develop relevant guidelines and best practices. In a follow-up project, they implemented four of those best practices in Italy, Poland, Portugal and Spain, building the capacity of national social partners to attract young workers to the footwear sector. ([92]) The EU social partners from the tanning and leather sectors, together with their national member organisations, carried out promotional activities in Austria, Bulgaria, France, Germany, Hungary, Italy, Portugal, Romania, Spain, Sweden and the UK.

Social dialogue is adapting to the changing world of work, and cross-border initiatives can enhance the creation of synergies between national social partners' organisations. At EU level, the European Commission is launching a two-part social dialogue initiative in 2022. The first part is a chapeau communication on strengthening social dialogue in the EU, while the second is a proposal for a Council recommendation on the role of social dialogue at national level. The initiative aims to improve the relationship between sectoral social dialogue and EU policy-making, support sectoral social dialogue to respond better to structural trends and new economic developments, and facilitate the EU's contribution to a future-proof sectoral social dialogue. Social partners are increasing their efforts to recruit young members, but further efforts could be made to utilise broader means of communication and modernise strategies to recruit new members, particularly young workers. Common cross-border projects facilitate exchanges and enhance mutual learning activities. EU-level social dialogue can thus play an important role in creating synergies and generating new sector-specific insights. This allows national social partners to train their affiliates to develop strategies to adapt to the changing world of work.

([90]) Young Professionals' Academy available here.
([91]) Digital Youth Academy available here.
([92]) In My Shoes project available here.

8. CONCLUSIONS

The COVID-19 pandemic has exacerbated the challenges for young workers, who experienced major difficulties throughout the crisis, similar to previous negative economic fluctuations. Unsurprisingly, structural weaknesses created an additional burden for young workers.

Although education and training activities have increased among young people, socioeconomic background remains highly relevant to individual opportunities. In fact, although the likelihood of being NEET strongly depends on education level, its impact is significantly reduced once parental and socioeconomic background is taken into account, notably in southern regions of Europe.

As in previous recessions, it is expected that labour market outcomes for young people will primarily depend on the length of the current subdued economic conditions. Mild and long recessions typically have a considerably more negative impact on young people compared to deep and short recessions. This suggests that the length of the crisis matters more than the size of the GDP loss. To date, the path of economic activity during and after the COVID-19 crisis is closest to the 'deep and short recession' scenario. Consequently, if the EU economy continues to expand in the coming years, the gap between young people and prime-age individuals can be expected to narrow and eventually disappear in the medium term. However, should the EU economy plunge back into recession, labour market conditions for young people entering the labour market during or shortly after the economic downturn may remain subdued for a far longer period.

Despite their good – and growing – digital skills, young people do not seem to have fully benefited from the opportunities associated with the technological change during the pandemic. For example, they are relatively underrepresented in teleworkable occupations, which have grown significantly in recent years.

Once the European economy recovers, young people are expected to be well equipped to contribute to the green and digital transitions. The digital intensity of work performed by young people already exceeds that of their older counterparts. European and national policies aim to facilitate the integration of young people into the labour market by strengthening education and training. For example, the 2020 Reinforced Youth Guarantee implements a targeted approach to the needs of NEETs. In addition, a proportion of Member States' policy measures carried out in the context of RRPs is allocated to young people, specifically in those regions most in need of positive youth labour market outcomes.

Collective bargaining and social dialogue remain an important aspect of the EU social model. Young workers have a positive attitude towards social dialogue and evidence suggests that declining trade union membership and collective bargaining coverage are not due to generational change but, rather, reflect structural changes and the employment contracts typical for young workers. By adapting new modes of communication and dealing with priority issues for young people, social partners can attract new members and remain representative. The outreach of collective bargaining and social dialogue depends on the structure and organisation of national collective bargaining institutions. It is important to support and involve social partners in national institutions and decision-making frameworks to benefit from their expertise and insights.