Danube Region Monitor "People & Skills"

Report 2022

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Abbreviations

COVID Corona Virus Disease
EU European Union
EUR Euro
ESCS Index of Economic, Social and Cultural Status
EUSDR European Union Strategy for the Danube Region
GDP Gross Domestic Product
ICT Information and Communication Technologies
ISCED International Standard Classification of Education
ITU International Telecommunication Union
LLL Life-Long Learning
LMP Labour market policies
NEET Not in Education, Employment, or Training
OECD Organisation for Economic Co-operation and Development
PISA Programme for International Student Assessment
TIMSS Trends in International Mathematics and Science Study

Country Codes

AT Austria
BA Bosnia and Herzegovina
BG Bulgaria
CZ Czechia
DE Germany
DR Danube Region
HR Croatia
HU Hungary
MD Republic of Moldova
ME Montenegro
RO Romania
RS Serbia
SI Slovenia
SK Slovakia
UA Ukraine

Region Codes

DE: B-W Baden-Württemberg
DE: Bav Bavaria
UA: Ch Chernivtsi
UA: I-Fr Ivano-Frankivsk
UA: Od Odesa
UA: Zak Zakarpattya

Introduction

This report is conducted within the scope of Priority Area 9 "People and Skills" of the European Union Strategy for the Danube Region (EUSDR). The report contributes to the main objectives of Priority Area 9 by providing an evidence-based assessment of the sustainable and inclusive development goals of the Danube Region through education, training and labour market systems, and investments in human capital.

By highlighting trends, similarities and differences in economic performance, societal welfare and social protection across the countries, the report delivers a comprehensive overview of disparities and convergence across the Danube Region with respect to the four objectives, which will be outlined below. A special focus is on the effects of the COVID-19 crisis on the labour market and education outcomes in the countries of the Danube Region.

Employment dynamics and equal opportunities are heavily dependent on economic growth and performance. The main drivers of the latter are education and accumulation of skills and competences (also in new technologies, e.g. digital skills).

A set of key statistical indicators concerning the performance of labour markets and education systems over the period of 2011-2021 are analysed related to the four objectives of Priority Area 9, as contained in the EUSDR Action Plan [1], in the fields of (i) employment, (ii) educational outcomes and skills, (iii) quality and efficiency of education, training and labour market systems, and (iv) equal opportunities and inclusiveness.

The report covers the countries and regions that are part of the EUSDR, including nine European Union Member States (Austria, Bulgaria, Croatia, Czechia, Germany – the regions of Bavaria and Baden-Württemberg, Hungary, Romania, Slovakia and Slovenia), three (potential) candidate countries (Bosnia and Herzegovina, Montenegro and Serbia), and two European Neighbourhood countries, the Republic of Moldova and Ukraine – the regions of Chernivtsi, Ivano-Frankivsk, Odesa and Zakarpattya). When discussing the results of the report, the Danube Region countries will be grouped based on their status in relation to the European Union (EU-27) in 2021:[2]

1. "Old" EU Member States - countries which joined the EU before 2004 (Austria and Germany)
2. "New" EU Member States - countries which joined the EU in 2004 or later (Bulgaria, Croatia, Czechia, Hungary, Romania, Slovakia and Slovenia)

[1] `https://ec.europa.eu/regional_policy/sources/cooperate/danube/eusdr_actionplan_swd202059_en.pdf`

[2] Throughout the report EU-27 refers to the EU Member States as of 2021, consequently excluding the UK which left the EU in 2020, including Croatia which joined in 2013 and referring to Republic of Moldova and Ukraine as European Neighbourhood countries within the Eastern Partnership initiative.

3. EU (potential) candidate countries (Bosnia and Herzegovina, Montenegro and Serbia)[3]
4. European Neighbourhood countries within the Eastern Partnership initiative (the Republic of Moldova and Ukraine)[4]

However, in the graphs presented, the countries are grouped as follows : (i) "Old" EU Member States, the German regions Bavaria and Baden-Württemberg, and EU-27 and Danube Region average estimates; (ii) "New" EU Member States; (iii) EU (potential) candidate countries and European Neighbourhood countries. The latter grouping allows for the best visual representation and readability of graphs presenting the dynamics of various indicators over the considered time period of 2011-2020. The ordering of the countries on all bar charts is as follows: (i) EU-27 average; (ii) Danube Region average; (iii) EU Member States ranked alphabetically by the full names of the countries; (iv) (potential) candidate countries ranked alphabetically by the full names of the countries; and (v) EU candidate countries since 2022 ranked alphabetically by the full names of the countries.

Throughout this report, the Danube Region average levels of all considered indicators are computed as a simple arithmetic average over countries with available data on a specific indicator. Detailed information on each indicator, including the definition, source and data availability, is enclosed in the Indicators and data description appendices.

Since February 24, 2022 marked a start of a brutal Russian invasion of Ukraine - one of the Danube Region countries - this report includes a separate section on the assessment of the current effects of the war for Ukraine and other Danube Region countries. Given that the time span covered by this report is 2011-2021, no specific statistics along the major labour market and education variables in light of the war in Ukraine is provided. A more detailed statistical analysis of the consequences of Russian invasion will remain open for further reports. However, the short discussion of the up-to-date implications of the war for Ukrainian economy, labour market and education system, as well as assessment of the major consequences for other Danube Region countries is provided in the last section of this report.

[3]The report refers to the status in relation to the EU as in 2021. With Bosnia and Herzegovina having been granted EU candidate status in December 2022, all three countries are now candidate countries.

[4]These are the countries classified as European Neighbourhood countries in the Eastern Partnership initiative until 2022. We refer to these countries as European neighbourhood countries throughout the text (as this has been their official status in 2021). As of 2022, these countries are EU candidate countries.

The Danube Region: Population and Socio-Economic Performance

Population

The Danube Region is one of the four macro-regions defined by the EU. It is composed of 12 states as well as certain regions of Germany and Ukraine. Nine of these states are Member States of the EU (Austria, Bulgaria, Croatia, Czechia, Germany, Hungary, Romania, Slovakia and Slovenia), three are (potential) candidate countries (Bosnia and Herzegovina, Montenegro and Serbia), and two are European Neighbourhood countries (the Republic of Moldova and Ukraine). In 2021, 110.3 million people were living in this area (see Table 0.1). However, the population has been in decline since 2011.

Table 0.1: Population (in 1000s)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
EU27	441,564	442,229	442,688	443,256	444,181	445,187	445,910	446,701	447,643	448,043	447,871
Danube Region	112,174	112,127	111,842	111,889	111,288	111,353	111,261	111,166	111,094	110,883	110,312
Austria	8,389	8,426	8,477	8,544	8,630	8,740	8,795	8,838	8,878	8,917	8,952
Bulgaria	7,348	7,306	7,265	7,224	7,178	7,128	7,076	7,025	6,976	6,934	6,878
Croatia	4,283	4,269	4,254	4,236	4,208	4,172	4,130	4,091	4,067	4,047	3,958
Czechia	10,496	10,511	10,514	10,525	10,546	10,566	10,594	10,630	10,672	10,698	10,506
Baden-Württemberg	10,495	10,541	10,600	10,674	10,798	10,916	10,988	11,046	11,085	11,100	11,109
Bavaria	12,413	12,481	12,562	12,648	12,768	12,887	12,964	13,037	13,101	13,124	13,147
Hungary	9,972	9,920	9,893	9,866	9,843	9,814	9,788	9,776	9,771	9,750	9,710
Romania	20,148	20,058	19,984	19,909	19,816	19,702	19,589	19,474	19,372	19,258	19,120
Slovakia	5,398	5,408	5,413	5,419	5,424	5,431	5,439	5,447	5,454	5,459	5,447
Slovenia	2,053	2,057	2,060	2,062	2,064	2,065	2,066	2,074	2,088	2,102	2,108
Bosnia and Herzegovina	3,840	3,836	3,531	3,526	3,518	3,511	3,504	3,496	3,491	3,475	3,453
Montenegro	620	621	621	622	622	622	622	622	622	621	619
Serbia	7,237	7,201	7,167	7,132	7,095	7,058	7,021	6,983	6,945	6,899	6,834
Republic of Moldova	3,560	3,560	3,559	3,556	2,835	2,802	2,755	2,708	2,665	2,620	2,615
Chernivtsi	905	906	908	909	910	909	907	906	903	898	894
Ivano-Frankivsk	1,380	1,381	1,382	1,382	1,382	1,381	1,379	1,375	1,371	1,363	1,356
Odesa	2,389	2,392	2,396	2,396	2,393	2,388	2,385	2,382	2,379	2,367	2,360
Zakarpattya	1,249	1,253	1,256	1,258	1,259	1,259	1,258	1,257	1,255	1,251	1,247

Source: wiiw Annual Database and Eurostat.
Notes: Data refer to census 2011 if not otherwise stated. Bosnia and Herzegovina: From 2013 according to census October 2013, census 1991 before. Republic of Moldova: From 2015 usual resident population according to census May 2014, previously resident population and census October 2004.

Of course, there are significant differences with respect to the population sizes of the economies. In 2021, the German regions (Bavaria and Baden-Württemberg) of the area accounted for almost 22% of the population and the Ukrainian oblasts for about 5%. The next largest country is Romania, accounting for about 17%, whereas all other countries have shares of about 10% or less. The population has been on a decline in most countries; positive growth rates have only been observed for Austria, Czechia, Germany, Slovakia and Slovenia.[5]

Gross Domestic Product Growth

The gross domestic product (GDP) has increased in all countries over the period of 2011-2019.[6] However, the average annual growth rates over this period widely differed, ranging from 4% in the Republic of Moldova and 3.9% in Romania to 1.4% in Croatia. Ukraine

[5]One has to acknowledge a major increase in the Daube Region population in 2022 following a Russian invasion of Ukraine and an inflow of Ukrainian refugees. This will be discussed in detail later in the report.

[6]Comparable data in purchasing power parities for the regions in Germany and Ukraine are not available.

experienced only a marginally positive growth of 0.1% over this period. The COVID-19 pandemic has hit the economies strongly, with the GDP declining by 5.5% (average) compared to a decline in the EU-27 of 5.9% (see Table 0.2). Montenegro has been particularly hit by the crisis, suffering a loss in GDP of 15.3%, whereas in Serbia, for example, the decline has been only 0.9%.

However, economies recovered rapidly in 2021, as restrictions were gradually lifted and economy returned to normal operations. An average economic growth in the Danube Region reached 7.2% in 2021, higher than the average EU-27 growth. GDP growth ranged from almost 14% in the Republic of Moldova to 2.6% in Germany, with a clear pattern – countries which experienced the starkest economic decline in 2020 posted the highest economic growth in 2021.

Table 0.2: GDP growth (real) in %

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
European Union	1.8	-0.7	0.0	1.6	2.3	2.0	2.8	2.1	1.8	-5.9	5.4
Danube Region	2.5	-0.5	1.6	1.3	1.9	3.0	3.8	3.7	3.3	-5.5	7.2
Austria	2.9	0.7	0.0	0.7	1.0	2.0	2.3	2.5	1.5	-6.7	4.6
Bulgaria	2.1	0.8	-0.6	1.0	3.4	3.0	2.8	2.7	4.0	-4.4	7.6
Croatia	-0.1	-2.3	-0.4	-0.3	2.5	3.5	3.4	2.9	3.5	-8.1	13.1
Czechia	1.8	-0.8	0.0	2.3	5.4	2.5	5.2	3.2	3.0	-5.8	3.5
Germany	3.9	0.4	0.4	2.2	1.5	2.2	2.7	1.1	1.1	-4.6	2.6
Hungary	1.9	-1.3	1.8	4.2	3.7	2.2	4.3	5.4	4.6	-4.7	7.1
Romania	1.9	2.0	3.8	3.6	3.0	4.7	7.3	4.5	4.2	-3.9	5.1
Slovakia	2.6	1.4	0.7	2.7	5.2	1.9	3.0	3.8	2.6	-4.4	3.0
Slovenia	0.9	-2.6	-1.0	2.8	2.2	3.2	4.8	4.4	3.3	-4.2	8.2
Bosnia and Herzegovina	1.0	-0.8	2.3	1.2	3.1	3.1	3.2	3.7	2.8	-3.2	7.5
Montenegro	3.2	-2.7	3.5	1.8	3.4	2.9	4.7	5.1	4.1	-15.3	13.0
Serbia	2.0	-0.7	2.9	-1.6	1.8	3.3	2.1	4.5	4.3	-0.9	7.5
Republic of Moldova	5.8	-0.6	9.0	5.0	-0.3	4.4	4.7	4.3	3.7	-7.0	13.9
Ukraine	5.4	0.2	0.0	-6.6	-9.8	2.4	2.4	3.5	3.2	-4.0	3.4

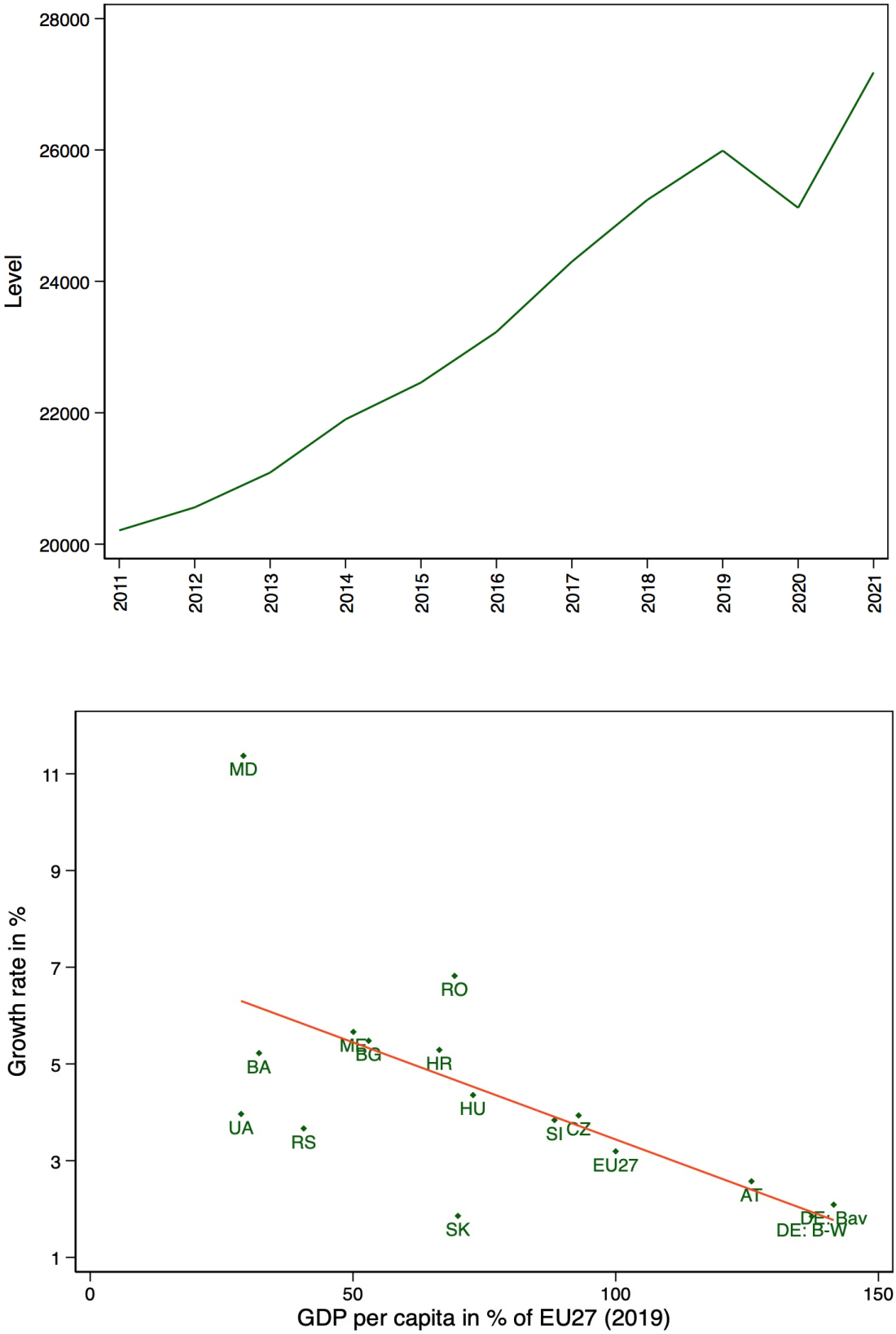
Source: wiiw Annual Database and Eurostat.
Notes: Ukraine: From 2014 excluding the occupied territories of Crimea and Sevastopol and temporarily occupied territories in the Donetsk and Luhansk regions.

GDP Per Capita and Convergence

The demographic development together with the robust positive growth performance until 2021 led to a significant increase in the GDP per capita in the Danube Region (see upper panel in Figure 0.1).[7] According to these figures, the GDP per capita in the Danube Region increased by almost 30% in the period of 2011-2019 but declined by 3.3% in 2020. The GDP per capita has been growing faster in countries/regions with lower levels to begin with, i.e. one finds convergence in the GDP per capita in such regions (see lower panel in Figure 0.1). Austrias and Germanys GDP per capita levels of 20% above the EU average experienced the lowest growth rates, whereas in particular, the Western Balkan

[7]However, it has to be acknowledged that increasing GDP per capita to certain extent reflects declining population size all across the Danube Region. Yet, the annual population growth rate is -0.17% against the average GDP growth of around 2%, suggesting that the positive contribution of the total GDP growth dominates.

Figure 0.1: GDP per capita and convergence



Source: wiiw Annual Database and Eurostat.
Notes: Bosnia and Herzegovina: From 2013 according to census October 2013, census 1991 before. Republic of Moldova: From 2015 usual resident population according to census May 2014, previously resident population and census October 2004. Ukraine: From 2014 excluding the occupied territories of Crimea and Sevastopol.

economies with GDP per capita levels much lower than those of the EU average grew faster. The COVID-19 pandemic also strongly negatively impacted the GDP per capita growth.

Objective I

Contribution to a Higher Employment Rate in the Danube Region, Especially Through Tackling Youth and Long-Term Unemployment

Employment Dynamics

Improvements of employment prospects and increases in employment rates are fundamental for economic development and social welfare, which constitute a core issue of the EUSDR. While employment gained positive momentum in the majority of the Danube Region countries over the recent decade, the COVID-19 pandemic resulted in a major economic recession and labour market disturbances. Therefore, apart from longer-term trends, this report focuses on developments in pandemic years 2020 and 2021 and will shed light on the similarities and divergencies in the employment impacts of the pandemic across the Danube Region.

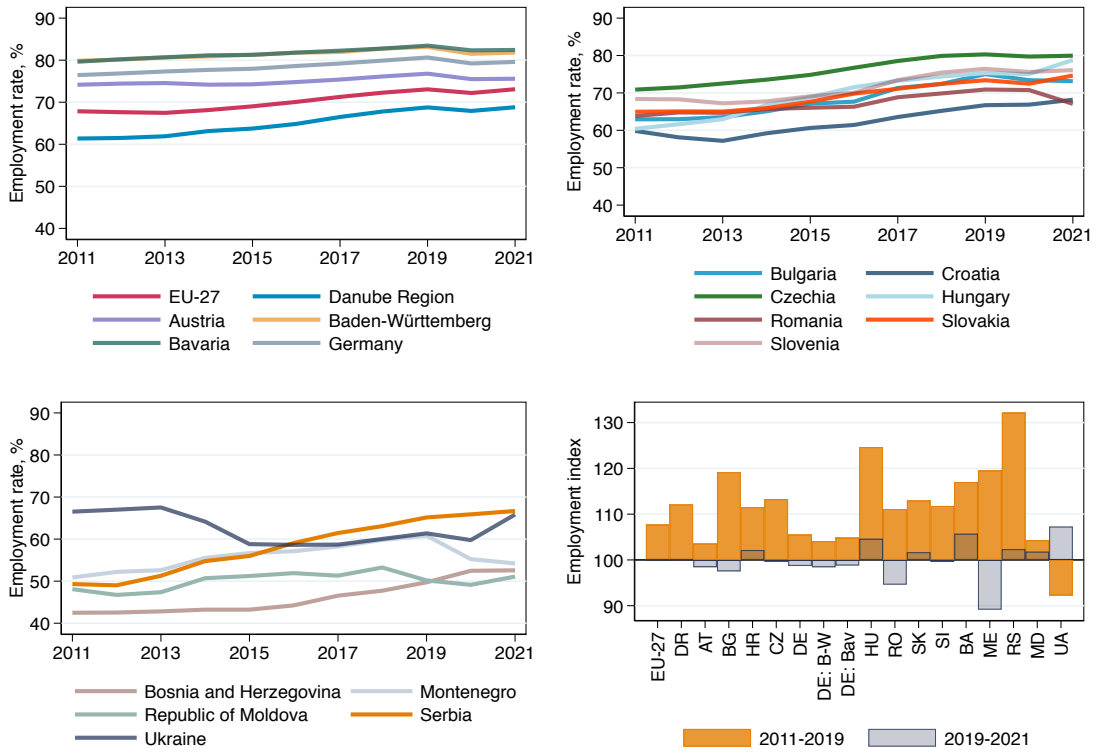
1.1 Employment Rate

The majority of the Danube Region countries experienced increasing employment rates over the observed time period (see Figure 1.1). The overall change in the employment rate in the region reached 13% compared to an EU-27 average of 8% over 2011-2019. Serbia, Hungary, Montenegro and Bulgaria revealed the amplest employment rate growth at 32%, 25%, 20% and 19%, respectively, over this period. Montenegro and Bulgaria, though ranging below the average EU-27 level at the beginning of the observation period, reached the average EU-27 level by 2021.

Other Danube Region states, particularly Czechia, Slovakia and Slovenia, revealed a gradual convergence to the EU-27 employment rate with employment increases of 13% for Czechia and Slovakia and 12% for Slovenia over 2011-2019. The employment rate in the Republic of Moldova were still well below the EU-27 and Danube Region average, despite gradual increases over 2012-2018.

Gender-specific employment rate dynamics varied across the region (see Figure 1.2). From 2011 to 2019, the average female employment rate in the Danube Region increased more than the male rate (14% vs 12%, respectively), mirroring EU-27 trends (9% vs 6%, respectively). However, in several countries, the male employment growth topped the female rate – in the Republic of Moldova (8 pp gap), Romania (3 pp gap), Bulgaria (2 pp gap) and Hungary (1 pp gap) – resulting in a magnified gender gap in employment in

Figure 1.1: Employment rates from 2011 to 2021 and employment indices across countries for the population aged 20 to 64



Source: EU Member States, Bosnia and Herzegovina, Montenegro and Serbia – Eurostat database segment *lfsa_ergaed*. Bavaria and Baden-Württemberg – Eurostat database segment *lfst_r_lfe2emprt*. The Republic of Moldova and Ukraine – the national statistical offices.
Notes: Employment indices are estimated as (a) employment rate in 2019 relative to employment rate in 2011 (index 2011-2019); (b) employment rate in 2021 relative to employment rate in 2019 (index 2019-2021).

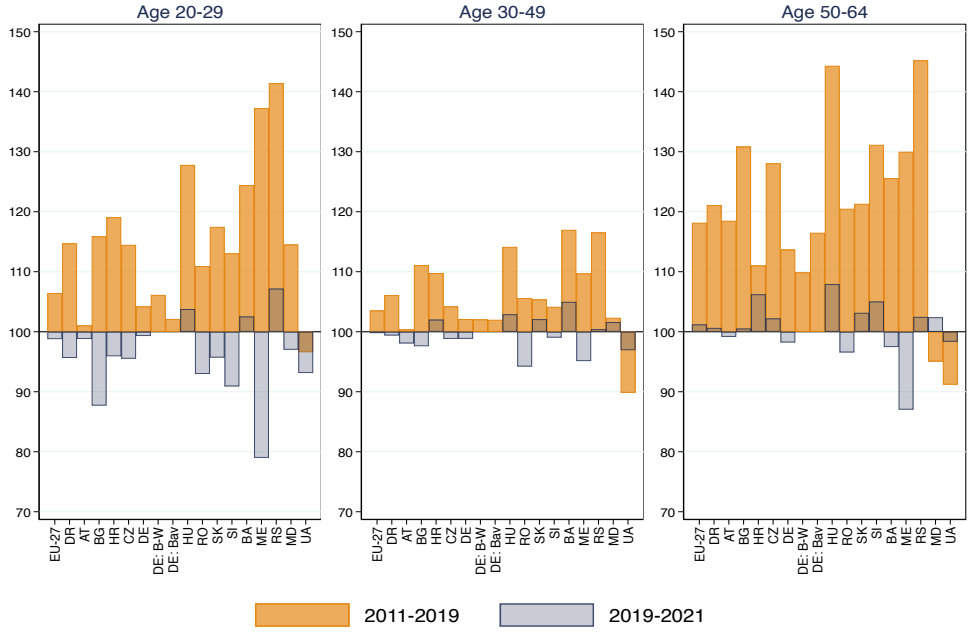
these four countries.

The employment dynamics across age groups (see Figure 1.3) reveal that younger (20-29 years) and older employees (50-64 years) experienced the most pronounced increases in employment rates. The average increase of the youth employment rate marked 15%, for older employees 22%, but for middle-aged workers only 7%. This pattern was not consistent with the overall EU-27 dynamics, except for the employment growth in the age group of 50-64 years. Compared to the overall EU-27 levels, however, cross-country heterogeneities were dramatic. For youth, the employment rate increased by 41% in Serbia, 37% in Montenegro and 28% in Hungary, and for older employees, it increased by 45% in Serbia, 44% in Hungary and 31% in Bulgaria and Slovenia. Meanwhile, the rate for middle-aged employees (30-49 years) increased by around 10% in 2019 in most of the Danube Region. The climbing employment rates in Bulgaria, Hungary, Montenegro and Serbia were, to a large extent, driven by young and older workers. In Serbia, younger and older workers employment rates in 2019 were 42% and 45% higher, respectively, than those in 2011, while the rates reached 37% and 30% in Montenegro, respectively, 25% and

Figure 1.2: Employment indices by gender across countries for the population aged 20 to 64

Source: EU Member States, Bosnia and Herzegovina, Montenegro and Serbia – Eurostat database segment *lfsa_ergaed*. Bavaria and Baden-Württemberg – Eurostat database segment *lfst_r_lfe2emprt*.The Republic of Moldova and Ukraine – the national statistical offices.
Notes: Employment indices are estimated as (a) employment rate in 2019 relative to employment rate in 2011 (index 2011-2019); (b) employment rate in 2021 relative to employment rate in 2019 (index 2019-2021) with both indices estimated separately for men and women.

Figure 1.3: Employment indices by age groups across countries



Source: EU Member states, Bosnia and Herzegovina, Montenegro and Serbia – Eurostat database segment *lfsa_ergaed*. Bavaria and Baden-Württemberg – LFS microdata. The Republic of Moldova and Ukraine – the national statistical offices.
Notes: Employment indices are estimated as (a) employment rate in 2019 relative to employment rate in 2011 (index 2011-2019); (b) employment rate in 2021 relative to employment rate in 2019 (index 2019-2021) with both indices estimated separately for three age groups

44% in Hungary, respectively, and 16% and 31% in Bulgaria, respectively. The Republic of Moldova and Ukraine were the sole Danube Region countries revealing lower employment rates in 2019 as compared to 2011 among those aged 50-64 (1% drop in Ukraine and 5%

drop in the Republic of Moldova).

The effect of the COVID-19 pandemic on employment in the Danube Region has been surprisingly moderate for the majority of the Danube Region countries, with a zero or insignificantly negative impact in Czechia, Germany and Slovenia (see Figure 1.1).[8] Bosnia and Herzegovina, Croatia, Hungary, Republic of Moldova, Serbia and Slovakia experienced a notable increase in employment rate in 2021 relative to 2019, suggesting post-pandemic labour markets largely recovered (see Figure 1.1). However, several countries, including Bulgaria, Montenegro and Romania posted lower employment rates in 2021, relative to pre-pandemic 2019, with employment decline being a bit over 10% in Montenegro. As highlighted in the previous report, Montenegro was one of the countries which experienced the biggest employment drop in 2020, which is likely related to tourism sectors downturn. Full-scale recovery of tourism happened only in Summer 2022, hence, employment drop in Montenegro persisting in 2021 was likely related to slow recovery of tourism, hospitality and other recreation-related industries, yielding less vacancies in the sector. This argument is supported by the evidence on employment drop, which was the largest among youth (aged 20 to 29), who are largely employed in tourism and leisure sectors (see Figure 1.3).

The resilience of employment in light of COVID-19 and rapid employment rebound in 2021 may stem from several reasons. First, the majority of employment distortions concerned the changing nature of work, implying either transition to part-time employment or telework, and thus was likely reflected in work time (hours worked) but not employment status. Second, governmental support in the form of various job retention schemes helped cushion the negative effect of COVID-19 on the labour markets of the majority of EU Member States, particularly Austria, Czechia, Germany, Hungary, Slovakia and Slovenia.[9]. Thirdly, the majority of labour markets faced severe labour shortages as economic restrictions were lifted and business operations returned to normal.[10] As workers reallocated from sectors most hit by the pandemic to those being more resilient, industries like tourism, leisure and recreation, entertainment, food and catering faced the most stringent shortages of workforce. As a result, number of vacancies increased sharply and employment figures raised. However, not only low-skilled labour appeared in big demand

[8]The Labour Force Survey methodology was changed in 2021 and is currently based on the Regulation of the European Parliament and the Council `https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_Labour_Force_Survey_-_new_methodology_from_2021_onwards`. It results in a break in the time series in 2020 - the data from years up to and including 2020 cannot be comparable with the data from 2021. This chance concerns all indicators covered within the Objective I of this report and has to be acknowledged when interpreting the results.

[9]In Austria, Hungary and Slovenia, special short-time work schemes were promoted. In Germany, Czechia and Slovakia, pre-existing short-time work schemes were exploited, benefits were generosity increased, and access to various jobs (particularly for workers in non-standard jobs) was offered.

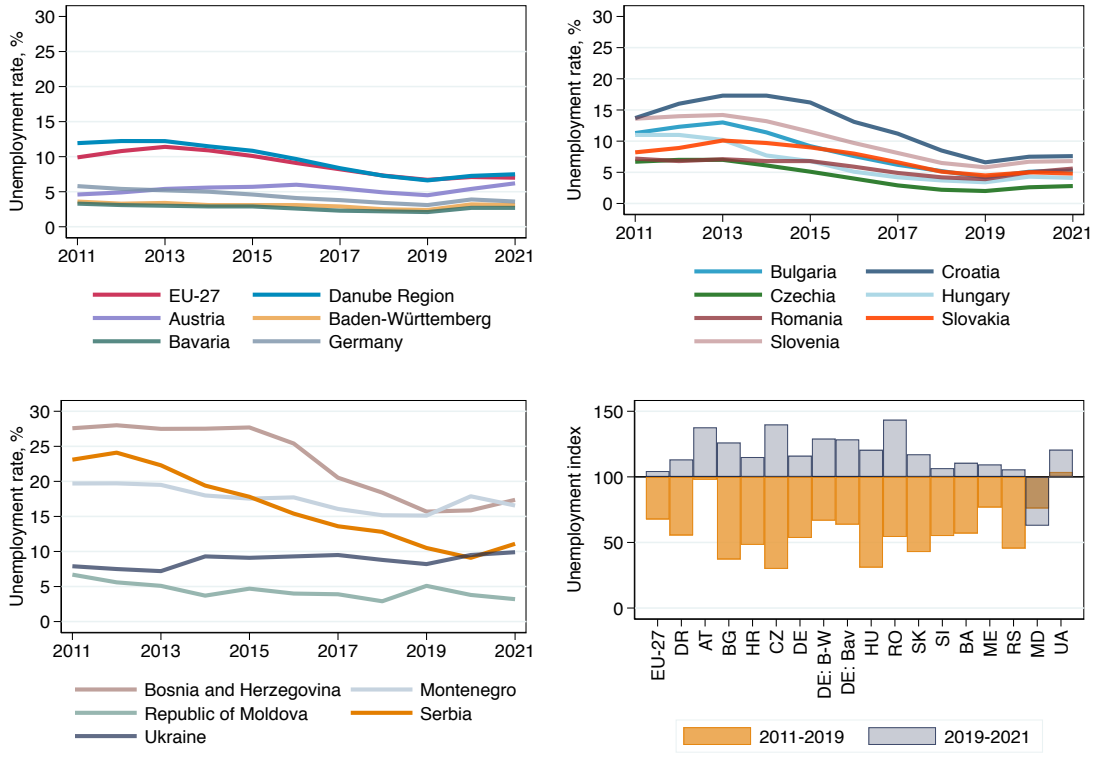
[10]For more elaborate disccussion of the post-pandemic labour shortages, please, refer to `https://wiiw.ac.at/how-do-economies-in-eu-cee-cope-with-labour-shortages-dlp-6406.pdf`

in 2021. Shortages of skilled workers is equally strong.[11]

1.2 Unemployment Rate

Unemployment is considered one of the major dangers for economic development and societal prosperity. High unemployment implies that valuable labour resources remain idle, causing economic loss and undermining individual well-being. Moreover, rapid depreciation of human capital and high wage returns to work experience can challenge labour market re-entry and threaten well-being in the long run, with unemployment transforming into long-term unemployment (i.e. lasting longer than 12 months).

Figure 1.4: Unemployment rates from 2011 to 2021 and unemployment indices across countries for the population aged 15 to 74

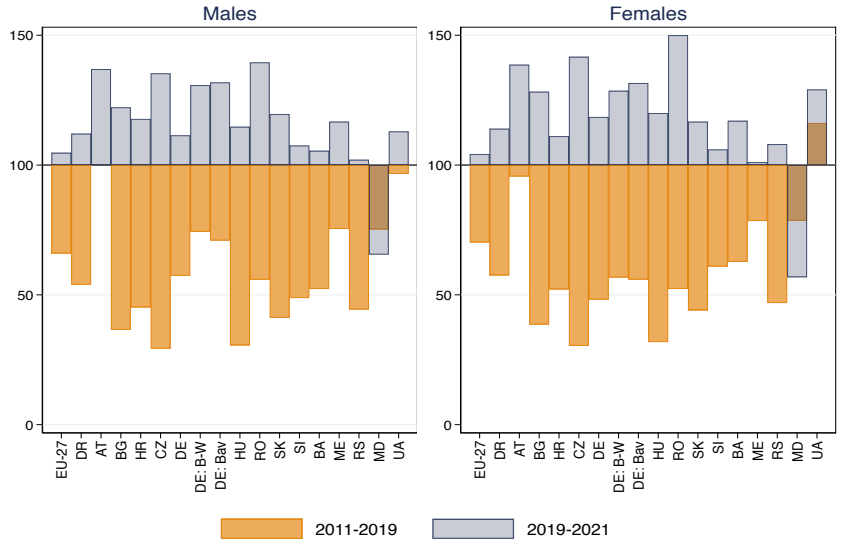


Source: EU Member States, Montenegro and Serbia – the Eurostat database segment *lfsa_urgaed*. Bavaria and Baden-Württemberg – the Eurostat database segment *lfst_r_lfu3rt*. Bosnia and Herzegovina, the Republic of Moldova and Ukraine – the national statistical offices.
Notes: Unemployment indices are estimated as (a) unemployment rate in 2019 relative to unemployment rate in 2011 (index 2011-2019); (b) unemployment rate in 2021 relative to unemployment rate in 2019 (index 2019-2021).

Without exception, all Danube Region countries underwent a decline in the unemployment rate in 2011-2019 up until the COVID-19 crisis (see Figure 1.4). Overall, the unemployment rate declined in the Danube Region (average) over the period of 2011-2019, reaching almost 45% as compared to the 32% on average in the EU-27, suggesting a

[11] For more details, please, refer to `https://www.ela.europa.eu/en/news/analysis-shortage-and-surplus-occupations-2021`

Figure 1.5: Unemployment indices by gender across countries for the population aged 15 to 74



Source: EU Member States, Montenegro and Serbia – the Eurostat database segment *lfsa_urgaed*. Bavaria and Baden-Württemberg – the Eurostat database segment *lfst_r_lfu3rt*. Bosnia and Herzegovina, the Republic of Moldova and Ukraine – the national statistical offices.
Notes: Unemployment indices are estimated as (a) unemployment rate in 2019 relative to unemployment rate in 2011 (index 2011-2019); (b) unemployment rate in 2021 relative to unemployment rate in 2019 (index 2019-2021) with both indices estimated separately for men and women.

substantial improvement of employment prospects in the region. Unemployment rates in some Danube Region countries, including Bulgaria, Croatia, Czechia, Hungary, Slovakia and Slovenia, fell to the EU-27 average level or below by 2019, with declines of 63%, 52%, 70%, 69%, 57% and 45%, respectively, in 2011-2019. The declining unemployment rates in the aforementioned countries fostered their gradual convergence to the "old" EU Member States of Austria and Germany.

Among the other countries of the Danube Region, Romania had an outstandingly low unemployment rate of 3.9% in 2019. The Republic of Moldova posed an interesting case, with both employment and unemployment rates ranging well below the EU-27 level and marking the lowest levels recorded in the Danube Region. This counterintuitive evidence was likely related to a high share of unofficial employment in the country, with the individuals involved in the shadow economy assigned to the inactive population in the official statistics[12]. A high share of citizens working abroad, both permanently and temporarily, were also assigned as neither employed nor unemployed, driving the counterintuitive observation.

For the individual EU (potential) candidate countries, diverging trends were revealed. While the unemployment rate declined by more than 50% in Serbia in 2011-2019, Bosnia

[12]The size of "shadow economy" in Republic of Moldova is strikingly high - around 30% in years 2015-2016. For more details, please, see Putnins, T. J., Sauka, A., and Davidescu, A. A. M. (2019). Shadow Economy Index for Moldova and Romania, in *Subsistence Entrepreneurship*, Eds. Ratten et al., Springer, p. 89-130.

and Herzegovina and Montenegro were still characterised by a high unemployment rate, which with more than 15% persisting on a level double the EU-27 average.

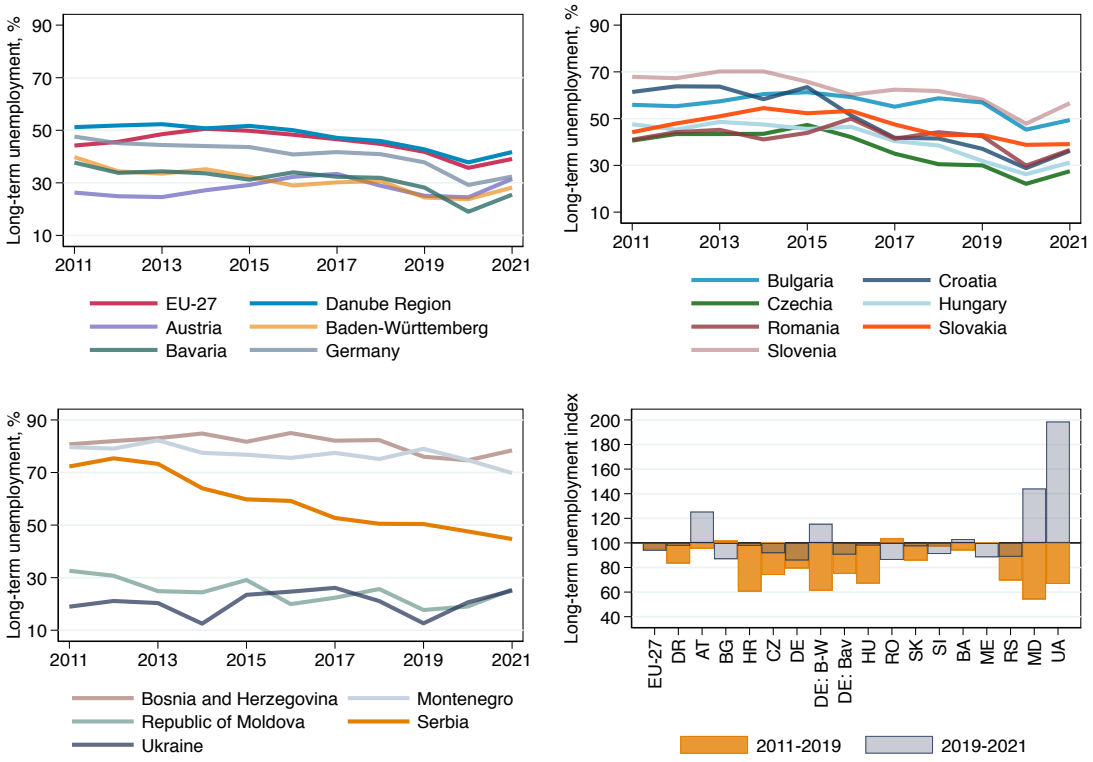
The COVID-19 pandemic strongly impacted unemployment in the Danube Region, as unemployment rate in 2021 stood above the pre-pandemic level of 2019 in all Danube Region countries, with the only exception of Republic of Moldova. Coupled with a moderate decline or even an increase in the employment rates in 2021 relative to 2019 (see Figure 1.1), the substantial hike in the unemployment rates suggested that many workers moved to inactivity in response to the COVID-19 crisis. Unemployment rose disproportionately across the countries, ranging from a 6% increase in Serbia to a 44% increase in Romania. The Republic of Moldova was the only outlies, revealing a substantial decline in the unemployment rates in 2021 recorded for both men and women. A further look at the changes in the unemployment rates in 2021 relative to 2019 by gender suggested that men and women were affected differently across the Danube Region (see Figure 1.5). In Croatia, Slovakia and Slovenia men incurred greater job distortion, in line with the Danube Region average trend, whereas in all other Danube Region countries unemployment rose more substantially among women.

1.3 Long-Term Unemployment Share

Unemployment is defined to be long-term whenever it lasts longer than a year. While short-term unemployment captures cyclical economic changes, long-term unemployment stems from structural changes in the economy that deter employment recovery. Long-term unemployment may be exacerbated due to, for instance, a mismatch between workers' qualifications and the labour demand or economic downturns yielding major underlying changes in the economy.

Similar to the unemployment rates, the long-term unemployment shares declined sharply in the Danube Region over 2011-2019 as compared to the overall EU-27 (17% decline vs 6%, respectively). Concerning the dynamics of long-term unemployment, a clear-cut division of the Danube Region into two groups was observed (see Figure 1.6). The first group - Austria, Bulgaria, Montenegro, Romania and Slovenia - experienced insignificant changes in the long-term unemployment, with either a moderate increase around 2012-2016 and a subsequent decline to the level of 2011 or a flat trend. The second group, comprising all other countries of the Danube Region, revealed a notable decline in the long-term unemployment. It was noteworthy that in Croatia, Czechia and Hungary, structural unemployment rolled from the level above or around the EU-27 average in 2011 to a point well below the EU-27 average in 2019, marking a 42%, 26% and 33% decline, respectively.

Figure 1.6: Long-term unemployment shares from 2011 to 2021 and long-term unemployment indices across countries for the population aged 15 to 74



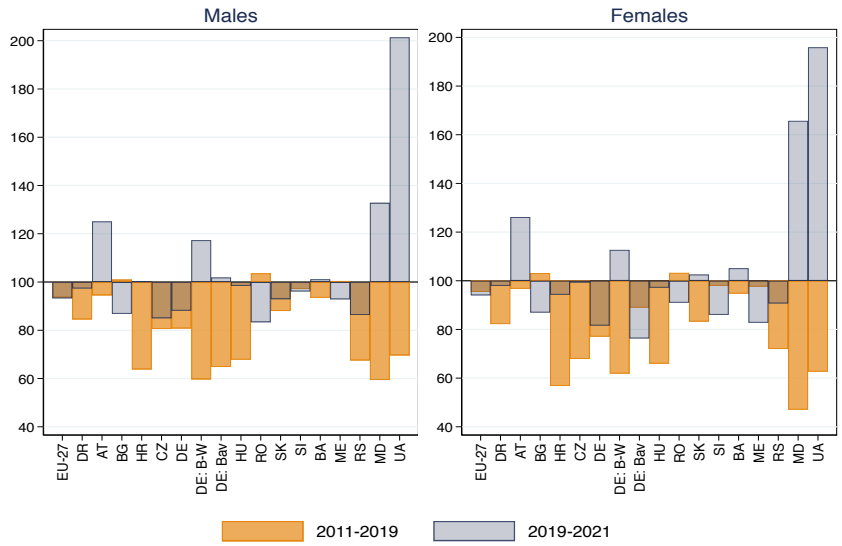
Source: EU Member States, Montenegro, Serbia and German regions of Bavaria and Baden-Württemberg – the Eurostat database segment *lfst_r_lfu2ltu*. Bosnia and Herzegovina, the Republic of Moldova and Ukraine – the national statistical offices.
Notes: Long-term unemployment indices are estimated as (a) long-term unemployment share in 2019 relative to long-term unemployment share in 2011 (index 2011-2019); (b) long-term unemployment share in 2021 relative to long-term unemployment share in 2019 (index 2019-2021).

Further disaggregation by gender revealed that women incurred more substantial long-term unemployment reduction as compared to men in several countries (see Figure 1.7). However, the most pronounced decline of 53% in 2019 as compared to 2011 in the structural unemployment of women was recorded in the Republic of Moldova, followed by a 45% drop in Croatia. As a result, the average long-term unemployment reduction in the Danube Region was more substantial for women compared to men (18% vs 16%) whereas the opposite was observed in the overall EU-27 dynamics (5% decline among women and 7% among men).

The positive trend observed particularly in the "new" EU Member States signalled substantial improvement of employment prospects and increasing correspondence between workers education and skills and labour market demands. The overall economic upswing that followed the Global Financial Crisis of 2008-2009 reflected the observed dynamics as the economy revived and grew during the last decade.

The major economic recession caused by the COVID-19 pandemic could easily have a long-lasting trace on the labour market. Job distortions and economic impacts spread

Figure 1.7: Long-term unemployment indices by gender across countries for the population aged 15 to 74



Source: EU Member States, Montenegro, Serbia and German regions of Bavaria and Baden-Württemberg – the Eurostat database segment *lfst_r_lfu2ltu*. Bosnia and Herzegovina, the Republic of Moldova and Ukraine – the national statistical offices.
Notes: Long-term unemployment indices are estimated as (a) long-term unemployment share in 2019 relative to long-term unemployment share in 2011 (index 2011-2019); (b) long-term unemployment share in 2021 relative to long-term unemployment share in 2019 (index 2019-2021) with both indices estimated separately for men and women.

asymmetrically across different sectors and different labour market groups. This has already been observed from the change in long-term unemployment over years 2020 and 2021, particularly for the Republic of Moldova and Ukraine, where the increase in long-term unemployment reached 44% and striking 99%, respectively. It is noteworthy that, in the Republic of Moldova, the long-term unemployment increase among women was almost two times higher than among men (see Figure 1.7). In Austria long-term unemployment raised by 25% and in German region Baden-Württemberg by 16%.

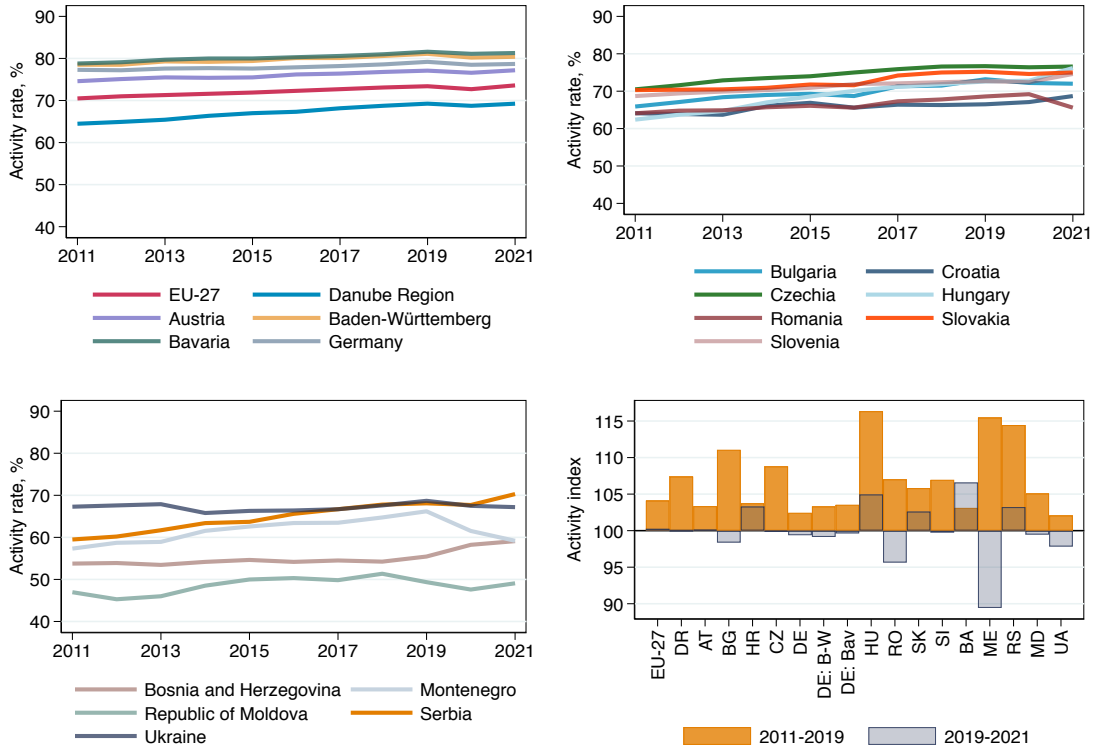
In other countries, structural unemployment revealed a different dynamics. It declined at different rates - from 2% in Croatia to 14% in Romania, suggesting that COVID-19 crisis has not caused a notable labour market stagnation and, largely fuelled by labour shortages, employment re-bound in 2021. However, in several countries the pandemic may likely leave a long-lasting trace through a persistent increase in structural unemployment.

1.4 Activity and Inactivity Rates

Activity and inactivity rates provide an important snapshot of the labour resources available in an economy. The economically active population, i.e. employed or unemployed, constitutes a major labour resource of the economy, regardless of an individual's current employment status. The rest of the working-age population is deemed as economically inactive, as they are out of the labour force and are neither working nor looking for

employment.

Figure 1.8: Activity rates from 2011 to 2021 and activity indices across countries for the population aged 15 to 64

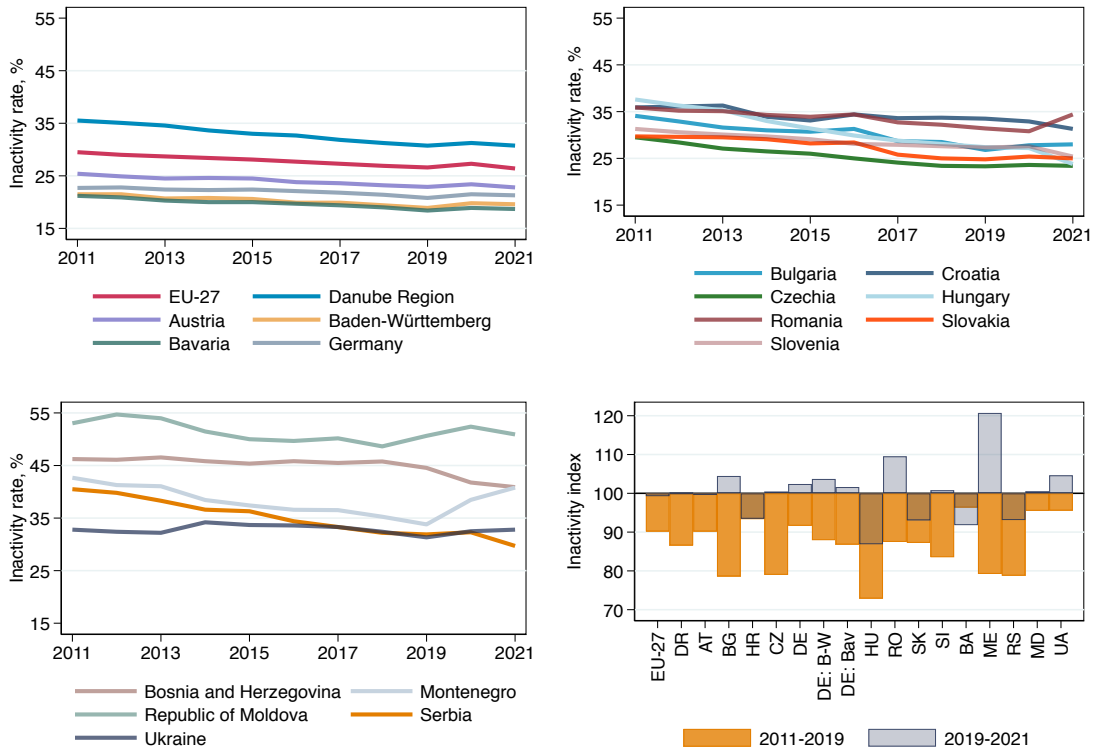


Source: EU Member States, Montenegro and Serbia – the Eurostat database segment *lfsa_argaed*. Bavaria and Baden-Württemberg – the Eurostat database segment *lfst_r_lfp2actrt*. The data for Bosnia and Herzegovina, the Republic of Moldova and Ukraine – the national statistical offices.
Notes: Activity indices are estimated as (a) activity rate in 2019 relative to activity rate in 2011 (index 2011-2019); (b) activity rate in 2021 relative to activity rate in 2019 (index 2019-2021).

The share of the economically active population steadily increased in the entire region in 2011-2019 (see Figures 1.8 and 1.9). The highest growth was achieved by Bulgaria (11%), Hungary (16%), Montenegro (16%) and Serbia (14%). Inactivity rates developed as a mirror opposite to the activity rate, with the most substantial declines visible in Bulgaria (21%), Czechia (21%), Hungary (27%), Montenegro (21%) and Serbia (21%). This development stemmed from rising employment and rapidly declining unemployment, particularly in the case of Bulgaria, Hungary and Serbia (see Figures 1.1 and 1.4), resulting in a gradual convergence to the EU-27 average activity/inactivity rates.

There were substantial differences in the activity and inactivity rate dynamics across men and women (see Figures 1.10 and 1.11). As compared to 2011, in 2019, the inactivity rates fell relatively more among men in countries revealing the most pronounced decline in inactivity (Bulgaria, Czechia, Hungary and Montenegro), while the activity rates grew relatively more among females in all countries, except Hungary, the Republic of Moldova and Romania.

Figure 1.9: Inactivity rates from 2011 to 2021 and inactivity indices across countries for the population aged 15 to 64



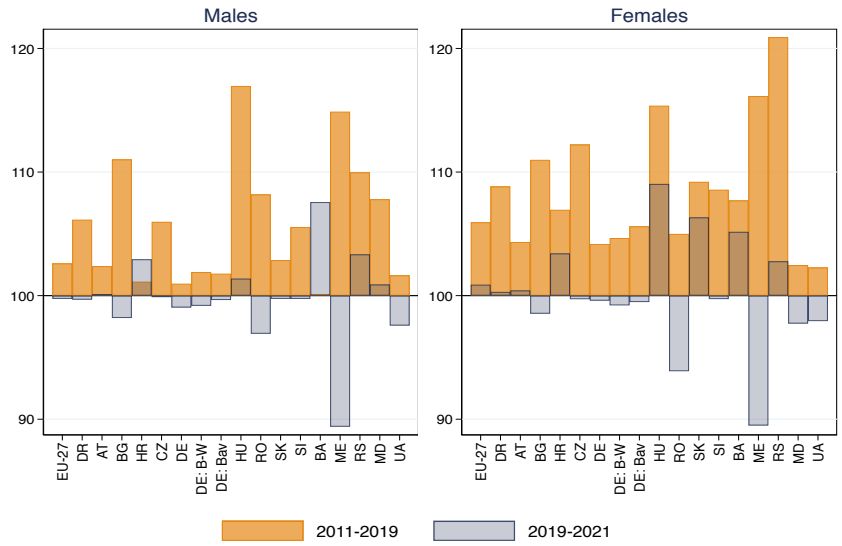
Source: EU Member States, Montenegro and Serbia – the Eurostat database segment *lfsa_ipga*. Bavaria and Baden-Württemberg – calculated from Eurostat LFS microdata. Bosnia and Herzegovina, the Republic of Moldova and Ukraine– the national statistical offices.
Notes: Inactivity indices are estimated as (a) inactivity rate in 2019 relative to inactivity rate in 2011 (index 2011-2019); (b) inactivity rate in 2021 relative to inactivity rate in 2019 (index 2019-2021).

Dynamics of activity and inactivity rates in response to the pandemic over years 2020-2021 varied drastically across the Danube Region. The sharpest change in year 2021 relative to 2019 was documented in Montenegro, where activity dropped by over 10% and inactivity rose by over 20%. This dynamics is very consistent with changes in employment and in unemployment over the same period (see Figures 1.1 and 1.4). Romania also appeared heavily affected by the pandemic in terms of activity rates, as activity rate fell by almost 5% and inactivity increased by almost 10%. In all other Danube Region states effect of the pandemic on labour activity, as of 2021, was either mildly negative (Bulgaria, Germany, Republic of Moldova, Slovenia, Ukraine) or even positive (Bosnia and Herzegovina, Croatia, Hungary, Slovakia), with the latter countries experiencing an increase in activity rates and a decline in activity.

Diverging labour activity dynamics in pandemic and post-pandemic years may stem from several factors. Firstly, labour markets were affected differently due to varying sectoral composition, and so does the post-pandemic recovery.[13] Secondly, implementation

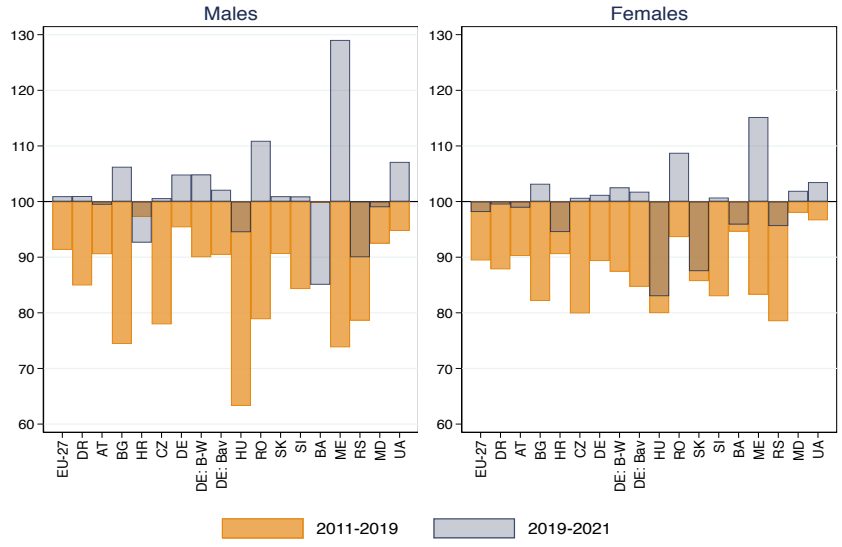
[13]For instance, economies which rely heavily on tourism, like Montenegro, were more affected in terms of employment decline than economies dominated by sectors less affected by the pandemic.

Figure 1.10: Activity indices by gender across countries for the population aged 15 to 64



Source: EU Member States, Montenegro and Serbia – the Eurostat database segment *lfsa_argaed*. Bavaria and Baden-Württemberg – the Eurostat database segment *lfst_r_lfp2actrt*. Bosnia and Herzegovina, the Republic of Moldova and Ukraine – the national statistical offices.
Notes: Activity indices are estimated as (a) activity rate in 2019 relative to activity rate in 2011 (index 2011-2019); (b) activity rate in 2021 relative to activity rate in 2019 (index 2019-2021) with both indices estimated separately for men and women.

Figure 1.11: Inactivity indices by gender across countries for the population aged 15 to 64



Source: EU Member States, Montenegro and Serbia – the Eurostat database segment *lfsa_ipga*. Bavaria and Baden-Württemberg – calculated from Eurostat LFS microdata. Bosnia and Herzegovina, the Republic of Moldova and Ukraine – the national statistical offices.
Notes: Inactivity indices are estimated as (a) inactivity rate in 2019 relative to inactivity rate in 2011 (index 2011-2019); (b) inactivity rate in 2021 relative to inactivity rate in 2019 (index 2019-2021) with both indices estimated separately for men and women.

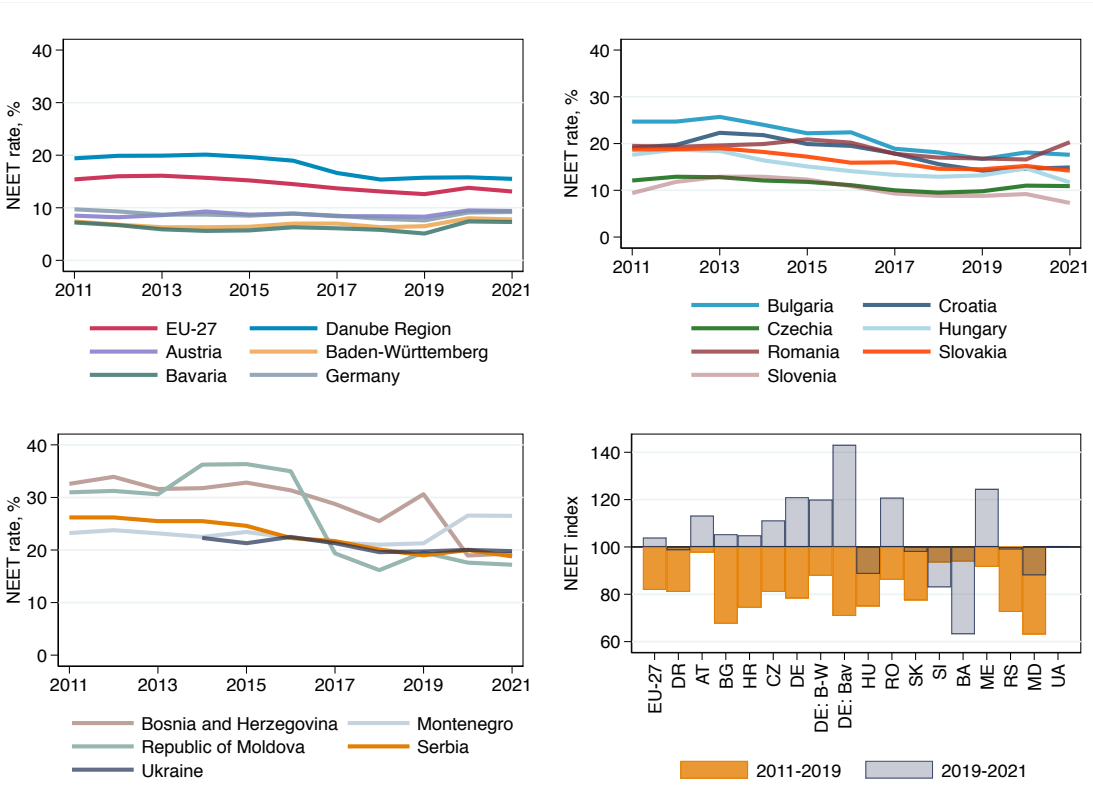
of job retention schemes or similar schemes to cushion unemployment increase in 2020 played a big role in keeping people employed and economically active. Some employees, like women with small children or elderly receiving pensions, are more likely to become economically inactive upon losing jobs and for this group of employees job retention

schemes might have been a crucial factor for staying economically active.

1.5 Not in Education, Employment or Training Rate

The Not in Education, Employment or Training (NEET) rate identifies the share of young people who did not work and did not participate in any sort of education or training activities in the four weeks preceding the survey as a share of the total population in the corresponding age group. The NEET rate is a crucial indicator capturing a broad array of youth vulnerabilities, including early school leaving, labour market discouragement and unemployment. Thus, NEET rates have been in the spotlight of EU and Danube Region programmes promoting inclusive and sustainable economic growth with equal opportunities for everyone, including young people.

Figure 1.12: NEET rates from 2011 to 2021 and NEET indices across countries for the population aged 15 to 29

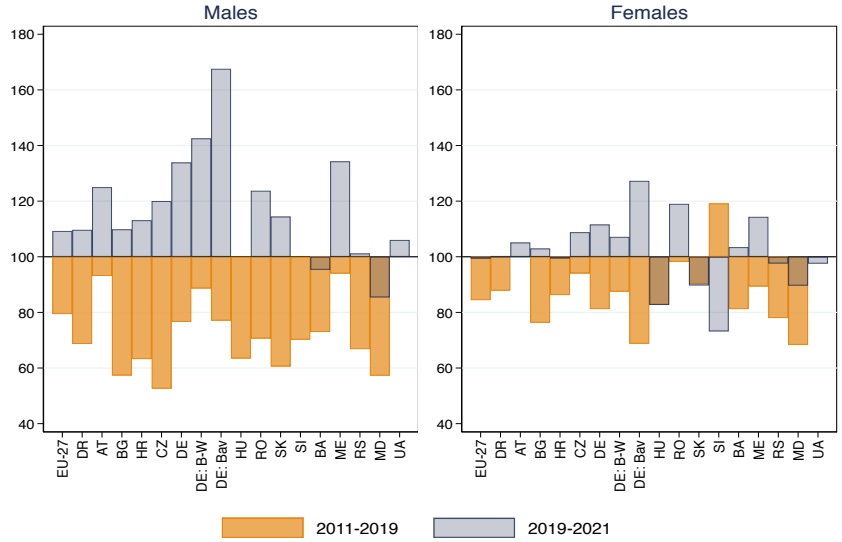


Source: EU Member States – the Eurostat database segment *yth_empl_160*. Bavaria and Baden-Württemberg – the Eurostat database segment *edat_lfse_22*. Bosnia and Herzegovina, Montenegro, the Republic of Moldova, Serbia and Ukraine – the national statistical offices.
Notes: NEET indices are estimated as (a) NEET rate in 2019 relative to NEET rate in 2011 (index 2011-2019); (b) NEET rate in 2021 relative to NEET rate in 2019 (index 2019-2021).

In 2011-2019, the NEET rates declined in all countries in the Danube Region, except the Republic of Moldova (see Figure 1.12). The overall decline for the region was 19%, similar to the EU-27 rate. The Republic of Moldova revealed a peculiar trend, with an

increase to 36% in 2014-2015, a subsequent drop to 24% in 2018 and another upswing to 27% in 2019. In Bulgaria, the NEET rate declined by 32% during 2011-2019, and it fell by 26% in Croatia, by 25% in Hungary, by 22% in Slovakia and by 27% in Serbia. However, despite a gradual decline, the NEET rates in all "new" EU Member States and in EU (potential) candidate countries of the Danube Region remained persistently above the levels of the "old" EU Member States of Austria and Germany. Among all Danube Region countries, Austria, Czechia, Germany and Slovenia achieved NEET rates below the EU-27 level.

Figure 1.13: NEET indices by gender across countries for the population aged 15 to 29

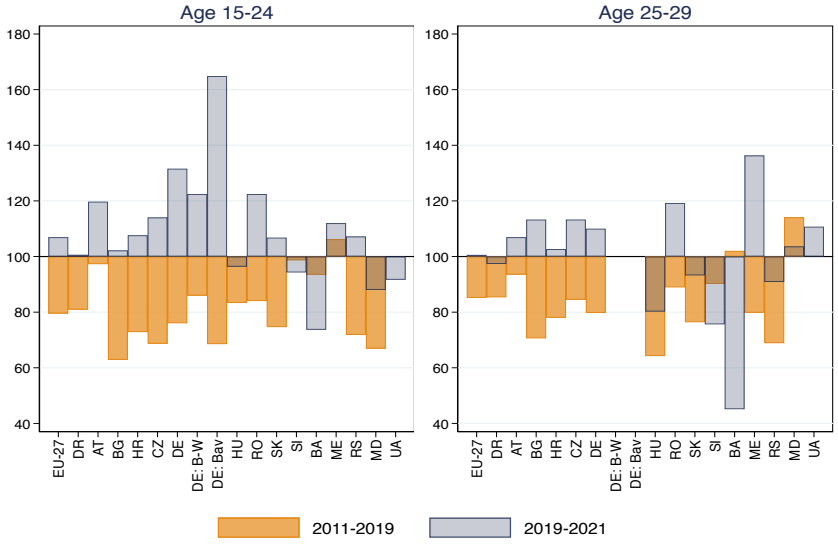


Source: EU Member States – the Eurostat database segment *yth_empl_160*. Bavaria and Baden-Württemberg – the Eurostat database segment *edat_lfse_22*. Bosnia and Herzegovina, Montenegro, the Republic of Moldova, Serbia and Ukraine – the national statistical offices.
Notes: NEET indices are estimated as (a) NEET rate in 2019 relative to NEET rate in 2011 (index 2011-2019); (b) NEET rate in 2021 relative to NEET rate in 2019 (index 2019-2021) estimated separately for men and women.

Further disaggregation of the NEET rate dynamics by gender (see Figure 1.13) indicates that young men experienced, on average, stronger improvement than young women (27% decline vs 8%, respectively, in the Danube Region overall). Baden-Württemberg, Bavaria, Bosnia and Herzegovina, and Montenegro were the only regions where the female NEET rate fell relatively more than the male one. In all other countries, the overall positive NEET rate dynamic was largely driven by young men. The latter was particularly vivid in Slovenia, where the female NEET rate rose by 19% in 2011-2019 while the male one fell by 30%. Additionally, in the Republic of Moldova, there was a 7% increase for women versus a 33% drop for men.

With respect to age differences (see Figure 1.14), the NEET rates in the "new" EU Member States declined more among younger youth (aged 15-24), while in the EU (potential) candidate countries of the Danube Region, it declined more among the age group 25-29 over the period of 2011-2019. The most drastic age differences in the NEET rate

Figure 1.14: NEET indices by age groups across countries



Source: EU Member States – the Eurostat database segment *yth_empl_160*. Bavaria and Baden-Württemberg – the Eurostat database segment *edat_lfse_22*. Bosnia and Herzegovina, Montenegro, the Republic of Moldova, Serbia and Ukraine – the national statistical offices.
Notes: NEET indices are estimated as (a) NEET rate in 2019 relative to NEET rate in 2011 (index 2011-2019); (b) NEET rate in 2021 relative to NEET rate in 2019 (index 2019-2021) estimated separately for two age groups.

changes were documented in Hungary and Montenegro (19 pp and 17 pp, respectively, as the difference between the two age groups, with the older youth group [25-29] having more substantial improvement) as well as in the Republic of Moldova and Czechia (47 pp and 16 pp, respectively, where younger youth [15-24] incurred a more pronounced NEET rate decline).

The economic recession induced by the COVID-19 pandemic was particularly hard on youth, with NEET rates being above the level of 2019 in year 2021 in many countries of the Danube Region. The German region of Bavaria stood out as the hardest hit, marking a 42% increase in the NEET rate, followed by Montenegro with a 24% increase. However, several countries posted lower NEET rates in 2021, relative to 2019, including Bosnia and Herzegovina (37% decline), Slovenia (18% decline), Hungary and republic of Moldova (both around 10% decline in NEET rates). This notably different trends likely relate to different speed of exiting the COVID-19 recession. Countries facing the most mild NEET increases and NEET rate declines are likely the ones with more positive overall labour market dynamics in 2021, higher labour demand and more pronounced labour shortages. As a result, youth employment recovered rapidly from the downturn caused by an overall economic slow-down in 2020 and distorted economic activity.

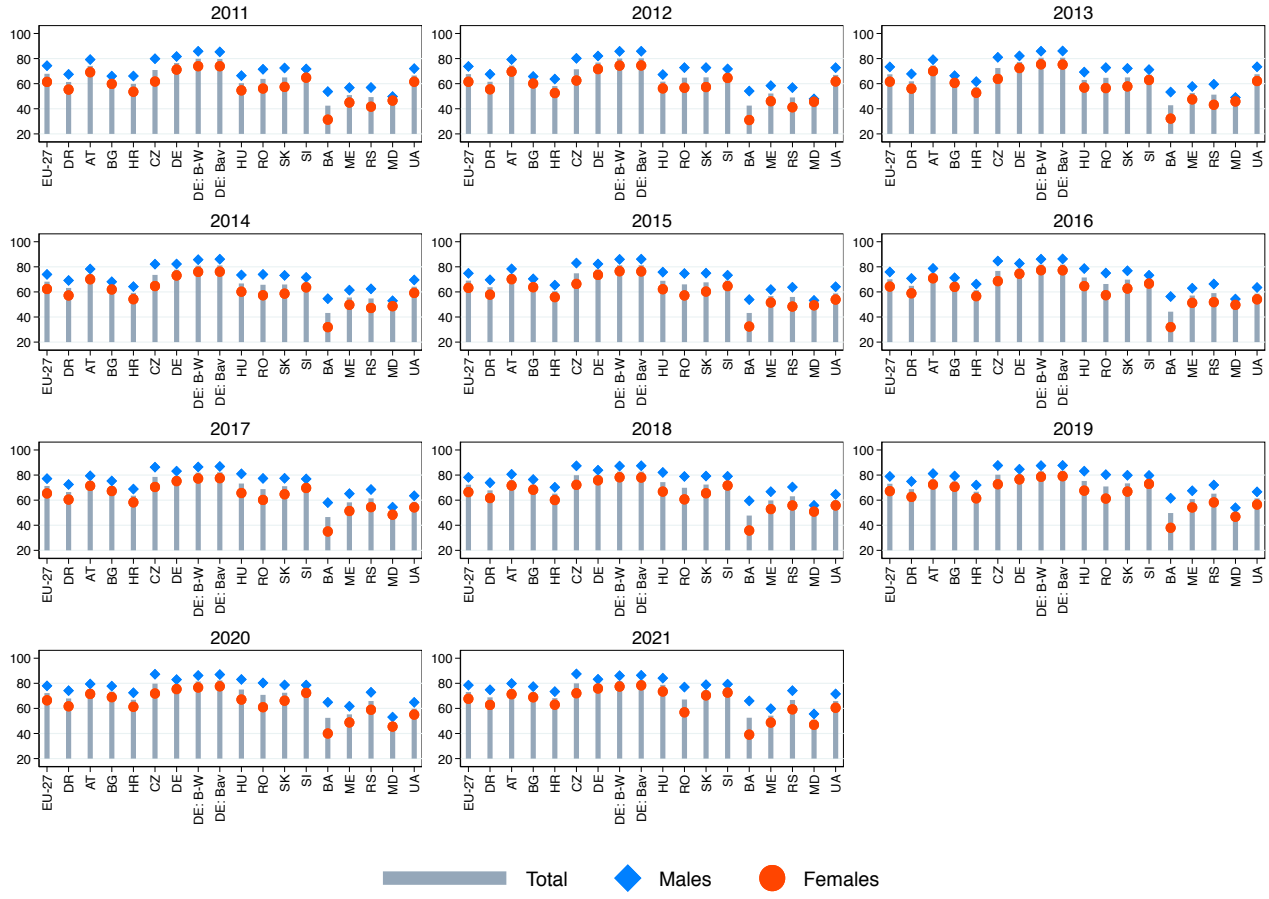
However, in may Danube Region countries increasing NEET rate over years 2020-2021 may be persistent, as youth is more vulnerable in terms of employment stability and less experienced, making it harder to find job. Young men were systematically more affected by the crisis, with NEET rates rising more among men in all countries, except Republic

of Moldova. This observation suggested that young men were most affected by the labour market distortions due to the pandemic in the entire Danube Region. This was likely related to the segregation of young men into industries most affected by the COVID-19 crisis (i.e. manufacturing, transportation and construction) and slower employment recovery in 2021.

1.6 Appendix: Additional Results

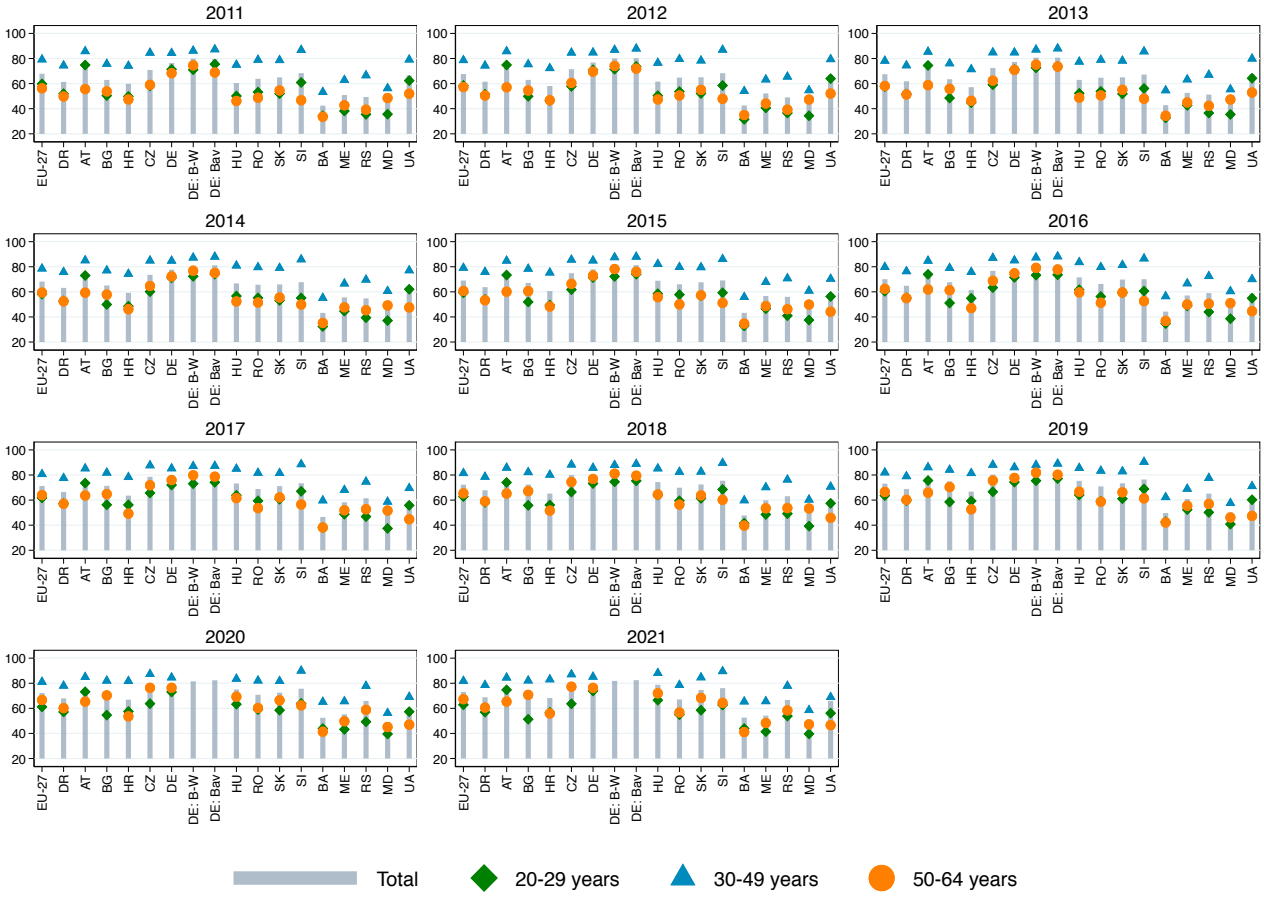
1.6.1 Employment rate

Employment rates from 2011 to 2021 by gender across countries for the population aged 20 to 64



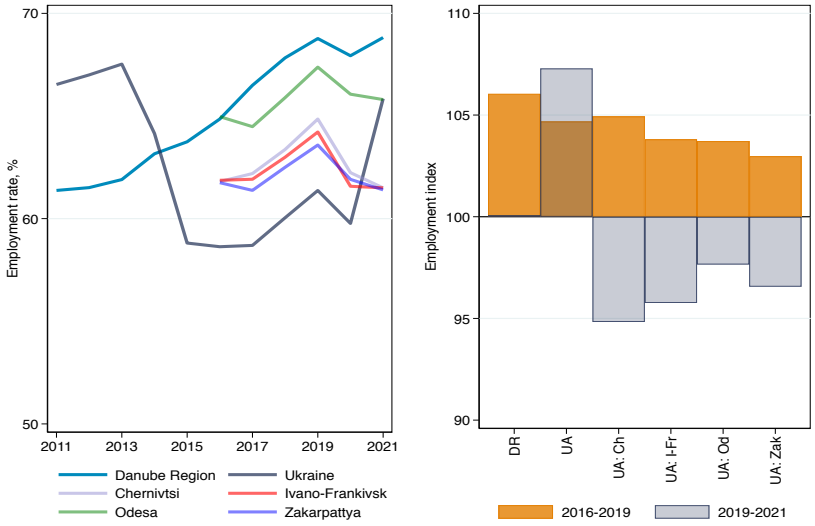
Source: EU Member States, Bosnia and Herzegovina, Montenegro and Serbia – Eurostat database segment *lfsa_ergaed*. Bavaria and Baden-Württemberg – Eurostat database segment *lfst_r_lfe2emprt*. The Republic of Moldova and Ukraine – the national statistical offices.

Employment rates from 2011 to 2021 by age across countries for the population aged 20 to 64



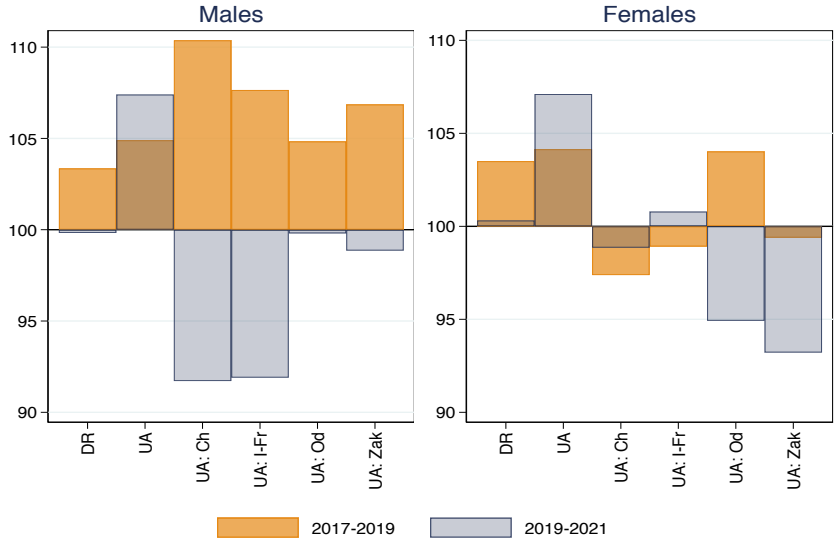
Source: EU Member States, Bosnia and Herzegovina, Montenegro and Serbia – Eurostat database segment *lfsa_ergaed*. Bavaria and Baden-Württemberg – Eurostat database segment *lfst_r_lfe2emprt* for age group 20 to 64 and from LFS microdata for age sub-groups. The Republic of Moldova and Ukraine – the national statistical offices.

Employment rates from 2016 to 2021 and employment indices across regions of Ukraine for the population aged 20 to 64



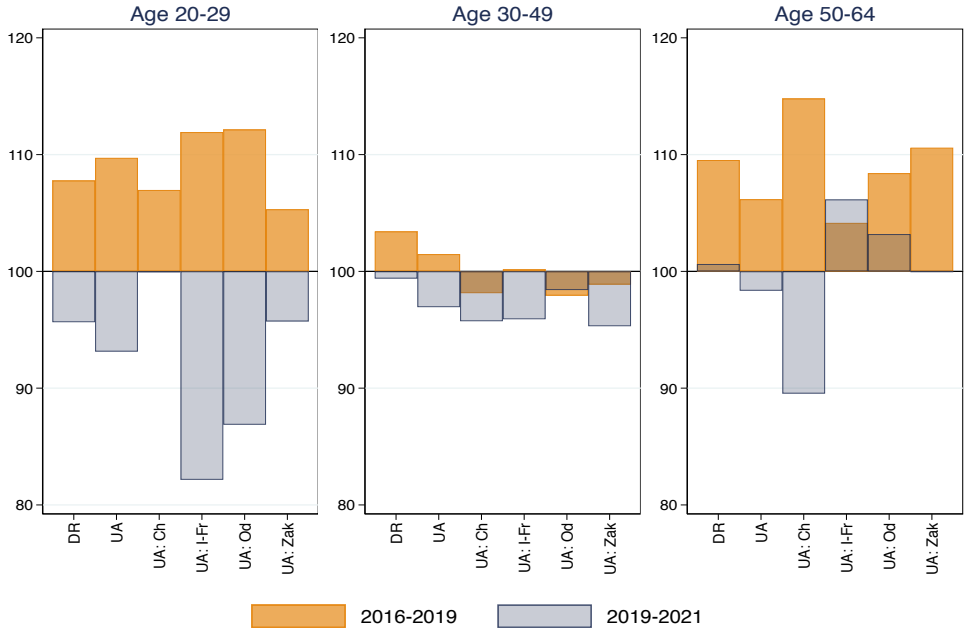
Source: Ukraine – the national statistical office; data on regional level available only for years 2016-2020.
Notes: Employment indices are estimated as (a) employment rate in 2019 relative to employment rate in 2016 (index 2016-2019); (b) employment rate in 2021 relative to employment rate in 2019 (index 2019-2021) with both indices estimated separately for men and women.

Employment indices by gender across regions of Ukraine for the population aged 20 to 64



Source: Ukraine – the national statistical office; data on regional level available only for years 2017-2020.
Notes: Employment indices are estimated as (a) employment rate in 2019 relative to employment rate in 2017 (index 2017-2019); (b) employment rate in 2021 relative to employment rate in 2019 (index 2019-2021) with both indices estimated separately for men and women.

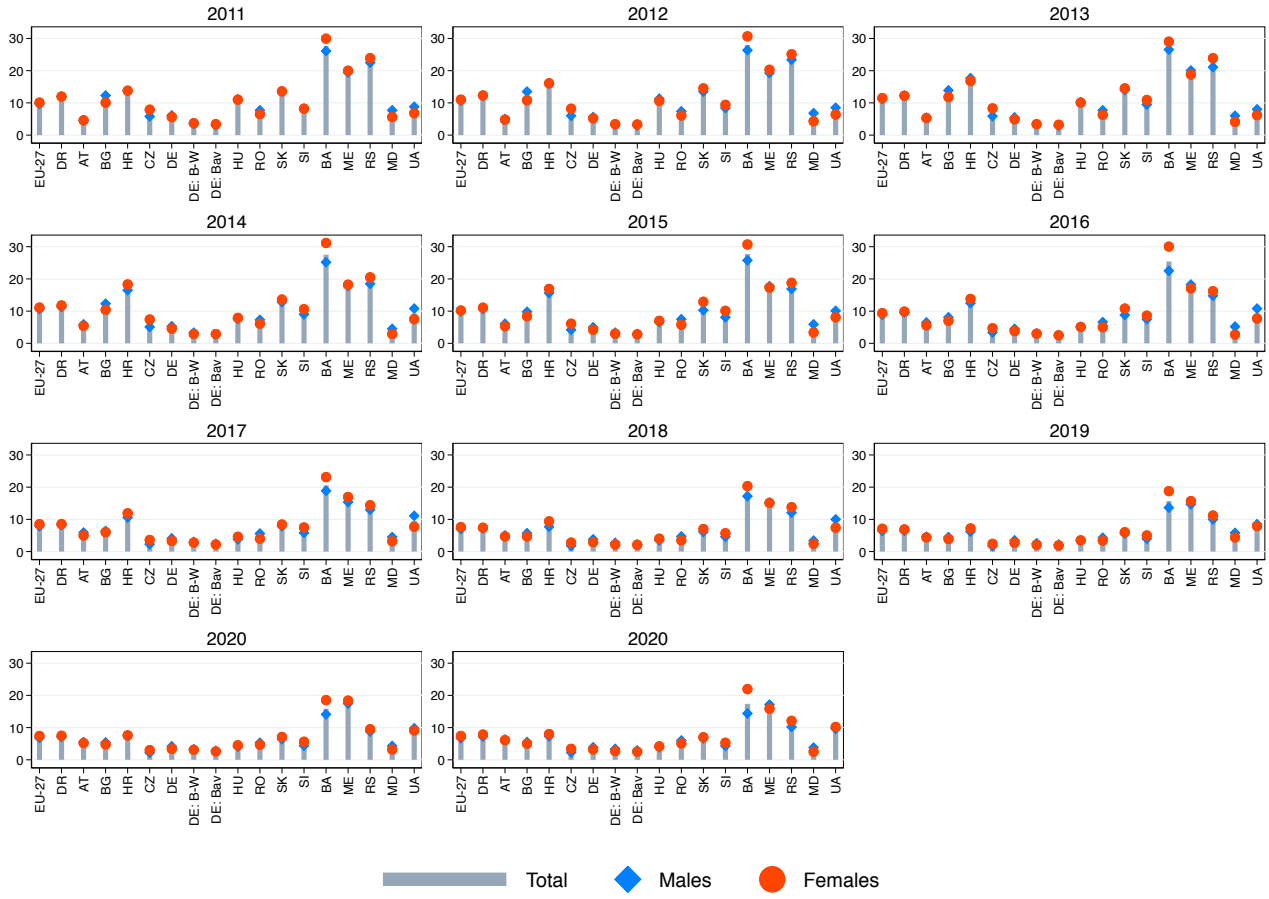
Employment indices by age groups across regions of Ukraine



Source: Ukraine – the national statistical office; data on regional level available only for years 2016-2020.
Notes: Employment indices are estimated as (a) employment rate in 2019 relative to employment rate in 2016 (index 2016-2019); (b) employment rate in 2021 relative to employment rate in 2019 (index 2019-2021) with both indices estimated separately for three age groups

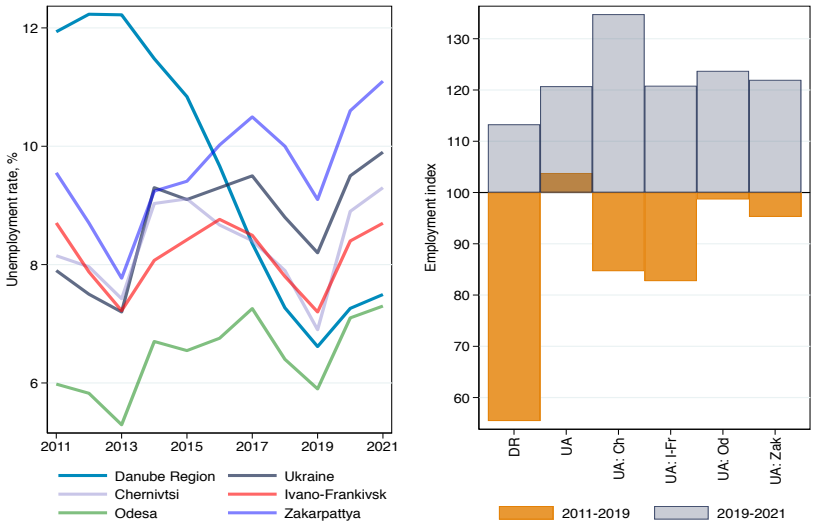
1.6.2 Unemployment rate

Unemployment rates from 2011 to 2021 by gender across countries for the population aged 15 to 74



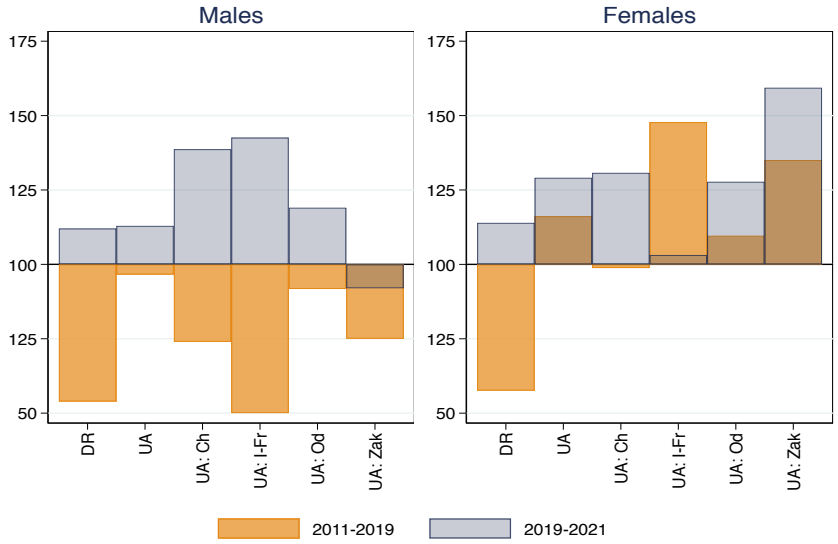
Source: EU Member States, Montenegro and Serbia – the Eurostat database segment *lfsa_urgaed*. Bavaria and Baden-Württemberg – the Eurostat database segment *lfst_r_lfu3rt*. Bosnia and Herzegovina, the Republic of Moldova and Ukraine – the national statistical offices.

Unemployment rates from 2011 to 2021 and unemployment indices across regions of Ukraine for the population aged 15 to 74



Source: Ukraine – the national statistical offices.
Notes: Unemployment indices are estimated as (a) unemployment rate in 2019 relative to unemployment rate in 2011 (index 2011-2019); (b) unemployment rate in 2021 relative to unemployment rate in 2019 (index 2019-2021).

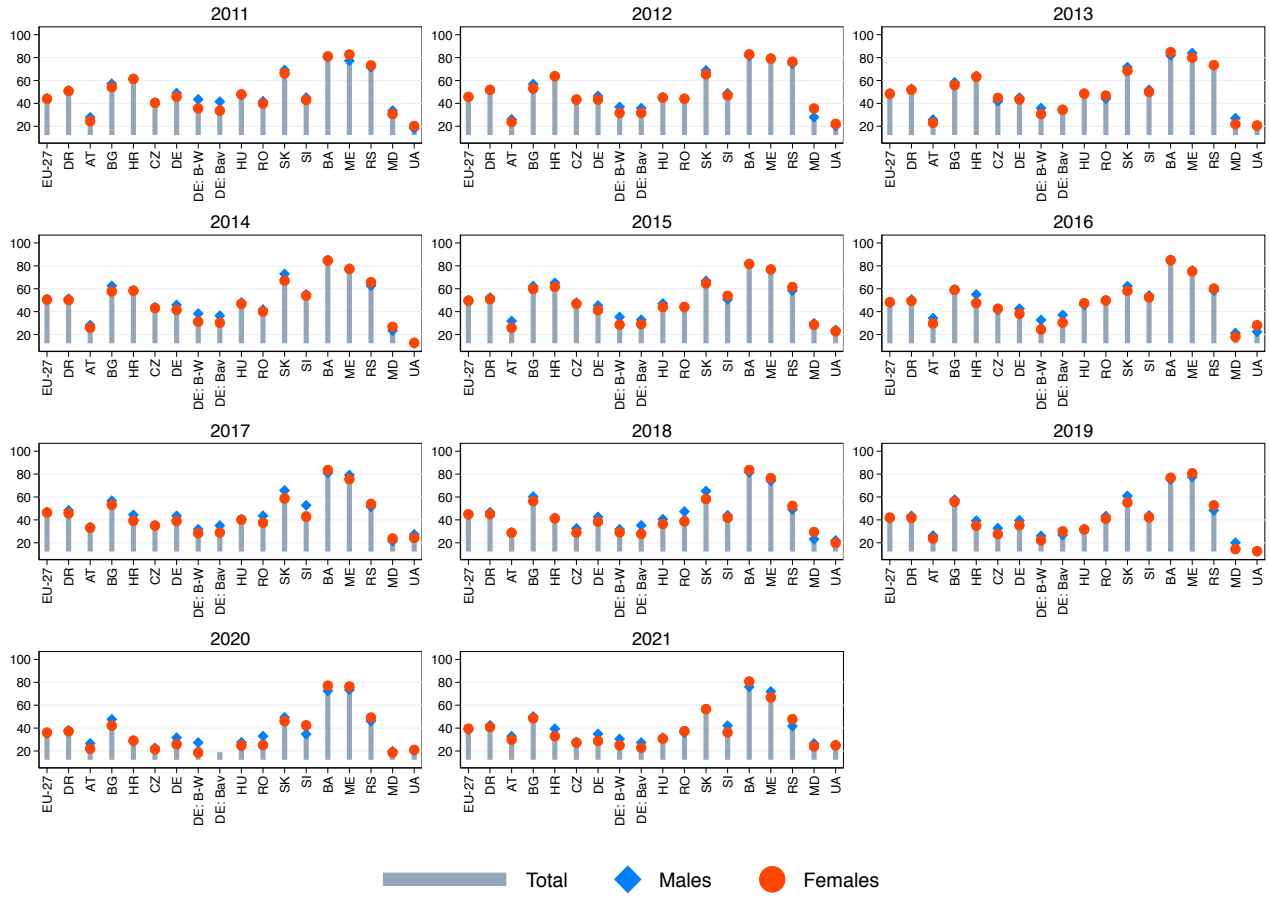
Unemployment indices by gender across regions of Ukraine for the population aged 15 to 74



Source: Ukraine – the national statistical offices.
Notes: Unemployment indices are estimated as (a) unemployment rate in 2019 relative to unemployment rate in 2011 (index 2011-2019); (b) unemployment rate in 2021 relative to unemployment rate in 2019 (index 2019-2021) with both indices estimated separately for men and women.

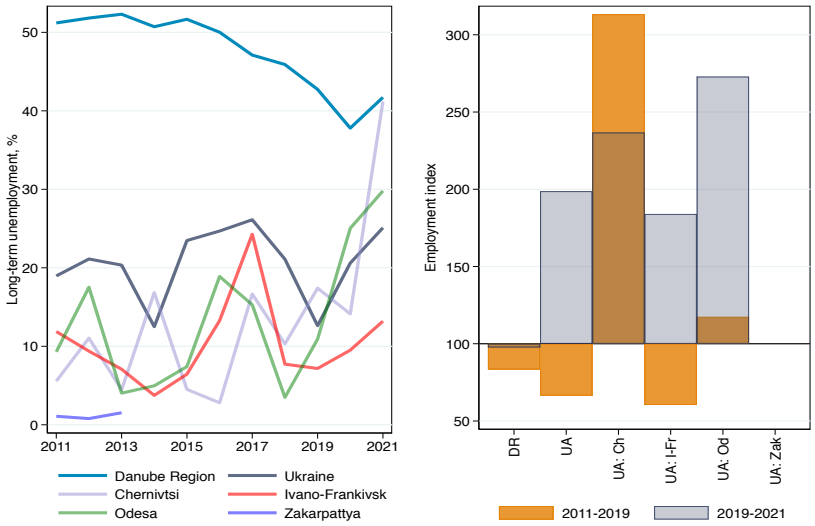
1.6.3 Long-term unemployment share

Long-term unemployment shares from 2011 to 2021 by gender across countries for the population aged 15 to 74



Source: EU Member States, Montenegro, Serbia and German regions of Bavaria and Baden-Württemberg – the Eurostat database segment *lfst_r_lfu2ltu*. Bosnia and Herzegovina, the Republic of Moldova and Ukraine – the national statistical offices.

Long-term unemployment shares from 2011 to 2021 and unemployment indices across regions of Ukraine for the population aged 15 to 74



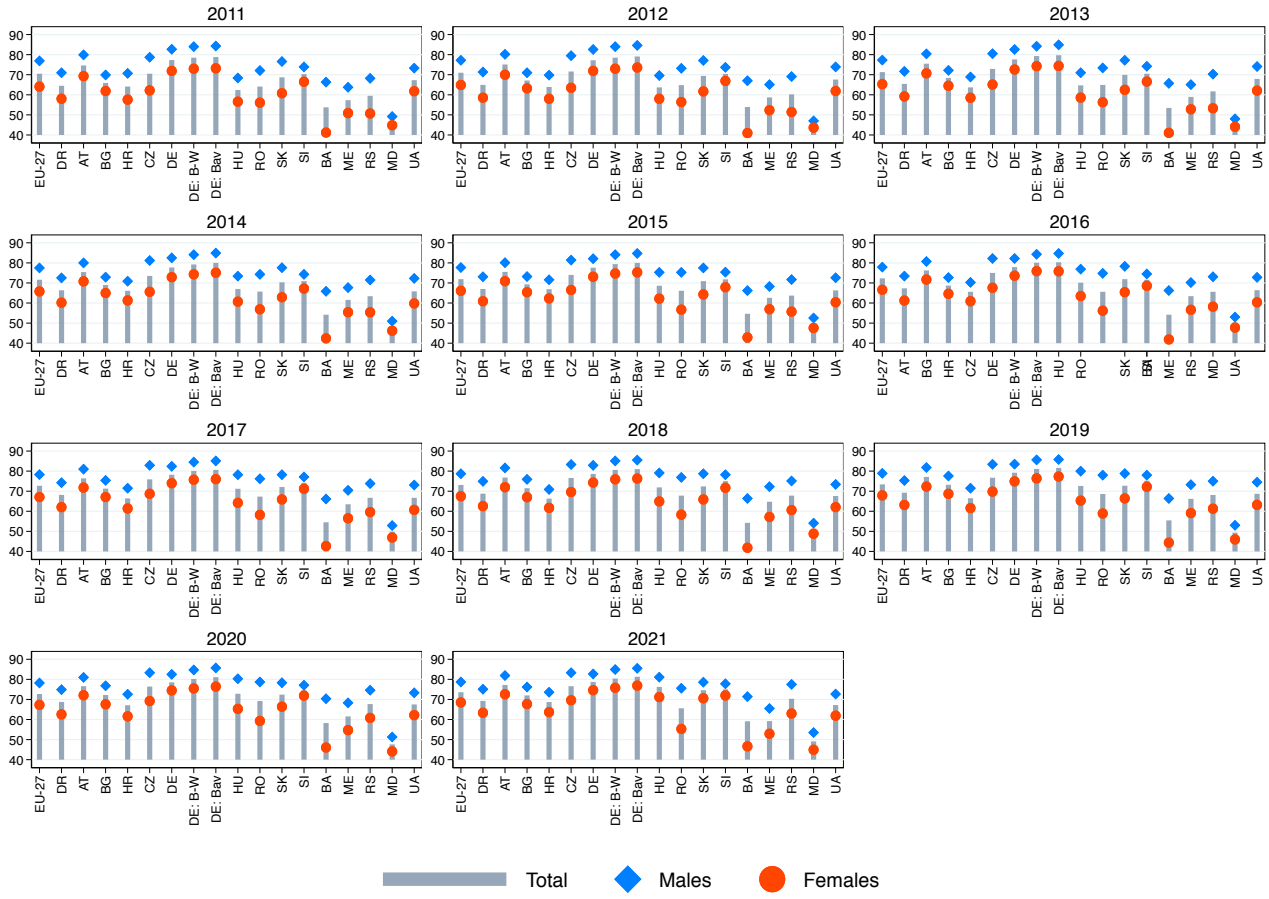
Source: Ukraine – the national statistical offices.
Notes: Long-term unemployment indices are estimated as (a) long-term unemployment rate in 2019 relative to long-term unemployment rate in 2011 (index 2011-2019); (b) long-term unemployment rate in 2021 relative to long-term unemployment rate in 2019 (index 2019-2021).

Long-term unemployment indices by gender across regions of Ukraine for the population aged 15 to 74

Source: Ukraine – the national statistical offices.
Notes: Long-term unemployment indices are estimated as (a) long-term unemployment rate in 2019 relative to long-term unemployment rate in 2011 (index 2011-2019); (b) long-term unemployment rate in 2021 relative to long-term unemployment rate in 2019 (index 2019-2021) with both indices estimated separately for men and women.

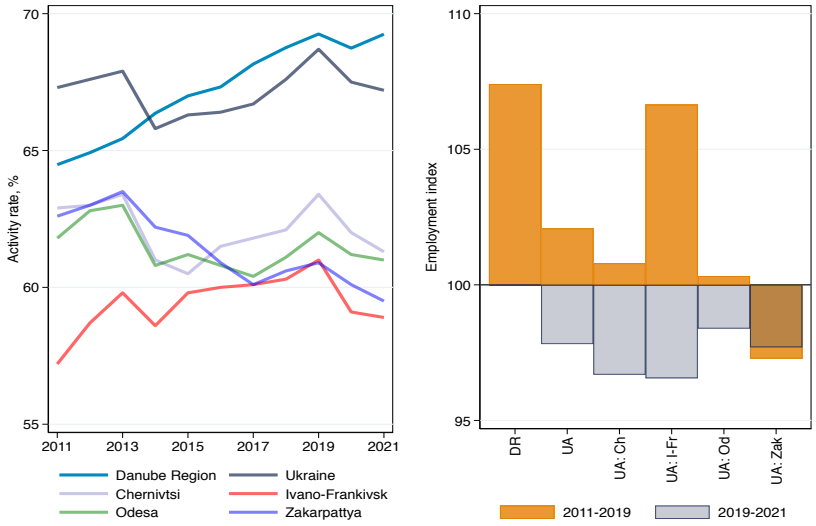
1.6.4 Activity and inactivity rates

Activity rates from 2011 to 2021 by gender across countries for the population aged 15 to 64



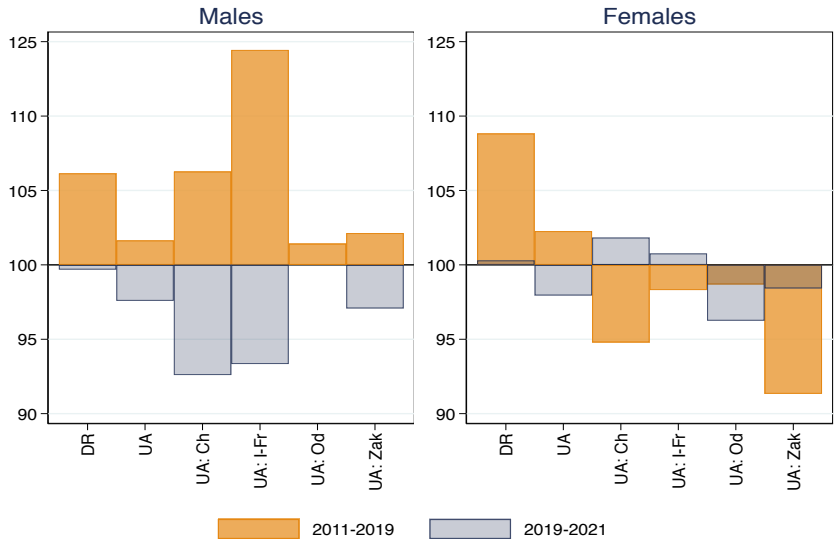
Source: EU Member States, Montenegro and Serbia – the Eurostat database segment *lfsa_argaed*. Bavaria and Baden-Württemberg – the Eurostat database segment *lfst_r_lfp2actrt*. The data for Bosnia and Herzegovina, the Republic of Moldova and Ukraine – the national statistical offices.

Activity rates from 2011 to 2021 and activity indices across regions of Ukraine for the population aged 15 to 74



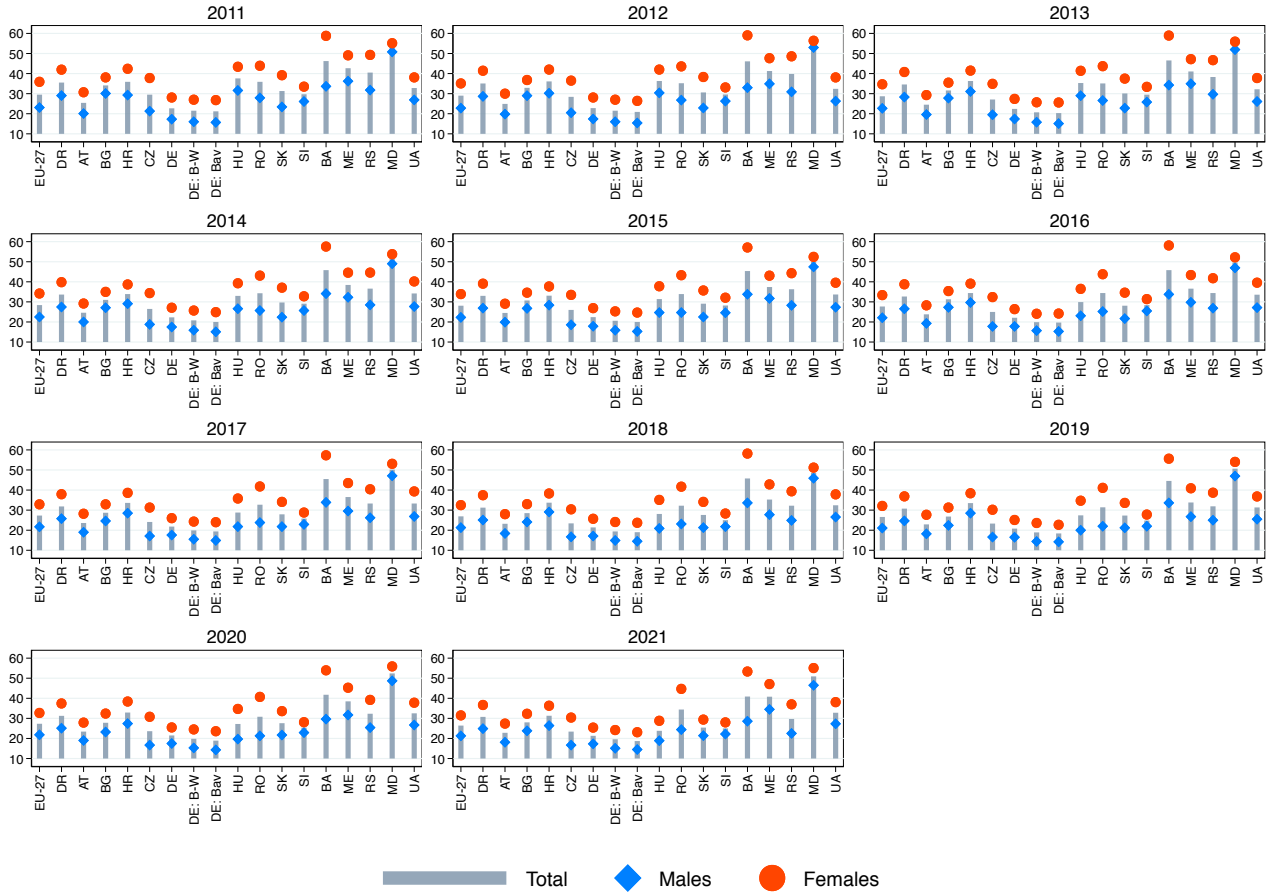
Source: Ukraine – the national statistical offices.
Notes: Activity indices are estimated as (a) activity rate in 2019 relative to activity rate in 2011 (index 2011-2019); (b) activity rate in 2020 relative to activity rate in 2019 (index 2019-2020).

Activity indices by gender across regions of Ukraine for the population aged 15 to 74



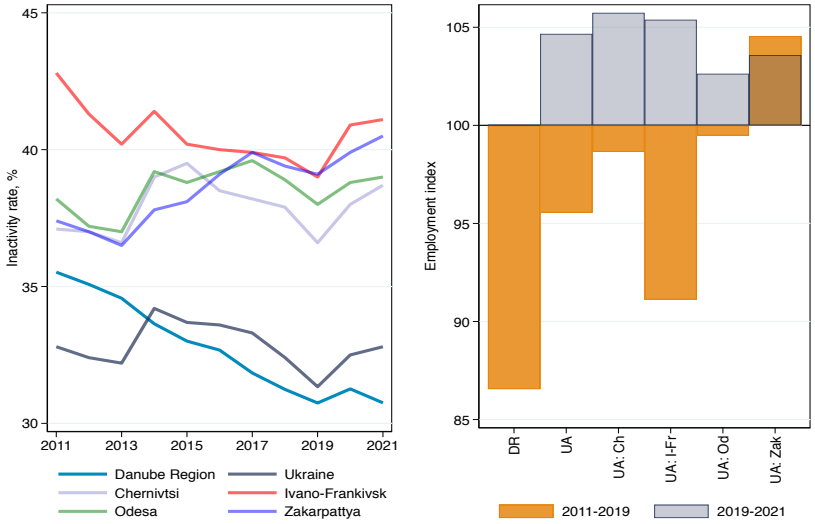
Source: Ukraine – the national statistical offices.
Notes: Activity indices are estimated as (a) activity rate in 2019 relative to activity rate in 2011 (index 2011-2019); (b) activity rate in 2021 relative to activity rate in 2019 (index 2019-2021) with both indices estimated separately for men and women.

Inactivity rates from 2011 to 2021 by gender across countries for the population aged 15 to 64



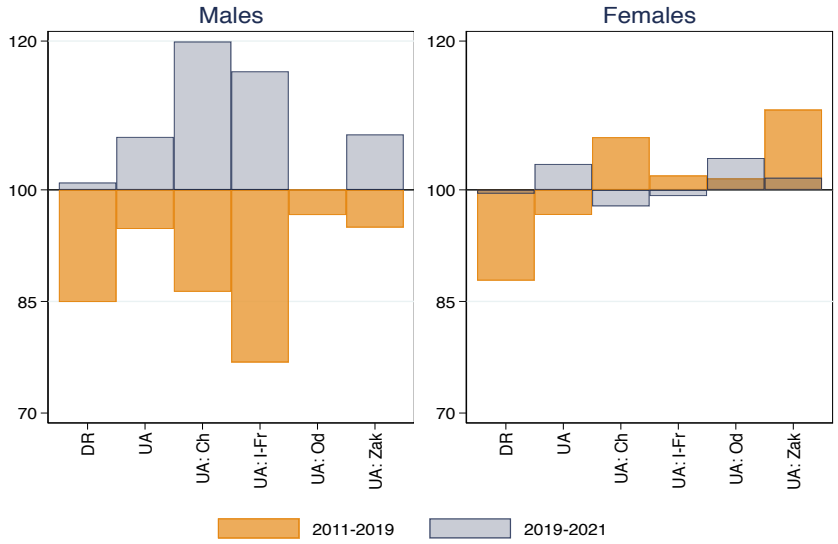
Source: EU Member States, Montenegro and Serbia – the Eurostat database segment *lfsa_ipga*. Bavaria and Baden-Württemberg – calculated from Eurostat LFS microdata. Bosnia and Herzegovina, the Republic of Moldova and Ukraine– the national statistical offices.

Inactivity rates from 2011 to 2021 and inactivity indices across regions of Ukraine for the population aged 15 to 74



Source: Ukraine – the national statistical offices.
Notes: Inactivity indices are estimated as (a) inactivity rate in 2019 relative to inactivity rate in 2011 (index 2011-2019); (b) inactivity rate in 2021 relative to inactivity rate in 2019 (index 2019-2021).

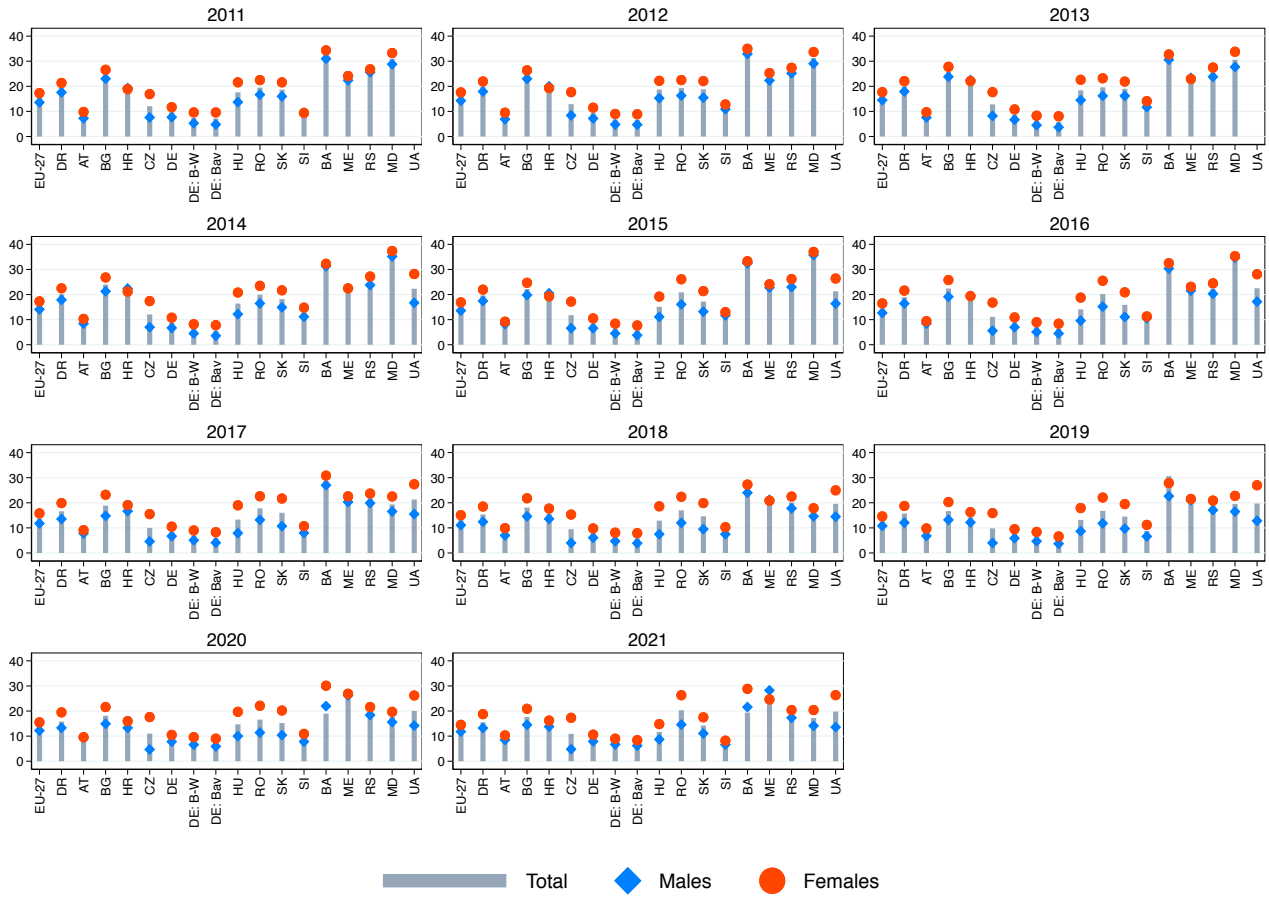
Inactivity indices by gender across regions of Ukraine for the population aged 15 to 74



Source: Ukraine – the national statistical offices.
Notes: Inactivity indices are estimated as (a) inactivity rate in 2019 relative to inactivity rate in 2011 (index 2011-2019); (b) inactivity rate in 2021 relative to inactivity rate in 2019 (index 2019-2021) with both indices estimated separately for men and women.

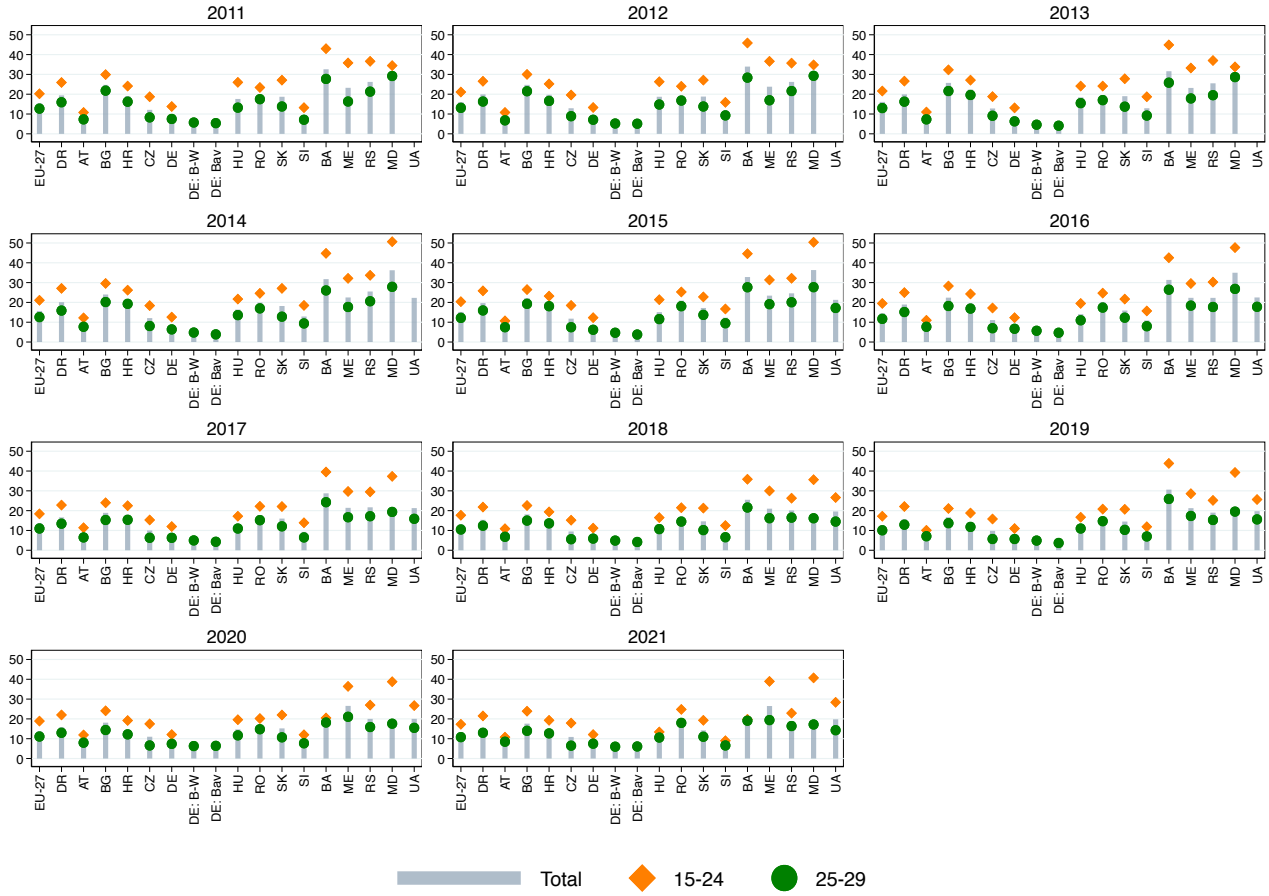
1.6.5 NEET rates

NEET rates from 2011 to 2021 by gender across countries for the population aged 15 to 29



Source: EU Member States – the Eurostat database segment *yth_empl_160*. Bavaria and Baden-Württemberg – the Eurostat database segment *edat_lfse_22*. Bosnia and Herzegovina, Montenegro, the Republic of Moldova, Serbia and Ukraine – the national statistical offices.

NEET rates from 2011 to 2021 by age groups across countries for the population aged 15 to 29



Source: EU Member States – the Eurostat database segment *yth_empl_160*. Bavaria and Baden-Württemberg – the Eurostat database segment *edat_lfse_22*. Bosnia and Herzegovina, Montenegro, the Republic of Moldova, Serbia and Ukraine – the national statistical offices.

1.7 Appendix: Indicators and Data Description

Employment rate

Definition: The employment rate is measured as the percentage of employed persons in the working-age population.

Source: The data for the EU Member States, Bosnia and Herzegovina, Montenegro and Serbia came from the Eurostat database segment *lfsa_ergaed*. The data for Bavaria and Baden-Württemberg came from the Eurostat database segment *lfst_r_lfe2emprt* for the age group 20-64 and from the LFS microdata for the age sub-groups. The data for the Republic of Moldova and Ukraine came from their national statistical offices.

Data availability: The data for the German regions Bavaria and Baden-Württemberg were available for the years 2011-2021 for the age group 20-64 and for the years 2011-2019 for the age sub-groups. For four regions of Ukraine, the data for the total population (men and women) in all age groups were available for the years 2016 to 2021. The data by gender for all age groups were available for the years 2017-2021.

Unemployment rate

Definition: The unemployment rate is the percentage of unemployed persons in the total labour force. A person is referred to as unemployed when he/she is not employed in a reference week, is willing to start working within two weeks or is actively looking for work.

Source: The data for the EU Member States, Montenegro and Serbia came from the Eurostat database segment *lfsa_urgaed*. The data for Bavaria and Baden-Württemberg came from the Eurostat database segment *lfst_r_lfu3rt*. The data for Bosnia and Herzegovina, the Republic of Moldova and Ukraine came from their national statistical offices.

Data availability: The data were available for all countries for the years 2011-2021.

Long-term unemployment

Definition: Long-term unemployment is measured as the percentage of long-term unemployed people (those who did not work in the 12 months preceding the survey but are actively looking for work) in the total unemployed population.

Source: The data for the EU Member States, Montenegro, Serbia and German regions of Bavaria and Baden-Württemberg came from the Eurostat database segment *lfst_r_lfu2ltu*. The data for Bosnia and Herzegovina, the Republic of Moldova and Ukraine came from their national statistical offices.

Data availability: For the German region Bavaria, the data for men and women were available for the years 2011-2019, and the data for the total population were available for the years 2011-2020. For the Ukrainian region Zakarpattya, the data for the total

population were available only for the years 2011-2013; for men, data were available for the years 2012 and 2013, and for women, data were available for the years 2011-2013 and 2015. For the Ukrainian region Odesa, the data for men were available for the years 2012-2021, and the data for women were available for the years 2011, 2012, 2017, 2019, 2021. For all other countries and regions, the data were available for the years 2011-2021.

Activity and inactivity rates

Definition:

(i) The activity rate is measured as the percentage of labour force in the working-age population. A person is referred to as a part of the labour force when he/she is actively participating in a labour market by either (a) being employed or (b) looking for a job (unemployed).

(ii) The inactivity rate represents a share of the working-age population (15 to 64 years old) who are neither working, nor looking for gainful employment. The economically inactive population includes students, early retired or long-term sick individuals, those taking care of responsibilities and housewives/househusbands.

Source: The data for the EU Member States, Montenegro and Serbia came from the Eurostat database segment *lfsa_argaed* for the activity rate and *lfsa_ipga* for the inactivity rate. The data for Bavaria and Baden-Württemberg came from the Eurostat database segment *lfst_r_lfp2actrt* for activity rate and inactivity rate is calculated from Eurostat LFS microdata. The data for Bosnia and Herzegovina, the Republic of Moldova and Ukraine came from their national statistical offices.

Data availability: The data were available for all countries for the years 2011-2021.

NEET rate

Definition: The NEET rate is measured as the young population not taking part in employment, education or training in the four weeks preceding the survey as a percentage of the total population of respective age.

Source: The data for the EU Member States came from the Eurostat database segment *yth_empl_160*. The data for Bavaria and Baden-Württemberg came from the Eurostat database segment *edat_lfse_22*. The data for Bosnia and Herzegovina, Montenegro, the Republic of Moldova, Serbia and Ukraine came from their national statistical offices.

Data availability: The data for the German regions Bavaria and Baden-Württemberg for the age group of 25- to 29-year-olds were not available; for other age groups, the data were available for the years 2011-2021. For Ukraine, the data for the age group 15-29 were available for the years 2014-2021; the data for the age group 15-24 were available for the years 2015-2021, and the data for the age group 25-29 were available for the years 2018-2021. For four regions of Ukraine, the data were not available. The data for all

other countries in all age groups for the total population and by gender were available for the years 2011-2021.

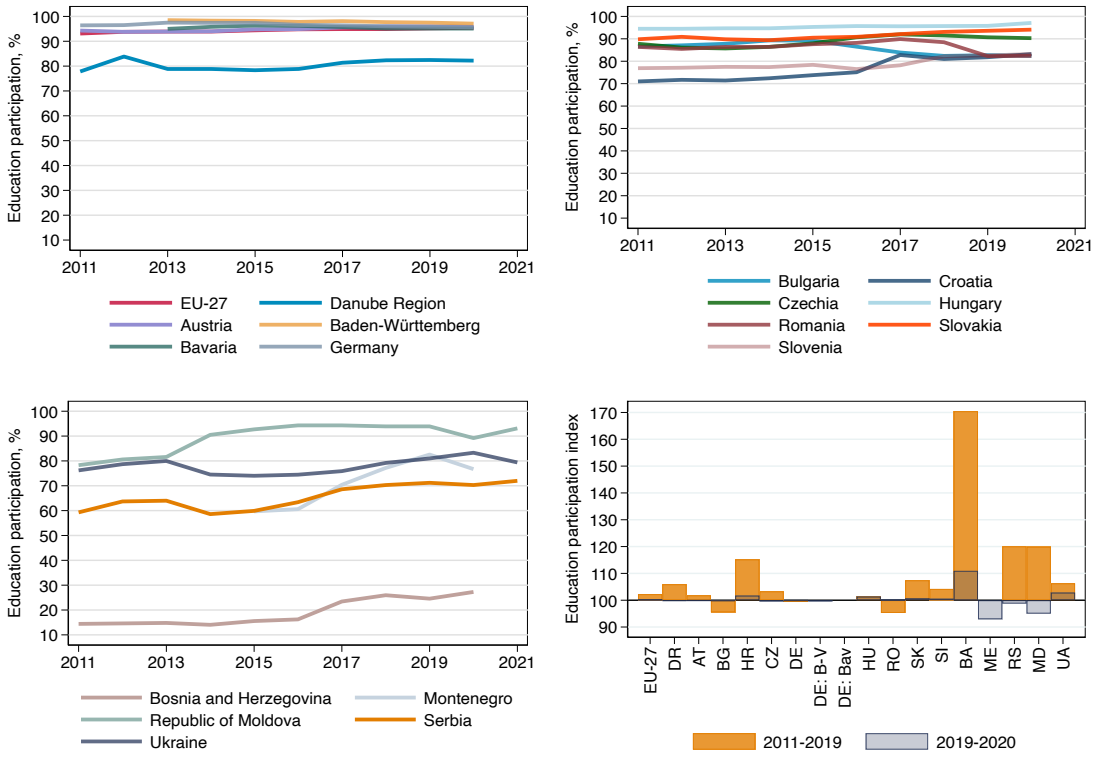
Objective II

Contribution to Improved Educational Outcomes and Relevant Skills and Competences in the Danube Region, Focusing on Learning Outcomes for Employability, Entrepreneurship, Innovation, Active Citizenship and Well-Being

2.1 Participation in Early Childhood Education and Care

Participation in early childhood education and care of children under the mandatory schooling age (ISCED 0 education level) is essential for the successful start of school studies and future educational achievements. Early childhood education and care builds important foundations in core study disciplines and develops crucial non-cognitive and social skills. The indicator of early childhood education and care participation measures the share of children between the age of four and the starting age of compulsory primary education who participated in early childhood education. However, despite the major role of early childhood education and care, the share of children attending kindergartens and other early childhood education institutions varies drastically across the Danube Region.

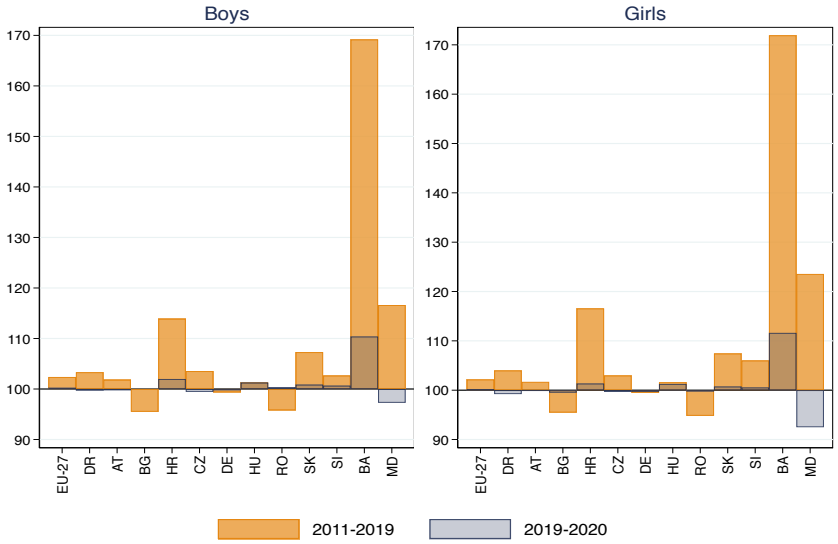
Figure 2.1: Participation in early childhood education and care of children aged four and up and the index change of the participation rate across countries from 2011 to 2019



Source: EU Member States, Montenegro – Eurostat dataset *SDG_04_30*. Bavaria and Baden-Württemberg – Eurostat database segment *educ_uoe_enra17*. Bosnia and Herzegovina – 2011-2017: RCC (`https://www.rcc.int/seeds/results/1/see2020-progress-tracker`); from 2018 onwards – Ministry of Civil Affairs. Serbia – 2011-2016: RCC (`https://www.rcc.int/seeds/results/1/see2020-progress-tracker`); 2017: Eurostat dataset *SDG_04_30*; 2018-2019: Ministry of Education, Science and Technological Development of the Republic of Serbia. The Republic of Moldova and Ukraine – the national statistical offices.
Notes: Indices are estimated as (a) a share of children involved in early education in 2019 relative to a share of children involved in early education in 2011 (index 2011-2019); (b) a share of children involved in early education in 2020 relative to a share of children involved in early education in 2019 (index 2019-2020).

Following the Council Resolution on a strategic framework for European cooperation

Figure 2.2: Participation in early childhood education and care of children aged four and up - index change by gender across countries



Source: EU Member States and Montenegro – Eurostat dataset *SDG_04_30*. The Republic of Moldova – the national statistical offices.
Notes: Indices are estimated as (a) a share of children involved in early education in 2019 relative to a share of children involved in early education in 2011 (index 2011-2019); (b) a share of children involved in early education in 2020 relative to a share of children involved in early education in 2019 (index 2019-2020) separately for boys and girls.

in education and training towards the European Education Area and beyond (2021-2030), at least 96% of children between the ages of three and the legal starting school age should participate in early childhood care and education by 2030. While the EU-27 average reached 95% by 2019, the average early childhood education and care participation in the Danube Region lagged far behind the Council Resolution's target level (83% in 2019), though there was an increase to 89% in 2018 (see Figure 2.1).

Not surprisingly, the shares of children attending early childhood education and care institutions were systematically higher in the "old" EU Member States of Austria and Germany (both 96% in 2019) and in several "new" EU Member States, i.e. Hungary (96% in 2019) and Slovakia (94% in 2019). The generous financing, good infrastructure, availability and relatively low cost of early childhood education and care for parents contributed to the high percentages of early childhood education and care participation. Another important factor was employment of mothers - higher female employment (including maternal employment) was likely associated with the higher participation of children in early childhood education and care.[14] Among the EU Member States, the lowest participation rates were documented in Bulgaria, Croatia, Romania and Slovenia (all 82% in 2019). Bulgaria and Romania incurred a drop of 5% in early childhood education and care participation in 2011-2019.

[14] An adequate provision of early childhood education and care opportunities may in turn also increase female labour market participation and employment, hence reducing maternal unemployment and wage penalty and facilitating labour market reintegration of mothers with young children.

Among non-EU countries, the Republic of Moldova experienced a major increase in early childhood education and care participation from 81% to 94% in 2011-2019. Notably, the increase was even more pronounced among girls (see Figure 2.2). Other non-EU countries of the region - particularly Bosnia and Herzegovina, Montenegro and Serbia - had very low participation in early childhood education and care, with the former country having outstandingly low early education participation. Limited state financial support and a lack of early childhood education and care facilities were likely contributing to the lower rates in these countries.

Since the data for 2021 is not available for majority of countries we focus on the change in participation in early childhood education and care in 2020, compared to 2019. We document no stark change in participation in early childhood education and care during 2020, apart from Bosnia and Herzegovina (over 10% increase), Montenegro (7% drop), Republic of Moldova (5% decline) and Ukraine (3% increase).[15] In all other countries participation in early childhood education and care remained largely unchanged.

2.2 Proportion of the Population Aged 20-24 Having Completed at Least Upper Secondary Education

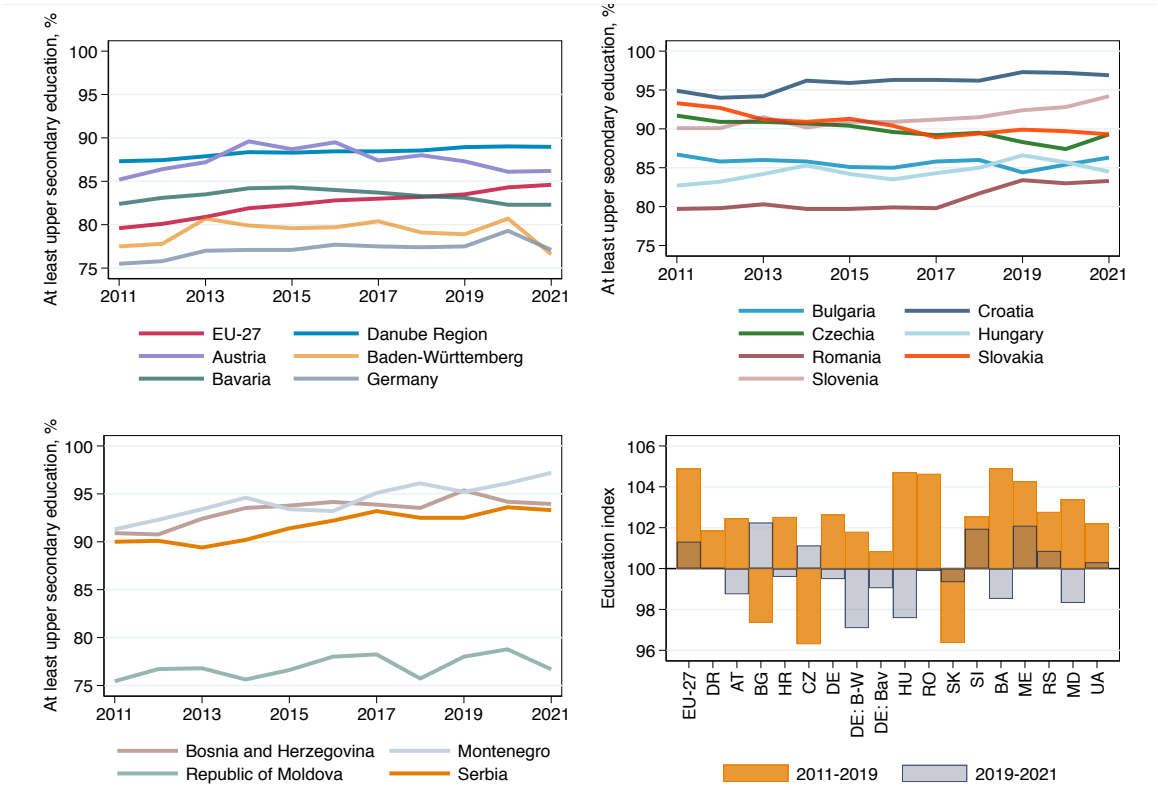
The estimate of the proportion of the population aged 20-24 having completed at least upper secondary education (ISCED Levels 3 to 8) quantifies a share of the population that is likely to have the minimum necessary qualifications to actively participate in social and economic life.

Figure 2.3 depicts the percentage of the population aged 20 to 24 who completed at least upper secondary education. The average share of youth with at least upper secondary education in the Danube Region ranged from 85% in 2011 to 87% in 2020, topping the EU-27 average levels (80% in 2011 and 84% in 2020). The shares varied drastically across the Danube Region countries, ranging from 79% in Germany to 96%-97% in Croatia, Montenegro and Ukraine in 2020.

Overall, very minor changes in the proportion of youth with at least upper secondary education occurred during the observation period. Hungary and Romania incurred a 5% increase in the share of youth with at least upper secondary education, followed by

[15]There may be several reasons attributed to a drop in participation in early childhood education and care, mainly closure of early childhood education and care institutions (mainly temporary), health considerations due to highly contagious virus and its rapid spread among children). Similarly, some factors might have increased participation, among others, a major transition to home office and/or less grandparental or other childcare, which could have motivated parents enrol their pre-school aged children in kindergartens if they were previously at home with babysitter or family member. Some evidence on this at `https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac104/6691466`

Figure 2.3: Proportion of the population aged 20 to 24 having completed at least upper secondary education across countries from 2011 to 2021



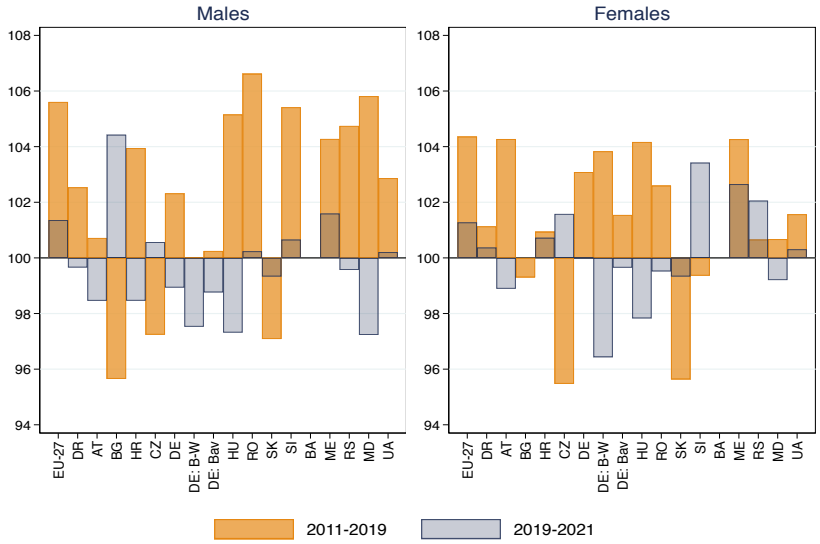
Source: EU Member States, Montenegro and Serbia – Eurostat segment *edat_lfse_03*. Bavaria and Baden-Württemberg – Eurostat database segment *edat_lfse_04*. Bosnia and Herzegovina and Republic of Moldova – Eurostat segment *enpr_siinr*. Ukraine – the national statistical office.
Notes: Indices are estimated as (a) proportion of people aged 20-24 holding at least secondary education in 2019 relative to a proportion of people aged 20-24 holding at least secondary education in 2011 (index 2011-2019); (b) a proportion of people aged 20-24 holding at least secondary education in 2021 relative to a proportion of people aged 20-24 holding at least secondary education in 2019 (index 2019-2021).

Montenegro (4%). The increase was mainly driven by males in Hungary and Romania (see Figure 2.4). The latter was not surprising given that females had, on average, a better education profile in most of the counties, but given the somewhat larger increase in the share of people with at least upper secondary education among men, the gender gap tended to narrow. The gender gap may have emerged due to the earlier labour market transition of men and their higher school leaving rate[16].

The effect of the COVID-19 pandemic over the years 2020 and 2021 was very uneven across the countries. However, the given time span was too short to quantify the actual impact of the pandemic on the share of people who completed at least upper secondary education. Distance learning, school closures and lack of social interaction might have had an adverse effect on some students, resulting in a higher likelihood of leaving school before completing an upper secondary education degree. However, for these effects to materialise

[16]For a more profound analysis of gender differences in early labour market transitions, see Iannelli, C. and Smyth, E., Mapping gender and social background differences in education and youth transitions across Europe, *Journal of Youth Studies 11, no. 2*(2008): 213-232.

Figure 2.4: Proportion of the population aged 20 to 24 having completed at least upper secondary education - index change by gender across countries



Source: Source: EU Member States, Montenegro and Serbia – Eurostat segment *edat_lfse_03*. Bavaria and Baden-Württemberg – Eurostat database segment *edat_lfse_04*. Republic of Moldova – Eurostat segment *enpr_siinr*. Ukraine – the national statistical office.
Notes: Indices are estimated as (a) proportion of people aged 20-24 holding at least secondary education in 2019 relative to a proportion of people aged 20-24 holding at least secondary education in 2011 (index 2011-2019); (b) a proportion of people aged 20-24 holding at least secondary education in 2021 relative to a proportion of people aged 20-24 holding at least secondary education in 2019 (index 2019-2021) separately for men and women.

in the statistical data of the population aged 20 to 24, a longer time frame is needed, as those who are currently being influenced by COVID-19 effects on the study processes will be captured by the indicator no earlier than a year or two from now. However, even with the data for years 2020 and 2021 only we already document a drop of 3% in Baden-Württemberg and around 2% in Bosnia and Herzegovina, Hungary and Republic and Moldova.

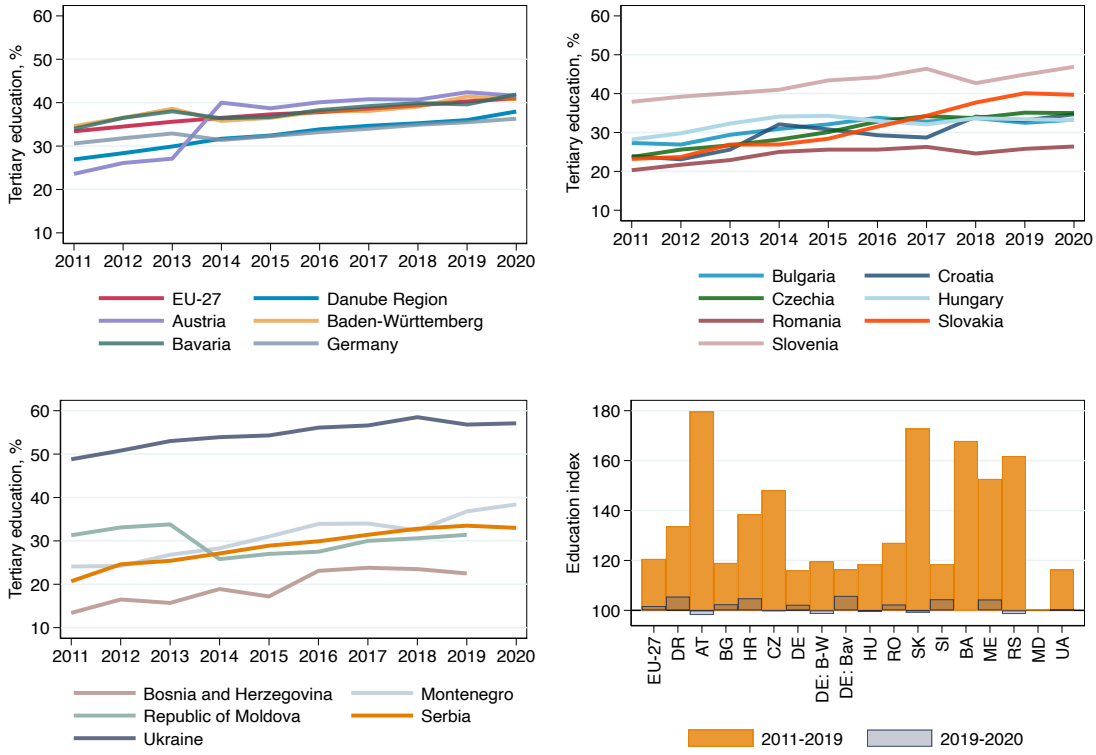
2.3 Proportion of the Population Aged 30-34 Having Completed Tertiary Education

People with tertiary education, i.e. those holding higher education degrees, are particularly crucial for successful development and growth, as they possess the skills, knowledge and training needed to conduct research, to develop and implement innovations, and to bring economies to a new level of technological and scientific advancement[17]. Therefore,

[17]For an in-depth analysis of an association between higher education, innovation and growth refer to the following sources: (i) Brunello, G., Garibaldi, P., and Wasmer, E. (2007). Higher education, innovation and growth. In *Education and training in Europe*. Oxford University Press; (ii) Kruss, G., McGrath, S., Petersen, I. H., and Gastrow, M. (2015). Higher education and economic development: The importance of building technological capabilities. *International Journal of Educational Development*, 43, 22-31.

promoting and facilitating access to higher education is an important objective.

Figure 2.5: Proportion of the population aged 30 to 34 having completed tertiary education across countries from 2011 to 2020



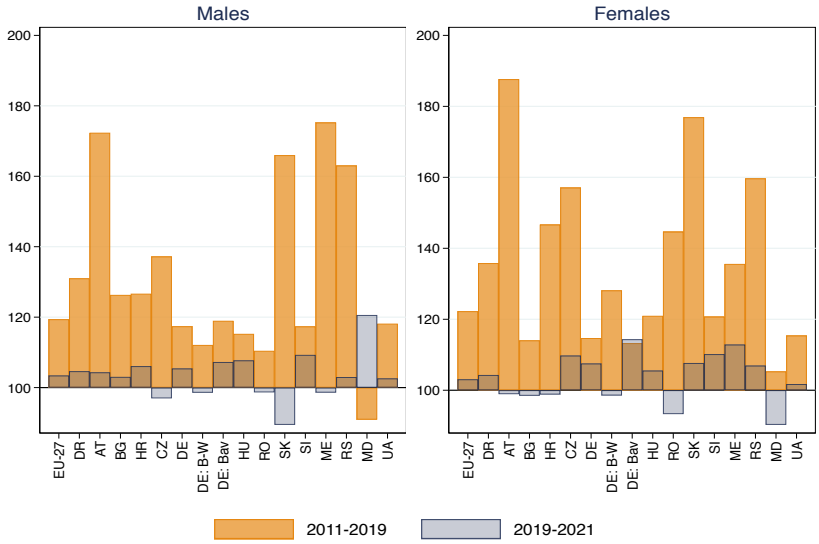
Source: EU Member States, Montenegro and Serbia – Eurostat segment *edat_lfse_03*. Bavaria and Baden-Württemberg – Eurostat database segment *edat_lfse_04*. Bosnia and Herzegovina – Eurostat segment *cpc_pseduc*. Republic of Moldova – Eurostat segment *enpe_edat_lfse_03*. Ukraine – the national statistical office.
Notes: Indices are estimated as (a) proportion of people aged 30-34 holding tertiary education in 2019 relative to a proportion of people aged 30-34 holding tertiary education in 2011 (index 2011-2019); (b) a proportion of people aged 30-34 holding tertiary education in 2020 relative to a proportion of people aged 30-34 holding tertiary education in 2019 (index 2019-2020).

According to the Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030), the proportion of 25- to 34-year-olds with a tertiary educational qualification should be at least 45% by 2030[18]. All countries in the Danube Region, except the Republic of Moldova, underwent a notable increase in the share of the population with tertiary education in 2011-2019, and the growth did not deteriorate in 2020 during the pandemic (see Figure 2.5). The Danube Region average is gradually converging towards the EU-27 average level, yet it remains somewhat below it (27% vs 33%, respectively, in 2011 and 38% vs 41%, respectively, in 2020). Given the positive dynamics, the chances that the Danube Region's average share of tertiary graduates will reach the target level of 45% by 2030 are rather high.

However, a number of countries are far below the policy objective. Among the EU

[18]One has to acknowledge that the analysis is performed for the age group 30 to 34, while the Council Resolution considers an age group 25 to 34.

Figure 2.6: Proportion of the population aged 30 to 34 having completed tertiary education - index change by gender across countries



Source: Source: EU Member States, Montenegro and Serbia – Eurostat segment *edat_lfse_03*. Bavaria and Baden-Württemberg – Eurostat database segment *edat_lfse_04*. Republic of Moldova – Eurostat segment *enpe_edat_lfse_03*. Ukraine – the national statistical office.
Notes: Indices are estimated as (a) proportion of people aged 30-34 holding tertiary education in 2019 relative to a proportion of people aged 30-34 holding tertiary education in 2011 (index 2011-2019); (b) a proportion of people aged 30-34 holding tertiary education in 2020 relative to a proportion of people aged 30-34 holding tertiary education in 2019 (index 2019-2020) separately for men and women.

Member States, Croatia, Czechia, Hungary and Romania were below 35% in 2020. Among these countries, Romania had the lowest level of tertiary graduates (26% in 2020). The lowest share of tertiary graduates was recorded in Bosnia and Herzegovina (23% in 2019), far below the regional average despite a major increase of 68% over the years of 2011-2019. The highest share of tertiary graduates in the Danube Region can be found in Ukraine (around 58% in 2020).

The gender gap in tertiary education degrees is stark – in all countries, except for the German regions of Bavaria and Baden-Württemberg, women aged 30 to 34 hold systematically more tertiatry degrees. Furthermore, the gap continued to widen in all countries, except for Bulgaria, Germany, Serbia and Ukraine, over the period of 2011-2019, as the share of graduates increased relatively more among women (see Figure 2.6). The notable overall increase in tertiary education in Austria and Slovakia in 2011-2019 was mainly driven by women (72% among men and 88% among women in Austria and 66% and 77%, respectively, in Slovenia). The share of men holding tertiary education degrees in Slovakia experienced a drop of 6% in 2020.

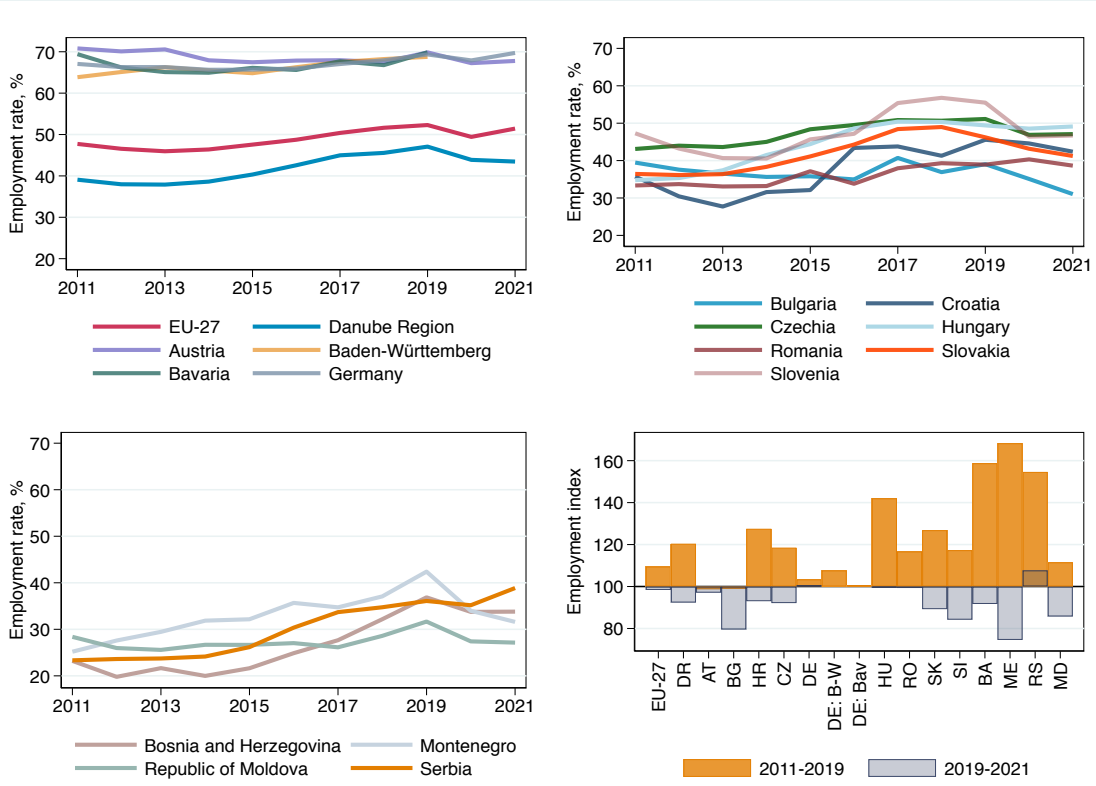
The gender gap in formal education has already emerged on the level of upper secondary education. The propensity to leave school early is higher among male students, and the likelihood of continuing education is somewhat higher among female students, as males tend to start working earlier.

Concerning the effect of the COVID-19 pandemic, we document no major implications for the propensity to hold tertiary education, however a longer time span is needed to grasp the implications.

2.4 Employment Rates by Educational Attainment Level

Education and youth employment are core factors for a successful career and well-being throughout one's lifetime. Therefore, the employment rate of young graduates who have completed at least upper secondary education (ISCED Levels 3 to 8) is an important indicator of the labour market integration of youth, being in the spotlight of policy agendas on youth unemployment.

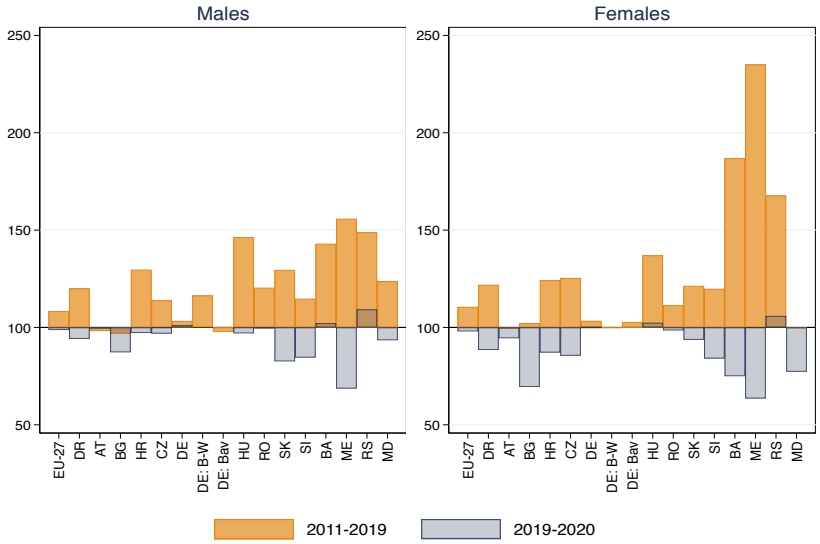
Figure 2.7: Employment rate of people aged 20 to 24 who have completed at least upper secondary education and the index change of the employment rate across countries from 2011 to 2021



Source: EU Member States, Montenegro and Serbia – Eurostat segment *lfsa_ergaed*. Bavaria and Baden-Württemberg – computed from Eurostat German LFS micro data. Bosnia and Herzegovina – the national statistical office.
Notes: Indices are estimated as (a) employment rate in 2019 relative to employment rate in 2011 (index 2011-2019); (b) employment rate in 2021 relative to employment rate in 2019 (index 2019-2021).

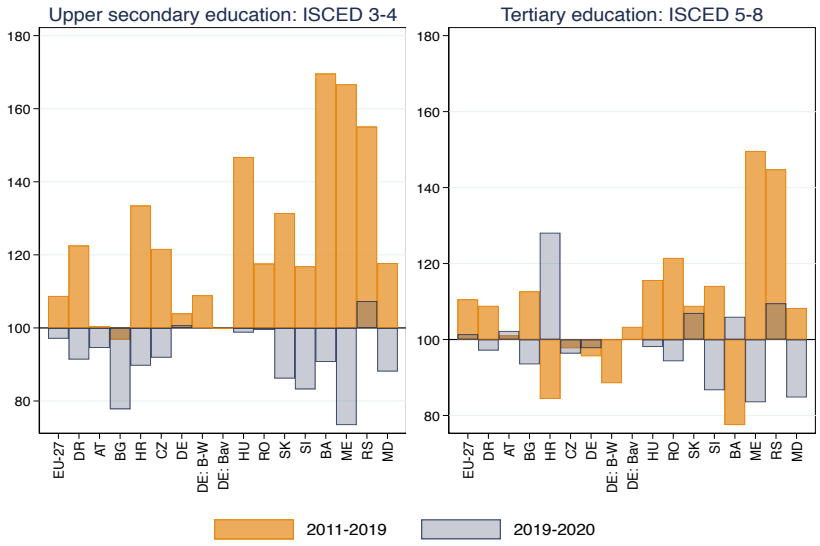
Figure 2.7 depicts the employment rates of youth aged 20 to 24 who completed at least upper secondary education in 2011-2020. Almost all countries of the Danube Region

Figure 2.8: Employment rate of people aged 20 to 24 who have completed at least upper secondary education - index change by gender across countries



Source: EU Member States, Montenegro and Serbia – Eurostat segment *lfsa_ergaed*. Bavaria and Baden-Württemberg – computed from Eurostat German LFS micro data. Bosnia and Herzegovina – the national statistical office.
Notes: Indices are estimated as (a) employment rate in 2019 relative to employment rate in 2011 (index 2011-2019); (b) employment rate in 2021 relative to employment rate in 2019 (index 2019-2021) separately for men and women.

Figure 2.9: Employment rate of people aged 20 to 24 who have completed (i) upper secondary education and (ii) tertiary education - index change across countries



Source: EU Member States, Montenegro and Serbia – Eurostat segment *lfsa_ergaed*. Bavaria and Baden-Württemberg – computed from Eurostat German LFS micro data. Bosnia and Herzegovina – the national statistical office.
Notes: Upper secondary education includes also post-secondary non-tertiary education. Indices are estimated as (a) employment rate in 2019 relative to employment rate in 2011 (index 2011-2019); (b) employment rate in 2021 relative to employment rate in 2019 (index 2019-2021) separately for two education groups.

revealed rather similar trends - growth of various magnitudes in 2011-2019 and a decline in 2020 due to the COVID-19 pandemic. Employment in the Danube Region grew by 21% overall (from 40% to 48% in 2011-2019). The most pronounced improvement in youth employment over 2011-2019 was documented in countries with initially low employment rates

- Bosnia and Herzegovina (from 23% to 37%), Hungary (from 35% to 49%), Montenegro (from 25% to 42%) and Serbia (from 25% to 36%).

Notably, the positive dynamics in Bosnia and Herzegovina, Montenegro and Serbia were mainly driven by females (see Figure 2.8) and by youth who completed upper secondary or post-secondary non-tertiary education, i.e. ISCED Levels 3 and 4 (see Figure 2.9). The latter trend was likely related to youth in the second education group - i.e. tertiary education (ISCED Levels 5 to 8) - having a higher propensity to remain in education when aged 20-24 and start working only upon completing a tertiary degree.

The only two countries with no positive dynamics in young graduates' employment were Austria and Bulgaria. In Austria, which had a relatively high employment rate at the beginning of the observation period (71% in 2011), the employment rate fell to 67% in 2015-2016, with a subsequent increase to almost 70% in 2019. Bulgaria had a low level of young graduates' employment, ranging from 35% to 40% during the period 2011-2019.

The effect of COVID-19 was largely negative for young graduates, as the pandemic hit youth relatively more than older groups of workers. Employment rates declined notably in 2020 in all countries except Romania and Serbia in response to the outbreak of the pandemic. Employment rates deteriorated furhter in 2021 in Bulgaria, Croatia, Montenegro and Slovakia, and remained below the level of 2019 in many countries. The Danube Region incurred an overall decline of 8% compared to almost no change on the EU-27 level in 2021, compared to 2019. Montenegro (-26%), Bulgaria (-20%), Republic of Moldova (-18%) and Slovenia (-17%) were hit the most in terms of young graduates' employment (see Figure 2.7). Serbia appeared the only country where youth posted higher employment in 2022 than in 2019 (7% increase). Hungary and Romania saw practically no change in youth employment in 2021 relative to 2019.

The employment of young female graduates was affected, on average, relatively more than that of young male graduates (see Figure 2.8) in the Danube Region overall (-12% vs -6%, respectively), while in the EU-27, both men and women incurred almost no employment decline.[19] The gender disparity in the effect of COVID-19 on young graduates' employment was particularly pronounced in Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Republic of Moldova, Slovenia where female employment was hit systematically

[19]This trend is likely related to the disproportional effects of the pandemic on employment across men and women, stemming from gender disparities in transitions to unemployment, reductions in working hours and transitions to working from home, which were documented in several studies including Reichelt, M., Makovi, K., & Sargsyan, A. (2021). The impact of COVID-19 on gender inequality in the labor market and gender-role attitudes. *European Societies*, 23(sup1), S228-S245. Furthermore, observed gender discrepancies may stem from disproportional effects of the COVID-19 pandemic on different sectors and occupations, documented, among others, by Cortes, G. M., & Forsythe, E. (2023). Heterogeneous labor market impacts of the COVID-19 Pandemic. ILR Review, 76(1), 30-55. As gender ratios vary across sectors, the pandemic has likely affected male and female employment differently, yet aligned with the overall effect of the pandemic on specific sector.

more.

The negative effect of the pandemic on youth labour was largely related to two factors. First, the types of jobs typically occupied by young people, such as those in the service sector, incurred a massive slump in employment in 2020. Second, young people may be more prone to work under employment contracts, which can be easily suspended or terminated, especially if they are still studying, unlike older workers, who are more likely to hold permanent job contracts.

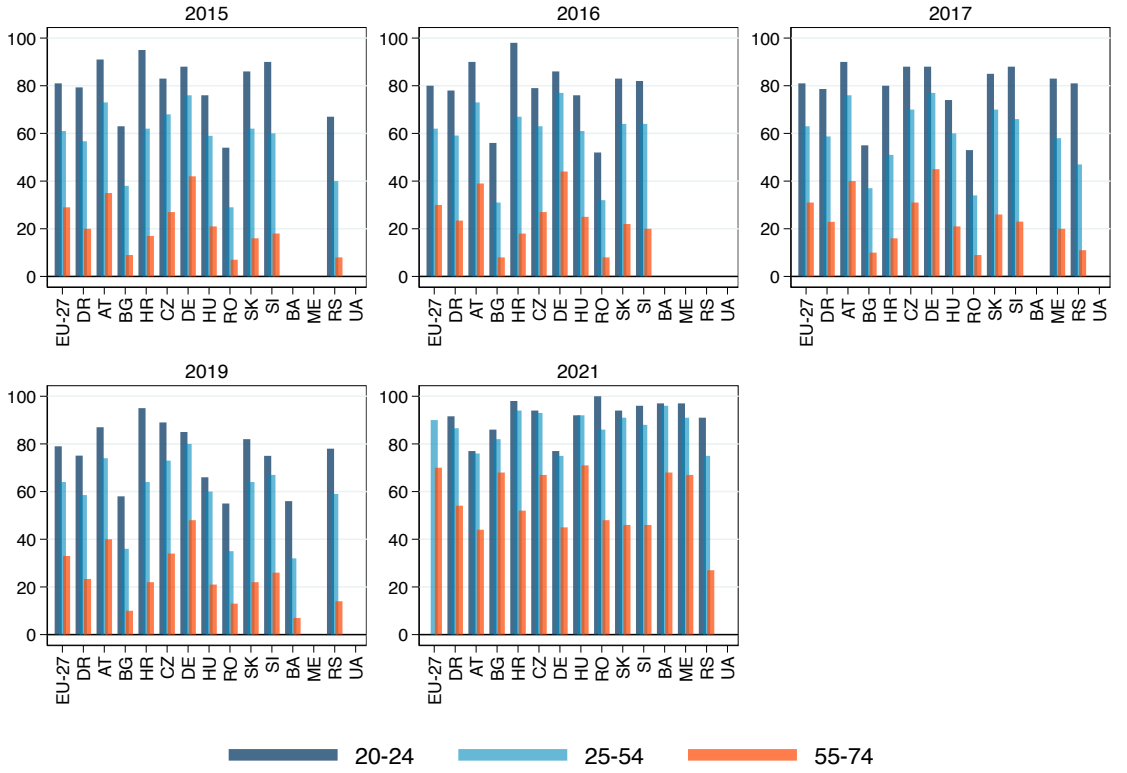
2.5 Information and Communication Technologies Skills: Individuals Who Have Basic or Above Basic Overall Digital Skills

The measure of information and communication technologies (ICT) skills refers to a share of the population in a respective age group and gender having basic or above basic overall digital skills - the minimum ability needed to perform activities on the internet in four specific areas (information, communication, problem solving and content creation) based on the EU survey on the ICT usage in households and by individuals. In light of technological advancements and massive digitalisation in various aspects of life, from various practical daily matters to educational activities and work, ICT skills appear to be a crucial ability needed to actively participate in various spheres of economic and social life, just like literacy and numeracy skills.

The estimates of population shares having basic or above basic overall digital skills are available in breakdowns by gender and age. Figure 2.10 displays the shares of the total population (both men and women) with basic or above basic ICT skills across three age groups (aged 20-24, 25-54 and 55-75). The average shares in the Danube Region reached 75% in the group aged 20-24, 59% in the group aged 25-54 and 23% in the group aged 55-74 in 2019, still below the EU-27 averages of 79%, 64% and 33%, respectively. However, a number of countries ranged far below the EU-27 and Danube Region averages. In Bosnia and Herzegovina, Bulgaria and Romania, people in all age groups had digital skills below the regional average in 2019; in Hungary, only youth aged 20-24 had ICT skills slightly above the average, while in Croatia and Slovakia, people aged 54-74 attained basic or above basic digital skills less frequently than the Danube Region average in 2019.

Not surprisingly, an age pattern was visible - the youngest group had the highest digital skills in all countries of the Danube Region, followed by the middle-aged and older groups. The largest age disparity was observed in Croatia and Serbia - the shares of the population aged 20-24 with basic or above basic ICT skills were 95% and 78%,

Figure 2.10: Share of population with basic or above basic overall digital skills by age groups across countries



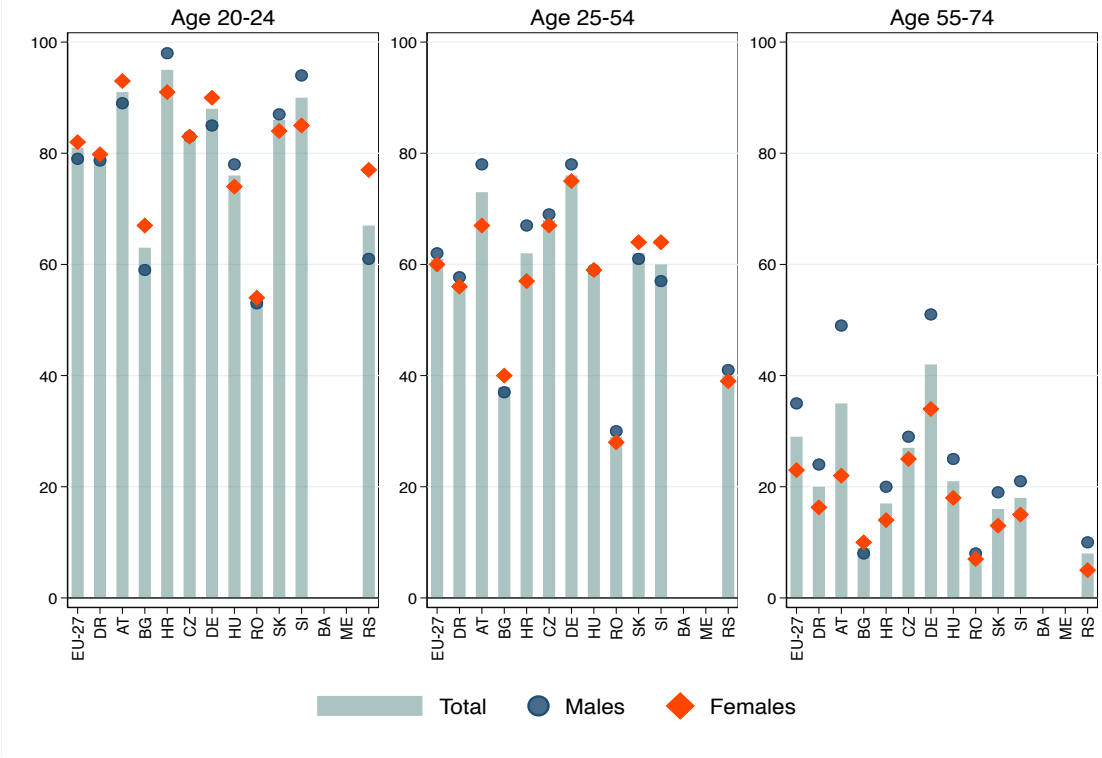
Source: EU Member States, Bosnia and Herzegovina, Montenegro, and Serbia – Eurostat segment *isoc_sk_dskl_i*. Ukraine – the national statistical office.

respectively, and among older individuals (aged 54-75), the shares were 22% and 14%, respectively.

The gender discrepancies in ICT skills were less systematic compared to the age disparities, with substantial cross-country variations (see Figures 2.11, 2.12, 2.13 and 2.14). The average gender gaps in ICT skills in the EU-27 and in the Danube Region were aligned throughout all years - in the age groups of 20-24 and 25-54, the gaps were either very marginal or insignificant, whereas in the oldest group of those aged 55-74, a stark male-favouring gap emerged (10 pp in the EU-27 and 5.5 pp in the Danube Region on average in 2019). Higher ICT skills among males aged 55-74 were reported in all countries of the region, except in Bulgaria (3 pp difference in favour of women) and Romania (zero gap). However, in Austria and Hungary, the gender gap in ICT skills in favour of men persisted in all age groups in 2019.

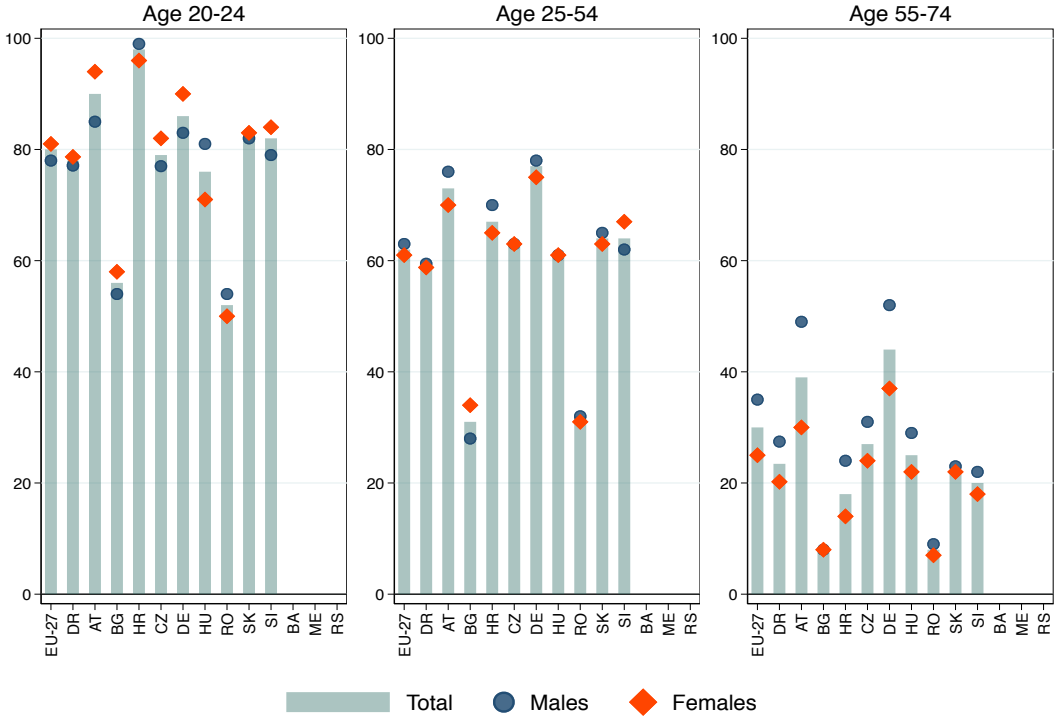
The COVID-19 outbreak highlighted the importance of ICT skills. With social distancing measures, remote education and telework, computer and internet use abilities have become a necessity, as to a certain extent, they allow people to preserve work, continue studying, perform certain daily activities (e.g. purchases, payments and communication) and remain connected to social and economic life despite the lockdowns. Figure 2.10 pro-

Figure 2.11: Share of population with basic or above basic overall digital skills by gender and age groups across countries, 2015



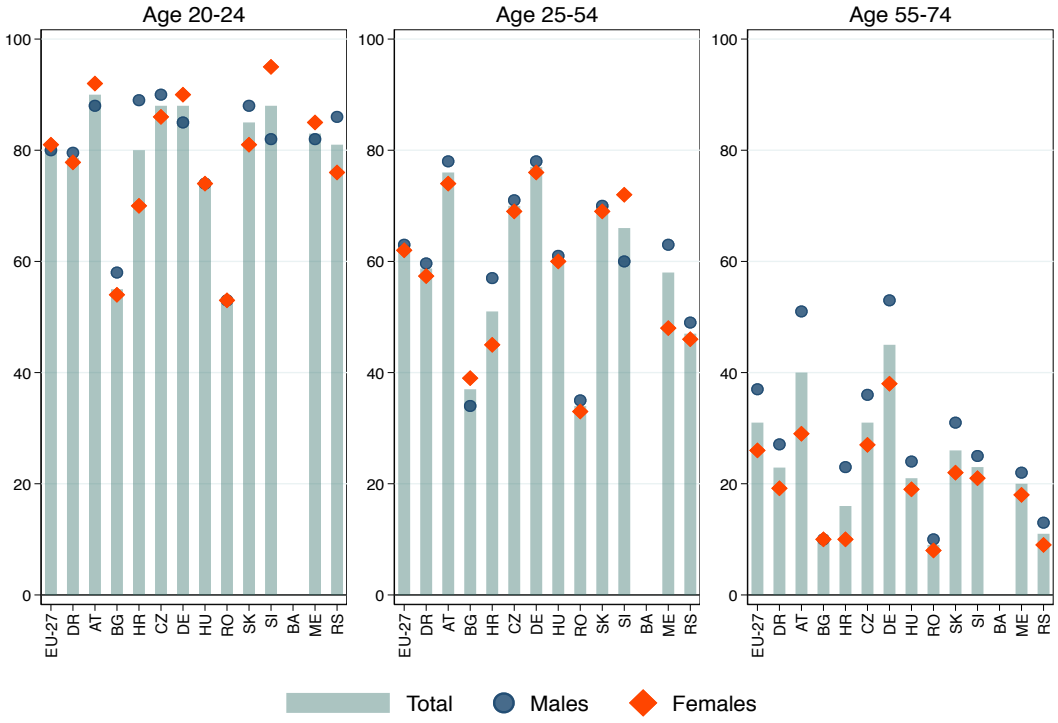
Source: EU Member States and Serbia – Eurostat segment *isoc_sk_dskl_i*.

Figure 2.12: Share of population with basic or above basic overall digital skills by gender and age groups across countries, 2016



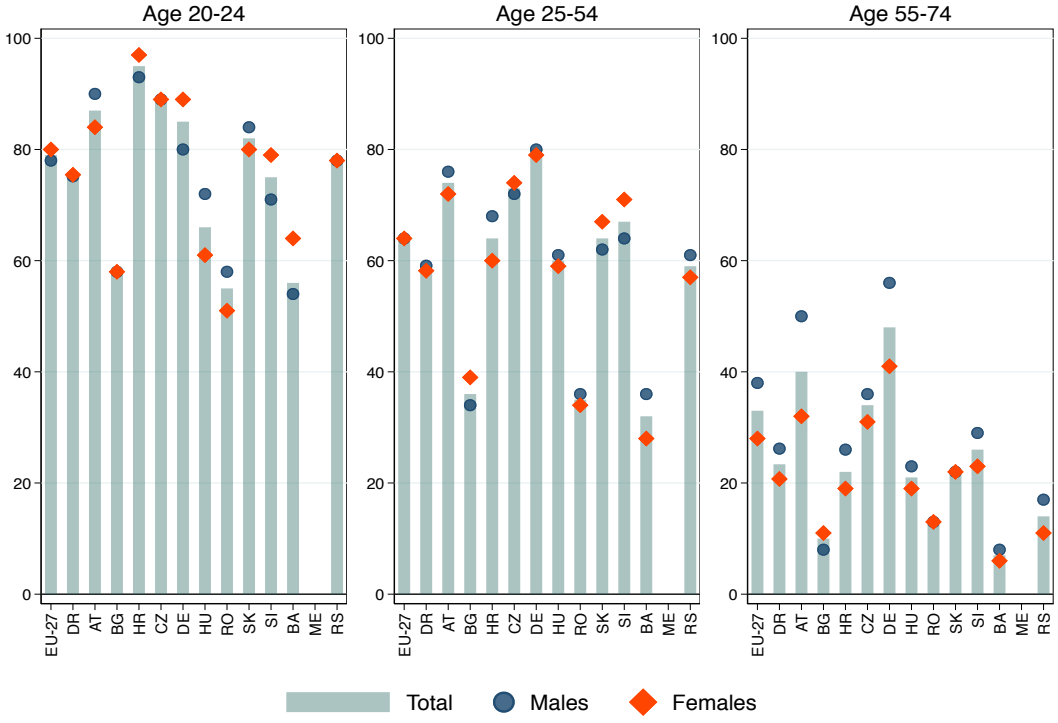
Source: EU Member States – Eurostat segment *isoc_sk_dskl_i*.

Figure 2.13: Share of population with basic or above basic overall digital skills by gender and age groups across countries, 2017



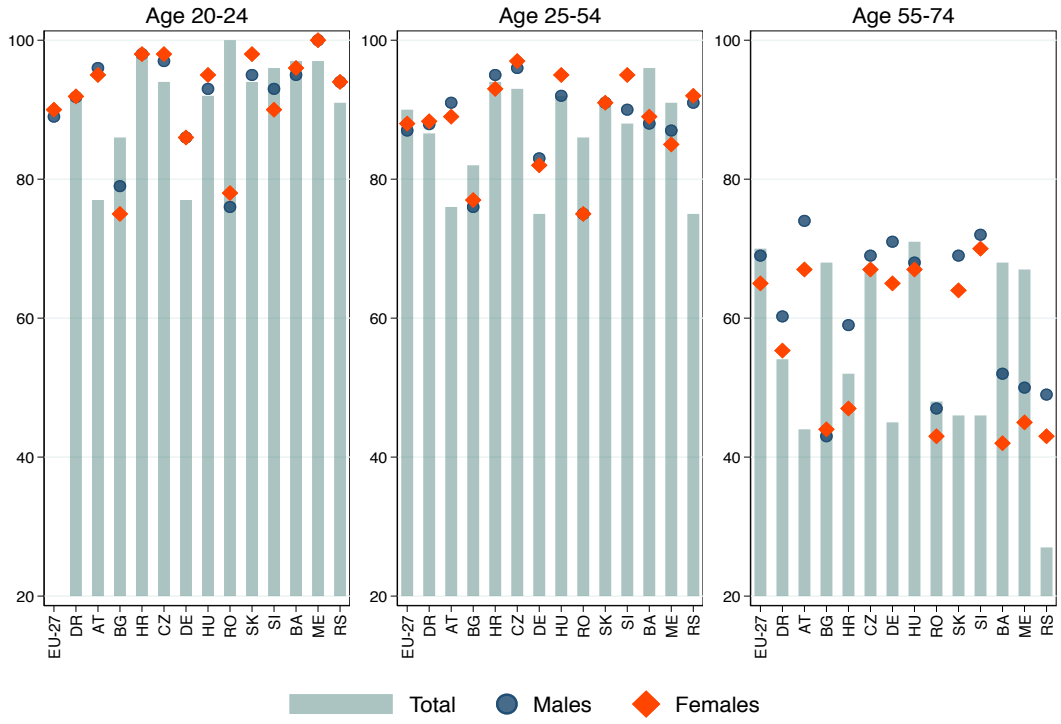
Source: EU Member States, Montenegro and Serbia – Eurostat segment *isoc_sk_dskl_i*.

Figure 2.14: Share of population with basic or above basic overall digital skills by gender and age groups across countries, 2019



Source: EU Member States, Bosnia and Herzegovina and Serbia – Eurostat segment *isoc_sk_dskl_i*.

Figure 2.15: Share of population with basic or above basic overall digital skills by gender and age groups across countries, 2021



Source: EU Member States, Bosnia and Herzegovina and Serbia – Eurostat segment *isoc_sk_dskl_i*.

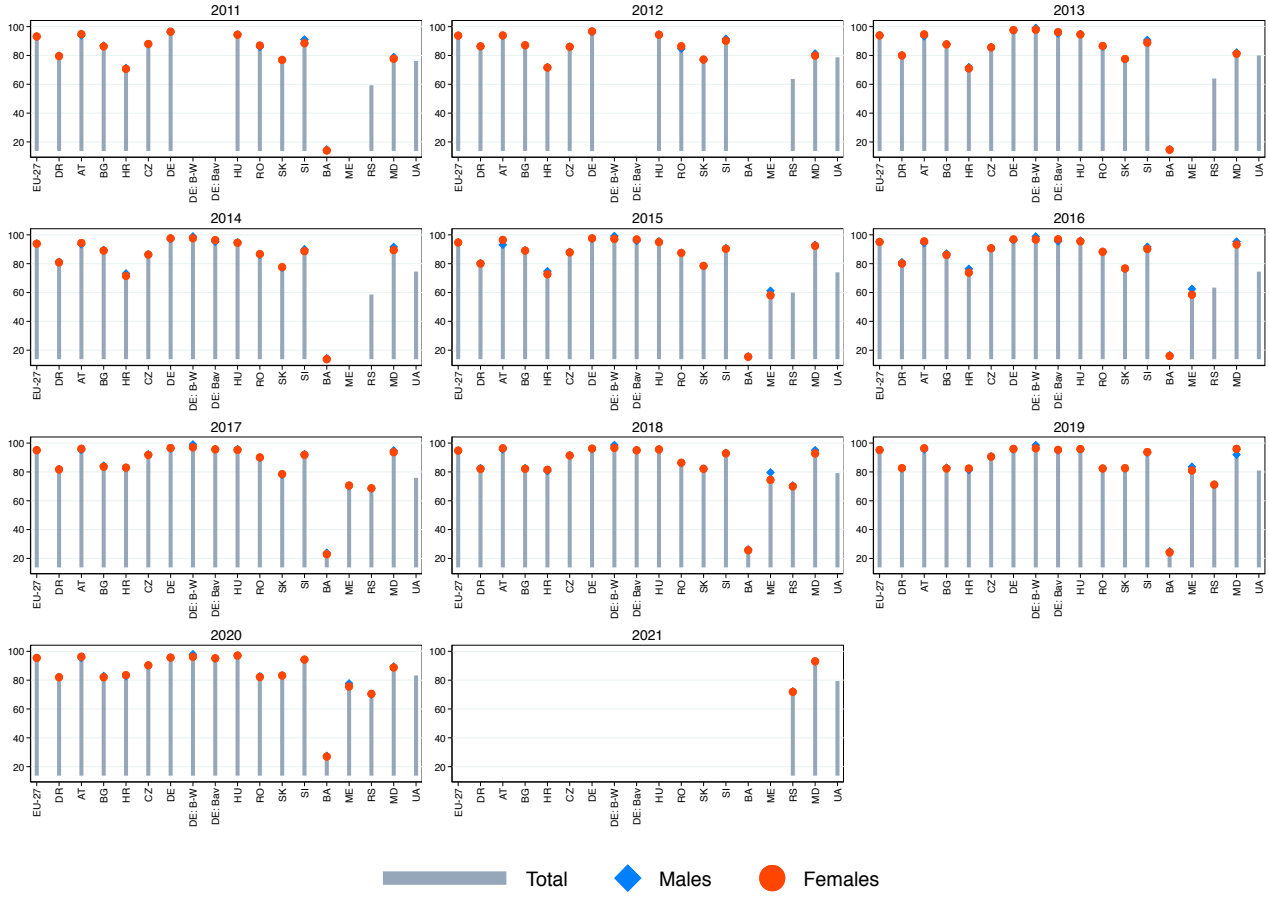
vides further support to this point, as share of population with basic or above basic overall digital skills has increased notably in 2021 in all countries and across all age groups. This result signals positive effect of the social distancing measured on the basic ICT literacy, as many people were forced to adapt to technological solutions to retain their jobs.

The most stark increases in the ICT skills over period 2019-2021 were recorded in Bosnia and Herzegovina, Bulgaria, Hungary, Romania, Serbia, Slovakia and Slovenia for all age groups, while in Croatia and Czechia ICT improved notably among those aged over 25, given that average ICT competence of the youngest cohort (20-24 years) was very high already before the pandemic. As Figure 2.15 reveals that ICT skills improved across men and women at different pace and also differently across various age groups. For instance, in Austria, Hungary and Romania the gender gap among those aged 20-24 closed in 2021 largely due to a notably higher improvement of female ICT skills. Whereas, in Bosnia and Herzegovina and Croatia the same dynamic was recorded among those aged 25-54. However, in the oldest group several countries posted increasing gender gaps with males having higher average achievements (e.g. Bosnia and Herzegovina, Croatia, Slovakia).

2.6 Appendix A: Additional Results

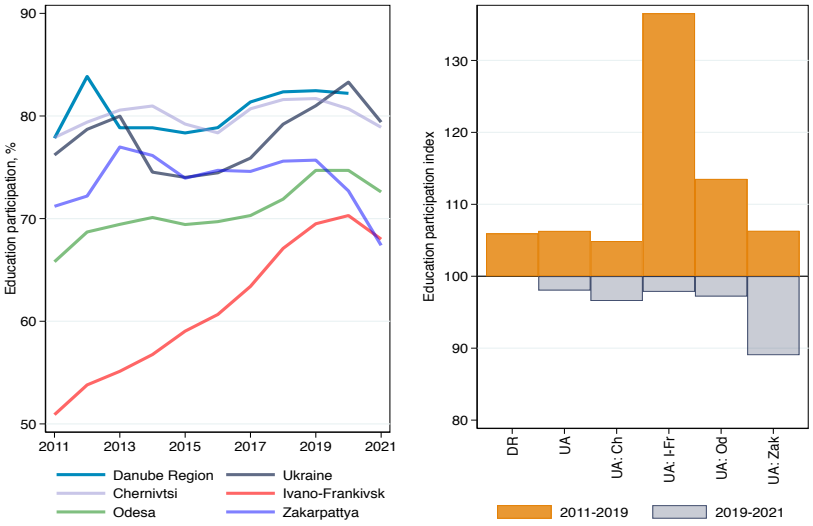
2.6.1 Participation in early childhood education and care

Participation in early childhood education and care of children aged four and up from 2011 to 2019 by gender across countries



Source: EU Member States, Montenegro – Eurostat dataset *SDG_04_30*. Bavaria and Baden-Württemberg – Eurostat database segment *educ_uoe_enra17*. Serbia – 2011-2016: RCC (`https://www.rcc.int/seeds/results/1/see2020-progress-tracker`); 2017: Eurostat dataset *SDG_04_30*; 2018-2019: Ministry of Education, Science and Technological Development of the Republic of Serbia. Bosnia and Herzegovina – 2013: RCC (`https://www.rcc.int/seeds/results/1/see2020-progress-tracker`); 2019: World Bank (`https://databank.worldbank.org/reports.aspx?source=2&series=SE.PRE.ENRR`).The Republic of Moldova and Ukraine – the national statistical offices.

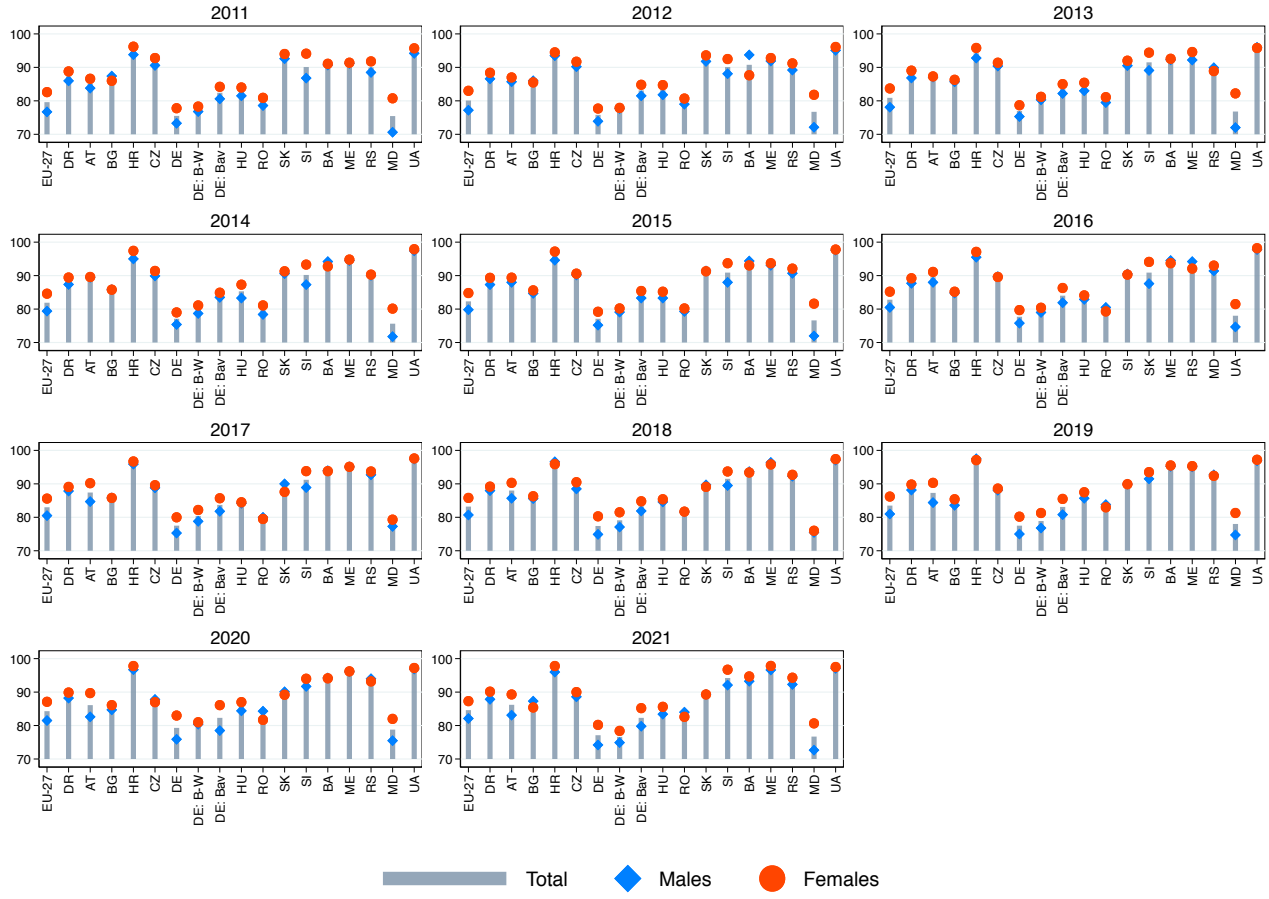
Participation in early childhood education and care of children aged four and up from 2011 to 2019 and the index change across regions of Ukraine



Source: The national statistical office.
Notes: Indices are estimated as (a) a share of children involved in early education in 2019 relative to aa share of children involved in early education in 2011 (index 2011-2019); (b) a share of children involved in early education in 2020 relative to a share of children involved in early education in 2019 (index 2019-2020).

2.6.2 Proportion of the population aged 20-24 having completed at least upper secondary education

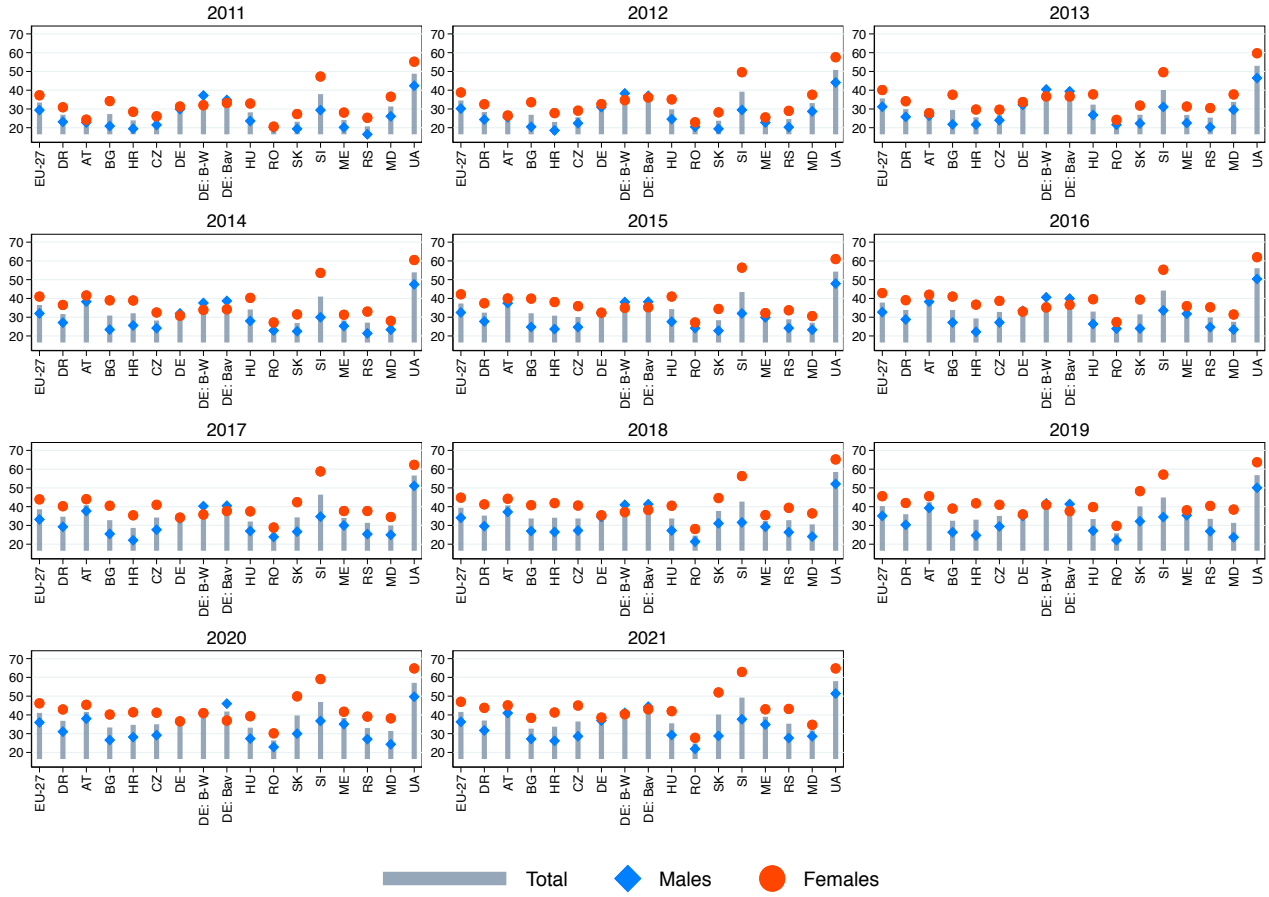
Proportion of the population aged 20 to 24 having completed at least upper secondary education from 2011 to 2019 by gender across countries



Source: EU Member States, Montenegro and Serbia – Eurostat segment *edat_lfse_03*. Bavaria and Baden-Württemberg – Eurostat database segment *edat_lfse_04*. Bosnia and Herzegovina and Republic of Moldova – Eurostat segment *enpr_siinr*. Ukraine – the national statistical office.

2.6.3 Proportion of the population aged 30-34 having completed tertiary education

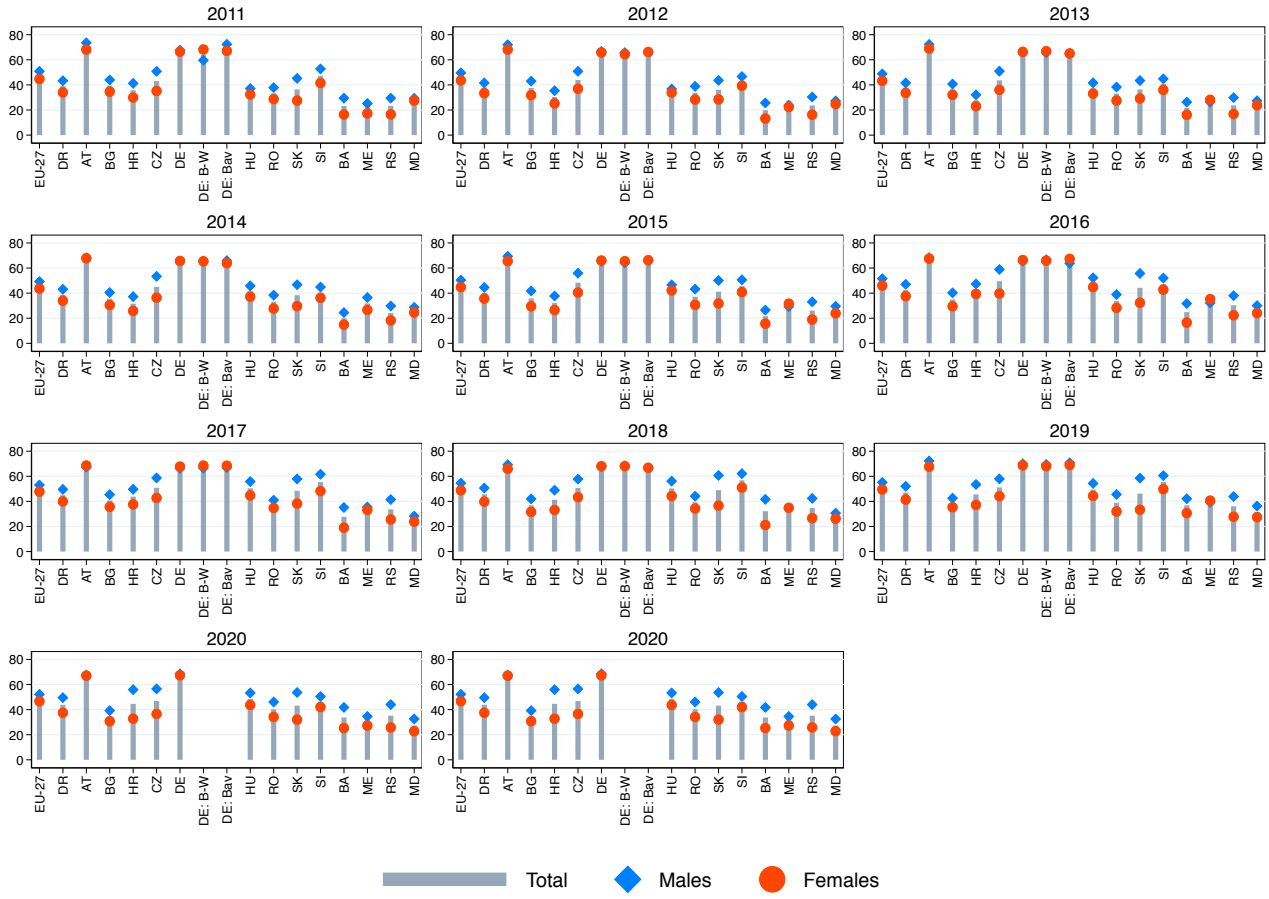
Proportion of the population aged 30 to 34 having completed tertiary education from 2011 to 2019 by gender across countries



Source: EU Member States, Montenegro and Serbia – Eurostat segment *edat_lfse_03*. Bavaria and Baden-Württemberg – Eurostat database segment *edat_lfse_04*. Republic of Moldova – Eurostat segment *enpe_edat_lfse_03*. Ukraine – the national statistical office.

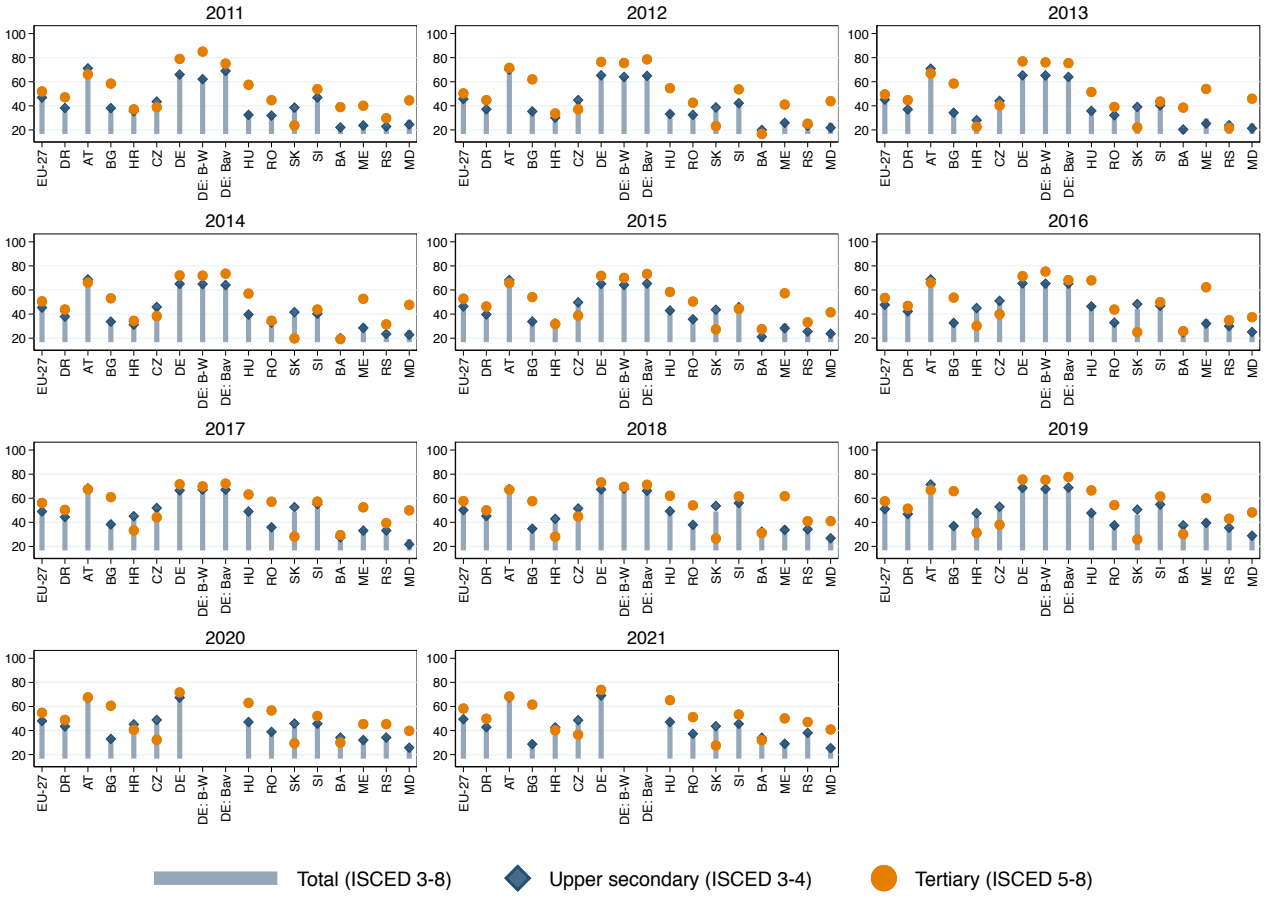
2.6.4 Employment rate by educational attainment level

Employment rate of people aged 20 to 24 who completed at least upper secondary education from 2011 to 2019 by gender across countries



Source: EU Member States, Montenegro and Serbia – Eurostat segment *lfsa_ergaed*. Bavaria and Baden-Württemberg – computed from Eurostat German LFS micro data. Bosnia and Herzegovina – the national statistical office.

Employment rate of people aged 20 to 24 who completed (i) upper secondary education and (ii) tertiary education from 2011 to 2019 across countries



Source: EU Member States, Montenegro and Serbia – Eurostat segment *lfsa_ergaed*. Bavaria and Baden-Württemberg – computed from Eurostat German LFS micro data. Bosnia and Herzegovina – the national statistical office.

2.7 Appendix: Indicators and Data Description

2.1 Participation in early childhood education and care

Definition: The indicator measures children between the age of four and the starting age of compulsory primary education participating in early childhood education as the percentage of the total population of respective age.

Source: The data for the EU Member States and Montenegro came from Eurostat dataset *SDG_04_30*. Bavaria and Baden-Württemberg - Eurostat database segment *educ_uoe_enra17*. Serbia - 2011-2016: RCC.
(`https://www.rcc.int/seeds/results/1/see2020-progress-tracker`); 2017: Eurostat dataset *SDG_04_30*; 2018-2019: Ministry of Education, Science and Technological Development of the Republic of Serbia. Bosnia and Herzegovina - 2013: RCC (`https://www.rcc.int/seeds/results/1/see2020-progress-tracker`); 2019: World Bank
(`https://databank.worldbank.org/reports.aspx?source=2&series=SE.PRE.ENRR`).
The Republic of Moldova and Ukraine - the national statistical offices.

Data availability: For the total population, the data were available for Montenegro, data were available for the years 2015-2020. For the German regions Bavaria and Baden-Württemberg, data were available for the years 2013-2020; for Ukraine and regions of Ukraine, as well as Republic of Moldova and Serbia, data were available for the entire time period from 2011 to 2021. For the remaining countries, the data on the total population were available for the years 2011-2020.
For gender division, the data on the German regions Bavaria and Baden-Württemberg, Ukraine and regions of Ukraine were not available. For Montenegro, only data from the years 2015-2020 were available; for Serbia, only data from the years 2017-2021 were available. For the remaining countries, the data on gender division were available for the years 2011-2020.

2.2 Proportion of the population aged 20-24 having completed at least upper secondary education

Definition: The indicator is defined as the percentage of people aged 20-24 who have successfully completed at least upper secondary education. This educational attainment refers to ISCED 2011 Levels 3-8 for data from 2014 onwards and to ISCED 1997 Levels 3-6 for data up to 2013. The indicator is based on the EU Labour Force Survey. It should be noted that completion of upper secondary education can be achieved in European countries after varying lengths of study according to different national educational systems.

Source: EU Member States, Montenegro and Serbia - Eurostat segment *edat_lfse_03*.

Bavaria and Baden-Württemberg - Eurostat database segment *edat_lfse_04*. Bosnia and Herzegovina and the Republic of Moldova – Eurostat segment *enpr_siinr*. Ukraine - the national statistical office.

Data availability: No data on regions of Ukraine were available. For all other countries of the Danube Region and the German regions Bavaria and Baden-Württemberg, the data for the years 2011-2021 (both the total and by gender) were used.

2.3 Proportion of the population aged 30-34 having completed tertiary education

Definition: The indicator is defined as the percentage of people aged 30-34 who have successfully completed tertiary or equivalent education. This educational attainment refers to ISCED 2011 Levels 5-8 for data from 2014 onwards and to ISCED 1997 Levels 5-6 for data up to 2013. It should be noted that completion of tertiary education can be achieved in European countries after varying lengths of study according to different national educational systems.

Source: EU Member States, Montenegro and Serbia - Eurostat segment *edat_lfse_03*. Bavaria and Baden-Württemberg - Eurostat database segment *edat_lfse_04*. Bosnia and Herzegovina - Eurostat segment *cpc_pseduc*. The Republic of Moldova - Eurostat segment *enpe_edat_lfse_03*. Ukraine - the national statistical office.

Data availability: No data on regions of Ukraine were available. For all other countries of the Danube Region and the German regions Bavaria and Baden-Württemberg, the data for the years 2011-2021 (both the total and by gender) were used.

2.4 Employment rate by educational attainment level

Definition: The employment rate of people aged 20-24 with (i) upper secondary or post-secondary non-tertiary education and (ii) tertiary education was measured as the percentage of employed persons in the population of a given age range and education level.

Source: The data for the EU Member States, Montenegro and Serbia came from Eurostat segment *lfsa_ergaed*. Bavaria and Baden-Württemberg - computed from Eurostat German LFS micro data. Bosnia and Herzegovina - the national statistical office.

Data availability: The data on the total and male/female employment rates by gender were available for the German regions Bavaria and Baden-Württemberg for the years 2011-2019; for the Republic of Moldova the data for period 2012-2021 is available; for Ukraine and regions of Ukraine, the data were not available. For all other countries of the Danube Region, the data for the years 2011-2021 were used.

2.5 ICT skills: individuals who have basic or above basic overall digital skills

Definition: The indicator refers to the share of individuals who have basic or above basic overall digital skills. The basic or above basic overall digital skills represent the two highest levels of the overall digital skills indicator, which is a composite indicator based on selected activities performed by individuals aged 16-74 on the internet in four specific areas (information, communication, problem solving and content creation). It is assumed that individuals having performed certain activities have the corresponding skills; therefore, the indicator can be considered as a proxy of the digital competences and skills of individuals. The indicator is based on the EU survey on the ICT usage in households and by individuals.

Source: EU Member States, Bosnia and Herzegovina, Montenegro and Serbia - Eurostat segment *isoc_sk_dskl_i*. Ukraine - the national statistical office.

Data availability: For the Republic of Moldova, the German regions Bavaria and Baden-Württemberg and four regions of Ukraine, no data were available. For all other countries, the data on the total population, gender and age division were available as follows: Bosnia and Herzegovina - only for the years 2019 and 2021; Montenegro - only for years 2017 and 2021; and Serbia - for the years 2015, 2016, 2017, 2019 and 2021. For all other countries of the Danube Region, the data for the years 2015-2017, 2019 and 2021 were available.

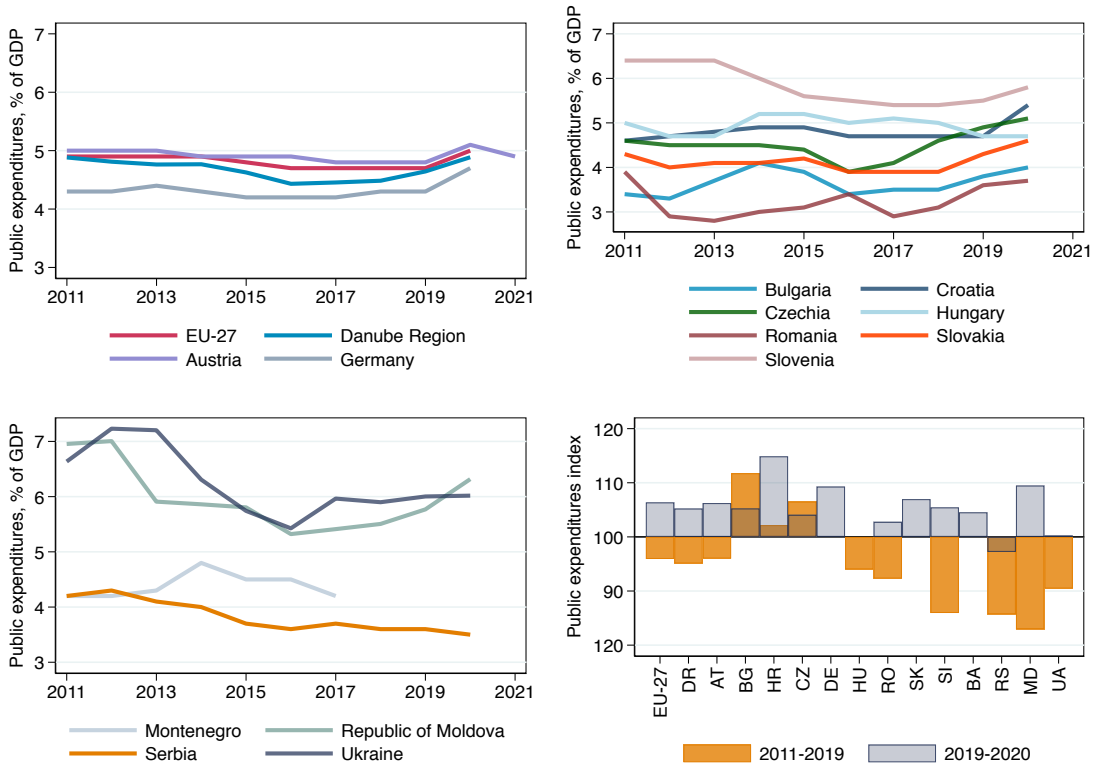
Objective III

Contribution to Increased Quality and Efficiency of Education, Training and Labour Market Systems

3.1 Public Expenditure on Education

Public spending on education, measured as the % of GDP, comprises direct expenditure on educational institutions as well as public subsidies given to households for education-related purposes. Governmental expenditures on education are disbursed to schools, universities, and other public and private institutions providing and facilitating educational activities. This indicator signals the relative importance of supporting and advancing education systems relative to other areas of governmental investments, including health care, social security and defence.

Figure 3.1: Public expenditure on education in % of GDP for selected countries



Source: EU Member States – Eurostat segment *gov_10a_exp*. Serbia – Eurostat segment *cpc_pseduc*. Montenegro – RCC (`https://www.rcc.int/seeds/results/1/see2020-progress-tracker`). The Republic of Moldova and Ukraine – GFS (`https://data.imf.org/regular.aspx?key=61037799`).
Notes: Indices are estimated as (i) public expenditures on education as % of GDP in 2019 relative to public expenditures on education as % of GDP in 2011 (index 2011-2019); (ii) public expenditures on education as % of GDP in 2020 relative to public expenditures on education as % of GDP in 2019 (index 2019-2020).

Figure 3.1 depicts the average public expenditures on education across the Danube Region. Between 2011-2019, the Danube Region's average level of expenditure on education varied from 4.4% of its GDP in 2016 to 4.8% of its GDP in 2019, remaining comparable to the average EU-27 level. The Republic of Moldova, Slovenia and Ukraine had the highest levels of governmental spending on education (5.8%, 5.5% and 6%, respectively, in 2019), which was largely related to their low GDP levels, particularly in the Republic of Moldova and Ukraine, relative to the EU Member States of the Danube Region. However, all three

countries experienced a sharp decline in public spending on education over the period of 2011-2019 (14%, 17% and 9% drops, respectively).

Public expenditures on education also declined in Romania and Hungary (8% and 12% drops, respectively). Bulgaria, Croatia and Czechia incurred an increase in public spending on education of 15%, 4% and 7%, respectively, reaching 3.9%, 4.8% and 4.9% in 2019. In the rest of the Danube Region countries, governmental spending on education remained relatively stable in 2011-2019.

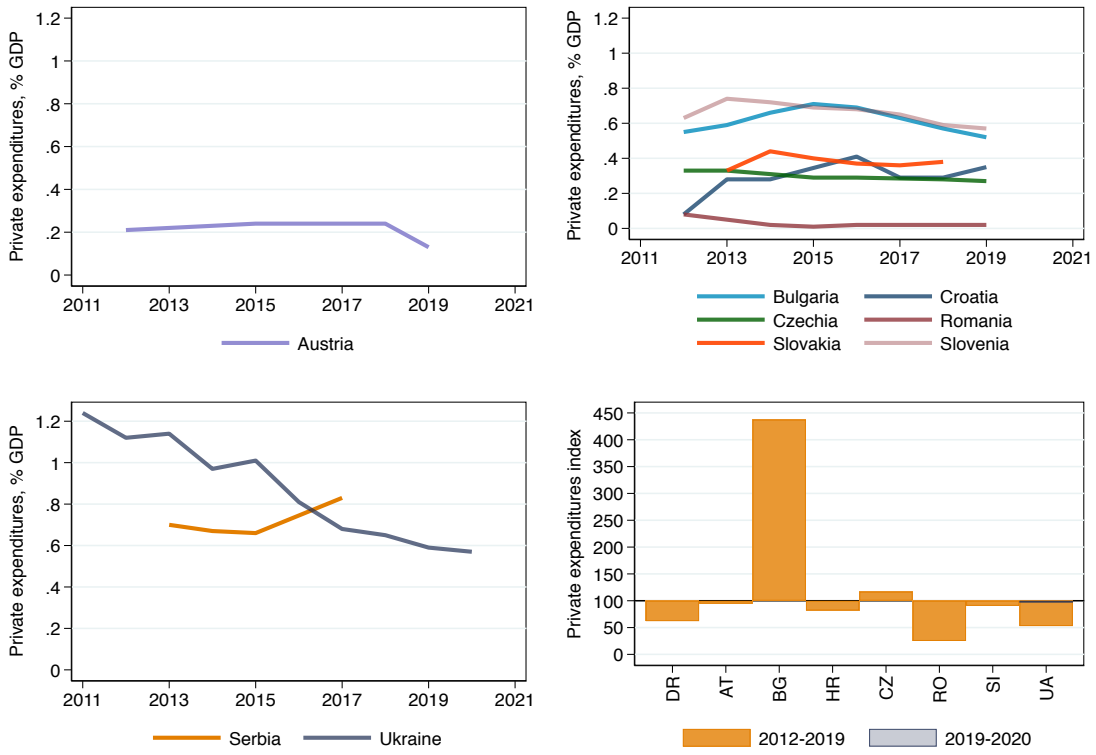
Notably, following the outbreak of the COVID-19 pandemic, public expenditures in education increased in 2020 in all Danube Regioncountries except Serbia (3% decline). The most sizable increase of 15% was in Croatia, followed by 10% increases hikes in Germany and Republic of Moldova. COVID-19 seems to have spurred public investment in education as social distancing measures required transition to online learning on all levels of education - from pre-school to tertiary education. This process likely required state support and investment in IT infrastructure and development. Yet, it was a crucial investment as it allowed to continue education, maintain commitment and quality even when face-to-face teaching was severely restrained.

3.2 Private Expenditure on Education

Private spending on education includes different types of expenditures funded by households, namely direct expenditure on pursuing various education degrees at educational institutions (excluding public subsidies), but not including expenditure related to education (textbooks, study materials, private tutoring and living costs of students). Private spending also refers to expenditure on schools, universities, and other public and private institutions providing or supporting educational services and can be measured either in the % of GDP or million EUR. For the total private spending on education, an indicator in % of GDP is used to keep it comparable to the total public expenditure on education. For spending by education degree, a measure in million EUR is used.

Figure 3.2 displays the total private spending on education for the countries with available data. The average level of private spending on education amounted to 0.5% in 2012 and 0.4% in 2018. Similar to the public expenditure on education, private spendings were the highest in Slovenia (varied from 0.6% to 0.7% in 2012-2019) and Ukraine (declined from 1.1% in 2012 to 0.6% in 2020) as well as in Bulgaria (fluctuated between 0.6% and 0.7% in 2012-2019). Austria, Croatia, Czechia and Romania had the lowest shares of private spending on education in GDP, all ranging below 0.3%; however, Croatia incurred a major increase in private investment in education (from 0.1% in 2012 to almost 0.4% in 2019), while in Austria private expenditure on education dropped notably in 2019 and

Figure 3.2: Private expenditure on education (by households) in % of GDP for selected countries



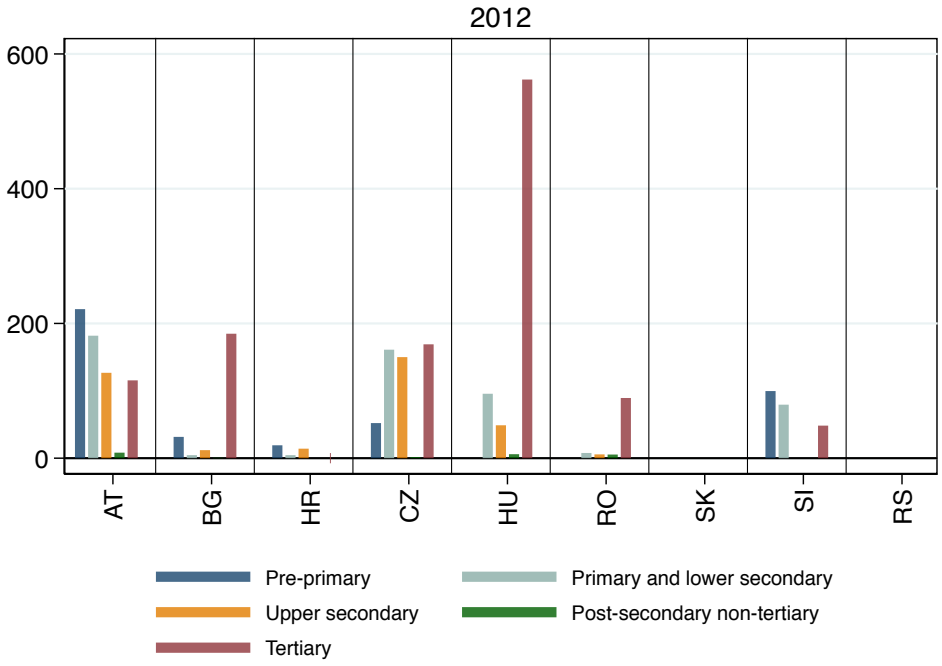
Source: EU Member States and Serbia – Eurostat segment *educ_uoe_fine03*. Ukraine – the national statistical office.
Notes: Index is estimated as private expenditures on education as % of GDP in 2018 relative to private expenditures on education as % of GDP in 2012.

ranged below 2%. For the other countries, the level of expenditure remained rather stable.

Figures 3.3 to 3.6 show the private spending on education by different education levels for the years 2012, 2013, 2018 and 2019 for countries where data were available: (i) early childhood education (pre-primary, ISCED 0), (ii) primary plus lower secondary education (ISCEDs 1 and 2), (iii) upper secondary education (ISCED 3), (iv) post-secondary non-tertiary education (ISCED 4), and (v) tertiary education (ISCEDs 5 to 8). Notably, in Austria, private expenditure on pre-primary education exceeded expenditure on all other education degrees in years 2012 to 2018, however, in 2019 primary and lower secondary education received the largest share of private financing. In Slovenia, pre-primary education had the highest share of private financing throughout 2012-2019. This may have stemmed from relatively high shares of privately funded pre-school educational institutions (kindergartens, early childhood development centres, etc.) and very high early education participation rates. However, a lack of publicly funded childcare facilities may have magnified the share of private expenditures on pre-primary education.

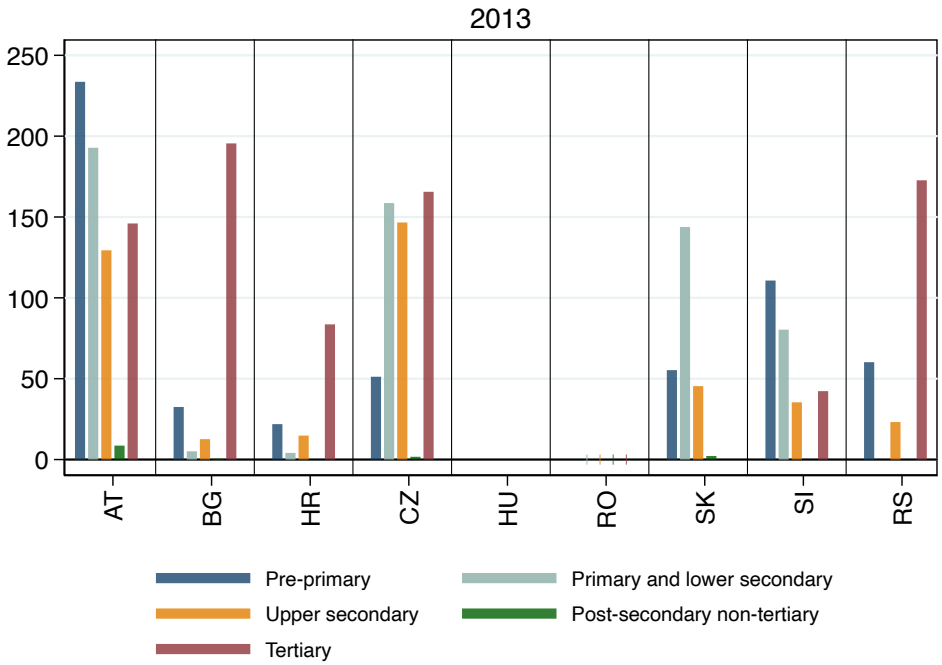
In Bulgaria, Croatia and, to a lesser extent, Czechia, a dominating share of private expense on education was spent on tertiary education in both 2012 and 2019. Whereas in

Figure 3.3: Private expenditure on education (by households) in million EUR in 2012 for selected countries



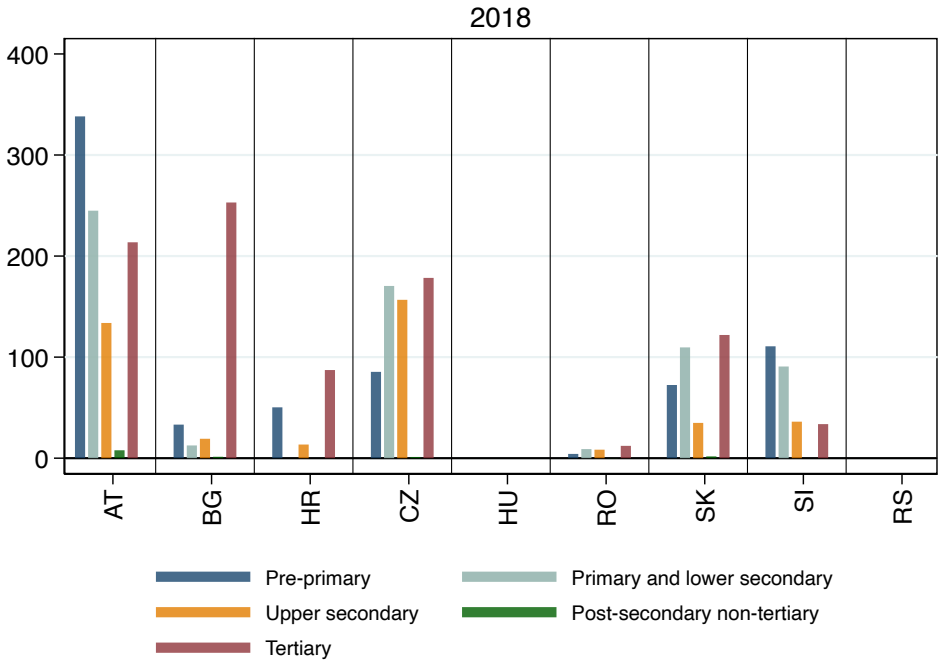
Source: EU Member States and Serbia – Eurostat segment *educ_uoe_fine03*.

Figure 3.4: Private expenditure on education (by households) in million EUR in 2013 for selected countries



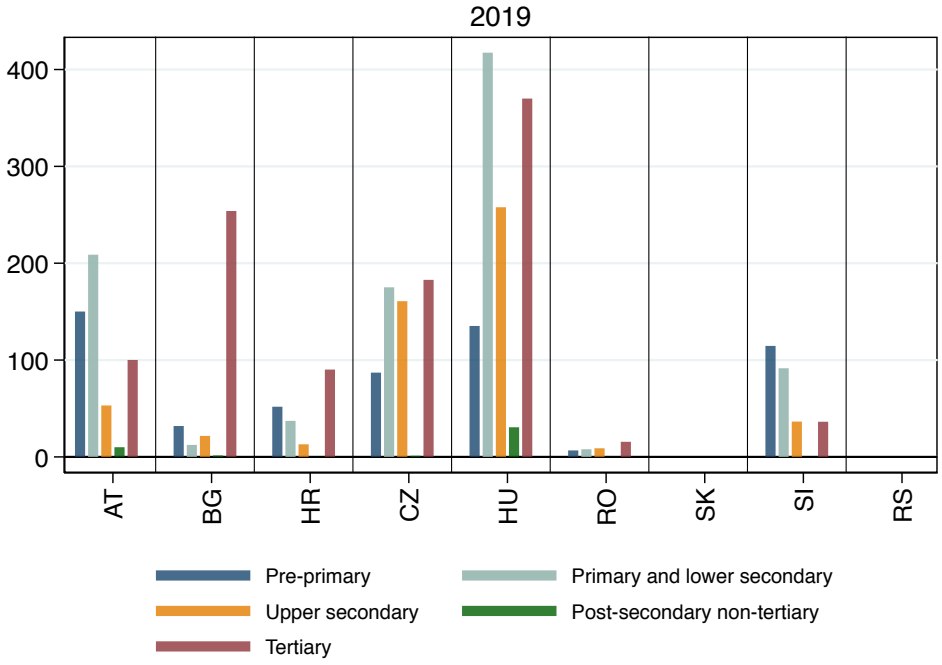
Source: EU Member States and Serbia – Eurostat segment *educ_uoe_fine03*.

Figure 3.5: Private expenditure on education (by households) in million EUR in 2018 for selected countries



Source: EU Member States and Serbia – Eurostat segment *educ_uoe_fine03*.

Figure 3.6: Private expenditure on education (by households) in million EUR in 2019 for selected countries



Source: EU Member States and Serbia – Eurostat segment *educ_uoe_fine03*.

Hungary private financing increased drastically in all education levels in 2019, compared to 2012. The allocation of private funds to different levels of education seems to reflect the specificity of the national education system and, mainly, the extent of public funding for a specific level of education. A large share of private investments in tertiary education may suggest limited public funding of tertiary education, resulting in households bearing a large (if not major) share of the costs associated with acquiring tertiary education (e.g. tuition fees).

3.3 Distribution of Teachers and Staff

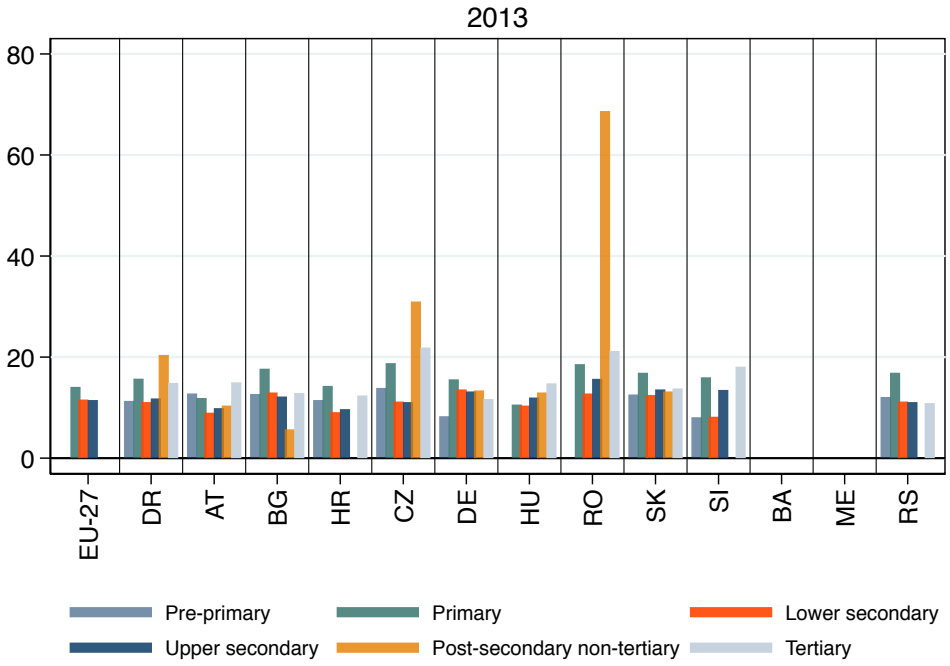
The quality of education depends to a great extent on teachers - i.e. their skills, competences and knowledge. However, the number of pupils/students per teacher is equally as important in evaluating the quality of education since more pupils/students to teach or supervise implies that a teacher has less time to interact with each pupil/student in the class. As a result, smaller classes often prove better in terms of study outcomes, especially in intensive classes requiring individual interactions[20]. Naturally, for older pupils/students, an individualised approach is less crucial, while at the pre-primary and primary education levels, a small group size is a core prerequisite.

Due to data limitations, only the years 2013-2019 were covered. Figures 3.7 and 3.8 display the ratio of pupils/students to teachers and academic personnel across six education levels, i.e. (i) early childhood education (pre-primary), (ii) primary education, (iii) lower secondary education, (iv) upper secondary education, (v) post-secondary non-tertiary education and (vi) tertiary education, for the years 2013 and 2019 for countries where data were available. The average share of pupils/students per teacher in the Danube Region generally increased over the period of 2013-2019 from 11.5 to 14.3 for pre-primary education, from 15.7 to 17.4 for primary education, from 11.1 to 12.8 for lower secondary education and from 12.2 to 13.5 for upper secondary education. Meanwhile, for higher education levels, the ratios either declined or remained stable.

The ratio of pupils/students per teacher was remarkably high in primary education in most of the countries, exceeding ratios on lower secondary, post-secondary and upper secondary degrees in Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Germany, Slovakia and Slovenia in 2019. In Romania, the ratio of pupils/students per teacher in

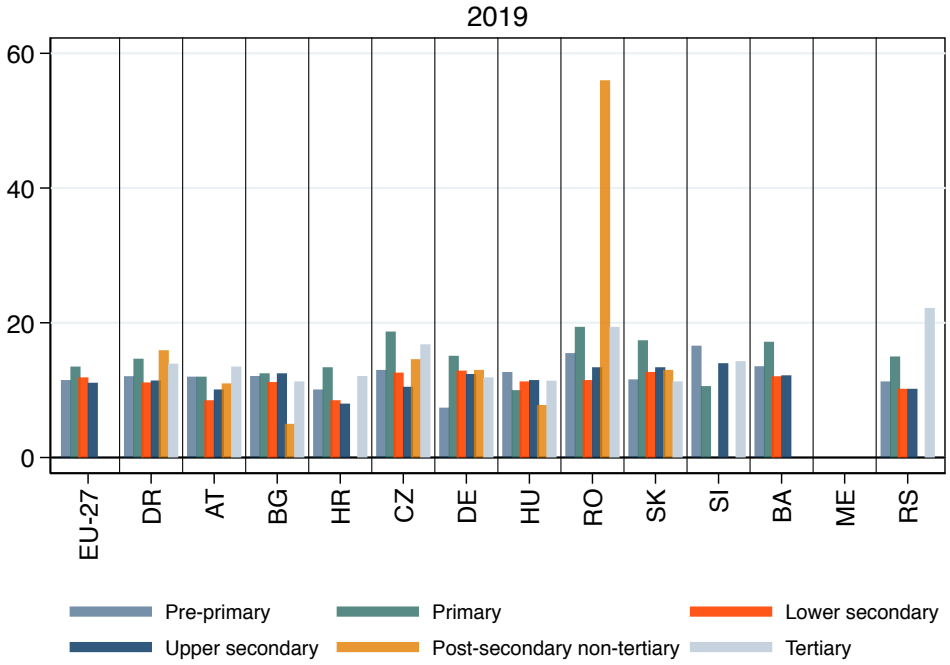
[20]For an empirical assessment of the effect of class size on student performance, please refer to (i) Arias, J. J., and Walker, D. M., Additional evidence on the relationship between class size and student performance, *The Journal of Economic Education 35, no. 4* (2004): 311-329; (ii) Borland, M. V., Howsen, R. M., and Trawick, M. W., An investigation of the effect of class size on student academic achievement, *Education Economics 13, no. 1*(2005): 73-83; (iii) McEwan, P. J., Improving learning in primary schools of developing countries: A meta-analysis of randomized experiments, *Review of Educational Research 85, no. 4*(2015): 353-394.

Figure 3.7: Ratio of pupils and students to teachers and academic staff in 2013 for selected countries



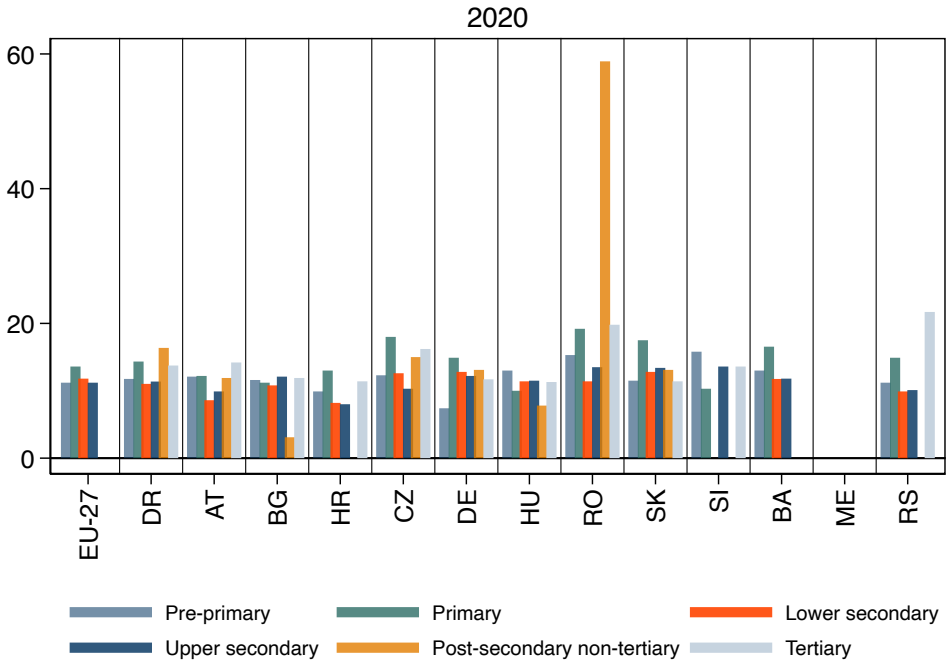
Source: EU Member States and Serbia – Eurostat segment *educ_uoe_perp04*.

Figure 3.8: Ratio of pupils and students to teachers and academic staff in 2019 for selected countries



Source: EU Member States and Bosnia and Herzegovina – Eurostat segment *educ_uoe_perp04*.

Figure 3.9: Ratio of pupils and students to teachers and academic staff in 2020 for selected countries



Source: EU Member States and Bosnia and Herzegovina – Eurostat segment *educ_uoe_perp04*.

primary education was exceeded only by an outstandingly high ratio in post-secondary education. As for the cross-country differences in the ratio of pupils/students per teacher, no stark differences across the Danube Region were observed.

This dynamic points towards increased pressure on the lower and medium education levels, with the number of pupils/students increasing and/or the number of teachers declining. Unfortunately, these two factors cannot be disentangled from the available data. The observed dynamics may result in potentially negative long-run effects on study performance since at the pre-primary, primary and lower-secondary education levels in particular, pupils need individualised approaches and support from teachers. As the ratio increases, teachers have less possibilities to provide attention and support in response to pupils' needs.

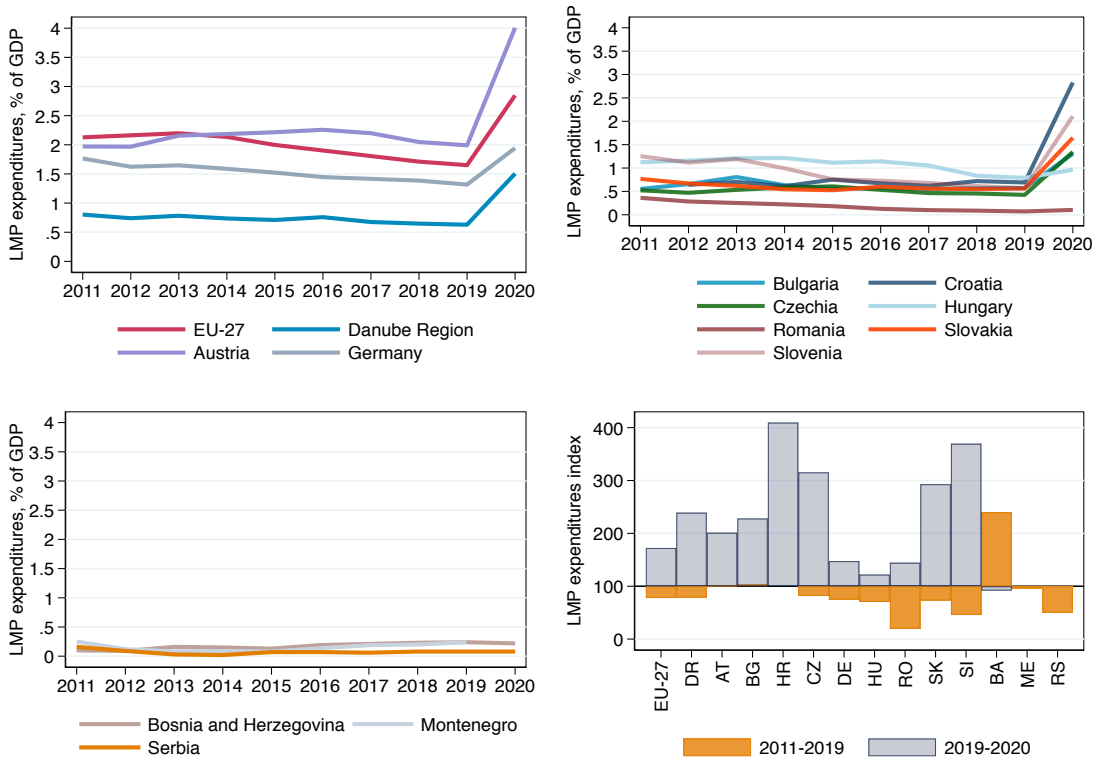
The comparison of Figures 3.8 and 3.9 suggests that the COVID-19 pandemic had, if anything, a very minor effect on the distribution of teachers and staff across all education levels. No major changes are documented for the ratios of pupils/students to teachers and academic personnel in 2020, as compared to the year 2019. The education systems continued operating in (partially) online format or in in-person format, with only temporary interferences when complete lockdown measures were in place (e.g. in early education and care institutions). Hence, these had no major effect neither on the number of education personnel, nor on the numbers of students/teachers for majority of education levels.

However, one may expect certain effects to surface in the upcoming years, as student commitment could have dropped and the propensity to leave school might have increased due to the pandemic and adverse effects of social-distancing measures on pupils'/students' performance and commitment.

3.4 Public Expenditure on Labour Market Policies

Labour market policy (LMP) refers to labour market interventions, which are government actions to help and support the unemployed and other disadvantaged groups in the transition from unemployment or inactivity to work. Governmental LMP (see Figure 3.10) appears crucial for maintaining labour market activity and combating unemployment.

Figure 3.10: Public expenditure on labour market policies in % of GDP for selected countries



Source: EU Member States – Eurostat database *LMP_IND_EXP*. Bosnia and Herzegovina, Montengro and Serbia – RCC (`https://www.rcc.int/seeds/inc/get_indic.php?id=191&cat_id=1`).
Notes: Indices are estimated as (i) public expenditures on labour market policies as % of GDP in 2019 relative to public expenditures on labour market policies as % of GDP in 2011 (index 2011-2019); (ii) public expenditures on labour market policies as % of GDP in 2020 relative to public expenditures on labour market policies as % of GDP in 2019 (index 2019-2020).

The scope of LMP actions include the following: (i) LMP services (all services and activities of the public employment services together with any other publicly funded services for jobseekers); (ii) LMP measures (interventions that provide temporary support for groups that are disadvantaged in the labour market and aim at activating the unemployed,

helping people move from involuntary inactivity into employment or maintaining the jobs of persons threatened by unemployment, including training, employment incentives, supported employment and rehabilitation, direct job creation and start-up incentives); and (iii) LMP supports (financial assistance that aims to compensate individuals for loss of wages or salaries and support them during job searches, including unemployment benefits, out-of-work income maintenance and early retirement).

However, the scope of public LMP financing was drastically different across the countries of the Danube Region, resulting in the regional average falling far behind the EU-27 average level (see Figure 3.10). There were stark cross-country differences in the absolute levels of LMP funding, with the Austrian government spending 2% of its GDP on LMP support in 2019 while Romania and Serbia were spending practically zero. Notably, the level of LMP funding declined in all countries, except for Austria and Bulgaria (very minor increase), in 2011-2019, with the most pronounced drops being in Romania (from 0.36% in 2011 to 0.07% in 2019), Serbia (from 0.16% in 2011 to 0.08% in 2019) and Slovenia (from 1.25% in 2011 to 0.57% in 2019).

The effect of COVID-19 on the levels of LMP financing appeared very strong and positive, as expected in the previous report. Various job retention schemes were implemented across the EU and Danube Region to prevent unemployment surges and LMP expenditures increased in 2020 to fund these.[21] Several countries posted the most pronounced increase, like 400% in Croatia and around 380% in Slovenia. However, these increases will most likely be temporary, as most of the job retention schemes were of a temporary nature and were withdrawn as soon as restrictions on economic operations and human mobility (lockdowns) were lifted.

[21] https://www.oecd.org/coronavirus/policy-responses/job-retention-schemes-during-the-covid-19-lockdown-and-beyond-0853ba1d/

3.5 Appendix: Indicators and Data Description

3.1 Public expenditure on education

Definition: General government expenditure on education in % of GDP.

Source: EU Member States - Eurostat segment *gov_10a_exp*. Serbia - Eurostat segment *cpc_pseduc*. Montenegro - RCC (`https://www.rcc.int/seeds/results/1/see2020-progress-tracker`). The Republic of Moldova and Ukraine - GFS (`https://data.imf.org/regular.aspx?key=61037799`).

Data availability: The data for the German regions Bavaria and Baden-Württemberg and four regions of Ukraine were not available. For Bosnia and Herzegovina, only data for the years 2016-2020 were available; for Montenegro, data for the years 2011-2017 were available. For the rest of the Danube Region countries, the data for the years 2011-2020 were used.

3.2 Private expenditure on education

Definition: Private (household) spending on education in % of GDP for the total expenditure and in million EUR for education-level specific expenditures.

Source: EU Member States and Serbia - Eurostat segment *educ_uoe_fine03*. Ukraine - the national statistical office.

Data availability: For the total private expenditure on education (in % of GDP), the following data were available: Austria: 2012-2019; Bulgaria: 2012-2016 and 2018-2019; Croatia: 2012-2014 and 2016-2019; Czechia: 2012-2016 and 2018-2019; Hungary: 2012 and 2017-2019; Romania: 2012 and 2014-2019; Slovakia: 2013-2019; Slovenia: 2012-2019; Serbia: 2013-2015 and 2017; Ukraine: 2011-2020. For the rest of the countries and regions, no data on the total private expenditure on education were available.

3.3 Distribution of teachers and staff

Definition: The ratio of pupils and students to teachers and academic staff by education level.

Source: EU Member States, Bosnia and Herzegovina, Montenegro and Serbia - Eurostat segment *educ_uoe_perp04*

Data availability: The data for the German regions Bavaria and Baden-Württemberg, the Republic of Moldova, Ukraine and four regions of Ukraine were not available. For the remaining countries, the data were mainly available for the years 2013-2020, with several exceptions. For Hungary and Romania, data for primary education were only available for the years 2015-2020; for Slovenia, data were available for the years 2013-2017 for lower secondary, and there were no data for post-secondary non-tertiary education. Bosnia and Herzegovina had data only for the year 2019 for all education degrees, expect

post-secondary non-tertiary and tertiary; for the latter two, no data were available. Montenegro had data only for the year 2018 for the pre-primary, lower secondary and upper secondary levels and no data available otherwise; Serbia had data for the years 2013-2018 for the pre-primary, primary, lower secondary and upper secondary levels and no data for the post-secondary non-tertiary level or the years 2013-2017 for tertiary education.

3.4 Public expenditure on labour market policies

Definition: The LMP refers to labour market interventions, which are government actions to help and support the unemployed and other disadvantaged groups in the transition from unemployment or inactivity to work. Public expenditures on LMP are measured as the % of GDP.

Source: EU Member States - Eurostat database *LMP_IND_EXP*. Bosnia and Herzegovina, Montengro and Serbia - RCC (`https://www.rcc.int/seeds/inc/get_indic.php?id=191&cat_id=1`).

Data availability: The data for the German regions Bavaria and Baden-Württemberg, the Republic of Moldova, Ukraine and four regions of Ukraine were not available. For Croatia, only data for the years 2012-2020 were available. For Montenegro, data for the years 2011-2015 and 2017-2019 were available. For all other countries, the data for the years 2011-2020 were used.

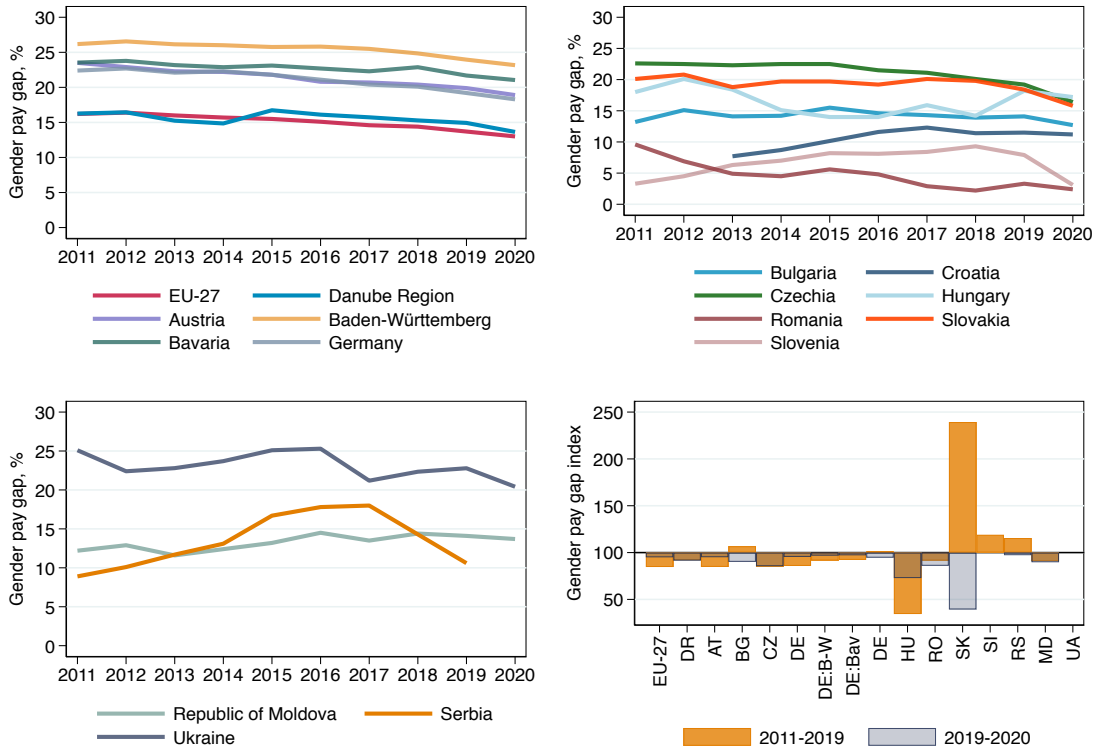
Objective IV

Contribution to Ensuring Inclusive Education and Training and Promoting Inclusive Labour Markets, Equal Opportunities and Non-Discrimination as well as Promoting Civic Competences and Life-Long Learning Opportunities for All

4.1 Gender Pay Gap

The gender pay gap represents the earnings inequality between men and women and appear as a crucial indicator of gender equality in the labour market. The magnitude of the gender pay gap also signals the overall gender equality in various domains, including society and family, as well as the labour market commitment of women and gender segregation in the labour market.

Figure 4.1: Gender pay gap from 2011 to 2020 and the index change of the gap across countries



Source: EU Member States – Eurostat segment *earn_gr_gpgr2*. The Republic of Moldova, Serbia and Ukraine – United Nations Economic Commission for Europe (UNECE) Statistical database (`https://w3.unece.org/PXWeb2015/pxweb/en/STAT/STAT__30-GE__03-WorkAndeconomy/017_en_GE_GPG2_r.px`).
Notes: Indices are estimated as (a) a gender pay gap in 2019 relative to a gender pay gap in 2011 (index 2011-2019); (b) a gender pay gap in 2020 relative to a gender pay gap in 2019 (index 2019-2020).

The gender pay gap is measured differently for EU Member States and Montenegro and the other Danube Region countries (see Figure 4.1), the pay gap is calculated as the difference in terms of hourly wages; therefore, it accounts for potentially large gender difference in weekly/monthly work hours, as women tend to work part-time. For other Danube Region countries, e.g. the Republic of Moldova, Serbia and Ukraine, the pay gap was estimated using the average monthly wage rates, which is a less accurate indicator than the one based on hourly wages since we cannot disentangle a fraction of the gender pay gap originating from a gender difference in work hours. This limitation has to be acknowledged when discussing the indicators, and most importantly, we cannot directly

compare the two measures. The data were available for the years 2011-2019 only, which did not allow for tracing of the effect of the COVID-19 pandemic on the gender pay gap. For the remaining Danube Region countries, the data were not available.

On average, the dynamics of the gender pay gap in the Danube Region were relatively positive - there was an overall decline of 11% over 2011-2019 compared to the EU-27 gender pay gap reduction of 13%. However, the dynamics across countries were rather uneven, with the most drastic decline of 65% being in Romania, followed by Czechia (16%) and Austria (15%), and the most striking jumps being in Slovenia (140%), Serbia (19%), and the Republic of Moldova (16%). It is noteworthy that the most pronounced changes in the level of gender pay gaps occurred in the countries with the lowest absolute levels of the gap. In Romania, the pay inequality declined from 9.6% to 3.3%, and in Slovenia, it rose from 3.3% to 7.9%, still remaining under the EU-27 and Danube Region averages of 14% and 15%, respectively, in 2019.

Based on the data from 2020, the COVID-19 had, if anything, mild effect on the gender pay gap and in some countries (Bulgaria, Czechia, Hungary, Romania and Slovakia) resulted in a notable reduction of the gender pay gap. Despite COVID-19 crisis was feared to widen gender inequalities[22] as female employment appeared more affected and women tend to reduce work hours and terminate employment, on average, more often then men in the face of increased childcare needs. However, the evidence from the Danube Region suggests that, if anything, gender pay gap was not exacerbated by the pandemic. However, this evidence is not yet enough to conclude on the effects of the pandemic on the gender inequality in wages, as one would need to account for entire period of COVID-19 crisis, and this will include year 2021. Moreover, gender pay gap tells only about wage inequality and this does not capture potential expansion of gender inequality in work hours[23] in response to childcare facilities and school closures.

4.2 People at Risk of Poverty

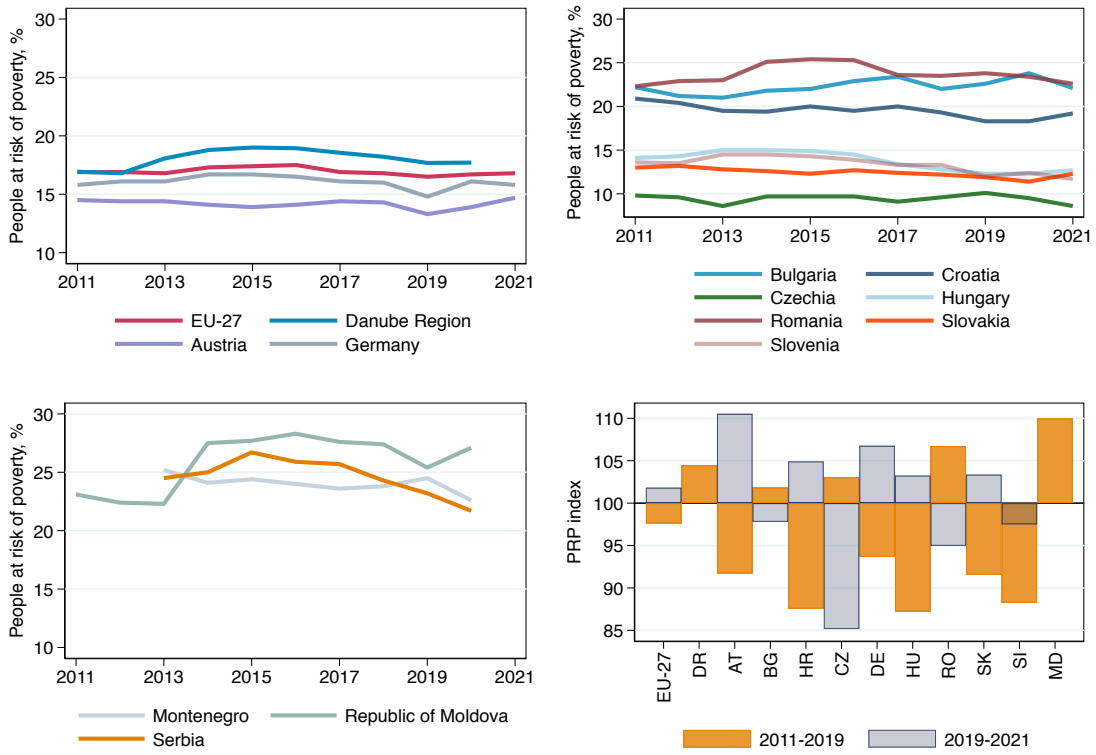
Combating poverty is one of the crucial EU objectives and is a key factor for EU integration. Poverty implies not only a low income but also non-accessibility of essential services (e.g. health care) and social exclusion. In countries with relatively weak welfare state support (e.g. the Republic of Moldova, Serbia and Ukraine), being in poverty or at risk of poverty often implies having no rights to various social transfers and state services. As

[22]For a broader discussion of COVID-19 implications for gender inequalities on labour market, please, refer to `https://www.oecd.org/coronavirus/en/data-insights/the-gender-pay-gap-continues-to-close-but-slowly`

[23]`https://wiiw.ac.at/gender-gaps-in-employment-wages-and-work-hours-assessment-of-covid-19-implications-dlp-5827.pdf`

a result, reducing poverty appears essential for societal well-being and economic growth.

Figure 4.2: Share of people at risk of poverty from 2011 to 2021 and the index change in the proportion of people at risk of poverty across countries



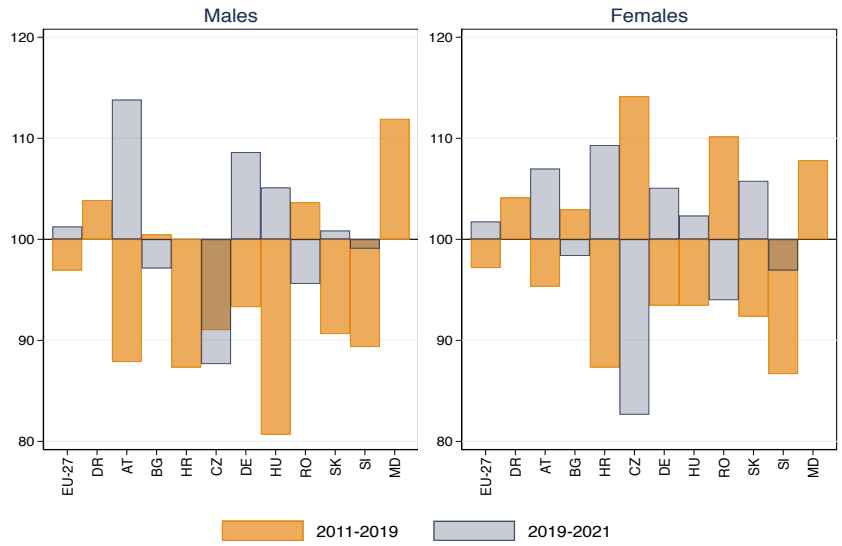
Source: For all countries except the Republic of Moldova – Eurostat segment *ilc_li02*. For the Republic of Moldova – *enpe_ilc_li09*.
Notes: Indices are estimated as (a) a share of people at the risk of poverty in 2019 relative to a share of people at the risk of poverty in 2011 (index 2011-2019); (b) a share of people at the risk of poverty in 2021 relative to a share of people at the risk of poverty in 2019 (index 2019-2021).

Households with an equivalised income below a threshold of 60% of the national median household income are considered to be at risk of poverty. Therefore, the share of people at risk of poverty captures those with a very low income compared to the rest of the population in a given country and not poverty per se.

The shares of people at risk of poverty differed dramatically across the Danube Region countries, with EU Member States Austria, Czechia, Hungary, Germany, Slovakia and Slovenia having lower shares as compared to both the EU-27 and Danube Region average levels over the observed period. All other Danube Region countries ranged persistently above the EU-27 and Danube Region averages (see Figure 4.2). Among the latter, the share of people at risk of poverty declined substantially in Croatia (-12% decline over 2011-2019), while in Romania and Bulgaria, it increased by 6% and 2%, respectively, over the same time period.

Among all people facing a risk of poverty, females constituted a larger share in the majority of countries, and the dynamics also appeared worse among women (see Figure 4.3).

Figure 4.3: People at risk of poverty indices by gender across countries



Source: For all countries except the Republic of Moldova – Eurostat segment *ilc_li02*. For the Republic of Moldova – *enpe_ilc_li09*.
Notes: Indices are estimated as (a) a share of people at the risk of poverty in 2019 relative to a share of people at the risk of poverty in 2011 (index 2011-2019); (b) a share of people at the risk of poverty in 2021 relative to a share of people at the risk of poverty in 2019 (index 2019-2021) with both indices estimated separately for men and women.

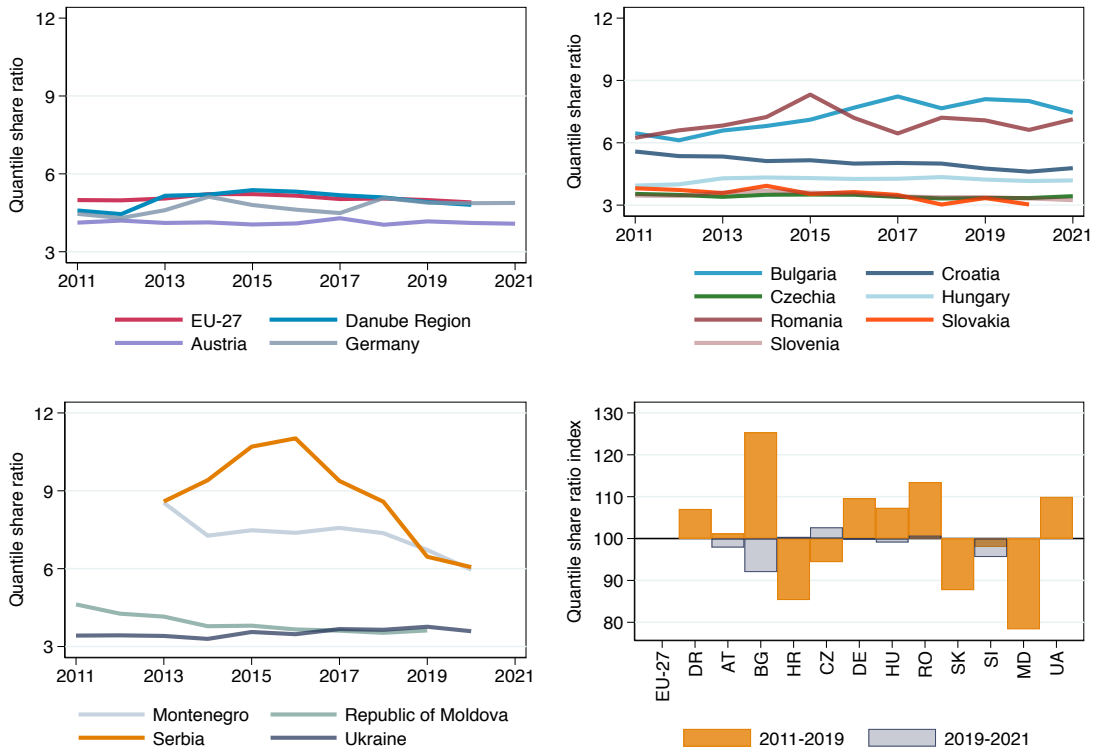
This suggested that, for example, single households headed by women (e.g. single mothers) are more likely to be at risk of poverty than single men or couple households. Men experienced a substantial decline concerning the risk of poverty over 2011-2019 in all countries, except for Bulgaria and Romania, with the most pronounced drop seen in Hungary with 19%. The decline in the risk of poverty was much more modest among women, and the indicator even increased dramatically in several countries, e.g. Bulgaria (3%), Romania (10%) and Czechia (14%).

The effect of the pandemic on the risk of poverty was dramatically different across the countries. Based on the data from 2021, as compared to 2019, the share of people at risk of poverty increased in Austria (11%), Croatia (5%), Germany (7%), Hungary and Slovakia (around 3%). Yet in Czechia it dropped by sizable 15%, followed by 5% drop in Romania and around 2% drops in Bulgaria and Slovenia. Men appeared to be hit the most in Austria, Germany and Hungary, while in Croatia the risk of poverty increased drastically for women (almost 9%) and dropped for men (-12%), similarly as in Slovakia (1% increase for men and almost 7% for women).

Different gender dynamics reflects, above everything varying magnitude of employment and income distortions experienced by men and women in different countries. Similarly, job retention and income support schemes launched across the Danube Region countries might have been disproportionately distributed among men and women.[24] However, to

[24]For more elaborate discussion of the issue of gender-unequal job retention schemes, please, refer to `https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_813449/lang--en/index.htm`

Figure 4.4: Inequality of income distribution - quantile share ratio from 2011 to 2021 and the index change in the ratio across countries



Source: EU Member States, Montenegro and Serbia – Eurostat segment *ilc_di11*. Republic Moldova and Ukraine – World Bank Database, World Development Indicators (`https://databank.worldbank.org/reports.aspx?source=2&series=SI.DST.05TH.20`).
Notes: Indices are estimated as (a) a quantile share ratio in 2019 relative to a quantile share ratio in 2011 (index 2011-2019); (b) a quantile share ratio in 2021 relative to a quantile share ratio in 2019 (index 2019-2021).

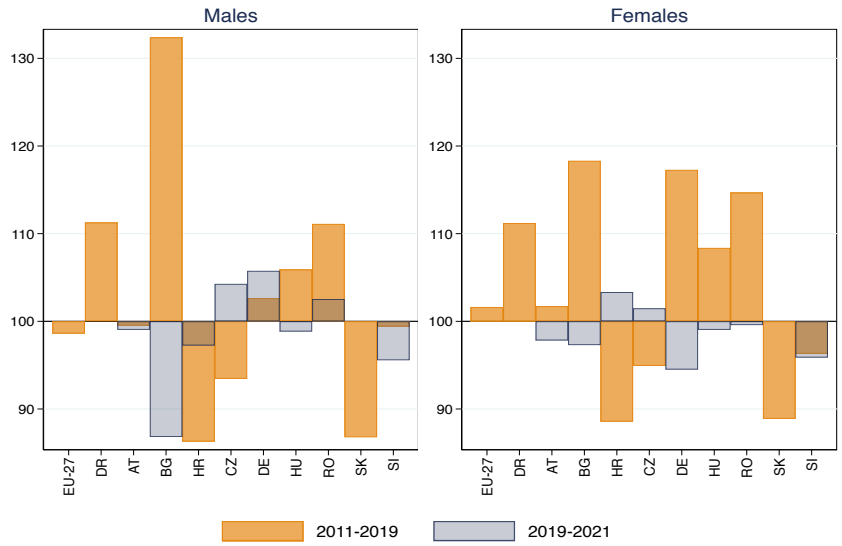
trace the effect of the pandemic on the risk of poverty, a longer time horizon is needed, as job distortions due to the pandemic-induced crisis may prove lasting and may magnify poverty rates in the long run.

4.3 Inequality of Income Distribution

Income inequality shows how unevenly income is distributed in the population, i.e. how strongly the earnings are polarised across the population. High income inequality is deemed negative, as it yields a low quality of life and limited opportunities for those at the bottom of the income distribution while those at the top reap the benefits. As a result, risks of social decline, exclusion and a society clustered according to the income groups increase,

Two measures are usually employed to address income inequality - the quantile share ratio and Gini coefficient. Quantile share ratios are calculated as the ratio of total disposable income received by the 20% of the population with the highest income (the top

Figure 4.5: Inequality of income distribution - quantile share ratio indices by gender across countries



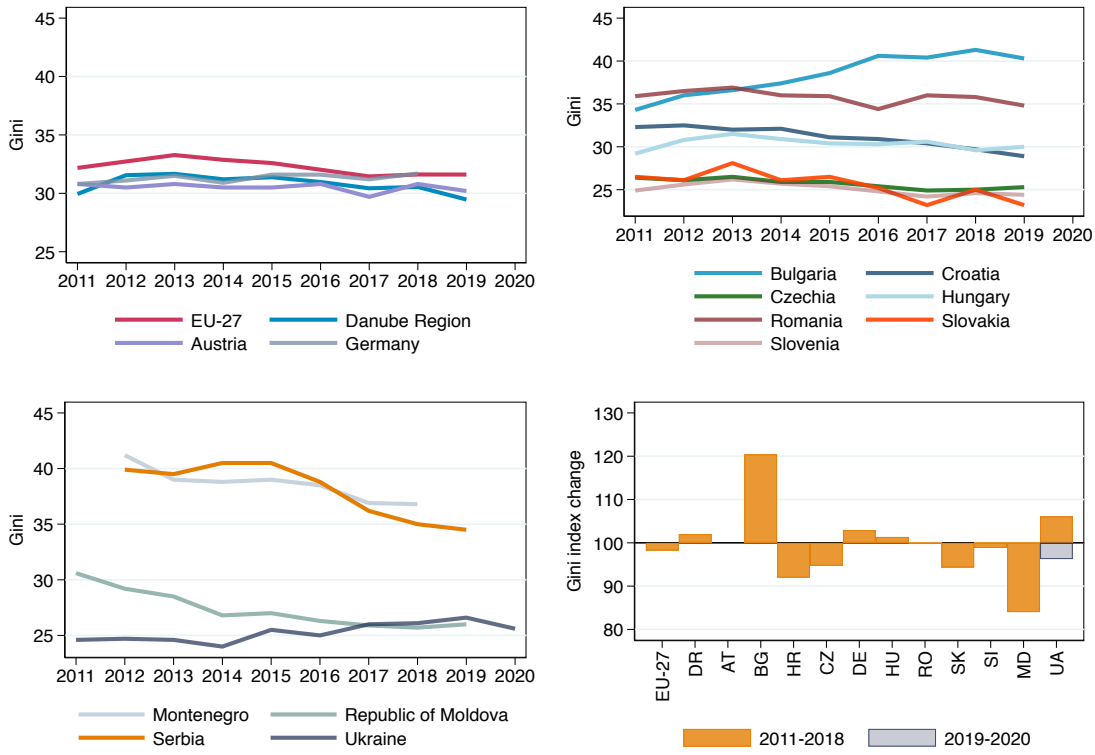
Source: Eurostat segment *ilc_di11*.
Notes: Indices are estimated as (a) a quantile share ratio in 2019 relative to a quantile share ratio in 2011 (index 2011-2019); (b) a quantile share ratio in 2020 relative to a quantile share ratio in 2019 (index 2019-2020) with both indices estimated separately for men and women.

quintile) to that received by the 20% of the population with the lowest income (the bottom quintile). It expresses the number of years people in the bottom income quantile need to work in order to achieve the same income result that the top quantile earns annually. The Gini index measures how far the income distribution in a country differs from being totally equal. A Gini index of 1 stands for a perfectly equal distribution, and 100 represents a perfectly unequal distribution.

Figure 4.4 depicts the quantile share ratio across the Danube Region countries. Stark differences in the absolute values of the ratios arose, with Bulgaria, Montenegro, Romania and Serbia ranging far above the Danube Region and EU-27 averages. Furthermore, in Bulgaria and Romania, the income inequality increased substantially by 25% and 13% over 2011-2019 - the most substantial increases in the region. The EU Member States Austria, Czechia, Hungary, Germany, Slovakia and Slovenia ranged below the Danube Region and EU-27 average levels in terms of income inequality. Croatia experienced a substantial drop in the quantile share ratio from 5.6% to 4.8% over 2011-2019 and converged to the EU-27 average.

Gender differences in the quantile share ratios were rather minor across the countries; however, the magnitude of the ratio dynamics in 2011-2019 appeared different across men and women (see Figure 4.5). In Bulgaria, men incurred a stark jump in equality of 32%, while inequality among women increased by 18%. The gender difference in the ratio change was the opposite in Germany, Hungary and Romania, where inequality rose more

Figure 4.6: Inequality of income distribution - Gini index from 2011 to 2021 and the index change in Gini across countries



Source: World Bank Database, World Development Indicators (`https://databank.worldbank.org/reports.aspx?source=2&series=SI.DST.05TH.20`).
Notes: Indices are estimated as (a) a Gini index in 2019 relative to a Gini index in 2011 (index 2011-2019); (b) a Gini index in 2020 relative to a Gini index in 2019 (index 2019-2020).

substantially among women in 2011-2019.

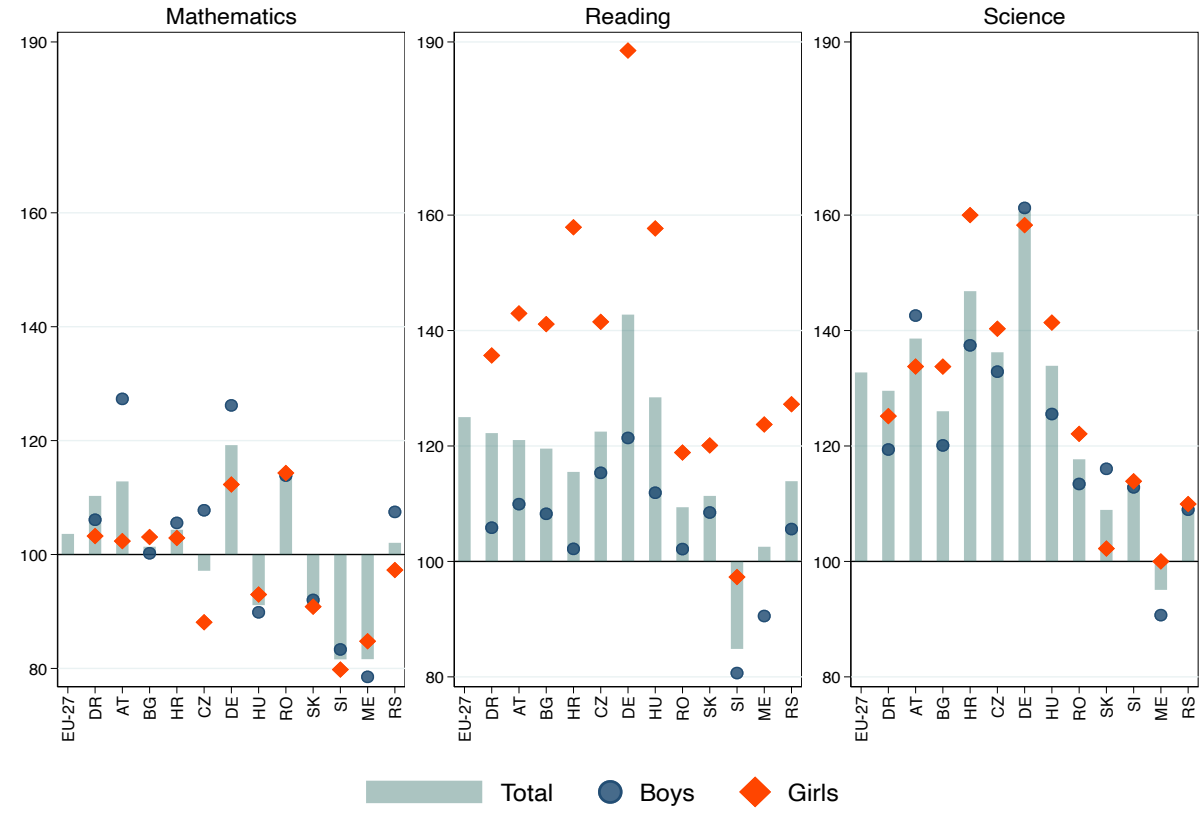
The Danube Region countries ranged dramatically in the effects of the pandemic on income inequality. Bulgaria experienced a drop in income inequality of almost 8%, albeit employment decline and unemployment surge in 2020-2021. Whereas in Czechia inequality increased by around 2% throughout the pandmemic. However, it may be still too early to conclude on the effect of the pandemic on income inequality, as long-term employment distortions, such as structural unemployment and inactivity, can magnify inequality indicators in the following years.

Figure 4.6 depicts the Gini index across the Danube Region countries. The absolute cross-country differences in the Gini index dynamics and relative levels compared to the Danube Region and EU-27 averages generally mirrored the evolution of the quantile share ratio. The most pronounced increase in 2011-2018 was reported in Bulgaria (from 34% to 41%), whereas inequality dropped in Croatia (from 32% to 30%), Czechia (from 26% to 25%), the Republic of Moldova (from 31% to 26%) and Slovakia (from 27% to 25%). Since the data for year 2020 is missing for all countries except Ukraine, we cannot conclude on the implications of the COVID-19 crisis for income inequality based on Gini index.

4.4 Performance in Basic Competences

The indicators used in this section are based on the Programme for International Student Assessment (PISA) test results. The PISA is conducted every three years to assess 15-year-olds' ability to apply their mathematics, reading and science knowledge and skills to deal with real-life challenges[25]. Thus, PISA test scores reflect the actual cognitive abilities of adolescents in three major domains. We relied on PISA data from three waves, i.e. 2012, 2015 and 2018, focusing on the index change between 2012 and 2018. The data were available for all Danube Region countries, except for Bosnia and Herzegovina. For the Republic of Moldova, only the last two waves were available, whereas for Ukraine, only the last one was available. For consistency, we considered only countries with available test scores from all three waves.

Figure 4.7: Change in the share of low-achieving students in mathematics, reading and science by gender across countries for 2018 relative to 2012

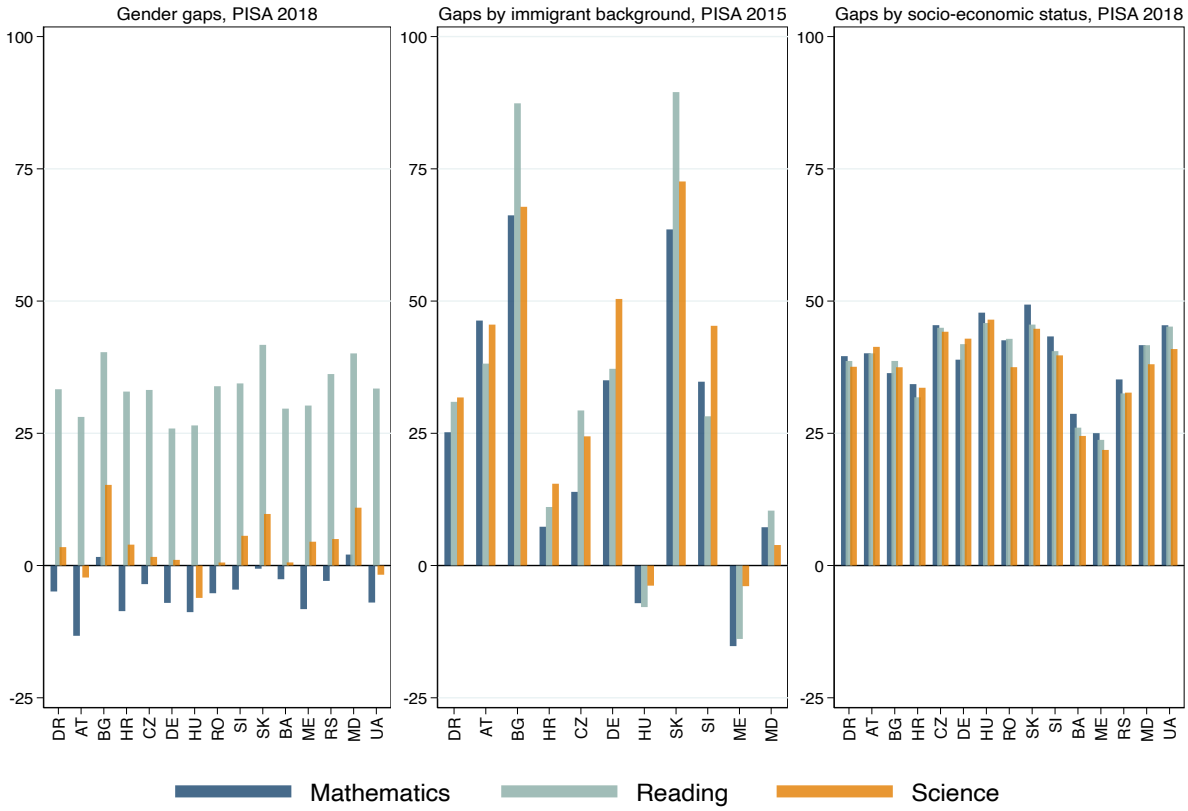


Source: OECD PISA 2012: https://www.oecd-ilibrary.org/education/pisa-2012-results-excellence-through-equity-volume-ii_9789264201132-en. OECD PISA 2018, Annex B1.7: https://www.oecd-ilibrary.org/education/pisa-2018-results-volume-ii_b9935c8e-en.
Notes: Index change is estimated as a share of low-achieving students in 2018 relative to a share of low-achieving students in 2012, estimated separately for three subjects.

The share of low-achieving students among 15-year-old students should be no more

[25]The PISA 2021 assessment was postponed to 2022 to reflect post-COVID-19 difficulties.

Figure 4.8: Gaps in test performance by gender, migration status and socio-economic status across countries



Source: OECD PISA 2015: https://www.oecd-ilibrary.org/education/pisa-2015-results-volume-i/pisa-2015-data_9789264266490-14-en.
OECD PISA 2018: https://www.oecd-ilibrary.org/education/pisa-2018-results-volume-ii_b9935c8e-en.
Notes: The data for immigrants and non-immigrants in all three skill domains is avaialble for year 2015 only. Gaps are measures in test score points. Gender gap is a difference between female and male average scores. Migration status gap is a difference between average scores of non-immigrant and immigrants. Socio-economic gap is score difference adjusted by ESCS status.

than 15% by 2030 according to the Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030). However, all Danube Region countries fell far behind this objective in 2018, with a high variation in the share of low-achieving students (see Figure 4.7). Slovenia approached the target level (16% in mathematics, 18% in reading and 15% in science), while Bulgaria and Montenegro were equally far from the target (44% and 46%, respectively, in mathematics, 47% and 44%, respectively, in reading and 47% and 48%, respectively, in science).

Furthermore, the share of low-achieving students increased in the majority of countries, with the most striking jump in science and least pronounced change in mathematics. Germany experienced the most pronounced spike in the share of low-achievers in all domains - 19% in mathematics, 43% in reading (with 21% among boys and 89% among girls) and 61% in science. The total share of low-achieving students declined in mathe-

matics in Hungary, Montenegro, Slovakia and Slovenia, in reading only in Slovenia and in science only in Montenegro. In all remaining countries, the shares of low-achieving students increased in the last years, threatening the fulfilment of the 15% target.

Differences in the test scores were visible across gender, migration status[26]. and different socio-economic backgrounds (see Figure 4.8). Girls were systematically better in reading and in science in all countries of the Danube Region, except for Austria, Hungary and Ukraine. Boys achieved systematically higher scores in mathematics, with Bulgaria and the Republic of Moldova being the only exceptions. The pattern of gender gaps across test domains was in line with earlier trends and rather expected. However, the mathematics gaps were of a smaller magnitude as compared to the reading gaps, suggesting that the chances of closing the gender gap in mathematics are higher as compared to the chances for reading. Girls tended to have, if anything, marginally lower test scores in mathematics, while the reading gaps were huge and may be much harder to narrow, as boys scored much less in reading compared to girls[27].

Non-immigrant students performed much better in all domains in all countries, except for Hungary and Montenegro. The most striking gaps were recorded in Bulgaria and Slovenia, with reading gaps ranging close to 90 test score points and mathematics and science gaps exceeding 60 points. This result suggested that students with an immigrant background are particularly vulnerable and may need additional support and guidance due to both potential language and cultural barriers and difficulties integrating into the school community. The latter is most relevant for immigrant students who arrived in their host country relatively recently[28]. The gaps are expected to reduce for second-generation immigrants.

Students with a more favourable socio-economic background performed much better in all domains in all countries without exceptions. Therefore, socio-economic status is the strongest and most persistent predictor of test performance and has a high policy relevance. Students from lower socio-economic groups need particular support in their studies, including the provision of equal opportunities, equal access to study materials and equal treatment. Addressing these challenges will foster better performance of adolescents

[26]A PISA participant is referred to as an immigrant students if he/she is a first-generation immigrants (foreign-born students whose parents are also both foreign-born) or second-generation immigrants (students born in the country/economy where they sat the PISA test and whose parents are both foreign-born).

[27]The role of motivation in shaping the gender gap in reading is discussed in Schwabe, F., McElvany, N., and Trendtel, M. (2015). The school age gender gap in reading achievement: Examining the influences of item format and intrinsic reading motivation. *Reading Research Quarterly*, 50(2), 219-232.

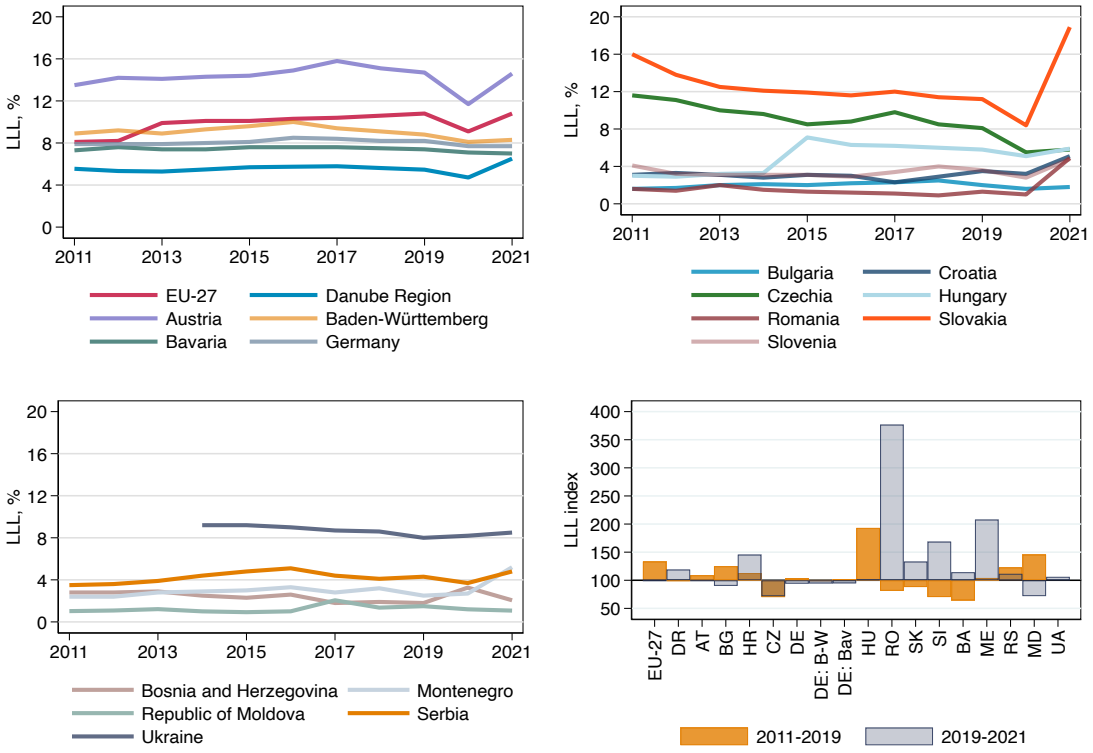
[28]For a detailed analysis on the role of an immigrant background in PISA test performance, please refer to (i) Ammermüller, A. (2005). Poor background or low returns? Why immigrant students in Germany perform so poorly in PISA. *ZEW - Centre for European Economic Research Discussion Paper*, No. 05-018; (ii) Schnepf, S. V. (2007). Immigrants' educational disadvantage: an examination across ten countries and three surveys. *Journal of population economics*, 20(3), 527-545.

from lower socio-economic groups both via improved educational opportunities and via strengthened study motivation[29].

4.5 Life-Long Learning

The measure of life-long learning (LLL) captures the adult population (aged 25 to 64 years) surveyed by the EU Labour Force Survey who participated in education or training during the four weeks preceding the survey. Life-long learning refers to all learning activities undertaken throughout a lifetime, aiming at improving skills and abilities and gaining new knowledge. These learning activities do not necessarily relate to employment - LLL also comprises education and training for personal reasons, with no employment spillover.

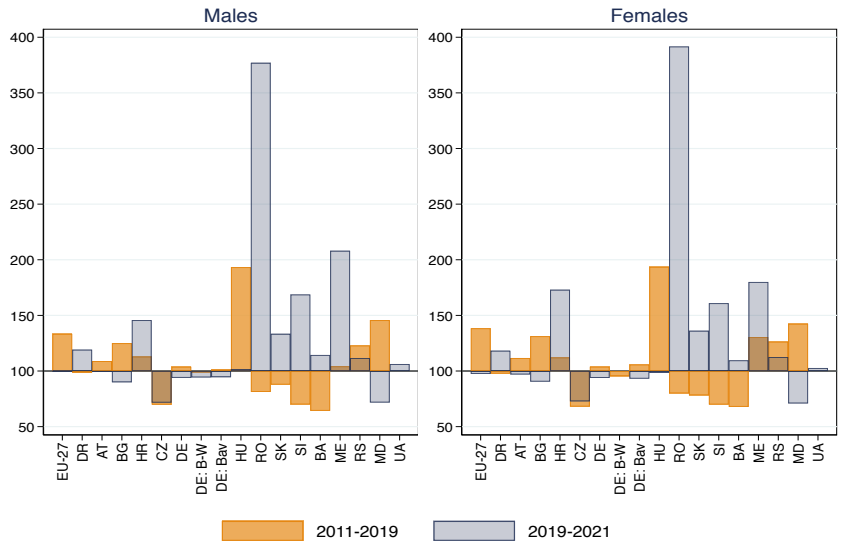
Figure 4.9: The LLL - the share of individuals participating in education and training from 2011 to 2021 and the index change in LLL across countries for the population aged 25 to 64



Source: EU Member States, Montenegro and Serbia - Eurostat segment *trng_lfse_01*; German sub-regions - Eurostat segment *trng_lfse_04*.
Notes: Indices are estimated as (a) LLL share in 2019 relative to LLL share in 2011 (index 2011-2019); (b) LLL share in 2021 relative to LLL share in 2019 (index 2019-2021).

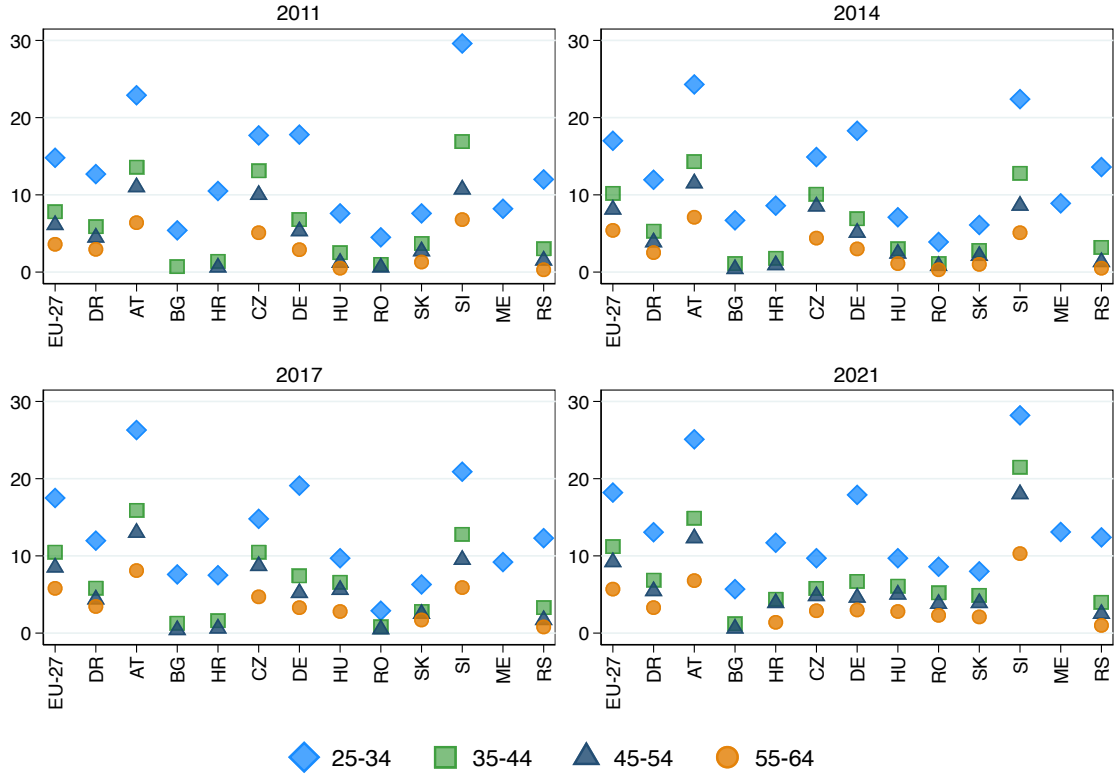
[29]Improving education inclusiveness and equality is in the spotlight of the OECD research agenda and policy; for instance, see `https://www.oecd.org/education/educational-opportunity-for-all-9789264287457-en.htm`

Figure 4.10: The LLL - the share of individuals participating in education and training indices by gender across countries for the population aged 25 to 64



Source: EU Member States, Montenegro and Serbia - Eurostat segment *trng_lfse_01*; German sub-regions - Eurostat segment *trng_lfse_04*.
Notes: Indices are estimated as (a) LLL share in 2019 relative to LLL share in 2011 (index 2011-2019); (b) LLL share in 2021 relative to LLL share in 2019 (index 2019-2021) with both indices estimated separately for men and women.

Figure 4.11: The LLL - the share of individuals participating in education and training from 2011 to 2021 by age groups across countries for selected years



Source: EU Member States, Montenegro and Serbia - Eurostat segment *trng_lfse_01*.

According to the Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030), by 2025, at least 47% of adults between the ages of 25 and 64 should have participated in learning within the preceding 12 months. However, available data refer to the LLL activities during the past four weeks. Therefore, the data can be only compared to the 15% target set in the European Cooperation in Education and Training (ET) 2020[30]. Figure 4.9 discloses the shares of the adult population participating in LLL activities and changes in the LLL shares between 2011 and 2019 as well as 2019 and 2021. The results suggested that by 2021, two Danube Region countries - Austria and Slovakia - achieved the target level, whereas other countries in the region lagged behind the objective of 15% in 2021, although the goal was supposed to be achieved by 2020. In the Danube Region, the average share of adults undertaking LLL activities was around 6%, whereas the EU-27 average fluctuated between 8% and 10% during the sample period. Austria, Czechia and Slovakia had the highest LLL shares at the beginning of the observation period; however, they declined from 12% to 6% in Czechia and from 16% to 8% in Slovakia between 2011 and 2020. Hungary, on the contrary, revealed a massive increase in LLL (from 3% in 2011 to 6% in 2019), whereas Bulgaria and Serbia experienced moderate growth in LLL. The remaining countries of the Danube Region revealed rather minor changes.

Men and women revealed comparable changes in LLL in all countries in 2011-2019 (see Figure 4.10). Significant gender differences in the LLL dynamics over 2011-2019 were observed only in Montenegro (30% increase among women and 4% increase among men) and Slovakia (22% drop among women and 12% drop among men).

Figure 4.11 depicts the LLL shares across four age groups in selected years. The results suggested that the highest percentage of people participating in education and training was recorded in the youngest age group, i.e. 25 to 34, in all countries of the Danube Region, which was likely related to enrolment in universities and other educational institutions with a purpose to obtain higher or professional (vocational) education. The likelihood to participate in LLL activities declined with age.

The COVID-19 pandemic had, initially, a rather negative association with the frequency of LLL activities, as highlighted in the previous report. A decline in LLL in 2020 was most likely related to the overall decline in educational activities due to social distancing measures and the suspension of various trainings. Increased childcare and home-schooling demands in light of kindergarten and school closures had a negative impact on the learning activities of parents.

However, LLL activities largely recovered in 2021 and even exceeded the pre-pandemic

[30]For more information, please refer to `https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52009XG0528(01)&from=EN`

level of 2019. Romania posted a notable increase in LLL, with a share of adults involved in LLL in 2021 being more than 3.5 times higher than in 2019. Similarly, in Montenegro LLL activities doubled, while in Croatia and Slovenia increased by around 50%.

Rapid recovery of LLL among adults may stem from several reasons. Firstly, as educational activities, particularly those for adults, were largely terminated or put on hold in 2020, lifting of the social distancing measures and revival of in-person teaching might have caused a major spur in LLL as those who were not able to participate in LLL activities in 2020 did so in 2021. Secondly, LLL may be a part of employment recovery programs, as those who lost jobs during the pandemic re-educate or acquire additional qualifications in order to find jobs.[31] With COVID-19 effects being very uneven across the sectors, some qualifications appeared in greater need in post-pandemic times, while others are of lower demand. Hence, LLL paves the way of labour market re-integration of people who lost their jobs during the pandemic and now seek to get a job in a new sector, requiring other qualifications, skills or knowledge.

4.6 Early Leavers from Education and Training

The measure of early leavers from education and training assesses the share of people aged 18 to 24 who leave the education system upon completing, at most, lower secondary education, do not receive further education and do not participate in training.

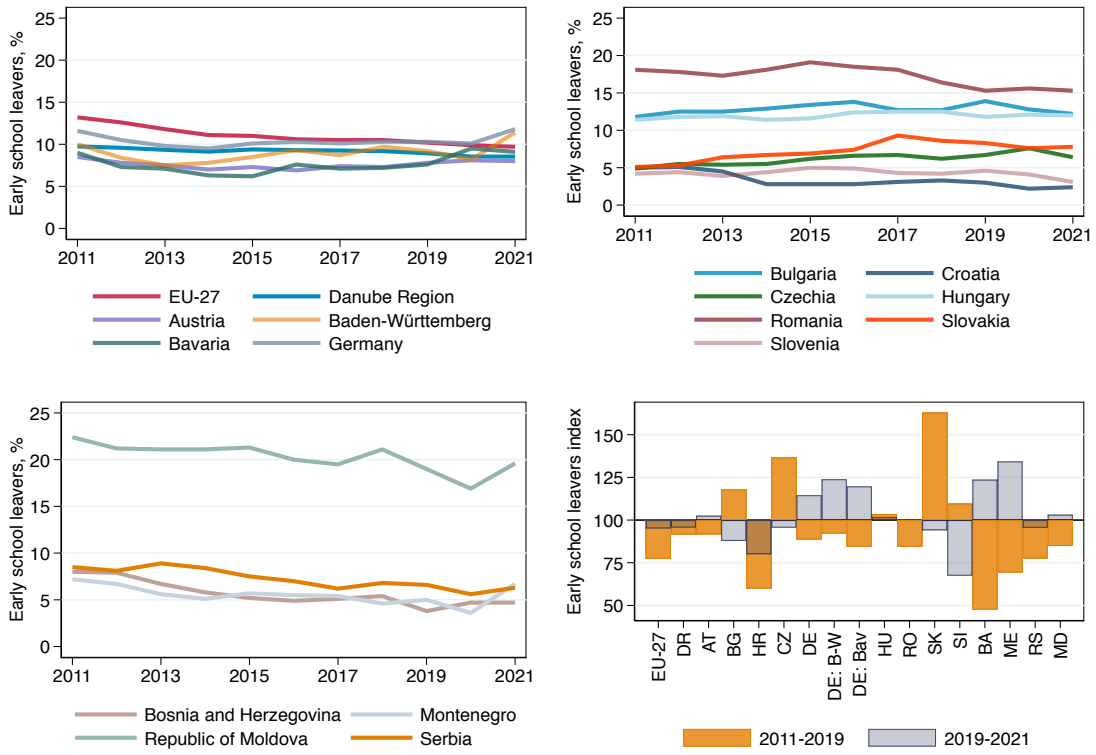
The Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030) sets an EU-level target of the share of early leavers from education and training of no larger than 9% by 2030. Figure 4.12 depicts the shares of early leavers across the Danube Region and reveals that several countries were far above the target level in 2021, namely the Republic of Moldova (20%), Romania (16%), Bulgaria and Hungary (12%), whereas several Danube Region countries had already achieved the level by 2021, namely Czechia (7%), Slovakia (8%), Serbia and Montenegro (6%), Slovenia (4%) and Croatia (3%).

The developments in the share of early school leavers between 2011-2019 were, on average, positive across the Danube Region. The only countries where the proportion of those who left school upon completing lower secondary education increased over 2011-2019 were Bulgaria (18%), Czechia (37%), Slovakia (63%) and Slovenia (10%). However, given the overall low share of early leavers in the latter three countries, all of them still remained below the 9% target level.

The gender differences in the developments of the shares of early leavers (see Fig-

[31] https://www.oecd.org/education/covid-19-pandemic-highlights-urgent-need-to-scale-up-investment-in-lifelong-learning-for-all-says-oecd.htm

Figure 4.12: Early leavers from education and training from 2011 to 2021 and the index change share of early leavers across countries for the population aged 18 to 24

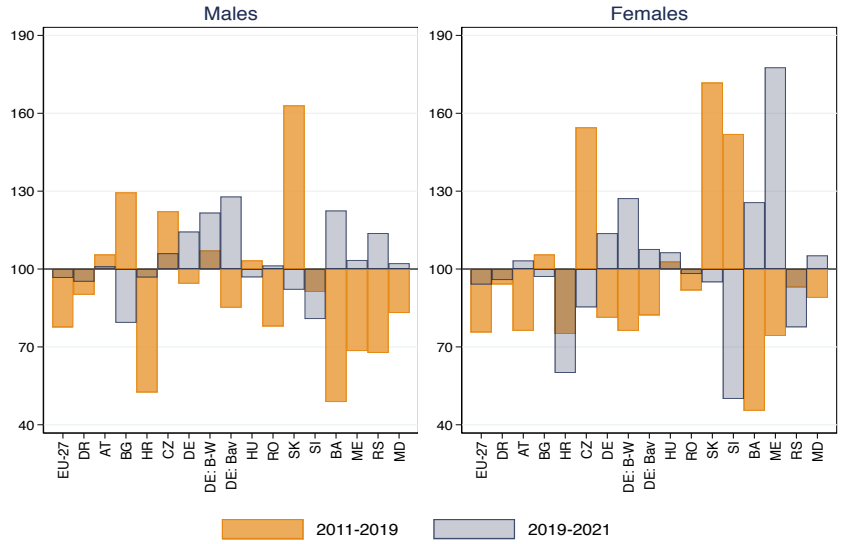


Source: EU Member States, Montenegro and Serbia - Eurostat segment *edat_lfse_02*; German sub-regions - Eurostat segment *edat_lfse_16*. Bosnia and Herzegovina - the national statistical office. Republic of Moldova - the national statistical office, internal code *gen021200mun*.
Notes: Indices are estimated as (a) a share of early leavers in 2019 relative to a share of early leavers in 2011 (index 2011-2019); (b) a share of early leavers in 2021 relative to a share of early leavers in 2019 (index 2019-2021).

ure 4.13) revealed that the overall increase in Bulgaria was driven by the early school leaving of male students (29% vs 6% among female students), while in Czechia, Slovakia and Slovenia, the incidence of early school leaving increased more among females (22% vs 56%, 63% vs 72%, -9% vs 52% among males and females, respectively).

The pandemic had an uneven effect on the share of early school leavers across the Danube Region. In Bulgaria, Croatia, Czechia, Serbia, Slovakia and Slovenia, the total share of early school leavers dropped in 2021 relative to 2019, while in Austria, Bosnia and Herzegovina, Germany (including the regions of Bavaria and Baden-Württemberg), Montenegro and Republic of Moldova it rose (see Figure 4.12). The most pronounced increase was documented in Montenegro (over 30%), Bosnia and Herzegovina and Baden-Württemberg (around 30%). Rising shares of early leavers are likely related to substantial interruptions of studies and a transition to partial distance learning due to lockdowns and social distancing measures imposed in 2020. These might have had a negative effect for marginalized students, who would have stayed in education if education remained in-person and if there had been strong or even binding participation incentives.

Figure 4.13: Early leavers from education and training by gender across countries for the population aged 18 to 24



Source: EU Member States, Montenegro and Serbia - Eurostat segment *edat_lfse_02*; German sub-regions - Eurostat segment *edat_lfse_16*. Bosnia and Herzegovina - the national statistical office. Republic of Moldova - the national statistical office, internal code *gen021200mun*.
Notes: Indices are estimated as (a) a share of early leavers in 2019 relative to a share of early leavers in 2011 (index 2011-2019); (b) a share of early leavers in 2021 relative to a share of early leavers in 2019 (index 2019-2021) with both indices estimated separately for men and women.

4.7 Educational Equality

Measuring education equality is crucial for the evaluation of the effectiveness, fairness and inclusiveness of education systems. In this section, two measures of education equality are used. The first one is the PISA index of economic, social and cultural status (ESCS) and is employed to evaluate the role that socio-economic background plays in student test performance. The index is composed on the basis of several variables: (i) the International Socio-Economic Index of Occupational Status; (ii) the highest level of education of the student's parents, converted into years of schooling; (iii) the PISA index of family wealth; (iv) the PISA index of home educational resources; and (v) the PISA index of possessions related to "classical" culture in the family home.

Table 4.1 presents the ESCS indices in mathematics for the years 2015 and 2018 for the countries with data available. An index value of 1 corresponds to the case of perfect equality, i.e. social background plays no role in educational outcomes, whereas an index value below 1 implies that students from higher socio-economic groups perform systematically better than those from lower groups. Unsurprisingly, socio-economic background played a huge role in student performance, with the largest discrepancies seen in Montenegro (0.38 in 2018), Romania (0.4 in 2018), and Bulgaria and Bosnia and Herzegovina (both with 0.45 in 2018). Similar trends were evident from Figure 4.8, with the PISA test scores being disproportionately worse among students from lower socio-economic backgrounds.

Table 4.1: Education equality - ESCS index in mathematics in 2015 and 2018 for selected countries

Country	2015	2018	Index change (2015=100)
Austria	0.70	0.70	100.39
Bulgaria		0.45	
Croatia		0.68	
Czechia	0.64	0.66	103.58
Germany	0.76	0.68	90.05
Hungary	0.56	0.55	98.68
Romania		0.40	
Slovakia	0.61	0.57	94.14
Slovenia	0.80	0.77	95.76
Bosnia and Herzegovina		0.45	
Montenegro		0.38	
Serbia		0.60	
Moldova		0.60	
Ukraine		0.54	

Source: OECD https://www.oecd-ilibrary.org/education/education-at-a-glance-2018_eag-2018-en Table 2. Equity in skills acquisition (Mathematics, numeracy and ICT Skills); for 2018 ESCS is retrieved from https://www.oecd-ilibrary.org/education/education-at-a-glance-2018/equity-in-skills-acquisition-mathematics-numeracy-and-ict-skills_eag-2018-table7-en.

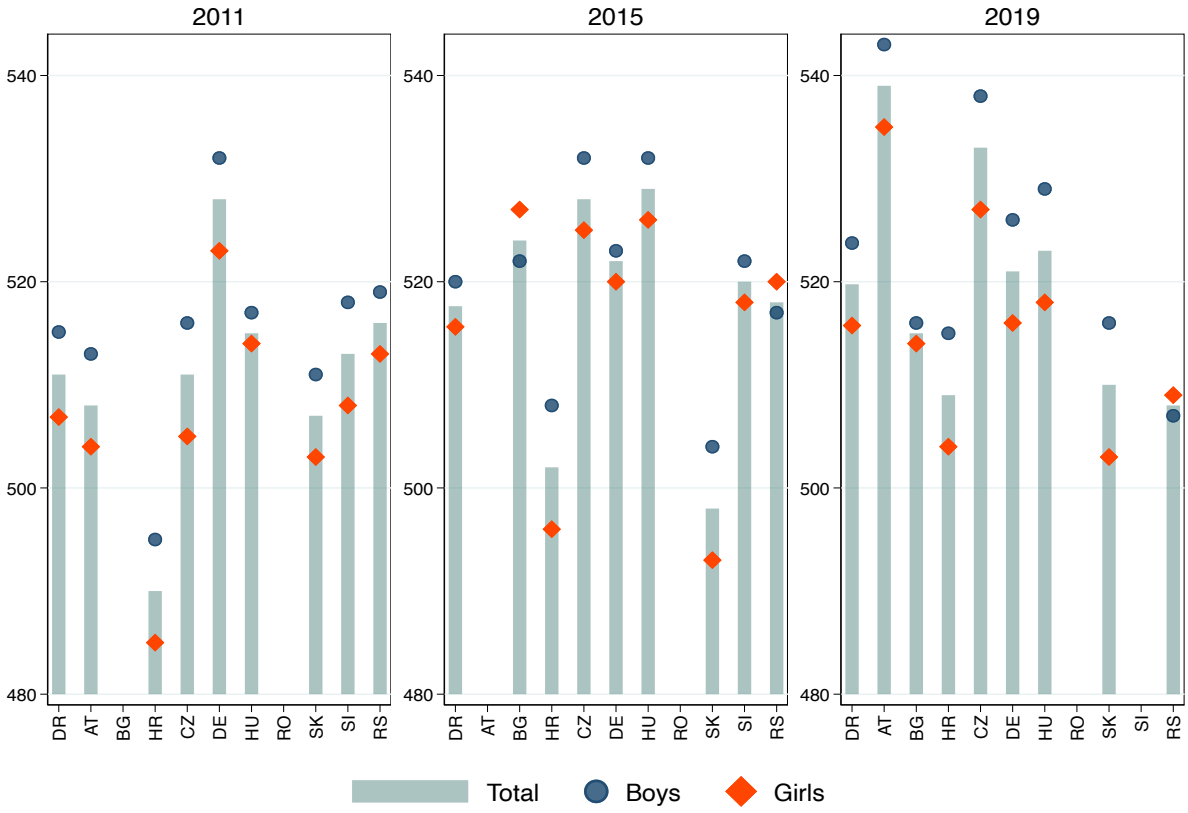
In the countries with available data for both the 2015 and 2018 rounds of the PISA ESCS index, only Czechia experienced a slight reduction in education inequality (from 0.64 in 2015 to 0.66 in 2018).

The second measure of education equality aims to shed more light on gender disparities in educational outcomes and to complement the estimated gender gaps in the PISA test scores presented in Figure 4.8. For this purpose, the TIMSS survey was employed for the years 2011, 2015 and 2019; it assesses the basic skills (mathematics and science) of fourth- and eighth-grade students in the form of standardised tests. Since the PISA tests refer to 15-year-old students, the TIMSS test performance of students in fourth grade (students aged 9.5 years or less) is considered in order to obtain a better picture of the evolution of gender gaps in test performance. Furthermore, the data on eighth-grade student performance in mathematics is limited.

Figure 4.14 presents the gender gaps in mathematics among fourth-grade students. Two stark observations arose: first, boys attained systematically higher scores in mathematics compared to girls. Thus, the patterns observed among 15-year-old pupils (see Figure 4.8) emerge at a much younger age. Second, the dynamics of the gender gaps during 2011-2019 varied drastically across the Danube Region, with inequality declining to a statistically insignificant level in Bulgaria and Serbia and widening dramatically in Hungary and Slovakia.

Figure 4.15 depicts the gender gaps in the science test scores. In 2011, boys achieved

Figure 4.14: Performance in mathematics by gender across countries via the Trends in International Mathematics and Science Study (TIMSS) 2011, 2015 and 2019 for fourth-grade students



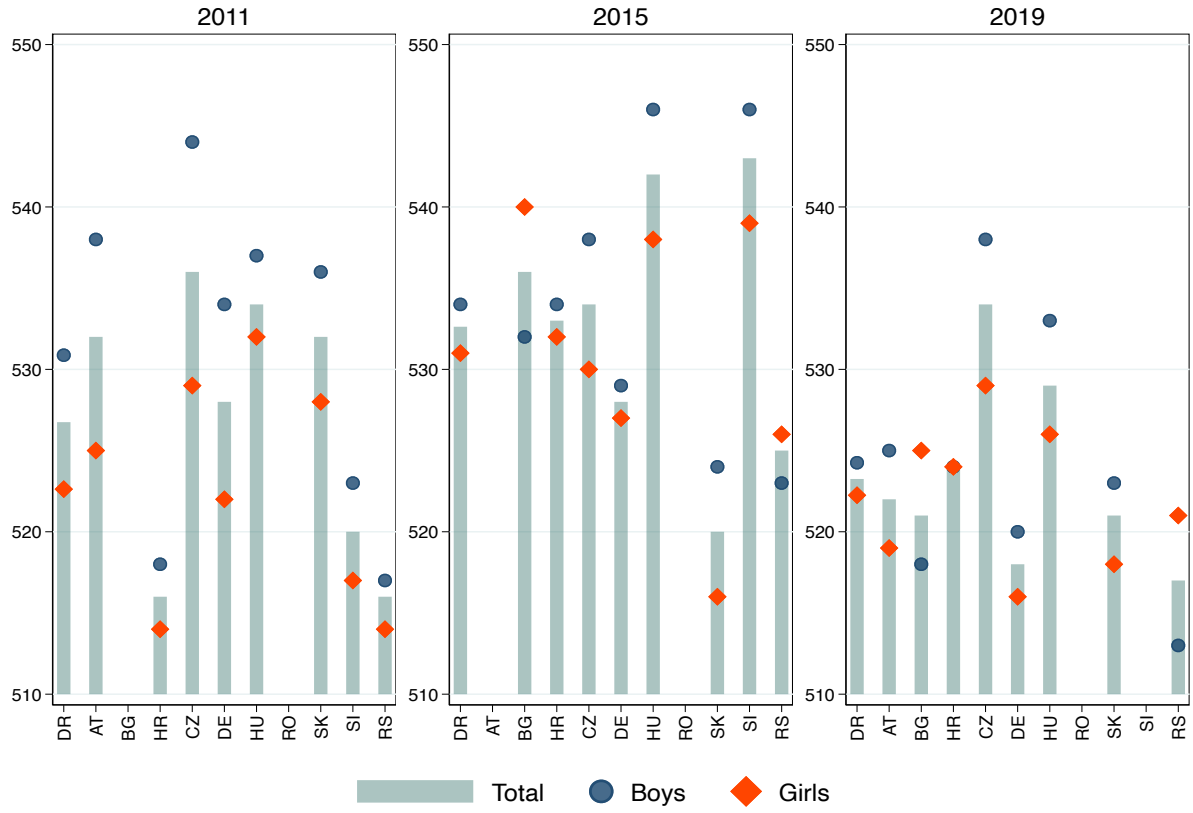
Source: TIEA TIMSS & PERLS, International Study Center:
2011: https://timssandpirls.bc.edu/timss2011/international-database.html
2015: http://timssandpirls.bc.edu/timss2015/international-results/download-center/
2019: https://timss2019.org/international-database/

systematically better science test scores in all countries of the Danube Region, whereas in 2015, girls outperformed boys in Bulgaria (2011 data were not available) and in Serbia (gender gap reversed in favour of girls). Otherwise, the magnitude of the gender gaps fluctuated over the years, with a substantial increase in Czechia, Germany, Hungary and Slovakia by 2019, where girls underperformed in both the mathematics and science domains.

4.8 Access to the Internet

Access to the internet has become essential for education, training and work over the last decade and even more so with the COVID-19 pandemic. Having access to the internet in the times of the pandemic provided a possibility to participate in online education for everyone from elementary school children to adults attending various trainings as well as an opportunity to telework, which, in many cases, directly yielded job preservation when

Figure 4.15: Performance in science by gender across countries in test score points via the TIMSS 2011, 2015 and 2019 for fourth-grade students



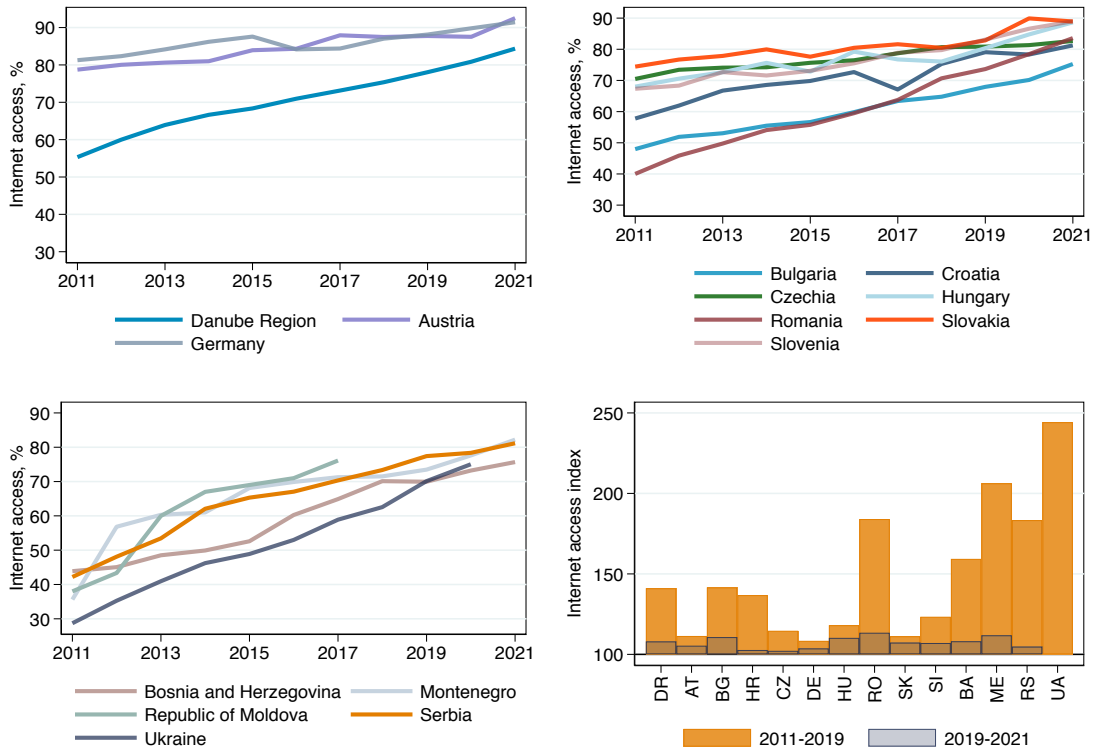
Source: TIEA TIMSS & PERLS, International Study Center:
2011: https://timssandpirls.bc.edu/timss2011/international-database.html
2015: http://timssandpirls.bc.edu/timss2015/international-results/download-center/
2019: https://timss2019.org/international-database/

social distancing and limits on personal interactions were imposed. Therefore, evaluating internet access across the Danube Region will give some evidence on the differences in digital advancement across countries and how they converged over 2011-2021 and, most importantly, allow us to assess how internet access might have fostered inclusiveness of education, training and work as the pandemic emerged[32].

There is no unified measure of internet access for the Danube Region countries, and importantly, the data sources vary by years for some countries. In most cases, the data came from Eurostat, national statistical offices or national ministries. Detailed information on the data sources is provided in the footnote to Figure 4.16. In the majority of countries, the population aged 16-74 was considered; however, there were several exceptions. For the Republic of Moldova and Ukraine, the measure was based on the total population; in Czechia, from 2014, all people aged 16 and up were included. In Germany, from 2016,

[32]Access to digital devices also plays an important role, but that the analysis here focuses on internet access due to better availability of data.

Figure 4.16: Share of the population having access to the internet from 2011 to 2021 across countries



Source: Retrieved from `https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2021/July/PercentIndividualsUsingInternet.xlsx`.
Austria - 2010-2014: Eurostat; 2015-1016: ITU; From 2017: Statistik Austria.
Bosnia and Herzegovina - 2010-2015: ITU estimate, from 2016: Agency for Statistics of Bosnia and Herzegovina.
Bulgaria - 2010: Communications Regulation Commission; 2011-2014: Eurostat; from 2015: National Statistical Institute.
Croatia - 2010: Croatian Post and Electronic Communications Agency (HAKOM); 2011-2014: Eurostat; from 2015: Croatian Bureau of Statistics.
Czechia - 2010-2013: Eurostat; from 2014: Czech Statistical Office.
Germany - 2010-2015: Eurostat; 2016: ITU: from 2017: Federal Statistical Office.
Hungary - 2010-2015: Eurostat; 2016: ITU: from 2017: Hungarian Central Statistical Office.
Moldova - 2010-2012 and 2017: ITU estimate. 2013: Government of Moldova E-Government Center; 2014: Ministry of Information Technologies and Communication; 2015, 2016, from 2018: National Bureau of Statistics of the Republic of Moldova.
Montenegro - 2010 and 2014: ITU estimate; 2013: Eurostat; 2011, 2012 and from 2015: Statistical Office of Montenegro.
Romania - 2010-2014: Eurostat. From 2015: National Institute of Statistics.
Serbia - 2010-2011: Republic Agency for Electronic Communications (RATEL). 2012: ITU estimate. From 2013: Statistical Office of the Republic of Serbia.
Slovakia - 2010: Ministry of Transport, Construction and Regional Development of Slovakia. 2011-2013: Eurostat. From 2014: Statistical Office of Slovakia.
Slovenia - 2010-2013: Eurostat. From 2014: Statistical Office of the Republic of Slovenia.
Ukraine - State Statistics Service of Ukraine.
Notes: Indices are estimated as (a) a share of population with internet access in 2019 relative to a share of population with internet access in 2011 (index 2011-2019); (b) a share of population with internet access in 2021 relative to a share of population with internet access in 2019 (index 2019-2021).

users aged 10 years and up were considered, and in Romania, from 2014, people aged 16 and up were included.

Figure 4.16 shows the evolution of the share of internet users across countries in 2011-2020. Two stark observations arose: first, internet access became more widespread in all countries of the Danube Region, with no exceptions. Access to the internet increased from 55% to 78% in 2011-2019 in the Danube Region overall. Second, the most pronounced increase in internet access over 2011-2019 occurred in all countries with low shares of

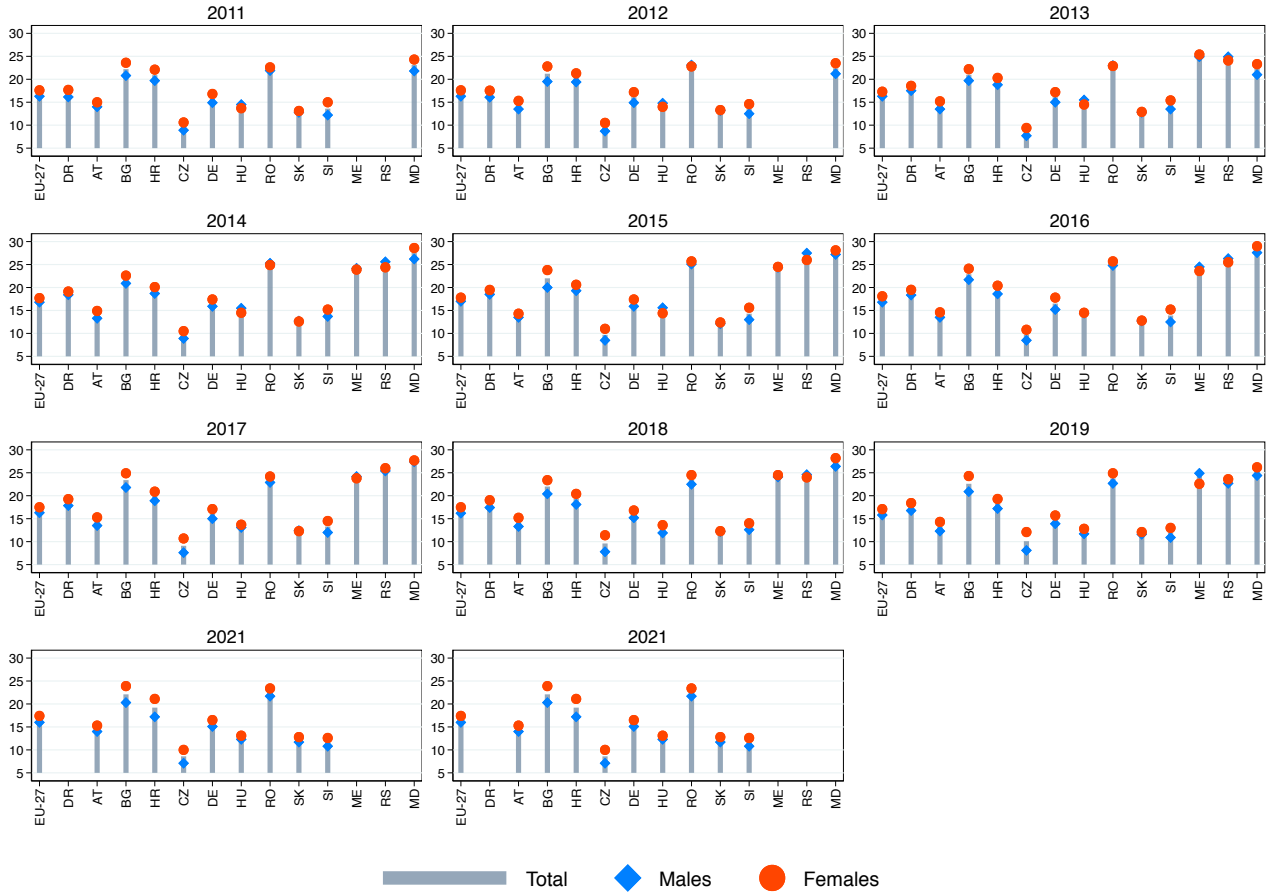
the population having access to the internet at the beginning of the sample period - Montenegro (from 44% to 70%), Romania (from 40% to 74%), Serbia (from 42% to 77%) and Ukraine (from 29% to 70%).

As expected, the pandemic had a positive effect on the share of the population with internet access. Given the essential role of internet access for education and work during the pandemic, access to internet increased in all countries, e.g. Romania (13%), Montenegro (12%), Bulgaria (11%), Hungary (10%) and Bosnia and Herzegovina (8%). The most marginal increases of 2% are documented in Croatia and Czechia. The marginal increases were likely related to the fact that those individuals who used the internet for study, work or leisure purposes already had access before the pandemic; thus, the fraction of those who faced a necessity to use the internet during the pandemic and did not have access was rather small. The latter situation was very likely in countries with high shares of internet users, whereas in countries with relatively small shares (e.g. Bosnia and Herzegovina or Montenegro), potential infrastructure difficulties and associated costs carried by personal users might have prevented an increase in internet usage.

4.9 Appendix: Additional Results

4.9.1 People at risk of poverty

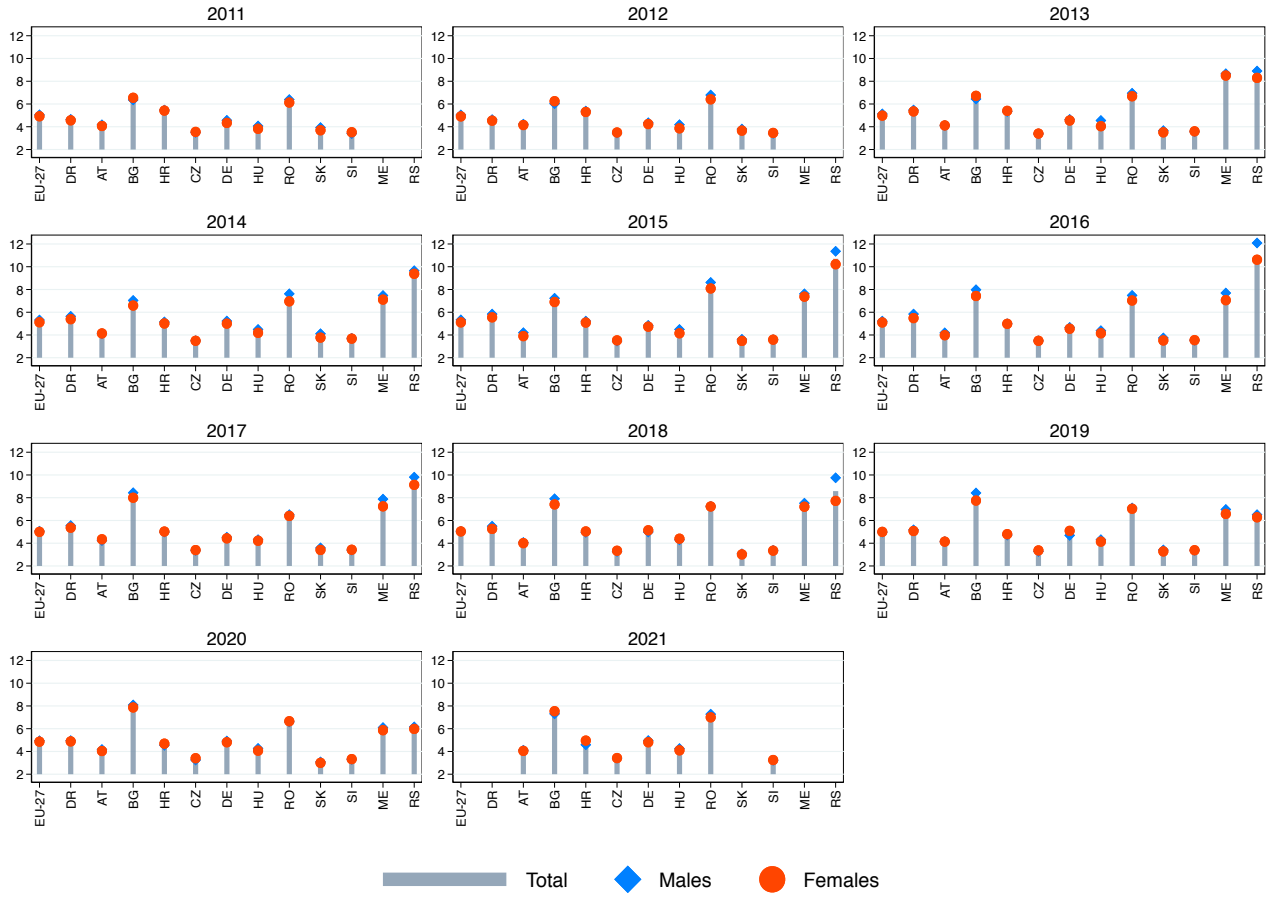
Share of people at risk of poverty from 2011 to 2021 by gender across countries



Source: For all countries except the Republic of Moldova – Eurostat segment *ilc_li02*. For the Republic of Moldova – *enpe_ilc_li09*.

4.9.2 Inequality of income distribution

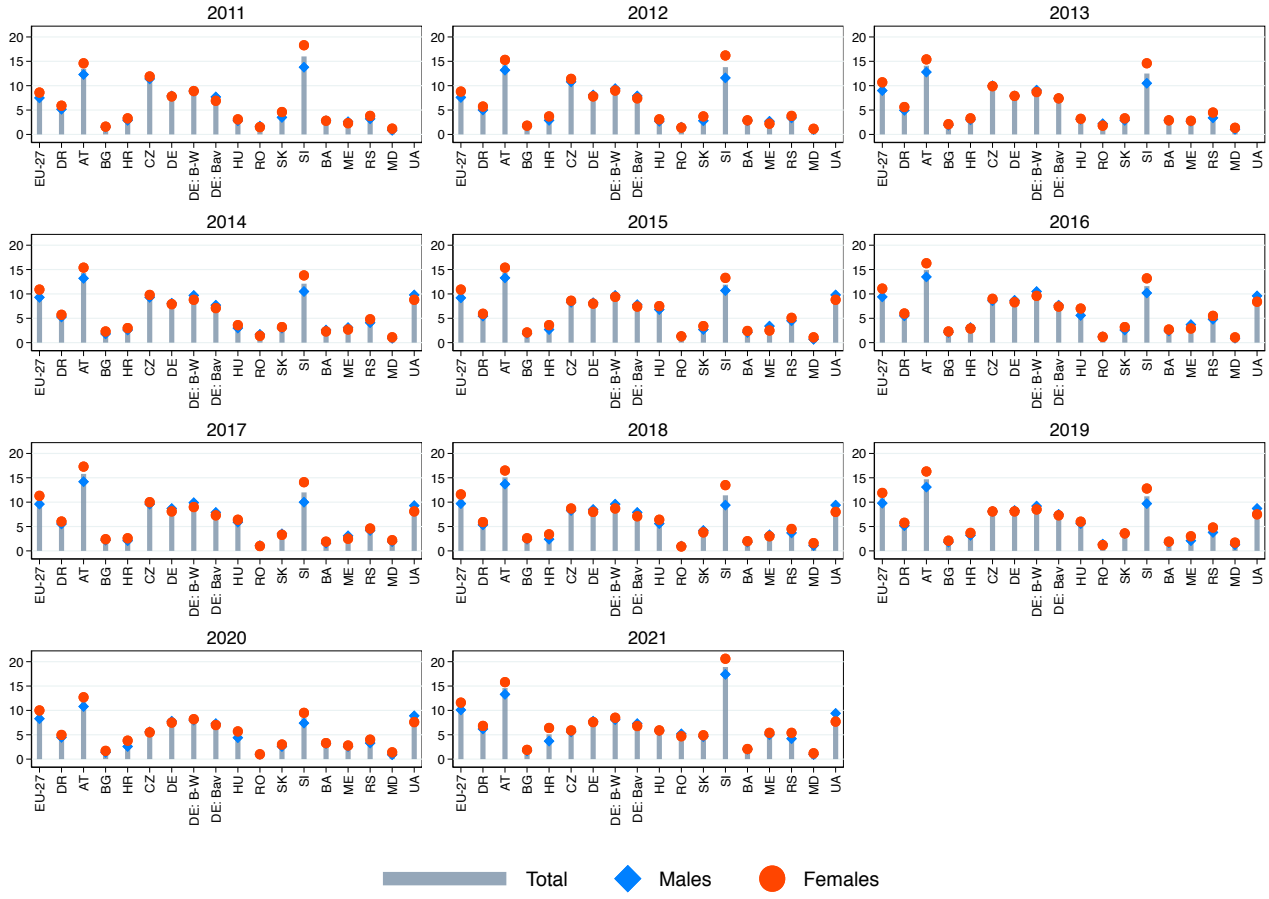
Inequality of income distribution - quantile share ratio from 2011 to 2021 by gender across countries



Source: EU Member States, Montenegro and Serbia – Eurostat segment *ilc_di11*.

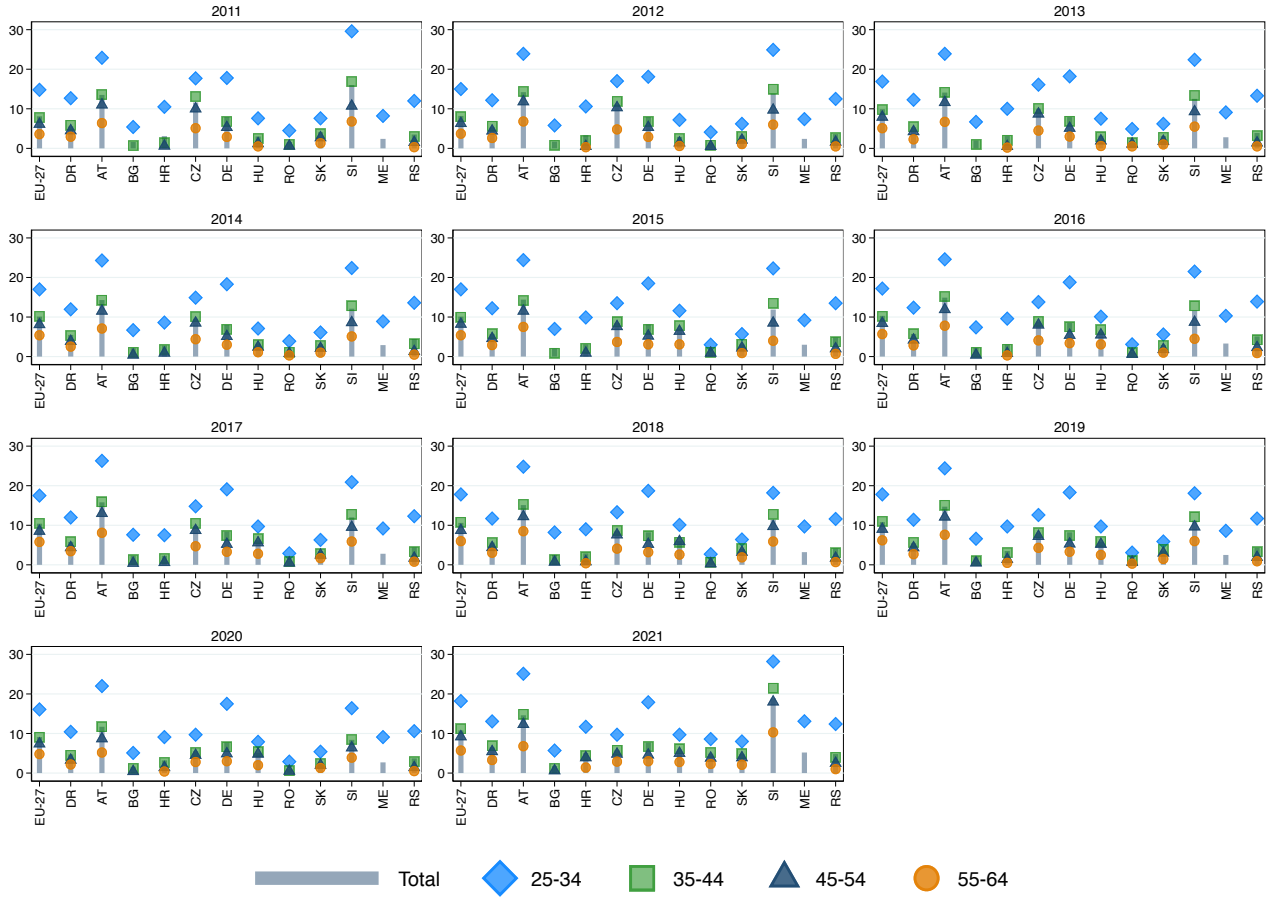
4.9.3 LLL – share of individuals having participated in education and/or training in the past four weeks

The LLL - the share of individuals participating in education and training from 2011 to 2021 by gender across countries for the population aged 25 to 64



Source: EU Member States, Montenegro and Serbia - Eurostat segment *trng_lfse_01*; German sub-regions - Eurostat segment *trng_lfse_04*.

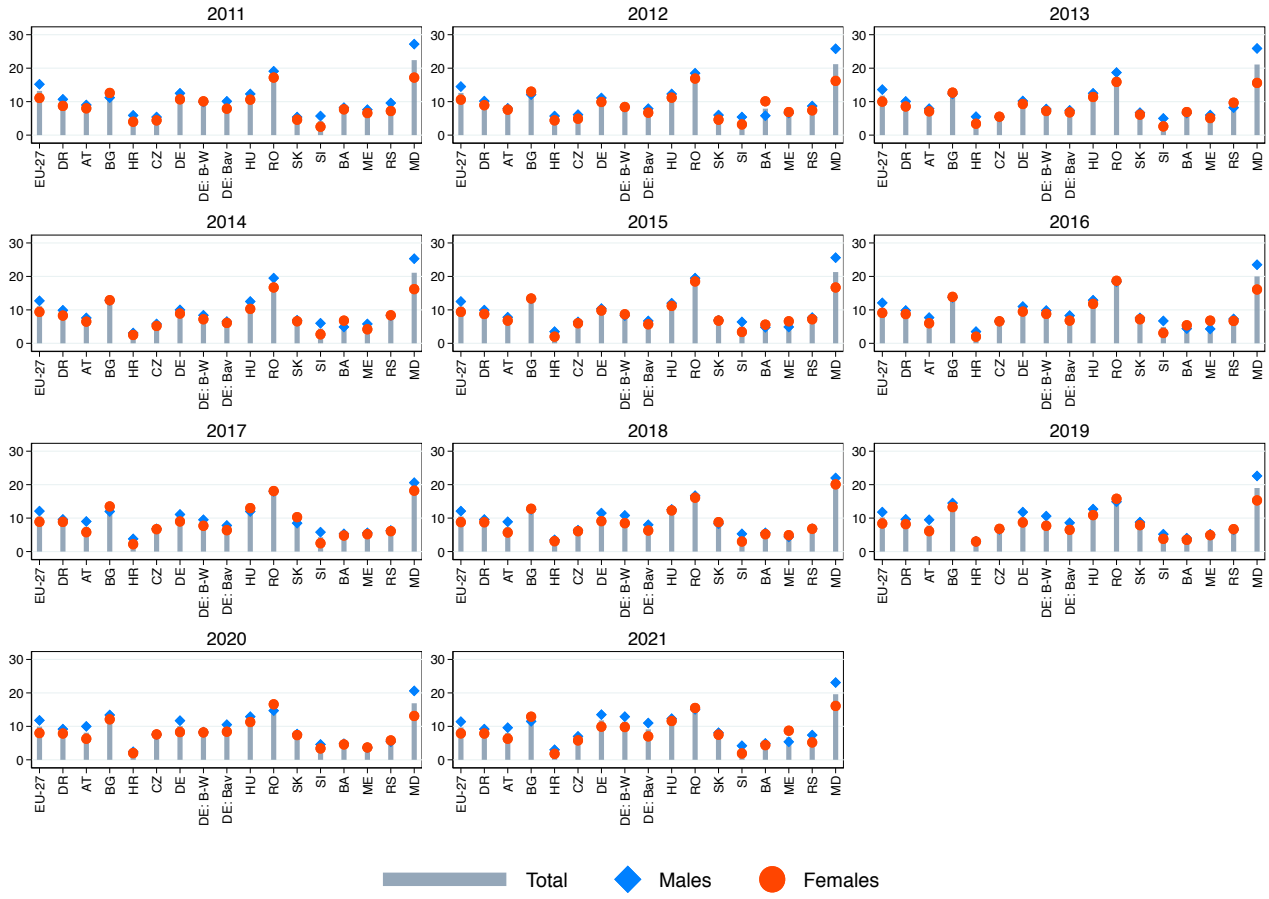
The LLL - the share of individuals participating in education and training from 2011 to 2021 by age groups across countries



Source: EU Member States, Montenegro and Serbia - Eurostat segment *trng_lfse_01*.

4.9.4 Early leavers from education and training

Early leavers from education and training from 2011 to 2021 by gender across countries for the population aged 18 to 24



Source: EU Member States, Montenegro and Serbia - Eurostat segment *edat_lfse_02*; German sub-regions - Eurostat segment *edat_lfse_16*. Bosnia and Herzegovina - the national statistical office. Republic of Moldova - the national statistical office, internal code *gen021200mun*.

4.10 Appendix: Indicators and Data Description

Gender pay gap

Definition: The gender pay gap is measured as follows:

(i) For EU Member States and Montenegro - the average gross hourly earnings of male paid employees minus the average gross hourly earnings of female paid employees divided by the average gross hourly earnings of male paid employees expressed in percentages.

(ii) For the Republic of Moldova, Serbia and Ukraine - the average gross monthly earnings of male paid employees minus the average gross monthly earnings of female paid employees divided by the average gross monthly earnings of male paid employees expressed in percentages.

Source: The data for the EU Member States came from Eurostat segment *earn_gr_gpgr2*. For the Republic of Moldova, Serbia and Ukraine, the data came from the United Nations Economic Commission for Europe (UNECE) Statistical database (`https://w3.unece.org/PXWeb2015/pxweb/en/STAT/STAT__30-GE__03-WorkAndeconomy/017_en_GE_GPG2_r.px`).

Data availability: For Croatia, only data for the years 2013, 2014 and 2016-2020 were available. For Montenegro, only data for the year 2014 were available. For four regions of Ukraine and Bosnia and Herzegovinia, no data were available. For Serbia only years 2011-2017 and 2019 were available. For all other countries, the data for the years 2011-2019 were used.

Risk of poverty rate

Definition: The indicator used is the proportion of people in the total population whose disposable income, including social transfers, is below the limit of 60% of the median equalised income after social transfers.

Source: For all countries, except the Republic of Moldova - Eurostat segment *ilc_li02*. For the Republic of Moldova - *enpe_ilc_li09*.

Data availability: For Montenegro, Serbia and the Republic of Moldova, only data for the years 2011-2020 were available. No data for the German regions Bavaria and Baden-Württemberg, Bosnia and Herzegovina, Ukraine and four regions of Ukraine were available.

Inequality of income distribution

(a) Quantile share ratio

Definition: The ratio between the income of the 20% of the population earning the highest income and the income of the 20% of the population earning the lowest income is used. The indicator of inequality in income distribution is calculated as the ratio of the

share of the richest and poorest income-related population quintiles.

Source: EU Member States, Montenegro and Serbia - Eurostat segment *ilc_di11*. The Republic of Moldova and Ukraine - World Bank Database, World Development Indicators (`https://databank.worldbank.org/reports.aspx?source=2&series=SI.DST.05TH.20`).

Data availability: For Slovakia, only data for the years 2011-2020 were available. For Montenegro and Serbia, only data for the years 2013-2020 were used. For Bosnia and Herzegovina, only data for the years 2011 and 2015 were available for the total population, but there were no data by gender. Data for the years 2011-2019 for the Republic of Moldova and for the years 2011-2020 for Ukraine were available for the total population. No data by gender were available for these two countries. For the German regions Bavaria and Baden-Württemberg and four regions of Ukraine, neither total population nor gender data were available.

(b) Gini index

Definition: The Gini index measures the distance between the income distribution in a country and the totally equal distribution. A Gini index of 1 indicates that the income distribution in a country is perfectly equal, and a Gini index of 100 indicates that the income distribution in a country is perfectly unequal.

Source: World Bank Database, World Development Indicators (`https://databank.worldbank.org/reports.aspx?source=2&series=SI.DST.05TH.20`).

Data availability: For Germany, data for the years 2011-2018 were used. For Bosnia and Herzegovina, only data for the year 2011 were available; for Montenegro, data for the years 2012-2017 were available. For Serbia, data for the years 2012-2019 were available; for the Republic of Moldova, data for the years 2011-2018 were available. For the German regions Bavaria and Baden-Württemberg and four regions of Ukraine, neither total population nor gender data were available. For the remaining countries, the data for the years 2011-2019 were used.

Performance in basic competences

Definition: Performance in basic competences - i.e. the share of low-achieving students, gender, migration and socio-economic gaps - is measured by relying on the PISA test scores in the mathematics, reading and science domains of 15-year-olds.

Source: The data came from the PISA survey results from the years 2012, 2015 and 2018, retrieved from the following:

(i) PISA 2012:

`https://www.oecd-ilibrary.org/education/pisa-2012-results-excellence-through-equity-volume-ii_9789264201132-en`.

(ii) PISA 2015:

https://www.oecd-ilibrary.org/education/pisa-2015-results-volume-i_9789264266490-en.

(iii) PISA 2018:

https://www.oecd-ilibrary.org/education/pisa-2018-results-volume-ii_b5fd1b8f-en.

Data availability:

(i) *Share of low-achieving students.* For Bosnia and Herzegovina, only the total share was available for the year 2018, and there were no data by gender. For Serbia, there were data for the years 2012 and 2018 for both the total share and gender; for the Republic of Moldova, data for the years 2015 and 2018 were available for both the total share and gender. For Ukraine, only data for the year 2018 for both the total share and gender were available. For the German regions Bavaria and Baden-Württemberg and four regions of Ukraine, neither total population nor gender data were available. For the remaining countries, the data for the years 2012, 2015 and 2018 were used.

(ii) *Gender gaps.* For Austria, Bulgaria, Croatia, Czechia, Germany, Hungary, Romania, Slovakia, Slovenia and Montenegro, the data for the mathematics domain were available for the years 2012, 2015 and 2018, while data for the reading and science domains were available only for the years 2015 and 2018. For Bosnia and Herzegovina, all skill domains were available only for the years 2015 and 2018. For Serbia, the mathematics domain was available for the years 2012 and 2018, while reading and science were only available for the year 2018. For the Republic of Moldova, all domains were available for the years 2015 and 2018. For Ukraine, all domains for only the year 2018 were available. For the German regions Bavaria and Baden-Württemberg and four regions of Ukraine, no data were available.

(iii) *Migration gaps.* For Austria, Croatia, Czechia, Germany, Hungary, Slovakia, Slovenia and Montenegro, the data for the mathematics domain were available for the years 2015 and 2018; data for the reading domain was available for the years 2012 and 2015, and data for the science domain was available only for the year 2015. For Bulgaria, the data for the mathematics domain were available for the year 2018; data for the reading domain was available for the years 2012 and 2015, and data for the science domain was available only for the year 2015. For Serbia and Ukraine, only the reading gap in the year 2018 was available. For the Republic of Moldova, the mathematics and science gaps were available for the year 2015 and the reading gap for the years 2015 and 2018. For Romania, Bosnia and Herzegovina, the German regions Bavaria and Baden-Württemberg and four regions of Ukraine, neither total population nor gender data were available.

(iv) *Socio-economic gaps.* For Bosnia and Herzegovina and Ukraine, only data for

the year 2018 were available; for Serbia, data for the years 2012 and 2018 were available. For the Republic of Moldova, data for the years 2015 and 2018 were available. For the German regions Bavaria and Baden-Württemberg and four regions of Ukraine, neither total population nor gender data were available. For the remaining countries, the data for the years 2012, 2015 and 2018 were used.

LLL - share of individuals having participated in education and/or training in the past four weeks

Definition: Life-long learning encompasses all learning activities undertaken throughout life with the aim of improving knowledge, skills and competences within personal, civic, social or employment-related perspectives. Participation in education and training is a measure of LLL. The participation rate in education and training covers participation in formal and non-formal education and training. The reference period for the participation in education and training is the four weeks prior to the interview. Participation rates in education and training for various age groups and by different breakdowns are presented.

Source: For EU Member States, Montenegro and Serbia - Eurostat segment *trng_lfse_01*. For German sub-regions - Eurostat segment *trng_lfse_04*.

Data availability: Data by age groups were not available for the German regions Bavaria and Baden-Württemberg, Bosnia and Herzegovina, or the Republic of Moldova. For Ukraine years 2014-2021 were available. For four regions of Ukraine, no data were available. All other data is available for the time period 2011-2021.

Early leavers from education and training

Definition: Early leavers from education and training denotes the percentage of the population aged 18 to 24 having attained, at most, lower secondary education and not having been involved in further education or training. The numerator of the indicator refers to people aged 18 to 24 who meet the following two conditions:

(a) the highest level of education or training they have completed is ISCED 2011 Level 0, 1 or 2 (ISCED 1997: 0, 1, 2 or 3C short);

(b) they have not received any education or training (i.e. neither formal nor non-formal) in the four weeks preceding the survey.

The denominator in the total population consists of the same age group, excluding the respondents who do not answer the questions on the 'highest level of education or training successfully completed' and 'participation in education and training'.

Source: EU Member States, Montenegro and Serbia - Eurostat segment *edat_lfse_02*. German sub-regions - Eurostat segment *edat_lfse_16*. Bosnia and Herzegovina - the national statistical office. The Republic of Moldova - the national statistical office, internal

code *gen021200mun*.

Data availability: For Ukraine and four regions of Ukraine, no data were available. For all other countries, the data for the years 2011-2021 were used.

Education equality

(a) PISA ESCS index

Definition: The PISA index of socio-economic status, i.e. ESCS, is derived from a broad number of indicators, including the education level of the parents, number of books at home, language spoken at home and conditions for doing homework. The ESCS parity index measures the impact of the socio-economic status of students on their PISA scores and is calculated as the ratio of the mean score of the least advantaged students to the mean score of the most advantaged ones.

Along with ESCS parity, the gender and migration parities are measured as the ratio of the mean scores of girls to the mean scores of boys and the ratio of the mean scores of students with immigrant backgrounds to the mean scores of native students, respectively. A parity index equal to 1 indicates no impact of the compared attribute (socio-economic status, gender or immigrant background) on the students achievements.

Source: The ESCS index for 2015 was retrieved from OECD `https://www.oecd-ilibrary.org/education/education-at-a-glance-2018_eag-2018-en` Table 2. Equity in skills acquisition (Mathematics, numeracy and ICT Skills). For 2018, the ESCS was retrieved from `https://www.oecd-ilibrary.org/education/education-at-a-glance-2018/equity-in-skills-acquisition-mathematics-numeracy-and-ict-skills_eag-2018-table7-en`.

Data availability: The index for the years 2015 and 2018 was available for Austria, Czechia, Germany, Hungary, Slovakia and Slovenia. For Bulgaria, Croatia, Romania, Bosnia and Herzegovina, Montenegro, Serbia, Moldova and Ukraine, only the index for the year 2018 was used. No data were available for other countries or regions.

(b) TIMSS test performance

Definition: The TIMSS test measures the basic skills in mathematics and science of fourth- and eighth-grade students (aged below 9.5 years and 13.5 years, respectively) in the form of standardised tests. Direct test score measures are used; each skill measure is presented relative to the TIMSS centrepoint of 500 points for fourth-grade students. Thus, all scores are estimated relative to the reference of 500 points, with a higher score implying a stronger ability in a given domain.

Source: The data came from TIEA & PERLS, International Study Center:

(i) 2011:

`https://timssandpirls.bc.edu/timss2011/international-database.html`

(ii) 2015:

http://timssandpirls.bc.edu/timss2015/international-results/download-center/

(iii) 2019:

https://timss2019.org/international-database/

Data availability: Both the mathematics and science domains were available for the years 2011, 2015 and 2019 for Croatia, Czechia, Germany, Hungary, Slovakia and Serbia; for Austria, only the domains for the years 2011 and 2019 were available. For Bulgaria, only the domains for the years 2015 and 2019 were used; for Slovenia, only the domains for the years 2011 and 2015 were used.

Access to the internet

The definitions and data sources varied across the countries and were retrieved from https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2021/July/PercentIndividualsUsingInternet.xlsx.

- Austria

  (a) Definition - population aged 16-74. From 2011: users in the last three months, aged 16-74.

  (b) Source - 2011-2014: Eurostat; 2015-2016: ITU; 2017: Statistik Austria.

- Bosnia and Herzegovina

  (b) Source - 2011-2015: ITU estimate; 2016: Agency for Statistics of Bosnia and Herzegovina.

- Bulgaria

  (a) Definition - population aged 16-74. From 2011-2012: users in the last three months, aged 16-74.

  (b) Source - 2011-2014: Eurostat; 2015: National Statistical Institute.

- Croatia

  (a) Definition - population aged 16-74. From 2011-2012 and 2015: users in the last 3 months, aged 16-74.

  (b) Source - 2011-2014: Eurostat; 2015: Croatian Bureau of Statistics.

- Czechia

  (a) Definition - from 2011-2013. population aged 16-74. From 2011-2012: users in the last three months. From 2014: population aged over 16.

  (b) Source - 2011-2013: Eurostat; 2014: Czech Statistical Office.

- Germany

  (a) Definition - from 2011-2015: population aged 16-74. From 2011-2012: users in the last three months, aged 16-74. From 2016: population over 10, break in comparability.

  (b) Source - 2011-2015: Eurostat; 2016: ITU; 2017: Federal Statistical Office.

- Hungary

  (a) Definition - population aged 16-74. From 2011-2012 and 2015: users in the last three months, aged 16-74.

  (b) Source - 2011-2015: Eurostat; 2016: ITU: 2017: Hungarian Central Statistical Office.

- Moldova

  (a) Definition - from 2016: according to the analytical survey report Citizens perception, uptake and support for the e-Transformation of Governance in the Republic of Moldova's 2016, the share of internet users who accessed the internet in the past 12 months at least once a day was 71%.

  (b) Source - 2011-2012 and 2017: ITU estimate; 2013: Government of Moldova E-Government Center; 2014: Ministry of Information Technologies and Communication; 2015, 2016 and 2018: National Bureau of Statistics of the Republic of Moldova.

- Montenegro

  (a) Definition - population aged 16-74.

  (b) Source - 2011 and 2014: ITU estimate; 2013: Eurostat; 2011, 2012 and 2015: Statistical Office of Montenegro.

- Romania

  (a) Definition - 2011-2013: population aged 16-74. From 2011-2012: users in the last three months. From 2014: population aged over 16. From 2015: number of individual internet users in the last three months.

  (b) Source - 2011-2014: Eurostat; 2015: National Institute of Statistics.

- Serbia

  (a) Definition - population aged 16-74.

  (b) Source - 2011: Republic Agency for Electronic Communications (RATEL); 2012: ITU estimate; 2013: Statistical Office of the Republic of Serbia.

- Slovakia

  (a) Definition - population aged 16-74 in the last three months (source: Eurostat).

  (b) Source - 2011-2013: Eurostat; 2014: Statistical Office of Slovakia.

- Slovenia

  (a) Definition - from 2010: population aged 16-74. From 2011: users in the last three months, aged 16-74.

  (b) Source - 2011-2013: Eurostat; 2014: Statistical Office of the Republic of Slovenia.

- Ukraine

  (a) Definition - from 2011-2014: total population. From 2015: total population using the internet in the past 12 months.

  (b) Source - State Statistics Service of Ukraine.

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Russian invasion of Ukraine: A short overview of current consequences for Ukraine and other Danube Region countries

The Russian war of aggression against Ukraine brought a major geopolitical and economic catastrophe. The costs of the war are far-reaching, as all EU countries and all Danube Region countries appear affected by the war indirectly, bearing the cost of a disruption of long-term economic ties with Russia. However, economic effects are only a minor part, above all, the war is an immense, unjustified human tragedy. Hundreds of thousands of lives being lost or ruined irreparably, millions of homes were turned to rubble and an enormous psychological trauma will likely last for decades – all of these will leave deep scars. This section will give a short overview of the effects of the war as of now for Ukraine and other Danube Region countries, focusing on the implications for labour market and education systems as these are in the spotlight of the given report.

Consequences for Ukraine

From the start of the war, Russian aggression dramatically undermined the Ukrainian economic, demographical and societal developments. With the Ukrainian population being subject to the same demographic trends as a majority of European countries – rapid population aging and declining fertility[33] – the war fueled enormous population decline. Along with the immediate demographic shock being mounting mortality (especially among the military)[34] and an immense outflow of war refugees[35], Ukrainian population dynamics face potentially long-term consequences, mainly through a notable decline in life expectancy (particularly among those physically and psychologically affected by the war), possibly slow return of war refugees[36], declining birth due to an outflow of young women and due to economic hardship of the post-war reconstruction.

With the frontline situation remaining very uncertain and with the humanitarian crisis rapidly escalating from October onwards, as Russian forces target civilian infrastructure, demographic implications of the war have become increasingly devastating. And so have

[33] https://www.unfpa.org/data/UA

[34] According to Ukrainian Government over 8.3 thousands civilians were killed as of November 20 (https://www.rferl.org/a/32152524.html). The estimate does not include currently occupied territories, so the actual number are likely much higher, since in Mariupol alone over 87 thousands deaths were documented in August 2022 (https://bykvu.com/eng/bukvy/87-000-documented-deaths-in-mariupol-media-report/) and around 90% of residential buildings were destroyed or damaged. Among military the number of fatalities range up to 100 thousands according to the US estimates (https://www.bbc.com/news/world-europe-63580372), however, Ukrainian Government does not disclose the actual numbers.

[35] As of November 29 almost 7.9 million refugees from Ukraine were recorded across Europe and over 4.7 million registered under temporary protection or similar scheme (https://data.unhcr.org/en/situations/ukraine).

[36] According to the UNHCR survey, only 13% plan to return to Ukraine within next three months, however around 81% of refugees hope to return some day, yet the return prospects depend primarily on the war development and security situation in Ukraine (https://www.unhcr.org/news/briefing/2022/9/632d6fba4/unhcr-survey-refugees-ukraine-eager-work-need-sustained-support-ensure.html).

the economic consequences. As of the beginning of September, the damage to Ukraine's infrastructure caused by the Russian invasion was estimated at USD 114.5 billion (or 58% of 2021 GDP). Over 420 enterprises had been totally or partially damaged and the assets of the basic metals industry – one of the major industrial and key exporting sectors in Ukraine – had been almost completely destroyed.[37]

The Ukrainian labour market faced severe crisis, as hundreds of thousands of jobs disappeared due to either enterprises and infrastructure being ruined or wiped out, or due to employers cutting labour costs and facing bankruptcies in light of enormous economic downturn. Unemployment stood as striking 30% in August 2022 and internally displaced persons appeared disproportionately affected. According to a survey by the International Organization for Migration conducted in August 2022, of those internally displaced persons who were employed before the war, 60% had lost their jobs since their displacement, and only 33% of those internally displaced aged 18-64 marked salary as their primary source of income.[38] Given that numbers of internally displaced people are rising steadily since the beginning of the war and given uncertain reconstruction outlooks, one cannot expect rapid employment recovery even in the most optimistic scenario of war being over within the next months. Apart from employment, income level is steadily declining, as around 70% of Ukrainians who participated in a survey conducted by the National Demographic Institute reported financial issues resulting from the war.[39] [40] Hence, as the war continues, the share of people living in poverty and at the risk of poverty is climbing.

The education sector incurred major damages from the war. In a report released by the Ministry of Education and Science in Ukraine, 2783 educational institutions have been damaged by bombing and shelling, with 337 of them are completely destroyed as of November 28, 2022.[41] Despite a major destruction and loss caused by the war, the education system managed to rebuild and adjust to the wartime reality, mainly by ensuring online education and equipping educational institutions with bomb shelters, allowing to continue classes even under air raids. However, while this allows survival and ensures basic operations, it does so below the pre-war quality and is far from sufficient for fur-

[37] The assessment is the result of joint work by the Kyiv School of Economics and government authorities under the leadership of the Ministry of Reintegration of Temporarily Occupied Territories, the Ministry for Communities and Territories Development and the Ministry of Infrastructure, in cooperation with other ministries and partner organisations under the umbrella of the National Council for the Recovery of Ukraine from the Consequences of the War. https://kse.ua/about-the-school/news/due-to-the-last-estimates-damage-caused-to-ukraine-s-infrastructure-during-the-war-is-114-5-bln/

[38] https://dtm.iom.int/reports/ukraine-%E2%80%94-internal-displacement-report-%E2%80%94-general-population-survey-round-8-17-23-august

[39] https://www.ndi.org/sites/default/files/Opportunities%20and%20Challenges%20Facing%20Ukraine's%20Democratic%20Transition%20August%20%28Ukrainian%29.pdf

[40] https://www.ndi.org/sites/default/files/Opportunities%20and%20Challenges%20Facing%20Ukraine's%20Democratic%20Transition%20August%20%28Ukrainian%29.pdf

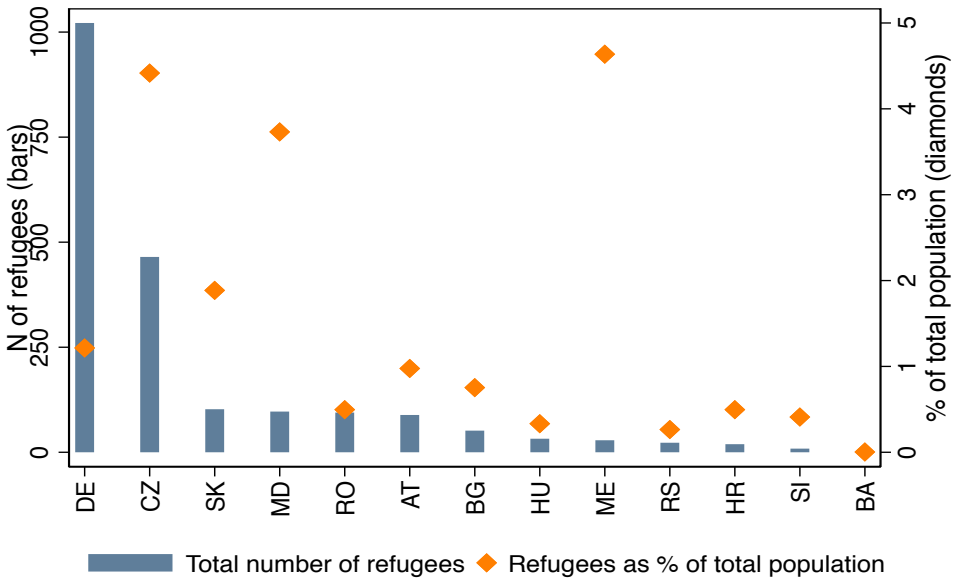
[41] https://drive.google.com/file/d/1EWkRpho55tAcmIhdewmnZDsnNgqxTmjf/view

ther improvement of educational outcomes and safeguarding equality and accessibility of education.

Consequences for other Danube Region countries

The war has both direct and indirect effects on the Danube Region countries. With inflation being on a rise all across the region and with energy crisis seeking long-term solution, economic growth has lost its pace in all Danube Region countries, not surprisingly.[42] However, when it comes to the consequences of the war for the Danube Region labour markets and education systems, the major effect associates with the refugee crisis. With almost 7.9 million Ukrainians fleeing from Ukraine from the beginning of the Russian invasion, over 2 million settled in the other Danube Region countries as of the end of November.[43] Figure 5.1 depicts the total number of Ukrainian refugees settling in the different countries of the Danube Region, both total and as a percentage of the total population in the respective country.

Figure 5.1: Ukrainian refugees across the Danube Region countries



Source: `https://data.unhcr.org/en/situations/ukraine`
Notes: Data on refugees across the Danube Region countries dates from November 15 until November 29, 2022.

In total terms, the largest share of Ukrainian refugees registered in Germany (over 1 million, thus almost half of all refugees residing in the Danube Region), however Montenegro and Czechia are the leading host states in terms of numbers of accepted refugees

[42]For more details on economic developments in individual countries, see `https://wiiw.ac.at/bracing-for-the-winter-p-6364.html`

[43]`https://data.unhcr.org/en/situations/ukraine`

relative to the total population (4.6% and 4.4% respectively). Noteworthy, four Danube Region states – Hungary, Republic of Moldova, Romania, and Slovakia – share borders with Ukraine, thus, they were among the countries who received the major inflow of Ukrainians fleeing the war within the first weeks of the war, along with Poland.

Hence, many Danube Region countries are now facing the major challenge – how to integrate Ukrainian refugees socially and economically and how to ensure their unrestrained access to the education system and labour market.

As the war outlooks, the extent of damage to civilian and critical infrastructures and the numbers of internally displaced people and those moving abroad remain unforeseeable, one thing is clear – as the war has been lasting over half a year increasingly more Ukrainians see no end of their refuge in Europe and eventually decide on a longer – if not a permanent – stay. Even though an increasing number of refugees are coming back, the return flow is still rather limited to people having very strong pull factors, such as family reunion, as well as people having private property undamaged, originating from the regions less affected by the direct military aggression and those having initially strong return incentives. According to the survey among refugees in Czechia, Hungary, Moldova, Poland, Romania and Slovakia in May-June 2022, only 16% reported strong incentives to come back, yet 60% of those are unsure when exactly they will do so, as the situation on the frontline is very fluid and immense uncertainty magnifies safety considerations.[44] A follow-up survey conducted in August-September in 43 countries suggests that 81% of all refugees intend to return home at some point in the future, but only 13% plan to do so within next three months, which largely relates to the persistent danger and uncertain war developments.[45]

Unlike the previous refugee waves to Europe, the absolute majority of Ukrainians fleeing the war are women and children (at least 70% of adults are women and over one third are children according to various surveys conducted in different EU countries[46,47,48]), due to mandatory military conscription of Ukrainian men aged 18 to 60. Yet, there are some notable differences in gender and age profiles of refugees between the EU countries geographically closer to Ukraine and the more distant ones. For instance, in Poland over 87% of adults are women and over 40% of all refugees are children; in Lithuania the percentages are respectively 83% and 36%; whereas in more distant Spain and Italy

[44] https://data.unhcr.org/en/documents/details/94176

[45] https://data.unhcr.org/en/documents/details/95767#_ga=2.5544499.1218543842.1663938030-518881478.1646318875

[46] https://data.unhcr.org/en/documents/details/95767#_ga=2.5544499.1218543842.1663938030-518881478.1646318875

[47] https://blogs.lse.ac.uk/europpblog/2022/09/07/what-the-self-selection-of-ukrainian-refugees-means-for-support-in-host-countries/

[48] https://reliefweb.int/report/poland/refugees-ukraine-poland-profiling-update-june-2022

the shares of women are 70% and 75% and the share of children are 33% and 30%, respectively.[49] Among adult refugees in the countries bordering Ukraine, 34% are aged 18 to 34, 54% are aged 35 to 59, and 12% are older than 60[50].

Evidence on exact educational attainments of Ukrainian refugees is still rather limited, but existing data suggests that there is a significantly higher share of highly educated (university degree of equivalent) refugees among Ukrainians, compared to the refugees from the earlier waves. The studies from Germany report that the share of tertiary-educated refugees exceed 73%[51]; a similar share of highly-educated Ukrainian refugees is documented by the European Union Agency for Asylum; in Austria the share of tertiary-educated refugees range as high as 83%[52]. The high educational profile of Ukrainian refugees is explained by formal education levels of Ukrainians ranging above the EU-27 average, as well as by the positive self-selection, as Ukrainian refugees registered in Europe are, on average, more educated than the overall Ukrainian population[53].

Despite Ukrainian refugees being drastically different in socio-demographic and educational profiles from refugees from the previous waves as well as intensions to stay and work in the EU, unlimited labour market access is a crucial step on the way of economic and social integration. It allows Ukrainians to find employment, learn the local language, build up social networks and integrate in societal life faster, whereas hosting countries experience an upsurge in labour force, a much needed one in face of looming labour shortages as economies recover from COVID-19.

Yet, getting employed in the EU is not smooth and easy even with unrestrained access to the job market. One needs to find a job which matches skills, knowledge and experience. Naturally, this issue is less crucial for refugees who seek only short-term protection in Europe and plan to head back home as soon as the safety situation allows, or even earlier. The short-term refugees have no need of stable employment and long-term income perspective in the host country – their needs are rather in very affordable temporary accommodation and financial support of the basic needs. However, this is not sufficient for the refugees intending to stay longer, and existing surveys suggest this group constitutes an absolute majority of refugees in all EU member states. These people require longer-term housing and employment solutions, with the latter being essential for self-sustainment

[49] https://www.oecd-ilibrary.org/social-issues-migration-health/international-migration-outlook-2022_30fe16d2-en?utm_medium=email&utm_source=berlin-newsletter&utm_content=en&utm_term=berl&utm_campaign=berlin-international-migration-outlook-2022

[50] https://data.unhcr.org/en/documents/details/94176

[51] https://www.cesifo.org/en/publikationen/2022/article-journal/prospects-integration-ukrainian-refugees-german-labor-market

[52] https://blogs.lse.ac.uk/europpblog/2022/09/07/what-the-self-selection-of-ukrainian-refugees-means-for-support-in-host-countries/

[53] https://www.oecd-ilibrary.org/social-issues-migration-health/international-migration-outlook-2022_30fe16d2-en?utm_medium=email&utm_source=berlin-newsletter&utm_content=en&utm_term=berl&utm_campaign=berlin-international-migration-outlook-2022

and capitalization of own skills and knowledge. Ukrainian refugees hold, on average, more tertiary education degrees than migrants from the previous inflows, had their education curricula aligned with Bologna Process, have on average good English language command, and some even possess foreign work experience, yet, many of those fleeing the war find very limited application of their educational credentials or work experience on the EU labour market. Lack of local language skills and absence of recognition of work skills and education credentials are reported as major obstacles the refugees face when searching a job in the host countries[54].

This brings re-education and re-qualification into spotlight, just as it was back in 2015. However, two factors make it very different this time. Firstly, whereas the majority of Syrian refugees were young men, an absolute majority of Ukrainian refugees are women and a large share of them arrived with minor child(ren). Thus, affordable and accessible childcare must be provided before participation in education or employment is foreseeable. Yet, not only the pre-school education appears absolutely necessary for labour market integration of women with children. With over one third of refugees being aged under 18, schooling is essential, and many refugees tend to prefer enrolment of their minors in local schools over the remote learning in Ukrainian schools[55], as it allows greater flexibility for mothers and more possibilities to find a job. According to recent evidence, a majority of EU countries undertook a major effort to integrate Ukrainian children and adolescents in local education curricula by either creating additional study places in the local schools or designing new educational institutions specifically for Ukrainians[56].

[54] https://data.unhcr.org/en/documents/details/95767#_ga=2.5544499.1218543842.1663938030-518881478.1646318875

[55] 73% vs. 18% of refugees according to the recent cross-country survey https://data.unhcr.org/en/documents/details/95767#_ga=2.5544499.1218543842.1663938030-518881478.1646318875

[56] https://www.oecd-ilibrary.org/social-issues-migration-health/international-migration-outlook-2022_30fe16d2-en?utm_medium=email&utm_source=berlin-newsletter&utm_content=en&utm_term=berl&utm_campaign=berlin-international-migration-outlook-2022

Conclusions and Recommendations

Conclusions and Recommendations

The set of statistical indicators analysed in this report have provided a comprehensive picture of the developments in the labour markets and education systems of the Danube Region countries over the last decade. Although we document notable converge trends, especially over years 2011-2019 for a number of indicators, disparities still persist. This summary predominantly focuses on the policy actions to reduce these inequalities, accounting for institutional and socio-economic differences across the countries. The effect of the COVID-19 crisis is emphasised too, relying on the statistical evidence from the years 2020 and 2021.

Higher employment rate

The overall labour market situation generally improved substantially in most of the Danube Region countries over the period of 2011-2019. The "new" Member States experienced a gradual convergence to the level of the "old" Member States of Austria and Germany. Bulgaria, Czechia and Hungary were the most prominent examples of the ample reduction of unemployment, improving activity rates and decline in NEET rates.

However, substantial disparities persisted between the EU Member States and some EU (potential) candidate states and EU neighbourhood countries, with the only exception being Serbia, which revealed a massive reduction in unemployment, including long-term unemployment, and a surge in employment and activity rates.

The effect of the COVID-19 pandemic on employment in the Danube Region has been surprisingly moderate for the majority of the Danube Region countries, except for Bulgaria, Montenegro and Romania.[57] [58] In the latter countries employment and activity rates in 2021 were far below the pre-pandemic level of 2019, whereas unemployment and NEET rates ranged above the pre-pandemic levels. A major spur in NEET rates suggest that employment of young people was heavily hit by the pandemic and the negative effect may last longer than the economic decline caused by the pandemic, as economy started to revive in 2021.

The effect of COVID-19 on the labour market appears very heterogeneous across countries and seemed to be dependent to a large extent on the presence of various employment protection schemes that were introduced in some countries in response to the employment threats posed by the pandemic. While some of the EU Member States launched short-

[57] Mild employment declines in the majority of the Danube Region countries are largely explained by various job retention schemes launched all across the region in 2020. These were found to be of major importance in preventing mounting unemployment and safeguarding recovery of normal employment once restrictions were lifted.

[58] Fana, M., Tolan, S., Torrejon, S., Brancati, C. U., and Fernandez-Macias, E. (2020). The COVID confinement measures and EU labour markets. Luxembourg: Publications office of the European Union.

term job retention and wage subsidy schemes (e.g. Austria, Czechia and Hungary), the EU (potential) candidate states and the EU neighbourhood countries offered very limited support to workers. However, not only the job retention schemes matter in post-pandemic recovery of the labour markets. As the pandemic caused a notable reallocation of workers across the sectors, with industries heavily affected by the pandemic cutting down employment and sectors which performed relatively well or even expanded seeking new employees, labour shortages posted in 2021 appeared uneven across the sectors. Hence, many workers who lost jobs due to closures, bankruptcies or employment cost reductions in 2020 may now need to find job in other sectors, which may require extra training or re-education.

In light of the uneven effects of the pandemic on different sectors and occupations, various actions tackling employment recovery through additional training are needed. These will allow for the re-allocation of labour from the most affected branches, which faced major job reductions and very slow employment recovery (e.g. tourism and entertainment branches), to the sectors that were mildly affected by the pandemic (e.g. manufacturing, construction and public administration). Such actions will foster quick employment recovery of the people who lost their jobs and prevent long-term unemployment increase.

The reduction in labour market disparities in the Danube Region should remain high on the policy agenda. Importantly, it concerns both cross-country disparities and within-country socio-demographic disparities, as both were to some extent widened by the pandemic. Since the COVID-19 pandemic has, so far, expanded inequalities in a number of core labour market indicators across EU Member States and other countries of the region, policies should aim to facilitate post-pandemic stabilisation of labour markets, particularly in the EU (potential) candidate countries and the EU neighbourhood countries, which were hit the most by the pandemic. The limited governmental support and social benefit systems in some countries, e.g. in Montenegro, seem not to allow for reasonable policy responses aiming for (at least partial) job protection. Given that young people faced the heaviest employment disrupted, especially in countries like Bulgaria, Montenegro, Romania, Slovakia, Slovenia and Ukraine, policy should remain focused on young people, on facilitation of their quick labour market entry, employment recovery, training and re-education and, importantly, on shaping their long-term employment prospects, as with aging population and shrinking workforce in all countries of the Danube Region successful labour market integration of youth, their education and training, is crucial for further economic growth and prosperity.

Improved educational outcomes and relevant skills and competences

Despite overall improvements over the period of 2011-2019, the education outcomes remained strongly heterogeneous across the Danube Region. Similar to the labour market outcomes, EU (potential) candidate states and neighbourhood countries had, on average, lower educational attainments compared to the EU Member States. However, gaps also persisted within the EU, particularly in the employment rate of people aged 20 to 24 holding at least upper secondary education. In this group, the "old" Member States appeared to have the highest employment rates, followed by the "new" Member States and then by EU (potential) candidate states and EU neighbourhood countries. This suggests that there is space for improvement in all countries.

With technological advancements and automation changing skills and qualifications demands drastically, the pandemic has accelerated this transition and deepened skills shortages all through the economy. Hence, education systems need to adequately respond to current labour market needs and develop and train graduates' skills accordingly. This will ensure both successful labour market integration of young graduates and responding to the looming labour market shortages, which restrain further economic growth. Providing the next generation with relevant skills and competences will also support the Danube Region's transition towards a green, digital, and resilient economy.

Early childhood education and care participation, same as ICT skills and the propensity to hold tertiary education were higher among the EU Member States. Early childhood education and care participation remained strikingly low in Bosnia and Herzegovina, Montenegro, the Republic of Moldova and Serbia despite a major improvement in Bosnia and Herzegovina over years 2016-2020 and in other three countries over years 2011-2019. Yet, the indicator was also low in several EU Member States, e.g. Croatia. Bosnia and Herzegovina, Bulgaria and Romania revealed systematically low ICT skills, which likely stemmed from their education system. The gaps in tertiary education (relative to the EU Member States) were the highest for Bosnia and Herzegovina, Montenegro, the Republic of Moldova and Serbia, yet the dynamics remained positive, suggesting further narrowing of the disparities with adequate state funding of the education system on all levels. However, there are also disparities in the propensity to hold tertiary education within the EU, with Romania having substantially lower share of tertiary education compared to EU average level.

The effect of the pandemic appeared very heavy when employment of young graduates is concerned. The pandemic hit youth relatively more than older groups of workers, as employment rates of those holding at least upper secondary education worsened during

2020 and the effect remained visible even in 2021. Bulgaria, Montenegro, the Republic of Moldova and Slovenia appeared hit the most in terms of young graduates' employment. However, employment rates of graduates with tertiary degrees appeared either unaffected by the pandemic or even reached levels above those from 2019 in the year 2021. This evidence suggest that youth with lower and medium education levels appeared the most vulnerable to employment distortions caused by the pandemic and needs to be in the focus of the policy.

On the upside, the pandemic had a positive effect on the ICT skills, as the share of the population with basic or above basic overall digital skills has increased notably in 2021 in all countries and across all age groups. This result signals a positive effect of social distancing measures on basic ICT literacy, as many people were forced to adapt to technological solutions to retain their jobs, continue education and/or maintain social contacts.

As for the other indicators, one could expect that the pandemic disrupted the usual operations of educational institutions due to social distancing measures, resulting in (partial) switches to online schooling and closures of schools and kindergartens. Hence, medium-term consequences of the pandemic may include an overall decline in education attainments, commitment and eagerness to continue education, as a result of various disturbances in education process, interrupted social contacts and loosening of interpersonal connections throughout the pandemic. However, a longer time span is needed for these effects to surface. On the other hand, many countries have taken remedial measures to address potential learning losses due to the pandemic.

Policy action towards improvement of educational outcomes needs to take the interrelation of all study levels into account. An improvement in upper secondary educational achievements can lead to an increase in the share of the population with tertiary education, as good study records may encourage pursuing higher education and are often required for admission to studies or scholarships. Therefore, education policies require actions at all education levels, starting from pre-school education and aiming towards more inclusive and more accessible education, with an emphasis on skills and competences from an early age on.

Technological advancements have resulted in a growing need for ICT specialists as well as an average increase in ICT skill demands in other professions; ICT skills will be an essential part of the job profile for many jobs in the future. The COVID-19 pandemic highlighted the immense importance of ICT skills, as many jobs moved (at least partly) to home offices and required a sufficient level of ICT competences to continue work remotely using digital tools. Thus, improvements of ICT skills should be in the spotlight of educational policy to foster high competences in the ICT domain of high school and

graduates. However, older workers need to acquire sufficient ICT skills as well, which is only possible through on-the-job and off-the-job training, which might be supported by governments. Thus, improvements of ICT skills should be in the spotlight of educational policy to foster high competences in the ICT domain, since schools play an important role in the provision of digital skills, media literacy and analytical thinking. However, older workers need to acquire sufficient ICT skills as well.

Increased quality and efficiency of education, training and labour market systems

The dynamics of education-related spending and other indicators related to the quality of education varied drastically across the region. Both governmental and private expenditures on education increased substantially in Croatia, whereas in most of the other countries of the region, they declined in 2011-2019. As for the breakdown by education level, in Austria and Slovenia, private expenditure on early childhood education and care exceeded the expenditure on all other education levels, likely related to the dominating share of private childcare facilities and their high cost. Meanwhile, in Bulgaria, Czechia and Slovakia, a dominating share of private expenditure on education was spent on tertiary education.

The average share of pupils/students per teacher in the Danube Region increased on all education levels, except post-secondary (both non-tertiary and tertiary), reflecting a growing pressure on the educational systems. The rising share of pupils/students per teacher on the lower and medium education levels in the region needs a policy response, as it results in an increased workload per teacher, less time for the teacher to spend on individual work with each pupil/student and, as a result, (potentially) lower quality of education.

The pandemic resulted in a sizable changes in public spendings on education and LMP in nearly all Danube Region countries. All countries, except Serbia, raised notably governmental spendings on education in 2020 in response to the COVID-19. The crisis might have spurred public investment in education as social distancing measures required transition to online learning on all levels of education, especially in schools and universities. This process likely required state support and investment in IT infrastructure and development, as well as hiring additional specialists and technicians to set up and maintain the online study process.

The governmental LMP expenses increased drastically in 2020 in almost all Danube Regions countries with the data available. However, the magnitude of LMP funding increases ranged dramatically across the Region. Several countries posted the most pro-

nounced increase, like Croatia and Slovenia, whereas Hungary posted a very moderate increase of LMP financing and Bosnia and Herzegovina has practically reduced the spendings. Varying LMP expenses in 2020 are related to, above all, implementation of various job retention schemes - their extent, duration and exact coverage. However, LMP policies also cover various trainings, re-education and re-qualification programs for those seeking for jobs. Hence, well-organized and sufficiently funded LMP helps combat long-term unemployment and increase socio-economic well-being in the medium run. Furthermore, LMP appears most crucial in the post-pandemic recovery, as the people who lost their jobs may need to acquire new skills to re-integrate into the labour market and find a job in a different sector and/or occupation. Therefore, LMP is a crucial tool to prevent mounting long-term unemployment, as those who lost their jobs during the pandemic may fail to find new ones and stay unemployed.

Yet, it was a crucial investment as it allowed to continue education, maintain commitment and quality even when face-to-face teaching was severely restrained. While countries have committed significant resources in response to the COVID-19 pandemic, the importance of further investments in education systems in the recovery from the pandemic cannot be overestimated. With (partial) shifts to e-learning and other disruptions in the study processes related to the pandemic (e.g. sick leaves of pupils/students and teachers or self-isolation due to contact with infected people), some pupils/students need to catch up. For this, sufficient teaching personnel and various additional study activities are needed to improve education outcomes further. In this respect, adequate funding plays a crucial role, particularly for state-funded schools and other educational institutions.

As the major part of the COVID-19 pandemic is behind, importance of public support of education system in post-crisis times cannot be overestimated. With (partial) e-learning and other distortions in the study processes related to the pandemic (e.g. sick leaves of pupils/students and teachers or self-isolation due to contact with infected people), some pupils/students need to catch up. For this, sufficient teaching personnel and various additional study activities are needed to improve education outcomes further. Here, financial support from the state plays a crucial role in this respect, particularly for state-funded schools and other educational institutions.

Ensuring inclusive education and training and promoting inclusive labour markets

The share of people at risk of poverty ranged dramatically across the Danube Region, with the most striking gaps appearing across the EU Member States and (potential) candidate countries and neighbourhood countries. However, among the “new” Member

States, Bulgaria and Romania had a high risk of poverty rate compared to Serbia and Montenegro. Similar patterns appeared in the inequality of the income distribution.

The effect of the pandemic on the risk of poverty was dramatically different across the countries. The share of people at risk of poverty increased in Austria, Croatia,, Germany, Hungary and Slovakia, yet dropped in Czechia, Romania, Bulgaria and Slovenia. This evidence suggests that, in some countries, employment distortions coupled with damaging health effects of the pandemic reflected negatively on income levels, resulting to mounting risk of poverty in several countries. Interestingly, the share of people at risk of poverty increased in the counties where job retention schemes were implemented (e.g. Austria and Germany), suggesting that workers targeted by the job retention schemes are not the ones facing the highest probability to live at the risk of poverty. Increasing share of people at risk of poverty is a very disturbing signal suggesting that policy action is needed especially for this marginalized group of people, as they need support and hedging against crossing the poverty line.

The results suggest that educational outcomes have declined in most of the countries of the Danube Region, from an equity perspective, as the shares of low-achieving students have increased substantially, with the most striking jump being in science. Furthermore, gender, immigration and socio-economic status disparities persist. Girls tended to have much stronger reading skills and lower mathematics abilities. Immigrant pupils had systematically lower reading, mathematics and science scores in all countries, except for Hungary and Montenegro. Pupils with higher socio-economics status performed much better in all domains in all countries without exceptions.

The fact that the most striking gaps across students appeared across different socioeconomic backgrounds calls for particular attention, since gaps in learning outcomes, which emerge at an early age, may last throughout one's lifetime, widen income gaps and cause further income polarization in society. Pupils from lower socio-economic groups need additional support and encouragement. Equal opportunities in education should be increased, including access to additional training and individualised approaches from teachers. Having a lower (household) income should not translate to having a lower quality and/or quantity of education, which constitutes a major policy objective in all countries of the region.

The substantial gender gaps in mathematics call for special educational policy attention towards support and encouragement of girls in this discipline. The same applies to boys' reading skills. However, to effectively narrow the gender gaps in given disciplines, steps need to be taken as early as possible, as the gender disparities emerge already at a very young age. It appears more efficient to try to prevent the gaps than to narrow them later on, particularly via additional training, encouragement and psychological support.

The propensity to leave school early varied across the region.The Republic of Moldova and Romania appeared to have remarkably high shares of early school leavers, ranging far above the EU-27 average, followed by Bulgaria and Hungary. The COVID-19 pandemic's impact on the propensity to leave school early was very uneven when the data from the year 2021 is considered, yet several countries (Bosnia and Herzegovina, Germany, Montenegro) posted a sizeable increase in the share of early school leavers. However, given time horizon is still too short to properly address the effect of the pandemic on pupils' commitment to finish education, as an adverse effect of interruptions in study procedures and (partial) transition to e-learning may still materialize in the years to come. The Commitment to reducing early school leaving is essential, as early school leaving is linked to unemployment, social exclusion, poverty and poor health. Policy actions must address a variety of levels and may include providing additional learning support to low-achieving pupils and pupils from disadvantaged socio-economic backgrounds. Ensuring pupils' well-being at school is also important.

The Danube Region appeared extremely heterogeneous in terms of adult education and training, as the LLL propensity varied drastically, with "old" Member States having the highest shares of LLL along with several "new" Member States, such as Czechia and Slovakia. In all other countries in the region, the LLL was strikingly low.

The COVID-19 pandemic had, initially, a negative association with the frequency of LLL activities, as highlighted in the previous report. A decline in LLL in 2020 was most likely related to the overall decline in educational activities due to social distancing measures, suspension of various trainings and increasing childcare and home schooling needs among parents. However, LLL activities largely recovered in 2021 and even exceeded the pre-pandemic level of 2019, with the most notable increases recorded in Croatia, Montenegro, Romania and Slovenia. Rapid recovery of LLL among adults is likely related to the resumption of various educational activities which had been terminated or put on hold in 2020. Furthermore, LLL may be a part of employment recovery programs, as those who lost jobs during the pandemic re-educate or acquire additional qualifications in order to find jobs.

For the recovery from the COVID-19 pandemic, LLL appears as a key tool in combating long-term unemployment through re-education and re-qualification of adults who lost jobs and seek employment in other sectors. With the COVID-19 effects being very uneven across the sectors, some qualifications appeared in greater need, while others are in lower demand. Hence, LLL paves the way for labour market reintegration. Policy actions to increase LLL participation in the area of education include improving access to LLL and enhancing the attractiveness and quality of LLL.

Finally, internet access has become more widespread in all countries of the Danube

Region, with no exceptions, which appears to be essential for many areas of education, training and work during and after the COVID-19 pandemic. However, cross-region disparities have persisted: the EU (potential) candidate states and EU neighbourhood countries as well as some "new" Member States (Bulgaria, Croatia and Romania) had lower internet access rates than the "old" EU Member States, which was likely related to overall income levels as well as the propensity to live in rural areas. Investments in infrastructure improvements, the reduction of costs related to internet usage and the strengthening of digital skills in all age groups, particularly in rural areas, are therefore essential policy challenges in the Danube Region countries with lower income levels. The COVID-19 pandemic showcased the immense role of the internet in safeguarding employment, fostering education participation and staying connected with society in the face of social distancing measures and lockdowns. As the data suggests, Internet access improved in all countries of the Region, yet to different extents, during the pandemic. It will remain equally important even in post-pandemic times; some jobs may keep a (partial) remote mode, and online education sources gained immense popularity and proved very useful, especially for those who cannot participate in formal education programmes for various reasons.