Interactions between the social and employment objectives of the European Union

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Executive summary

Performance vis-à-vis the employment and social targets of the European Pillar of Social Rights (EPSR) Action Plan represent a central test for the success of the EPSR. The Belgian Presidency has the aim of strengthening the social agenda for the 2024-2029 period via a stronger integration of the EPSR in the European economic governance framework. Performance to date regarding the social target (AROPE) **at EU level** has not matched up to the success in increasing employment rates; a central challenge is to understand why and tease out the implications. This paper presents analysis and empirical evidence to contribute towards improved understanding of the relationship between the EU's employment and social target (at-risk-of-poverty or social exclusion rate, AROPE) indicators, including the implications of the way these are framed.

We analyse past trends of the employment rate and both the 2020 and 2030 AROPE rates and their components and examine their relationships at the EU and at Member States' level. Links between these indicators and some key demographic, economic and social policy measures are also explored. Our analysis is mainly built on quantitative data collected by Eurostat (mostly based on EU-LFS and EU-SILC), but other data sources are also used.

The developments of the employment and of the AROPE indicators over time in Europe show that the period prior to and after the Great Recession was marked by **a strong overall increase in employment rates,** reaching high levels just before the crisis and a peak in 2020 before the outbreak of the COVID-19 pandemic. The increase in employment was followed by improvements in AROPE during both pre- and post-crisis years. Still, there is a dissatisfaction with the achievements in the social field, as they could not (in general, at EU level) fully match up to those in employment, and because the EU 2020 social target (AROPE) was not achieved (although the employment target was not reached either, at EU level and in several Member States). The findings of this paper shed some lights on the extent to which one should interpret this as a failure and the extent to which these developments should be attributed to policies and to measurement (in terms of indicators and levels of analysis). The paper also contributes to the understanding of background mechanisms that channel employment growth into income poverty changes.

The **decline in the AROPE rate was not unsubstantial** in itself: from 25.8% in 2005 it dropped to 21.7% by 2021, meaning that there was a statistically significant drop in the number of persons at risk of poverty or social exclusion in the European Union. Regardless of the change in the definition of the AROPE components (specifically, the modified age brackets of the (quasi-)joblessness indicator (QJ) and replacement of the former "Severe Material Deprivation" (SMD) indicator by the "Severe Material and Social Deprivation" (SMSD) indicator), the overall trend remained the same.

The **interpretation of this as a "failure" is related to the direct comparison of social headline target to the actual decline** (i.e. when the planned reduction of the number of persons affected by AROPE-2020 by 20 million is contrasted to the actual decline by 7.8 million). The analysis of the grounding of the original targets and of the choice of the indicators for the measurement of the social developments is outside the scope of this paper. However, we present a number of facts that contribute to a better understanding of the "why"-s and "how"-s.

To account for the role of the various components in reaching the social target, **we decompose the change of AROPE aggregate indicator by change of its components** and by Member States. Poland, Romania, Bulgaria, and Hungary contributed to the AROPE decline by a combined 10.5 million persons (of which Poland alone contributed more than 5 million). There were another thirteen countries where the number of persons living in AROPE declined (by a combined 2.6 million in total). At the other end of the spectrum, Spain, Germany, the UK, France, Netherlands, and Sweden produced an increase in the number of AROPE by 5.3 million persons combined (of which Spain and Germany were the largest with 1.6 million and 1.4 million, respectively), and another five countries contribute a marginal (120

thousand people in total) addition to the AROPE aggregate. The all-European balance of these declines and increases added up to a 7.8 million decrease between 2008 and 2020, as highlighted above.

The major driver behind the overall decline of AROPE was the declining trend in the share of persons affected only by severe material (and social) deprivation, mostly in East Central European countries (converging up to the level of the core of Europe in terms of incomes), as well as in France, Italy, and Portugal. **Changes of AROP contributed negatively to the attainment of the target in most countries**. The largest increase in the number of persons living at the risk of relative income poverty was seen in Germany and the UK. **AROP rates in fact also increased** in Poland, Romania, Bulgaria, Hungary, and Czechia, but the drop in the SMD rates in these countries was sufficient to offset that. An AROP decline was seen in only a few countries (Spain and Greece).

Our paper examines the interactions between the employment and the social target. We **focus the analysis on the working-age population.** This, given that the EU target is for the population as a whole, constitutes a clear restriction, but, on the other hand, it also allows a more nuanced analysis of the employment-poverty relationships. This choice, by the exclusion of the older population (aged 65+), may undervalue the immense role of public expenditures to this sub-population (most notably, pensions) and somewhat reduces the validity of our results on the at-risk-of-poverty and social exclusion indicator and its components for the overall population, which is the social target in the end. The other core methodological decision of the paper is to break down the analysis to country level trends, which allows for a better understanding of what is hidden in a full European analysis, when the employment-poverty nexus is in question. Regarding the countries included in our analysis, we built our sample to include EU-28 Member States, as the United Kingdom was member of the EU for almost the whole period in question. A further methodological issue is related to the breaks in the time series. We did not take them into consideration in our analysis, although in some cases (e.g. Germany, Luxembourg) these may affect the results of the analysis, but not the main conclusions. Our analysis revealed that behind the all-European figures there **is very substantial cross-country heterogeneity in the levels and time trends of the employment and the social target indicators, as well as of the components of the latter**.

Over-time **employment trajectories** show **very substantial differences across Member States and between geographical regions**. For example, employment growth was larger in Germany and in the Netherlands than in other countries in the Continental region, while Belgium, France and Luxembourg showed less progress in this respect. There has been a strong convergence in the Northern part of Europe (between the Scandinavian and Baltic countries grouped together). In the East-Central country grouping there was no recessionary decline in Poland, and it was also small in Czechia. Other countries have shown a marked employment increase during the recovery following the Great Recession. However, the scars of the crisis prevailed for much longer in a number of countries, most importantly in Greece and some other Southern countries.

The heterogeneity within and between countries is also substantial when we observe levels and over time trends in the at-risk-of-poverty-or-social-exclusion rates. Over-time stagnation of AROPE (at low level) is seen in the group of Continental Member States (Austria, Belgium, France, Germany, Luxemburg, and the Netherlands) and in the Northern region (Denmark, Finland and Sweden). However, the decline of AROPE was substantial in most of East-Central Europe (most dramatically in Poland, Slovakia and Czechia) and in Bulgaria and Romania. Volatility of this trend was higher in the Baltic countries, while the Southern countries showed large internal heterogeneity.

Turning to the AROPE components, cross-county differentials in the **at-risk-of-poverty rate (AROP)** are also seen, but with less volatility: there was a decline of the AROP rate for the active age population of at least 2 pp in 4 of 25 countries, it increased by 2 pp or more in 9 of the 27 countries, while in the rest of the EU these relative income poverty rates stagnated (remained in a plus-minus 2 pp range of their 2005 levels). There were, however, very substantial cross-country differences in levels and in time trends for **severe material deprivation rates** across Europe. While SM(S)D rates of the active age

population in the non-Southern EU-15 remained low, they were very much higher in Bulgaria and Romania at the beginning of the period (but showing a spectacular decline later on), and also in the East-Central Member States. The third component, the share of persons living in (**quasi-)jobless households**, remained stubborn in many countries after the Great Recession. While these rates varied only marginally over time in the Continental Member States, there has been a significantly larger level of volatility over time in Southern Europe.

Both the EU and the country level analysis of the **co-movement of the employment rate and AROPE** among active age individuals shows a clear mirror image and thus, **a clear negative correlation between them**.

The negative relationship between employment and the AROPE indicator and its poverty components, respectively, is confirmed by the alternative analytical techniques we used. From the correlation analyses we show that **AROPE** rates calculated for the total population **correlate negatively with the employment** rate at a relatively high level (-0.54): an increase in employment is associated with a decrease in the at-risk-of-poverty-or-social-exclusion rate in the period between 2005 and 2020. The corresponding analysis restricted to the active age bracket results in even stronger (-0.61) correlation, underlining that there is indeed **a positive relationship between employment increase and income poverty reduction**.

This correlation is independent from other observable and unobservable factors, as it remains significant in the performed multivariate regression analysis. **Both levels and changes in individual employment are significantly and negatively associated with levels and changes in poverty outcomes**, most notably with the aggregate AROPE itself, but considerably less with AROP. Estimates for the severe material deprivation indicators stay in-between. A more substantial difference is seen when estimates for relative income poverty are compared with those for the anchored at-risk-of-poverty rate (fixed in 2008): **both the magnitude of the estimated coefficients and the explained variance are significantly larger when the anchored rate is used**.

We proposed five mechanisms to identify mediating factors between individual employment and household level poverty outcomes. Among these **the role of the distribution of jobs is crucial**: the lower is the share of persons living in (quasi-)jobless households, the lower is the risk of poverty, an observation supported by all relevant model specifications we used in our analysis. The important role of this factor is also highlighted when **alternative simulations on the effect of job growth on relative income poverty rates** are performed. Overall, income poverty is seen to decrease in all countries when the share (weight) of the working population is increased, and the decrease is strongest if job growth is assumed to reach the (quasi-)jobless households first. When the allocation of additional jobs is simulated, taking into account the statistical likelihood of individuals to move into employment, the impact on the at-risk-of-poverty rate of the active age population is generally smaller compared to when jobs are allocated first to the unemployed and the (quasi-)jobless households. Other factors, like **the quality of jobs** and the capacity of the social protection system to reduce poverty also played an important role. The quality of newly created jobs (measured by several indicators, out of which involuntary part-time rate seems to be the most powerful) may affect poverty outcomes: a larger share of these precarious forms of employment increases the likelihood of higher poverty rates. The contribution of **various types of social protection benefits** to poverty reduction is present especially when the poverty threshold is anchored in a fixed moment in time. Finally, both the results of the regression analysis (mentioned above regarding the estimates for anchored at-risk-of-poverty rate) and of the simulations we performed indicate that the effect of **changes in the median income** on poverty outcome is substantial. We learned from the simulations that in most countries attaining the employment targets per se would not be sufficient to achieve the work intensity and relative income poverty objectives. **The way jobs are distributed among individuals and households, the evolution of the at-risk-of-poverty rates among (quasi-)jobless households, and the impact of job growth on median incomes are crucial factors** in this regard.

Our analysis of the impact of changes over recent decades in **the composition profile of households shows that taken together with changes in household employment patterns** these were a much more important driver of changes in relative income poverty rates in some Member States than others. The proportion of couples with both partners in paid work has gone up to a varying extent and has sometimes gone together with a sharp decline in the share of couple households in the population. Having more two-earner couples means growth in a low-poverty household type but has also served to drive up mean incomes and relative income poverty thresholds substantially in some countries but much more modestly in others.

We also found that among alternative income-based macroeconomic benchmarks, GDP is only weakly correlated with relative income poverty, severe material deprivation and (quasi-)joblessness, while GNI is more strongly correlated with employment, AROP and SMD.

From a policy perspective, it is clear from our findings that **employment growth contributes positively to income poverty alleviation**. However, our analyses on the transmission mechanisms between individual employment and income poverty indicate that the distribution of the extra jobs among households is crucial. When employment growth first benefits the (quasi-)jobless households, its effect is significantly larger. This means that the impact of job growth on income poverty can be significantly enhanced by improving the distribution of extra jobs among households, as well as the quality of those jobs. The clear implication is that employment policies should focus (even) more on activating the most vulnerable.

The simulations also highlight the significance of the evolution of the at-risk-of-poverty rates among (quasi-)jobless households. This underscores the importance of **adequate social protection for households that do not benefit from employment growth**. The distributive upside of employment growth (more people in work, thus fewer people at risk of poverty) should not be affected by a distributive downside of social protection becoming less adequate.

Some lessons and priorities for **future research** on the topic are also highlighted**. Focusing the analysis on working-age households** is appropriate when the core question is the interrelationship between the employment and social target (AROPE) indicators.

Carrying out such **analysis both at the level of the EU as a whole and at the level of Member States** is key in understanding processes that take place and also facilitates the mutual learning process among the Member States.

Including both purely relative and „anchored" indicators of income poverty into the analysis has been shown to be highly informative. Given that the latter is also included in the EU social indicators portfolio, its use in monitoring poverty trends besides the AROPE target and its components could provide a more complex picture. In addition, we find that both long-term and short-term anchoring may be of a value. This would also require a further investigation of how the anchored at-risk-of-poverty rate can be improved to overcome its weaknesses. Rolling the anchored thresholds (e.g. by every two or three years) would be an example of such a methodological work.

While (quasi-)joblessness is a constituent component of AROPE, the underlying effect of employment growth on income poverty may be more clearly identified when this component is treated separately.

1. Introduction

Reaching the three social and employment targets of the European Pillar of Social Rights (EPSR) Action Plan endorsed by European Union (EU) leaders in Porto — an employment rate of at least 78%, at least 60% of adults attending training courses every year, and a number of persons at risk of poverty or social exclusion at least 15 million lower than in 2019 — is often considered as a test for the success of the EPSR.

The Belgian Presidency, as in 2001 and in 2010, intends to make a difference in the domain of social and employment policies. Its aim is to strengthen the social agenda for the 2024-2029 period, via a stronger integration of the EPSR in the European economic governance framework, placing fiscal and macroeconomic performance and social fairness on an equal footing. To prepare for that, it is very important to better understand the relationship between the employment (individual employment rate) and social (AROPE and its components) EU targets, the implications that the mode of measurement (e.g. the use of relevant, reliable and robust indicators) have for this relationship, and how measurement impacts target setting and policy choices.

This paper provides empirical evidence, which – among others - may contribute to the fulfilment of this ambition. In what follows, we analyse the developments of the relevant indicators set for the monitoring of social cohesion in the EU. We analyse past trends in the evolution of the employment and social targets of both the EU 2020 and EU 2030 strategies and analyse their relationships and interactions at the EU and at Member States' level. Links between these indicators/components and some key demographic and economic measures will be also explored. In addition, we consider a more thorough use of the role of anchored poverty indicator that may add to our knowledge of the employment-income poverty relationship, and therefore of the interactions between social and economic policies, in view of the social target. The aim of this exercise is analytical, and our paper do not aim to develop or recommend alternative measures to the existing social target indicator or its components.

Our analysis builds for the most part on quantitative data collected by Eurostat. We mainly use cross-sectional and cross-country comparative data retrieved from the Eurostat database, but also data from the secondary analysis of the EU Statistics on Income and Living Conditions (EU-SILC) micro-data, where the already published indicators are not available or when they are insufficient for our purposes. We also draw more briefly on longer-run data from the Luxembourg Income Study (LIS) database. The definition of indicators used in the analysis are presented in Annex 1. Data sources and the methods used are described in Annex 2.

In what follows we first introduce the employment (in Section 2.1.) and the social (Section 2.2.) target indicators, together their empirical trends over the period between 2005 and 2021 and an analysis of the extent to which these targets were achieved, as well as the country-level incidence of the achievements. In Section 3, we examine the role of employment in poverty reduction, by analysing the correlation between employment rate, AROPE rate and its components, both at EU and Member State level. We consider the latter an important move, as aggregate European trends may (and do) mask the real relationship between employment and poverty trends. Section 4 focuses on why employment increase *per se* cannot sufficiently contribute to the poverty reduction target and explores the role of other factors. This section uses various methods to explore these factors, including shift-share analysis and multivariate regression analysis.

Section 5 is devoted to conclusions and to the implications of our analysis. The paper explicitly takes into account that the European policy process (including EPSR) is realised via interactions between EU-level guidance and national policies, framed by global economic trends. This conceptualisation allows us to see the community of Member States as a large policy lab, in which various policy combinations at national and EU levels yield different results, from which Member States can learn from each other.

The main thrust of the paper is, therefore, to help this learning process, which was and is at the centre of the Belgian presidency in 2001, 2010, and, in 2023 as well. Therefore, we keep this nature of the EU policy process in mind when we summarise our conclusions and the lessons learned. We propose that considerations for complementary indicators, which may add knowledge on the nature of the employment-income poverty relationship and have the capacity to improve understanding and policy decision making, are fully justified. However, throughout the analysis, we – in accordance with the terms of reference of this study – restrict our focus to existing indicators of the monitoring portfolio. Suggestion for new indicators or revision of the existing ones would go beyond the scope of this paper. To keep the analysis concise and widely accessible, we delegate additional data and background information to the main findings to the end of the paper (into the lengthy Annexes 3 and 4).

2 The employment and the social target: overview and trends

2.1 The employment target

2.1.1 The employment rate indicator

The Europe 2020 strategy for Smart, Sustainable and Inclusive Growth aimed that **at least 75%** of people aged 20 to 64 should be in employment by the end of the period (see sub-section 2.1.2 for a short country level analysis of how this target was achieved). For the ongoing EU strategy period, this target, set out in the European Pillar of Social Rights Action Plan, endorsed by the European Council, was raised to **78%**. In the Action Plan the Commission also called on the Member States to define national targets, and these taken together marginally exceed the EU headline target, aggregating to an EU-wide 78.5% employment rate. The employment rate for this purpose is measured in the standard way as the number of employed persons as a percentage of the total population of working age. As measured in the European Union Labour Force Survey (EU-LFS), the principal condition for being counted as an employed person is to have worked for at least 1 hour for pay or profit during the reference week, including contributing family workers. (Those who had a job or business from which they were temporarily not at work in the reference week but had an attachment to their job, and those producing agricultural goods for sale or barter, are also counted as employed.)

The strengths and limitations of this measure of employment, which follows the so-called "ILO definition", are well-known. A key strength is that it has been embedded in statistical practice internationally via UN guidelines and so is available on a consistent basis across countries and over time (though some subtle differences in the underlying collection of the information required remain). It is also easy to describe and convey. Its relationship with macroeconomic developments has also been the subject of intense study over many years, producing a substantial knowledge base on that core issue.

However, the one-hour threshold on which the measure relies means that someone doing only a very modest amount of work in the reference week (in which their status is measured/determined) will still be counted as employed. This has given rise to the production and use of a variety of complementary indicators measuring full-time versus part-time employment (with different hours cut-offs or alternative ways of distinguishing what constitutes part-time), alongside indicators seeking to distinguish voluntary from involuntary part-time working.[1] Another key feature of the standard measure is its focus on the reference week, which gives no indication of the person's work status over the month or the year or of the stability and security of their employment. This has given rise to the development of various measures of insecure or precarious work. The overarching concern about job quality has led to the distinction between standard work (full-time and with a permanent contract) and

[1] Further, a comprehensive measure of full-time equivalent employment rate was proposed by Brandolini and Viviano (2016).

non-standard work (part-time and fixed-term contract) being widely used. A variety of measures aiming to capture such distinctions are now used by various international organisations, including the OECD. The EU's suite of employment indicators includes one on involuntary part-time employment as a percentage of the total part-time employment (where the person reports they would like to work more but cannot find a full-time job). Eurostat has also developed a regular statistical series on precarious temporary work defined as the percentage of employees with a short-term contract of up to 3 months. Eurostat and DG EMPL also make use of an indicator on „involuntary temporary work" where the main reason provided is that "no permanent job was found" or (generally) "job not available as open-ended contract".

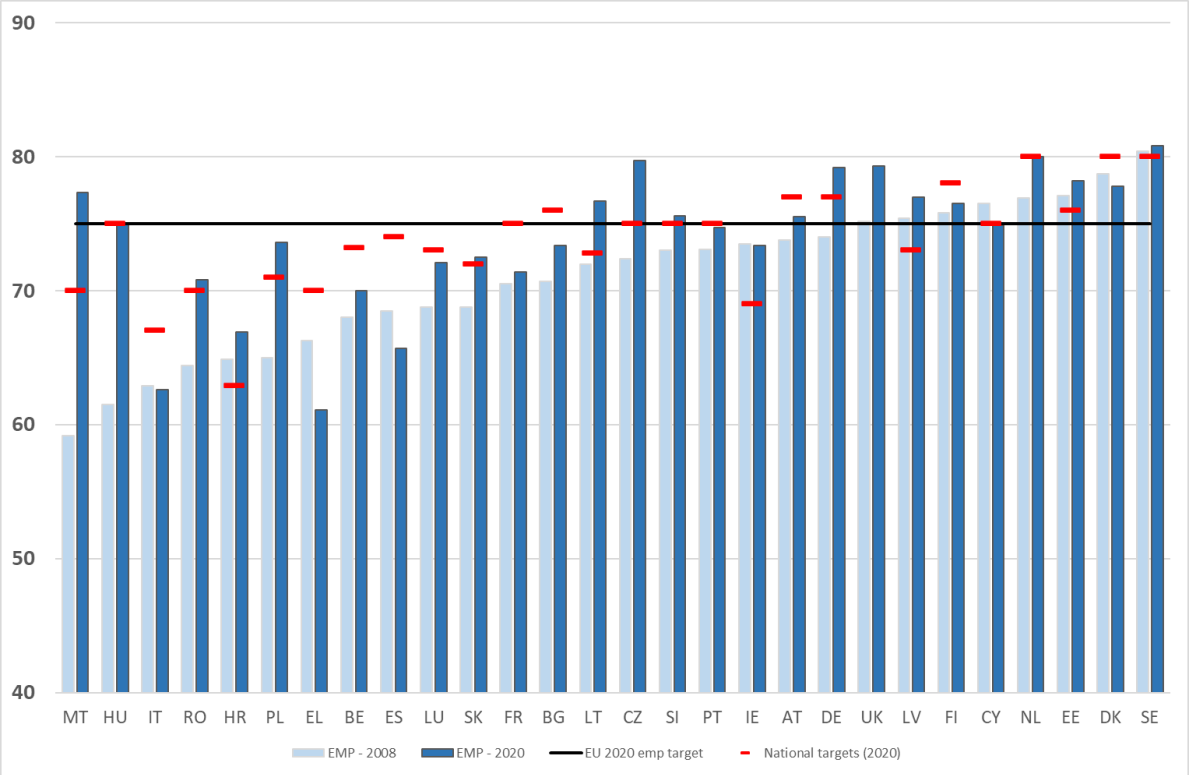
Since the quantity and quality of the work being done (at individual and household level) determines the impact it will have on reducing the risk of poverty, these are clearly of critical importance in the context of this report. This is reflected in the evidence from EU-SILC that the in-work poverty rate is significantly higher among non-standard than standard workers and for those in part-time versus full-time work. Furthermore, the pay level per hour, day or week of work is itself both a key indicator of the quality of a job and central factor in assessing the relationship between work and poverty risk, so incorporating the prevalence of low-wage work is also important. We seek to take these aspects of employment quantity and quality into account in our empirical analysis of the relationship between trends in employment and poverty, going beyond the core employment rate, to complement it with other indicators as we describe below. However, these measures may be subject to real constraints on the availability of suitable data over the period being studied.

2.1.2 How the employment target was achieved?

Overall, at EU level, we witnessed a considerable 5 pp increase in employment among persons aged 20-64 between 2008 and 2020, and the employment target of the Europe 2020 strategy was close to be met (European Union, 2019), finally it was not achieved. However, there was a large cross-Member States variation in employment trends. Table A3.1 presents the employment rates for each Member State in 2008 and 2020, together with their targets that they aimed to achieve by 2020. A combined presentation of these data in Figure 1 shows how national employment rates in 2008 and 2020 compared to national and EU level employment targets in 2020 and 2030, respectively.

In Figure 1, countries are ranked according to the level of employment in 2008. Employment rate in 2008, which was the reference year for the 2020 target, was the lowest in Malta, Hungary, Italy, Romania, Croatia, Poland and Greece, and highest in Sweden, Denmark, Estonia, Netherlands, Cyprus, Finland, Latvia and the UK. In the latter group of countries, the national employment rate in 2008 was already at least at the level of the EU 2020 target. During the observed period, the national employment rate significantly declined in Greece (by 5.2 pp) and in Spain (2.8 pp), but its 2020 level was also below the 2008 figure in Cyprus and Denmark (by 1.9 and 0.6 pp, respectively). The largest employment growth was produced in Malta (18.1 pp) and Hungary (13.5 pp): these two countries were able to reach the EU targets starting from the two last positions. Also, there were significant improvements in Poland (8.6 pp), Czechia (7.3 pp) and Germany (5.2 pp). Some countries were able to surpass their national targets substantively (like Malta, Poland, Lithuania, Czechia, Slovenia and – to a lesser extent – Germany), while for some of them the plan proved to be too ambitious: this was clearly the case in Italy, Greece, Belgium, Spain, and, to a lesser extent, Luxemburg, Bulgaria, Austria, and Denmark.

Figure 1 Employment rates in 2008 and 2020, national and EU level employment targets for 2020



Source: employment rates were retrieved from the Eurostat database on 31/07/2023. National and EU target values are from European Union (2019), and Paľová and Vejačka (2018). For data see Table A4.1.

2.2 The social target

2.2.1 The construction of the social target of the EU

A major step in monitoring progress in social inclusion and social protection was the adoption in 2001 of a portfolio of 18 EU social indicators in the fields of poverty and social exclusion (called Laeken indicators, see Atkinson et al., 2002; Marlier et al., 2007). This portfolio of indicators, designed from the outset to serve EU social objectives, evolved over time, as a result of interactions with EU-level policymaking processes (for details including the broadening of the indicator sets to pensions, health and long-term care, see Social Protection Committee Indicators Sub-Group, 2022, and European Commission, 2019). The adoption of the Europe 2020 strategy for "smart, sustainable and inclusive growth" introduced the AROPE-2020 target comprising three components: at-risk-of-poverty rate (AROP), severe material deprivation rate (SMD) and (quasi-)joblessness rate (QJ) (Engsted Maquet, 2013; Marlier et al., 2010). Subsequently with the adoption of the Action Plan of the EPSR and the EU 2030 strategy targets, AROPE-2020 was modified in two respects, with a new indicator for severe material and social deprivation (see Guio et al., 2012; Guio and Marlier, 2013; Guio et al., 2016, 2017) to increase reliability and comparability, and (together with some smaller adjustments) the age range for the (quasi-)jobless indicator expanded to 64 instead of 59. We refer to the modified AROPE indicator as AROPE-2030, and to the "AROPE-2030 target" based on it.

Parallel to the progress in developing indicators and the monitoring system, there were also important steps taken to strengthen economic and social governance in the EU, first via the introduction of the Open Method of Coordination (OMC) in 2001, and then via the institutional innovations of the Europe 2020 strategy in 2010 and the EPSR Action Plan in 2019 introducing and extending thematic programs and country reporting, integrated into the broader framework of the European Semester (Marlier et

al., 2010; Zeitlin and Vanhercke, 2014). The general operational model is simple in principle and complex in practice: The Council, based on proposals by the European Commission, issues Country Specific Recommendations to the Member States. Member States report on measures to respond to these recommendations and track progress in their National Reform Programme reports and continue to coordinate social policies via the OMC.

The aggregate indicator of AROPE-2020 was a result of a political coordination process reflecting the different views and interests of the Member States (Maître et al., 2013; Peña-Casas, 2012), with internal debates facilitated by the SPC and its Indicators Sub-Group[2]. The end-result of the process, that is, AROPE-2020 and the AROPE reduction target itself, represent a political compromise and the operation of the monitoring mechanism is also the result of political agreements between the Member States.

While the overall EU target is based on the AROPE indicators, in setting their national targets, Member States were free to choose the most appropriate indicator (or any combination of them). In practice, this means that the evaluation of their performance is relative to their own targets, measured by the indicator they choose for themselves, rather than in terms of the EU targets or their contribution to meeting them.[3]

As the joint assessment report of the Employment Committee Indicators Sub-Group (EMCO) and the SPC stated (European Commission 2019), while the OMC contributed positively to Europe 2020 objectives, "the overall impact of the OMC, which depends on voluntary take-up by Member States and national stakeholders, has not been strong enough, also given the difficult context of the Great Recession. It is also felt that dissemination of lessons learned, and the involvement of civil society and social partners could be improved, while some OMC strands such as health and long-term care could be addressed better." (European Commission 2019: 107). This perceived failure led to the setting-up of the EPSR at the Gothenburg Summit in 2017. The EPSR was conceived to be an efficient tool promoting social rights with joint collaboration and responsibility of the EU institutions together with Member States, civil society, social actors, and social partners.

The assessment of the Europe 2020 strategy (European Commission, 2019) stated that there was, despite setbacks in the crisis years, a strong expansion in employment, as a result of which the employment rate target was close to being met prior to the onset of the COVID crisis. However, the poverty and social exclusion target was not achieved: though AROPE-2020 declined, the actual fall in AROPE was well short of the target. Employment rates dropped in many Member States through the Great Recession, followed by recovery at different speeds, but relative income poverty rates have shown a standstill (Atkinson, 2010; Cantillon and Vandenbroucke, 2014; Cantillon et al. 2023, Fischer and Strauss, 2020). Two of the AROPE-2020 components were amended) from 2020 in framing the AROPE-2030 target as already noted above (see Box 1).

[2] For accounts on this process, see also Copeland and Daly (2012), Bontout and Delautre (2012), among others.

[3] Darvas (2019, footnote 5) found nine countries of the then 27 Member States that had a national social target indicator which differed from the AROPE-2020. They varied from choosing a specific component of AROPE-2020 (e.g. at-risk-of–poverty rate in Bulgaria and Estonia, or the share of households with (quasi-)joblessness in Denmark) to a combined poverty measure for the overlap of income poverty and material deprivation (Ireland), or some alternative measures, like that of the share of long-term unemployed (Germany), people aged 0-64 living in (quasi-)jobless households (the Netherlands), various numerical targets (UK), and a set of very specific targets like percentage of women and men aged 20-64 who are not in the labour force (except full-time students), the long-term unemployed or those on long-term sick leave (Sweden).

Box 1 Changes to the target and related indicators after the Europe 2020 strategy

After the end of the Europe 2020 strategy, new employment, training, as well as at-risk-of-poverty-or–social-exclusion (AROPE) targets were adopted at EU level, as part of the Action Plan on the European Pillar for Social Rights. These new targets are to be reached by 2030.

Two of the three indicators on which the AROPE target is based have been amended between the Europe 2020 and Europe 2030 strategies[4]:

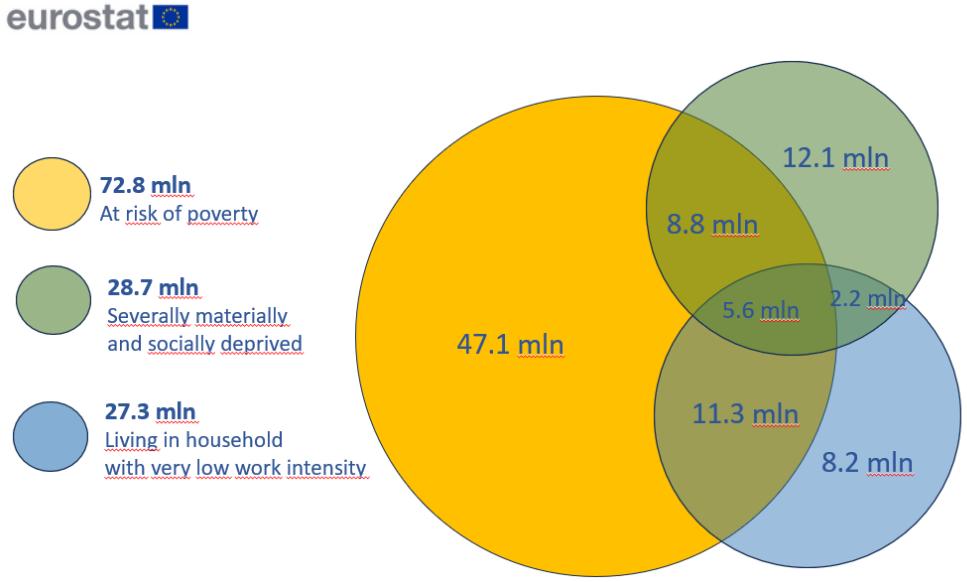
- The former "Severe Material Deprivation indicator" (SMD) was replaced by the "Severe Material and Social Deprivation" indicator (SMSD). SMD was based on the limited information available from the EU-SILC dataset when it was adopted in 2009, some of its nine items had weak reliability and it missed various aspects of social and material deprivation. To revise the indicator, the European Commission launched a Eurobarometer survey to collect evidence in each Member State on what people think is needed to have a decent life in their country. This made it possible to define a list of most "needed" goods/services to be collected in EU-SILC. The SMSD indicator is based on a selection of these items, which satisfactorily passed a battery of tests at both EU and country levels to ensure the reliability and comparability of the indicator.
- The age bracket considered for the (quasi-)jobless household (QJ) indicator was extended from 0-59 to 0-64; some adjustments to the reference population were also introduced, essentially to avoid including retired persons in the indicator. The criterion for identifying a QJ household remains very low work intensity i.e.: a household in which the percentage of the total number of months that all household members aged 18-64 have worked during the income reference year and the total number of months they could have worked theoretically in that period is less or equal to 20%. (Here QJ-2020 refers to QJ calculated for the age bracket 0-59, while notation of QJ-2030 refers to QJ calculated for the age bracket 0-64.)

The definition of the third indicator (at-risk-of-poverty rate indicator, AROP) remained unchanged. In this report, the new targets/indicators are referred to as "Europe 2030 targets/indicators".

The composition of those meeting the AROPE-2030 criteria in 2022 is presented in Figure 2. Those below the relative income poverty threshold dominated the overall group at risk of poverty or social exclusion at EU level. Over three-quarters of those meeting the specified conditions for inclusion in the AROPE aggregate are below the relative income threshold, with two-thirds of these not also reporting either of the other two dimensions. By contrast, only 14% of the AROPE aggregate report severe material and social deprivation but not AROP, while only 10% report very low work intensity but not AROP. The way the target is framed means the same weight is given to progress in reducing the numbers affected by only one versus two or even all three dimensions (for summary on the construct of AROPE see Box 2).

[4] For a description of the indicators, see: https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=8513&furtherPubs=yes

Figure 2 Number of people at risk of poverty or social exclusion in the EU in 2022 (AROPE-2030 and its components, million persons)



Source:
https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Living_conditions_in_Europe_-_poverty_and_social_exclusion#Poverty_and_social_exclusion

Box 2 Critical debates of the Europe-2020 poverty indicators

Once the Europe 2020 indicators were launched, extensive discussions began on the theoretical and policy implications of defining a single EU-level target for combatting poverty and social exclusion in this way (e.g. Nolan and Whelan, 2011a, 2011b; Copeland and Daly, 2012; Maître et al., 2013). Going beyond the unidimensional concentration on income was largely acknowledged to be an improvement in monitoring poverty and social exclusion in an enlarged Europe (Nolan and Whelan, 2011b; Hick 2012; Decancq et al., 2013). However, the way this was done led to debate about, among other things, the use of the union approach instead of the overlap approach, in other words whether just one of the criteria employed should be met versus two or more (Nolan and Whelan, 2011a, 2011b). (Nolan and Whelan (2011b) and B. Kis and Gábos (2016) for example produced estimates for the numbers experiencing both income poverty and material deprivation in Europe.)

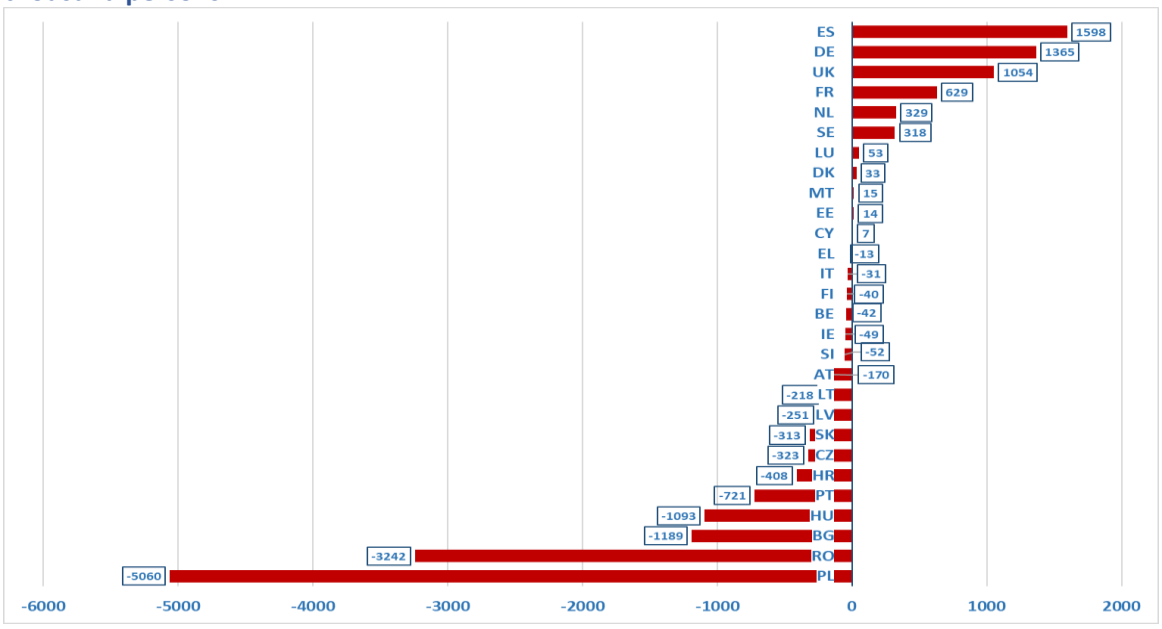
The analysis and measurement of the Europe 2020 and Europe 2030 at risk of poverty and social exclusion indicators needs to take into account two important factors (Ayllón and Gábos, 2017). The first is that components of AROPE (income poverty, material deprivation and low work intensity) may be affected by an important degree of genuine state dependence (e.g. being below the income poverty line in a given year increases the chances of being found in the same situation in the future). The second is that there are many possible feedback effects from one component to another. For example, a decrease in household income may increase the likelihood of material deprivation either currently or in the future, while a fall in work intensity may well lead to a reduction in income immediately or with some lag depending on replacement by social protection (Ayllón and Gábos 2017). There are few empirical accounts of these feedback effects, and they do not systematically cover all three components (Ayllón and Gábos, 2017). On material deprivation and income, there is some evidence that income poverty and material deprivation measure relatively distinct phenomena (e.g. Muffels and Fouarge, 2004; Nolan and Whelan, 2011b), but Guio et al. (2014) found that periods spent in relative income poverty are associated with higher material deprivation rates. Attachment to the labour market by all household members is perhaps the most important factor affecting household income and therefore the risk of income poverty and material deprivation (Fusco et al., 2011; Oxley et al., 2000). Joblessness or precarious work arrangements of

a household's members may increase the risk of poverty. Further, employment/unemployment status or household work intensity are among the most important determinants of material deprivation among children or households generally (e.g. Fusco et al., 2011; De Graaf-Zijl and Nolan, 2011; Whelan and Maître, 2012; Chzhen and Bradshaw, 2012; Bárcena-Martin et al., 2014; Visser et al., 2014; Bárcena-Martın et al., 2017; Verbunt and Guio, 2019). In their analysis, Ayllón and Gábos (2017) found a considerable degree of genuine state dependence. Material deprivation was found to be least affected by scarring, and low work intensity was most affected. They found clear evidence of a feedback loop between income poverty and material deprivation only in the East-Central European Member States. Feedback effects between income poverty and low work intensity are not important but current low work intensity contributes to the current probability of AROP.

2.2.2 How the social target (AROPE) was achieved?

The comparison of the national level fulfilment of the social target (AROPE), is not always straightforward (for the list, see Table A3.2 and Table A3.3). One can, however, measure the overall development of AROPE and it can also be decomposed by the effects of change in its components.

Figure 3 Change in the number of AROPE persons between 2008 and 2020 in EU member states, thousand persons



Source: own compilation from Eurostat data.

Note. In the case of Croatia, year 2010 was considered instead of 2008, while in the case of the UK 2018 instead of 2020.

The decline in the number of persons affected by AROPE, amounted to 7.8 million between 2008 and 2020 overall in the EU, as contrasted to the planned decline by 20 million (Figure 3).[5] What one may also see, is that the distribution of this amount was very uneven between countries. Poland, Romania, Bulgaria and Hungary contributed to the decline in AROPE by a combined 10.5 million persons (out of which Poland alone by more than 5 million), while Spain, Germany, the UK, France, Netherlands and Sweden contributed negatively, as they witnessed an increase in the number of persons affected by AROPE in their countries by 5.3 million (out of which Spain and Germany were the largest with 1.6

[5] See a short discussion of the developments pf the social target in relation with the SDG goals by Atkinson, Guio and Marlier (2017).

million and 1.4 million, respectively). The all-European balance of these Member State level drops and increases added up to 7.8 million mentioned above.

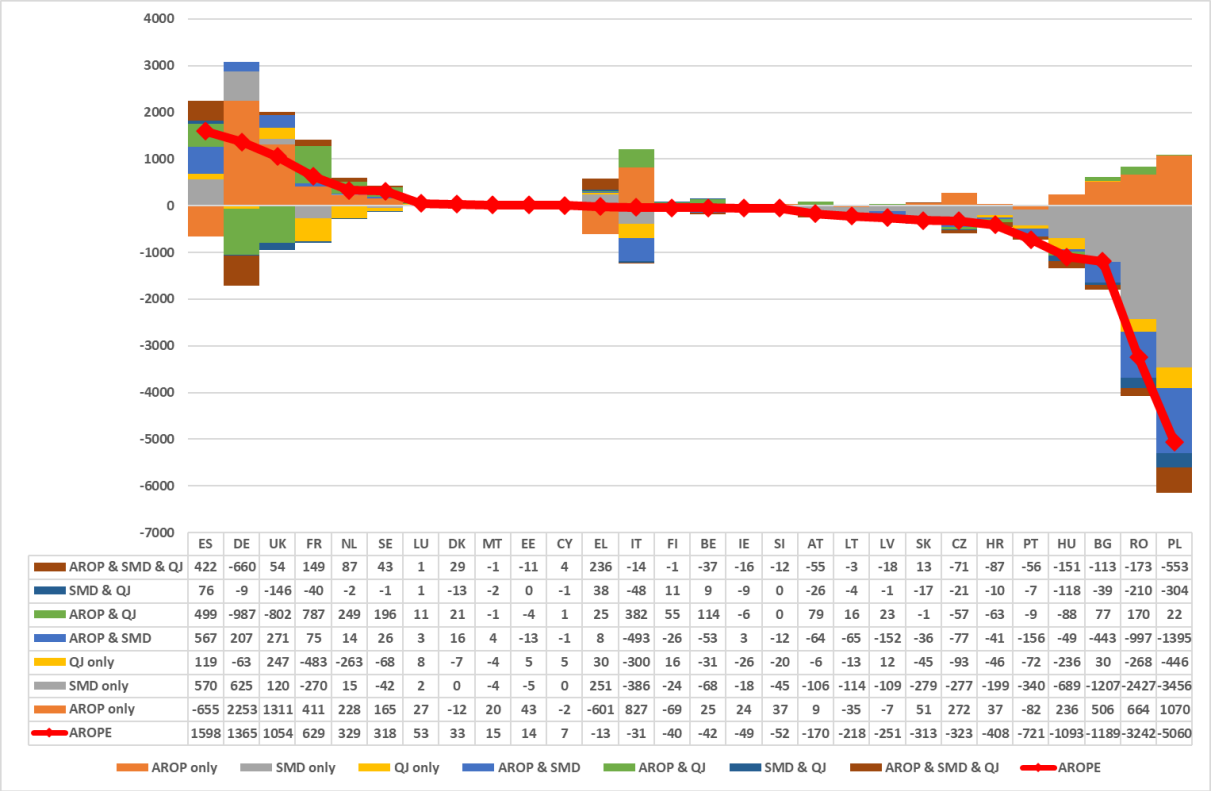
Figure 4 also shows AROPE change, but now decomposed by by its constitutive components and their combinations (persons affected only by AROP, only by SMD, and only by QJ-2020, jointly by AROP and SMD, AROP and QJ-2020, SMD and QJ-2020, and AROP, SMD and QJ-2020, respectively), one can again derive some interesting conclusions.

For the understanding of the decomposition, we first use the Polish case to present the findings. In Poland, the 5,060 thousands drop (shown by the red line) in the number of persons affected by AROPE is composed of a 3,456 thousand drop in the number of those who were severely deprived, but not affected by AROP or QJ-2020. Added to this, there was 1,395 thousand persons less in 2020 than in 2008 being both severely deprived AND living at risk of poverty, and 446 thousands less who were jointly severely deprived AND lived in (quasi-)jobless households, plus 553 thousands less who were affected by all three components, etc. However, the number of persons affected exclusively by AROP increased by 1,070 thousand persons in the same period. Adding up these increases and decreases, we get the 5,060 balance in the case of Poland.

In general, one may see that the largest AROPE reduction is attributed to the decline in severe material deprivation – mainly in East Central European countries (besides France, Italy and Portugal). Contrarily, changes in the number of persons affected by AROP contributed negatively to the improvement in AROPE figures in almost all countries, except Greece and Spain. The largest numbers characterised Germany and the UK, where no decline in those living in (quasi-)joblessness or in severe material deprivation could compensate for. AROP also increased in Poland, Romania, Bulgaria, Hungary, and Czechia, but in these countries the drop in the SMD figures was sufficient to compensate for that and to achieve a positive balance in terms of the target reach. There are several countries, where the balance of AROPE change between 2008 and 2020 is very close to zero (e.g. Luxembourg, Denmark, Malta, Estonia, Cyprus, Finland, Ireland, Slovenia, but changes were also considerably small in Belgium, Latvia, Lithuania, and Slovakia). These countries are either very small and therefore the absolute numbers are so low that no real contribution could be made or changes very so small between the two points in time that the change could not show up in comparison with other Member States.

The fact that the biggest reduction is from persons affected by SMD but not in AROP, seems to be surprising for the first glance. However, this simply reflects the fact that in these countries (e.g. Bulgaria, Hungary, Poland, Romania), the share of people who were “only” at risk of SMD (e.g. the 2008 baseline) was very large at the beginning of the period and it has decreased considerably – most importantly, as a consquence of economic recovery and convergence between Member States.

Figure 4 Change in the number of AROPE persons between 2008 and 2020, decomposed by AROPE constitutive components and their combinations, EU Member States, (thousand persons)



	ES	DE	UK	FR	NL	SE	LU	DK	MT	EE	CY	EL	IT	FI	BE	IE	SI	AT	LT	LV	SK	CZ	HR	PT	HU	BG	RO	PL
AROP & SMD & QJ	422	-660	54	149	87	43	1	29	-1	-11	4	236	-14	-1	-37	-16	-12	-55	-3	-18	13	-71	-87	-56	-151	-113	-173	-553
SMD & QJ	76	-9	-146	-40	-2	-1	1	-13	-2	0	-1	38	-48	11	9	-9	0	-26	-4	-1	-17	-21	-10	-7	-118	-39	-210	-304
AROP & QJ	499	-987	-802	787	249	196	11	21	-1	-4	1	25	382	55	114	-6	0	79	16	23	-1	-57	-63	-9	-88	77	170	22
AROP & SMD	567	207	271	75	14	26	3	16	4	-13	-1	8	-493	-26	-53	3	-12	-64	-65	-152	-36	-77	-41	-156	-49	-443	-997	-1395
QJ only	119	-63	247	-483	-263	-68	8	-7	-4	5	5	30	-300	16	-31	-26	-20	-6	-13	12	-45	-93	-46	-72	-236	30	-268	-446
SMD only	570	625	120	-270	15	-42	2	0	-4	-5	0	251	-386	-24	-68	-18	-45	-106	-114	-109	-279	-277	-199	-340	-689	-1207	-2427	-3456
AROP only	-655	2253	1311	411	228	165	27	-12	20	43	-2	-601	827	-69	25	24	37	9	-35	-7	51	272	37	-82	236	506	664	1070
AROPE	1598	1365	1054	629	329	318	53	33	15	14	7	-13	-31	-40	-42	-49	-52	-170	-218	-251	-313	-323	-408	-721	-1093	-1189	-3242	-5060

Source: own compilation from Eurostat data.

Note. In the case of Croatia, year 2010 was considered instead of 2008, while in the case of the UK 2018 instead of 2020.

3 The role of employment in poverty reduction: How individual employment, AROPE and its components move together?

3.1 The developments of the employment, of the AROPE target indicator and its components over time in Europe

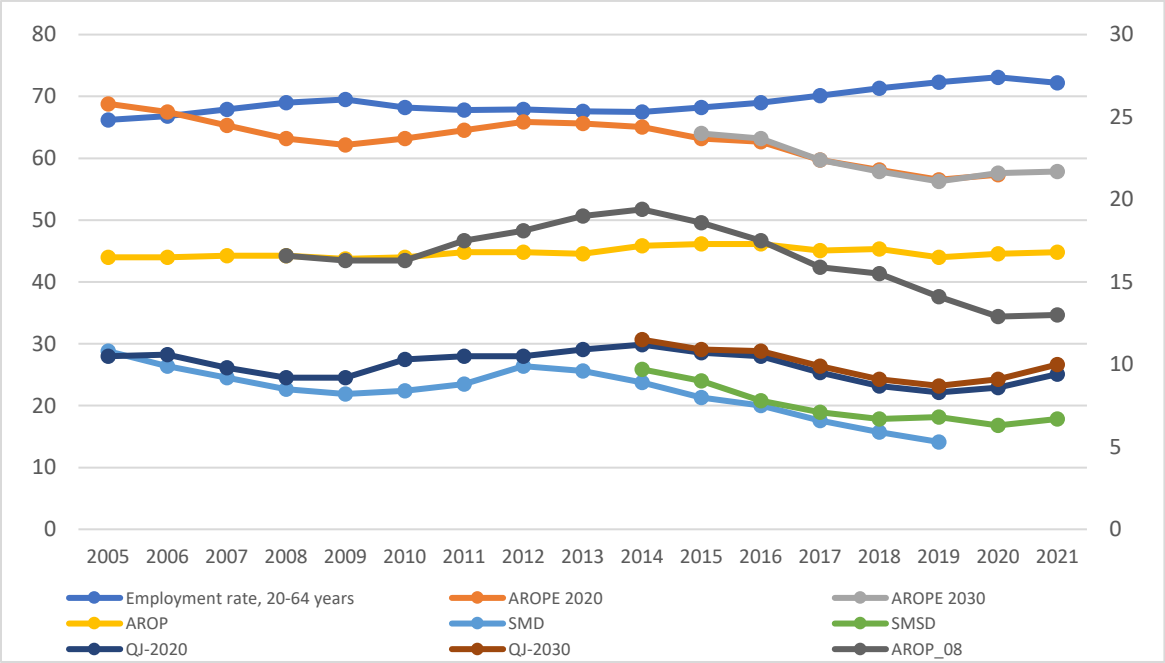
The period prior to and after the Great Recession was marked by a strong overall increase in employment rates, reaching high levels just before the crisis and a peak in 2020, at the outbreak of the pandemic (Figure 5). While aggregate European achievements in the social field could not fully match up to those in employment, the time trends indicate that an increase in employment was indeed followed by improvements in the social target (AROPE) indicator during both relevant (pre- and post-crisis) periods, as the two trends are mirrored for most of the period. This relationship, between 2015 and 2020/2021, is not affected by the choice between the AROPE-2020 and AROPE-2030. It should be noted, however, that AROPE started to increase already before the employment shock of the COVID-19 crisis.

AROPE is an aggregate indicator, including three very different components: a relative income measure (AROP), the severe material (and social) deprivation rate combining income and consumption aspects (SM(S)D), and a household-level aggregate labour market attachment indicator (QJ rate). Comparing

the trends of these components, one may immediately observe a standstill in the development of AROP, meaning the lack of both the co-movement with AROPE and almost any responsiveness to the employment trends. This standstill is contrasted by the co-movement of SM(S)D and QJ with the AROPE, mirroring the employment trends. Neither the anchored AROP shows an income poverty standstill. Rather, one may observe a pronounced response to employment changes (for an account of the interpretation of the employment and poverty trends is presented in Box 3).

The identification of interactions between employment and poverty (the ultimate aim of this paper) requires a careful definition of the population segment for which it is meaningful to carry out such an analysis. While indirect relationships between active-age employment and overall poverty are clearly mediated by the tax-transfer systems, the direct effects of employment on poverty is better seen by an analysis limited to active-age individuals (Gábos et al., 2019; Cantillon et al., 2018; Cantillon and Vandenbroucke, 2014). Figure 6 displays the same indicators as Figure 5, but for the active age population this time.[6] The responsiveness of changes in AROPE(a) to changes in employment rate is more accentuated than in the case of the overall population, and AROP(a) also seems to be slightly more responsive, especially during the period of the Great Recession. The negative association with employment rate and the co-movement with AROPE(a) is visible in the case of SM(S)D(a) and QJ(a) rates, while the EU-27 average figures of AROP still show little variation in this period. However, when the AROP threshold is anchored in a fixed moment in time (year 2008 in our case), the negative association between employment and income poverty seems to be even stronger than for the two other indicators (SM(S)D and QJ).

Figure 5 Trends in the employment (left axis), the social target (AROPE) indicator (AROPE-2020 and AROPE-2030) and its components (right axis), total population, EU-27 average, %, 2005-2021

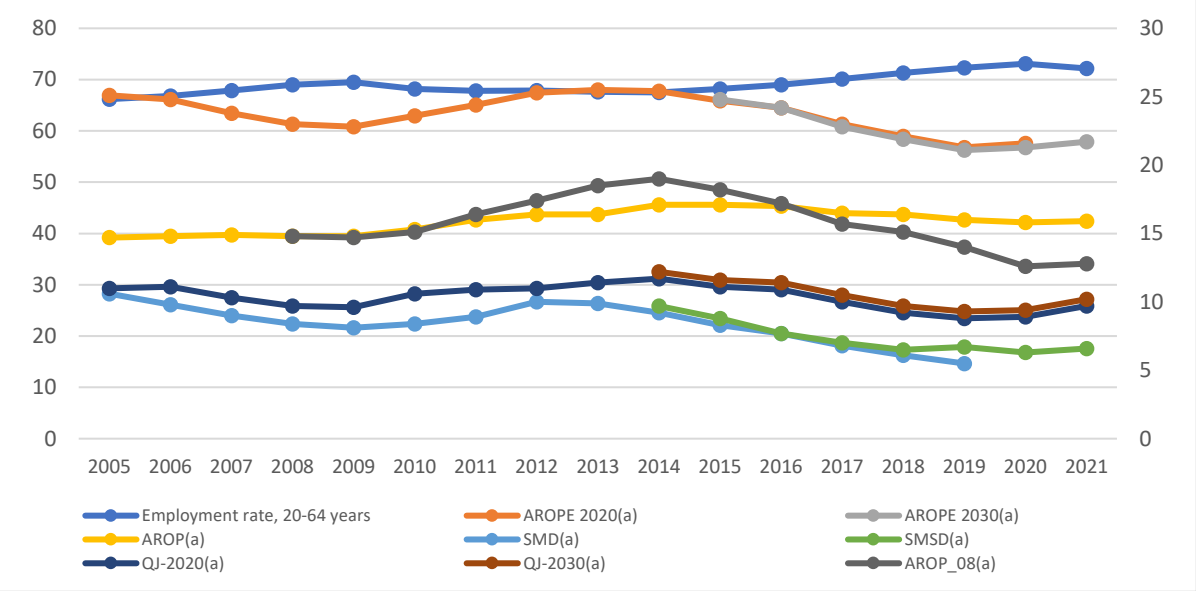


Source: Eurostat database, retrieved on 31/7/2023.

[6] In the case of AROP, the EU-average is calculated as a share of all individuals at risk of poverty in the EU according to the national threshold of all individuals in the EU. In the case of AROP(a) the 18-64 age restriction is applied to both the nominator and the denominator. EU-average for the severe material deprivation rate is expressed as the share of all individuals falling below the applied threshold (4 out of 9 items) in the EU among all EU citizens, while in the case of the very low work intensity rate, the share of individuals aged 18-64 living in households with a work intensity below 0.2 in the EU are calculated among EU citizens.

Notes. AROPE-2020: at-risk-of-poverty-or-social-exclusion rate, as for the EU 2020 strategy; AROPE-2030: at-risk-of-poverty-or-social-exclusion rate, as in the EPSR Action Plan. For AROPE-2020, EU-27 refers to the group of Member States 2007-2013 (including the UK, but excluding Croatia). For AROPE-2030, EU-27 refers to the group of Member States from 2020 (including Croatia, but excluding the UK). AROP: at-risk-of poverty rate. SMD: severe material deprivation rate, as component of AROPE-2020. SMSD: severe material and social deprivation rate, as component of AROPE-2030. QJ-2020: (quasi-)joblessness, as component of AROPE-2020. QJ-2030: (quasi-)joblessness, as component of AROPE-2030. For more details, see Box 1.

Figure 6 Trends in the employment (left axis)**, the social target (AROPE) indicator and its components, and anchored AROP rate** (right axis)**, active age population** (18-64)**, EU-27 average, 2005-2021**



Source: Eurostat database, retrieved on 31/7/2023.

Notes. The explanation of indicators is provided in the note below Figure 5. All measures in this figure refer to the population aged 18-64.

Overall, a visual observation of these co-movements at EU level indicate that trends in AROP, both for the overall and the active age population, does not reflect employment trends. This empirical observation stays at the base of an important strand of the social policy literature in the last two decades (see Box 3). Further, while those at risk of poverty constituted roughly the three fourth of all persons living in AROPE in 2022 (as seen in Figure 2), neither it co-moves with AROPE rates, in a similar way as the two other components do. Our later results, based on statistical analysis, will only strengthen this finding.

Box 3 The literature on the disappointing poverty trends

Despite the fact that AROPE as an aggregate measure consists the social target of the EU strategies, most of the relevant research literature has focused on the at-risk-of-poverty rate as the main income poverty outcome indicator during the last decade, prompting widespread disappointment and concern about relying on employment growth to reduce poverty. Explanations of these "disappointing" poverty trends focused on several factors. The declining capacity of welfare states to address relative income poverty, especially in the case of vulnerable households, was in the forefront of criticism (Cantillon and Vandenbroucke, 2014). More specifically, some scholars

investigated links between job creation, low wages and the adequacy of social protection (Collado et al., 2019). Also, the limited capacity of jobs to fully protect against income poverty was raised in the growing literature on in-work income poverty (e.g. Crettaz, 2013; Lohmann and Marx, 2019; Hick and Marx, 2022). Policy-relevant concerns pointed to the role of low wages (Marchal and Marx, 2018; Salverda, 2019), precarious forms of work (Eurofound, 2017; Horemans, 2019), long-term unemployment spells (Halleröd et al., 2015), and the number of workers in the household (Hick and Lanau, 2017; Tamayo and Popova, 2021). In addition, questions about the efficiency of social investment policies (Hemerijck, 2018) have also been raised since the end of the Lisbon decade (Cantillon, 2011; Vandenbroucke and Vleminckx, 2011), and debates continued among social policy scholars on the effectiveness of social investment policies and of vertical redistribution policies in reducing (relative income) poverty (Plavgo and Hemerijck, 2021; Parolin and Van Lancker, 2021).

A negative correlation between economic growth and unemployment is well-established. Empirical studies, both using macro- (Moller et al., 2003; Gábos et al., 2019; Tudorache, 2019) or micro-level data (Polin and Raitano, 2014; Valaavuo and Sirniö, 2022), support the hypothesis that employment and income poverty are also negatively correlated, this being more pronounced in crisis periods due to the increase in the share of jobless households (Corluy and Vandenbroucke, 2014; Marx et al., 2013; Gábos et al., 2019). In a recent study, Gábos et al. (2024) found that a 10 percentage-point (pp) increase in the individual employment rate is, on average, associated with a 1.8 pp decrease in AROP among the active-age population in Europe between 2004 and 2017, which estimates may vary depending on the alternative model specifications of employment to income poverty regressions. A recent Eurofound study also found that the employment rate is a predictor of the AROPE growth rate (Eurofound, 2023).

Finally, another aspect of the interactions needs to be mentioned here. Measuring the effect of employment on poverty measured in terms of relative income is complicated by the fact that an increase in employment may push up the floating threshold, and therefore may push down groups relying exclusively on non-market incomes or low paid workers and their households within the income dsitribution. This means that also having an „anchored" threshold is most informative. This anchoring may involve either fixing the AROP threshold based on external information (such as the estimated cost of an adequate consumption basket) or fixing it at a given point in time. In that context Atkinson (1998) raised the possibility of a pan-European reference point, to represent that the EU could also be understood as a social entity, and to introduce some more fixed benchmarks in addition to relative national income poverty rates. Brandolini (2007), Medgyesi (2008), Goedemé et al. (2019) and Gábos et al. (2022) provided estimates of income poverty rates computed based on various types of European income poverty lines. An income poverty measure anchoring the threshold at a certain point in time has been included in the EU monitoring system, namely the anchored AROP rate: initially fixed in 2005 terms when the indicator was adopted at EU level, then in 2008 (anchored for the 2008-2020 period as part of the Europe 2020 strategy), and most recently in 2019 (anchored for the 2019-2030 period of the Europe 2030 strategy), and we include this indicator in our analysis to complement it. It is worth highlighting that using this indicator implies that the income of the low-income people is compared to the poverty threshold as it was in 2008, solely increased by inflation, and that this anchored threshold, therefore, by definition, does not take into account the evolution of living standards in each country since 2008.

3.2 The developments of the employment, of the AROPE target indicator and its components over time at the level of Member States

EU level results are aggregates of country level developments, and the examination of EU averages may not be a reliable guide to the country-level relationship between employment and income poverty. As an example, there could be a strong relationship between employment increases and income poverty reduction for many individual countries, but if countries with a large population are characterized by different trends, then the dominant pattern could be masked in the aggregate. The underlying hypothesised/expected relationship is at country level, and this is what we analyse in what follows.

3.2.1. Over time developments in employment and income poverty trends

The results of our detailed analysis at country and at macro regional levels are presented in Annex 3 (Figures A3.1 to A3.6, with their background data in Tables A3.4 to A3.8). Our main findings reveal that behind the aggregate European figures there is large cross-country heterogeneity in the level and the time trend of the employment and the social target (AROPE) indicators, as well as of the components of the latter.

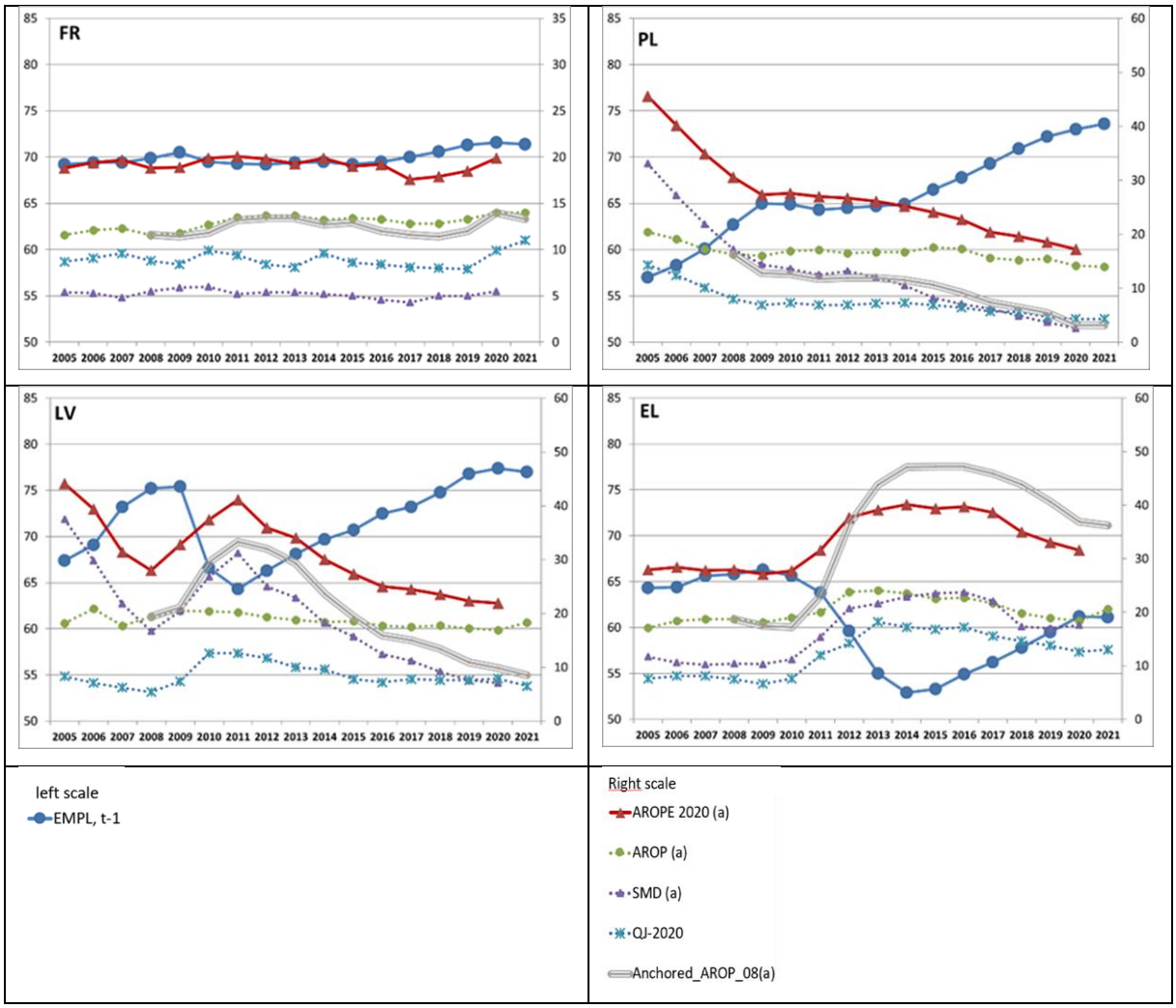
- Over-time employment trajectories, show very substantial differences across Member States and between geographical regions (Figure A3.1 and Table A3.4). For example, employment growth was larger in Germany and in the Netherlands than in other countries in the Continental region, while Belgium, France and Luxembourg seem to have shown less progress in this respect. There has been a strong convergence shown in the Northern part of Europe (between the Scandinavian and Baltic countries grouped together). In the Central-Eastern EU country grouping, there was no recessionary decline in Poland, and it was also small in Czechia. Other countries have shown a marked employment increase after the recovery, following the Great Recession. The scars of the crisis prevailed for long in a number of countries, most importantly in Greece and some other Southern countries.
- The heterogeneity within and between regions is also substantial when we observe levels and over time trends in AROPE rates across countries (Figure A3.2 and Table A3.5). Over time stagnation of AROPE (at low level) is seen in the group of Continental Member States (Austria, Belgium, France, Germany, Luxemburg, and the Netherlands) and in the Northern region (Denmark, Finland and Sweden). However, the decline of AROPE was substantial in most of East-Central Europe (most dramatically in Poland, Slovakia and Czechia) and in Bulgaria and Romania, while in some countries (like Hungary and Slovenia) there was a rise of this rate until around 2013 and 2014, followed by a massive decline later on only. Volatility of this trend was higher in the Baltic countries (most importantly in Latvia and Lithuania, and, to a lesser extent and at a lower level, for Estonia). The Southern countries showed large internal heterogeneity (Greece, with AROPE rates climbing to 40% and stayed there for some six years after 2012 being one extreme, and Malta being the other with the lowest levels and smallest volatility of AROPE rates).
- Turning to the AROPE components, cross-county differentials in AROP rate are also seen (Figure A3.3 and Table A3.6), but with less volatility: there was a decline of the active age AROP rates by at least 2 pp in 4 of 25 countries, it increased (by 2 pp or more) in 9 of the 27 countries, while in the rest of the EU, relative income poverty rates stagnated (remained the same in a plus-minus 2% range of the 2005 levels). There were, however, huge regional differences in levels and in time trends of severe material deprivation rates across Europe (see Figure A3.4 and Table A3.7). While SM(S)D rates of the active age population in the non-Southern EU-15 remained to be low (around or below 5% in Continental countries and between 5 and 10% in the UK and Ireland), they were in a different range in Bulgaria and Romania at the beginning of the period (but showing a spectacular decline later on), and also in the East Central Member States (some, like Poland and Slovakia, also showing large drops later on). The third

component, the share of persons living in (quasi-)jobless households, remained stubborn in many countries after the Great Recession (Figure A3.5 and Table A3.8). While these rates vary only marginally in the Continental Member States, there has been a significantly larger level of over time volatility in Southern Europe.

3.2.2 Joint over time developments in employment and AROPE trends at country level: mirrored patterns

The country level, over time observation of developments in the co-movement of and correlation between the employment and social target (AROPE) indicators, brings a special perspective into the understanding of this relationship (see Figure A3.6 for all Member States. With regard to the co-movements of employment, AROPE and its components, complemented with anchored AROP, one can distinguish some typical general patterns (see Figure 7).

Figure 7 The evolution of employment rate (left scale, for year t-1), AROPE-2020(a) and its components (AROP(a), SMD(a), QJ-2020(a)), and anchored AROP(a) in four idealtypical Member States, 2005-2021



Source: own editing based on data from the Eurostat Database.

From a broad perspective, one can identify four typical patterns that we represent here by the examples of four different countries (Figure 7). The first pattern is represented by France (but very similar developments can be observed in other countries like Belgium, Finland, and Luxembourg). The over

time change is very modest (at least as compared to the other countries), both in terms of employment, AROPE and its components. The second pattern (represented here by Poland, but also characterising Austria, Germany or Malta, among others), shows a massive and almost monotonous employment growth, with a corresponding decline in AROPE and relative income poverty rates. The third pattern, for which the Baltic States are the best examples (represented here by Lithuania), experienced relatively high volatility of employment, due to the shocks of the Great Recession in 2007-2008, but their trajectories are also characterized by quick recoveries in employment – mirrored by similar volatility in AROPE and components. Finally, a fourth pattern (represented by Greece here) is characterized by large employment shocks due to the Great Recession, followed by very slow recovery periods.

Taking an overview of trends in all the Member States, some general conclusions emerge regarding the co-movements of employment, AROPE and its components (see Figure A3.6).

- There is a marked mirror trend of employment and AROPE(a) in almost all countries. Exceptions are France, Luxembourg and Malta, where (at least in some relatively longer periods) employment and AROPE(a) move by and large parallel to each other.
- In countries where variation in employment is relatively small (Belgium, Finland and Italy, for example), AROPE(a) trends are also less volatile – but they do not go counter the mirror.
- In periods with significant employment growth, AROPE(a) increases very rarely (e.g. Hungary between 2011 and 2013, Italy between 2014 and 2017, Malta between 2009 and 2013, Sweden between 2007 and 2009).
- In countries characterised by moderately increasing employment (Belgium, Finland, France, Italy and Luxembourg), AROP(a) has shown similarly stagnant or moderately decreasing trends.
- In countries with steady employment growth, AROP(a) rates either remained stagnant or declined (but the decline seemed to be smaller than the speed of employment growth in the same countries). For example, Austria, Czechia, Germany, Malta, and the Netherlands belong to this group of countries.
- In many Member States, there was some volatility in employment trends (mostly in the period of or in the aftermath of the Great Recession) and AROP(a) rates in these countries have mirrored the evolution of the employment rates. Typical examples are the Baltic States, Ireland, Portugal or Greece, but this was the case in many other countries, differing from each other in the length of volatility and growth spells. The examples of Hungary or Poland can be mentioned here.
- In an overwhelming majority of countries AROPE(a), similarly to the EU average trends, correlates the most with SMD rate and there are only a very few countries (like Luxemburg, Sweden, and Spain) where the AROP(a) is the strongest covariate with AROPE.
- The co-movements of employment rate, AROPE(a) and anchored AROP(a) are also remarkably strong, especially compared to AROP(a), indicating that employment is more correlated with anchored AROP than to AROP (and consequently AROPE(a)), depending also on the relative share of AROP within AROPE in different countries.

3.2.3. Interactions between employment, AROPE and its components

In this part of our analysis, we provide basic correlations between employment rate, AROPE and its components, as well as their relationship with selected macroeconomic and social policy measures. We present two types of correlations: one between the values of two indicators at a certain point in time (level correlations) and the other between the values of a year to year change between consecutive years (first difference correlations). In the main text, we restrict ourselves to indicators referring to the period between 2005 and 2020.

3.2.3.1 Employment, AROPE and its components

Employment and AROPE-2020 correlates negatively and relatively strongly (-0.54 and -0.61, respectively), both in the total and the active age population. This means that an increase in employment rate is associated with a decrease in the AROPE rate in the period between 2005 and 2020 (Table 1). When first differences are used instead of levels, the correlation between employment and AROPE is still negative and relatively strong, but weaker.

Table 1 Correlations between employment rate (20-64) **and AROPE-2020 rate** (level and first difference)**, EU-28 Member States, 2005-2020**

var1	var2	Level	FD	N=
EMPL	AROPE	-0.54**	-0,39**	438
EMPL	AROPE(a)	-0.61**	-0.53**	410

Source. Own estimates based on data retrieved from the Eurostat database on 31/07/2023.

Notes. For abbreviations and definitions see Table A1.1. Correlation coefficients are significant at 5%* or 1%** level.

When analysed with AROPE-2020 components, employment rate correlates stronger with SMD and QJ-2020 rates, while less with AROP (Table 2). Furthermore, the AROP-employment correlation differs considerably between total and active population, either levels or first differences are used. This difference is markedly larger with FD, indicating that levels of relative poverty relate to employment more in the total population than their changes to employment changes. However, it is also worth noticing that none of the components correlate with employment as strongly as the aggregate AROPE-2020 itself: all correlation coefficients vary between -0.44 and -0.54 for the active age population, and -0.34 and -0.48 for the whole population, as opposed to the larger employment-AROPE coefficient values seen in Table 1. This latter means that employment also has an effect, independent of QJ-2020 on AROPE-2020, via its role in change of market generated incomes, contributing to decrease in SMD rates. Using FD, correlations are again weaker between employment and AROPE-2020 components (in some cases even non-significant), but the employment – (quasi-)joblessness relationship is an exception: in this case in both periods and both for the total and the active age population, correlation coefficients are larger than in the case of levels.

Table 2 The correlation between employment rate (20-64) **and AROPE-2020 components, 2005-2020,** (level and first difference)

var1	var2	Level	FD	N=
EMPL	AROP	-0.34**	-0.10*	465/437
EMPL	AROP(a)	-0.44**	-0.42**	
EMPL	SMD	-0.48**	-0.42**	438/410
EMPL	SMD(a)	-0.51**	-0.44**	
EMPL	QJ-2020	-0.44**	-0.62**	465/437
EMPL	QJ-2020(a)	-0.46**	-0.63**	

Source. Own estimates based on data retrieved from the Eurostat database on 31/07/2023.

Notes. For abbreviations and definitions see Table A1.1. Correlation coefficients are significant at 5%* or 1%** level.

An overall conclusion of the above analysis is that AROP is less reactive to employment than the other two AROPE components are. However, a balanced interpretation needs to stress that even the employment-AROP correlation is substantial, especially in the active age population.

As already highlighted earlier in the paper, observing the change in poverty using an anchored threshold (fixed it in 2008 in our case) can add to the depth of the analysis. Hence, it is informative to compare correlations between the anchored AROP and employment rates for the period between 2008-2020 to the ones between employment and "current" AROP rates, both for the total and the active age population, for the period between 2008 and 2021 (Table 3). We find that employment rate is correlated considerably stronger with anchored AROP than with any of the AROPE components, including AROP. The correlation coefficient is the same, -0.59 both in the case of the overall and the active age population, while we estimated previously a correlation coefficient of -0.44 between employment rate and AROP(a). The FD correlation between employment and anchored AROP is even slightly larger than in the case of indicator levels.

Table 3 Correlation of employment rate (20-64) **with AROP and anchored AROP, respectively, in total and active age population, 2008-2021** (level and first difference)

		AROP	Anchored AROP
Total population	level	-0.36**	-0.59**
	FD	0.098	-0.60**
Active age population (18-64)	level	-0.48**	-0.59**
	FD	-0.35**	-0.65**

Source. Own estimates based on data retrieved from the Eurostat database (on 31.07.2023).

Notes. For abbreviations and definitions see Table A1.1. Correlation coefficients are significant at 5%* or 1%** level. N=375-387/348-386.

3.2.3.2 AROPE and its components

AROPE-2020(a) correlates most with SMD(a) and to a somewhat lesser extent the AROP(a) rate, and least with the QJ-2020(a) rate (Table 4). The correlation coefficients between AROPE-2020(a) and QJ-2020(a) is, however, stronger and comparable in its level to that between AROPE-2020(a) and AROP(a) when first differences are considered. Between components, the strongest correlation is estimated between AROP(a) and SMD(a), while QJ-2020 correlates only weakly with the other two. The correlation of first differences is considerably stronger between SMD(a) and QJ-2020(a) when levels are used.

Table 4 Correlations of AROPE components with AROPE and with each other, in active age (18-64) **population, EU-28 Member States, 2005-2020** (level and first difference)

		AROP(a)	SMD(a)	QJ-2020(a)
AROPE-2020 (a)	level	0.74**	0.91**	0.41**
	FD	0.55**	0.89**	0.66**
AROP(a)	level		0.48**	0.34**
	FD		0.29**	0.36**
SMD(a)	level			0.17**
	FD			0.49**
		N=438-465/410-437		

Source. Own estimates based on data retrieved from the Eurostat database on 31/07/2023.

Notes. For abbreviations and definitions see Table A1.1. Correlation coefficients are significant at 5%* or 1%** level.

Box 4 The relationship between employment, AROPE-2030 and its components

Europe 2030 target indicators are in effect (within the frame of the EPSR) since 2020, with a 2019 reference year, as detailed in Box 1. These new components have been calculated since 2014/2015 and, therefore, for a shorter time period and hence with less statistical reliability, but the relations of the AROPE-2030 elements can also be observed and interpreted.

A comparison for the overlap years shows that the change in the calculation of the indicator on work poor households has led to an overall decrease in its value in various countries (the unweighted average of the QJ-2030(a) rates is around 90% of QJ-2020(a) rates), with a relatively smaller change in its variance across countries. For the deprivation indicators, on the contrary, the average did not change considerably: the average of SMSD(a) rates was around the same as those of SMD(a) rates, but the cross-country variance has increased enormously.

With regard to the relationship between employment and AROPE, we found that a shift to AROPE-2030 did not result in a significant change in the estimated coefficient. The correlation gets somewhat lower in the total population (-0.51) and somewhat larger in the active age population (-0.63), but these do not represent significant differences. It would also be difficult to tell whether this comes from the different period lengths (7 years from 2015 onwards vs. 16 years from 2005 onwards) or from actual developments in the field. When first differences are used instead of levels, the correlation between employment and AROPE is still negative and relatively strong, but weaker.

Also for AROPE-2030, it is seen that employment correlates most with the severe material and social deprivation rate and the (quasi-)joblessness rate, while somewhat less with AROP. However, it worth noticing that none of the components correlate with employment as strongly as the aggregate AROPE itself. Using first differences, correlations are again weaker between employment and AROPE components (in some cases even non-significant), but the employment – (quasi-)joblessness relationship is an exception: in this case in both periods and both for the total and the active age population, correlation coefficients are larger than in the case of levels.

The aggregate AROPE-2030(a) correlates most with SMD(a) and to a somewhat lesser extent the AROP(a) rate, and least with the QJ-2020(a) rate. The correlation between AROP(a) and AROPE-2030(a) is stronger than the correlation we have seen between AROP(a) and AROPE-2020(a) – however, again, it is difficult to disentangle if this is because of the different periods covered or a result of the change in the actual relationship between the components of AROPE(a). The correlation coefficients between AROPE(a) and QJ(a), is stronger and comparable in its level to that between AROPE(a) and AROP(a) when first differences are considered.

Between components, the strongest correlation is estimated between AROP(a) and SMD(a), while QJ-2020 correlates only weakly with the other two, while there is no significant correlation between QJ(a) and SMSD(a) at 5% level. The correlation of first differences is considerably stronger between SM(S)D(a) and QJ(a) in both periods compared to when levels are used.

3.2.3.3 Employment, AROPE and their macro contexts

We consider four macroeconomic income-based benchmarks to analyse the correlation of employment and income poverty indicators with variables reflecting the level of economic development:

- per capita Gross Domestic Product (GDP), as the most often used measure of economic affluence of nations;
- per capita Gross National Income (GNI), as a macro measure that is a closer reflection of macro value added actually available to the citizens of a given country (GNI equals the sum of a

country's income net of foreign factor incomes, hence provides a closer estimate to the incomes actually available for the domestic households in a country[7]);
- per capita unadjusted gross household disposable income (GHDI) growth index (2008=100), as a national account-based measure of the income of households; and
- the national AROP threshold based on EU-SILC survey, a measure used as a survey-based proxy for household incomes (see Table 5 for Employment and AROPE, and Table A1.1 for definitions).

In addition, annual expenditure on social protection benefits, excluding pensions (classified by ESSPROS), as percentage of GDP is used to measure the welfare effort of governments.

Employment level correlate positively, significantly, and fairly strongly with all macro measures of income, meaning that higher employment is associated with higher income, regardless of how income is measured (Table 5). The correlation of employment rate is strongest with per capita GNI (0.48) and the GHDI index (0.51), and is also stronger for income poverty threshold (0.44) than with per capita GDP (0.36). Overall, however, the difference between coefficients is not very large. The magnitude of the correlation coefficient of employment rate with the social protection expenditure (excl. pensions) variable is very similar (0.41). There are larger differences in estimates when yearly changes are compared (FD is applied). Both per capita GNI, per capita GHDI and income poverty threshold are still positively and significantly correlated with employment, and the coefficients are only slightly lower compared to when levels are used. However, the employment rate – per capita GDP coefficient is not significant at any level, meaning that yearly changes in GDP levels were not statistically related to yearly changes in employment during the period in the analysis. Finally, the coefficient for the social protection expenditure (excluding pensions) variable is still significant, but considerably smaller (0.16) when FD is applied. The coefficients are still positive, which indicates that higher employment levels are associated with higher social protection expenditure.

AROPE-2020 levels are negatively and significantly correlated with income measures, both in the total and the active age population. This means that (regardless of their concepts and measurement) higher macro income levels are associated with lower levels of at-risk-of-poverty or social exclusion rates across the EU. The largest coefficients were estimated with the per capita GNI and with the income poverty threshold, but per capita GDP also strongly correlates with AROPE-2020. Per capita GHDI proved to be the weakest correlate in this respect. Levels of AROPE rates, both in the total and the active age population, are also significantly, strongly, but negatively correlated with levels of social protection expenditure (excl. pensions). If we differentiate between different main expenditure types, means-tested cash benefit expenditures are correlated with AROPE-2020 at a considerably lower level (-0.22 in the total population, -0.13 in the active-age population) than in the case of non means tested cash benefits (-0.46 and -0.42, respectively) or in-kind benefits (-0.55 and -0.46, respectively). Also, unemployment benefits are less correlated with the social target indicator (-0.25 in the total population and -0.18 in the active-age population) than family and child benefits (-0.42 and -0.38, respectively) or social exclusion benefits not elsewhere classified (-0.39 and -0.33, respectively). Results are very similar when AROPE-2030 is examined for a shorter period of time, which points to the robust relationship between AROPE, economic performance and social protection expenditure. First differences are much less correlated, except for the GHDI index (again, as it is found for AROPE-2020, but only for the total population). Further, the correlation between AROPE-2030 and the social protection expenditure (pensions excluded) variable is also negative and significant. Active age estimates are weaker compared to the total population coefficients, gain, similarly to what we could observe for AROPE-2020.

In the case of FD, per capita GHDI becomes the strongest correlate: the value of the estimated coefficient is twice as high as compared to when levels are applied, while for all other income variables the coefficients are much smaller, and even not significant for per capita GDP and the poverty threshold

[7] More precisely, GNI is „equal to GDP minus primary income payable by resident units to non-resident units, plus primary income receivable from the rest of the world (from non-resident units to resident units).” (Eurostat https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Gross_national_income_(GNI))

for the period between 2014-2021. Neither is significant the correlation between AROPE and social protection expenditure, independently from the reference population or the time period in analysis.

Table 5 Correlation between employment rate, AROPE and various macroeconomic and social policy indicators, EU-28 Member States, 2005-2020 (level and first difference)

		GDP per capita	GNI per capita	GHDI index (=100)	Income poverty threshold	Social protection expenditure, (excl. pensions, % of GDP)
Employment rate	level	0.36**	0.48**	0.51**	0.44**	0.41**
	FD	0.01	0.40**	0.42**	0.35**	0.16**
AROPE-2020	level	-0.50**	-0.61**	-0.26**	-0.60**	-0.58**
	FD	-0.19**	-0.13**	-0.44**	-0.10	0.02
AROPE-2020(a)	level	-0.44**	-0.53**	-0.37**	-0.51**	-0.49**
	FD	-0.21**	-0.22*	-0.52**	-0.21**	-0.001
AROPE-2030	level	-0.37**	-0.49**	-0.10	-0.50**	-0.51**
	FD	0.02	-0.18**	-0.28**	0.09	0.03
AROPE-2030(a)	level	-0.28**	-0.37**	-0.28**	-0.35**	-0.35**
	FD	-0.001	-0.27**	-0.25**	-0.07	0.03

Source. Own estimates based on data retrieved from the Eurostat database on 31/07/2023, and from the World Development Indicators database of the World Bank on 03/08/2023, for the GNI per capita.

Notes. Income poverty threshold – 60% of the national median equalised household disposable income (after social transfers). Employment rate is calculated for population aged 20-64. For abbreviations and definitions see Table A1.1. Correlation coefficients are significant at 5%* or 1%** level. N=175-475.

4 Beyond employment: The role of other than individual employment factors in reducing poverty and social exclusion

In the previous section, we analysed - visually and using correlation analysis – the trends in employment, and poverty and social exclusion in Europe and the member states of the EU. We found that employment contributes to reduction in AROPE and all its components, although at a varying degree. In this section, we turn our attention to other factors that play an important role in mediating the relationship between employment and poverty outcomes. First we show that not only actual data, but simulations for the future also provide evidence that employment is an important contributing factor to poverty reduction. However, these results indicate that an achievement in employment targets does not necessarily lead to the fulfilment of the social target, at the same time. Second, an overview of the poverty reduction capacity of social transfers between 2009 and 2019 in the European Member States will be provided. Third, we perform multivariate regression analysis to account for the role of other factors: the distribution of jobs across households, the quality of employment, social benefits and changes in the median income (which points also to the role of conceptual and methodological choices). Fourth, the role of demographic factors, changes in the household structure in our case, on poverty is also assessed.

4.1 The potential impact of employment on the poverty and social exclusion target: simulations for the future

We use simulation techniques to analyse what we can expect for the future developments of the at-risk-of-poverty rates and of the poverty and social exclusion objectives, by increasing the employment rate of the active-age population under different scenarios. For the simulations, we use shift-share analysis and a regression-based model. The scenarios are based on assumptions about a) the allocation of jobs, b) the evolution of the income poverty threshold and c) income poverty trends among (quasi-)jobless households. Table 6 provides an overview of applied scenarios.

First, we conducted a shift-share analysis by increasing the employment rate in the 26 EU countries for which the employment rate falls below the 2030 target to the level[8] of i) 78% of the working age population (20-64 years old) using EU-SILC data from 2020, the income reference year of which is 2019, and ii) to the level of the country-specific employment rate target for 2030. The at-risk-of-poverty rate for 2030 is simulated in two different scenarios: (i) in which additional jobs are allocated first to unemployed individuals and the remaining part to the inactive population, and (ii) in which additional jobs are allocated first to individuals living in very low-work-intensity households, the remaining part, if any, is allocated to individuals in low-work-intensity households. For the different groups, including (quasi-)jobless households, at-risk-of-poverty rates (AROP(a)) observed in 2020 (income reference year 2019) are used. The combination of these criteria provide Scenarios 1-4 in Table 6.

Overall, at-risk-of-poverty rates decrease when the weight of the working population is increased to the level of the 2030 employment target. Not surprisingly, countries (e.g. Lithuania and Czechia) with a current employment rate very close to the Europe 2030 target experience the smallest drop in income poverty (see Figure 8). Income poverty decreases are strongest if job growth is assumed to reach the (quasi-)jobless households first. When country-specific employment rate targets are applied, AROP(a) also decreases in all Member States (Figures A3.7).

Further, the same scenarios are used as described above, but instead of keeping the income poverty rates constant when adjusting the shares of the unemployed/inactive/individuals living in (quasi-)jobless household, we assume that the within groups AROP(a) trends of the past (between the income years 2009-2019) were continued (see Figures A3.9 and A3.10). The rationale for this sensitivity test is that in the past, in many countries, a simultaneous increase in employment and the risk of poverty among job poor households was observed, suggesting a link between the way new jobs were created and the social protection available for those who did not benefit from job growth (Cantillon & Vandenbroucke, 2014). These scenarios are show as 5-8 in Table 6.

Figure 9 shows that assuming the continuation of AROP(a) trends within the groups of very low and low work-intensity households observed in the past, in most countries the expected decrease of AROP(a) rates would be overall smaller compared to the first set of scenarios suggested above, due to, among other things, the potential impact of social protection. In this scenario, in Portugal and Lithuania, the simulated at-risk-of-poverty rates for 2030 are even higher than the baseline AROP(a) rate in 2020, even if individuals in (quasi-)jobless households are simulated into work first. The same patterns are observed when country-specific employment targets are considered (Figure A3.8).

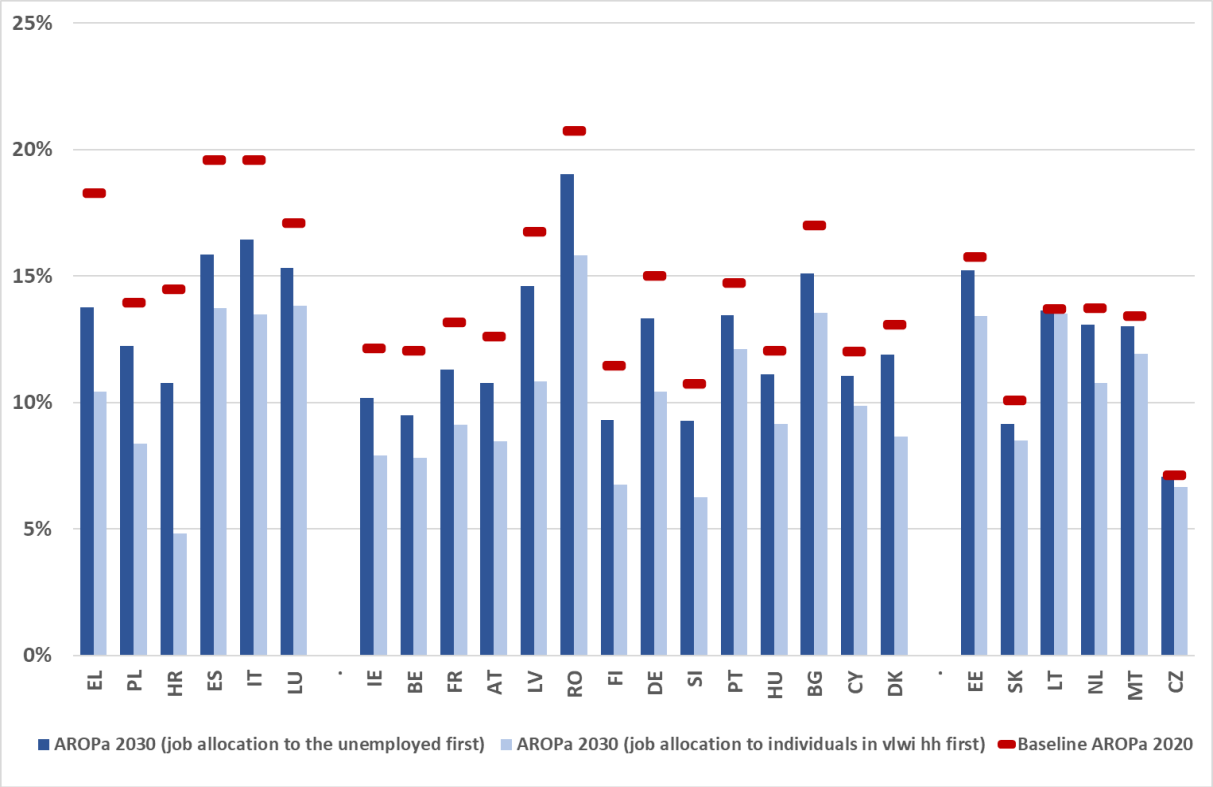
[8] Sweden is out of exercise, as the employment target is already reached.

Table 6 Overview of scenarios applied in various simulations (using shift-share and regression-based analysis) **on the impact of employment increase on poverty outcomes**

Scenario	Poverty outcome	Figures in which the scenario is shown	Assumptions			
			Employment target	Allocation of jobs	Evolution of income poverty threshold	Income poverty trends
Scenario 1	AROP(a)	Figure 8, 10	78% of the working age population (20-64 years old)	Shift-share approach: unemployed and inactive first	Fixed poverty line anchored in 2020	Observed AROP(a), income 2019
Scenario 2	AROP(a)	Figure 8, 10	78% of the working age population (20-64 years old)	Shift-share approach: (quasi-)jobless and low work intensity hhs first	Fixed poverty line anchored in 2020	Observed AROP(a), income 2019
Scenario 3	AROP(a)	Figure A3.7	Country-specific employment rate target for 2030	Shift-share approach: unemployed and inactive first	Fixed poverty line anchored in 2020	Observed AROP(a), income 2019
Scenario 4	AROP(a)	Figure A3.7	Country-specific employment rate target for 2030	Shift-share approach: (quasi-)jobless and low work intensity hhs first	Fixed poverty line anchored in 2020	Observed AROP(a), income 2019
Scenario 5	AROP(a)	Figure 9	78% of the working age population (20-64 years old)	Shift-share approach: unemployed and inactive first	Fixed poverty line anchored in 2020	Continuation of 2009-2019 AROP trends
Scenario 6	AROP(a)	Figure 9	78% of the working age population (20-64 years old)	Shift-share approach: (quasi-)jobless and low work intensity hhs first	Fixed poverty line anchored in 2020	Continuation of 2009-2019 AROP trends
Scenario 7	AROP(a)	Figure A3.8	Country-specific employment rate target for 2030	Shift-share approach: unemployed and inactive first	Fixed poverty line anchored in 2020	Continuation of 2009-2019 AROP trends
Scenario 8	AROP(a)	Figure A3.8	Country-specific employment rate target for 2030	Shift-share approach: (quasi-)jobless and low work intensity hhs first	Fixed poverty line anchored in 2020	Continuation of 2009-2019 AROP trends
Scenario 9	AROP(a), AROPE	Figure 10, 11	78% of the working age population (20-64 years old)	RB approach: unemployed and inactive first	Floating at-risk-of-poverty line	Observed AROP(a) and AROPE, income 2019
Scenario 10	AROP(a), AROPE	Figure 10, 11	78% of the working age population (20-64 years old)	RB approach: unemployed and inactive first	Fixed poverty line anchored in 2020	Observed AROP(a) and AROPE, income 2019

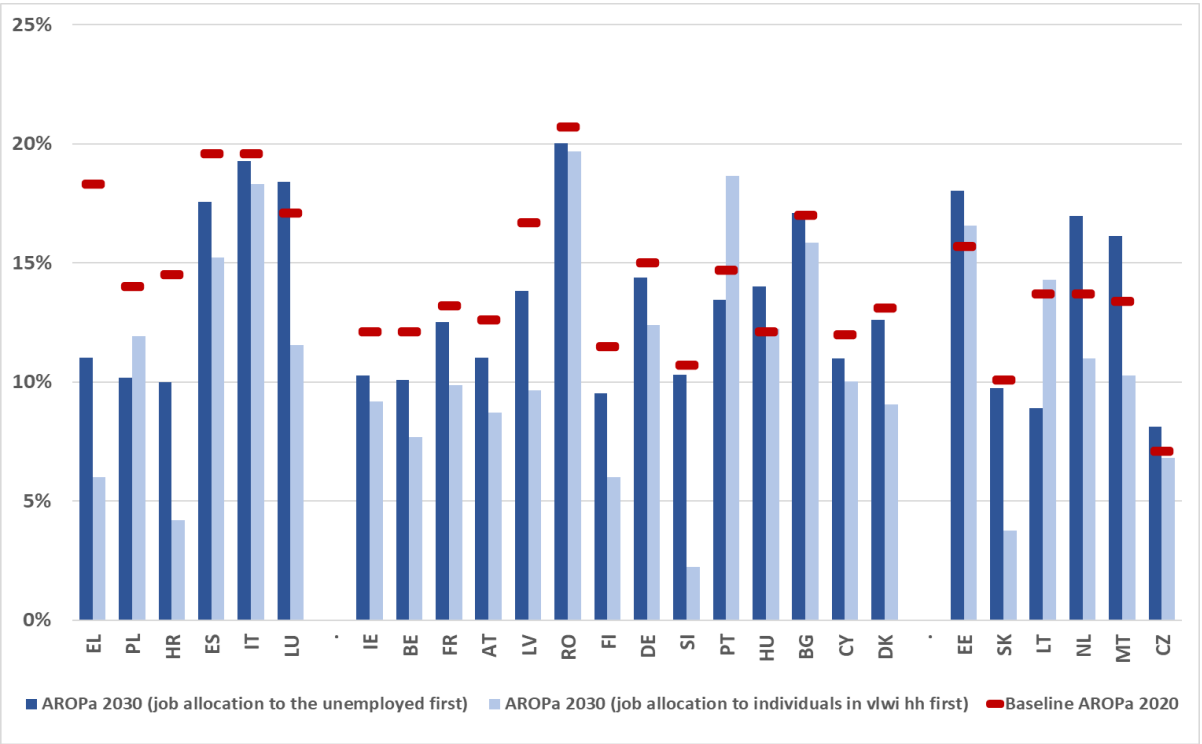
Source: own editing.

Figure 8 AROP(a) after increasing employment rate to 78% of the population aged 20-24, using shift-share (SS) in two different scenarios of job allocation, EU-27 (excl. Sweden)



Note: Calculations are based on EU SILC 2020. Countries are ranked according to observed employment rates in 2020.

Figure 9 AROP(a) after increase in employment rate to 78% if within group income poverty trends between 2009-2019 are continued in two different scenarios of job allocation, EU-27 (excl. Sweden)



Note: calculations are based on EU SILC 2020. Countries are ranked according to their observed employment rates in 2020.

Second, we performed a regression-based analysis to distribute jobs from employment increase that takes into account the various factors that determine individual's job chances. Similar to the method employed by Marx et al. (2012), a multinomial logit model is used to estimate the probability that an unemployed person of working age will work full-time, part-time, or remain unemployed. The following independent variables are used: gender, age, age squared, a dummy for the presence of a partner, the number of children, the logarithm of all other incomes in the household other than the individual's labour income, the highest education obtained (in four categories), a dummy for the country of birth (EU as a reference), and a dummy for limitations in daily activities (yes/no). To capture the variance of the dependent variables for men and women, we incorporate interaction terms between sex, age, the presence of a partner, the number of children and the country of birth.

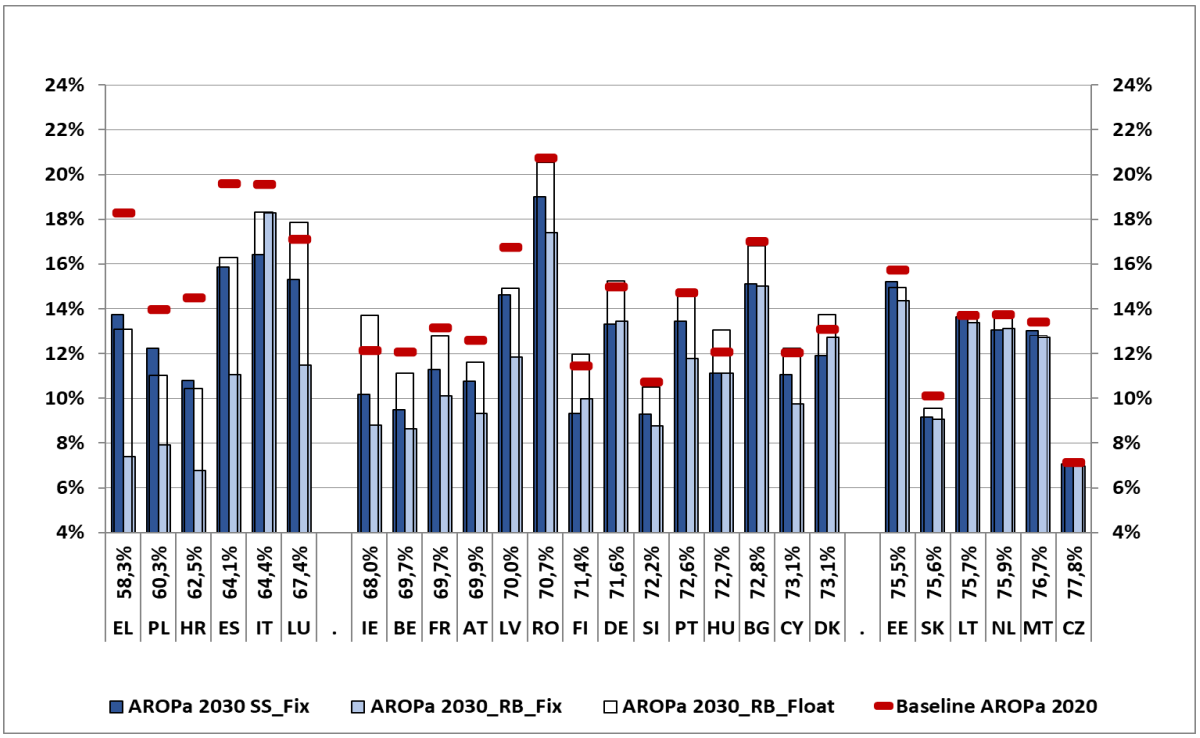
We evaluate the impact of changing employment rates on at-risk-of-poverty rates using two different benchmarks: in a first scenario, we recalculate the at-risk-of-poverty threshold taking into account the increased employment rates (Scenario 9 in Table 6). In a second scenario, we use a fixed income poverty line (Scenario 10 in Table 6).

When the allocation of jobs is simulated taking into account the statistical likelihood of individuals to move into employment (RB approach), the impact on AROP(a) is generally smaller than in the previous shift share analyses, where jobs were allocated first to the unemployed and the (quasi-)jobless households (Figure 10). In high employment countries, the hypothetical impact is obviously very small or non-existent. In low employment countries, the impact remains significant when the at-risk-of-poverty threshold remains fixed. If we assume that the income poverty threshold increases when employment raises, the theoretical impact of increasing employment rates is, however, negligible (or negative) in more than half of the countries (where the baseline employment is moderate or high). In this scenario, only in countries with low employment rates a significant positive impact on AROP(a) is observed[9].

Figure 11 shows the simulated effect of employment growth on two out of the three dimensions of AROPE (at-risk-of-poverty and (quasi-)joblessness). The results are compared with the national AROPE targets. Assuming that the income poverty thresholds will increase due to employment growth (floating income poverty line scenario) and assuming that additional jobs are allocated according to individual's job chances none of the countries attain the 2030 AROPE target. In the fixed income poverty line scenario the target is met only in Belgium, Spain, France, Ireland, Luxembourg and Poland. As said in these calculations the severe material and social deprivation (SMSD) rate is kept constant when simulating job growth. While increases in employment rates have a direct impact on household work intensity and incomes, the impact on SMD is indirect and therefore difficult to model. It is likely that in countries where SMSD is high, our simulations underestimate the impact of employment growth on AROPE.

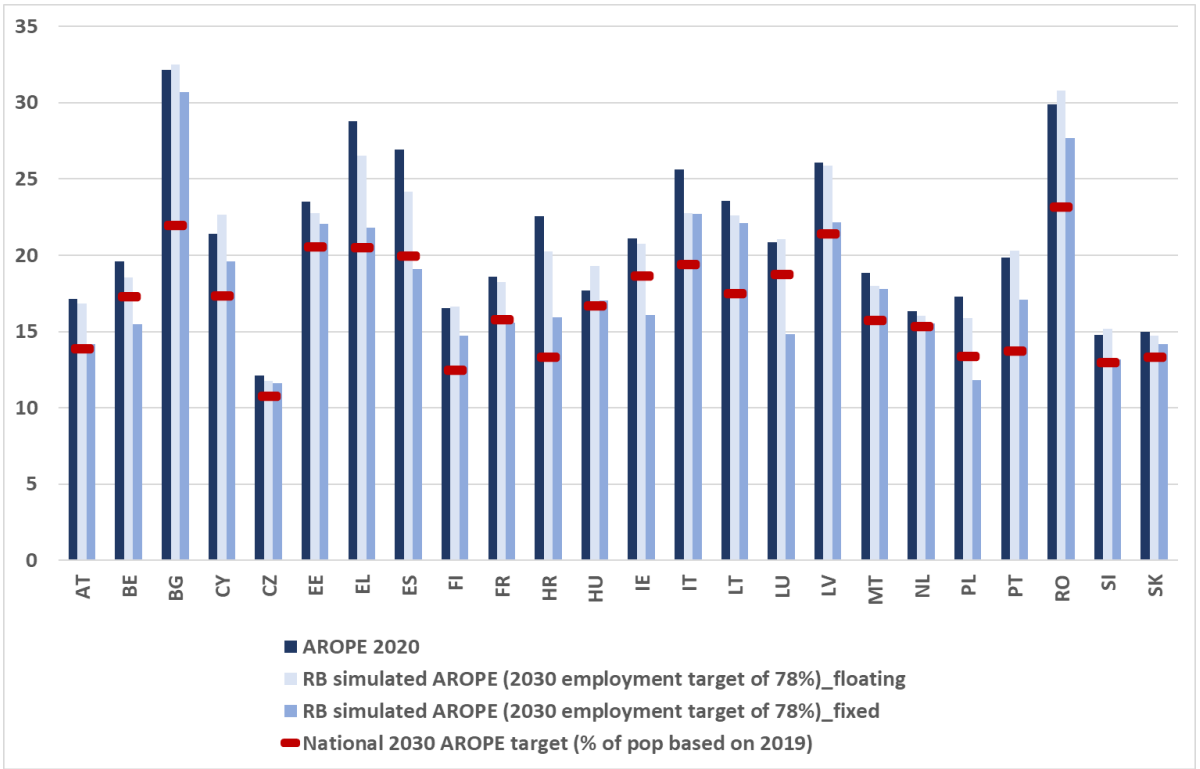
[9] The fact that in some countries with similar starting points in employment and AROP (see e.g. Belgium and Ireland), there may be a positive or negative impact on AROP resulting from the change of the AROP threshold. This might depend on various factors, including the proportion of jobs that can be allocated to work-poor households, or differing personal and household charactristics of those back to work. Nevertheless, getting a better answer to this would require further research.

Figure 10 AROP(a) before and after increase of employment to 78% using shift share (SS) **and RB approach** (fixed and floating income poverty line, job allocation to the unemployed first)



Note: calculations are based on EU-SILC 2020. Countries are ranked according to their observed employment rates in 2020.

Figure 11 AROPE(a) rates before and after increase of employment to 78% (fixed and floating income poverty line, SMSD kept constant) **compared to national 2030 AROPE targets**



Note: calculations are based on EU-SILC 2020. Germany and Denmark are excluded as they express their 2030 income poverty reduction targets as a reduction in the number of persons living in (quasi-)jobless households. SMSD is kept constant.

In summary, the simulation exercises indicate that in most countries attaining the employment targets alone is insufficient to achieve the poverty and social exclusion objectives. The way jobs are distributed among households, the evolution of the at-risk-of-poverty rates among (quasi-)jobless households, and the impact of job growth on median incomes are crucial factors in this regard.

4.2. The poverty reducing capacity of social transfers

It is well documented that alongside the growth in employment, the poverty-reducing effectiveness of social transfers has diminished (Cantillon and Vandenbroucke, 2014; Fischer and Strauss, 2021). This also occurred during the good years between the financial and COVID-19 crises. Figures A3.9, A3.10, and A3.11 display the evolution of employment rates and the poverty reducing capacity (PRC)[10] of social transfers for jobless and non-jobless households in the 2009-2019 decade. Between 2009 and 2019, employment rates increased to end up at higher levels than before the outbreak of the financial crisis while the poverty reducing capacity of social transfers declined in many countries. That in itself is not surprising: as unemployment falls, so does the need for social protection. However, we also observe downward trends of the poverty reducing capacity of social transfers for jobless households that further declined to very low levels: among the population living in jobless households, the percentage of people lifted out of poverty through social benefits ranges between a very low 8.9% in Malta, 14.8% in Sweden and 46.3% in Ireland at the eve of the health crisis. Although differences across countries are considerable and there are some exceptions, the weakening of the poverty reducing capacity of social protection for jobless households is a fairly universal trend, which is arguably linked to the sluggish growth of minimum wages (Cantillon et al., 2020; Hick and Marx, 2022; Lohmann and Marx, 2018; Marchal, 2017), tightened eligibility criteria, increased conditionality, as well as to the fact that more people work in non-standard jobs, that do not always entitle social insurance protection (Eichhorst and Konle-Seidl, 2008; Knotz, 2018; Weishaupt, 2013; Bonoli and Natali, 2012; Clasen and Clegg, 2011; Immervoll, 2009; Immervoll and Scarpetta, 2012).

4.3 The mediating factors of the employment-poverty relationship: a multivariate analysis

4.3.1 Short literature review and methods applied

Explanations for stagnant relative income poverty rates in the EU overall, despite rising employment, can be grouped into five interrelated *mediating mechanisms* (see Figure 12, also Gábos et al., 2024).[11] The first concerns **who benefits from job growth and how job growth is distributed among households**. Studies like Corluy and Vandenbroucke (2014) and Gábos et al. (2019) have shown that in the pre-crisis period, employment growth benefited households already integrated into the labour force, while governments were less successful in activating people living in (quasi-)jobless households. Gábos et al. (2024) found that when they moved from individual measurement of employment to household level, their estimated employment- income poverty elasticity increased.

[10] Poverty reducing capacity (prc) is defined as follows: prc=(〖pov〗 _b- 〖pov〗 _a)/ 〖pov〗 _b, where:
povb = the total at-risk-of-poverty rate before social transfers; pova = the total at-risk-of-poverty rate after social transfers.

[11] This analysis is concerned on how changes in individual employment (as the main employment target of consecutive European strategies) are related to changes in poverty outcomes, considering that poverty is a household concept. While a very important aspect regarding future societal developments, we are not interested here in what are the drivers of individual employment.

The **quality of the new jobs** represents the second factor. Structural changes in the labour market have led to an increase in non-standard and precarious employment, such as part-time, fixed-contract or pseudo-self-employment arrangements, contributing to labour market polarisation and a rise in in-work poverty (Alper et al., 2021; Brülle et al., 2019; Valaavuo and Sirniö, 2022).

A third mechanism concerns **the evolution of low wages**, affected by minimum wage policies in particular, compared to median income. Nolan (2018) for example emphasises the importance of supporting low wage growth in translating economic growth into income poverty reduction, and Cantillon et al. (2020) highlight downward pressure on low wages compared with median household incomes. The role of minimum wages in poverty reduction is also discussed in the literature (e.g. Burkhauser et al. 2023; Collado et al., 2017; Gábos and Tomka, 2022¸ Gindling, 2018). Increased minimum wages, on the one hand, may have a displacement effect on unskilled workers, increasing their risk of poverty. On the other hand, higher minimum wages may provide stronger incentives for unemployed and long-term unemployed to take up work. Due to the lack of reliable yearly and comparative data for all Member States that may serve as a good proxy, this mechanism is addressed only to a limited extent in the analysis below.

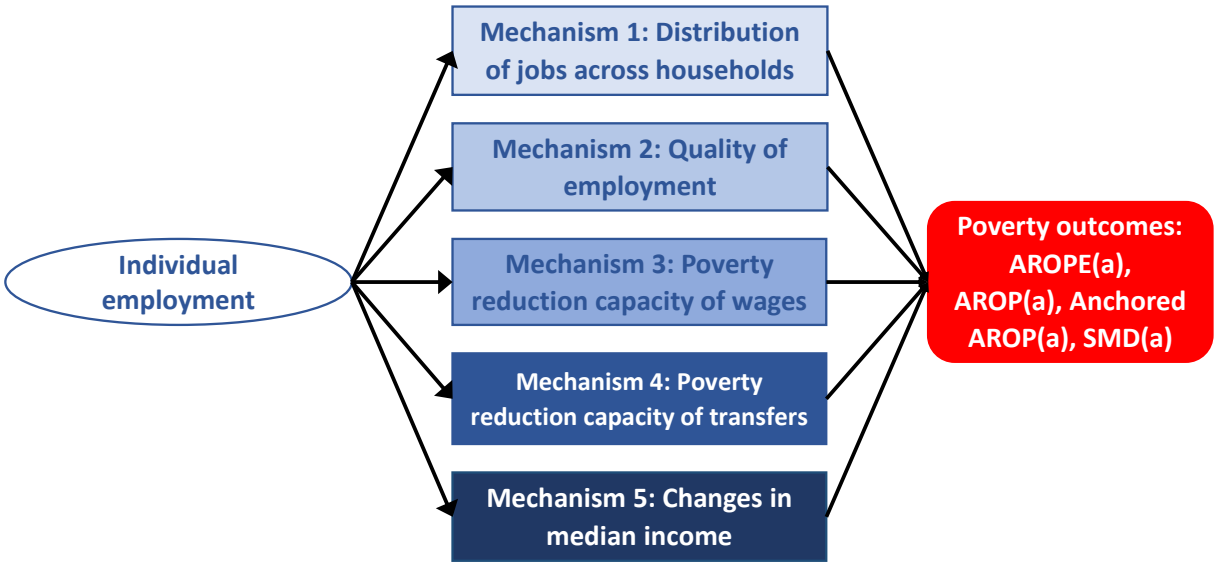
Fourth, the **declining effectiveness of redistribution** (Caminada et al., 2012; Holler et al., 2003; Nolan and Marx, 2009; Marx et al., 2015; Notten and Guio, 2019) may also have contributed to the income poverty standstill (Cantillon, 2011; Cantillon et al., 2020; Chen et al., 2018), adding to the declining adequacy of minimum income and social protection schemes in many Member States since before the Great Recession (Gábos and Tomka, 2022; Causa and Hermansen, 2017). Comparative research on minimum income schemes indicates an ongoing general retrenchment of their adequacy (e.g. Gábos and Tomka, 2022), but also highlights a stronger link between employment and social transfers in the recovery period through increased conditionality of benefits on taking up work, especially in Central-Eastern Member States (Knotz, 2018; Weishaupt, 2013). The difficulty of reducing income poverty through social transfers while not discouraging work nor running large public deficits is exacerbated when wage floors decline relative to median household incomes (Cantillon and Vandenbroucke, 2014; Collado et al., 2016). Higher public social spending is associated with lower income inequality and poverty but tends to benefit the elderly more than the working-age population, especially in Western and Southern Europe (McKnight et al., 2016; Chen et al., 2018; Chzhen et al., 2017; Jaumotte et al., 2013).[12]

The fifth intervening factor concerns **the trajectory of median income and its impact on relative income poverty thresholds** (Marx and Nolan, 2012; McKnight et al., 2016; Jenkins, 2020). When incomes near or below the income poverty line do not keep pace with overall income growth, which can occur for a variety of reasons, income poverty stagnates or increases. Conversely, during recessions, a decreased threshold may result in reduced levels of relative income poverty.[13] Various factors, many of them discussed above, contribute to the unequal increase in incomes across the distribution. Job gains may increase the share of two-earner households in the first place, and short-term unemployed individuals may find a job more easily than long-term unemployed persons during recovery. Also, the upward shift in the poverty threshold in times of economic expansion may hinder individuals in jobless households from crossing it.

[12] It is not only the incidence of benefits, but also the incidence of taxes on various segments of income distribution that may also matter for poverty outcomes. In this paper, however, we only focus on the benefit side, as the income poverty concept involves net incomes.

[13] In the case of overall income poverty rates, the changes in the relative income position of pensioners provides an additional complexity to the picture.

Figure 12 Core factors that may mediate the impact of employment growth on income poverty



Source: own editing.

The aim of the multivariate regression analysis followed here, is twofold: (i) to identify the *ceteris paribus* relationships between employment rate and various poverty measures to strengthen the validity of previous findings, and (ii) to assess the role of the five mediating mechanisms presented in Figure 12. To achieve our aim, we built 1) country-level panel fixed-effect regressions (TSCS) and 2) first difference (FD) models (for methodological details, see Annex 2).

We ran the models for AROPE(a) and for two of its components, AROP(a) and SMD(a). The third component, QJ-2020(a), was dropped from the analysis, as it is one of our main covariates, either as a category of the household work intensity variable or as a stand-alone variable in the model. Instead, the anchored AROP(a) is also used as a left-hand variable, to account for the fifth mechanism (changes in the median income, see Figure 12).

In each case, there is a model in which employment rate (for year t-1) is entered and the per capita GNI is used as a control (models 1 in Tables 7 and 8, and odd number models in Tables 9 and 10, as well as in Tables A3.7-12 in Annex 3). Further, for our main explanandum of interest, the AROPE(a) rate, variables representing each mechanism discussed earlier (with the exception of the fifth, for which and alternative dependent variable is used) are introduced stepwise (Tables 7 for the panel fixed effect regression and Table 8 for the first-difference models). The same was also done for the other three outcomes, the results of these models are available in Tables A3.7-12. The results of the full models are presented on Tables 9 (for the panel fixed-effect regressions) and Table 10 (for the first-difference models) for all four poverty outcome measures analysed in this sub-section (even number models).

In our models, the first four mechanisms are represented by the following proxy correlates. We distinguish between the base model, for which the results are presented in detail, and alternative models, where alternative variables are specified for each relevant mechanism, with the exception of mechanism 3 (the PRC of the wages, see below for explanation). An indication of the estimated role of these alternative variables is provided in the lower panel of Tables 9 and 10. The name and the definition of variables are found in Annex 1.

- ***Mechanism 1*** (distribution of jobs across households): the share of persons in households with various levels of work intensity, five categories (WI<0.2; 0.2<WI<0.45; 0.45<WI<0.55; 0.55<WI<0.85; WI>0.85), where the highest work intensity category is the reference and the

others are introduced as single variables. In an alternative model, only the share of persons living in (quasi-)jobless households was introduced.

- ***Mechanism 2*** (quality of employment): in the base model, we used the share of persons in involuntary part-time employment, as percentage of all persons in part-time employment (among those aged 20-64). Part-time employment is the most important and most widely used indicator of precariousness (see also sub-section 2.1.1) and is also captured by the work intensity variable at household level. The incidence of involuntary part-time work, however, might be independent from WI, this is why we opted for this measure in the base model. Alternatively, the following variables were also used: involuntary temporary contract employment rate, fixed-term contract employment rate and self-employment rate.
- ***Mechanism 3*** (the poverty reduction capacity of wages): no variable was used for this mechanism in the base model. The main reason for this is that the variable on the share of low wage workers of the OECD (see Annex 1 for more details) is available only for a shorter time period and the number of occasionally missing countries is high, overall resulting in very few (less than 200) observations, which would have considerably reduced the validity of the model compared to those without this variable.[14]
- ***Mechanism 4*** (the poverty reduction capacity of transfers): in the base model, total social protection expenditure (as share of GDP, excluding pensions) was used. Alternatively, this variable was split according to their type (expenditure on cash or in-kind benefits, where cash benefits were further split into means-tested and non means-tested benefits) and main function (unemployment benefits, family and child related benefits, social exclusion benefits not elsewhere classified).

4.3.2 Regression results

Employment is negatively and significantly correlated with poverty outcomes

Higher levels of individual employment are associated with lower poverty rates, either poverty measure is used. In this respect, both the results of models (1) in Table 7 and Table 8, and Tables A3.9-14, as well as all others where controls for mechanisms presented in Figure 12 were introduced, strengthen those of the previous sections that used either visual trend analysis or correlation analysis. In all of these models but a single one, the estimated coefficients are statistically significant and negative. For example, as shown in Table 7 (country-level panel fixed-effect regression), when individual employment rate (in year *t*-1) is regressed on AROP(a) rate (in year *t*), the estimated coefficient is large and negative (-0. 86), meaning that on average in the EU, between 2005 and 2021, higher employment rates were associated with lower AROPE(a) rates (model 1). Similarly, as shown in Table 8, changes in employment rate between year *t*-1 and *t* were associated with a reduction in AROPE(a) rates between years *t* and *t*+1 (estimated coefficient -0.68). The explained variation (R^2) is high, 0.49 in the case of the panel regression, and 0.33 in the case of the FD model (overall, the magnitude of estimated coefficients in FD models is smaller, as is the explained variation). Similar results can be observed for models, where alternative poverty outcomes are the dependent variables (see Tables 9 and 10). It is worth noted, however, that regardless that the coefficient or the explained variation is taken into account, AROP(a) displays the weakest, while anchored AROP(a) displays the strongest correlation with individual employment. Again, this is also the case in the extended models with variables accounting for the four mediating mechanisms, independently of the applied methods.

[14] An alternative data source could have been the Structure of Earnings Survey (SES) of the Eurostat, but data in this case are only collected every four year, which considerably reduces variation. Also, comparing the results of the two data sources in years where both are available, significant differences canbe osbserved. A further examination on the underlying causes of these differences and an improvement in the data infrastructure would be crucial for a better coverage of this important mechanism.

The distribution of jobs across households is an important mediating factor

In all relevant models (model 2 in Tables 7 and 8), some specific categories of the household work intensity variable are strong and significant, the magnitude of the employment coefficient slightly drop, while the explained variation is significantly increased (e.g. from 0.49 to 0.62 in the case of AROPE(a) in Table 7). The higher share of persons living in very low work intensity households (or in (quasi-) jobless households), the higher the risk of poverty is in most of the cases, specifically when poverty is measure by AROPE(a) and AROP(a). In the case of the SMD(a) and anchored AROP(a), the coefficient estimates for this category are not significant in most of the cases, although still positive (Tables A3.11-14). Instead, in the case of the anchored poverty, the low work intensity category provides significant and positive results. When the level of WI is medium (in most cases involving one-earner households), the estimated coefficients are negative and significant, indicating that higher the share of persons in these households in a country, lower the overall risk of poverty is. In the case of first differences, however, this relationship cannot be observed. There are no significant estimates at all for the high WI category. Alternatively, when only QJ-2020(a) is introduced (first line in the bottom panel of Tables 9 and 10), estimates are positive and significant, with the sole exception of the AROP(a) model (model 4 in Table 9). In this case, the employment coefficient loses its significance. This might be related to the fact that the use of the QJ-2020(a) variable provide a very heterogeneous reference category (all other WI levels together), and therefore it incorporates effects that are the captured in a more nuanced way by the full household WI variable.

The quality of employment matters, but only to a restricted extent

The share of persons in involuntary part-time employment is a significant and positive correlate in most of the models, but the estimates are quite strongly dependent on the method used. In the panel regression analysis, the estimated coefficient is only significant in the income poverty models, especially when the anchored AROP(a) is the explanandum. When, however, first-differences are applied, the coefficient is significant also in the AROPE(a) model. In FD regressions, the additional increase in the explained variance is visible, being around 2-4 pp. We found the same in the case of the anchored AROP(a) dependent variable in the country fixed-effect panel regression. Alternative measures provide mixed results: involuntary temporary contract employment (for AROP(a)) and fixed-term contract employment (for AROPE(a) and SMD(a)) is significant at low levels (10 pp) in some FD models, while self-employment is significant also at 10 pp level for all dependent variables. In all cases, estimates have a positive sign, indicating that the higher the employment rate in these precarious forms of employment, the higher is the risk of poverty. The limitations of the available indicators related to job quality which could be included in the analysis must however be emphasised.

At macro level, there is a need for an improved data infrastructure to better account for the role of wages in poverty outcomes

Neither of the estimates regarding the share of low wage workers (a variable representing mechanism 3) are significant. As mentioned earlier, available data do not cover the whole period for all countries, and therefore do not allow for reliable analysis for the whole EU coverage.

On average between 2008 and 2021, social benefits were associated with poverty reduction only in the case of the anchored AROP(a) rate

Using a large set of social protection measures, we found that estimates are not significant when AROPE(a) and its components are used as dependent variables. Contrarily, in country-level fixed-effect panel regression model, a strong negative correlation can be seen when the poverty threshold is fixed at a moment in time (2008 in our case). In our base model, with the total social protection benefits (excl. pensions) as the variable for interest, the additional increase in the explained variation (introducing the variable in the last step) of the fixed-effect panel model, was 1 pp at most across all specifications (Table A3.13). Alternative measures produced similar estimates, when cash and in-kind benefits were separately considered. In the case of the cash benefits, estimates were strongly negative and significant only when non means-tested benefit expenditure were used, while they proved not to

be significant with means-tested benefits expenditure. Further, unemployment benefits expenditure are also significantly correlated with the anchored poverty rate in fixed-effect panel regression model, as well as with AROP(a) rates at 5 pp level. In the case of the FD models, the estimates are less strong. In these models, non means-tested cash benefits are also significantly correlated with AROPE(a) and SMD(a), although at 10 pp level. Besides expenditure variables, we also used the share of social benefits (other than pensions) relative to the total income in (quasi-)jobless households, as a variable to measure the effect of mechanism 4, but no significant estimates were observed.

When changes in median income are controlled for, income poverty is more responsive not only to levels and changes in individual employment, but also to most of the other factors

As one could observe from the presentation of our results so far, in almost all cases, the magnitude and significance level of estimated coefficients is the largest and strongest respectively, and the explained variation is also the largest, when the anchored AROP(a) is considered as explanandum. Contrarily, in most of the cases, AROP(a), as a relative income measure, proved to be the least responsive to both employment and other factors considered in this analysis. All these point to the importance of mechanism 5 in Figure 12, and consequently to issues related to poverty conceptualisation and measurement, as well as policy making. We are coming back to the interpretation of this finding in more details in the concluding Section 5.

Table 7 The relationship between employment and AROPE(a) – beta coefficients of country-year panel fixed-effect (TSCS) regressions, EU-28, 2005-2020

Models	(1)	(2)	(3)	(4)
Employment rate	**-0.86**	**-0.79**	**-0.80**	**-0.79**
Share of persons by the WI level of hhs				
- in very low work intensity hhs(WI<0.2)		**0.46**	**0.46**	**0.48**
- in low work intensity hhs (0.2<WI<0.45)		0.14	0.14	0.14
- in medium work intensity hhs (0.45<WI<0.55)		**-0.77**	**-0.78**	**-0.78**
- in high work intensity hhs (0.55<WI<0.85)		0.15	0.16	0.16
Involuntary part-time employment rate			-0.01	-0.01
All soc. prot. exp. (% of GDP, excl. pensions)				-0.08
Number of countries	28	28	28	28
Observations	438	434	429	429
R-squared	0.49	0.62	0.62	0.62

Source: Own estimates based on data retrieved from the Eurostat database in the period between 31/07/2023 – 31/01/2024.

Note. The upper panel includes models (1) and (4) from Tables 7 and A3.9-14 from Annex 3, for each dependent variable, respectively. Levels of significance: *p<0.1*; p<0.05, **p<0.01**. Additional control: GNI per capita. For a detailed description of variables see Annex 1. Standard errors of estimates are available from the authors.

Table 8 The relationship between employment and AROPE(a) – beta coefficients of FD regressions, EU-28, 2005-2020

Models	(1)	(2)	(3)	(4)
Employment rate	**-0.68**	**-0.44**	-0.31	0.45
Share of persons by the WI level of hhs				
- in very low work intensity hhs(WI<0.2)		0.53	0.60	0.61
- in low work intensity hhs (0.2<WI<0.45)		-0.04	-0.02	-0.02
- in medium work intensity hhs (0.45<WI<0.55)		0.02	0.10	0.09
- in high work intensity hhs (0.55<WI<0.85)		0.02	-0.02	-0.02
Involuntary part-time employment rate			0.08	0.08
All soc. prot. exp. (% of GDP, excl. pensions)				-0.15
Number of countries	28	28	28	28
Observations	410	406	400	400
R-squared	0.33	0.42	0.45	0.45

Source: Own estimates based on data retrieved from the Eurostat database in the period between 31/07/2023 – 31/01/2024.

Note. See notes under Table 7.

Table 9 The relationship between employment and poverty – beta coefficients of country-year panel fixed-effect (TSCS) regressions, EU-28, 2005-2020

	1	2	3	4	5	6	7	8
Dependent variable	AROPE_2020(a)	AROPE_2020(a)	AROP(a)	AROP(a)	SMD(a)	SMD (a)	AROP_08(a)	AROP_08(a)
Employment rate	**-0.86**	**-0.79**	-0.24	*-0.13*	**-0.76**	**-0.88**	**-1.06**	**-0.67**
Share of persons by the WI level of hhs								
- in very low work intensity hhs (WI<0.2)		**0.48**		**0.22**		0.10		0.47
- in low work intensity hhs (0.2<WI<0.45)		0.14		0.05		0.25		*0.37*
- in medium work intensity hhs (0.45<WI<0.55)		**-0.78**		**-0.24**		**-0.80**		**-0.71**
- in high work intensity hhs (0.55<WI<0.85)		0.16		0.00		*0.24*		0.01
Involuntary part-time employment rate		-0.01		0.04		-0.02		**0.16**
All soc. prot. exp. (% of GDP, excl. pensions)		-0.08		-0.06		-0.28		**-0.55**
Number of countries	28	28	28	28	28	28	27	27
Observations	438	429	465	454	438	429	375	369
R-squared	0.49	0.62	0.24	0.46	0.39	0.50	0.61	0.77
Contents of the below panel: significance levels of estimates if variables from the upper panel were replaced with alternative measures: e.g. WI categories to only QJ for mechanism 1, involuntary part-time employment rate to involuntary temporary contract employment, fixed-term contract employment or self employment for mechanism 2, introducing the share of low wage workers for mechanism 3, or all social protection expenditure to alternative variables listed in the bottom panel for mechanism 4.								
QJ-2020(a) only		+++		ns		+++		+++
Involuntary temporary contract employment		ns		ns		ns		ns
Fixed-term contract employment		ns		ns		ns		ns
Self-employment		+		+		+		+
Share of low wage workers		ns		ns		ns		ns
Share of social benefits in QJ hhs		ns		+		ns		ns
Cash social benefits expenditure		ns		ns		ns		- - -
Non means tested cash social benefits exp.		ns		ns		ns		- - -
Means-tested cash social benefits exp.		ns		ns		ns		ns
In-kind benefit expenditure		ns		ns		ns		- -
Unemployment benefits expenditure		ns		- -		ns		- - -
Family and child related benefits expenditure		ns		ns		-		ns
Social excl. benefits not elsewhere classified		ns		ns		ns		ns

Source: Own estimates based on data retrieved from the Eurostat database in the period between 31/07/2023 – 31/01/2024.

Note. The upper panel includes models (1) and (4) from Tables 7 and A3.9, A3.11 and A3.13 in Annex 3, for each dependent variable, respectively. Sig. levels: *p<0.1*; p<0.05, **p<0.01**. Estimates for models in the lower panel may differ for all other variables not replaced in the given step, as may the model statistics, too. Full results are available from the authors. Colours in the lower panel correspond to the colours of the boxes with mechanisms in Figure 12. +++/++/+ coefficient positive and significant at 1/5/10 pp level; - - - coefficient negative and significant at 1/5/10 pp level; ns – not significant. Additional control in all models: GNI per capita. For a detailed description of variables see Annex 1. Standard errors of estimates are available from the authors.

Table 10 The relationship between employment and poverty – beta coefficients of FD regressions, EU-28, 2005-2020

	1	2	3	4	5	6	7	8
Dependent variable	AROPE_2020(a)	AROPE_2020(a)	AROP(a)	AROP(a)	SMD(a)	SMD (a)	AROP_08(a)	AROP_08(a)
Employment rate	**-0.68**	0.45	**-0.13**	*-0.07*	**-0.61**	-0.32	**-0.98**	**-0.67**
Share of persons by the WI level of hhs								
- in very low work intensity hhs (WI<0.2)		0.61		*0.13*		0.39		0.23
- in low work intensity hhs (0.2<WI<0.45)		-0.02		-0.01		-0.02		0.28
- in medium work intensity hhs (0.45<WI<0.55)		0.09		0.07		0.02		-0.05
- in high work intensity hhs (0.55<WI<0.85)		-0.02		0.02		0.00		-0.03
Involuntary part-time employment rate		0.08		0.00		**0.12**		**0.10**
All soc. prot. exp. (% of GDP, excl. pensions)		-0.15		0.08		-0.39		*-0.29*
Number of countries	28	28	28	28	28	28	27	27
Observations	410	400	437	425	410	400	348	341
R-squared	0.33	0.45	0.15	0.20	0.26	0.34	0.52	0.57
Contents of the below panel: significance levels of estimates if variables from the upper panel were replaced with alternative measures: e.g. WI categories to only QJ for mechanism 1, involuntary part-time employment rate to involuntary temporary contract employment, fixed-term contract employment or self employment for mechanism 2, introducing the share of low wage workers for mechanism 3, or all social protection expenditure to alternative variables listed in the bottom panel for mechanism 4.								
QJ-2020(a) only		+++		++		+		++
Involuntary temporary contract employment		ns		+		ns		ns
Fixed-term contract employment		+		ns		+		ns
Self-employment		ns		ns		ns		ns
Share of low wage workers		ns		ns		ns		ns
Share of social benefits in QJ hhs		ns		ns		ns		ns
Cash social benefits expenditure		ns		ns		ns		- -
Non means tested cash social benefits exp.		-		ns		-		- - -
Means-tested cash social benefits exp.		ns		ns		ns		ns
In-kind benefit expenditure		ns		ns		ns		ns
Unemployment benefits expenditure		ns		ns		ns		-
Family and child related benefits expenditure		ns		ns		ns		-
Social excl. benefits not elsewhere classified		ns		ns		ns		ns

Source: Own estimates based on data retrieved from the Eurostat database in the period between 31/07/2023 – 31/01/2024.

Note. The upper panel includes models (1) and (4) from Tables 7 and A3.10, A3.12 and A3.14 in Annex 3, for each dependent variable, respectively. See further notes under Table 9.

4.4 Household composition, employment, and income poverty: a shift-share analysis

Changes in employment rates, on which our analysis has concentrated so far, have taken place alongside major changes in household structures in many EU countries, and the way these interacti influences how employment changes impact on core poverty indicators. A particularly important example is the increasing prevalence of households containing one adult rather than a couple, while at the same time couples are more likely to have both rather than only one partner in employment. This becomes especially salient when dealing with measures of relative income poverty such as AROP as changes in the profile of households in terms of employment and composition will also affect the relative income threshold itself. This gives rise to the concern that, for example, having more dual-earner couples „raises the bar" for other households in terms of poverty risk, either artifactually or in reality.

The impact of changing household structures over time have been considered in OECD (2021), but here we are concerned with the effects of changes in employment and composition patterns taken together. As household composition changes relatively slowly, this is best seen over a considerably longer period than covered by the EU-SILC data we have employed up to this point. We therefore use harmonised household survey data from the Luxembourg Income Study (LIS) database to go back to the 1980s, which is available for a sub-set of eight EU countries ranging across conventional welfare clusters and geographies of the sort employed earlier. Since then, most of these countries saw an increase in the share of single person households with no children and a decline in the share of couples with children, especially 3 or more children, but the extent of those shifts varied considerably from country to country. How changes in employment patterns interacted with household composition also varied widely across countries. The share of households with only one adult and that person in employment rose everywhere except Denmark but by more in Italy than elsewhere, while the share of households comprising a couple with children and only one partner working fell everywhere but by much more in Germany than in Denmark and Greece (see Table A3.15).

To assess the impact of these shifts on poverty trends we construct counterfactual income distributions „as if" the profile of households in each country in terms of employment and composition taken together had not changed since the mid-1980s, but the incomes of households of each such type evolved as observed. Twenty-six detailed employment/composition categories are distinguished, and the relative poverty threshold is re-calculated for the counterfactual distribution and then applied to it (see Azzolini, Breen and Nolan, 2023 for a full description of the exercise). Comparing counterfactual with observed/actual change in AROP, Table 11 shows that without the changes in household employment and composition seen over the period the relative poverty rate would have increased by a good deal more than it actually did in Germany, Greece, Italy and Spain. By contrast, the changes in profile made little difference to the aggregate poverty rate in Denmark, Hungary, and the UK, and served to increase it in Czechia. Spain displays the most pronounced impact as it saw a particularly marked increase in the prevalence of households comprising one employed adult or a dual-earner couple, both groups with a relatively low risk of poverty.

Table 11 Impact of changes in prevalence of different household composition/employment types on trend in AROP, selected countries, 1986-2019

	Actual change in AROP 1986-2019	Counterfactual change in AROP with Composition/Employment held fixed at 1986 profile
Czechia	+5.5	-0.6
Denmark	+2.5	+2.4
Germany	+4.8	+8.4
Greece	+0.9	+4.8
Hungary	+0.3	-0.3
Italy	+3.6	+6.8
Spain	+3.6	+12.4
UK	+0.2	+1.7

Source: authors' analysis of LIS database.

Notes: The analysis and AROP are for the full sample; the counterfactual change is based on reweighting the 2019 samples to match the 1986 composition/employment profile for the country in question and re-calculating AROP for those reweighted samples.

As noted, such a shift in profile also serves to „push up" the relative income poverty threshold. An extension of our counterfactual exercise shows that if we do not allow this to happen the positive impact of changes in employment and composition patterns on measured poverty would be considerably greater in the case of Greece, Italy and especially Spain whereas this „threshold effect" is modest or insignificant in Denmark and the UK. The extent to which such increases in the income poverty threshold represent an artifact of measurement one should seek to abstract from versus the higher purchasing power of two-earner couples driving up the cost of living and setting the standard to which others relate is an issue that merits more attention than it has received to date.

The key message from this analysis is that changes in employment and household composition taken together have indeed significantly influenced changes in relative income poverty rates in EU countries, but in ways that differ markedly across countries (and presumably also across time periods). An increase in the proportion of couples with both partners in paid work been a widely noted phenomenon, but its impact has been less than it might have been given the declining overall importance of couple households in the population as the prevalence of single-adult households increased.

5. Conclusions and implications

5.1 Main findings

Performance vis-à-vis the employment and social targets of the European Pillar of Social Rights (EPSR) Action Plan represent a central test for the success of the EPSR. The Belgian Presidency has the aim of strengthening the social agenda for the 2024-2029 period via a stronger integration of the EPSR in the European economic governance framework. Performance to date regarding the social target (AROPE) at EU level has not matched up to in the substantial increase in employment rates, although neither the employment target set at 75% was achieved by 2020. A central challenge is to understand why, tease out the implications and draw policy conclusions. This paper has presented analysis and empirical evidence to contribute towards improved understanding of the relationship between the EU's

employment and social target (AROPE) indicators, including the implications of the way these are framed.

Our analysis was primarily based on quantitative data collected by Eurostat via EU-LFS and EU-SILC. The initial analysis of trends between 2005 and 2021 with respect to the employment and social target (AROPE) indicators of the EU 2020 and EU 2030 strategies revealed that trajectories for both varied widely between Member States and within geographical regions. All analyses regarding the employment-poverty relationship was restricted to the active age population.

Neither the employment, nor the social target was achieved between 2010 and 2020, but poverty reduction fell further short of the mark. Employment growth took place in two mains steps, before and after the Great Recession, while the late 2000s and early 2010s were characterised by declining or stagnating employment in most though not all countries. Overall, employment growth over the whole period was larger in Germany and the Netherlands than in other countries in the Continental region, there has been a strong convergence among the Scandinavian and Baltic countries, Poland and Czechia saw remarkably little negative impact from the Great Recession, whereas the effects of that crisis were particularly sustained for Greece and some other Southern countries. While in 2005 there were only three countries with employment rates (in the population aged 20-64) above 75%, by 2021, sixteen of the twenty-seven observed countries reached this level. Still, **the employment target was not achieved at EU level**. Moreover, in some countries (Belgium, Bulgaria Greece, Spain, France, Italy and Luxembourg), not even their own targets, let alone the European (%) were achieved.

AROPE rate, the social target indicator, registered declines in the period before and after the Great Recession, while rising during it. This was primarily due to changes in levels of severe material (and social) deprivation and (quasi-)joblessness rather than relative income poverty (as captured by the AROP indicator). Looking beneath this EU aggregate to national level trends, most countries saw spells of decline and increase, and there was a marked reduction in most of East Central European countries, most dramatically in Poland, Slovakia, and Czechia, although in Hungary and Slovenia there was a rise until around 2013 and 2014 followed by a decline. Overall, at the end of the period, the EU aggregate **AROPE rate fell below the 2008 benchmark level, but did not reach the social target** set by the Europe 2020 strategy.

The improvement in the AROPE rate was driven by changes in the severe material deprivation rate concentrated in a small number of East Central European Member States. An improvement in the AROPE rate, concentrated in a small number of East Central European countries (Poland, Bulgaria, Romania, and Hungary). There were another thirteen countries where the number of persons living in AROPE declined. At the other end of the spectrum, Spain, Germany, the UK, France, Netherlands, and Sweden produced a substantial increase in the number people who are at risk of poverty or social exclusion. The major driver behind the overall decline of AROPE was the declining trend in the share of persons affected only by severe material (and social) deprivation, mostly in East Central European countries (converging up to the level of the core of Europe in terms of incomes). Changes of AROP contributed negatively to the target reach in most of the countries. The largest increase in the number of persons living at the risk of relative income poverty was observed in Germany and the UK.

Employment and poverty outcomes, including the social target indicator, are strongly and negatively related to each other. AROPE rates at national level were seen to be correlated negatively and quite strongly with employment rates over the entire period in analysis: an increase in employment is associated with a decrease in the at-risk-of poverty or social exclusion rate. This relationship is not substantially affected by the changes in the components of the social target between AROPE-2020 and AROPE-2030.

Out of the AROPE components, **AROP** – while negatively correlated according to all methods we probed - **responds only modestly to changes in employment**, compared to SMD or AROPE itself. However, **the correlation between employment and income poverty** proved to be **considerably stronger when the AROP threshold was anchored** at a point in time (2008) rather than derived from actual median income

in the country. The SMD component was rather more responsive, as well as more highly correlated with the AROPE aggregate. The (quasi-joblessness) component also plays an important part in the overall correlation between employment and AROPE.

The distribution of additional jobs by economic status and household work intensity level strongly matters in how employment gains are translated in poverty reduction. The role of distribution of individual employment gains across households is highlighted by both multivariate regression analyses and simulations of the effect of job growth on both AROPE and AROP in the active age population. According to the latter, AROP would be expected to fall when the weight of the working population is increased in all countries. That decline in income poverty is strongest when job growth is assumed to reach (quasi-)jobless households first. When job growth is simulated, taking into account the statistical likelihood of individuals to move into employment, on the other hand, the impact on AROP is generally smaller than when the simulation allocates jobs first to the unemployed and (quasi-)jobless households. In countries where employment levels are already high, though, the hypothetical impact of further job growth is modest.

Other mediating mechanisms between individual employment and household level poverty also play a role. Besides the distribution of jobs across households, the quality of newly created jobs (measured by several indicators, out of which involuntary part-time rate seems to be the most powerful) may affect poverty outcomes: a larger share of these precarious forms of employment increase the likelihood of higher poverty rates. Redistribution via various types of social protection benefits played a less important role in poverty reduction in the period between 2005 and 2020. This role is present and fairly strong, however, when the poverty threshold is anchored in a fixed moment in time.

Further, changes in the composition of households combined with household employment patterns was also an important driver of changes in relative income poverty rates in some Member States. Among couples, the proportion with both partners in paid work has gone up to a varying extent and its impact has sometimes been offset by a sharp fall in the importance of couple households rather than single-adult ones in the population. Two-earner couples have below-average income poverty rates so having more of them would in itself be expected to reduce income poverty but has also helped drive up relative income poverty thresholds substantially in some countries which works in opposite direction.

5.2 Policy implications and future directions

From a policy perspective, it is clear from our findings that employment growth makes a positive contribution to income poverty alleviation. However, our analysis also shown that this contribution varies across countries and time-periods and that this relationship could be more effective if the transmission mechanisms between individual employment and income poverty were improved. In this respect, the distribution of the extra jobs among households is crucial. When employment growth first benefits the (quasi-)jobless households, its effect on poverty is significantly larger. This means that the impact of job growth on income poverty can be significantly enhanced by improving the distribution of job gains among households. The clear implication is that employment policies should focus (even) more on activating the most vulnerable.

Furthermore, job quality is clearly another critical intervening factor in the relationship between employment growth and poverty reduction. While we were able to take this aspect into account to a more limited extent than would have been ideal in our own analysis (due to data constraints), both the results of our analysis and of the existing literature provide a compelling evidence that non-standard and precarious work is generally associated with a higher risk of poverty than secure full-time employment. This points towards the importance of building on and strengthening existing policy interventions at national and EU level to underpin job quality, via strategies encompassing labour

market regulation (including minimum wages), collective bargaining, education and training, and innovation.

Finally as regards policy, social protection systems and social provision more broadly – in particular their design and generosity – for those of working age may also play an important role in enhancing the impact of employment growth on poverty reduction. The coverage and adequacy of cash transfers is clearly critical: the general weakening of the poverty reducing capacity of these transfers for jobless households is a particularly concerning trend. The role of public provision and support via non-cash benefits in targeting child poverty in particular has been brought out in recent studies. In this context, a stronger emphasis on the accessibility and sufficiency of social protection and minimum incomes may improve their poverty reduction capacity, should potential disincentive effects be successfully avoided. Further, a "social inclusion proof" implementation of social investment initiatives in the domains of gender and the work-life balance should be strengthened to make sure an efficient coverage of the most vulnerable.

Our analysis also has implications for further investigation and future monitoring of the relationship between employment and social inclusion indicators. First, after the basic presentation of trends and correlations between various indicators, we focused the analysis on working-age persons only. The rationale behind this is simple: as the key question for this report has been the interrelationship between the employment and social targets, we intended to limit the analysis to where it is reasonable to assume a direct relationship between them. If persons in already inactive/pensioner households were also included, the analysis would have given a larger weight to social expenditures most relevant to those households (to pensions in the first place), and therefore, the explanation and interpretation of changes in income poverty would have required different approaches. We suggest that this is adopted in further analyses aiming to capture the effects of employment on social indicators.

Secondly, we carried out analysis both at the level of the EU as a whole and at the level of Member States. The report – from the start to the end – explicitly takes into account that the EU policy process (including EPSR) is realised via interactions between EU-level coordination and national policies, framed by global economic trends. This conceptualisation allows us to see the community of Member States as a large policy lab, in which various policy combinations at national and EU levels yield different results. Thinking in this framework helps in understanding the real causal chains between policy targets and concrete outcome indicators, and it also better facilitates the mutual learning process of the Member States, which was at the centre of the previous Belgian presidencies in 2001 and 2010.

Thirdly, there is a dilemma on how to link poverty monitoring with social inclusion policies. The empirical relationship between employment and income poverty can best be captured by using both relative and anchored AROP indicators. In terms of measurement, discussions about the strengths and weaknesses of the relative poverty indicator (based on 60% of median income threshold) were intense when it was introduced, and this remains on the agenda of expert debates.

The aim of our paper was to examine the relationship between the existing employment and the social target indicators, so we have not had the ambition to develop or recommend alternative measures. However, we cannot disregard the fact that the comparative results of the statistical analysis we carried out show that the correlations between employment and income poverty are stronger when the poverty threshold is fixed than when the floating threshold is applied. At the EU level, the correlation between employment rate and income poverty increases from -0.44 to -0.59 when income poverty is measured by incomes that fall short of the indexed 2008 threshold compared to when measured by the floating threshold of the 60% of the median of the actual reference year, and regression estimates strengthened this finding, resulting in even larger differences between the coefficients. It should be noted that the anchored at-risk-of poverty rate indicator has also both strengths (e.g. directly captures the poverty effects of changes in real income, and also of levels and changes in social protection benefits targeted to the poor) and weaknesses (e.g. the threshold is anchored for a long time period, and therefore may not apply the same living standards for those at risk of poverty as enjoyed by the

rest of the population). As the indicators is already part of the EU social inclusion and social protection monitoring system, we think that it worth considering the potential of this alternative measure of income poverty to provide a more complex picture on poverty trends. This would also require a further investigation of how the anchored at-risk-of-poverty rate can be improved to overcome its previously discussed weaknesses. Rolling the anchored thresholds (e.g. by every two or three years) would be an example of such a methodological work.

Finally, the fact that (quasi-)joblessness is a constituent component of AROPE while directly capturing an aspect of employment itself complicates the unpacking of the underlying effect of changes in employment so there is clear merit in also assessing the relationship between employment and the other components of AROPE, i.e. relative income poverty and severe deprivation.

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Annexes

Annex 1 Indicators: concepts, definitions and sources

Table A1.1. Description of main indicators in the analysis

Short name	Full name	Definition	Source
EMP	Employment rate	Persons in employment as a percentage of the population of working age (20 - 64 years in this paper). Persons carrying out obligatory military or community service are not included in the target group of the survey, as is also the case for persons in institutions/collective households such as boarding houses, halls of residence and hospitals. The employed population consists of those persons who during the reference week did any work for pay or profit for at least one hour during the reference week, or were not working but had jobs from which they were temporarily absent. In all analyses, the indicator is lagged by one year.	Eurostat database. Primary data source: EU-LFS
AROPE-2020	At-risk-of-poverty or social exclusion rate in the total population, the social target of the EU 2020 strategy	The share of the population that is either at risk of poverty, or in a situation of severe material deprivation, or living in households with very low work intensity.	Eurostat database. Primary data source: EU-SILC. The time series is only available until 2020.
AROPE-2020(a)	At-risk-of-poverty or-social exclusion rate in the active age (18-64) population	The share of the population aged 18-64 that is either at risk of poverty, or in a situation of severe material deprivation, or living in households with very low work intensity.	Eurostat database. Primary data source: EU-SILC.
AROPE-2030	At-risk-of-poverty or social exclusion rate in the total population, the 2030 social target indicator with the revised components (EPSR action plan)	The share of the population that is either at risk of poverty, or in a situation of severe material or social deprivation, or living in (quasi-)jobless households.	Eurostat database. Primary data source: EU-SILC. The time series is only available from 2015.
AROPE-2030(a)	At-risk-of-poverty or social exclusion rate of active age (18-64) population	The share of the population aged 18-64 that is either at risk of poverty, or in a situation of severe material or social deprivation, or living in (quasi-)jobless households.	Eurostat database. Primary data source: EU-SILC.

Short name	Full name	Definition	Source
AROP	At-risk-of-poverty rate of total population	Headcount of individuals, whose income falls below the at-risk-of-poverty threshold established as 60% of median equivalent income of total population.	Eurostat database. Primary data source: EU-SILC
AROP(a)	At-risk-of-poverty rate of active age (18-64) population	Headcount of individuals aged 18-64, whose income falls below the at-risk-of-poverty threshold established as 60% of median equivalent income of total population.	Eurostat database. Primary data source: EU-SILC
AROP_08	At-risk-of-poverty rate of total population when the AROP threshold is anchored in a fix moment in time	Headcount of individuals, whose income falls below the at-risk-of-poverty threshold established as 60% of median equivalent income of total population in a certain point in time (2008 in this paper), only price level index is applied over time.	Data source: Eurostat database. Primary data source: EU-SILC.
AROP_08(a)	At-risk-of-poverty rate of active age (18-64) population when the AROP threshold is anchored in a fix moment in time	Headcount of individuals aged 18-64, whose income falls below the at-risk-of-poverty threshold established as 60% of median equivalent income of total population in a certain point in time (2008 in this paper), only price level index is applied over time.	Data source: Eurostat database. Primary data source: EU-SILC.
SMD	Severe material deprivation rate of total population	Headcount of individuals whose household cannot afford four or more items out of the following nine: (1) to pay their rent, mortgage or utility bills; (2) to keep their home adequately warm; (3) to face unexpected expenses; (4) to eat meat or proteins regularly; (5) to go on holiday; (6) a television set; (7) a washing machine; (8) a car; (9) a telephone.	Eurostat database. Primary data source: EU-SILC.
SMD(a)	Severe material deprivation rate of active age (18-64) population	Headcount of individuals whose household cannot afford four or more items out of nine, as listed above.	Eurostat database. Primary data source: EU-SILC.
SMSD	Severe material and social deprivation rate of total population	Headcount of individuals whose household cannot afford seven or more items out of the following thirteen: (1) to face unexpected expenses; (2) to afford paying for one week annual holiday away from home; (3) to being confronted with payment arrears (on mortgage or rental payments, utility bills, hire purchase instalments or other loan	Eurostat database. Primary data source: EU-SILC.

Short name	Full name	Definition	Source
		payments); (4) to afford a meal with meat, chicken, fish or vegetarian equivalent every second day; (5) to keep home adequately warm; (6) have access to a car/van for personal use; (7) replacing worn-out furniture; (8) having internet connection; (9) replacing worn-out clothes by some new ones; (10) having two pairs of properly fitting shoes (including a pair of all-weather shoes); (11) spending a small amount of money each week on him/herself; (12) having regular leisure activities; (13) getting together with friends/family for a drink/meal at least once a month.	
SMSD(a)	Severe material and social deprivation rate of active age (18-4) population	Headcount of individuals whose household cannot afford seven or more items out of thirteen, as listed above.	Eurostat database. Primary data source: EU-SILC.
WI	Household work intensity	The ratio of the number of months worked during the income reference year by all working age (18-64) household members to the number of months (measured in terms of full-time equivalent) they could theoretically have worked. The ratio ranges from 0 (meaning that no one at active age worked during the preceding year) to 1 (meaning that everyone at active age was full-time full-year employed). Households composed only of children, of students (aged 18-24) and/or people aged 65+, are excluded from the calculation. The indicator is defined for the population aged 0-64. Before 2021, the upper boundary of active age was set at 59.	Eurostat database. Primary data source: EU-SILC.
QJ-2020	(Quasi-)joblessness rate, 0-59 years	If the value of household work intensity is below 0.2, for individuals in the age range 0-59 (includes children).	Eurostat database. Primary data source: EU-SILC. The time series is only available until 2020.
QJ-2020(a)	(Quasi-)joblessness rate, 18-59 years	If the value of household work intensity is below 0.2, for individuals in the age range 18-59.	Eurostat database. Primary data source: EU-SILC. The time series is only available until 2020.

Short name	Full name	Definition	Source
QJ-2030	(Quasi-)joblessness rate, 0-64 years	If the value of household work intensity is below 0.2. Upper boundary of active age is 64 (includes children).	Eurostat database. Primary data source: EU-SILC. The time series is only available from 2015.
QJ-2030 (a)	(Quasi-)joblessness rate, 18-64 years	If the value of household work intensity is below 0.2, for individuals in the age range 18-64.	Eurostat database. Primary data source: EU-SILC. The time series is only available from 2015.
IVPTE	Involuntary part-time employment rate	Share of individuals aged 20-64 in part-time employment, who would like to work full time but could not find such a job on the labour market (as a percentage of the total part-time employment).	Eurostat database. Primary data source: EU-LFS.
ITE	Involuntary temporary employment rate	Share of individuals aged 20-64 who have temporary contracts and want to have a permanent job but could not find it.	Eurostat database. Primary data source: EU-LFS.
FCE	Fixed-term contract employment rate	Share of individuals aged 20-64 who are in employment with a fixed-term contract.	Eurostat database. Primary data source: EU-LFS.
SE	Self-employment rate	Share of individuals aged 20-64 who are sell-employed.	Eurostat database. Primary data source: EU-LFS.
SP_NP	Total social protection expenditure (excl. pensions)	Total social protection benefits expenditure, excluding pensions, classified according to ESSPROS, as % of GDP.	Own computation on Eurostat data, based on ESSPROS classification.
SP_C_NP	Cash social protection expenditure	Cash social protection benefits expenditure, excluding pensions, classified according to ESSPROS, as % of GDP.	Own computation on Eurostat data, based on ESSPROS classification.
SP_NMTC_NP	Non means-tested cash social protection expenditure	Non means-tested cash social protection benefits expenditure, excluding pensions, classified according to ESSPROS, as % of GDP.	Own computation on Eurostat data, based on ESSPROS classification.
SP_MTC_NP	Means-tested cash social protection expenditure	Means-tested cash social protection benefits expenditure, excluding pensions, classified according to ESSPROS, as % of GDP.	Own computation on Eurostat data, based on ESSPROS classification.
SP_IK_NP	In-kind social protection expenditure	In-kind social protection benefits expenditure, excluding pensions, classified according to ESSPROS, as % of GDP.	Own computation on Eurostat data, based on ESSPROS classification.
SP_UE	Cash social protection expenditure on unemployment	Cash social protection benefits expenditure on unemployment function, classified according to ESSPROS, as % of GDP.	Eurostat data, based on ESSPROS classification.

Short name	Full name	Definition	Source
SP_FC	Cash social protection expenditure on family and child related benefits	Cash social protection benefits expenditure on family and child function, classified according to ESSPROS, as % of GDP.	Eurostat data, based on ESSPROS classification.
SP_SE	Cash social protection expenditure on social exclusion benefits not elsewhere classified	Cash social protection benefits expenditure on social exclusion not elsewhere classified function, classified according to ESSPROS, as % of GDP.	Eurostat data, based on ESSPROS classification.
GDPpc	Purchasing power adjusted GDP per capita	The value of the total output of goods and services produced by an economy, less intermediate consumption, plus net taxes on products and imports. GDP per capita is calculated as the ratio of GDP to the average population in a specific year.	Eurostat database, National Accounts.
GNIpc	Gross National Income per capita	Per capita value of gross national income (GNI) expressed in current international dollars converted by purchasing power parity (PPP) conversion factor.	World Development Indicators database.
GHDIpc	Growth rate in real gross disposable income of households per capita in (2008=100)	Calculated as the unadjusted gross disposable income of households and Non-Profit Institutions Serving Households (NPISH) divided by the price deflator (price index) of household final consumption expenditure and by the total resident population. Then the indicator is indexed with base year 2008. The indicator is based on European sector accounts.	Eurostat database, National Accounts.
PovTh_s	At-risk-of-poverty threshold – single person	The 60% of the national equivalent household disposable income in a single person household, in PPS.	Eurostat database. Primary data source: EU-SILC.

Annex 2 Data and methods

Most of the data to be used in our analysis come from the Eurostat database and other similar data infrastructures, while some of the indicators are directly extracted from the most recent version of the EU-SILC microdata. For the latter, we use all available waves of the EU-SILC cross-sectional dataset for analysis from survey year 2005 to 2021[15]. The countries we analyse are the EU Member States of the time of the analysis, depending on the availability of data[16]. Also, the United Kingdom is included in the analysis, where possible[17]. As the relationship between employment and income poverty is a major topic of this paper, the population at working age is in the focus in the core part of the analysis. The availability of the microdata used in the analysis is listed in Table A2.1.

For the multivariate analyses we apply both a first difference (FD) and a time-series cross-sectional (TSCS) design for 27 EU Member States between 2005 and 2021 to study the association between employment and income poverty outcomes. For both models, our unit of analysis is country *i* in year *t*. First differences are calculated for each variable in the model in the first case. As we are interested in the role of employment indicators that vary over time within countries, fixed effects (FE) models that control for all other time-invariant differences between countries are run in the second case, the use of which mitigates the risk of omitted variable bias compared to random effects models.[18] The same models are run for various income poverty and social exclusion indicators: AROPE(a), anchored AROP(a), SM(S)D(a) and QJ-2020(a)/QJ-2030(a) as dependent variables, with a reduced model for the latter, as QJ is an important right hand-side variable in our analysis. First difference (FD) models are to compare simultaneous changes in the observed variables – i.e. we observe the links between change to change rather than level to levels.

Right-hand (explanatory) variables include individual employment rate, share of persons living in (quasi-)jobless households and expenditure on social protection benefits as % of GDP, as proxies for mechanisms 1, 2 and 3 presented in Figure 7. As controls, GNI per capita for cross-country differences in standard of living are included.

In all our analyses involving both employment rate and AROPE or its components, we always relate year *t-1* employment rate to year *t* AROPE (or components), as the reference year for the AROPE components are in fact *t-1*.

For exploring alternative scenarios of reaching the Europe 2030 national employment targets we conduct a shift-share analysis using two scenarios (conditional upon different sources of employment growth). We also perform a regression-based analysis taking into account the various factors that determine individual's job chances. Similar to the method employed by Marx et al. (2012), a multinomial logit model is used to estimate the probability that an unemployed person of working age will work full-time, part-time, or remain unemployed.

In addition, we consider what role varying household structures (and their change) can play in differential poverty and social exclusion rates (with labour market conditions unchanged) – via shift-share analysis of different demographic settings.

[15] Version 2023-01, release date May 2023.

[16] The earliest income years per country are as follows: Bulgaria: 2006; Romania: 2007; Croatia: 2010.

[17] Data for the UK is partial for 2019 onwards.

[18] Additionally, the assumption behind random effects regressions that the unobserved heterogeneity across countries is random and uncorrelated is unlikely to hold.

Table A2.1 Sources and availability of the indicators used in the correlation analysis

	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21
AROP	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
AROP(a)	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
AROPE-2020	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	.
AROPE-2020 (a)	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	.
AROPE-2030	.	.	.	.	.	.	.	.	.	.	S	S	S	S	S	S	S
AROPE-2030 (a)	.	.	.	.	.	.	.	.	.	.	S	S	S	S	S	S	S
SMD	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	.
SMD(a)	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	.
SMSD	.	.	.	.	.	.	.	.	.	.	S	S	S	S	S	S	S
SMSD(a)	.	.	.	.	.	.	.	.	.	.	S	S	S	S	S	S	S
AROP_08	.	.	.	S	S	S	S	S	S	S	S	S	S	S	S	S	S
AROP_08(a)	.	.	.	S	S	S	S	S	S	S	S	S	S	S	S	S	S
EMP	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
QJ-2020	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	.
QJ-2020(a)	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	.
QJ-2030	.	.	.	.	.	.	.	.	.	.	S	S	S	S	S	S	S
QJ-2030(a)	.	.	.	.	.	.	.	.	.	.	S	S	S	S	S	S	S

Note: S = indicator calculated by Eurostat, based on EU-SILC of the year, downloaded from Eurostat database; L = indicator calculated by Eurostat, based on EU-LFS of the year, downloaded from Eurostat Database; . = data not available

Annex 3 Tables and figures

Table A3.1 Employment rates in 2008 and 2020, national and EU level employment targets for 2020 and 2030

	Employment rates		National and EU employment targets	
	2008	2020	2020	2030
BE	68.0	70.0	73.2	80
BG	70.7	73.4	76	79
CZ	72.4	79.7	75	82.2
DK	78.7	77.8	80	80
DE	74.0	79.2	77	83
EE	77.1	78.2	76	81.3
IE	73.5	73.4	69	78.2
EL	66.3	61.1	70	71.1
ES	68.5	65.7	74	76
FR	70.5	71.4	75	78
HR	64.9	66.9	62.9	75
IT	62.9	62.6	67	73
CY	76.5	74.9	75	80
LV	75.4	77.0	73	80
LT	72.0	76.7	72.8	80.7
LU	68.8	72.1	73	77.6
HU	61.5	75.0	75	85
MT	59.2	77.3	70	84.6
NL	76.9	80.0	80	82.5
AT	73.8	75.5	77	79.9
PL	65.0	73.6	71	78.3
PT	73.1	74.7	75	80
RO	64.4	70.8	70	74.7
SK	68.8	72.5	72	76.5
SI	73.0	75.6	75	79.5
FI	75.8	76.5	78	80
SE	80.4	80.8	80	reached
UK	75.2	79.3	-	-
EU-27	69.5	72.2	75	78

Source: own editing based on Paľová and Vejačka (2018).

Note. The EU-27 figures refer to the present status of the Member States composition (including Croatia, but excluding the UK).

Table A3.2 At-risk-of-poverty or social exclusion rate, its change between 2008 and 2020, and the values of the EU 2020 social target, EU-27 and the UK (thousands persons)

	AROPE			
	2008	2020	Change (2020-2008)	EU 2020 social target
BE	2 194	2 152	-42	380
BG	3 421	2 232	-1 189	260
CZ	1 566	1 243	-323	100
DK	887	920	33	22
DE	16 345	17 710	1 365	a
EE	291	305	14	36.2[d]
IE	1 050	1 001	-49	200[e]
EL	3 046	3 033	-13	450
ES	10 786	12 384	1 598	1 450
FR	11 150	11 779	629	1 900
HR	1 322	914	-408	122[f]
IT	15 082	15 051	-31	2 200
CY	181	188	7	27[g]
LV	740	489	-251	121
LT	910	692	-218	170
LU	72	125	53	6
HU	2 794	1 701	-1 093	450
MT	81	96	15	6.6
NL	2 432	2 761	329	100[h]
AT	1 699	1 529	-170	235
PL	11 491	6 431	-5 060	1 500
PT	2 757	2 036	-721	200
RO	9 115	5 873	-3 242	580
SI	361	309	-52	40
SK	1 111	798	-313	170
FI	910	870	-40	140
SE	1 528	1 846	318	b
UK	14 069	15 123	1 054	c
EU	**117 391**	**109 591**	**-7 800**	**20 000**

Source: own compilation from Eurostat data. The target values are from European Commission (2019).

Notes. a - to decrease the number of long-term unemployed by 320 thousands; b – to reduce the % of women and men aged 20-64 who are not in the labour force (except full-time students), the long-term unemployed or those on long-term sick leave to well under 14%; c - ; d – to reduce by 15%; e – to reduce the number of persons living in consistent poverty by 200 thousands; f – reduce to 1 200 thousands; g- to reduce from 23.3% to 19.3%; to reduce (quasi-)joblessness among those aged 0-64.

In the case of Croatia, year 2010 was considered instead of 2008, while in the case of the UK 2018 instead of 2020.

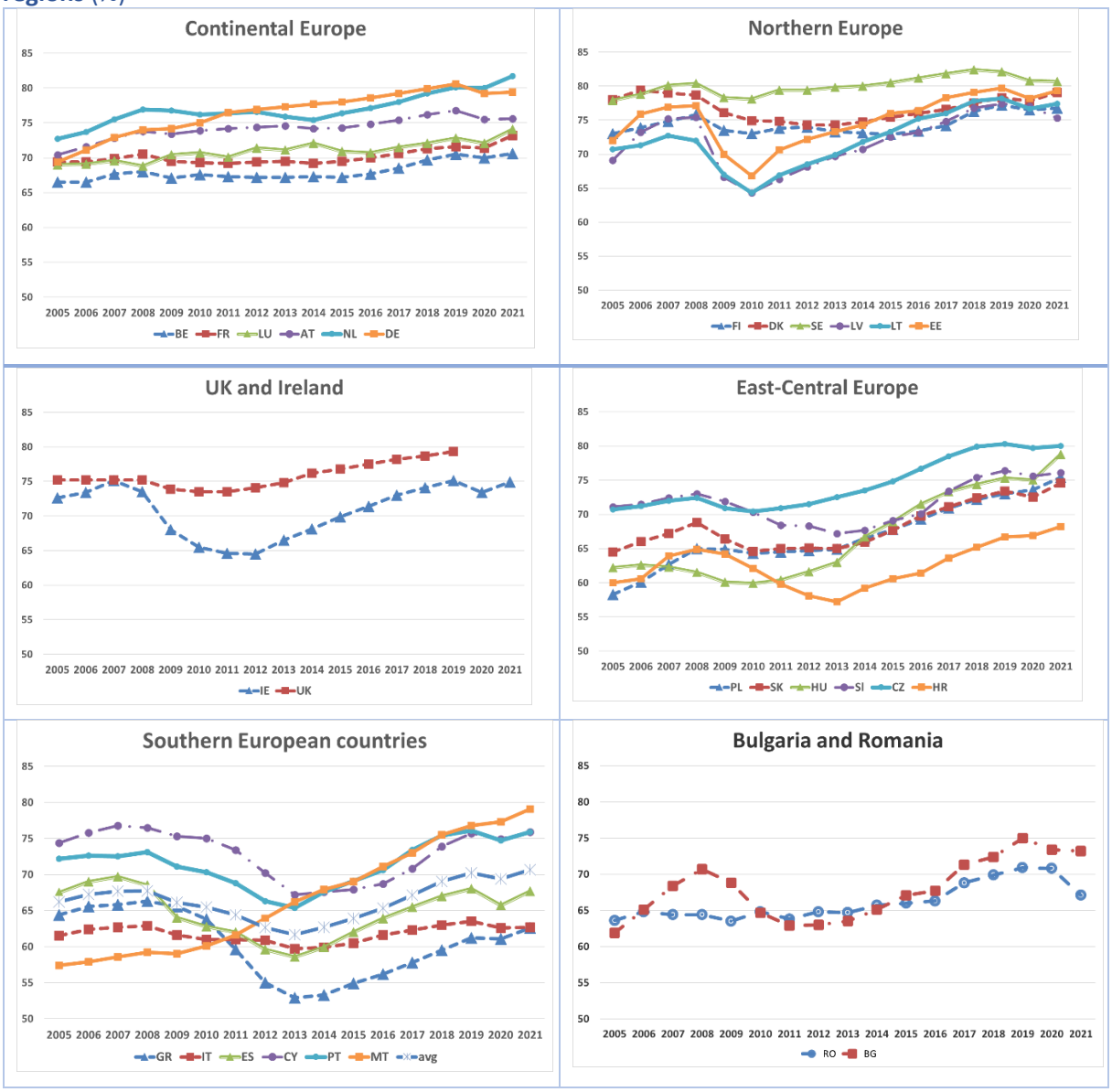
Table A3.3 National minimum 2030 targets for the reduction of poverty and social exclusion, EU-27

	National minimum 2030 target for the reduction of poverty and social exclusion (in number of persons)	Summary of AROPE reference values in 2019		
		2019 AROPE population (in thousands)	Relative reduction in AROPE population (in %)	2019 AROPE rate
EU	**Reduce the population in AROPE by at least 15 million**	92,209	-16.3	21.1
BE	Reduce the population in AROPE by 279,000	2,260	-12.3	20.0
BG	Reduce the population in AROPE by 787,000	2,324	-33.9	33.2
CZ	Reduce the population in AROPE by 120,000	1,264	-9.5	12.1
DK*	Reduce the number of persons living in households with very low work intensity by 30,000	994	n.a.	17.3
DE*	Reduce the number of persons living in households with very low work intensity by 1,200,000	14,121	n.a.	17.3
EE	Reduce the population in AROPE by 39,000	311	-12.5	23.7
IE	Reduce the population in AROPE by 90,000	1,005	-9.0	20.6
EL	Reduce the population in AROPE by 860,000	3,059	-28.1	29.0
ES	Reduce the population in AROPE by 2,815,000	12,169	-23.1	26.2
FR	Reduce the population in AROPE by 1,100,000	11,716	-9.4	18.9
HR	Reduce the population in AROPE by 298,000	841	-35.4	20.8
IT	Reduce the population in AROPE by 3,200,000	14,803	-21.6	24.6
CY	Reduce the population in AROPE by 10,000	162	-6.2	18.6
LV	Reduce the population in AROPE by 95,000	506	-18.8	26.7
LT	Reduce the population in AROPE by 223,000	712	-31.3	25.5
LU	Reduce the population in AROPE by 4,000	119	-3.4	20.1
HU	Reduce the material and social deprivation rate of families with children to 13%, and thereby reduce the population in AROPE by 292,000	1,923	-15.2	20.0
MT*	Reduce the AROPE rate by 3.1 percentage points	100	n.a.	20.8
NL	Reduce the population in AROPE by 163,000	2,809	-5.8	16.5
AT	Reduce the population in AROPE by 204,000	1,434	-14.2	16.5
PL	Reduce the population in AROPE by 1,500,000	6,575	-22.8	17.9
PT	Reduce the population in AROPE by 765,000	2,173	-35.2	21.1
RO	Reduce the population in AROPE by 2,532,000	7,032	-36.0	36.1
SI	Reduce the population in AROPE by 9,000	279	-3.2	13.7
SK	Reduce the population in AROPE by 70,000	795	-8.8	14.8
FI	Reduce the population in AROPE by 100,000	838	-11.9	15.4
SE	Reduce the population in AROPE by 15,000	1,879	-0.8	18.4

Notes. * Countries that have expressed their national target in relation to an indicator different from the EU headline target indicator (AROPE) or in a format other than absolute population reductions. Denmark and Germany[19] express their national poverty and social exclusion reduction targets as a reduction in the number of persons living in (quasi-)jobless households (i.e. households with very low work intensity) that are expected to translate into similar declines in the numbers of people in AROPE over the decade. MT expresses its national poverty and social exclusion reduction target as a reduction of the AROPE rate by 3.1 percentage points.

[19] The reference year for the German national target is 2020.

Figure A3.1 Employment rates of individuals aged 20-64, 2005-2021, EU-27, by main geographical regions (%)

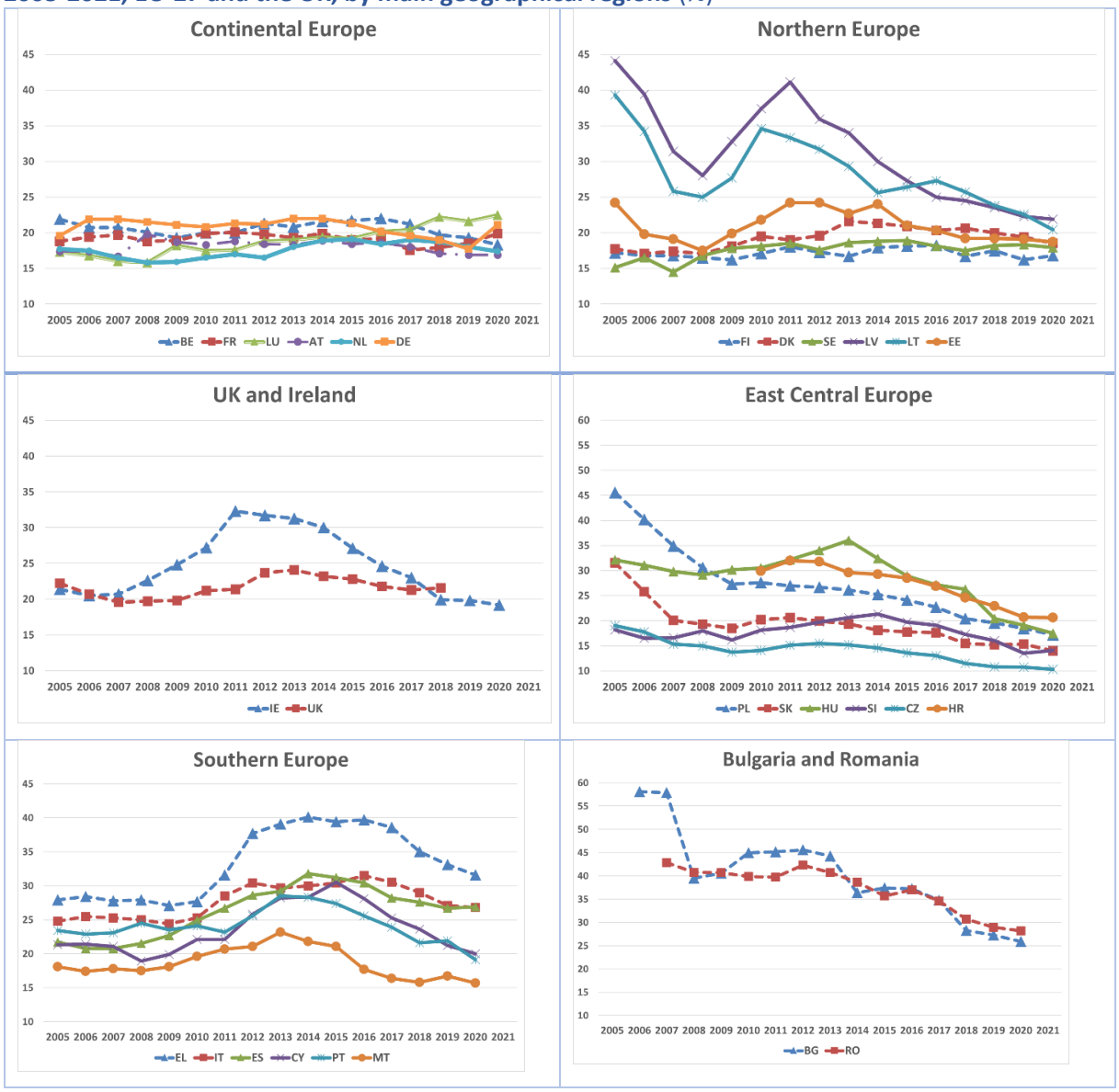


Source. Own editing based on data retrieved from the Eurostat database (on 31.07.2023).

Table A3.4 Employment rate of individuals aged 20-64, EU-27 and the UK, 2005-2021 (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
EL	64,4	65,6	65,8	66,3	65,6	63,8	59,6	55	52,9	53,3	54,9	56,2	57,8	59,5	61,2	61,1	62,6
IT	61,5	62,4	62,7	62,9	61,6	61	61	60,9	59,7	59,9	60,5	61,6	62,3	63	63,5	62,6	62,7
RO	63,6	64,8	64,4	64,4	63,5	64,8	63,8	64,8	64,7	65,7	66	66,3	68,8	69,9	70,9	70,8	67,1
ES	67,5	69	69,7	68,5	64	62,8	62	59,6	58,6	59,9	62	63,9	65,5	67	68	65,7	67,7
HR	60	60,6	63,9	64,9	64,2	62,1	59,8	58,1	57,2	59,2	60,6	61,4	63,6	65,2	66,7	66,9	68,2
BE	66,5	66,5	67,7	68	67,1	67,6	67,3	67,2	67,2	67,3	67,2	67,7	68,5	69,7	70,5	70	70,6
FR	69,4	69,4	69,9	70,5	69,5	69,3	69,2	69,4	69,5	69,2	69,5	70	70,6	71,3	71,6	71,4	73,2
BG	61,9	65,1	68,4	70,7	68,8	64,7	62,9	63	63,5	65,1	67,1	67,7	71,3	72,4	75	73,4	73,2
LU	69	69,1	69,6	68,8	70,4	70,7	70,1	71,4	71,1	72,1	70,9	70,7	71,5	72,1	72,8	72,1	74,1
SK	64,5	66	67,2	68,8	66,4	64,6	65	65,1	65	65,9	67,7	69,8	71,1	72,4	73,4	72,5	74,6
IE	72,6	73,4	75,1	73,5	68	65,5	64,6	64,5	66,5	68,1	69,9	71,4	73	74,1	75,1	73,4	74,9
LV	69,1	73,2	75,2	75,4	66,6	64,3	66,3	68,1	69,7	70,7	72,5	73,2	74,8	76,8	77,4	77	75,3
PL	58,3	60,1	62,7	65	64,9	64,3	64,5	64,7	64,9	66,5	67,8	69,3	70,9	72,2	73	73,6	75,4
AT	70,4	71,6	72,8	73,8	73,4	73,9	74,2	74,4	74,6	74,2	74,3	74,8	75,4	76,2	76,8	75,5	75,6
CY	74,4	75,8	76,8	76,5	75,3	75	73,4	70,2	67,2	67,6	67,9	68,7	70,8	73,9	75,7	74,9	75,9
PT	72,2	72,6	72,5	73,1	71,1	70,3	68,8	66,3	65,4	67,6	69,1	70,6	73,4	75,4	76,1	74,7	75,9
SI	71,1	71,5	72,4	73	71,9	70,3	68,4	68,3	67,2	67,7	69,1	70,1	73,4	75,4	76,4	75,6	76,1
FI	73	73,9	74,8	75,8	73,5	73	73,8	74	73,3	73,1	72,9	73,4	74,2	76,3	77,2	76,5	76,8
LT	70,7	71,3	72,7	72	67	64,3	66,9	68,5	69,9	71,8	73,3	75,2	76	77,8	78,2	76,7	77,4
HU	62,2	62,6	62,3	61,5	60,1	59,9	60,4	61,6	63	66,7	68,9	71,5	73,3	74,4	75,3	75	78,8
DK	78	79,4	79	78,7	76,1	74,9	74,8	74,3	74,3	74,7	75,4	76	76,6	77,5	78,3	77,8	79,1
MT	57,4	57,9	58,6	59,2	59	60,1	61,6	63,9	66,2	67,9	69	71,1	73	75,5	76,8	77,3	79,1
EE	72	75,9	76,9	77,1	70	66,8	70,6	72,2	73,3	74,3	76	76,4	78,3	79,1	79,7	78,2	79,3
DE	69,4	71,1	72,9	74	74,2	75	76,5	76,9	77,3	77,7	78	78,6	79,2	79,9	80,6	79,2	79,4
CZ	70,7	71,2	72	72,4	70,9	70,4	70,9	71,5	72,5	73,5	74,8	76,7	78,5	79,9	80,3	79,7	80
SE	77,9	78,8	80,1	80,4	78,3	78,1	79,4	79,4	79,8	80	80,5	81,2	81,8	82,4	82,1	80,8	80,7
NL	72,7	73,7	75,5	76,9	76,8	76,2	76,4	76,6	75,9	75,4	76,4	77,1	78	79,2	80,1	80	81,7
UK	75,2	75,2	75,2	75,2	73,9	73,5	73,5	74,1	74,8	76,2	76,8	77,5	78,2	78,7	79,3		

Figure A3.2 At-risk-of-poverty or social exclusion (AROPE) rate of individuals aged 18-64 (AROPE(a)), 2005-2021, EU-27 and the UK, by main geographical regions (%)



Source. Own editing based on data retrieved from the Eurostat database (on 31.07.2023).

Table A3.5 At-risk-of-poverty or social exclusion rates (AROPE-2020) among individuals aged 18-64 (AROPE(a)), EU-27 and the UK, 2005-2020 (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
EL	27,9	28,4	27,8	27,9	27,1	27,7	31,6	37,7	39,1	40,1	39,4	39,7	38,6	35	33,1	31,6
RO			42,9	40,8	40,7	39,9	39,7	42,3	40,7	38,7	35,7	37	34,6	30,7	29	28,2
ES	21,7	20,8	20,8	21,5	22,7	24,9	26,7	28,6	29,2	31,8	31,2	30,4	28,2	27,6	26,7	26,9
IT	24,8	25,5	25,3	25	24,4	25,3	28,5	30,4	29,7	30	30,4	31,5	30,5	29	27,1	26,8
BG		58,1	57,9	39,5	40,6	45	45,2	45,6	44,3	36,4	37,4	37,2	34,8	28,3	27,3	25,9
LU	17,3	16,8	16	15,8	18,2	17,5	17,6	18,8	19	19,4	19,2	20,2	20,4	22,2	21,6	22,5
LV	44,1	39,4	31,4	28	32,8	37,4	41,1	35,9	34	30	27,3	25	24,5	23,5	22,3	21,9
UK	22,2	20,7	19,6	19,7	19,8	21,2	21,4	23,7	24,1	23,2	22,8	21,8	21,3	21,6		
DE	19,6	21,9	21,9	21,5	21,1	20,8	21,3	21,2	22	22	21,3	20,2	19,6	19	17,7	21,1
HR						29,9	32	31,8	29,6	29,3	28,5	26,9	24,6	22,9	20,7	20,6
LT	39,3	34,2	25,8	25	27,7	34,6	33,3	31,7	29,3	25,6	26,4	27,3	25,7	23,8	22,6	20,4
CY	21,3	21,4	21,1	18,9	19,9	22,1	22,1	25,8	28,2	28,3	30,5	28,1	25,3	23,6	21,2	20
FR	18,8	19,4	19,7	18,8	18,9	19,9	20,1	19,8	19,3	19,9	19	19,2	17,6	17,9	18,5	19,9
IE	21,4	20,5	20,7	22,6	24,8	27,2	32,3	31,7	31,3	30	27,1	24,6	23	19,9	19,8	19,2
PT	23,4	22,9	23,1	24,5	23,5	24,1	23,2	25,6	28,5	28,3	27,4	25,6	23,9	21,6	21,9	19,1
EE	24,2	19,8	19,1	17,5	19,9	21,8	24,2	24,2	22,7	24	21	20,3	19,2	19,2	19,1	18,7
DK	17,7	17,1	17,4	17,1	18,1	19,5	19	19,6	21,6	21,3	20,9	20,3	20,6	20	19,4	18,5
BE	21,9	20,7	20,7	20,1	19,3	20	20	21,3	20,8	21,6	21,7	22	21,2	19,7	19,3	18,3
SE	15,1	16,5	14,5	16,8	17,8	18,1	18,5	17,6	18,6	18,8	18,9	18,1	17,5	18,2	18,3	17,9
HU	32,1	31,1	29,8	29,1	30,2	30,5	32,2	34	36	32,4	28,9	27,2	26,3	20,4	19,1	17,5
NL	17,7	17,5	16,5	15,8	15,9	16,5	17	16,5	18	18,9	19,1	18,4	19	18,7	18	17,4
PL	45,6	40,2	34,9	30,6	27,3	27,6	27	26,7	26,1	25,2	24,1	22,7	20,4	19,6	18,5	17,2
AT	17,4	17,4	16,7	19,8	18,7	18,3	18,8	18,4	18,3	18,9	18,4	18,6	18	17,1	16,9	16,9
FI	17,2	16,8	16,8	16,5	16,2	17,1	18	17,3	16,7	17,9	18,1	18,2	16,7	17,5	16,2	16,8
MT	18,1	17,4	17,8	17,5	18,1	19,6	20,7	21,1	23,2	21,8	21,1	17,7	16,4	15,8	16,7	15,7
SI	18,2	16,5	16,6	18	16,2	18,1	18,7	19,7	20,6	21,3	19,7	19,1	17,3	16	13,5	14,1
SK	31,6	25,8	20,1	19,3	18,5	20,2	20,6	19,9	19,4	18,1	17,8	17,6	15,5	15,2	15,3	14
CZ	19	17,8	15,3	15	13,7	14,1	15,1	15,5	15,2	14,6	13,6	13	11,5	10,8	10,7	10,3

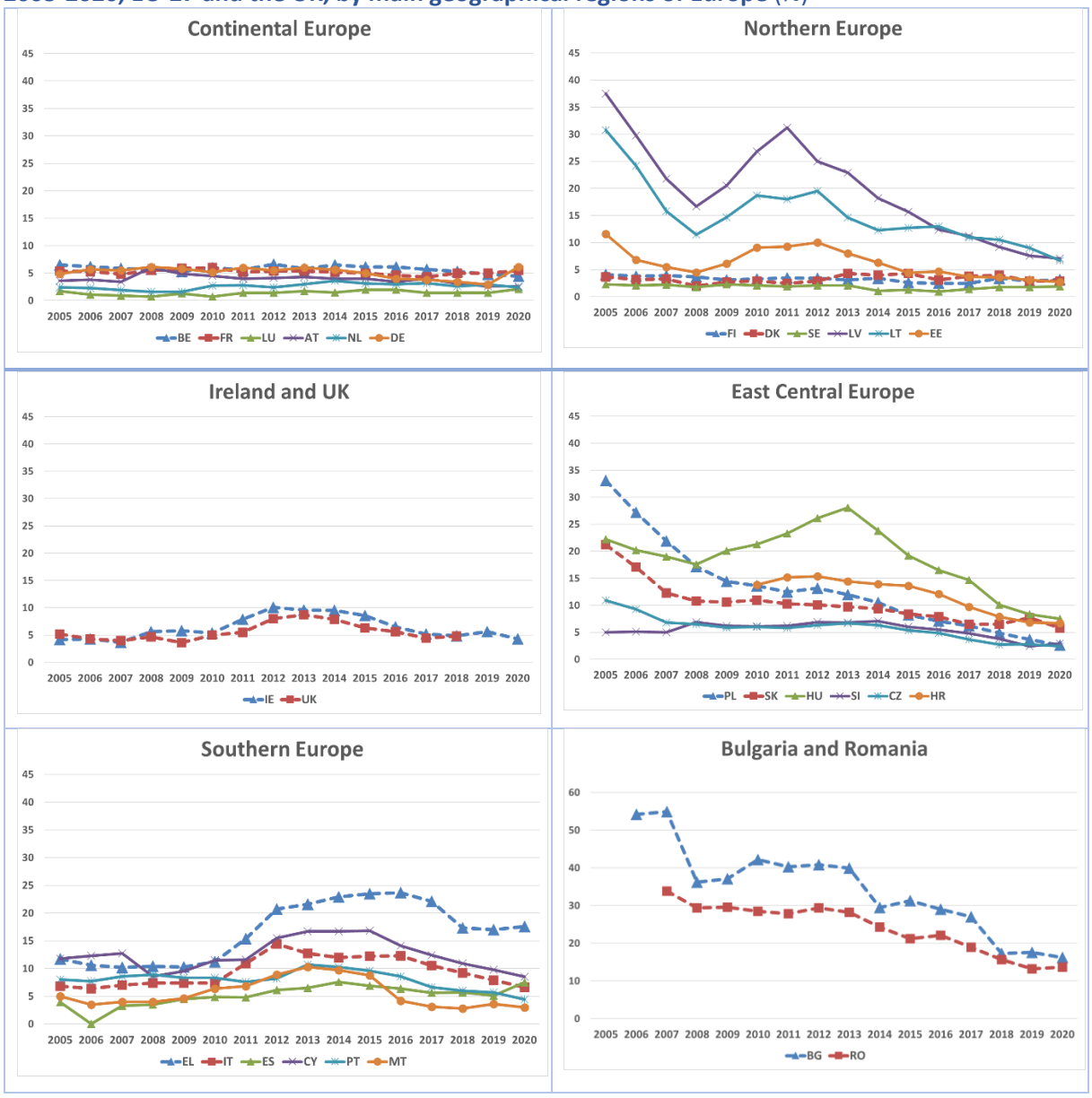
Figure A3.3 At-risk-of-poverty rates of individuals aged 18-64, annual average, 2005-2021, EU-27 and the UK, by main geographical regions (%)

Source: own editing based on data retrieved from the Eurostat database (on 31.07.2023).

Table A3.6 At-risk-of-poverty rates among individuals aged 18-64 (AROP(a) rates), EU-27 and the UK, 2005-2021 (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
ES	16,4	16,3	16,4	16,5	17,2	18,1	19	20,4	20,4	22,9	22,8	22,9	21,7	21,8	20,6	19,8	20,9
GR	17,1	18,4	18,7	18,7	18,1	19	20	23,8	24,1	23,5	22,5	22,7	21,7	19,8	18,9	18,4	20,6
RO			20,7	19,8	19,4	19,5	20,9	21,9	21,7	23,4	23,3	23,3	21,9	21,2	21,3	21	20,5
IT	16,6	17,1	17,2	16,8	16,5	17,5	19	18,7	19,1	19,7	19,8	20,9	20,3	20,5	20,3	19,9	20,2
LV	18,2	20,9	17,7	19,4	20,5	20,4	20,2	19,3	18,8	18,4	18,6	17,7	17,5	17,8	17,2	16,9	18,3
PT	15,9	15,7	15,2	16,3	15,8	15,7	16,2	16,9	18,4	19,1	18,8	18,2	18,1	16,7	16,9	14,9	17,2
BG		16,2	19,4	17	16,4	16	18,2	17,4	17,1	18,9	18	20	18,9	18,2	17,1	17,5	17,1
LU	12,8	13,5	12,7	12,9	14,2	13,9	13,1	14,5	15	15,8	14,9	15,5	16,2	16,5	17,3	17,6	16,7
SE	9,1	11,4	10,2	12,4	13,3	14,1	14,4	14,2	15,3	15,4	15,8	15,1	14,8	15,9	16,1	15,4	15,7
LT	19	17,8	15,6	17,5	18,4	22,2	20,2	17,9	19	17,6	19,5	19,1	18,8	18	16,5	16,3	15,6
EE	16,8	15,9	16,1	15	15,8	15,6	18	17,7	17,3	19,4	17,9	17,1	16,2	16,4	16,1	15,8	15,6
HR						18,2	18,6	18,1	17,8	17,9	17,9	17,2	16,9	16,4	14,8	14,5	15,3
DE	11,9	12,6	15,2	15,4	15,8	15,6	16,4	16,6	16,9	17,2	17,3	16,4	16	15,7	14,5	15	14,7
FR	11,6	12,1	12,3	11,6	11,8	12,7	13,5	13,7	13,7	13,2	13,4	13,3	12,8	12,8	13,3	14	14
NL	10,2	9,3	8,9	9,9	10,3	10,1	10,5	10,1	10,9	12,4	12,5	13,2	13,8	14	13,5	13,7	14
PL	20,4	19,1	17,2	16,3	16	16,9	17,1	16,5	16,7	16,7	17,6	17,3	15,6	15,2	15,5	14,2	14
DK	11	11	10,9	11,3	12,2	12,9	12,2	12,3	13,4	13,8	13,8	13,9	14,3	14,5	14,4	13,1	13,4
AT	11,5	11	10,6	13,3	13	12,9	13,1	13,3	12,9	12,9	13	13,6	13,5	13	12,8	12,7	13,2
MT	11,4	11,2	12,6	12	12,1	13,1	13,1	12,4	13,5	13,1	13,4	13,3	13,2	13,3	13,2	13,5	13,1
HU	13,2	14,5	11,6	12	11,9	11,9	13,8	14	15,2	14,9	15,5	15	14,2	13,4	12,9	12,2	12
CY	11,1	10,6	10,1	10,8	11,2	11,9	11,5	12,2	14,4	13,4	15,9	15,1	14,2	13,4	11,9	12	11,9
SK	12,7	10,6	9,3	9,5	9,6	11,2	12,4	12,3	12,1	12,3	11,6	12	11,5	11,3	10,7	10,3	11,2
BE	12	12,2	12,6	12,2	12,1	12,1	12,9	13,5	13,4	14,2	13,7	14,9	15,1	15,1	13,1	12,2	11,1
IE	16	15,3	14,4	13,4	13,2	14,6	15,1	15,9	15,7	17	16,1	16	15,3	13,3	11,5	12,2	10,8
FI	10,5	11,2	11,5	11,8	12,2	12,3	12,8	12,4	11,3	12,5	12,7	12,2	11,6	11,9	11,1	11,8	10,6
SI	10,4	9,7	9,8	10,5	9,2	11	11,7	12,2	13	13,7	13,6	13,4	12,6	12,3	10,5	10,8	10,5
CZ	9,4	8,8	8,6	8,3	7,6	8,1	9,1	9,3	8,6	9,1	9	8,8	7,9	7,7	7,8	7,3	7,2
UK	16,2	15,5	15,1	14,7	14,8	14,9	14,1	15,3	14,7	15,6	15,6	14,6	15,5	16,3			

Figure A3.4 Severe material deprivation rates of individuals aged 18-64 (SMD(a)), annual average, 2005-2020, EU-27 and the UK, by main geographical regions of Europe (%)

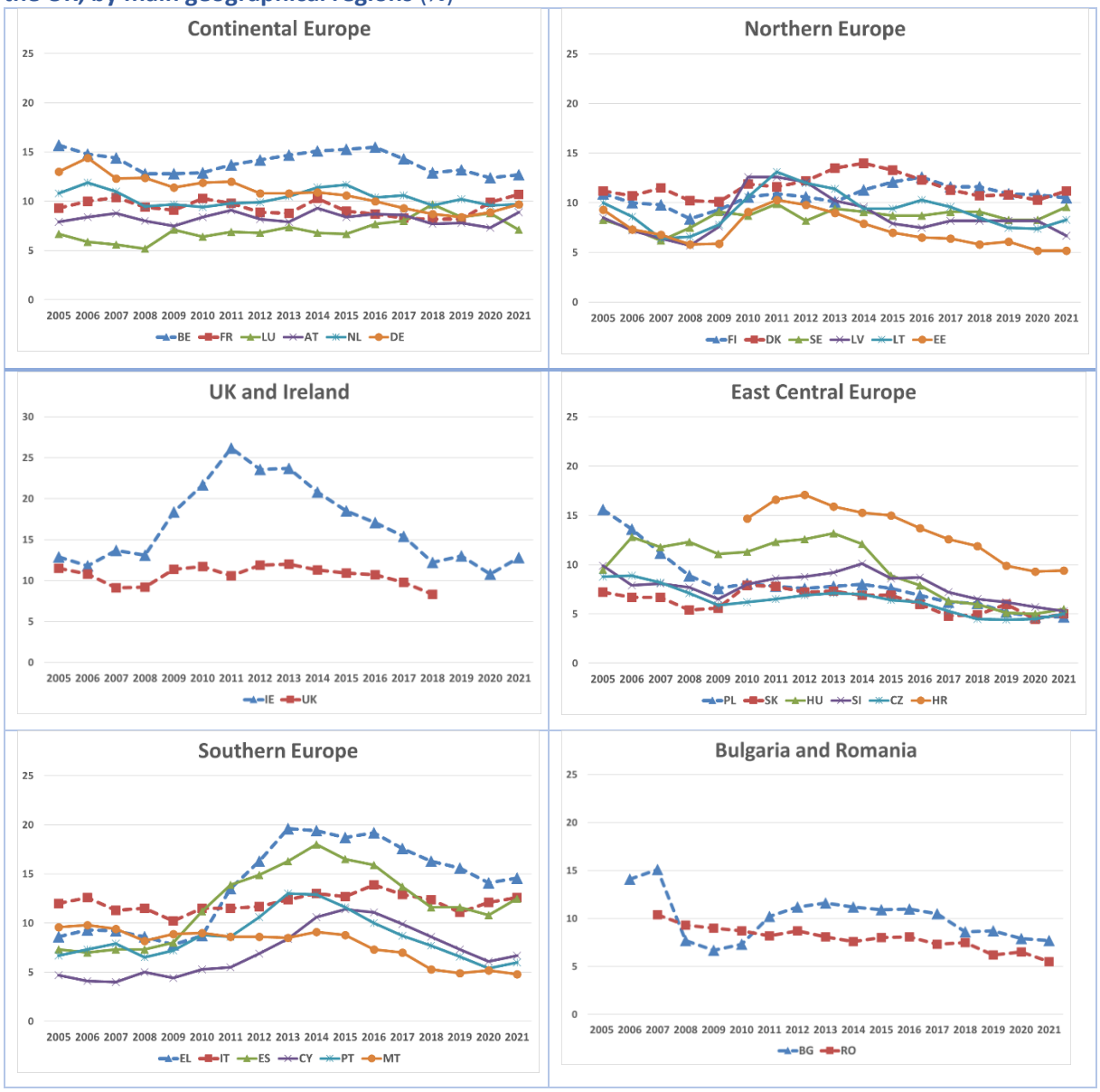


Source: own editing based on data retrieved from the Eurostat database (on 31.07.2023).

Table A3.7 Severe material deprivation rates of individuals aged 18-64 (SMD(a)), EU27 and the UK, 2005-2020 (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
EL	11,7	10,6	10,2	10,4	10,3	11,2	15,4	20,7	21,6	22,9	23,5	23,7	22,1	17,3	17	17,6
BG		54,2	54,9	36,2	37,1	42,2	40,3	40,8	39,9	29,5	31,3	29	27	17,3	17,6	16,2
RO			33,8	29,4	29,6	28,5	27,8	29,4	28,2	24,3	21,2	22,1	18,9	15,7	13,2	13,7
CY	11,8	12,3	12,7	8,6	9,5	11,5	11,6	15,5	16,7	16,7	16,8	14,1	12,4	10,9	9,8	8,5
HU	22,2	20,2	19	17,6	20,1	21,3	23,3	26,1	28,1	23,8	19,2	16,5	14,7	10,1	8,3	7,5
ES	3,9	0	3,3	3,5	4,5	4,9	4,8	6,1	6,5	7,6	6,9	6,4	5,6	5,7	5,1	7,5
LV	37,5	29,8	21,8	16,7	20,5	26,8	31,2	25	22,9	18,2	15,7	12,4	11,2	9,2	7,6	7,1
HR						13,8	15,2	15,4	14,4	13,9	13,6	12,1	9,7	7,9	6,8	6,7
LT	30,8	24,2	15,8	11,5	14,7	18,7	18	19,5	14,6	12,3	12,7	13	11	10,5	9	6,7
IT	6,8	6,4	7	7,4	7,4	7,4	10,9	14,4	12,7	12	12,2	12,3	10,5	9,2	7,9	6,6
DE	4,9	5,7	5,5	6,1	5,8	5,2	6	5,5	6	5,6	5	4	3,8	3,4	2,9	6,1
SK	21,2	17,1	12,3	10,8	10,6	11	10,3	10,1	9,7	9,4	8,4	7,9	6,5	6,5	7,7	5,8
FR	5,4	5,3	4,8	5,5	5,9	6	5,2	5,4	5,4	5,2	5	4,6	4,3	5	5	5,5
BE	6,5	6,2	5,9	5,7	5,3	6	5,6	6,6	5,8	6,5	6,1	6,1	5,7	5,3	4,8	4,4
PT	8	7,7	8,6	8,9	8,3	8,3	7,6	8,2	10,7	10,3	9,6	8,6	6,6	6	5,7	4,4
IE	4,2	4,3	3,7	5,6	5,8	5,4	7,9	10,1	9,6	9,5	8,6	6,5	5,2	4,9	5,6	4,3
FI	4,1	3,8	3,9	3,7	3,1	3,3	3,5	3,4	3,1	3,4	2,6	2,5	2,5	3,4	2,9	3,2
MT	5	3,5	4	4	4,6	6,4	6,8	8,9	10,3	9,7	8,8	4,2	3,1	2,8	3,6	3
SI	5	5,1	5	6,9	6,2	6,1	6,2	6,9	6,8	7,1	6	5,5	4,8	3,8	2,4	2,9
DK	3,7	3,2	3,3	2	2,7	2,9	2,5	2,9	4,3	4	4,3	3,1	3,8	4	2,9	2,9
EE	11,6	6,8	5,5	4,5	6,1	9,1	9,3	10	8	6,3	4,4	4,7	3,7	3,6	3,1	2,7
AT	3,6	3,8	3,4	6	4,9	4,5	4	4,1	4,3	4	4	3,4	4	3,1	2,6	2,6
PL	33,1	27,2	21,9	17,2	14,4	13,6	12,5	13,2	12	10,5	8,2	7,1	6,2	4,9	3,7	2,6
NL	2,4	2,3	1,9	1,6	1,6	2,7	2,8	2,4	3	3,6	3,1	3	3,2	2,6	2,9	2,4
CZ	10,9	9,3	6,8	6,5	5,9	6	5,8	6,3	6,7	6,3	5,4	4,9	3,7	2,7	2,8	2,4
LU	1,7	1,1	0,9	0,7	1,3	0,7	1,4	1,4	1,7	1,5	2	2	1,4	1,4	1,4	2,1
SE	2,3	2,1	2,2	1,8	2,3	2,1	1,9	2,1	2,1	1,1	1,3	1	1,4	1,8	1,8	1,9
UK	5,2	4,3	4	4,7	3,6	5	5,5	8	8,7	7,9	6,3	5,6	4,4	4,8		

Figure A3.5 (Quasi-)joblessness rates in in the active age population (18-59), 2005-2021, EU-27 and the UK, by main geographical regions (%)

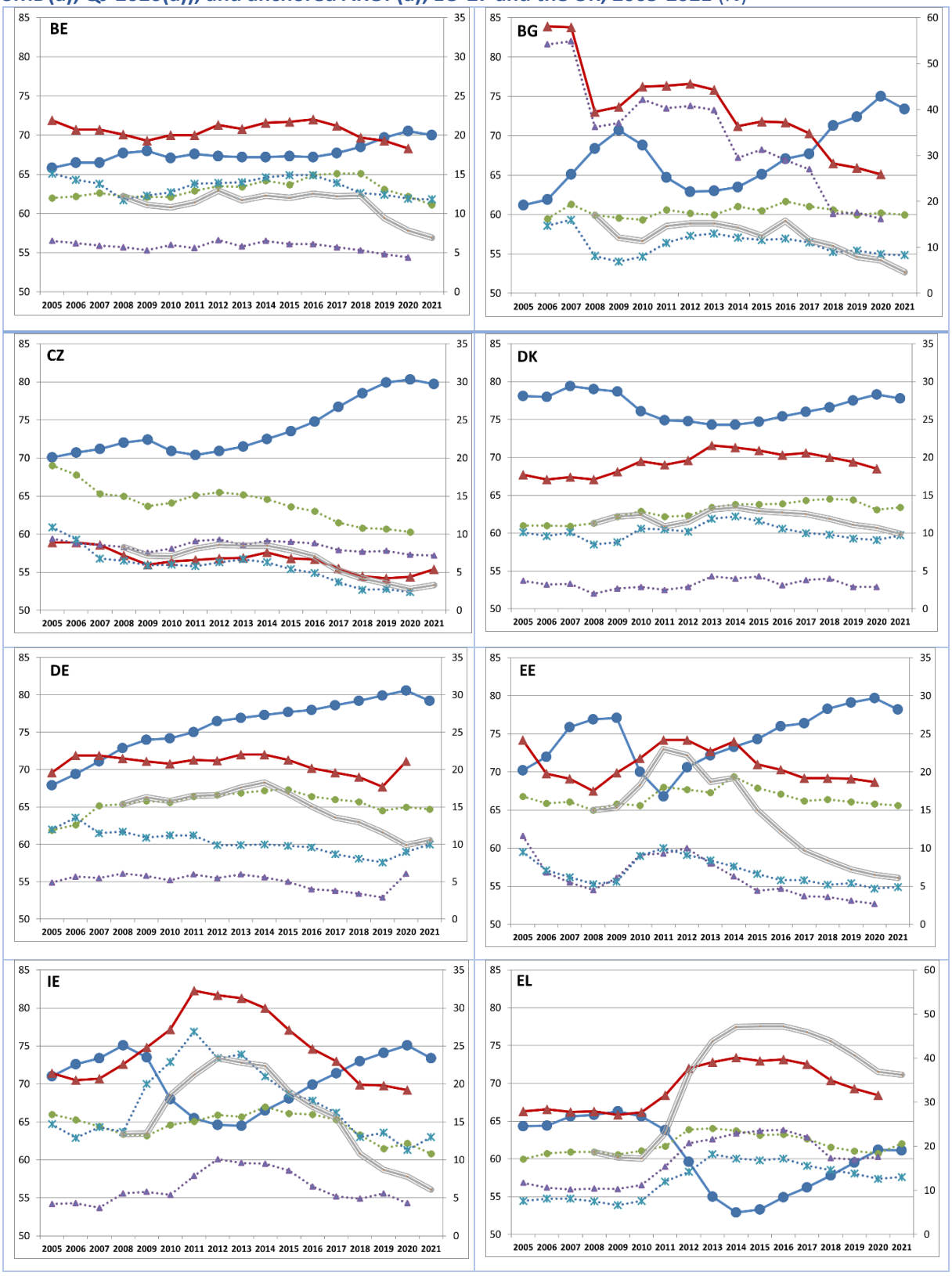


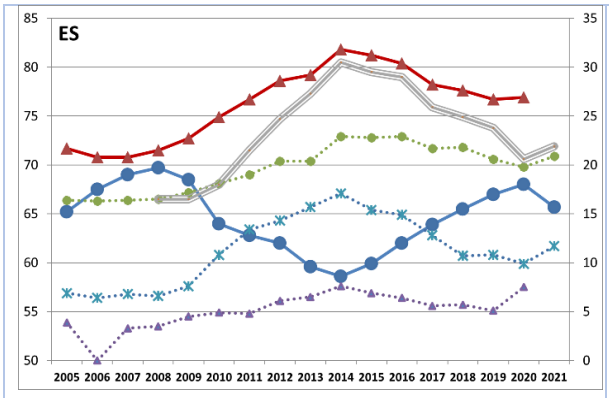
Source: own editing based on data retrieved from the Eurostat database (on 31.07.2023).

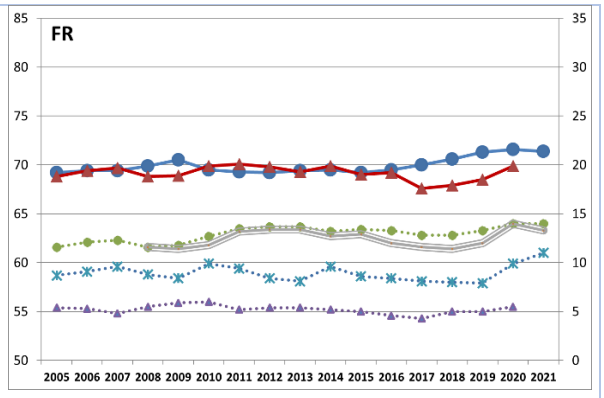
Table A3.8 (Quasi-)joblessness rates, EU-27 and the UK, 2005-2021 (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
EL	8,6	9,3	9,2	8,6	7,8	8,7	13,5	16,3	19,6	19,4	18,7	19,2	17,6	16,3	15,6	14,1	14,6
IE	12,9	11,8	13,7	13,1	18,4	21,7	26,2	23,6	23,7	20,8	18,5	17,1	15,4	12,2	13	10,8	12,8
BE	15,7	14,8	14,4	12,8	12,8	12,9	13,7	14,2	14,7	15,1	15,3	15,5	14,3	12,9	13,2	12,4	12,7
IT	12	12,6	11,3	11,5	10,2	11,5	11,5	11,7	12,4	13	12,7	13,9	12,9	12,4	11,1	12,1	12,6
ES	7,3	7	7,3	7,3	8	11,2	13,9	14,9	16,3	18	16,5	15,9	13,7	11,6	11,6	10,8	12,5
DK	11,2	10,7	11,5	10,2	10,1	11,9	11,6	12,2	13,5	14	13,3	12,3	11,3	10,7	10,8	10,3	11,2
FR	9,3	10	10,4	9,4	9,1	10,3	9,8	8,9	8,8	10,3	9	8,7	8,3	8,2	8,2	9,9	10,7
FI	10,9	10	9,8	8,4	9,3	10,6	10,9	10,6	10,1	11,3	12,1	12,6	11,6	11,6	10,9	10,8	10,5
DE	13	14,4	12,3	12,4	11,4	11,9	12	10,8	10,8	10,9	10,6	10	9,3	8,7	8,4	8,9	9,7
NL	10,8	11,9	11	9,5	9,7	9,4	9,8	9,9	10,5	11,4	11,7	10,4	10,6	9,6	10,2	9,6	9,7
SE	8,3	7,4	6,2	7,5	9,1	8,7	9,9	8,2	9,4	9,1	8,7	8,7	9,1	9,1	8,3	8,3	9,6
HR						14,7	16,6	17,1	15,9	15,3	15	13,7	12,6	11,9	9,9	9,3	9,4
AT	7,9	8,4	8,8	8	7,5	8,4	9,1	8,2	7,9	9,3	8,4	8,7	8,6	7,7	7,8	7,3	8,9
LT	10	8,6	6,4	6,6	7,8	10,6	13,1	12	11,4	9,4	9,4	10,3	9,6	8,5	7,5	7,4	8,3
BG		14,1	15,1	7,7	6,7	7,3	10,2	11,2	11,6	11,2	10,9	11	10,5	8,6	8,7	7,9	7,7
LU	6,7	5,9	5,6	5,2	7,1	6,4	6,9	6,8	7,4	6,8	6,7	7,7	8	9,7	8,4	8,8	7,1
CY	4,7	4,1	4	5	4,4	5,3	5,5	6,9	8,4	10,6	11,4	11,1	9,9	8,6	7,3	6,1	6,7
LV	8,5	7,2	6,4	5,7	7,6	12,6	12,6	12,1	10,2	9,6	7,9	7,5	8,2	8,2	8,2	8,2	6,7
PT	6,7	7,3	7,9	6,5	7,2	8,8	8,6	10,6	13	12,9	11,6	10	8,7	7,7	6,6	5,4	6
HU	9,5	12,8	11,8	12,3	11,1	11,3	12,3	12,6	13,2	12,1	8,9	7,9	6,3	6	5,1	5	5,5
RO			10,4	9,3	9	8,7	8,2	8,7	8,1	7,6	8	8,1	7,3	7,5	6,2	6,5	5,5
SI	9,9	7,9	8,1	7,7	6,5	8	8,6	8,8	9,2	10,1	8,6	8,7	7,2	6,5	6,2	5,7	5,3
EE	9,3	7,3	6,8	5,8	5,9	9,1	10,3	9,8	9	7,9	7	6,5	6,4	5,8	6,1	5,2	5,2
CZ	8,8	8,9	8,2	7,1	5,9	6,2	6,5	6,9	7,1	7	6,4	6,2	5,3	4,5	4,4	4,5	5
SK	7,2	6,7	6,7	5,4	5,6	7,9	7,8	7,2	7,3	6,9	6,9	6	4,8	4,9	6	4,5	5
MT	9,6	9,8	9,4	8,2	8,9	9	8,6	8,6	8,5	9,1	8,8	7,3	7	5,3	4,9	5,2	4,8
PL	15,6	13,6	11,2	8,9	7,6	8,1	7,8	7,6	7,8	8	7,6	6,9	6,2	6,1	5,2	4,7	4,7
UK	11,5	10,8	9,1	9,2	11,4	11,7	10,6	11,9	12	11,3	10,9	10,7	9,8	8,3			

Figure A3.6 Employment rate (left scale, year t-1), AROPE-2020(a) and its components (AROP(a), SMD(a), QJ-2020(a)), and anchored AROP(a), EU-27 and the UK, 2005-2021 (%)




ES
85 80 75 70 65 60 55 50
35 30 25 20 15 10 5 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


FR
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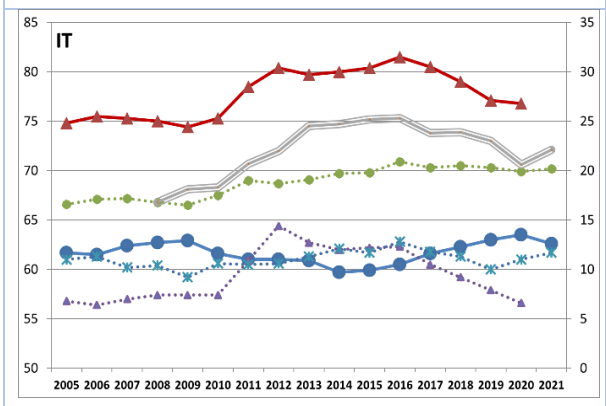
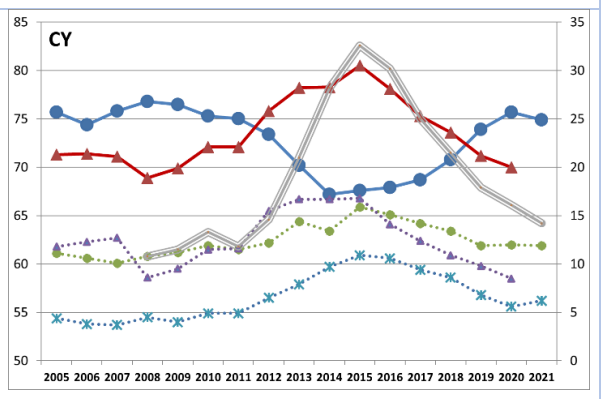
35 30 25 20 15 10 5 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


IT
85 80 75 70 65 60 55 50
35 30 25 20 15 10 5 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


CY
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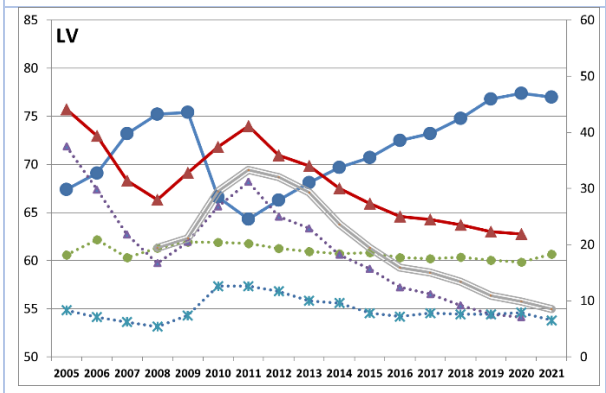
35 30 25 20 15 10 5 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


LV
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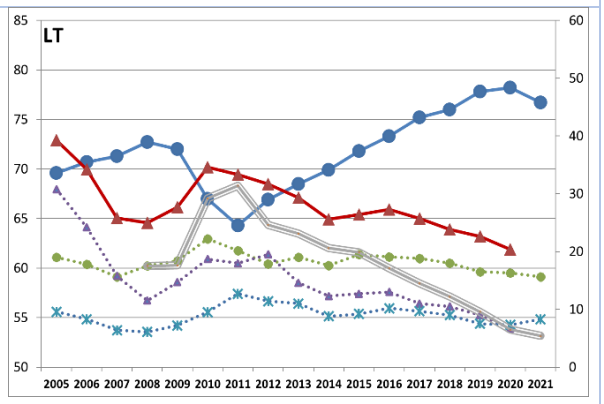
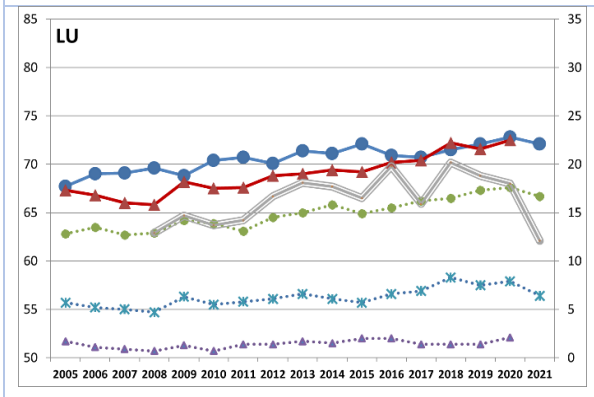
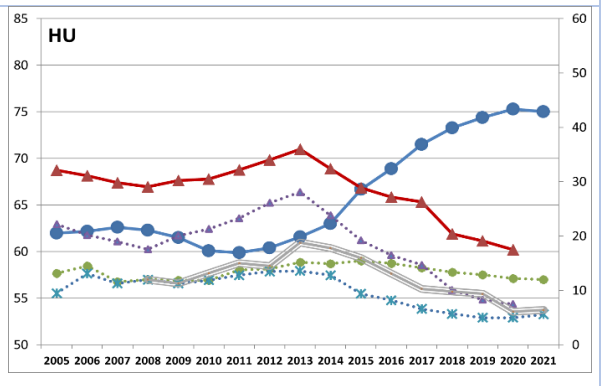
60 50 40 30 20 10 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


LT
85 80 75 70 65 60 55 50
60 50 40 30 20 10 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


LU
85 80 75 70 65 60 55 50
35 30 25 20 15 10 5 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


HU
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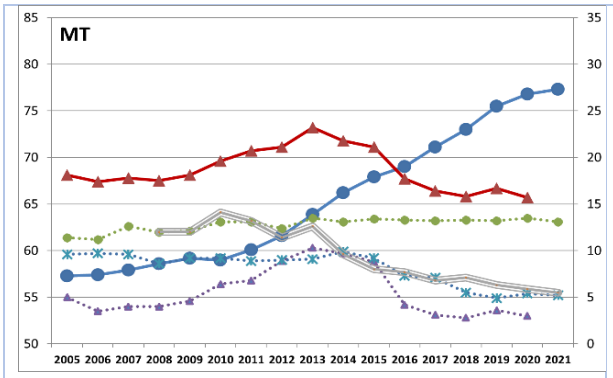
60 50 40 30 20 10 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


MT
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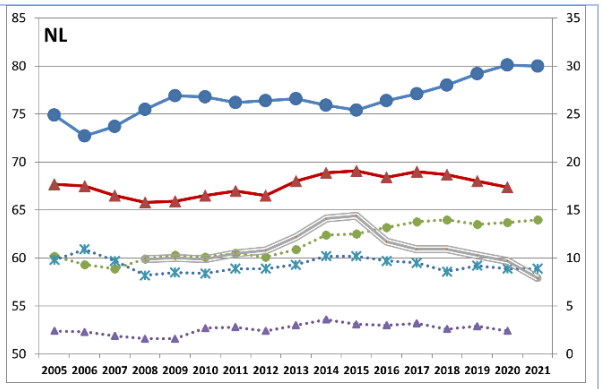
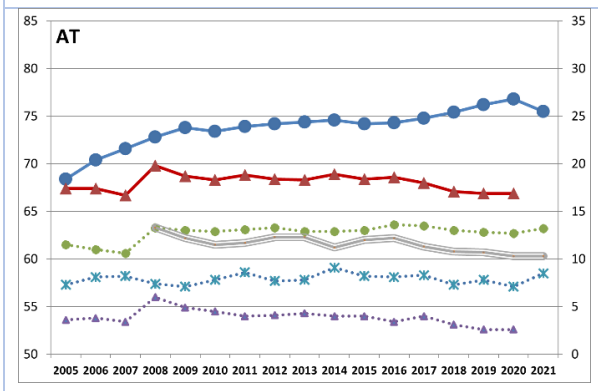
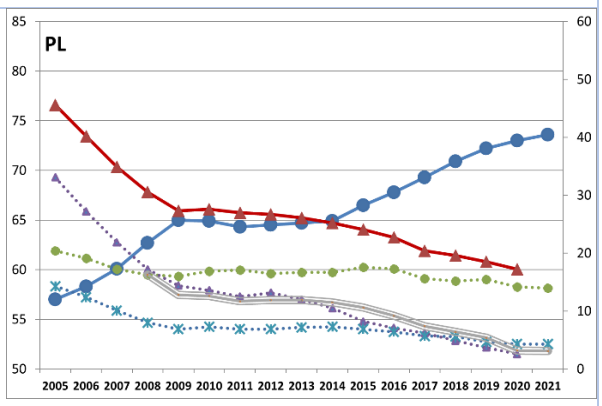
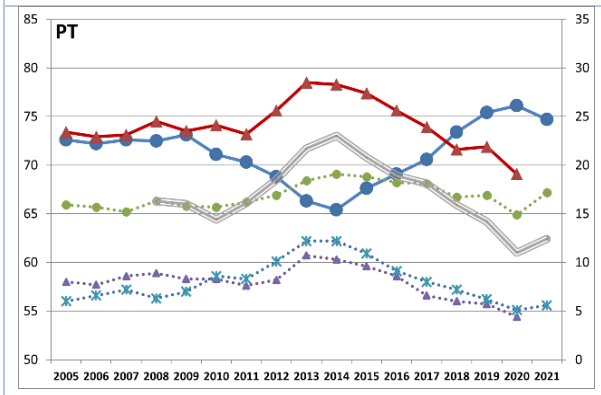
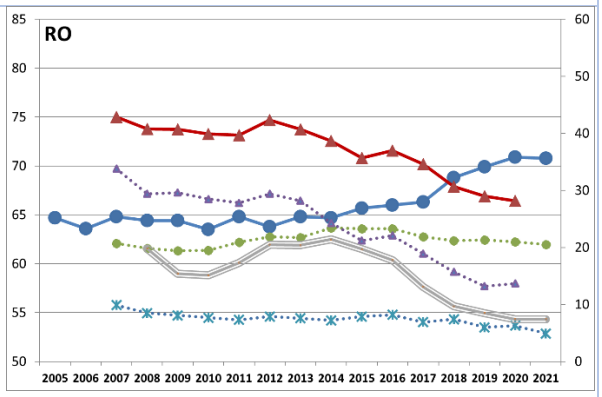
35 30 25 20 15 10 5 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

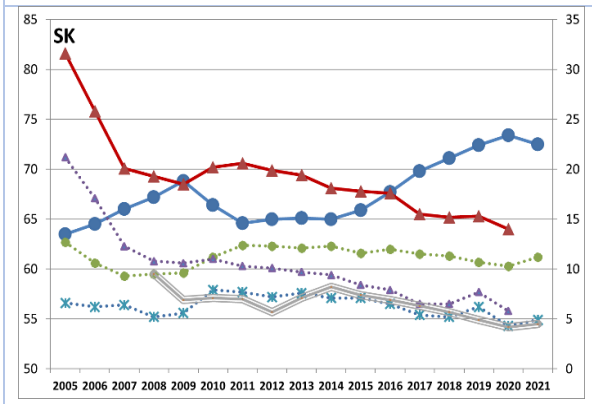

NL
85 80 75 70 65 60 55 50
35 30 25 20 15 10 5 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

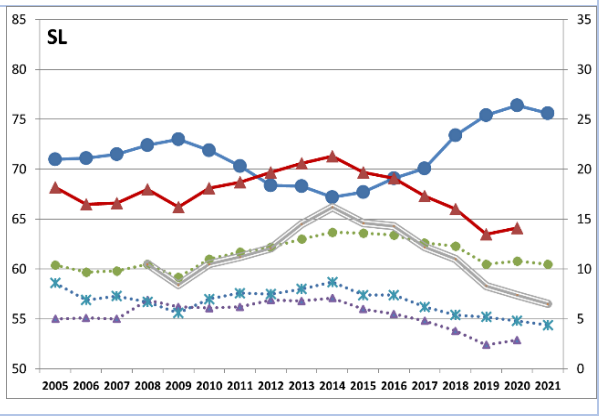

AT
85 80 75 70 65 60 55 50
35 30 25 20 15 10 5 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

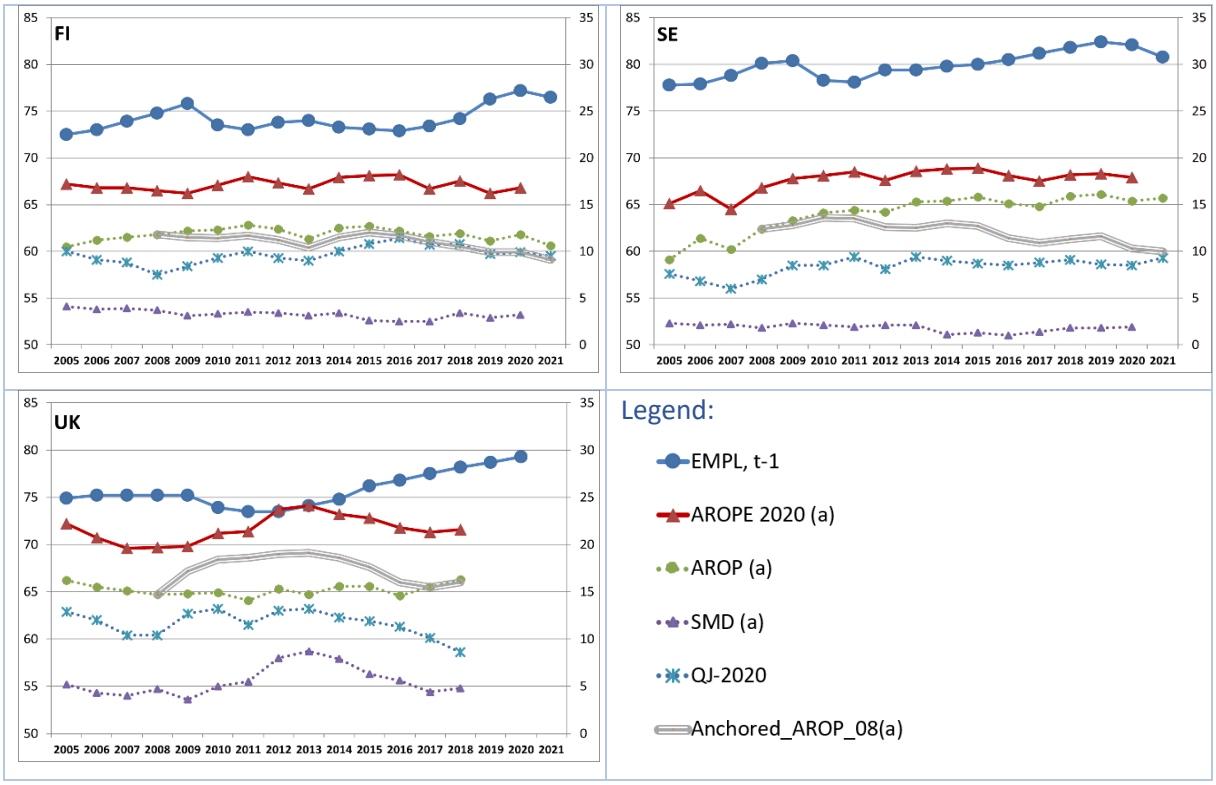

PL
85 80 75 70 65 60 55 50
60 50 40 30 20 10 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


PT
85 80 75 70 65 60 55 50
35 30 25 20 15 10 5 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


RO
85 80 75 70 65 60 55 50
60 50 40 30 20 10 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


SK
85 80 75 70 65 60 55 50
35 30 25 20 15 10 5 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

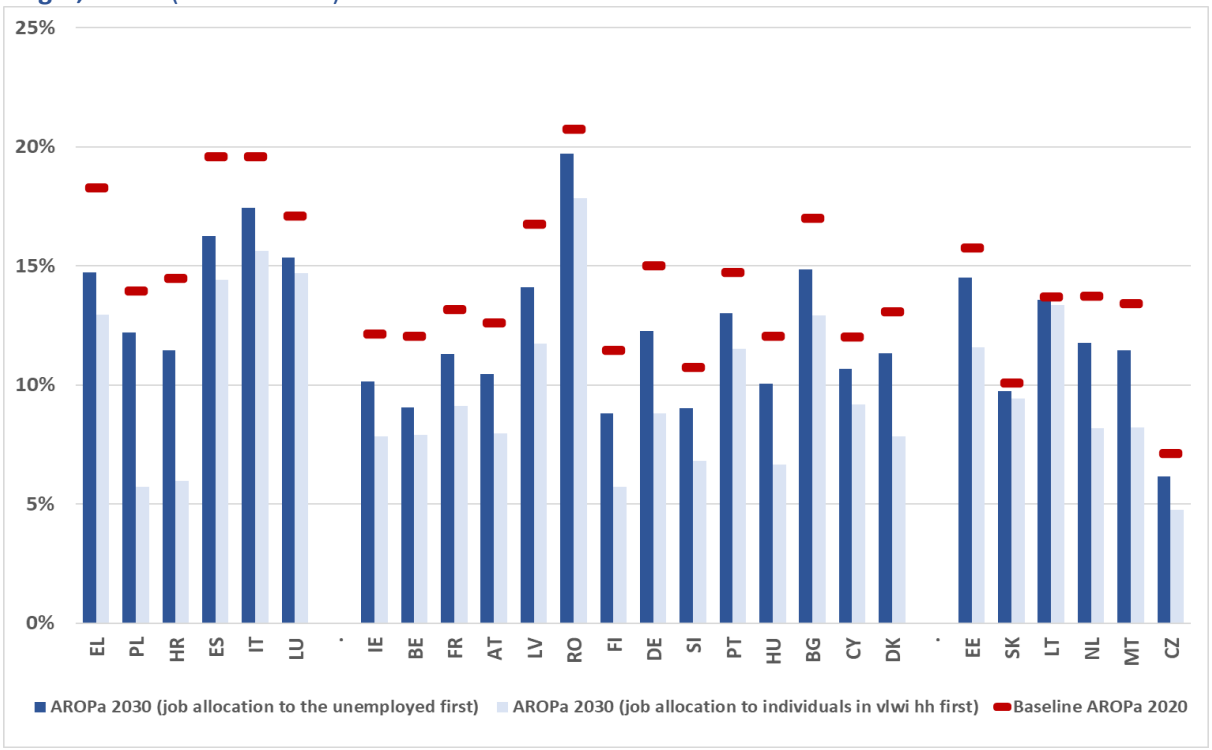

SL
85 80 75 70 65 60 55 50
35 30 25 20 15 10 5 0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021



Source. Own edits based on data retrieved from the Eurostat data retrieved on 31/7/2023.

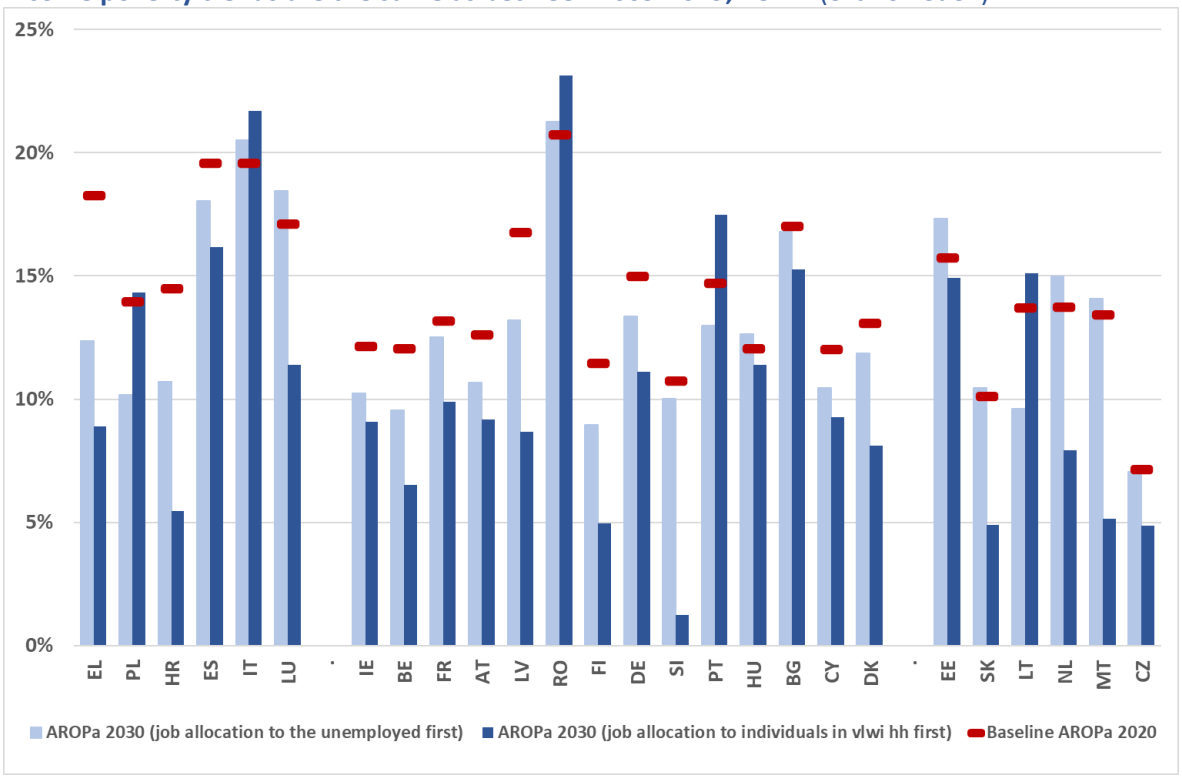
Note: the right-hand scales for Bulgaria, Greece, Latvia, Lithuania, Hungary, Poland and Romania are extended to 60% to allow reflecting very high material deprivation rates in certain periods.

Figure A3.7 AROP(a) after increase of employment to country specific Europe 2030 employment target, EU-27 (excl. Sweden)



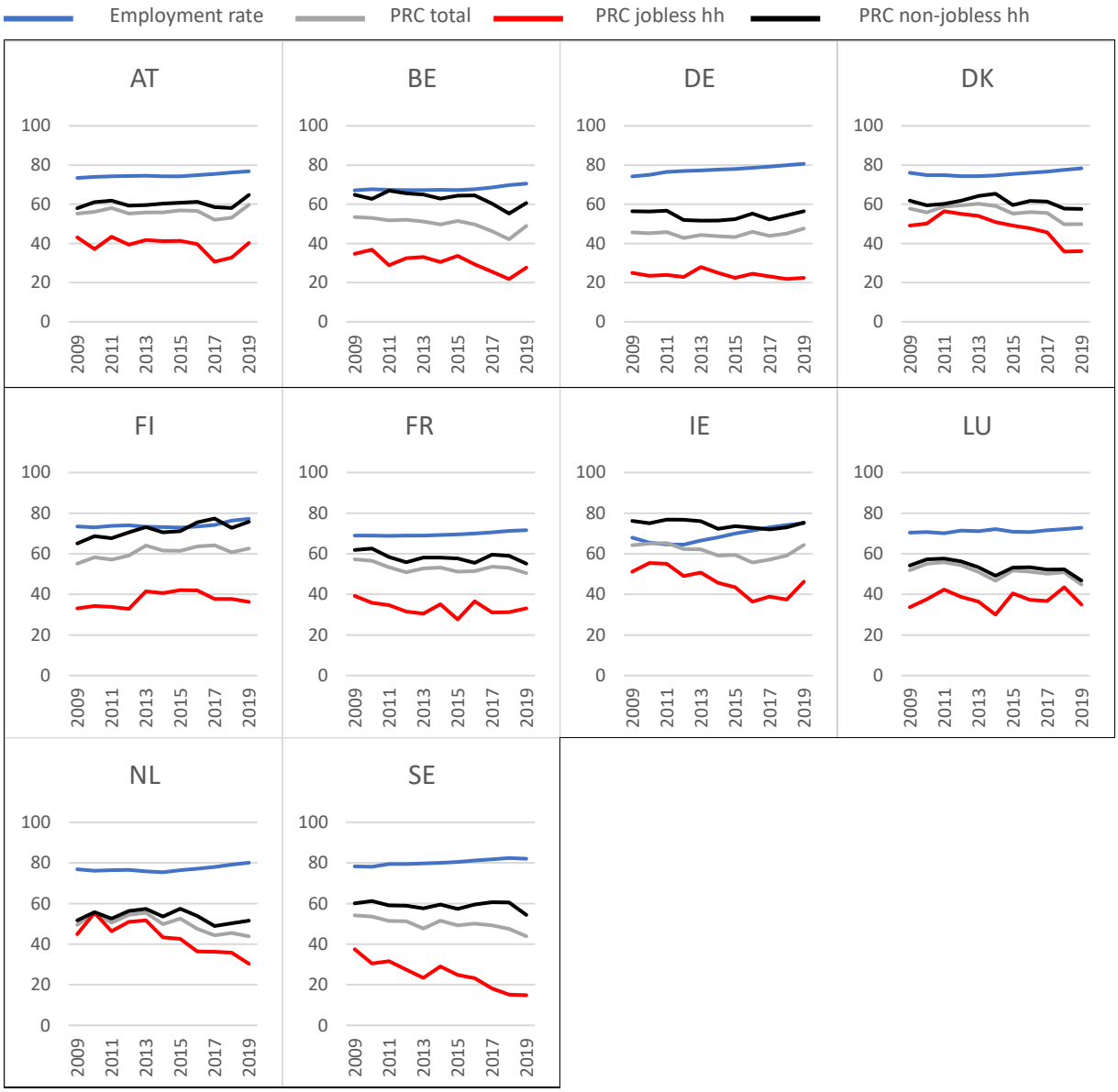
Note: own calculations based on EU-SILC 2020. Countries are ranked according to their observed employment rates in 2020.

Figure A3.8 AROP(a) after increase of employment to country specific 2030 employment target if income poverty trends are the same as between 2009-2019, EU-27 (excl. Sweden)



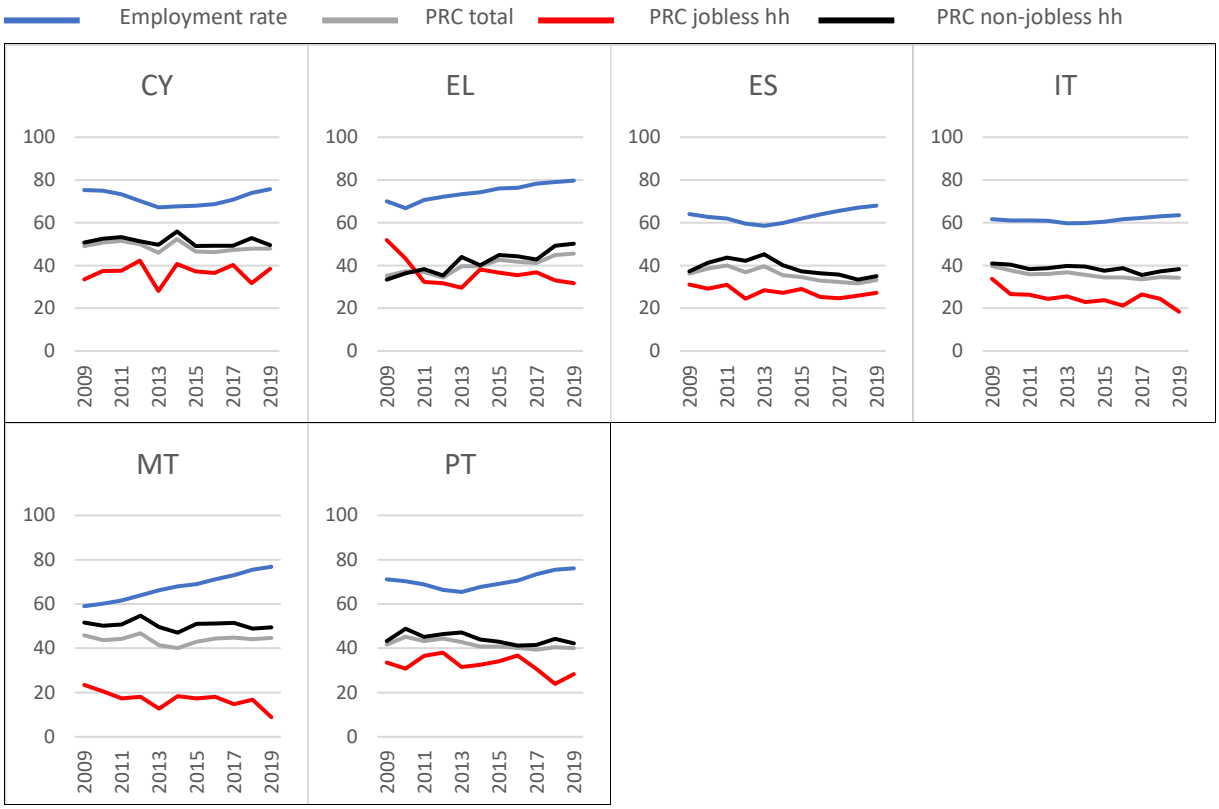
Note: own calculations based on EU-SILC 2020. Countries are ranked according to their observed employment rates in 2020.

Figure A3.9 Employment and poverty reducing capacity of social transfers' trends in the Continental and Nordic states (2009-2019, %)



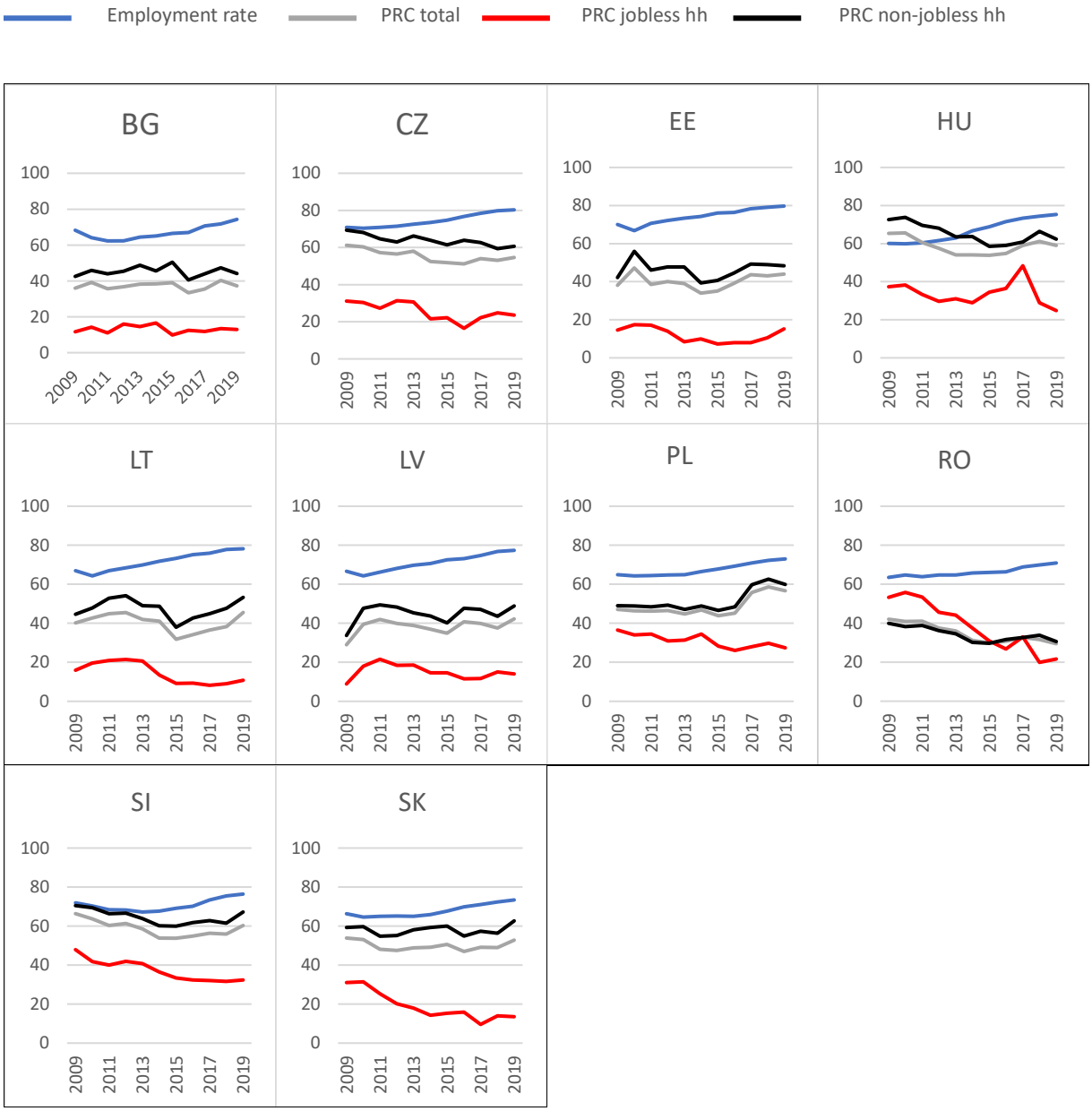
Source: own calculations based on EU-SILC.

Figure A3.10 Employment and poverty reducing capacity trends in Southern Member States (2009-2019, %)



Source: own calculations based on EU-SILC.

Figure A3.11 Employment and poverty reducing capacity of social transfers trends in Central-Eastern Member States (2009-2019, %)



Source: own calculations based on EU-SILC.

Table A3.9 The relationship between employment and AROP(a) – beta coefficients of country-year panel fixed-effect (TSCS) regressions, EU-28, 2005-2020

Models	(1)	(2)	(3)	(4)
Employment rate	-0.24	**-0.20**	-0.13	*-0.13*
Share of persons by the WI level of hhs				
- in very low work intensity hhs(WI<0.2)		**0.23**	**0.21**	**0.22**
- in low work intensity hhs (0.2<WI<0.45)		0.02	0.05	0.05
- in medium work intensity hhs (0.45<WI<0.55)		**-0.31**	**-0.24**	**-0.24**
- in high work intensity hhs (0.55<WI<0.85)		0.00	0.00	0.00
Involuntary part-time employment rate			**0.04**	0.04
All soc. prot. exp. (% of GDP, excl. pensions)				-0.06
Number of countries	28	28	28	28
Observations	465	459	454	454
R-squared	0.24	0.40	0.46	0.46

Source: Own estimates based on data retrieved from the Eurostat database in the period between 31/07/2023 – 31/01/2024.

Note. Levels of significance: *p<0.1*; p<0.05, **p<0.01**. Additional control: GNI per capita. For a detailed description of variables see Annex 1. Standard errors of estimates are available from the authors.

Table A3.10 The relationship between employment and AROP(a) – beta coefficients of FD regressions, EU-28, 2005-2020

Models	(1)	(2)	(3)	(4)
Employment rate	**-0.13**	*-0.07*	*-0.07*	*-0.07*
Share of persons by the WI level of hhs				
- in very low work intensity hhs(WI<0.2)		0.12	0.13	*0.13*
- in low work intensity hhs (0.2<WI<0.45)		-0.01	-0.01	-0.01
- in medium work intensity hhs (0.45<WI<0.55)		0.06	0.07	0.07
- in high work intensity hhs (0.55<WI<0.85)		0.02	0.02	0.02
Involuntary part-time employment rate			0.00	0.00
All soc. prot. exp. (% of GDP, excl. pensions)				0.08
Number of countries	28	28	28	28
Observations	437	431	425	425
R-squared	0.15	0.20	0.20	0.20

Source: Own estimates based on data retrieved from the Eurostat database in the period between 31/07/2023 – 31/01/2024.

Note. See notes under Table A3.9.

Table A3.11 The relationship between employment and SMD(a) – beta coefficients of country-year panel fixed-effect (TSCS) regressions, EU-28, 2005-2020

Models	(1)	(2)	(3)	(4)
Employment rate	**-0.76**	**-0.86**	**-0.90**	**-0.88**
Share of persons by the WI level of hhs				
- in very low work intensity hhs(WI<0.2)		0.07	0.03	0.10
- in low work intensity hhs (0.2<WI<0.45)		0.26	0.26	0.25
- in medium work intensity hhs (0.45<WI<0.55)		**-0.76**	**-0.81**	**-0.80**
- in high work intensity hhs (0.55<WI<0.85)		*0.22*	*0.23*	*0.24*
Involuntary part-time employment rate			-0.01	-0.02
All soc. prot. exp. (% of GDP, excl. pensions)				-0.28
Number of countries	28	28	28	28
Observations	438	434	429	429
R-squared	0.39	0.50	0.50	0.50

Source: Own estimates based on data retrieved from the Eurostat database in the period between 31/07/2023 – 31/01/2024.

Note. See notes under Table A3.9.

Table A3.12 The relationship between employment and SMD(a) – beta coefficients of FD regressions, EU-28, 2005-2020

Models	(1)	(2)	(3)	(4)
Employment rate	**-0.61**	**-0.48**	-0.34	-0.32
Share of persons by the WI level of hhs				
- in very low work intensity hhs(WI<0.2)		0.32	0.36	0.39
- in low work intensity hhs (0.2<WI<0.45)		-0.03	-0.03	-0.02
- in medium work intensity hhs (0.45<WI<0.55)		-0.02	0.04	0.02
- in high work intensity hhs (0.55<WI<0.85)		0.04	0.01	0.00
Involuntary part-time employment rate			**0.12**	**0.12**
All soc. prot. exp. (% of GDP, excl. pensions)				-0.39
Number of countries	28	28	28	28
Observations	410	406	400	400
R-squared	0.26	0.29	0.33	0.34

Source: Own estimates based on data retrieved from the Eurostat database in the period between 31/07/2023 – 31/01/2024.

Note. See notes under Table A3.9.

Table A3.13 The relationship between employment and anchored AROP(a) – beta coefficients of country-year panel fixed-effect (TSCS) regressions, EU-28, 2005-2020

Models	(1)	(2)	(3)	(4)
Employment rate	**-1.06**	**-1.07**	**-0.79**	**-0.67**
Share of persons by the WI level of hhs				
- in very low work intensity hhs(WI<0.2)		0.44	0.28	0.47
- in low work intensity hhs (0.2<WI<0.45)		0.27	*0.37*	*0.37*
- in medium work intensity hhs (0.45<WI<0.55)		**-0.76**	**-0.71**	**-0.76**
- in high work intensity hhs (0.55<WI<0.85)		-0.09	0.00	0.01
Involuntary part-time employment rate			**0.18**	**0.16**
All soc. prot. exp. (% of GDP, excl. pensions)				**-0.55**
Number of countries	27	27	27	27
Observations	375	372	369	369
R-squared	0.61	0.72	0.76	0.77

Source: Own estimates based on data retrieved from the Eurostat database in the period between 31/07/2023 – 31/01/2024.

Note. See notes under Table A3.9.

Table A3.14 The relationship between employment and anchored AROP(a) – beta coefficients of FD regressions, EU-28, 2005-2020

Models	(1)	(2)	(3)	(4)
Employment rate	**-0.98**	**-0.83**	**-0.70**	**-0.67**
Share of persons by the WI level of hhs				
- in very low work intensity hhs(WI<0.2)		0.18	0.21	0.23
- in low work intensity hhs (0.2<WI<0.45)		*0.22*	0.26	0.28
- in medium work intensity hhs (0.45<WI<0.55)		-0.05	-0.05	-0.05
- in high work intensity hhs (0.55<WI<0.85)		-0.03	-0.03	-0.03
Involuntary part-time employment rate			**0.10**	**0.10**
All soc. prot. exp. (% of GDP, excl. pensions)				*-0.29*
Number of countries	27	27	27	27
Observations	348	345	341	341
R-squared	0.52	0.54	0.56	0.57

Source: Own estimates based on data retrieved from the Eurostat database in the period between 31/07/2023 – 31/01/2024.

Note. See notes under Table A3.9.

Table A3.15 Changes in prevalence of different employment/household composition types, selected countries, 1986-2019

	Single not working	Single Working	Couple with children 1 working	Couple none working	Couple 2 working
	Change in share of total sample 1986-2019 (pp)				
Czechia	0.26	6.55	-5.46	-5.33	3.39
Denmark	0.86	-2.34	-2.85	-2.15	-3.08
Germany	1.09	7.33	-12.23	-1.21	6.91
Greece	0.02	4.15	-3.31	-20.5	18.73
Hungary	-0.17	5.59	-4.27	-2.82	2.89
Italy	-0.20	11.63	-9.69	-15.29	14.86
Spain	-0.85	6.83	-24.64	-13.72	33.75
UK	1.32	3.29	-5.45	-1.99	2.13

Source: authors' analysis of LIS database.