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Abstract

This paper attempts to shed light on post-COVID-19 labour market developments across the EU, notably on the simultaneous presence of elements of slack and indications of tightness over the course of 2021. It presents available data on labour market mismatch and discusses possible dynamics going forward. In light of the strong sectoral dimension of the COVID-19 shock, the paper explores differences in the impact of the COVID-19 crisis across countries, relevant sectoral aggregates, and workers' characteristics. The paper also conducts econometric estimations with a view to gauge whether Beveridge curves have shifted upward after the COVID-19 outbreak. The results indicate a modest upward shift in the EU Beveridge curves in 2020, partly reversed in the course of 2021. Despite the fact that skill mismatch somewhat worsened in the wake of the COVID-19 pandemic, this deterioration appears to have had a very minor impact on the efficiency of labour market matching. Overall, a number of considerations suggest the simultaneous presence of labour market slack and shortages is likely to have been a temporary phenomenon. Labour shortages appear to be driven mainly by the labour market recovery and not by hampered labour market reallocation.

JEL Classification: E24, E32, J08, J21, J63.

Keywords: Labour market slack, labour shortages, mismatch, Beveridge curve, Covid-19 impact.

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CONTENTS

1. INTRODUCTION

By the end of 2021, output rebounded from the economic shock caused by the pandemic, but labour market indicators were conveying mixed signals: still elevated labour market slack indicators coexisted with growing evidence of labour shortages. Such contrasting signals could point at growing labour market mismatch, a concern deriving from the strong sectoral dimension of the COVID-19 crisis, as labour shedding was concentrated in a few sectors that were disproportionally hit by containment measures. An ex-post examination of what happened in the past can provide useful insights on the drivers of the labour shortages that have been surging strongly as of late, as well as inform possible outlooks and policy formulation going forward.

Against this background, this paper attempts to shed light on post COVID-19 labour market developments across Europe over the course of 2021, to better understand why shortages were reappearing while slack (i.e., an excess potential supply of labour as compared to that demanded at prevailing wage conditions) remained high. The paper discusses the impact of COVID-19 on labour market mismatch and possible dynamics going forward. In light of the strong sectoral dimension of the COVID-19 shock, the paper explores differences in the impact of the COVID-19 crisis across countries, relevant sectoral aggregates, and workers' characteristics.

The analysis focuses on developments in the aftermath of the COVID-19 outbreak, and their implications over the short to medium term. The interpretation of labour market data over the pandemic period is complicated by the interplay of containment measures, notably lockdowns and other health-related measures, and of support measures such as short-time work schemes (STWs), which helped containing labour shedding during the crisis. STWs blurred the interpretation of most labour market variables and reduced their cross-country comparability (Koester et al. 2020; Koester and Hahn 2020). The interpretation of the effects of containment measures is complicated by the fact that they arguably affect not only the incentives for employers to keep workers, but also those of workers in their decision to engage in job search and/or accept alternative job offers. A further difficulty in interpreting the data comes from the fact that COVID-19 may have had also more indirect and potentially persistent effects, accelerating pre-existing trends linked, among other things, to a growing relative demand for higher-skilled, teleworkable occupations (European Commission 2021b). Given the above difficulties and limitations, in addition to standard labour market tightness indicators such as unemployment and vacancies, additional complementary indicators are reviewed, and interpretations take into account the difficulties in reading the data.

The analysis in the paper goes a step beyond existing analyses of the implications of COVID-19 for skill mismatch (e.g. Duval et al. 2022; European Commission, 2021a; European Commission 2021b, OECD 2021). Skills and sectoral mismatch indicators are built and tracked over the pre- and post-COVID-19 periods. Econometric estimations of Beveridge curves from quarterly data across a panel of EU countries are presented with a view to identify possible structural shifts in the relation between unemployment and vacancies. In contrast with previous analyses, the presented Beveridge curve analysis takes into account possible biases induced by residual autocorrelation by means of panel-specific feasible GLS estimation (using the Prais-Winsten estimator). The standard Beveridge curve is augmented by a term capturing a non-linear relation between unemployment and vacancies and by skills and sectoral mismatch variables to capture possible shifts in the Beveridge curve attributable to changes in mismatch.

In addition to analysing aggregate economy-wide data, in light of the considerable sectoral dimension of COVID-19 containment measures, the paper also digs deeper into sectoral data. In particular, indicators of labour market performance, slack and shortages are reviewed across sectors. To better understand the social implications of the crisis, impacts on employment are also disaggregated by worker type (by gender, age, and qualification level).

The paper shows that after the COVID-19 outbreak employment contracted rather mildly compared with output: because of a widespread use of STWs, adjustment was largely on hours worked. The drop in labour demand was concentrated in a number of contact-intensive sectors highly exposed to the pandemic. The effect on unemployment was also dampened by the fact that job search stalled to a great extent in the heat of the crisis and therefore many jobseekers became, at least temporarily, inactive (e.g. available to work but not seeking a job).

The disaggregation of labour market data by different worker types suggests that, compared to other recessions, when male employment is typically affected to a much greater extent than female employment, the impact of the Covid-19 crisis was relatively similar for men and women. Young and low-qualified workers, and workers on temporary contracts were particularly affected. While employment outcomes for young people recovered swiftly, those for low-qualified workers lagged considerably behind those for higher qualified workers.

At the same time, indicators of slack still stood above pre-COVID levels in many EU countries until at least 2021Q2, in spite of recovering labour market conditions and the fact that STWs already tend to deflate unemployment figures. Moreover, while unemployment remained just slightly higher than before the pandemic, broader measures of slack revealed additional remaining slack, in particular among jobseekers that were available for work but not seeking. Labour market slack continued to be reabsorbed over the second half of 2021.

While the COVID-19 outbreak coincided with a sudden and sharp drop in vacancies, the increase in unemployment was more moderate compared with what observed in previous recessions. As progress was made in fighting the pandemic and severe lockdowns were lifted, vacancies rose back to levels exceeding pre-COVID ones within one year after the initial shock. The typical counterclockwise path in the vacancies-unemployment relationship, typical of economic cycles, was therefore short-lived after COVID-19, and characterised by relatively small changes in unemployment as compared to previous recessions. As the recovery gathered momentum, labour market shortages started building up, albeit with different intensity across EU countries.

The analysis suggests that the simultaneous presence of tightness and slack was not the result of a major deterioration in the matching efficiency of EU labour markets. The econometric analysis indicates only a modest upward shift of Beveridge curves in 2020, partly reversed in 2021. This means that, historically, the position of Beveridge curves appears to be relatively low, implying a relatively low degree of matching inefficiency by historical standards. Despite the fact that skill mismatch has somewhat increased in the wake of the pandemic, this appears to have had a very minor impact on labour market matching. The Beveridge curve estimation indicates that this variable explains little of the cumulated unemployment changes in the aftermath of COVID-19. Moreover, while the economic impacts of the pandemic had a marked sectoral character, these proved mostly transitory, as witnessed by the return of the dispersion of sectoral labour shortages to pre-pandemic levels.

The apparent coincidence of labour market slack and growing labour shortages could be linked to a number of possible explanations. On the one hand, the observed labour shortages could be a temporary phenomenon, linked to the fact that vacancies react faster than unemployment, to the widespread use of STWs, and to the sudden increase in labour demand after the lifting of severe lockdowns in a context where the labour force was less reactive than usual. This interpretation is underpinned by the empirical assessment of Beveridge curve dynamics. On the other hand, the observation of increasingly high peaks in labour shortages during economic upturns may signal a structural trend in a context where economies rely increasingly on skilled labour and where demographic trends are leading to a declining working age population across the EU.

In 2022, the EU labour market continued to recover, reaching an all time high participation rates and all time low unemployment figures. Going forward, the labour market outlook remains highly

uncertain. Further developments will crucially depend on the evolution of the economic outlook, notably in relation to the pandemic, geo-political tensions and macro policy responses. The green, digital and demographic transitions are likely to continue putting pressure on the labour market to reallocate labour between different tasks, jobs and economic activities. To facilitate labour market reallocation, policy support can focus on re-skilling and up-skilling programmes, strengthening public employment services and broader matching services. In light of increased labour market transitions and the risk of increasing inequalities stemming from the uneven impact of the Covid-19 crisis, policies should also address the inclusiveness and adequacy of safety nets. Reforms and investments supported through the Recovery and Resilience Facility can play an important role in this respect.

The paper is structured as follows. The next section reviews the labour market situation in the EU in the aftermath of the pandemic, including the apparent coincidence of signals of labour market slack and tightness in 2021. Section 3 reviews the uneven impact of the pandemic on labour markets across countries, sectors, and population groups. Section 4 examines broader indicators of labour market slack to complement insights from looking at primary key labour market indicators. Section 5 subsequently presents an econometric estimation of the relationship between employment and vacancies, to get some insights into the drivers and the dynamics of remaining slack in 2021. Finally, Section 6 discusses results and proposes implications for policy.

2. ECONOMIC ACTIVITY AND LABOUR MARKET DEVELOPMENTS AFTER THE COVID-19 OUTBREAK

Economic growth in the EU and the euro area regained traction in the second half of 2021, helped by progressively increasing vaccination rates and easing policy restrictions. After a contraction by -5.9% in the EU in 2020, the EU economy expanded by 5.4% in 2021. Growth continued relatively dynamically in 2022, at a rate of 2.7%. As a result of the Russia's invasion of Ukraine and its consequences, including global inflationary pressures, it is expected to moderate to 1.4% in 2023.[1]

While working hours contracted to a similar extent as value added over the pandemic period, the drop in employment, though significant, was muted in comparison. The increase in unemployment remained significantly below what would have been expected based on the historical relationship between GDP and unemployment (Okun's law).[2] This was to a large extent the result of the extensive policy support provided, notably in the form of short-time work schemes, but also of considerable outflows to inactivity. One year after the onset of the pandemic, in 2021Q2, employment was around 1% (i.e., around 1.7 million persons) below pre-crisis levels in the EU (see Figure 1). This means employment losses were of a similar magnitude as job losses one year after the 2008 financial crisis, although in that case, the labour market further deteriorated until 2013 (European Commission 2021b). In the case of the pandemic, the labour market started to improve significantly and swiftly one year after the onset of the shock.

Unemployment rates in the EU slowly creeped upwards as of the first half of 2020, to reach a peak (7.8%) in 2020Q3 (from 6.6% in 2019Q4).[3] After a short period of recovery, unemployment rose

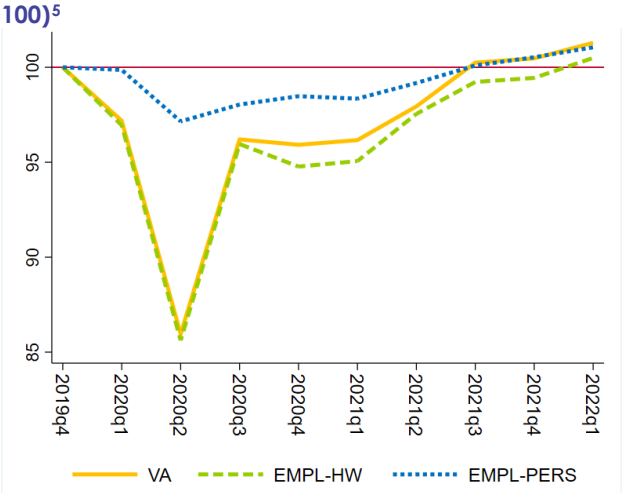
[1] See ECFIN Summer 2022 (interim) Economic forecast.

[2] See European Commission, 2020.

[3] Seasonally adjusted data (Eurostat code une_rt_q).

again briefly (to 7.6%). The deterioration of the labour market situation in 2021Q1 resulted from the re-introduction of several policy restrictions to address a new wave of infection rates across Europe. From then on, however, unemployment started a downward trend in most EU countries, reflecting increased vaccination rates and easing policy restrictions. By the end of 2021, unemployment had fallen back to 6.5%, a historical low. The downward trend continued in 2022 – albeit at a slower pace than in the second half of 2021.[4]

Figure 1: **Output and employment dynamics in the EU27 (index, 2019Q4 = 100)[5]**



Note: Value added (VA) is calculated based on gross value added in chain linked volumes (index 2015=100). Employment, both in hours worked (EMPL-HW) and in persons (EMPL-PERS), is based on domestic concepts. Data are seasonally and calendar adjusted.

Source: ECFIN calculations based on quarterly national accounts data (ESTAT).

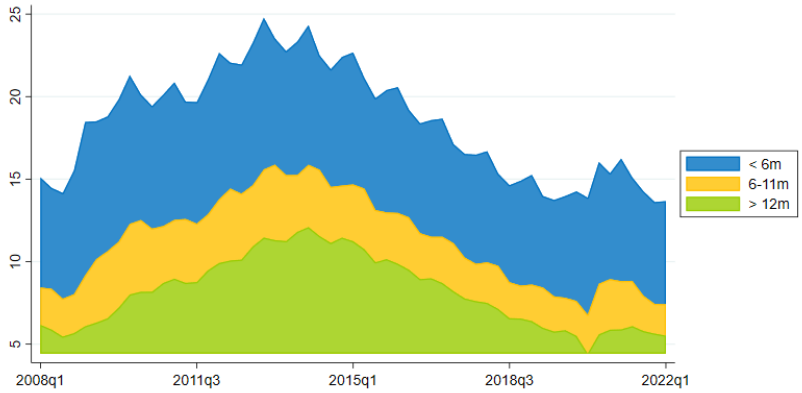
At the onset of the pandemic, unemployment increased especially for short durations. In 2020Q2, the number of long-term unemployed individuals (more than 12 months) even decreased, most likely on account of their reduced search activity, and their consequent recording as inactive. Long-term unemployment started to grow in the second half of 2020, plateaued over 2021Q1-Q3, and then returned to its prepandemic level by 2021Q4 (see Figure 2). The Commission's estimates of the non-accelerating inflation rate of of unemployment continued their downward trend of the last decade.

Activity rates were less resilient after the COVID-19 outbreak than after the start of the 2008 financial crisis, where unemployment surged while activity rates held up as people continued to seek work. In contrast, the EU unemployment rate only saw a moderate uptick during the pandemic, but there was a marked decline in activity rates (see Figure 3). A contributing factor was that new recruitment was complicated by lockdown policies, affecting not only workplaces but also childcare and education institutions. A significant number of individuals reported that they were available for work but not seeking a job, thereby becoming (at least temporarily) inactive. Perceived health risks could be a contributing factor as well.

[4] See Figure A.3 for the latest monthly unemployment data by Member State.

[5] Note that the figures in this paper showing continuous time series are, where possible, updated to the latest data point available at the time of the latest update of this paper (September 2022). Static graphs (showing only 1 or 2 points in time) nevertheless mostly depict the situation before the pandemic (2019Q4) and the situation around 1 year after the onset of the pandemic (2021Q2), which presents the focal point of the discussion.

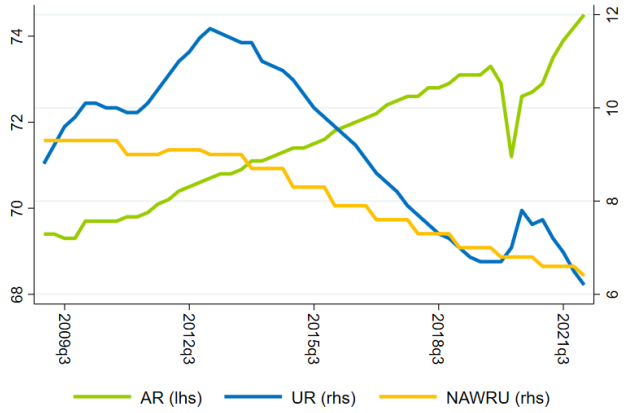
Figure 2: **Unemployment by duration (EU27, thousand persons)**



Note: <6m: less than 6 months; 6-11m: between 6 and 11 months; >12m: more than 12 months unemployed. Data are not seasonally nor calendar adjusted.

Source: LFS (ESTAT online data code lfsq_ugad).

Figure 3: **Evolution over time of unemployment, NAWRU and activity rates (EU27)**

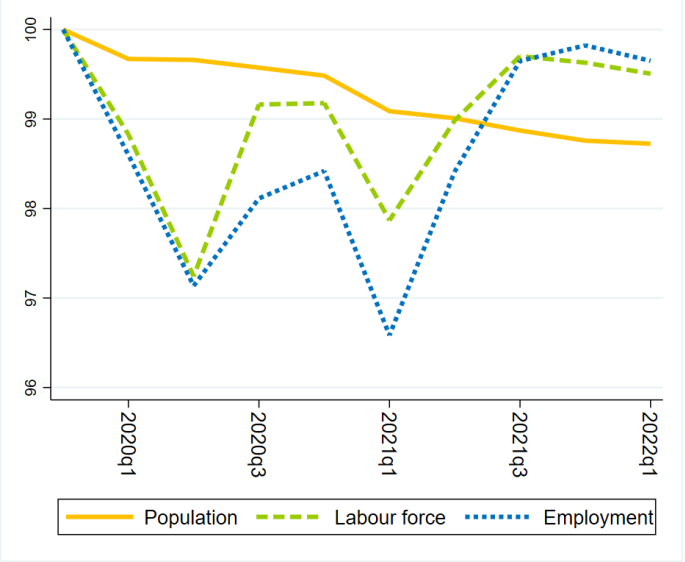


Note: AR refers to the activity rate (Y15-64), UR refers to the unemployment rate (Y15-74), NAWRU refers to the non-accelerating wage rate of unemployment (Y15-74). The AR is expressed as a proportion of the population of the considered age group, the UR is expressed as a proportion of the active population. AR and UR reflect seasonally but not calendar adjusted quarterly data.

Source: LFS and AMECO.

These developments are taking place against a background of a shrinking working age population across the EU. This is also an element that sets apart post-pandemic labour market developments from previous business cycles, as working-age population increased between 2000 and 2008 and stagnated between 2008 and 2015, while a slow downward trend set in after that. This also means that despite increased activity rates, the labour force is slightly below its pre-pandemic level (Figure 4).

Figure 4: **Evolution over time of population, labour force, and employment (EU27, index, 2019Q4 = 100)**



Note: Data are expressed as a proportion of their pre-pandemic levels (based on nr of persons)

Source: European Commission calculations based on LFS data.

3. THE UNEQUAL IMPACT OF THE PANDEMIC ACROSS COUNTRIES, SECTORS AND WORKERS

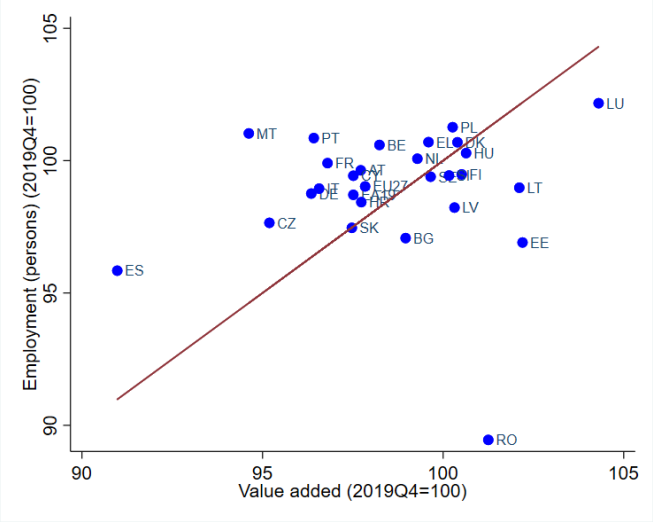
The impact of the pandemic has been uneven across countries, sectors and population groups, highlighting the need to go beyond the EU aggregate level and looking at impacts at the national level, the sectoral level and for specific groups.

3.1. DIFFERENCES ACROSS COUNTRIES

While performance in terms of output and employment were visibly correlated, developments have been heterogeneous across Member States in terms of the recovery over the first year after the onset of the Covid-19 pandemic (Figure 5). For example, while output remained at around 2% below pre-crisis levels (reference: 2019Q4) in 2021Q2 for the EU-average, it remained 3% or more below its pre-crisis value in Spain, Portugal, Czechia, Italy, France, Malta, Greece and Germany. In Spain, it even remained at 9% before its pre-crisis levels. Hours worked remained most behind in Slovakia, Romania, and Czechia by then (-6% as compared to -2.5% for the EU average).[6] Employment in persons performed the weakest (relative to its pre-crisis levels) in Romania (-11%), Estonia (-5.5%), Spain (-4%), and Latvia (-4%) (see Figure A.1 in Annex).

[6] No data available for Belgium.

Figure 5: **Performance across Member States, 2021Q2 (index, 2019Q4 = 100)**



Note: Value added is calculated based on gross value added in chain linked volumes (index 2015=100). Employment in persons is based on domestic concepts. Where available, data are seasonally and calendar adjusted. IE has been dropped for being an outlier.

Source: ECFIN calculations based on quarterly national accounts data (ESTAT).

Some countries (such as Malta, Portugal, France, and Spain) presented particularly good employment outcomes relative to output volumes as compared to others (see Figure 5). A contributing factor could have been the relatively wide coverage of STWs in these countries, which protected jobs. On the other hand, other countries showed comparatively weak employment developments, in particular Romania and the Baltics (EE, LT, LV).[7] This suggests that short-time work schemes and other support measures may not have protected employment as much as elsewhere, due to comparatively lower budgetary expenditure (such as in RO) but also possibly due to their design, notably on access requirements.[8] The structure of the labour market also plays a role, as the Baltic countries have adjusted relatively quickly also in previous economic downturns (see e.g. Figure A.2), pointing at rather flexible hiring and firing practices. Earlier research has suggested that countries with stricter employment protection legislation tend to rely more heavily on short-time work schemes (e.g. Cahuc 2019).

3.2. DIFFERENCES ACROSS SECTORS

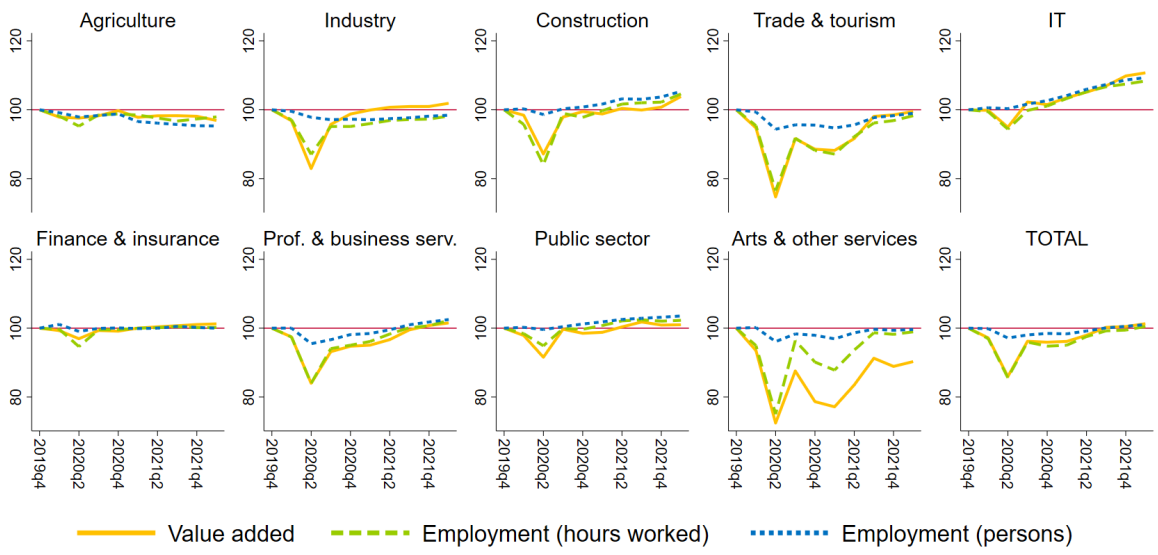
The adjustment of labour demand also had a strong sectoral dimension. Losses were concentrated in a few sectors most affected by the pandemic-related containment measures, notably in contact-intensive activities (i.e., tourism, hospitality and arts and other services). By 2021Q2, employment had recovered for IT, the public sector, industry, finance and real estate, and for construction and

[7] In Ireland, employment did not recover as swiftly as output, but this is mostly due to exceptional growth of output, inter alia as a result of strong business growth experienced by certain multinationals headquartered in Ireland (See for more details SWD(2022) 615 final/2). Due to these large fluctuations in output volumes, Ireland is considered as an outlier here.

[8] In general, countries with newly introduced STWs, such as the BG, EE, LT, LV and RO, have been on average less effective in curbing the increase in unemployment as compared to countries with schemes already in place. See European Commission (2020).

professional and business services. It remains subdued in trade and tourism (NACE sectors G-I, -4%) and arts and entertainment and other service activities (NACE sectors R-U, -3%) (Figure 6).[9]

Figure 6: **Performance by economic activity in the EU (Index, 2019Q4 = 100)**



Note: Performance is expressed as an index (2019q4=100). Data are seasonally and calendar adjusted. Value added (VA) is calculated based on gross value added in chain linked volumes (index 2015=100). Employment in persons (EMPL-PERS) and hours worked (EMPL-HW) are based on domestic concepts, calculated from absolute levels (resp. nr. persons and nr. hours worked).

Source: ECFIN calculations based on quarterly national accounts data (ESTAT).

In industry, output and employment had fully recovered in some Member States but not in others. Sectoral developments show clear heterogeneity across countries. Industrial employment returned to previous levels (or remained stable) in more than half of the Member States by 2021Q2 (AT, BE, CY, EL, HU, IE, IT, LT, LU, LV, MT, NL, PT, SE, SI). In many cases, developments in output even surpassed those in employment. At the same time, in some countries, both industrial production and employment remained below pre-pandemic levels in 2021Q2 (BG, CZ, DE, ES, FR, RO; see Figure A.4). In these countries, even by 2022Q1 the industry sector had not fully recovered.

In contrast, output and employment still lagged behind significantly in the trade, transport and hospitality sector by mid-2021, with only Romania being close to a full recovery (see Figure A.5). In some Member States employment remained stable or had fully recovered ahead of output (BE, CY, FR, HR, MT, PT, PL). Employment in this sectoral aggregate was hit particularly hard in Spain, Ireland, Italy, and the Baltic countries, which could again reflect *de facto* relatively flexible labour market conditions.

While short-term unemployment increased for workers of all sectors in 2020, long-term unemployment significantly increased only for workers previously employed in food and accommodation and in arts and entertainment (Figure 7). Many of the workers that were laid off in hospitality were young, at the start of their professional career, and had worked on short-time contracts, in jobs not requiring very high job-specific human capital investment. They were expected

[9] Note that, while the focus of the discussion in this paper is on labour market developments in 2021, the most recent available data are shown in time series graphs, to provide more context to readers.

to have reasonably good prospects to reintegrate into the labour market upon the reopening of the sectors closed as a result of the containment measures. A recent study by Bénassy-Quéré (2021) found that workers that are laid off from the food and accommodation sector tend to be more mobile across sectors than workers originating from for instance the car industry. Others countered that workers in food and accommodation often have lower skill levels, especially as compared to other occupations in the service sectors (see, e.g., Basso et al., 2021), making transitions to new occupations more difficult and their return to the job market more dependent on the recovery in demand in the sector. In reality, what was observed when sectors were reopened, was a surge in labour shortages, as employers faced considerable difficulties to fill their vacancies.

Figure 7: **Change in unemployment by duration and sector (EU27), 2020**

Note: Data depict the % change in unemployment (persons) by duration (less than 6 months, more than 6 months) and by economic activity.

Source: Eurostat, Labour Force Survey.

Labour market shortages reported by employers started to rise again as of 2020Q4 across all sectors, after an initial drop in the first half of 2020 (Figure 8).[10] By 2021Q3, they rose above the pre-pandemic level in industry and construction in the EU average.

Labour shortages recovered fastest in the industry sector. A contributing factor was that reported shortages in industry had already fallen back to some extent ahead of the pandemic, in contrast with services. In almost half of the Member States, labour shortages reported in industry exceeded their pre-pandemic level by 2021Q3. This was especially the case for Member States in the Northwest of the EU (cfr. Figure A.6 and Figure A.7). These increases drove the EU27 and the euro area averages up, where reported labour shortages in industry reached their highest level ever recorded.[11] At the same time, reported shortages in industry remained below their pre-pandemic level in some Central and Eastern European Member States (including BG, CZ, HR, HU, PL).

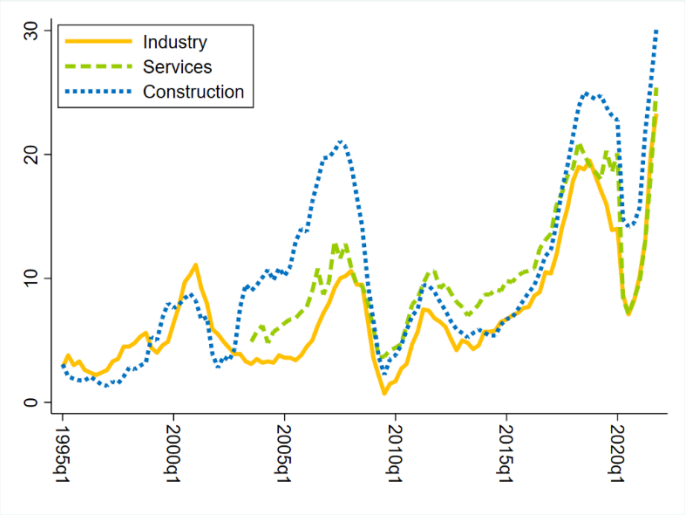
In services, labour shortages re-appeared less swiftly. Notable increases were visible by mid-2021 only in Belgium, Denmark, Ireland and Malta (see Figure A.6 and Figure A.9). Also the euro area and EU averages caught up with pre-pandemic levels by end-2021. In construction, the recovery

[10] The proportion of firms reporting that labour is one of the main factors limiting production is a survey-based proxy of labour shortages that is available ahead of other labour market data. As a survey-based indicator, it is also volatile.

[11] Since the start of data series in 1982.

proceeded at an intermediate pace (See Figure A.6 and Figure A.8). The recovery was faster in Denmark, Germany and Luxembourg, and slower in several Central and Eastern European Member States as well as in France and Sweden. Even by mid-2022, labour shortages in construction remained moderate (in historical perspective) in Central and Eastern Europe.

Figure 8: **Labour shortages reported in industry, services and construction, EU27**



Note: Data depict the share of firms reporting labour shortages are a factor limiting their production. Data for LU missing for services.

Source: EU Business and Consumer Surveys.

Data on new recruitment suggest that hiring had not yet recovered by 2021Q2 (Figure 9): lower levels than before the pandemic prevailed across all sectors, with the exception of highly teleworkable sectors (IT, finance and insurance, real estate, and professional and technical services). While hiring in industry partially recovered after 2020Q2, it slightly declined again in 2021Q1, in spite of the rising trend in reported labour shortages. Hiring rates bounced back by the end of 2021 and accelerated particularly in some sectors significantly affected by the pandemic, such as wholesale and retail, transport as well as food and accommodation.

Figure 9: **Newly employed by economic activity (EU27) (until 2022Q1)**

Note: Data reflect individuals who started a new job less than 3 months ago, expressed in million persons.

Source: Eurostat, Labour Force Survey.

3.3. DIFFERENCES ACROSS POPULATION GROUPS

In terms of population groups, the impact of the pandemic was strongest for young people, low-skilled workers, workers on temporary contracts, and migrant workers.[12] Young people were particularly suffering from pandemic related halt in recruitment (Figure 10, panel (a)). Last-in first-out practices and generous dismissal packages for workers with high seniority may also help explain why young people experienced more job losses than older workers.

Employment dynamics were also strongly differentiated by the skill level of workers. High skilled workers started showing higher employment levels than before the crisis quite quickly after the onset of the pandemic (Figure 10, panel (b)). This was helped by the well-documented fact that these workers have generally better possibilities for telework. As will be discussed below, teleworkability helped shield jobs against the pandemic to a major extent. Conversely, less-skilled workers observed a significant deterioration of their employment prospects, a tendency that may not be easily reversed going forward, as newly created jobs tend to be more skills intensive than the jobs that are being destroyed. This compounds the challenges related to the broad interruptions to education and training systems as a result of the pandemic.

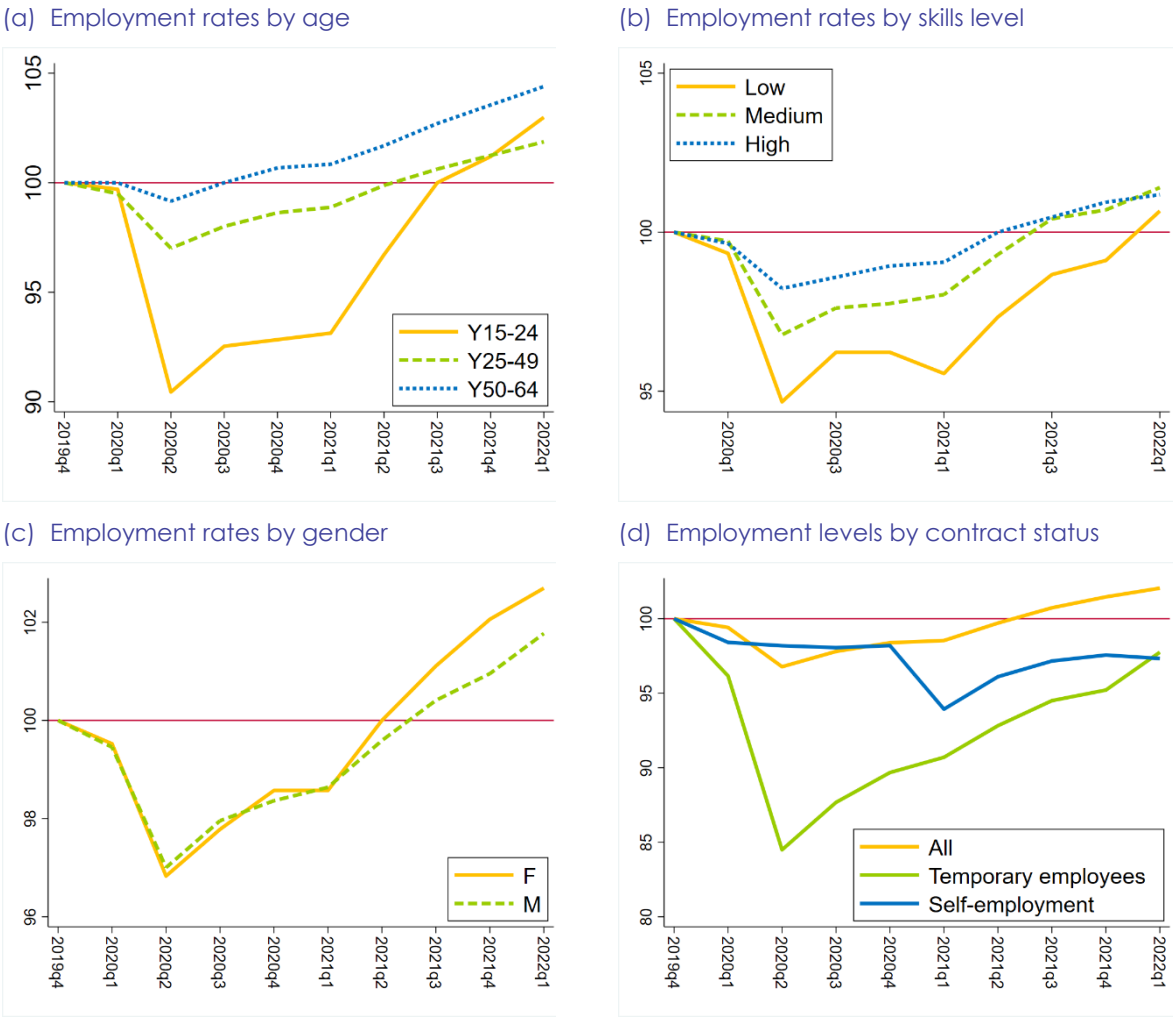
Along the gender dimension, less divergence in labour market developments was observed as compared to previous economic downturns. During economic busts like the one observed in 2008, male employment tends to be affected more than female employment. As the COVID-19 crisis fell most heavily on services, women were widely expected to be affected to a greater degree than men. Data suggest instead that women and men were affected to a similar extent by the pandemic (Figure 10, panel (c)). At the same time, some recent studies suggest that the increased burden of childcare resulting from widespread school closures has disproportionally fallen on women, which may have affected their ability to perform at work and their career prospects going forward.

Workers on temporary contracts were hit particularly hard. Of all groups considered in Figure 10, workers on temporary contracts have seen the sharpest contraction in employment (Figure 10, panel (d)). Not only do they tend to be overrepresented in the sectors that have been affected most by the containment measures; they were also protected less by the short-time work schemes and therefor at higher risk of job shedding. The employment of temporary workers reached its trough in 2020Q2, with a fall of 15%. In the subsequent three quarters, about half of these job losses were recovered.

Self-employed were hit harder than employees in 2020Q1 and 2021Q1, but less badly than temporary employees (see Figure 10, panel (d)). Analysis in the OECD Employment Outlook 2021 suggests they were also hit harder than employees in terms of the reduction in hours worked, particularly during the first wave. Furthermore, it finds that for self-employed, the reduction was more even across skills levels than in the case of employees (OECD 2021). Possible contributing factors include the fact that among self-employed, there is no gradient in employment protection as there is among employees (with low-skilled more often in temporary contracts than high-skilled); that labour demand for low-skilled self-employed (e.g. in agriculture, or in delivery serices) did not decline as strongly as for employees, and/or that self-employed have less access to social protection and government support, leaving them with no other option than to continue working in the face of health risks.

[12] See European Commission (2021a); Fasani and Mazza (2020); OECD (2020).

Figure 10: **Employment dynamics across different groups (by age, skills, gender, and contract type) in the EU**



Note: Panels (a), (b) and (c) consider employment rates (% population aged 15-64). Panel (d) considers employment in levels as it considers job instead of worker characteristics. Data are seasonally (but not calendar) adjusted and presented as an index, with 2019Q4 = 100.

Source: ECFIN calculations based on Eurostat, Labour Force Survey.

The strong differentiation of employment dynamics by qualification levels could raise concerns over possible risks of skills mismatch. Tasks and skills requirements of the newly created jobs may be different from those of the jobs that have been lost as a result of the crisis. Job losses have been concentrated in those sectors affected most by the containment measures (food and accommodation, arts and entertainment). As mentioned before, the brunt of the workers in these sectors could probably return to their sectors of origin once policy restrictions are lifted and these sectors recover. Yet, there remain concerns that lower-skilled individuals who lost their jobs (in these and other sectors such as industry) might find it difficult to move to other sectors if labour demand does not fully recover.

Even within industries, some changes in task composition may have been accelerated, e.g. by raising the demand for high-skilled workers (e.g. workers with digital skills, workers in tele-workable occupations), or by speeding up the process of automation of routine tasks. Analysis at the occupational level suggests a marked divergence in employment developments based on job characteristics such as teleworkability and routine task content, with the latter being more strongly affected (European Commission, 2021b). Employment growth dynamics for jobs with a stronger routine task content also showed less of a bounce-back as of end-2020 than for other jobs.

Data on macro-economic skills mismatch, i.e. the relative dispersion in employment rates across skills levels, show that the pandemic has (at least temporarily) brought to a halt the longstanding and broad-based decline in skills mismatch since 2015 (see Section 5), confirming the data on the unequal impact of the pandemic across skills groups discussed above (Figure 10, panel (b)).

The apparent coincidence of labour market slack with growing labour shortages during the recovery mid-2021 has led several commentators to be concerned about rising skills mismatch.[13] Nevertheless, since hiring takes time and effort, hiring intentions of firms and vacancy rates are leading indicators of the business cycle while labour market slack is a lagging indicator. For this reason, apparent labour shortages could be a harbinger of further falls in labour market slack, rather than an indication of labour market mismatch. Moreover, while labour shortages had surpassed pre-crisis indicators in industry by mid-2021, this was not the case for other sectors. Labour market slack also did not rise as much as in previous recessions. A continued increase in labour shortages without improvements in labour market slack could indicate increasing structural mismatch in the labour market. However, as will be discussed in more detail in Section 4, by 2021Q3, labour market slack returned to pre-pandemic levels and continued further downwards, while shortages continued to rise.

4. BROADER MEASURES OF LABOUR UNDERUTILISATION

Labour market slack is defined as a situation where the potential supply of labour exceeds the amount of labour demanded at the prevailing wage conditions. There are several indicators used to measure labour market slack. Unemployment is the most prominent one but needs to be complemented with other measures and analysis to arrive at a more comprehensive picture.[14] Previous sections already considered complementary measures such as activity rates and the NAWRU.

The labour market slack indicator developed by Eurostat considers a wider definition of labour market underutilisation. It aggregates two categories of active individuals, the unemployed and underemployed (persons in part-time jobs that would like to work more hours) and two categories of inactive individuals, those that are available for work but not seeking a job or seeking a job but not available, then calculated as a proportion of the extended labour force.[15] This allows accounting simultaneously for labour market underutilisation in terms of persons but also in terms of desired working hours at the same time.

The Eurostat broad labour market slack indicator shows an uptick in 2021Q1, but reductions in the second quarter, after having risen more moderately than during the financial crisis as a result of the cushioning effect of policies. In 2021Q1, labour market slack peaked at around 16% of the extended labour force, as compared to 19.5% at its previous peak after the financial crisis in 2014Q1 (Figure 11). Slack increased both on account of the number of unemployed and of those available to work but not seeking. The proportion of underemployed and of individuals that are seeking work but are not available remained relatively stable over the crisis period. As of 2021Q2, labour market slack started to decline again, returning to pre-crisis levels in 2021Q3, and moving further downwards in 2021Q4 and 2022Q1.

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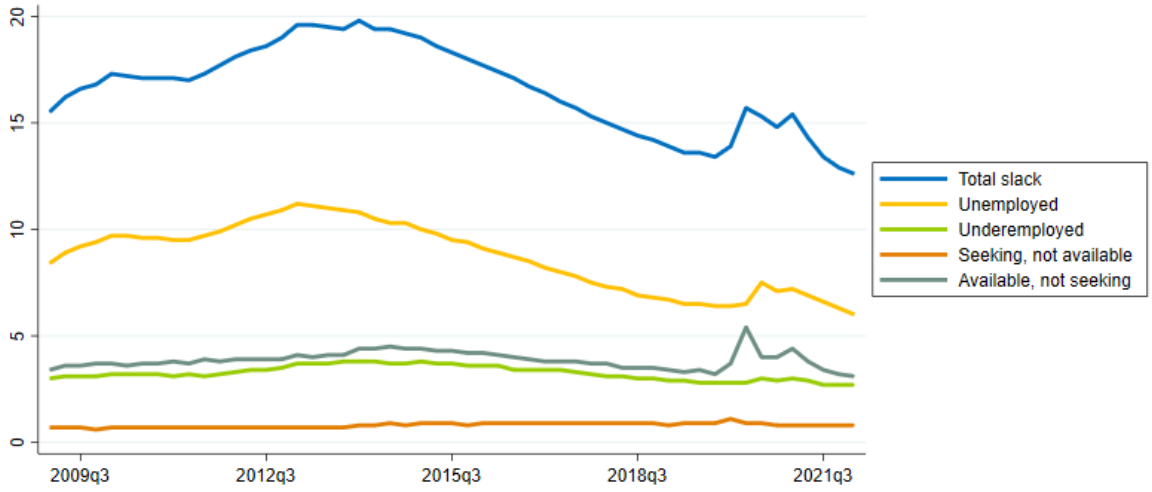
[13] Mismatches may as well arise at the level of geographical location: job losses may have occurred in areas that are distinct from those where new jobs are being created. However, the most recent data on disparities in (un)employment rates available refer to 2019.

[14] See e.g. Faberman et al. (2020).

[15] The "extended labour force" comprises the unemployed, the employed and the two categories of inactive individuals referred to above.

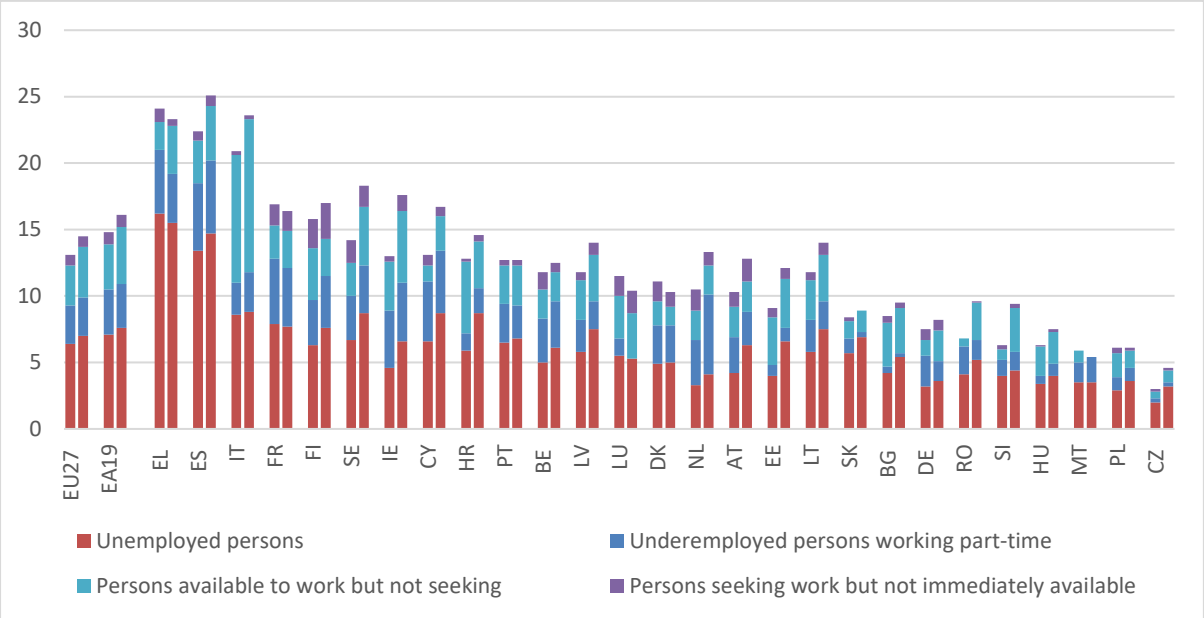
Figure 11: **Dynamics in labour market slack and its components (EU27)**



Note: Data are seasonally, but not calendar adjusted, refer to age group 15-74 and are expressed as % of the extended labour force.

Source: Eurostat, Labour Force Survey.

Figure 12: **Labour market slack by its components, people aged 15-74, by country, 2019Q4 and 2021Q2 (% of extended labour force)**



Note: No available data for MT, RO, SK, unreliable data for EE, HR, MT, RO for the category "Persons seeking work but not immediately available". Unreliable data for BG, EE, HR, MT, SK for the category "Underemployed persons working part-time". Data are unreliable for MT and SI for the category "Persons available to work but not seeking". Definitions differ in 2021Q2 for ES and FR. Data are seasonally (not calendar) adjusted.

Source: Eurostat (online data code: LFSI_SLA_Q).

In most Member States, labour market slack still exceeded pre-pandemic levels by 2021Q2 (with the exception of Malta, Poland, Denmark, France[16], Finland, and Greece). Important differences in total

[16] Definition changed for FR.

labour slack levels remained, with Italy, Spain and Greece above 20% in 2021Q2, and Czechia, Malta and Poland at 6% or below. The Member States that experienced the highest increase (between 2019Q4 and the peak in 2020-21) were Ireland, Estonia, Latvia, Slovenia, and Austria, all by 4 pps or more, followed by Greece, Spain, Italy and Cyprus (Figure 12).With the exception of the Netherlands, where the increase relates to underemployment of part-time workers, and Estonia, where only unemployment increased significantly, in other countries the increase was mostly on account of inactive persons available to work but not seeking, in conjunction with an increase in unemployment. Slovenia and Romania experienced the largest increase in the share of people available for work but not seeking. Greece experienced a significant increase in inactivity, whilst the active categories of labour market slack (unemployed, underemployed) actually declined, as also shown in the previous section.[17]

5. UNEMPLOYMENT AND VACANCIES

This section looks into the negative relationship between vacancies and unemployment, commonly referred to as the Beveridge curve. An analysis of possible shifts in Beveridge curves provides additional insights into the efficiency of matching on the labour market. This in turn provides indications on what is driving slack, notably whether increases in unemployment are more likely to be driven by cyclical or rather structural forces.

5.1. EVOLUTION OF UNEMPLOYMENT AND VACANCIES FOR THE EURO-AREA AGGREGATE

The Beveridge curve relation is downward sloping, as lower vacancies imply a lower probability to find jobs for the unemployed, and thus a higher steady-state unemployment rate. Shocks to aggregate demand move vacancies and unemployment in opposite directions. However, vacancies and unemployment may also increase at the same time if mismatch in the labour market gets worse, or fall together when the matching between jobs and jobseekers improves.[18]

Figure 13 reports two versions of the Beveridge curve for the EU27 aggregate: one based on vacancy rates, and another one based on a proxy for vacancies that allows for a longer times series, namely reported labour shortages.[19] Both vacancy measures dropped significantly at the COVID-19 outbreak in the second quarter of 2020, but unemployment increased only in the third quarter. Since then, vacancies have increased in each quarter, while unemployment has followed the developments in the pandemic: improving in 2020Q4, suffering a setback in 2021Q1 and improving ever since (see Figure 13 and Figures A.10 and A.11 in Annex). This pattern is in line with the experience of past business cycles: while vacancies are a leading indicator of the business cycle, unemployment moves with some lags. Negative shocks to labour demand are therefore followed by typical counter-clockwise movements in the vacancy-unemployment space where Beveridge curves are defined.

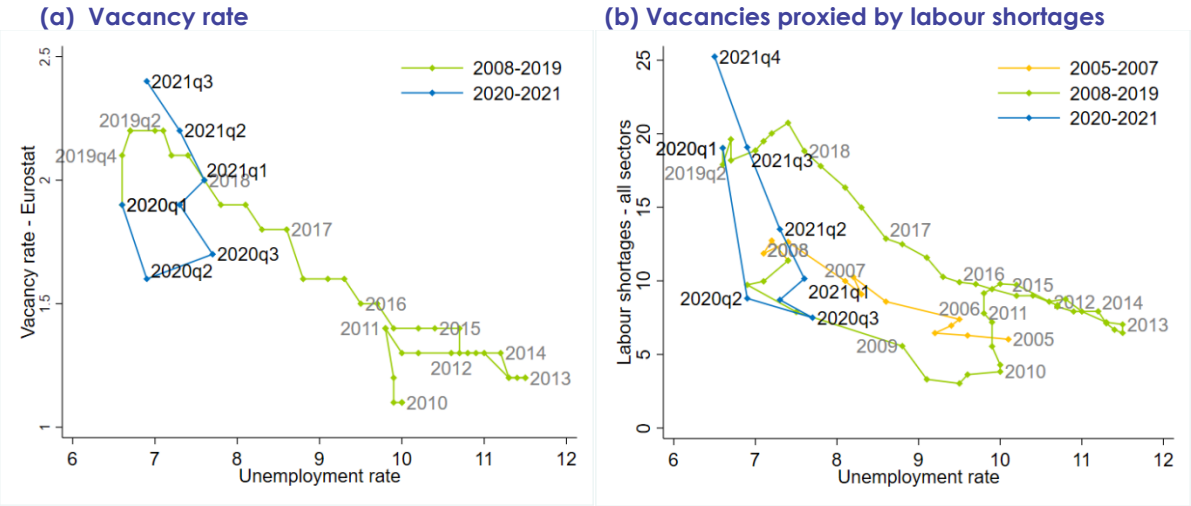
[17] A contributing factor may have been the dismissal bans that were imposed for workers covered by short-time work schemes in Greece, up to 30 days after the end of the suspension of employment.

[18] Nevertheless, since developments in vacancies lead those in unemployment, it is common at the beginning of labour market recoveries to observe a rebound in vacancies before unemployment starts to fall.

[19] The labour shortage indicator is calculated as a weighted average of sectoral shorages in industry, services and construction.

Simple visual inspection of the Beveridge curves in Figure 13 does not indicate a deterioration of labour market matching as the latest observations do not seem to allude to an upward shift in the Beveridge curve.

Figure 13: **Two variants of the Beveridge curve for the EU27, 2000-2021**



Note: The indicator of labour shortages is defined as the share of firms reporting that labour is a factor limiting production. It is a weighted average (based on value-added weights) of sectoral indicators on manufacturing, services and construction.

Source: Unemployment rate: EU Labour Force Survey, Eurostat; Vacancy rate: Job vacancy statistics (JVS), Eurostat; Labour shortages: European Business and Consumer Survey, DG ECFIN.

5.2. UNEMPLOYMENT AND VACANCIES ACROSS EU MEMBER STATES

Around mid-2021, there was significant heterogeneity in the labour market situation across Member States. In very broad terms, there remained a negative relationship between the unemployment rate and the job vacancy rate (i.e. the ratio of vacancies to the total number of jobs) across EU Member States (Figure 14).

Some countries showed comparatively low unemployment rates and high vacancy rates hinting at comparatively tight labour markets (e.g. in AT, BE, CY[20], CZ, NL). Some countries, in contrast, presented comparatively high unemployment rates and low vacancy rates, suggesting labour market slack (EL, ES, IT[21]). Other countries presented an intermediate situation. A group of Member States displays comparatively low levels of both unemployment and vacancy rates (BG, PL, RO).[22]

When considering cross-country patterns of *changes* in unemployment and vacancies after the COVID-19 outbreak, it appeared that unemployment increases were not necessarily matched by

[20] While unemployment seems still relatively high in CY in, the latest monthly unemployment figures show that it has declined rapidly and stood below 5% in August 2021.

[21] While unemployment in IT is below the rate in ES and EL, it has a high proportion of inactive workers that are available for work, see further.

[22] This could also relate to differences in the methodology underlying the data collection between countries: PL reports relatively high shares of labour shortages in the EU Business and Consumer Survey (see Figure A.6).

falling vacancy rates. In thirteen countries, both unemployment and vacancy rates had increased (AT, BE, CY, ES, FI, HR, IE, IT, LT, MT, PL, SI, SE) over the period 2019Q4-2021Q2. Vacancy rates decreased in eight countries where unemployment increased (CZ, DE, EE, HU, LV, PT, RO, SK), while they remained unchanged in Bulgaria (see Figure 15). Unemployment rates remained (virtually) steady in Luxembourg and the Netherlands.[23] Greece showed a remarkable pattern of reduced (even if still high) unemployment and vacancy rates, which may be partially explained by restrictions on dismissals and a decline in activity (see Section 3).

Figure 14: **Vacancies and unemployment across countries in the EU, 2021Q2**

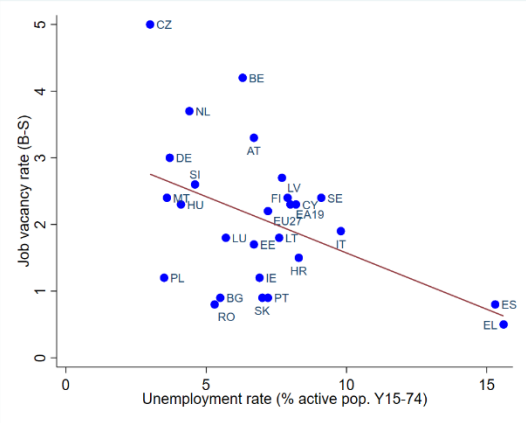
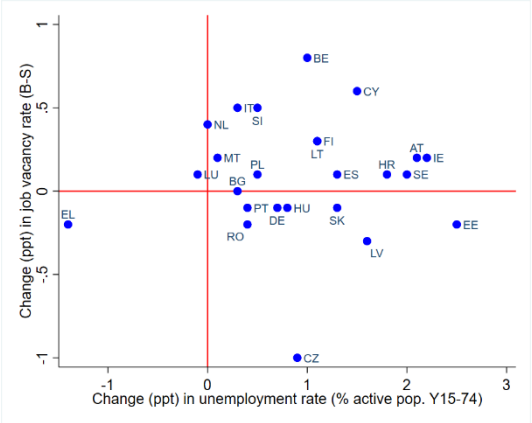


Figure 15: **Vacancies and unemployment across countries in the EU, change 2019Q4-2021Q2**



Note: Data are seasonally and calendar adjusted. The red line in Figure 6 presents a linear fit of the presented observations (excluding EU and EA aggregates).

Source: Eurostat variables une_rt_m and jvs_q_nace2.

Country-specific Beveridge curves also do not suggest that matching efficiency has significantly deteriorated in most countries as compared to the pre-pandemic situation (Figure A.10 in Annex). A possible outward shift in the Beveridge curve, hinting at a deterioration of matching efficiency, can only be observed in a few Member States including Austria, Denmark, Italy, Luxembourg and Sweden. The Beveridge curve does not seem to have shifted recently in countries such as Bulgaria, Finland, Germany, Latvia, Lithuania, Spain and Portugal. Finally, matching efficiency may have even improved, as compared to the previous business cycle, in Croatia and Hungary, as labour market shortages eased from historically high levels while unemployment increased only moderately.[24]

5.3. ESTIMATING BEVERIDGE CURVES IN A PANEL OF EU COUNTRIES

To better identify possible shifts in EU Beveridge curves we estimate econometrically the Beveridge curve relation across a panel of EU27 countries using quarterly data. To obtain longer time series, vacancies are proxied by the labour shortage variables (similar results are obtained using vacancy

[23] At the same time, the Netherlands has seen a significant surge in underemployment (individuals working part-time and willing to work more hours as a result of the pandemic) and this dimension of labour market slack remained elevated even in 2021Q2, as will be discussed below.

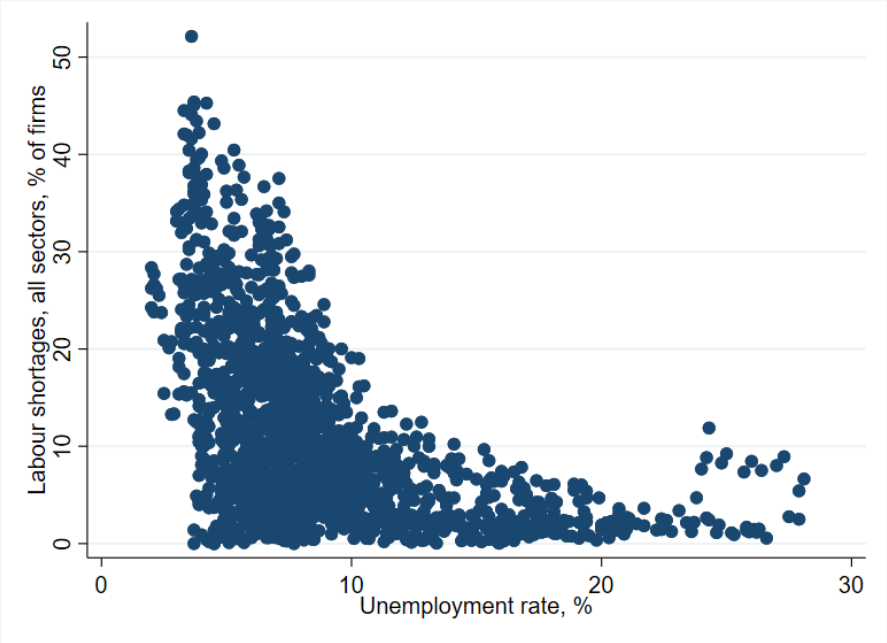
[24] This analysis is based on Beveridge curves for which vacancies are proxied by reported labour shortages (all sectors), but the patterns are qualitatively robust to the choice of vacancy data. In particular, the groups of countries are broadly stable when Eurostat's vacancy rates are used to depict Beveridge curves (see Figure A.11).

rates).[25] The analysis of the behaviour of time trends and regression residuals from such estimations can be exploited to gauge Beveridge curve shifts.[26]

Previous studies have estimated Beveridge curve relationships across regions in specific countries.[27] Compared with past work in this vein, the present analysis explicitly takes account issues linked to residual autocorrelation, and estimates regressions paramenters using the Prais-Winsten feasible GLS estimator (FGLS), besides OLS, to address the induced bias.[28]

Figure 16 plots unemployment rates versus labour shortages, pooling observations across countries and time (quarterly observations from 2003Q3 to 2021Q3). The graph confirms the typical negative and convex relation between unemployment and labour shorages or vacancy rates.

Figure 16: **Unemployment and labour shortages (all sectors): Scatter plot of pooled quarterly observations of EU Member States, 2003Q3-2021Q3**



Source: European Commission based on Eurostat data.

Table 1 summarises the regression results. Columns (1) to (3) report results from OLS regressions, while columns (4) to (6) report results from Prais-Winsten feasible GLS regressions. With the latter,

[25] The labour shortage variables are available disaggregated by sector. The variable used captures economy-wide shortages, and is constructed as the weighted average of industry, services and construction.

[26] This approach is similar to that applied by Consolo and Dias da Silva (2019, p. 76) who estimate a statistical Beveridge curve relationship for the euro area aggregate and use the residual as a proxy for matching efficiency.

[27] Papers choosing this approach include Börsch-Supan (1991) for Germany, Wall and Zoega (2002) for the UK and Valletta (2005) for the US.

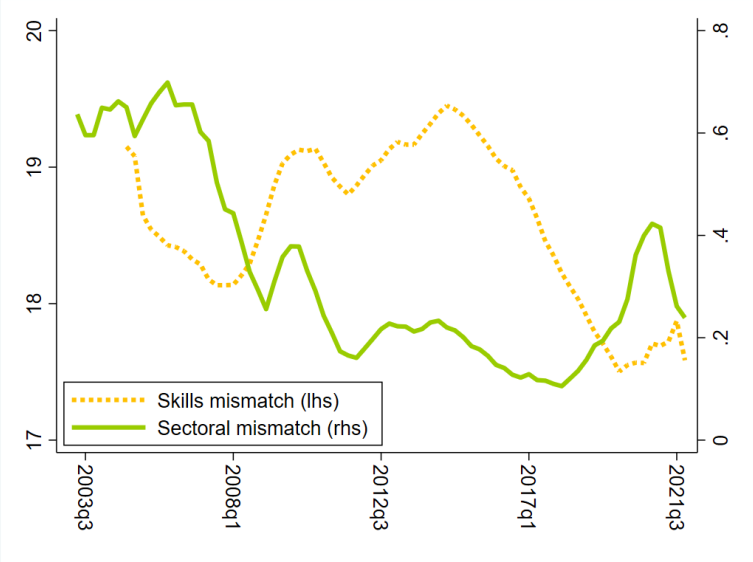
[28] Other recent approaches (e.g. Bonthuis et al., 2013; and Ebeke and Everaert, 2014) dealt with the econometric issue of autocorrelation by including the lagged dependent variable in the estimation or used co-integration techniques (such as Groenwold, 2003 and Bova et al. 2018).

the estimation procedure allows for country-specific first-order autocorrelation in the disturbances and standard errors to take into account the heteroskedasticity of the data.[29]

The dependent variable is the unemployment rate. All specifications reported in Table 1 include among the explanatory variables the labour shortages as a proxy for vacancies, the square of labor shortages to control for the non-linearity of the relationship, and country fixed effects. Specifications (3) and (6) include time effects to pick up joint movements of Beveridge curves across the EU.

In specifications (2), (3), (5) and (6), two additional explanatory variables are added which may shift Beveridge curves. The first potential shifter is an indicator of macroeconomic skills mismatch, defined as relative dispersion of employment rates across the three main skill groups (low, medium and high qualifications).[30] The greater the discrepancies between the employment rates of various skills groups, the higher the indicator will be. The hypothesis is that labour market matching could be less smooth (implying higher unemployment at a given level of vacancies or shortages) at times when there is a greater imbalance between the skills demanded and supplied in the labour market. After nearly a decade of continuous decline, average macroeconomic skills mismatch in the EU briefly ticked up as a result of the pandemic, to subsequently decline as of mid-2021 – by end-2021 it reached its pre-pandemic level again (Figure 18). The uptick in the aftermath of the pandemic was dwarfed by the surge in the aftermath of the financial crisis.

Figure 17: **Macroeconomic skills mismatch and sectoral dispersion of labour shortages in the EU27**



Source: European Commission based on LFS and EU-BCS.

Note: Both the skills mismatch and the sectoral mismatch have been smoothed for clarity of presentation. Member State-level graphs are provided in the Appendix (see Figure A.12).

The second potential shifter controls for the effects of possible sectoral mismatch: it is calculated as the dispersion (coefficient of variation) of the three sectoral components of the labour shortage indicator (i.e., industry, services and construction). The greater the difference in labour shortages reported across the three sectors, the higher is the indicator. The hypothesis is that labour market

[29] The estimation procedure is implemented with the xtpcse command in Stata.

[30] For the definition of the indicator, see Kiss and Vandeplas (2015); the relationship of this indicator with matching efficiency has been analysed by European Commission (2013) and Arpaia et al. (2014).

matching could be less smooth at times when labour shortages are concentrated in some sectors only. Sectoral mismatch had been on an increasing trend since 2017. This increase was accelerated by the onset of the pandemic until around mid-2021. As of then, sectoral mismatch started to move back to its prepandemic level.

The regression analysis confirms the expected negative and convex relationship between unemployment and vacancies. This finding is significant and robust with respect to alternative specifications and alternative estimation methods. The magnitude of the coefficients however seem to depend on the specification, as the Beveridge curve appears to become less steeply negative once time effects and mistmach indicators are included. Moreover, the estimations by means of FGLS indicate that OLS estimates are affected by bias, as the slope of the Beveridge curve drops considerably. This factor, which was neglected in previous literature, need sto be taken into account, in our analysis, as the bias can affect also the estimation of time trends and therefore the assessment of whether the Beveridge curve has shifted over time.

Turning to the the other explanatory variables, Table 1 suggests that skills mismatch is associated higher unemployment at a given level of labour shortages or vacancies and thus, potentially, with less efficient labour market matching.[31] Conversely, the dispersion of labour shortages actoss sectors does not appear to have an effect. This result is robust to the methods used and the specifications chosen.

Table 1: **Estimations of the Beveridge curve, EU countries**

	(1) OLS country effects	(2) OLS, additional variables	(3) OLS, time effects added	(4) FGLS country effects	(5) FGLS, additional variables	(6) FGLS, time effects added
Dependent variable:			Unemployment rate			
Labour shortages, all sectors	-0.402***	-0.355***	-0.257***	-0.128***	-0.136***	-0.049***
	(0.074)	(0.067)	(0.088)	(0.014)	(0.013)	(0.012)
Labour shortages squared	0.006***	0.006***	0.005***	0.002***	0.002***	0.001***
	(0.002)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Skills mismatch indicator		0.387***	0.515***		0.095***	0.056***
		(0.130)	(0.181)		(0.021)	(0.017)
Sectoral dispersion of labour shortages		-0.037	-0.044		-0.006	-0.003
		(0.030)	(0.045)		(0.010)	(0.011)
Country effects	Yes	Yes	Yes	Yes	Yes	Yes
Time period effects	No	No	Yes	No	No	Yes
Observations	1,749	1,743	1,743	1,749	1,743	1,743
R-squared	0.687	0.728	0.784	.	.	.
Number of countries	27	27	27	27	27	27

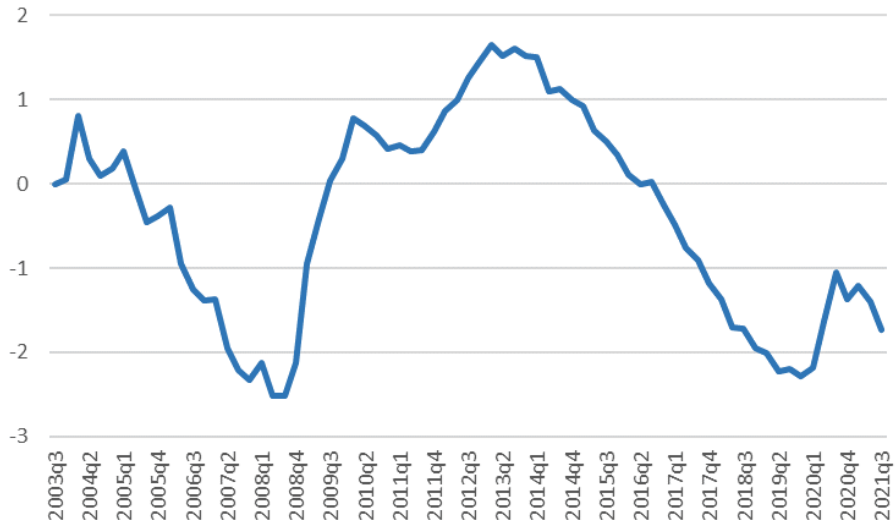
Notes: Robust standard errors in parentheses. Asterisks mark estimated coefficients that are statistically significant at the 10% (*), 5% (**) and 1% (***) level. Unemployment rates are sourced from Eurostat. The labour shortages indicator is based on DG ECFIN's European Business Survey, sourced from Eurostat, based on the % of firms reporting that labour is a factor limiting production. The indicator is constructed as a weighted average of industry, services and construction. The sectoral dispersion of labour shortages is constructed as the coefficient of variation of the three sectoral components. Finally, the skills mismatch indicator is the relative dispersion of employment rates by skills levels (see Kiss and Vandeplas, 2015 for the underlying methodology).

[31] An alternative explanation is that changes in skills mismatches may be temporary effects of cyclical developments, and may not always reflect on matching efficiency.

The time period effects estimated in these regressions can be interpreted as the parts of unemployment developments that are not explained by developments in labour shortages (vacancies) and the other explanatory variables. In this sense, they are related to shifts of the Beveridge curve, as opposed to movements along the curve, and can thus be seen as proxies for the efficiency of labour market matching.[32] More precisely, time period effects can be interpreted as joint movements in the position of Beveridge curves across EU Member States. As for country-specific shifts, these can be inferred from the regression residuals.

Figure 18 shows the estimated time effects from specification (6) in Table 1.[33] Between the 2008 financial crisis and the COVID outbreak, the estimated time effects broadly follow the joint movements in unemployment rates across the EU, with an upward swing in the aftermath of the financial crisis, and a continuous improvement between 2013 and 2019. Time effects in the aftermath of the COVID outbreak show a relatively modest increase, followed by a downward trajectory in 2021. By the third quarter of 2021, the time effects are close to historical lows seen in 2008, suggesting that the EU Beveridge curves post COVID-19 do not reveal a high degree of matching inefficiency by historical standards.

Figure 18: **Proxy for joint movements of Beveridge curves: Estimated time effects in FGLS estimation**



Note: Time effects are estimated based on specification reported in column (6) in Table 1.

The Beveridge curve estimation provides also information on the relative importance of unemployment drivers post COVID-19. Figure A.13 (in Annex) shows that cumulative changes in unemployment compared to the pre-pandemic situation in 2019Q4 are explained mostly by changes in labour shortages (vacancies), while the contribution of skills mismatch is very small. [34] Despite some worsening of skill mismatch after the COVID-19 outbreak, its magnitude is insufficient to explain much of the variation in unemployement, while the immediate drop in vacancies after the pandemic

[32] They are just proxies because apparent shifts in the Beveridge curve can be caused also by other factors, including temporary fluctuations.

[33] Since the data are quarterly, in this specification, one dummy variable is included for each quarter.

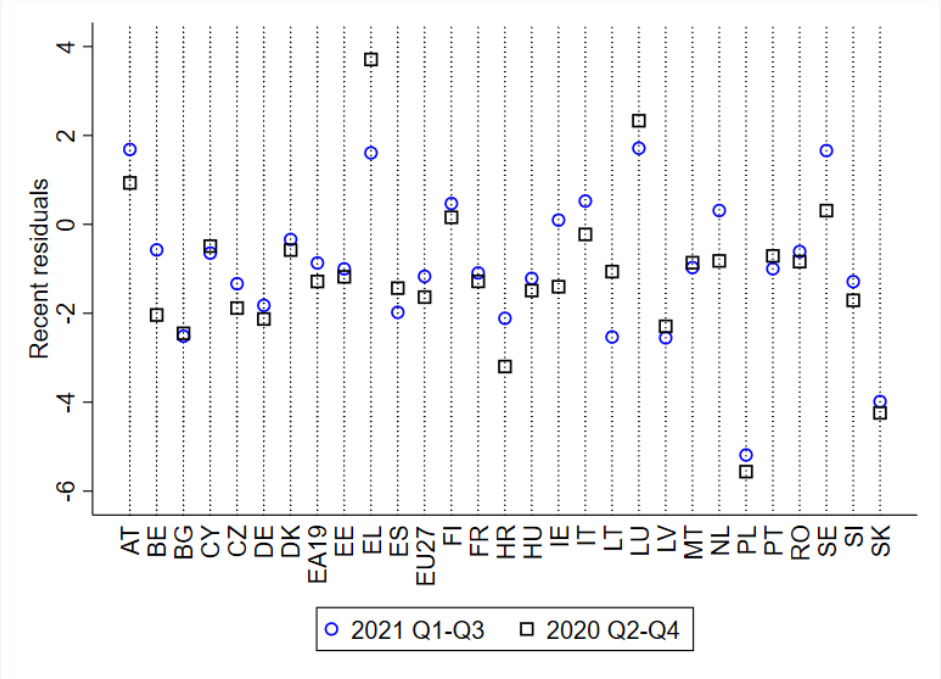
[34] The exercise is based on a variant of specification (5) in Table 1, in which the dispersion of sectoral shortages is eliminated (for not being statistically or substantively significant).

appears to be a much more relevant driver of joblessness. Finally, the negative residual in the second quarter of 2020 (for the EU and euro area aggregates as well as a number of countries) is consistent with the notion that job retention schemes significantly dampened the increase in unemployment as compared to what would have been expected based on the fall in vacancies.

There are however signs of significant heterogeneity across Member States in terms of how labour market matching developed over the pandemic period. Figure 19 shows country-specific residuals estimated in specification (5) in Table 1 over recent periods. The specification adopted to estimate the residuals includes country fixed effects but no time effects. This specification permits to identify the residuals as capturing not only random errors but also more structural shifts taking place over time.[35]

The figure compares the average of three quarterly observations of the pandemic period in 2020 (quarters 2 to 4) with the average of three quarterly observations in 2021 (quarters 1 to 3). For most countries, the residual was below zero over the pandemic period, suggesting a lower position of the Beveridge curve (i.e. better matching efficiency) than on average since 2003. For a majority of countries, residuals have increased somewhat between 2020 and 2021, suggesting some worsening of labour market matching (comparatively large increases are seen, for instance in AT, BE, HR, IE, NL, SE).

Figure 19: **Proxy of country-specific position of Beveridge curve: Recent residuals in FGLS estimations**



Note: Residuals are estimated based on specification reported in column (5) in Table 1 (specification without time effects).

[35] In other words, direct comparisons between countries cannot be made, but comparisons within country over time are meaningful.

6. SLACK OR TIGHTNESS IN EU LABOUR MARKETS: TENTATIVE ASSESSMENT AND POLICY IMPLICATIONS

6.1. INTERPRETING THE FACTS

European labour markets recovered in 2021. Slack indicators were still slightly above pre-pandemic levels, while labour market shortages started to emerge. Signals remained mixed, as the speed of labour market tightening varied across sectors and across countries, while signs of structural labour market mismatches were not yet clearly visible in the data.

Post-COVID-19 labour market developments presented a number of peculiar features. A first distinguishing aspect were the relatively moderate increases in unemployment, associated with a substantial drop in hours and activity rates. Unemployment changes have been more muted than expected based on the typical relation between growth and unemployment (Okun's law). These developments also mark a clear difference as compared with the developments after the financial crisis where unemployment surged in a majority of countries while activity rates remained resilient or even increased. This pattern is mainly related to the support policies put in place after the COVID-19 outbreak (STWs limiting the increase in unemployment) and health risks and containment measures (which contributed to reducing activity rates).

The second distinguishing feature of the recent developments was the increase in vacancy rates and other indicators of tightness in many countries while labour market slack remained above pre-pandemic levels. In the vast majority of Member States unemployment was still higher in 2021Q2 than before the pandemic, despite recent reductions, while vacancy rates had already returned to or even surpassed pre-pandemic levels.

The third distinguishing feature of the current labour developments was the strong sectoral character. The reduction in employment and hours was much stronger in sectors highly exposed to the containment measures (accommodation and food, arts and entertainment). Other sectors that were less affected recovered quite swiftly after the initial shock. In industry and to a lesser extent construction, labour shortages started to re-emerge relatively early, surpassing the pre-pandemic level, even when employment levels had not yet fully recovered. Sectoral specialisation patterns contributed to substantial cross-country differences, but other factors mattered as well (e.g. structural labour market features, the type and amount of policy support provided).

The econometric estimates presented in this paper aim at gauging whether Beveridge curve relations have shifted upward after the COVID-19 outbreak. The results indicate a modest upward shift in 2020, partly reversed in the course of 2021. In spite of the fact that skills mismatch somewhat worsened in the wake of the COVID-19 pandemic, such worsening appears to have had a very minor impact on driving labour market mismatch: the Beverdige curve estimation augmented with labour market mismatch indicators suggests that these variables explained little of the cumulated unemployment changes after COVID-19.

Overall, the findings suggest that the simultaneous presence of labour market slack and shortages was temporary in the euro area.[36] The removal of containment measures led to a very sudden increase in labour demand in a context where the labour force was less reactive than usual. In particular, health

[36] Such evidence is in line with other recent analyses for advanced economies, see e.g. Duval et al. (2022).

risk concerns, and restrictions and containment measures may have hampered labour mobility, not only within countries but also across the border. Vacancy rates reacted rapidly both downward, at the start of the lockdown, and with the labour market recovery, with unemployment moving with lags. Containment and support measures (STWs) after COVID-19 may have contributed to keeping unemployment low, especially at the peak of the pandemic, postponing workers' decisions to seek a job in another firm or sector or accept job offers. This may have put upward pressure on vacancy rates, especially in sectors less affected by the crisis.

Other parts of the world, such as the United States and the United Kingdom, also observed sudden strong surges in labour shortages in the aftermath of the pandemic. In the United States and the United Kingdom, the impact of the rebound in labour demand was exacerbated by a decline in activity rates (see e.g. BLS 2022, IES, 2022). This was not the case in the EU, where activity rates currently stand at an all-time high (Figure 3).

While there is no evidence yet of rising structural mismatch, such eventuality cannot be excluded going forward, in light of substantial inter-sectoral reallocation needs of labour with sector-specific skills and an acceleration of changes in the relative skills demand triggered by the Covid-19 shock (notably the increased relative demand for teleworkable occupations and non-routine tasks). The assessment of such hypothesis would require tracking the future evolution of Beveridge curves and more granular mismatch indicators.

At the same time, the observation of increasingly high peaks in labour shortages during economic upturns is likely to stay in a context where economies rely increasingly on skilled labour and where demographic trends are leading to a declining working age population across the EU.

6.2. OUTLOOK AND POLICY IMPLICATIONS

The extensive deployment of policy support measures helped cushion the negative impact of the Covid-19 crisis on employment. Short-time work schemes helped protecting viable worker-job matches and job- and firm-specific human capital from temporary contractions in production and consumption. They have reduced the disruption in the labour market and protected human capital and productive capacity when containment measures remained in place (Giupponi et al., 2022). The EU has helped Member States to implement short-time work schemes by providing financial assistance in the form of loans through the SURE instrument.[37]

The overarching approach to policy support taken in Europe was markedly different from the one taken for instance in the United States, as documented by Giupponi et al. (2022). While the focus in the United States was on insuring workers, in particular by reinforcing unemployment insurance schemes, in Europe policy support was centered on saving jobs, by subsidising labour hoarding. One of the contributing factors explaining the difference in policy approach is no doubt the fact that firing costs in Europe tend to be higher than in the United States, increasing the cost of 'inefficient' temporary dismissals.

[37] SURE stands for temporary Support to mitigate Unemployment Risks in an Emergency. See https://economy-finance.ec.europa.eu/eu-financial-assistance/sure_en for more details.

Figure 20: **Share of jobs receiving government support, selected countries, %**

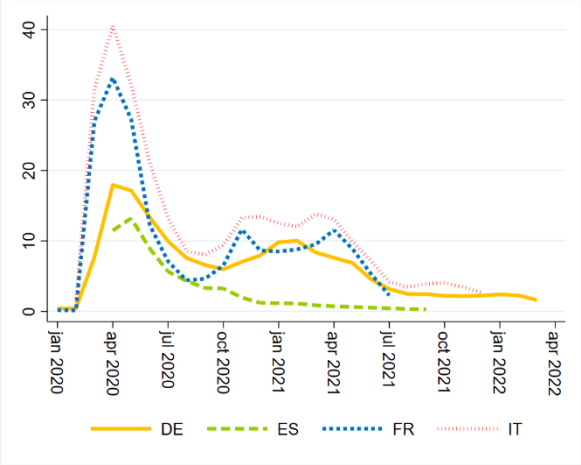
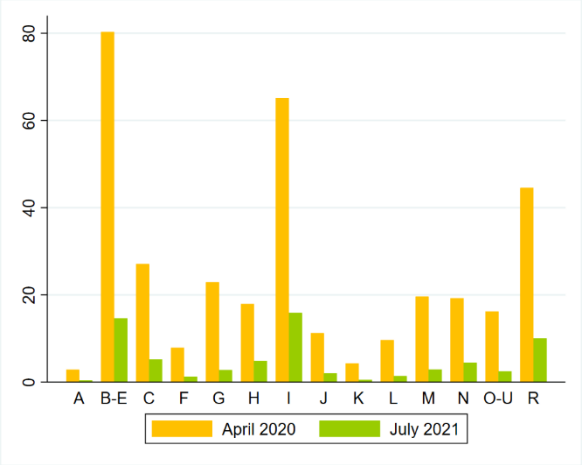


Figure 21: **Share of jobs receiving government support for selected sectors, Germany, %**



Note: Support received includes short-time work schemes and temporary furlough schemes. Presented sectors: C: manufacturing; F: construction; G: wholesale/retail; H: transport; I: food/accommodation; J: IT and communication; M: professional and technical services; N: business and administrative support; R: arts and entertainment. For more country-level details, see Figure A.14 and Figure A.15 in Annex.

Source: Eurostat Covid Dashboard.

There was however a concern that if maintained for too long, support schemes would stand in the way of the necessary sectoral reallocation.[38] Over the course of 2021, most Member States started to withdraw or scale back the emergency support schemes, in line with the easing of policy restrictions. The number of jobs receiving government support peaked during the first wave of the pandemic (in 2020Q2). By mid- 2021, coverage of STW schemes was significantly reduced, concentrating particularly in contact-intensive services that were hit hardest by the containment measures (Food and accommodation, Arts and entertainment) (see Figure 20, Figure 21, and Figures A.14 and A.15 in Annex).[39] The ECB (2021, p. 24) estimated that around 2.7% of the euro area workforce still remained on short-time work (and other similar) schemes in July 2021, against an average of 6.2% in the first five months of 2021. The possible impact on obstructing labour reallocation was therefore limited by mid-2021.[40] Going forward, the outlook for the EU labour market is however clouded not only by the pandemic but also by other factors affecting labour demand, linked notably to the implications of the ongoing geo-political tensions, growing energy and commodity prices, and confidence effects. Policy responses may play a key role determining labour demand going forward.

The experience from the pandemic has shown that short-time work schemes can be successful at protecting 'efficient' job matches in the face of adverse temporary shocks, while care should be taken to avoid the subsidisation of unviable firms. Support provisions should account for differences in country and sector-specific situations. In normal times, there is scope to adjust eligibility rules in a way that incentivises the right firms to self-select into support, e.g. by increasing the rate of cost-

[38] See e.g. IMF (2022); Ando et al. (2022).

[39] Besides the STWs, a plethora of other types of corporate level support measures will also be gradually phased out as progress in made in fighting the pandemic. These included tax deferrals and reliefs, loan guarantees, debt repayment moratoria, grants, subsidies, and provision of some form of bridge financing or equity participation. In addition, the ECB has implemented measures to ensure financial stability, and at the EU level an exceptional temporary state aid framework was put in place to provide more flexibility to Member States to extend support where needed.

[40] By January 2022, the share of of jobs in the euro area supported by such schemes continued to fall to 1.5%.

sharing by firms of worker salaries on short-time work. Workers can be encouraged to participate in training to ease transitions to other sectors that are expanding, in line with the recently adopted Commission recommendation for Effective Active Support to Employment (EASE).[41]

Policy support to labour market reallocation should work along different axes. First, training would support workers to make professional transitions.[42] Ideally, all players who benefit should invest in training: workers, companies, as well as the government (Thum-Thysen et al., 2021). Second, policy interventions to strengthen public employment services need to be part of the policy toolkit to improve the labour market matching process. Modern and effective public employment services can facilitate professional transitions by offering high-quality job search assistance, in combination with appropriate incentives and sanctions, drawing on up-to-date labour market intelligence, new matching technologies, and individualised approaches accounting for worker preferences. Third, adjustment of additonal policy frameworks may also facilitate labour reallocation, including by addressing overly strict employment protection legislation, the non-transferability of social security or training rights across jobs and employment statuses, and housing policies that hamper labour mobility.

In light of the expected relevant sectoral transitions, policy should address the adequacy of safety nets and social security entitlements. Due to diverging employment developments across different groups, policy should also address emerging risks of increased inequalities, including through equal opportunities in education and fair and transparent tax and benefit policies. Finally, in view of ongoing demographic changes in Europe, drawing on an as broad as possible labour supply base can help mitigate labour shortages, underlining the importance of policies that support the inclusiveness of labour markets as well as effective legal migration policies.[43]

[41] European Commission, C(2021) 1372 final. See https://ec.europa.eu/info/publications/commission-recommendation-effective-active-support-employment-ease_en.

[42] Training policies are however no panacea: research shows that positive impacts only appear in the medium to longer run and that the effectiveness of training measures depends critically on the quality of training, the economic context and the ”fine print” of their implementation. An effective adult learning system needs to be underpinned by high-quality and inclusive initial education, with strengthened support to overcome the set-backs in learning losses and inequalities due to the pandemic.

[43] See for instance the 2022 Communication on Attracting Skills and Talent to the EU (COM/2022/657 final).

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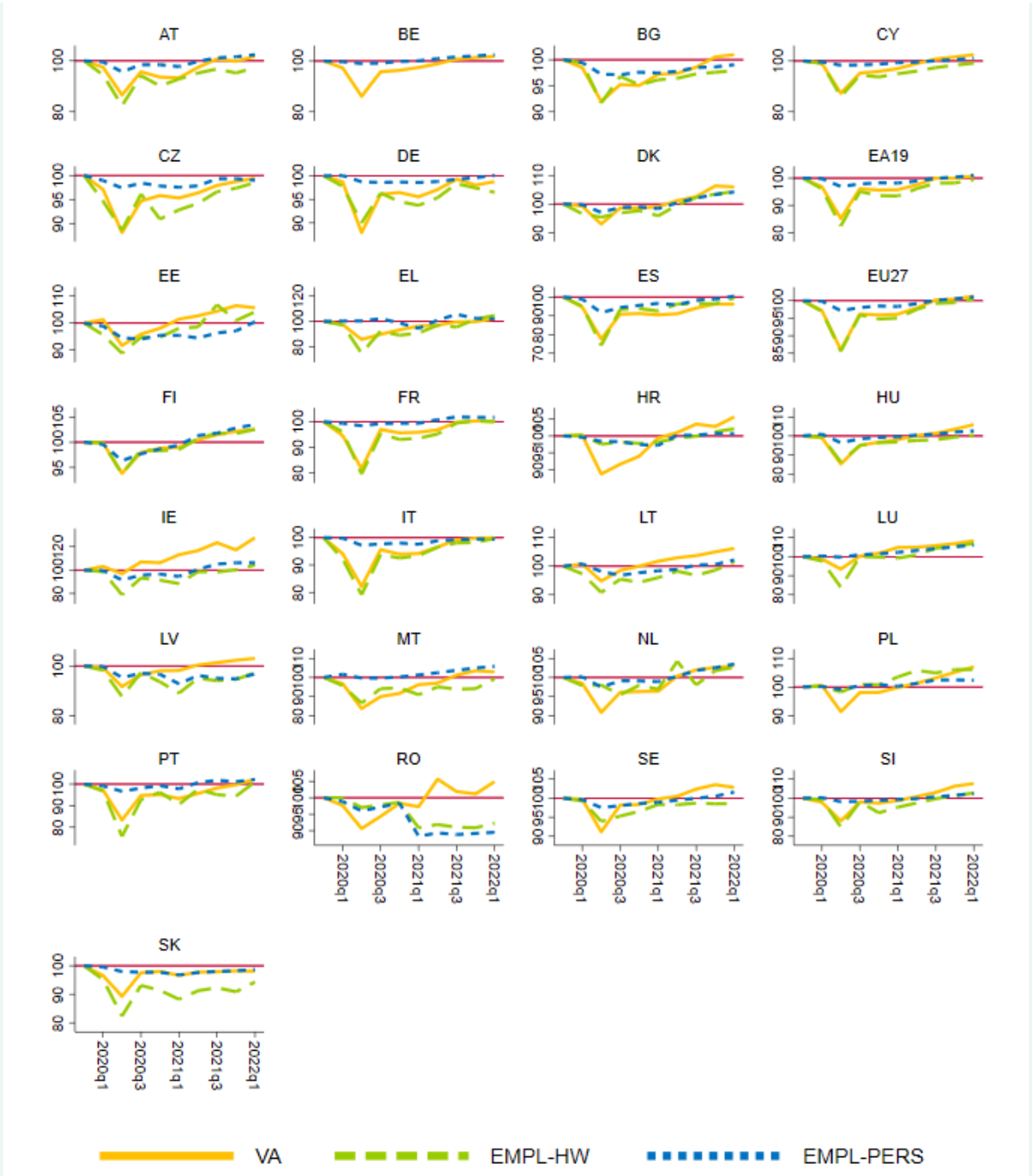
ANNEX: ADDITIONAL FIGURES

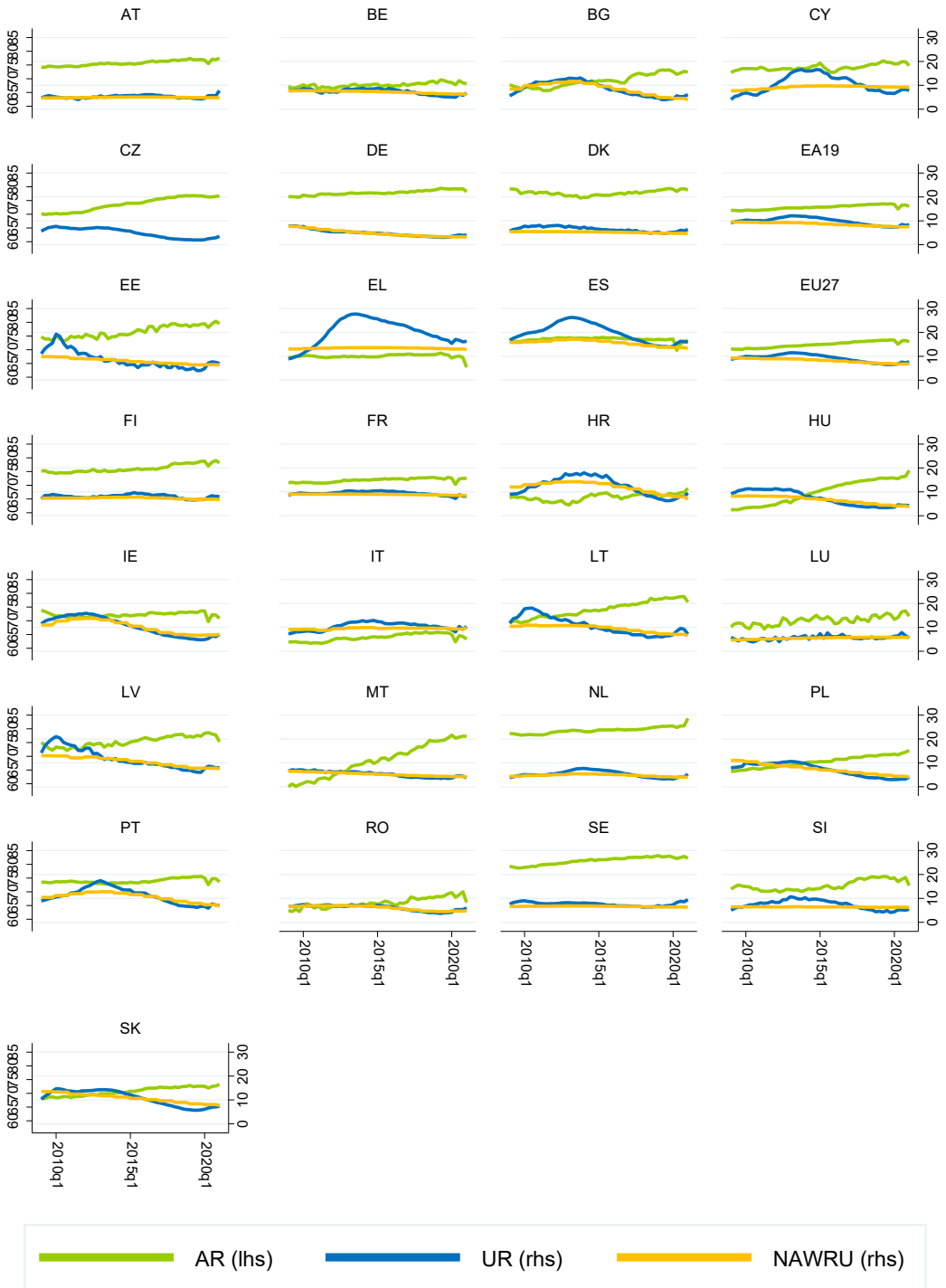
Figure A.1: **Performance by Member State in the EU, 2019Q4-2022Q1 (Index, 2019Q4 = 100)**



Note: Performance is expressed as an index (2019q4=100). Data are seasonally and calendar adjusted, except for EMPL-PERS in CZ, EL, FR, MT, PL, PT and for EMPL-HW in MT. Value added (VA) is calculated based on gross value added in chain linked volumes (index 2015=100). Employment in hours worked (EMPL-HW) and in persons (EMPL-PERS) are based on domestic concepts.

Source: ECFIN calculations based on Eurostat quarterly national accounts data.

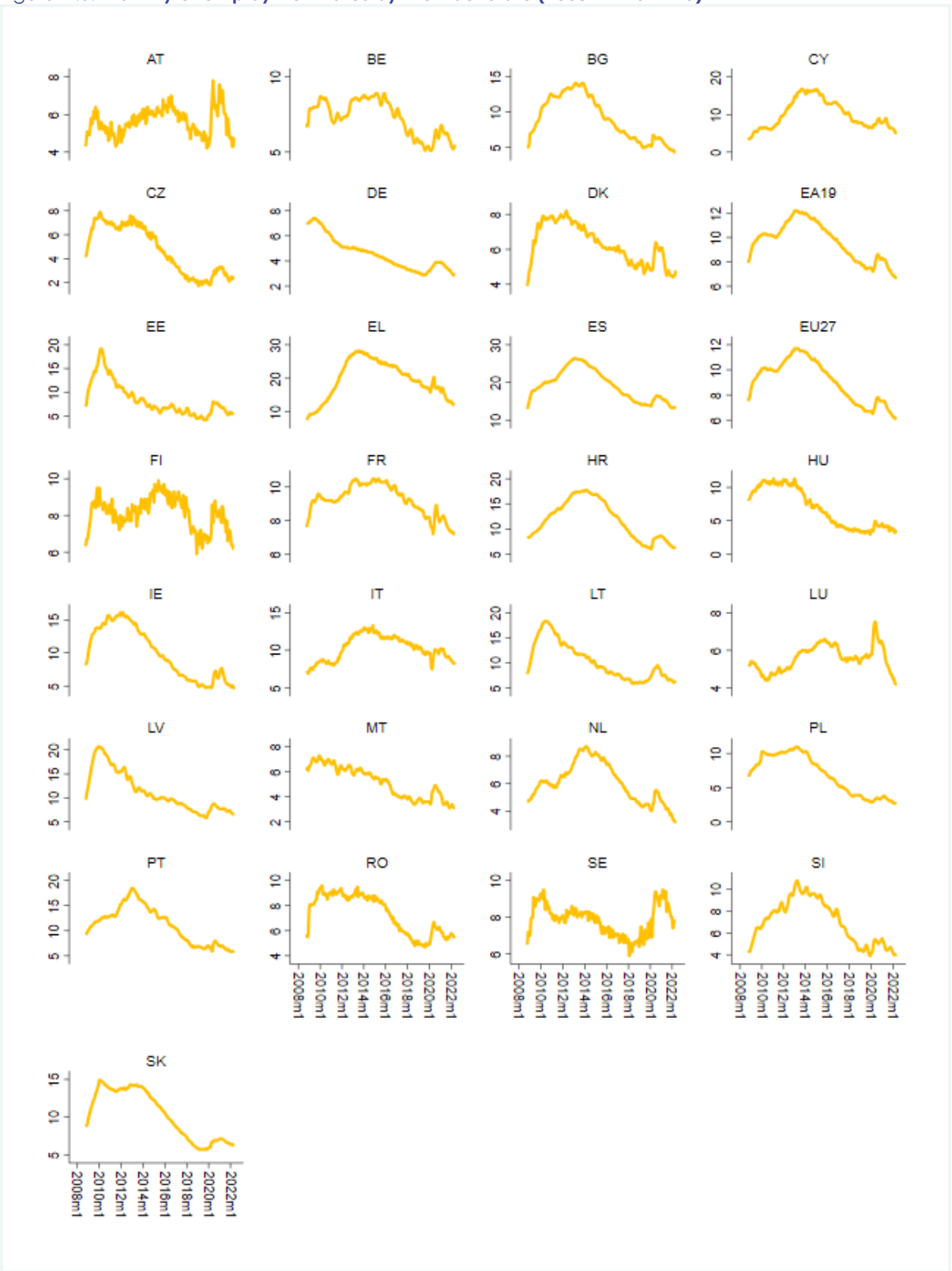
Figure A.2: **Evolution over time of unemployment, NAWRU and activity rates by Member State**



Note: AR refers to the activity rate (Y15-64), UR refers to the unemployment rate (Y15-74), NAWRU refers to the non-accelerating wage rate of unemployment (Y15-74). AR and UR are seasonally but not calendar adjusted.

Source: Eurostat Labour Force Survey and European Commission AMECO data.

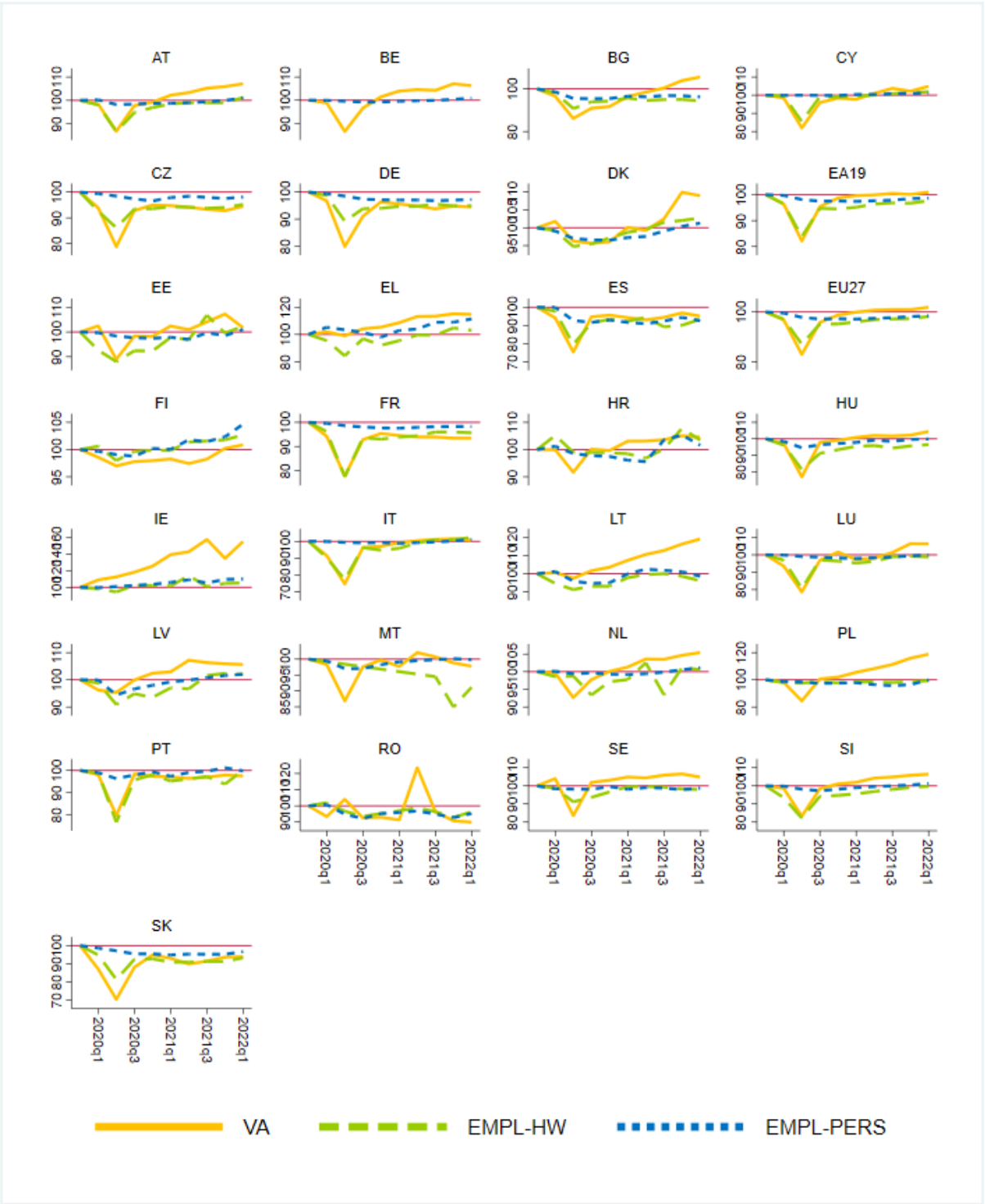
Figure A.3: **Monthly unemployment rates by Member State (2008m1-2022m5)**



Note: Data represent monthly unemployment rates. Data are seasonably (but not calendar) adjusted. They are available up to August 2021 for some countries, and to July 2021 for the others.

Source: Eurostat (online code: une_rt_m).

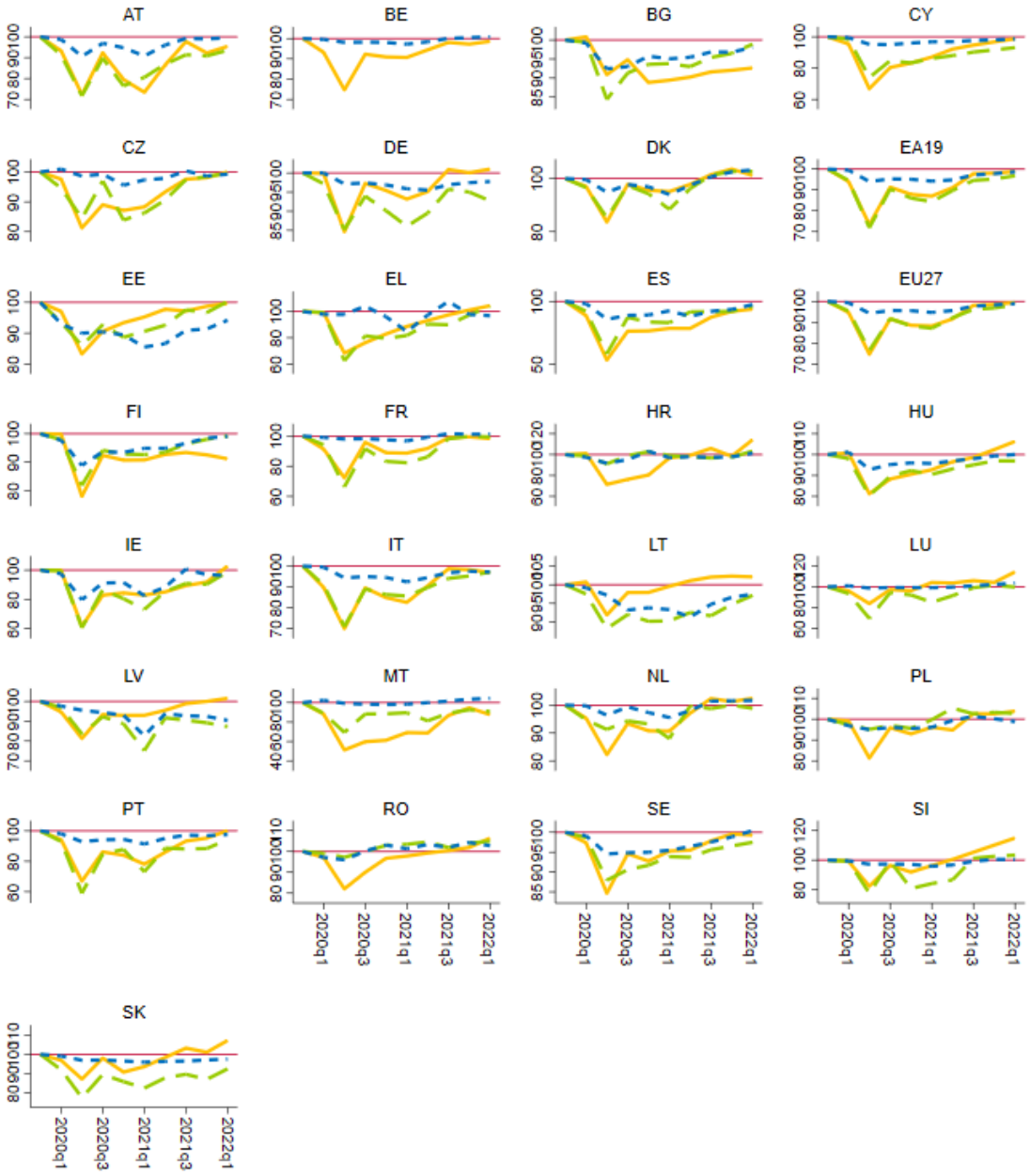
Figure A.4: **Performance by Member State - Industry w/o construction (Nace Rev2 B-E)**



Note: Data cover Nace Rev2 B-E. Performance is expressed as an index (2019q4=100). Data are seasonally and calendar adjusted, except for EMPL-PER in CZ, EL, FR, MT, PL, PT, where adjusted data are not available and unadjusted data are used instead. Data on EMPL-HW missing for BE and MT. Value added (VA) is calculated based on gross value added in chain linked volumes (index 2015=100). Employment in persons (EMPL-PERS) and hours worked (EMPL-HW) are based on domestic concepts, calculated from absolute levels (nr. persons/nr. hours worked).

Source: DG ECFIN calculations based on Eurostat quarterly national accounts data.

Figure A.5: **Performance by Member State – Trade, transport, food & accommodation (Nace Rev2 G-I)**

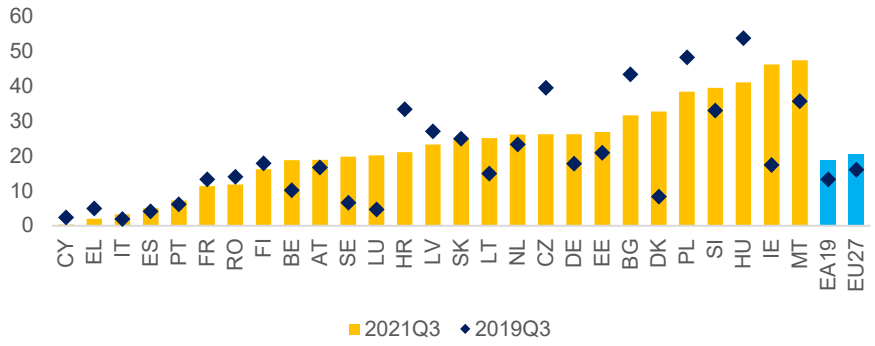


Note: Data cover Nace Rev2 G-I. Performance is expressed as an index (2019q4=100). Data are seasonally and calendar adjusted except for EMPL-HW in MT and EMPL-PER in CZ, EL, FR, MT, PL, PT, where adjusted data are not available and unadjusted data are used instead. Data on EMPL-HW missing for BE. Value added (VA) is calculated based on gross value added in chain linked volumes (index 2015=100). Employment in persons (EMPL-PERS) and hours worked (EMPL-HW) are based on domestic concepts, calculated from absolute levels (nr. persons/nr. hours worked).

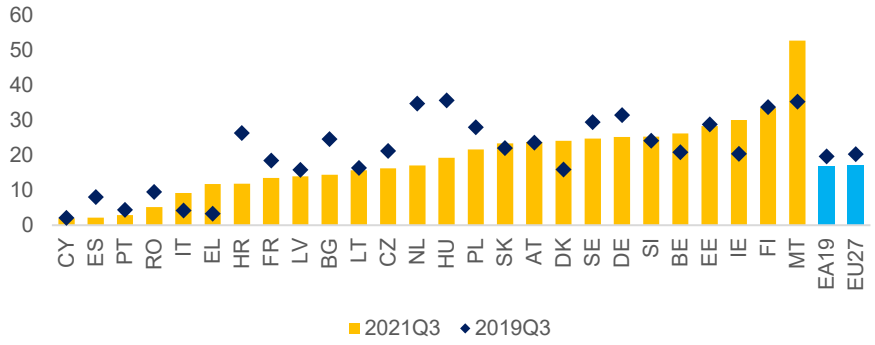
Source: DG ECFIN calculations based on Eurostat quarterly national accounts data.

Figure A.6: **Labour shortages across Member States in industry, services, and construction**

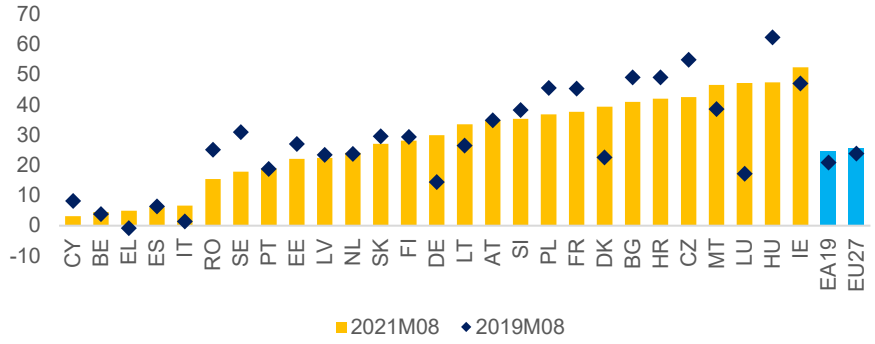
(a) Industry



(b) Services



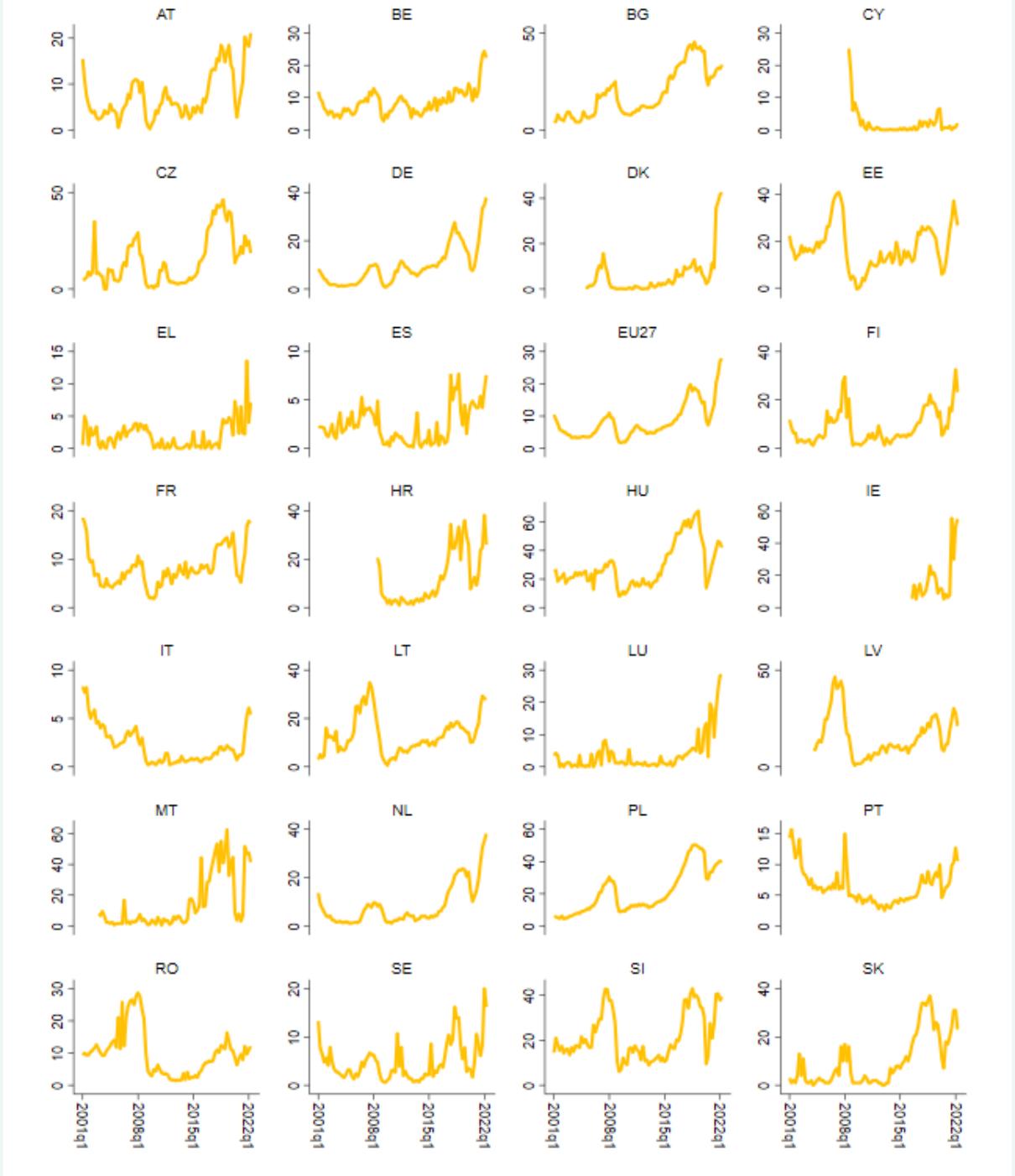
(c) Construction



Note: Data depict the share of firms reporting labour shortages are a factor limiting their production. Data for LU missing for services.

Source: EU Business and Consumer Surveys.

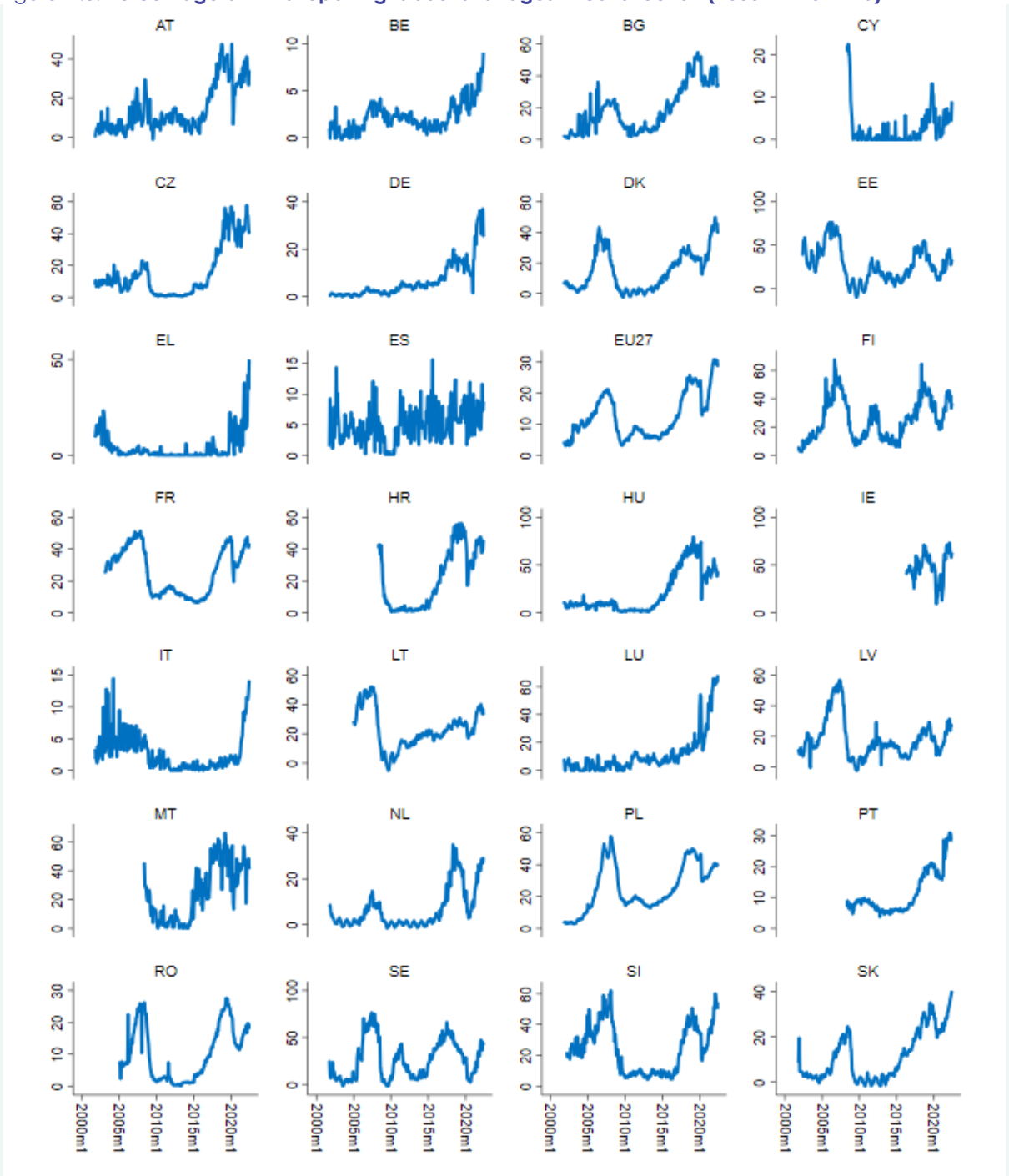
Figure A.7: **Percentage of firms reporting labour shortages in industry (2000q1-2022q2)**



Note: Data depict the % of firms reporting labour shortages as an obstacle to production.

Source: EU Business and Consumer Survey.

Figure A.8: **Percentage of firms reporting labour shortages in construction (2000m1-2022m6)**



Note: Data depict the % of firms reporting labour shortages as an obstacle to production.

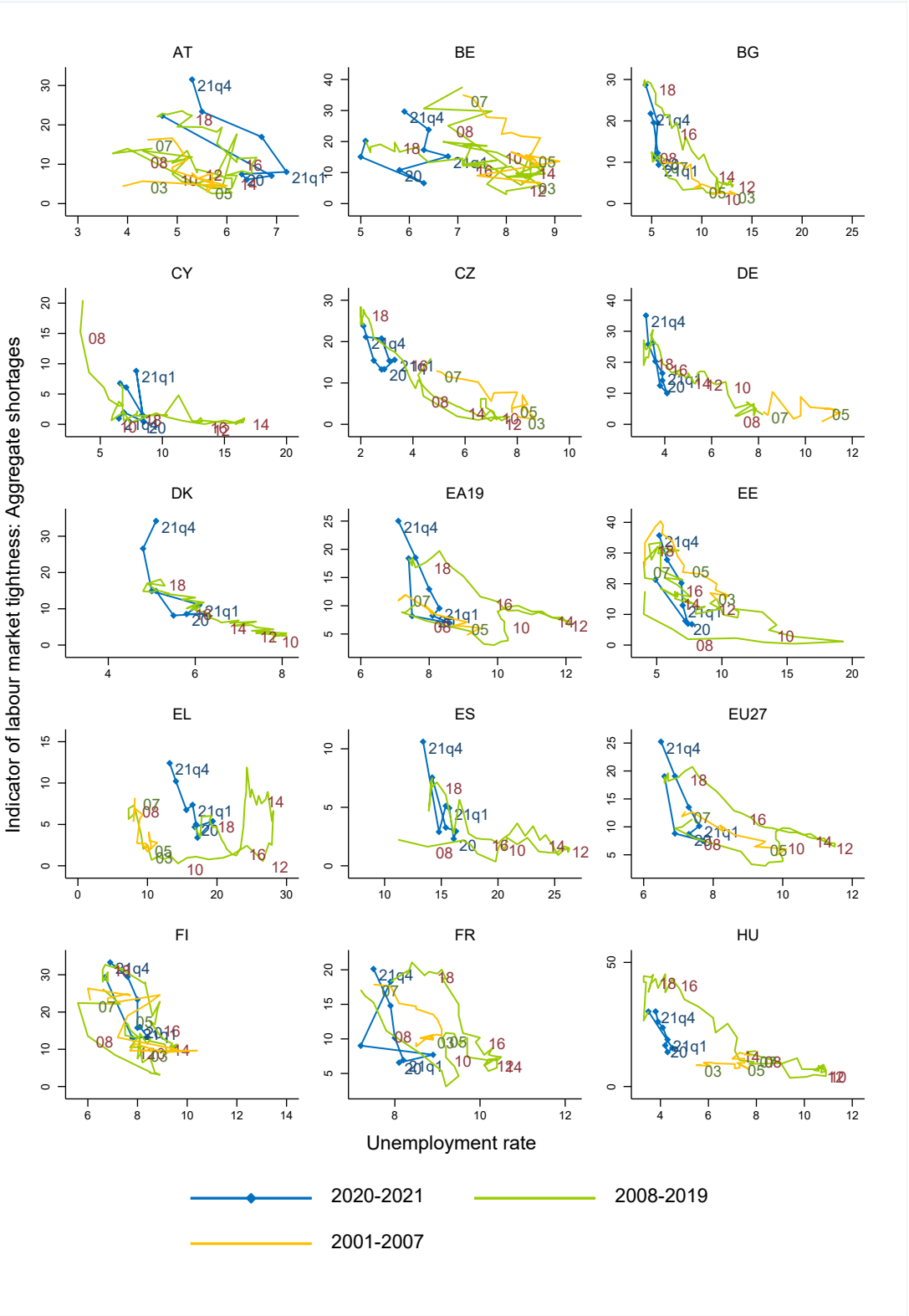
Source: EU Business and Consumer Survey.

Figure A.9: **Percentage of firms reporting labour shortages in services (2000q1-2022q2)**

Note: Data depict the % of firms reporting labour shortages as an obstacle to production. They cover Nace Rev.2 sectors H to N and R to S and thus exclude wholesale/retail and the public sector.

Source: EU Business and Consumer Survey.

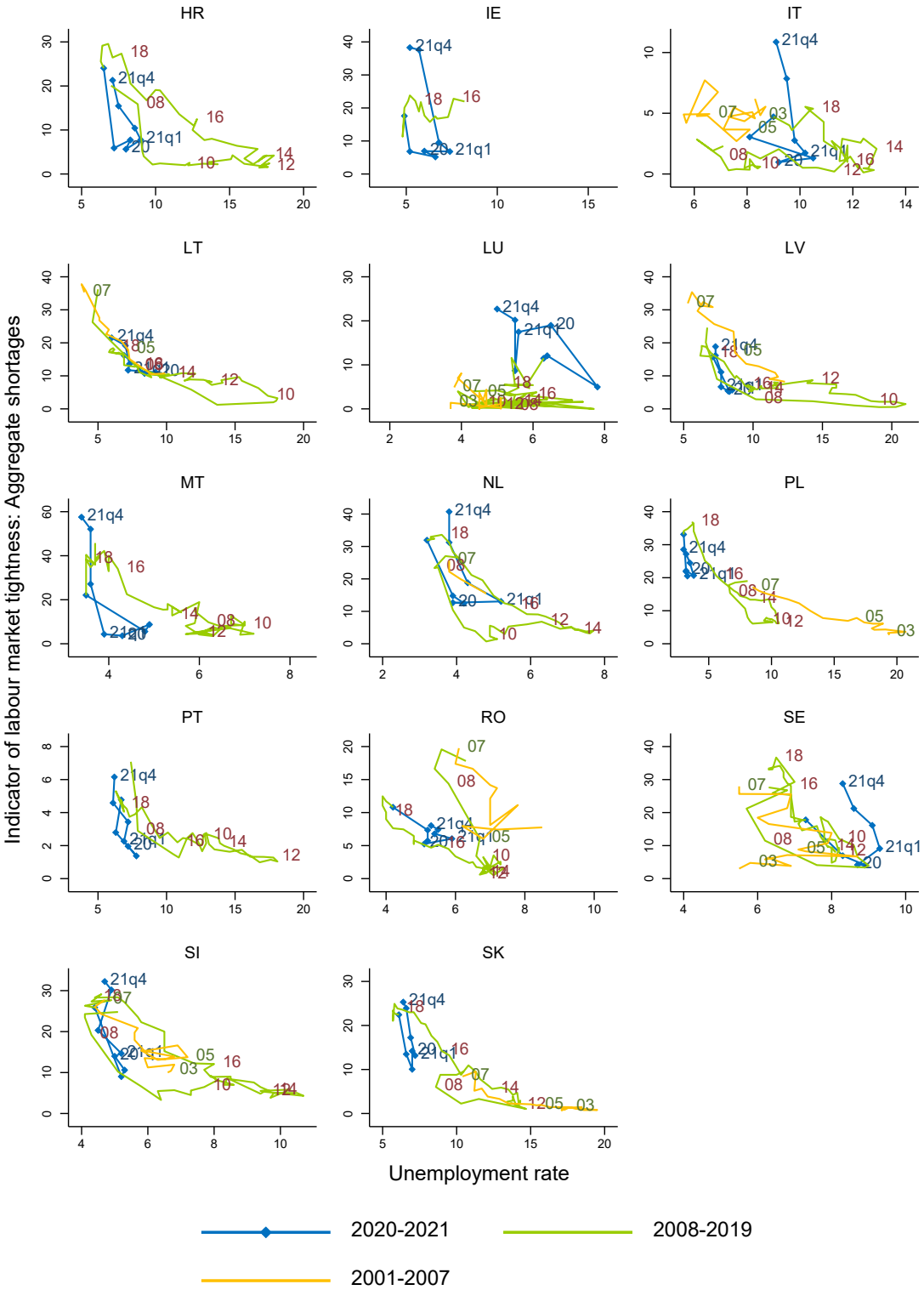
Figure A.10: **Beveridge curves for EU27 Member States, vacancies proxied by labour shortages (industry, services and construction)**



Note: The indicator of labour shortages is defined as the share of firms reporting that labour is a factor limiting production. It is a weighted average (based on value-added weights) of sectoral indicators on manufacturing, services and construction.

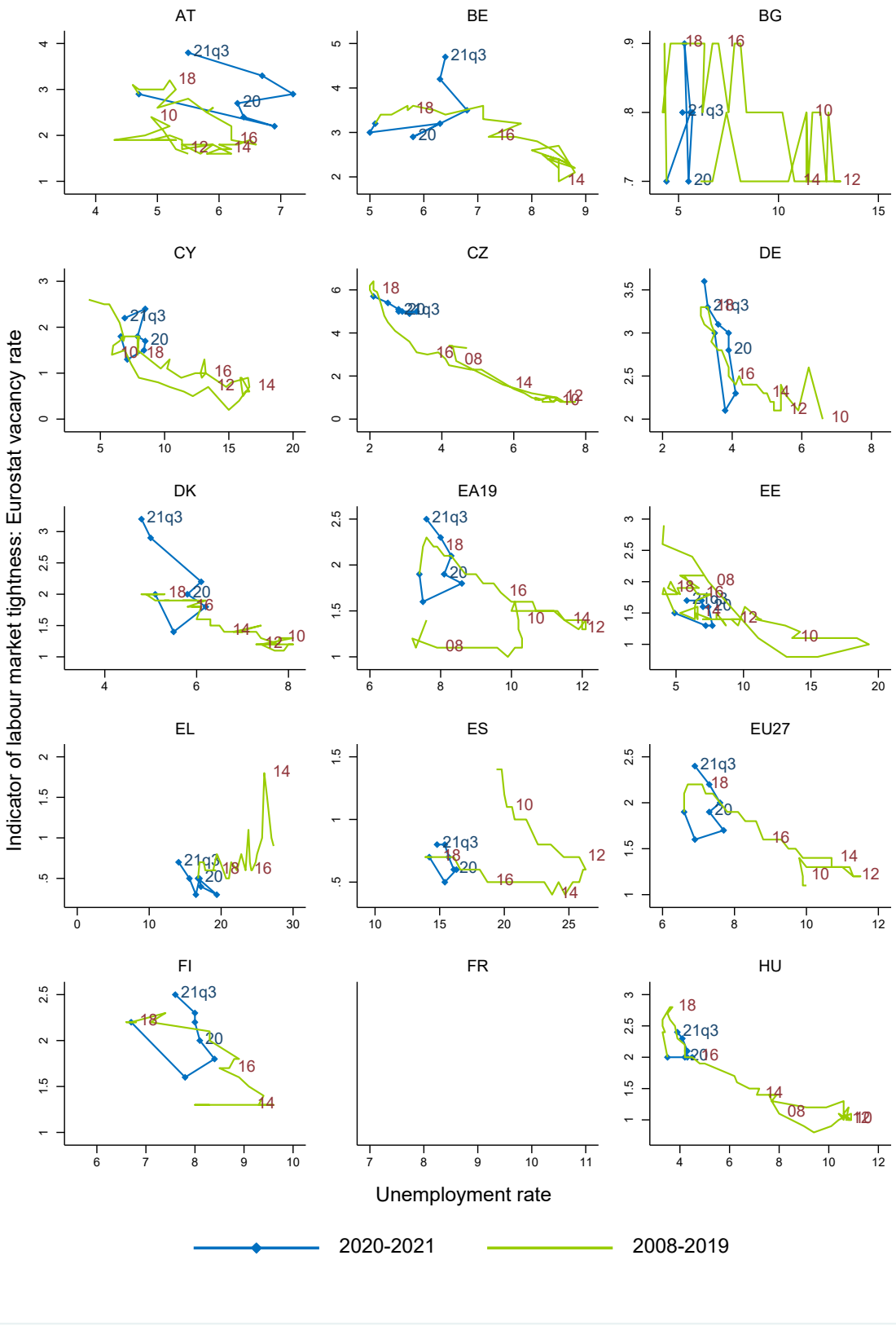
Source: Unemployment rate: EU LFS, Eurostat; Labour shortages: European Business and Consumer Survey, DG ECFIN.

Figure A.10: **Beveridge curves for EU27 Member States, vacancies measured by labour shortages (industry, services and construction) (cont'd)**



Note and source: see previous page.

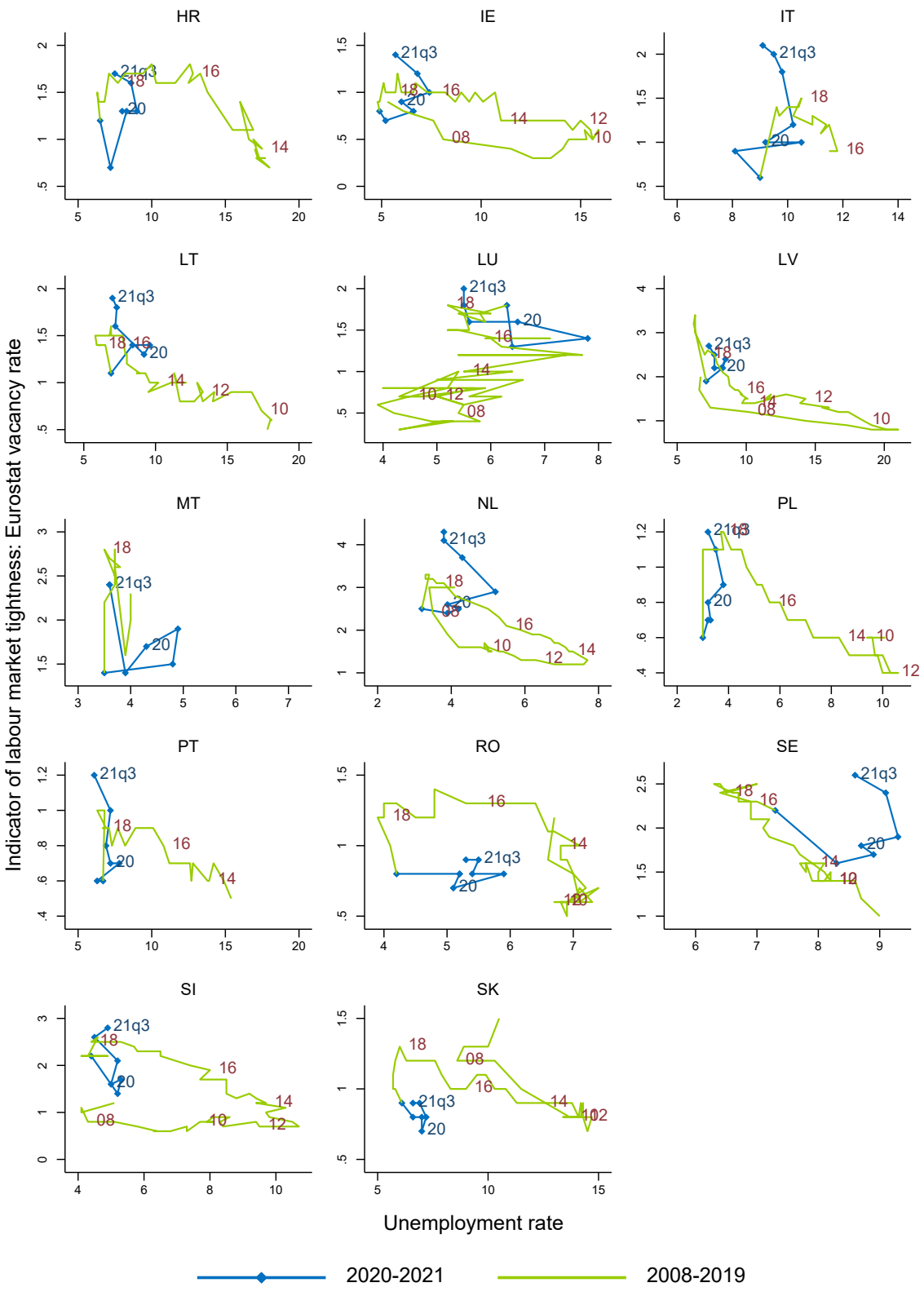
Figure A.11: **Beveridge curves for EU27 Member States (Vacancy rates - Eurostat)**



Note: The vacancy rate reflects NACE sectors B-S, except for DK (B-N). Vacancy data are not available for FR.

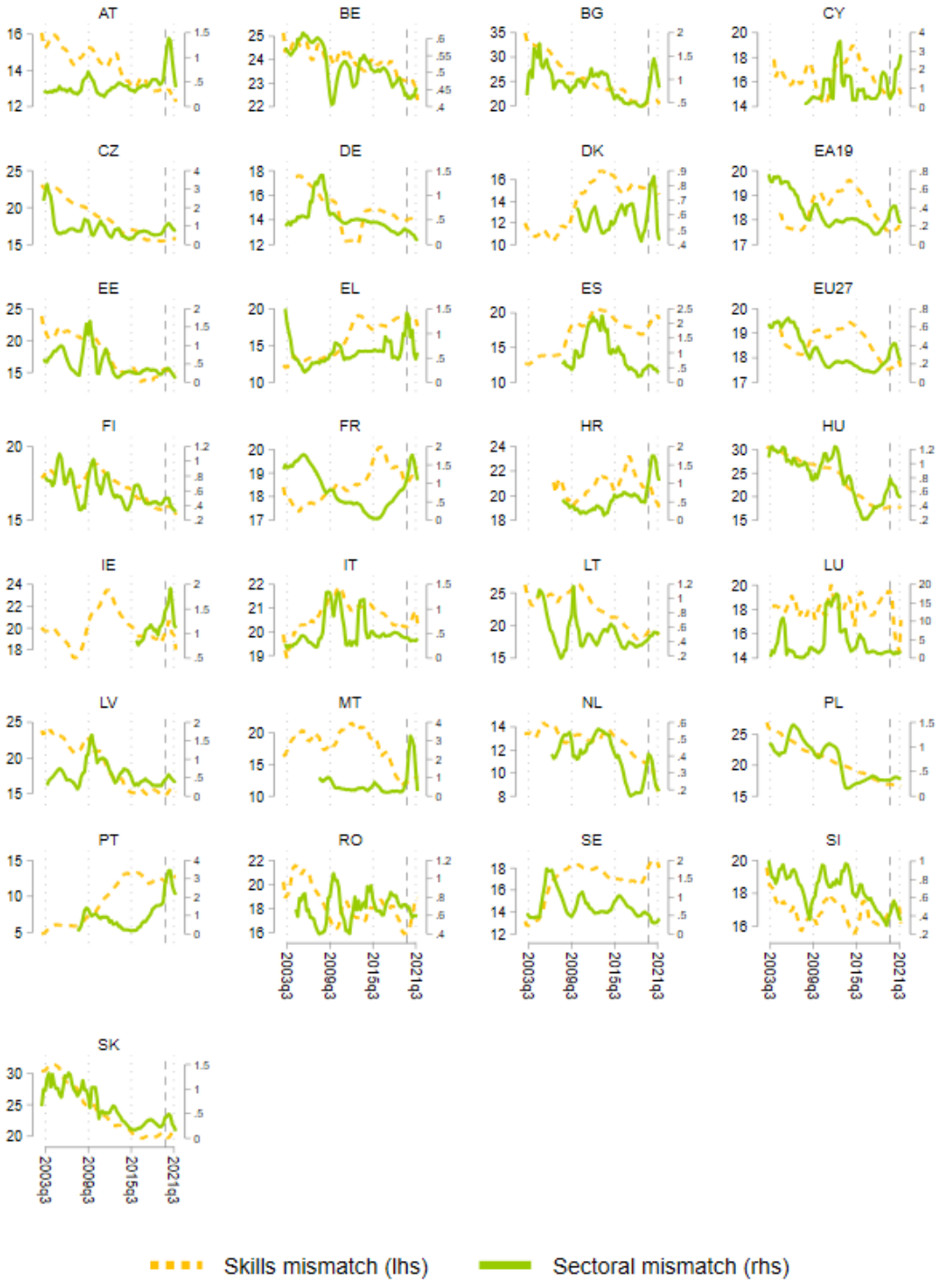
Source: DG ECFIN calculations based on Eurostat data.

Figure A.11: **Beveridge curves for EU27 Member States (Vacancy rates, cont'd)**



Note and Source: see previous page.

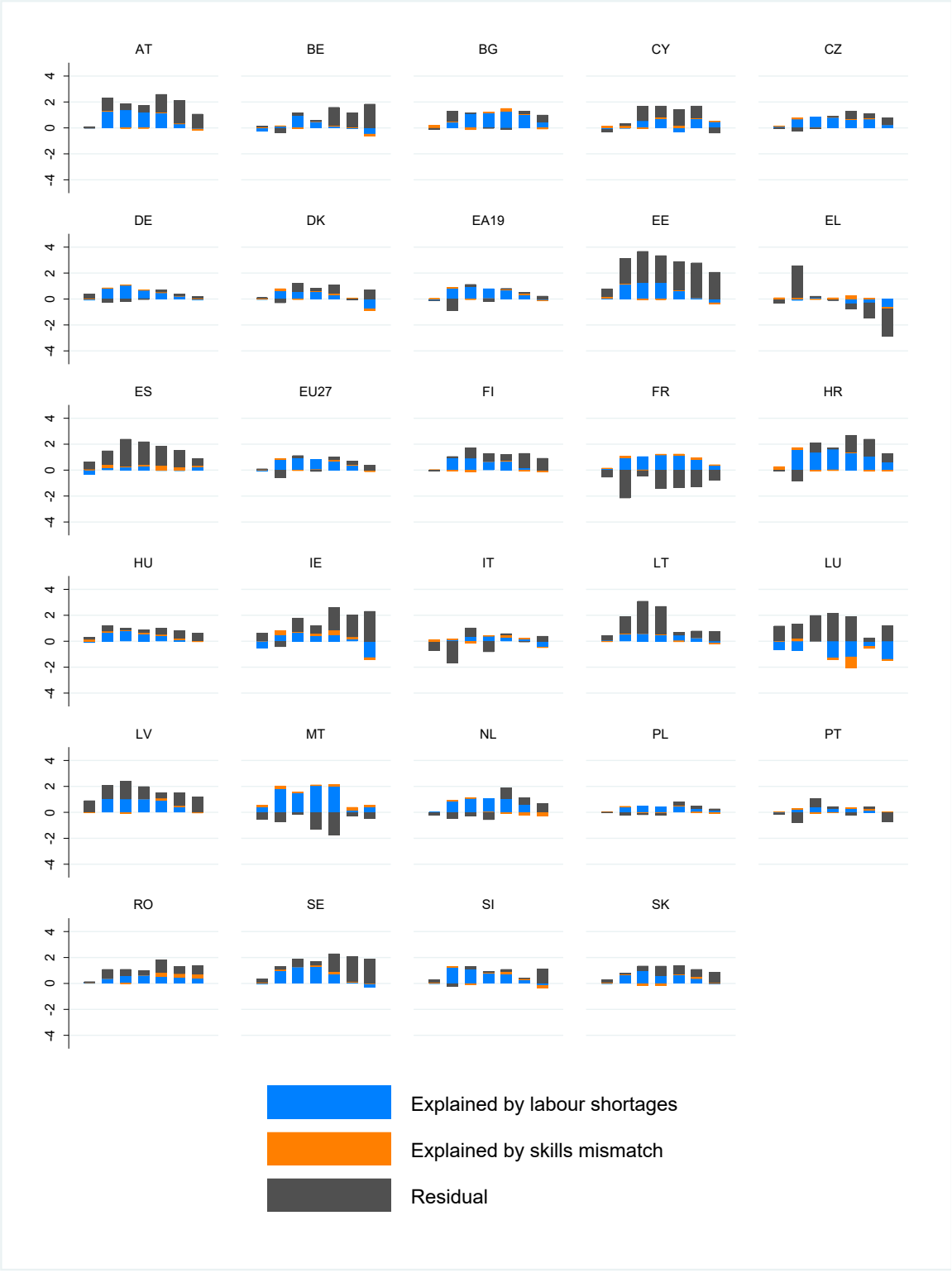
Figure A.12: **Macro-economic skills mismatch and sectoral dispersion of labour shortages for EU27 Member States**



Source: European Commission calculations based on LFS and EU-BCS.

Note: Macroeconomic skills mismatch is measured as the relative dispersion of employment rates by skills levels (see Kiss and Vandeplas, 2015 for the underlying methodology). The red line marks the onset of the pandemic (2020Q2).

Figure A.13: **Contributions of explanatory variables to unemployment developments based on FGLS estimation: 2020Q1-2021Q3**



Source: DG ECFIN calculations based on Eurostat data.

Figure A.14: **Percentage of jobs receiving government support**

Note: The total number of jobs supported by governmental measures comes from national public authorities such as the Unemployment or Employment Offices (BE, FR, LU for example) or Tax authorities (EE, IE for example). The data regarding the total number of jobs in the economy either comes from the National Statistical Office of the country, or from the EU Labour Force Survey (in this case they refer to quarter 1 data for January-March 2020, and to quarter 2- April-June data for the rest of the months available, and are not month specific).

Source: Eurostat.

Figure A.15: **Percentage of jobs receiving government support by sector, selected Member States**

Note: Data are shown for April 2020 and for July 2021 or the latest month for which data were available from Eurostat. For DE, data are available only for a selected set of sectors. Data on the total number of jobs supported by governmental measures comes from national public authorities such as the Unemployment or Employment Offices (BE, FR for example) or Tax authorities (EE for example). The data regarding the total number of jobs in the economy either comes from the National Statistical Office of the country, or from the EU Labour Force.

Source: Eurostat.

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