



EUROPEAN CENTRAL BANK  
EUROSYSTEM

## Occasional Paper Series

Ramon Gomez-Salvador, Michel Soudan    The US labour market after the  
COVID-19 recession

No 298 / July 2022

**Disclaimer:** This paper should not be reported as representing the views of the European Central Bank (ECB). The views expressed are those of the authors and do not necessarily reflect those of the ECB.

# Contents

<b>Abstract</b>	<b>2</b>
<b>Executive summary</b>	<b>3</b>
<b>1 Introduction</b>	<b>5</b>
<b>2 Employment, participation and unemployment</b>	<b>7</b>
<b>Box 1</b> Labour market developments after the COVID-19 recession in the United States and the euro area	11
<b>3 Inflows into and outflows from unemployment</b>	<b>13</b>
<b>4 Wages and productivity</b>	<b>16</b>
<b>5 Outlook for the recovery</b>	<b>19</b>
<b>Box 2</b> Productivity and wage developments in the recovery from the COVID-19 recession in the United States and the euro area	22
<b>References</b>	<b>26</b>

# Abstract

The US economy has endured an exceptionally severe recession caused by the measures put in place to contain the spread of COVID-19. This occasional paper assesses the impact of this crisis on key labour market variables, such as (un-) employment, wages and productivity, and highlights the differences versus past recessions, with an emphasis on the global financial crisis (GFC). It also presents a comparison of developments in certain key variables between the euro area and the United States, and it discusses the outlook in the United States for the ongoing recovery.

**JEL codes:** J20, J30, J60

**Keywords:** unemployment rate, job flows, labour market tightness, Beveridge curve, Phillips curve

## Executive summary

The broad-based shutdown of the US economy put in place to control the coronavirus outbreak led to an unprecedented rise in unemployment. During March and April 2020, around 25 million jobs were lost, pushing up the unemployment rate from 3.5% in February to 14.7% in April, despite the efforts made by the authorities to limit the impact of the crisis. At the same time a larger than usual fall in labour market participation dampened the rise in unemployment. In contrast to previous recessions, women, part-timers, low-wage earners and the hospitality industry were particularly affected by the job losses, while less so workers in manufacturing and construction. Due to the pandemic containment measures that were taken, many more workers lost jobs than in past recessions, while hiring was suspended, in line with evidence on previous downturns, at the start of the recession.

Most of the job losses were temporary at the outset, and virtually all of those were reversed from April 2020 onwards as lockdowns were lifted, although this dynamic continued to be affected by subsequent waves of COVID-19. In particular, while permanent job losses rose for some months, suggesting that unemployment could continue to be higher than its pre-pandemic level for a while, they had been re-absorbed by the start of 2022. Productivity rose much more quickly during this recession than in past episodes, reflecting the rapid job losses across the economy, although more visibly in hospitality and other services sectors, a testimony to the flexibility of the US labour market. Moreover, job losses economy-wide were in line with the size of the drop in activity, pointing to a broadly stable Okun's law. Wage growth, in nominal terms, has not declined significantly since the COVID-19 shock, unlike in previous recessions, and has shown strong growth in the last few quarters. Still, the relationship between wage costs and unemployment has been within historical norms.

The level of labour market tightness, i.e. the ratio between vacant jobs and unemployed people, has increased very rapidly, recently to record levels. The increase in labour market tightness, which has translated into a broadening of wage pressures, is pointing to a fall in matching efficiency. While the unemployed and inactive adjust to the COVID-19 shock and take up open vacancies, employers have been making efforts to attract workers, such as by offering more flexible working arrangements and higher wages. As most of the factors holding back labour supply are expected to be temporary and to continue to reverse in the coming months, the level of tightness should diminish. However, a slow normalisation of the supply/demand imbalances, coupled with the high inflation environment, could translate into a heightened risk of higher wage demands proliferating.

Looking at the policy response in the euro area and the United States, although it is too early to assess possible medium-term scarring effects, it appears that the policies implemented in the euro area – focusing on preserving jobs – have delivered more stable labour market outcomes in the short term than in the United States.

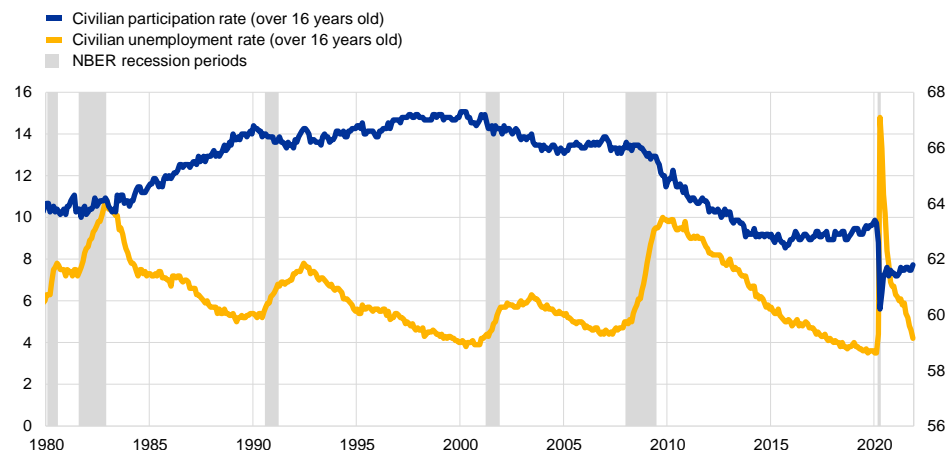
Indeed, gaps in participation and employment rates between the United States and the euro area were lower at the end of 2021 than before the COVID-19 crisis.

# 1 Introduction

The broad-based shutdown of the US economy put in place to control the coronavirus outbreak led to an unprecedented rise in unemployment and a decline in labour force participation. From March to April 2020, around 25 million jobs were lost, and the unemployment rate reached 14.7% in April 2020 from 3.5% in February (see Chart 1).<sup>1</sup> Workers that were temporarily laid off accounted for 75% of the inflow in unemployment. In the first few weeks of the shutdown, around 33.5 million people, or 20% of the labour force, applied for unemployment benefits.<sup>2</sup> In addition, 8 million workers left the labour force in March and April, leading to a drop in the participation rate from 63.4% in February to 60.2% in April, its lowest level since the early 1970s. These numbers dwarf the labour market developments seen in previous recessions, including the GFC.

**Chart 1**  
Unemployment and participation rate

(percentages of labour force, monthly data, seasonally adjusted)



Source: Bureau of Labor Statistics (BLS).  
Notes: The latest observations are for March 2022.

The severe adjustment took place despite efforts by US authorities to cushion the impact of the crisis on the labour market. Special measures were introduced to provide incentives to firms to retain workers, including: (i) the Paycheck Protection Program, which provided loans and guarantees to companies with up to 500 employees to cover payroll costs, mortgage or rent payments, utilities and health benefits; the loans were eligible for partial or total forgiveness if the firm maintained most of its pre-crisis employees on payroll; and (ii) the Employee Retention Credit: a

<sup>1</sup> The actual rate was estimated to have reached 20%, as some workers who were not at work during the reference week having been temporarily laid off were misclassified as employed but absent from work.

<sup>2</sup> As part of the CARES Act, the main fiscal support package adopted to counteract the effects of the crisis, namely access to unemployment benefits, was broadened to include independent contractors, self-employed individuals, or individuals who otherwise would not qualify for benefits in regular state programmes.

tax credit, equal to 50% of the qualified wage paid by eligible employers through end-2020, provided the business keeps the workers on their payroll.

The labour market bounced back rapidly as containment measures were relaxed and has continued to improve despite successive waves of COVID-19 infections. The unemployment rate fell to 3.6% in March 2022, 11.1 percentage points below its April 2020 high and only just above its pre-pandemic low of 3.5%. The number of employed has risen by 25.1 million, as virtually all temporarily laid-off workers have now returned to work following the re-opening of their workplaces and hiring has accelerated. After an initial bounce-back, the participation rate has been recovering more convincingly since late 2021, but still remains 1.0 percentage points below its pre-pandemic level.

The aim of this occasional paper is to provide an assessment and outlook for the US labour market, given the specificities of the coronavirus-induced labour market shock. In particular, it aims to identify the differences between the labour market impact of the COVID-19-induced recession and previous recessions, and to discuss how the US labour market is likely to recover from this unprecedented shock. It also presents a comparison of developments in some key variables between the euro area and the United States.

## 2 Employment, participation and unemployment

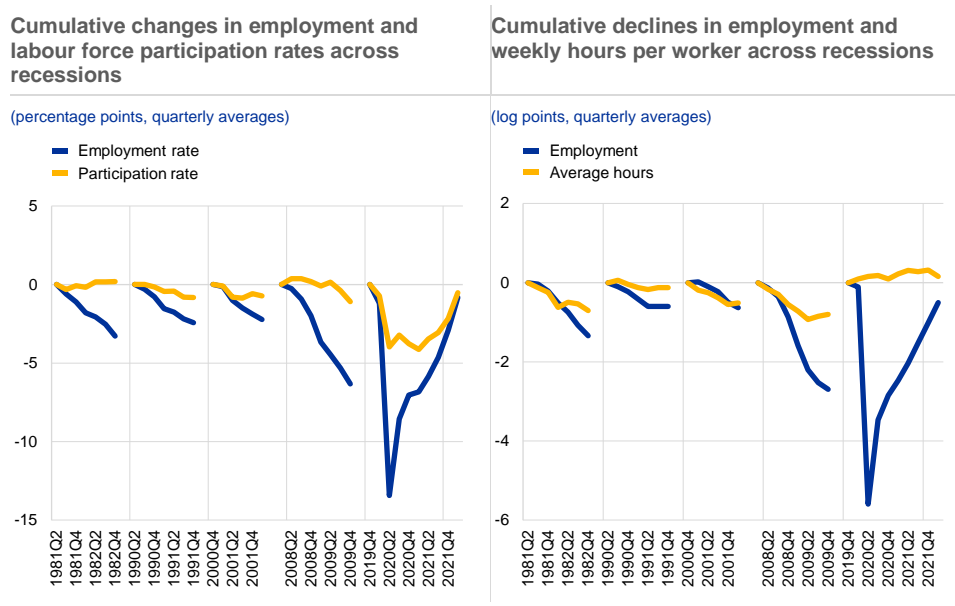
Unemployment has risen due to an unprecedented fall in employment, attenuated by a similarly large decline in labour force participation. We use a standard metric to gauge the relative role of employment and labour force participation in accounting for the increase in unemployment, following Elsby et al. (2010):

$$du_t = (1 - u_t) \left[ d \log \left( \frac{L_t}{P_t} \right) - d \log \left( \frac{E_t}{P_t} \right) \right], \quad (1)$$

where  $u_t$  is the unemployment rate,  $E_t$  the level of employment,  $L_t$  the size of the labour force and  $P_t$  denotes the population over 16 years old; the model being a continuous time model, in which  $t$  refers to variables at a given point in time. In past recessions the bulk of the increase in unemployment was related to the decline in employment, which was particularly marked during the GFC (see Chart 2, left-hand panel). At the same time, declines in participation, i.e. workers leaving the labour market, have cushioned the increase in the unemployment rate, but only to a limited extent.

### Chart 2

#### Employment, participation and average hours worked



Sources: BLS and authors' calculations.

Notes: Cumulative deviations from trend; add up to unemployment rate developments. Latest data are for the first quarter of 2022. Cumulative developments; add up to developments in total hours.

By contrast, in the COVID-19 crisis, not only has the decline in employment been unprecedented compared to previous recessions, but also the decline in participation. This has alleviated the increase in unemployment to a greater extent than in the past. Particularly, women with children at home (amid



closure/unavailability of childcare services/facilities) left the labour force, as well as older workers (given the elevated risk of contracting the virus) and some minorities (greater discouragement effect). Had the labour force stayed at the same level as in January 2020 and unemployed workers continued to look for work, the unemployment rate in April 2021 would have been 4 percentage points higher than observed (18.8% vs. 14.8%).

Hours worked per employed person did not adjust, in contrast with the marginal declines observed in the past. In past recessions, the decline in employment (the extensive margin) was often mitigated by the fall in hours worked per employed person (the intensive margin). During the GFC, the decline in employment was by far the dominant factor, although hours declined more than in past recession episodes. During the COVID-19 crisis, average hours worked have remained broadly unchanged (see Chart 2, right-hand panel). The reason behind this different pattern is related to compositional effects. Indeed, compared to previous recessions most of the adjustment took place in service industries, where hours worked are on average lower, therefore pushing up the average.

As expected, the current recession was short-lived compared to previous ones, as businesses reopened after the temporary lockdown measures were eased. Indeed, the trough was reached in the second quarter of 2020, while in the third quarter, employment showed a significant recovery. Employment continued to recover in 2021 and was virtually back to pre-pandemic levels at the end of March 2022. The participation rate bounced back quickly after the initial recession but, until the third quarter of 2021, remained stuck well below its pre-pandemic level. In late 2021, however, the participation rate began to rally, and at the end of March 2022 stood only 1 percentage point below its pre-pandemic level. By contrast, average hours worked have remained broadly stable over the whole period.

The impact of unemployment was very heterogeneous across demographic groups at the start of the crisis, affecting particularly women and part-time workers. Table 1 reports the average unemployment rates across demographic groups and for full-time and part-time workers, as well as the increase in each category relative to the overall unemployment rate; a ratio above 1 means that the group was more affected than the overall economy. As documented by Elsby et al. (2010), in past recessions (including the GFC), men, young workers, less educated workers and members of ethnic minorities experienced steeper rises in unemployment than other population groups (see also Duzhak, E.A., 2021). Also, full-time workers were more affected than part-time workers in past recessions. By contrast, two distinctive factors are worth highlighting in the current recession compared to past ones: women were more affected than men and part-time workers were more affected than full-time workers. As indicated in an April 2021 San Francisco Fed Economic Letter, gender gaps in labour market outcomes during the pandemic largely reflect differences in parents' experiences. Labour force participation fell much less for fathers compared with other men and all women at the onset of the pandemic, and the recovery has been more pronounced for men and women without children. Meanwhile, labour force participation among mothers declined at the start of the school year (Lofton O., et al., 2021).

**Table 1**

Changes in unemployment rates (URs) across selected demographic groups relative to the overall unemployment rate across recessions

(percentages, ratios)

	Average 1980-2020	Ratio of the UR change by group to overall UR				
		early 80s	early 90s	early 00s	2007	2020
<b>Gender</b>						
Male	6.3%	1.18	1.15	1.17	1.18	0.89
Female	6.1%	0.79	0.81	0.83	0.79	1.13
<b>Age</b>						
16-19	17.9%	1.30	3.35	2.58	2.20	1.78
20-24	10.3%	1.24	1.19	1.54	1.45	1.72
25-54	5.2%	1.06	0.85	0.92	0.98	0.88
55 and over	4.0%	0.73	0.96	0.71	0.68	0.98
<b>Educational attainment</b>						
Less than high school	9.0%	n.a.	n.a.	1.25	1.48	1.42
High school diploma	5.6%	n.a.	n.a.	0.88	1.25	1.21
Some college	4.7%	n.a.	n.a.	1.04	0.91	1.08
College degree or higher	2.8%	n.a.	n.a.	0.63	0.52	0.57
<b>Race or ethnicity</b>						
White	5.5%	0.97	0.92	0.88	0.96	0.98
Black	11.7%	1.58	1.58	1.75	1.32	0.99
Asian	4.8%	n.a.	n.a.	1.26	0.82	1.06
Hispanic	8.6%	1.64	1.69	1.33	1.39	1.31
<b>Working status</b>						
Full-time	6.3%	1.18	1.08	1.08	1.16	0.84
Part-time	6.1%	0.36	0.54	0.50	0.30	1.85
<b>Memo: change in overall UR</b>		3.3	2.6	2.4	5.6	11.2

Sources: BLS and authors' calculations.

The short-term impact across industries and occupations was very different from the GFC, with services taking the bulk of the adjustment. Due to limited data availability, unemployment data at industry and occupation level is only available for the two recessions prior to the current one.<sup>3</sup> Common patterns in past recessions indicate that unemployment grows relatively more in manufacturing, construction and extraction industries (mining and oil) than in service-related activities, such as transportation, financial activities, education and leisure. The only exceptions are information and professional services in the early 2000s, due to their tight link to the dotcom bubble. In line with that, employment in construction, production, installation and transportation typically suffers more in recessions (see Table 2). In sharp contrast to previous recession episodes, the implementation of lockdown measures in the current recession paints a different picture. At the industry level, unemployment in leisure and hospitality and other services has taken the brunt of the adjustment, while construction and manufacturing were much less affected. This is also visible at the occupations level, with service and sales occupations playing a

<sup>3</sup> Industry and occupation are based on previously-held jobs.

central role instead of construction and production in this recession. Moreover, the variability of employment across states during this recession is also much larger than in previous recessions, both for goods-producing and service-providing industries (Albert S. et al., 2021).

Box 1 presents a comparison of labour market developments in the United States and the euro area following the COVID-19 recession.

**Table 2**  
Changes in unemployment rates (URs) across selected industries relative to the overall unemployment rate across recessions

(percentages, ratios)

	Average 1980-2020	Ratio of the UR change by group to overall UR		
		early 80s	early 90s	early 00s
<b>Industries</b>				
Mining/quarrying/oil & gas extraction	5.5%	1.62	1.46	0.42
Construction	9.6%	1.27	2.41	1.09
Manufacturing	5.8%	1.50	1.44	0.89
Wholesale and retail trade	6.1%	0.96	0.83	1.05
Transportation and utilities	5.3%	0.88	0.85	0.77
Information	5.5%	1.46	0.81	0.65
Financial activities	3.7%	0.58	0.83	0.30
Professional and business services	6.8%	1.58	0.80	0.52
Education and health services	3.8%	0.58	0.54	0.69
Leisure and hospitality	8.6%	0.50	0.98	2.79
Other services	5.5%	0.77	0.69	0.42
<b>Occupations</b>				
Management & financial operations	2.9%	0.75	0.69	0.43
Professional and related	3.0%	0.63	0.43	0.64
Service	7.1%	0.50	0.83	2.11
Sales and related	5.9%	0.96	0.91	1.23
Office and administrative support	5.4%	0.96	0.98	0.79
Farming, fishing, and forestry	11.7%	0.00	0.94	0.53
Construction and extraction	10.0%	1.13	2.63	1.38
Installation, maintenance and repair	4.7%	1.63	1.06	0.89
Production	7.5%	1.54	1.74	1.41
Transportation & material moving	7.7%	1.88	1.22	1.18
<b>Memo: change in overall UR</b>		2.6	5.9	12.3

Sources: BLS and authors' calculations.

Notes: Based on non-seasonally adjusted data. Recessions adjusted to take into account this fact. Change in overall UR refers to non-agricultural wage and salary workers.

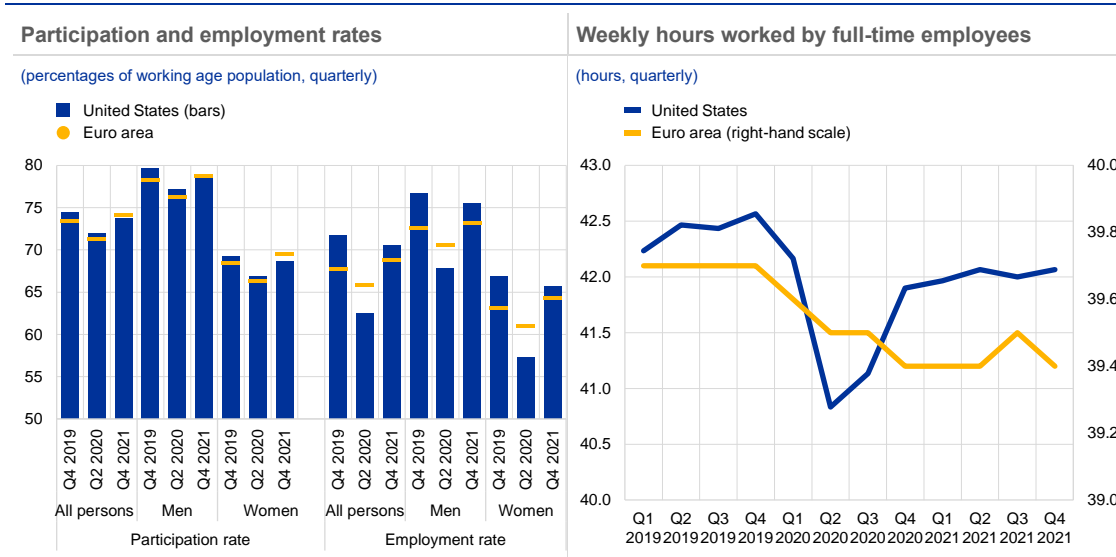
## Box 1

### Labour market developments after the COVID-19 recession in the United States and the euro area

Labour market developments have differed between the United States and the euro area in some dimensions during the COVID-19 recession. This box shows some of these differences at the aggregate level, including employment, participation and unemployment rates. It highlights that different policy responses led to different margins of adjustment, the extensive margin being more visible in the United States, and the intensive margin in the euro area. Overall, this resulted in big swings in employment and unemployment in the United States, compared to more stable developments in the euro area.

#### Chart A

##### Participation, employment and hours worked



Sources: OECD, Eurostat and BLS.

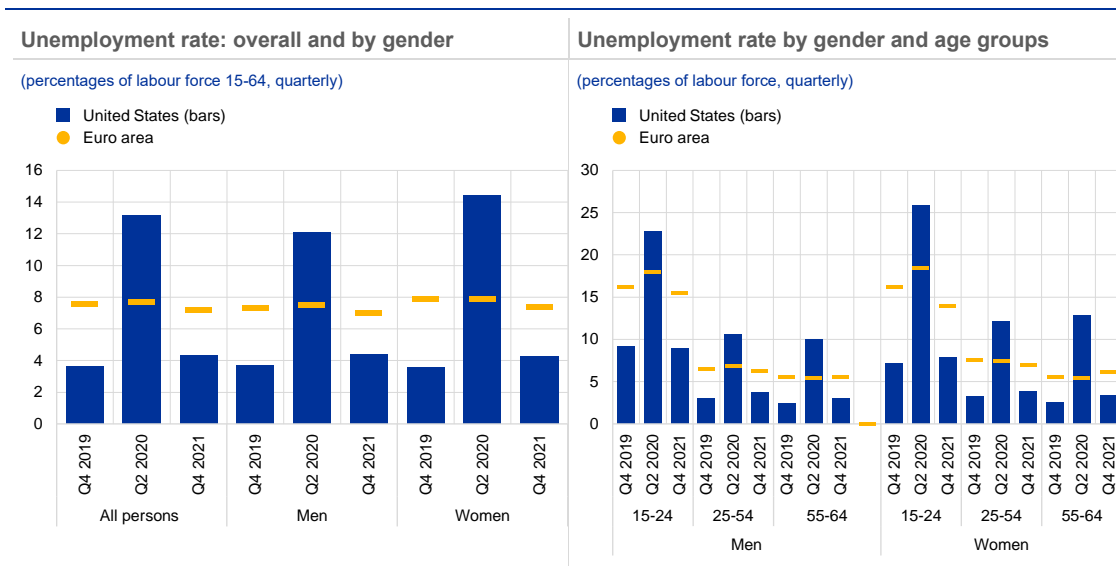
Note: The latest observations are for the fourth quarter of 2021.

Participation rates showed very similar developments in both economic areas during the crisis, while employment rates differ substantially. Participation rates, which are only marginally higher in the United States than in the euro area, recorded a significant decline in both economic areas in the second quarter of 2020, but have recovered since then to reach 73.7% and 74.1% respectively in the last quarter of 2021 (see left panel of Chart A); still remain below pre-crisis levels in the United States, while climbing past that mark in the euro area. This pattern is visible in overall participation as well as by gender in the United States and the euro area, with the gap between men and women being around 10 percentage points for both. In the euro area the widespread support from job retention schemes is likely to have stemmed flows from employment to inactivity, but these schemes are particularly relevant in explaining the relatively smooth pattern of employment rates in the euro area compared to the marked V-shaped pattern in the United States. In particular, recourse to job retention schemes in the euro area implied a stronger adjustment through average hours worked, which also took place in the United States but less persistently (see right panel of Chart A). Overall, the employment rate gap between the United States and the euro area, which was around 4 percentage points at the end of 2019, more than halved by end-2021 (1.7 percentage points), with rates in the last quarter being 70.5% in the United States and 68.8% in the euro area (see left panel

of Chart A), only in the euro area rising above pre-crisis levels. Again, the pattern across gender groups is very similar to the overall developments in both economic areas, although the negative impact on women relative to men was more pronounced in the United States. The recovery of employment has been led by women in both economic areas, particularly in the euro area.

## Chart B

### Unemployment rate



Source: OECD.

Note: The latest observations are for the fourth quarter of 2021.

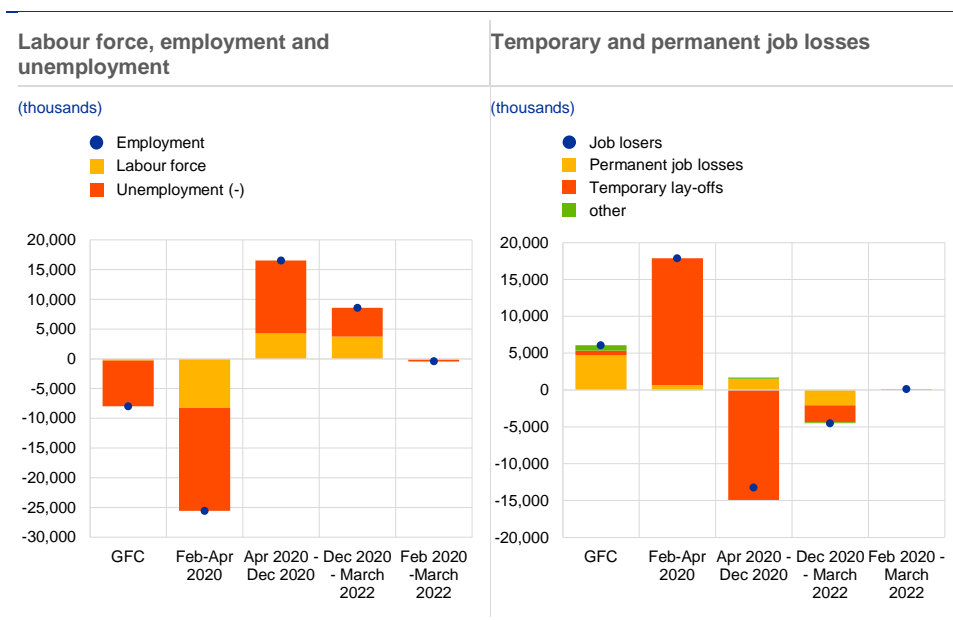
The unemployment rate, as a result, also showed more abrupt changes in the United States than in the euro area, especially among the younger groups. While the United States had a lower unemployment rate than the euro area at the end of 2019 (-4 percentage points), the crisis brought it to a higher level (+5.5 percentage points) before the strong employment recovery in the United States translated again into a lower unemployment rate – 4.3% in the United States compared to 7.2% in the euro area in the last quarter of 2021 (see left panel of Chart B). Overall, this reflects the V-shape pattern of the employment rate together with a relatively flatter participation rate, as described above. Across gender and age groups, those more affected in the second quarter of 2020 were younger men and women both in the United States and the euro area, although more significantly in the former. In the United States, prime-age (25-54) and older (55-64) women were particularly affected, albeit to a lesser extent. Following the employment recovery, the overall impact on unemployment rates is currently more visible in prime-age men and older women in the United States, and in older women in the euro area (see right panel of Chart B).

Although it is too early to reliably assess possible medium-term scarring effects in both economic areas, it appears that the policies implemented in the euro area conducive to preserving jobs have delivered more stable labour market outcomes in the short term than in the United States. Indeed, gaps in participation and employment rates between the United States and the euro area were lower by end-2021 than prior to the COVID-19 crisis.

### 3 Inflows into and outflows from unemployment

Employment losses during the COVID-19 shock were three times larger than during the GFC but were mostly temporary. During the GFC, employment fell by 8 million, which was the largest decline observed since the Second World War up until then. Between February 2020 – marking the onset of the current crisis – and April 2020 – marking the unemployment peak – employment dropped by 25 million jobs; 17 million people became unemployed and 8 million left the labour force, a much higher figure than in previous recessions, although this development did not take long to reverse. Between April 2020 and March 2022, 25 million people regained employment, with unemployment dropping by more than 17 million, while over 8 million people re-joined the labour force. This leaves employment at just 0.4 million short of its pre-pandemic level, as about 0.2 million more people continue to be unemployed and 0.2 million remain outside the labour force. The pace at which employment losses have been reversing slowed significantly in 2021 compared with the rapid improvement during 2020 (see Chart 3, left-hand panel), but has not stopped.

**Chart 3**  
Observed labour market flows



Sources: BLS and authors' calculations.

Notes: Employment changes expressed as labour force and unemployment (inverted) changes. "GFC" refers to the inflow in unemployment between January 2008 and the peak in unemployment in October 2009. The latest observations are for February 2022.

Permanent job losses have been relatively low during the COVID-19 crisis. Unlike in the GFC and prior recessions, the vast majority of the job losses between February and April of 2020 were temporary lay-offs, most of which were reversed quickly as lockdowns were eased (see Hall, R.E. and Kudlyak, M., 2021). By contrast,

permanent job losses continued to increase until late 2020, by about 2 million, and have only started coming down visibly since May 2021, fully reversing by March 2022 (see Chart 3, right-hand panel).<sup>4</sup>

In the current recession, the outflow rate from unemployment shows the expected procyclical behaviour, while the inflow rate has shown a more marked reaction than in past recessions. The path over time of the level of unemployment can be expressed as the difference between the flows into and out of the pool of unemployed:

$$dU/dt = s_t(L_t - U_t) - f_t U_t, \quad (2)$$

where  $s_t$  is the unemployment inflow rate, i.e. the probability of losing a job and becoming unemployed, and  $f_t$  is the unemployment outflow rate, i.e. the probability of leaving the unemployment pool.  $U_t$  and  $L_t$  are the unemployment and the labour force stocks, respectively. Shimer (2007) argued that the unemployment rate ( $u_t$ ) is very well approximated by its steady-state value ( $u_t^{ss}$ ):

$$u_t \approx u_t^{ss} = s_t / (s_t + f_t) \quad (3)$$

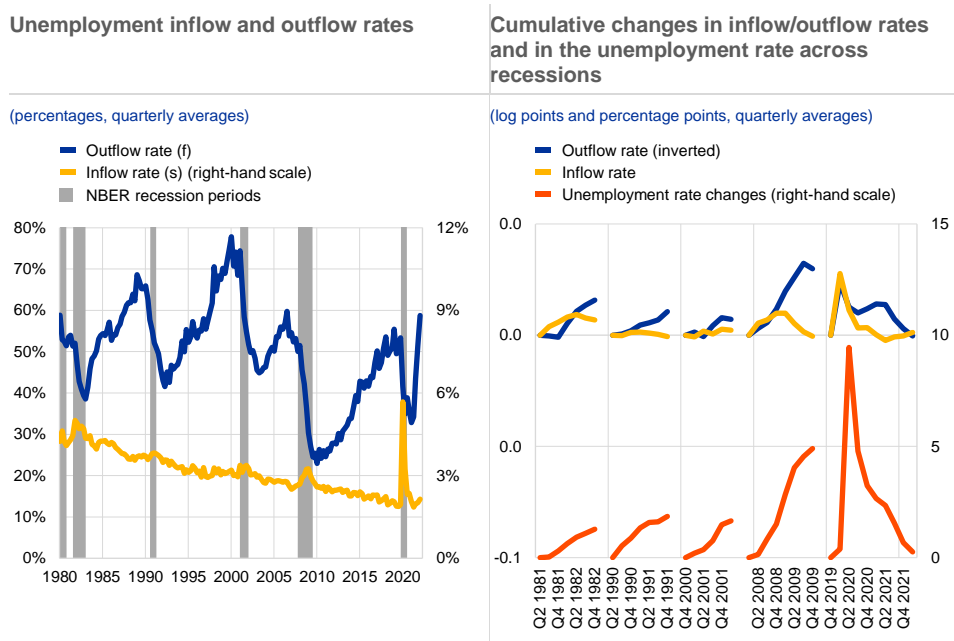
We estimate these monthly flow rates and the results are shown in the left panel of Chart 4. In line with previous literature, we observe that (i) the outflow rate is markedly procyclical, showing prolonged downswings in all recessions; and (ii) the inflow rate is countercyclical, exhibiting subdued increases in recessions that subside quickly. The outflow rate showed the expected procyclical behaviour in the current recession, while the inflow rate displayed a more marked reaction than in past recessions.

---

<sup>4</sup> Job losses do not equal changes in unemployment due to other labour market flows, such as people voluntarily quitting jobs.

**Chart 4**

**Estimated inflows in and outflows from unemployment**



Sources: BLS and authors' calculations.  
 Notes: Calculations made following Shimer's (2007) methodology. Cumulative changes in the outflow rates; unemployment rate levels. The latest data are for the first quarter of 2022.

Inflows into and outflows from unemployment have both played a significant role in the current recession, in contrast with an overall more subtle role of inflows in the past. Developments in both flows around recessions can give us a good approximation of the relative importance of each one in explaining the increase in the unemployment rate. Elsby et al. (2009) show that from the steady-state value described in expression (3) one can derive the following relationship:

$$du_t \approx \beta_{t-1} [d \log s_t - d \log f_t], \text{ where } \beta_{t-1} = u_{t-1}(1 - u_{t-1}) \quad (4)$$

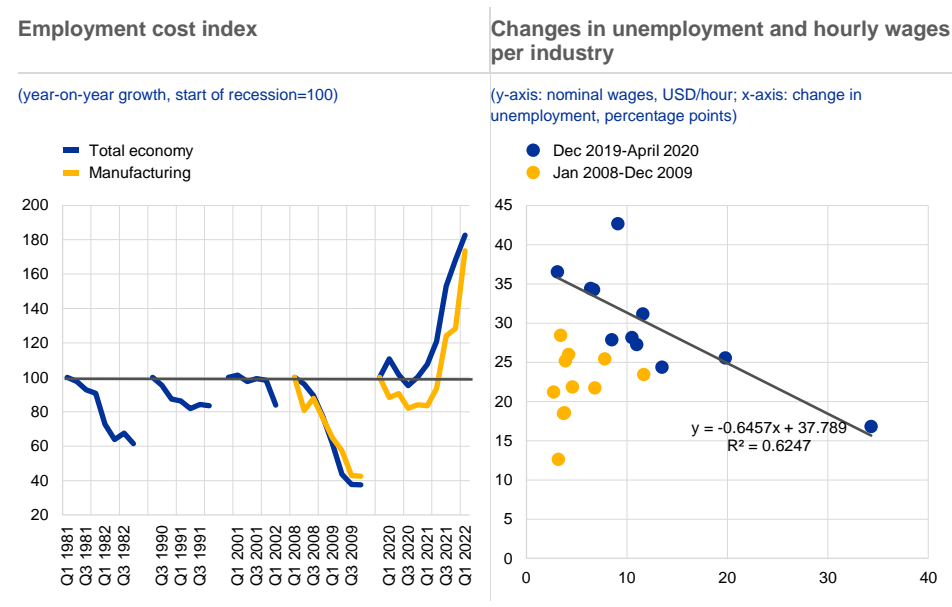
The right hand panel of Chart 4 shows this decomposition and confirms that in past recessions higher inflows account for part of the increase in the unemployment rate at an early stage, while the contribution of lower outflows becomes more relevant and the dominant factor as the recession unfolds. In the current recession, higher inflows and lower outflows have played a similar role, in contrast with the more subtle role of inflows versus that of outflows in the past. Indeed, relative to a normal recession, a shutdown implies both a sudden adjustment in employment and a suspension of hiring activities. Recent developments in flows indicate that such adjustments very much depended on how the pandemic was evolving. In particular, after a swift decline in the unemployment rate and an (incomplete) return to pre-crisis levels of outflows and inflows in late summer 2020, when infection numbers declined, unemployment outflows declined again in early 2021 as the pandemic worsened. However, unemployment outflows have recovered again more recently, bringing the unemployment rate close to pre-crisis levels.



## 4 Wages and productivity

Wage growth, in nominal terms, has recovered significantly since the COVID-19 shock, unlike in previous recessions. In contrast with previous recessions, employment cost growth for the total economy did not decline significantly before rising quickly after a few quarters, while manufacturing employment costs dropped until the second quarter of 2021, before shooting up in the following quarters (see Chart 5, left-hand panel). We use the employment cost index as a measure for wage costs as it captures all elements of employee compensation (including benefits) and, relative to other measures such as hourly wages, is not affected by compositional changes in employment. Still, looking at developments in manufacturing can help better capture the dynamics in wages over the recent period. Indeed, during the initial pandemic shock, unemployment rose more sharply for low-wage industries (see Chart 5, right-hand panel), which seemingly caused the level of hourly wages – a much-watched, monthly indicator of wage pressures – to rise due to compositional effects. The quick recovery in nominal wages could be partly related to the shortness of the acute phase of the crisis. However, wages have also risen recently on account of the delay in reincorporating workers in some industries, particularly leisure and hospitality, forcing firms to attract them via higher wages. This lower matching efficiency is discussed further in the next section.

**Chart 5**  
Wage developments



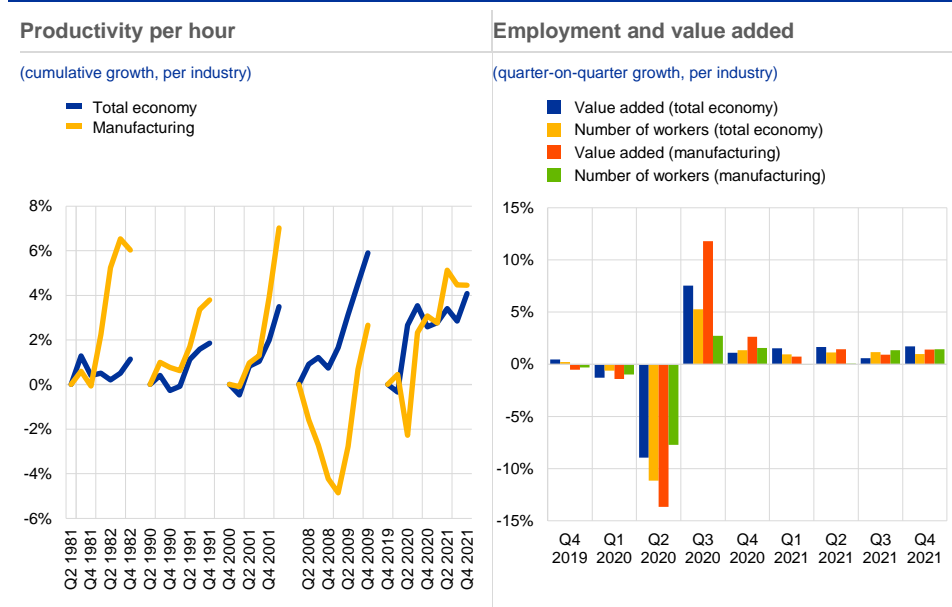
Sources: BLS and authors' calculations.

Notes: Year-on-year growth rates at the start of each recession normalised to 100. Each dot represents an industry. The latest observations are for the first quarter of 2022 (LHS).

Productivity has risen relatively quickly in this recession. Given the flexibility of the US labour market, productivity often rises at the start of a recession, as firms quickly cut staff levels to bring down costs. Indeed, since the start of the COVID-19 crisis

productivity per hour for the economy as a whole was almost 4% higher by the third quarter of 2020, staying close to that level since. During previous recessions, productivity gains tended to be more limited at the start of the recession. Comparing overall productivity developments with those specific to manufacturing shows that the current recession is somewhat similar to the 2008-09 financial crisis. Whereas productivity per hour overall rose as the economy contracted and continued increasing thereafter, it fell at first in manufacturing before recovering. Productivity unexpectedly fell in the third quarter of 2021 as the pandemic worsened over the summer, negatively affecting output, especially in services (see Chart 6, left-hand panel), but recovered in the last quarter.

**Chart 6**  
Productivity developments



Sources: BLS and authors' calculations.  
Notes: Cumulative growth since start of the recession. The latest observations are for the fourth quarter of 2021.

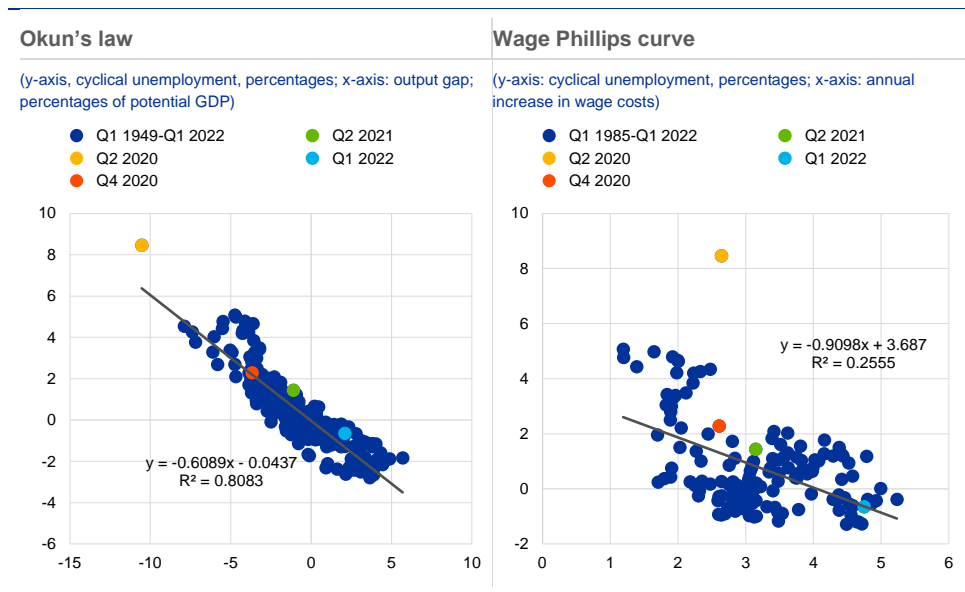
The differences in productivity reflect the immediate impact of lockdowns on the services industries of the economy. In the overall economy, labour shedding in the second quarter of 2020 was larger than the fall in value added, as lockdowns led to an immediate wave of lay-offs in service-providing industries. The opposite was true in manufacturing, where labour was let go relatively slowly even though value added dropped sharply (see Chart 6, right-hand panel). In the third quarter of 2020 and beyond, total hiring rebounded, but value added rebounded even more, allowing productivity to continue rising. In manufacturing, value added growth recovered strongly, while hiring was much more modest, allowing productivity to recover.<sup>5</sup> The same pattern could be seen during the GFC, which also started with a slump in services, more precisely financial services. However, it remains uncertain whether the pandemic itself will have a more long-lasting effect on productivity, for instance

<sup>5</sup> Again, the third quarter of 2021 was an exception, with a surge in the pandemic depressing growth in value added.

through increased adoption of working from home, as noted by Fernald, J. et al. (2021).<sup>6</sup>

The temporary rise in unemployment is in line with its historical relationship with activity and wages. Okun’s law relates the output gap to cyclical unemployment, i.e. the difference between the non-accelerating inflation rate of unemployment (NAIRU) and actual unemployment. Looking at the behaviour of unemployment during the current recession shows that it did not deviate more strongly from the historical relationship despite the large size of the activity and unemployment shock (see Chart 7, left-hand panel). Moreover, since the end of 2020, cyclical unemployment has returned to a normal level, suggesting no important shifts in the relationship between unemployment and activity. The same applies to the wage Phillips curve, which plots wage costs against cyclical unemployment.<sup>7</sup> Except for the second quarter of 2020, when unemployment was temporarily exceptionally high, the relationship between wage cost and unemployment has been within historical norms (see Chart 7, right-hand panel).

**Chart 7**  
Okun’s law and wage Phillips curve



Sources: BLS, Bureau of Economic Analysis and Congressional Budget Office (CBO).  
Notes: Cyclical unemployment=unemployment – NAIRU (CBO). The latest observations are for the first quarter of 2022.

<sup>6</sup> OECD research based on microdata suggests that the effect on productivity of the job retention schemes introduced in many countries during the pandemic is ambiguous and that the precise design of job preservation schemes can have a large impact on job re-allocation and productivity developments. See “COVID-19, productivity and reallocation: Timely evidence from three OECD countries”, by Andrews D., Charlton A. and Moore A., 2021.

<sup>7</sup> We use the Employment Cost Index to measure wage costs, as it is free from the influence of employment shifts among occupations and industries. It thus avoids the artificial jump in hourly wages due to composition effects seen in other measures, such as average hourly earnings.

## 5 Outlook for the recovery

The main driver of the decline in the unemployment rate in recovery phases is the increasing outflow rate, which currently depends on the speed of the reopening of the economy. As illustrated in Chart 6, the inflow rate has subsided since the peak in the unemployment rate and, therefore, the decline in unemployment is mainly linked to the recovery in the outflow rate. Elsby et al. (2014) indicate that the rebound of the outflow rate is determined by two elements: (i) the opening of new jobs and (ii) the speed at which the unemployed find new jobs. As the pandemic is still affecting a substantial part of the economy, mainly services industries, the opening of new jobs largely depends on the speed at which those sectors become fully operational again.

The level of labour market tightness, i.e. the ratio between vacant jobs and unemployed people, has recovered rapidly to reach record levels. The job search literature provides a framework to model the evolution of the outflow or hiring rate. The matching function relates the outflow rate with the level of tightness in the labour market, the elasticity of hiring to tightness and the matching efficiency:

$$f_t = \vartheta_t \theta_t^\eta, \quad (5)$$

where  $f_t$  is the outflow rate,  $\vartheta_t$  is the matching efficiency,  $\theta_t$  is the labour market tightness and  $\eta$  is the matching elasticity. For a given elasticity, a tighter labour market or gains in efficiency push up the outflow rate. Labour market tightness is measurable, as the ratio of vacancies over unemployment. As illustrated in Chart 8 (left-hand panel), tightness is a procyclical variable that peaks just before a recession, when it falls substantially, before recovering over expansions. The chart also indicates that tightness declined to a historically low level in the second quarter of 2020 (from record levels at the end of 2019), but has since started to recover quickly and in the first quarter of 2022 reached record levels.

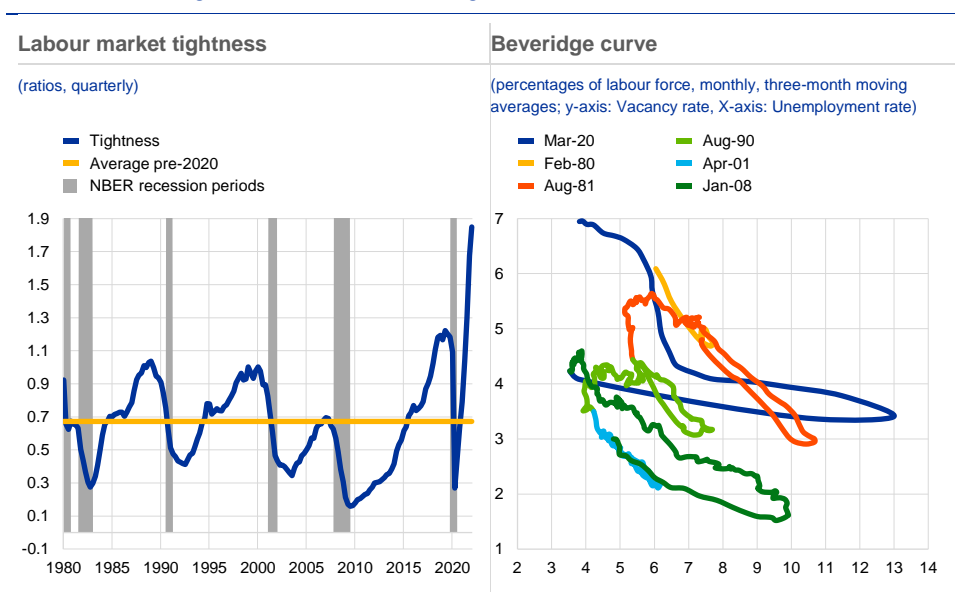
Most of the significant loss in matching efficiency seen during 2021 is expected to be of a temporary nature. During recessions, the number of vacancies usually declines in conjunction with a rising unemployment rate, and vice versa during expansions, leading to anticlockwise loops in the Beveridge curve (BC; the relation between vacancies and unemployment) across economic cycles. By contrast, inward (outward) movements of the BC point to gains (losses) in matching efficiency. Anticlockwise loops are visible in each of the economic cycles shown in different colours in Chart 8 (right-hand panel), while an inward movement since the 1980s points to long-term gains in matching efficiency. As the COVID-19 crisis unfolded, unemployment rose and declined massively in a short period of time, yet the impact on vacancies was relatively modest. Since the start of 2021, however, which is the inflection point in the blue-dotted line in Chart 8 (left-hand panel), the decline in unemployment has slowed to a crawl, while the number of vacancies has risen to the highest level since the 1980s. The increase in vacancies is also very broad-based, but most pronounced in leisure and hospitality, hovering just over 10% between April

and June 2021, and markedly lower in financial services, at just 3.6% in June 2021. So, currently, labour market matching efficiency seems to be back to the 1980s level.

The decrease in matching efficiency is thought to be largely the result of the COVID-19 crisis and the associated policy response. The ongoing infections make people less likely to take on jobs involving regular contact with customers (such as in leisure and hospitality). Moreover, many people, especially women, are taking care of children or are caring for dependants. Also, temporarily high unemployment benefits coupled with increased eligibility have allowed, until recently, more people to remain out of work. Anecdotally, the extremely tight housing market in the United States might also be keeping people from moving to where jobs are more plentiful.

Short-term developments in vacancies are likely to be driven primarily by pandemic developments. As indicated in an April 2021 Chicago Fed Letter, the COVID-19 pandemic has led to a potential need for some workers to leave heavily-impacted sectors for healthier industries with plenty of job openings (Aaronson D. et al., 2021). Still, the need for this reallocation was almost entirely due to developments in the leisure and hospitality sector. If employment in leisure and hospitality bounces back relatively quickly, the need for reallocation will be much lower and should be less of a concern. Such a benign scenario pre-supposed a low level of COVID-19 infections, given the apparent high sensitivity of the leisure and hospitality industry to the course of the pandemic, both in terms of consumer behaviour as well as in the willingness of workers to take up jobs in this high-contact industry. Currently, the gap of employment relative to pre-crisis levels has been closed in many industries, such as construction, non-durable goods manufacturing, retail trade and transportation, but remains open particularly in leisure and hospitality and, to a lesser extent, in durable goods manufacturing, wholesale trade and education and health services.

**Chart 8**  
Labour market tightness and the Beveridge curve

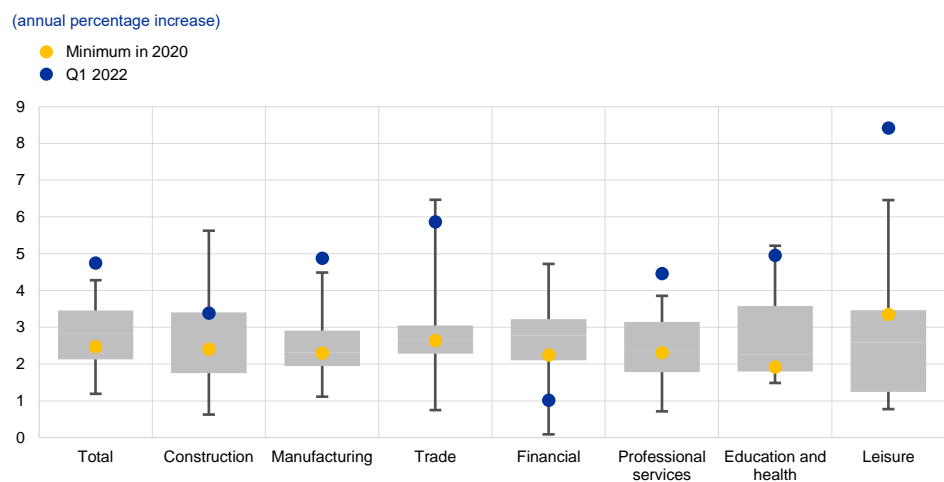


Source: BLS and authors' calculations.  
Notes: Tightness is the ratio of the vacancy rate to the unemployment rate. In the Beveridge curve chart, each colour depicts a business cycle (NBER classification). The latest observations are for the first quarter of 2022.

However, some increase in matching inefficiency could also reflect more longer-lasting, structural changes in the economy. The COVID-19 crisis is likely to lead to some behavioural changes, for instance a permanent reduction in business travel or more people working from home, leading to reduced demand for travel services and food-related and other services in city centres. Reallocating workers to different jobs and industries in response to such changes is likely to be a relatively slow process, given for instance the need for retraining. Moreover, long spells of unemployment (e.g. because of delays in vaccinations or a mutation of the virus) could lead to skill losses. Both impacts have a negative effect on matching efficiency, meaning that part of the outward shift of the BC could become permanent, as happened after the 2008-09 recession. On the other hand, the increased use of teleworking observed during the COVID-19 shock (Dey A. et al, 2021) is likely to increase matching efficiency in the long run. Increased teleworking allows workers to take up employment farther away from home, increasing the number of available jobs, while also deepening the pool of potential workers available to employers.

The increase in labour market tightness has translated into broadening wage pressures. While the high level of vacancies has been broad-based across industries, wage growth up to the second quarter of 2021 was limited to leisure and hospitality, as firms tried to make these contact-intensive and mostly low-paid jobs more attractive (Chart 9). From the third quarter of 2021, however, an acceleration in wages became also visible in most other industries, such as trade and, to a lesser extent, manufacturing, financial activities and professional services, though in the latter still remaining within ranges observed in the past.

**Chart 9**  
Employment cost index per industry



Sources: Bureau of Labor Statistics (BLS) and authors' calculations.  
Note: The latest observations are for the first quarter of 2022.

This development has sparked a debate about the risk of a further broadening of wage pressures, and whether it could ultimately lead to a wage-price spiral. Whether these risks will materialise depends on various factors. Firstly, most of the factors which have held back labour supply in the United States are expected to be temporary and to continue to reverse in the coming months, thus reducing the level

of tightness. The temporary increase in unemployment benefits has already expired, and higher wages should incentivise the unemployed and inactive to fill vacancies. Second, new COVID-19 infections have been falling and use of vaccination reduces the risks associated with infection, which should allay fears of going back to work in high-contact industries. The reopening of schools should favour a return to work by parents. Moreover, the recent increase in inflation has been driven to a large extent by goods and services, where wage growth has remained subdued (car manufacturing), or is related to other factors (such as rent, which are linked to tightness in the housing market). On the other hand, although indexation clauses are not common practice in the United States, the high inflation environment (March 2022 saw the highest CPI headline inflation rate recorded since the early 1980s), coupled with very high labour market tightness, could lead to a proliferation of higher wage demands going forward. Moreover, while above-average productivity growth kept unit labour costs (a measure that is more relevant for firms in setting prices than nominal wages) contained at the start of the crisis, recent developments point to an acceleration of unit labour costs above long-term averages. Box 2 presents a comparison of euro area and US productivity and wage developments during the pandemic in relation to pre-crisis trends. Hence, although a wage-price spiral does not seem inevitable, risks that one could emerge seem to have risen.

## Box 2

### Productivity and wage developments in the recovery from the COVID-19 recession in the United States and the euro area

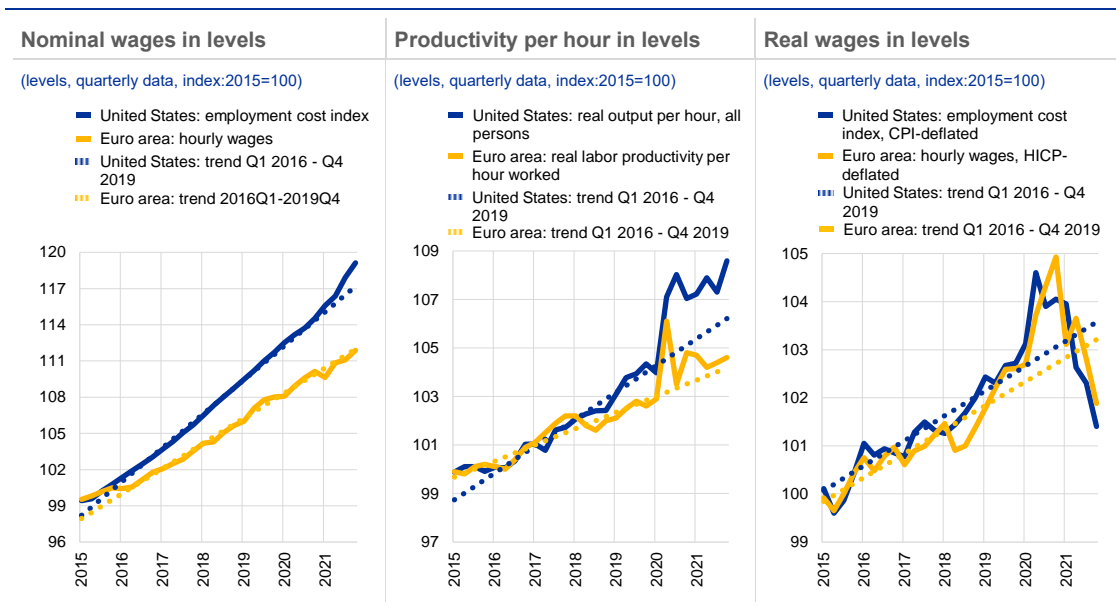
---

This box assesses recent developments in wages, nominal and real, and productivity in the United States and the euro area and compares them to their pre-pandemic trends, in order to shed some light on the possible building up of inflationary pressures as both economies recover from the COVID-19 recession.

Chart A (left-panel) shows that the trend in nominal wages, measured as compensation per hour, over 2016-19 was stronger in the United States than the euro area, with an average growth rate of 2.6% and 1.8% respectively over that period (Table A). During the pandemic crisis and its recovery, nominal wages remained in line with the previous trend in the euro area, while they showed an acceleration in the United States.

## Chart A

### Nominal wages, productivity and real wages



Sources: Eurostat, BLS and authors' calculations.

Notes: Nominal wages measured by hourly compensation and the employment cost index (which also refers to hourly compensation) in the euro area and the United States respectively; euro area developments over 2020-21 are adjusted using negotiated wages to avoid compositional effects; productivity is measured by labour productivity per hour worked in both the euro area and the United States; real wages obtained by deflating euro area and US nominal wages by HICP and CPI respectively; real wage developments in the euro area in the most recent period are partly affected by the temporary cut in value added tax (VAT) in Germany in the second half of 2020 and its subsequent reversal in the second half of 2021. The latest observations are for the fourth quarter of 2021.

As regards the pre-crisis trend in productivity per hour, it was slightly stronger in the United States than in the euro area over 2016-19, with average growth of 0.9% and 0.6% respectively. Following the pandemic and ensuing crisis, developments point to stronger productivity growth than trend in both economic areas, although more markedly in the United States (Chart A, center-panel). As a result, unit labour costs (ULC) growth has been on average, over the last two years, below the pre-crisis trend in both economic areas, while the reverse is true for real profits (see Chart B).

Meanwhile, real wage trends were broadly comparable in both economic areas before the crisis, with an average growth rate of 0.6%. Then, after the pandemic shock, real wages declined relative to their pre-pandemic trend, particularly in the United States following the strong pick-up in inflation (Chart A, right-panel).



**Table A**

## Productivity, unit labour costs, profits, real and nominal wages growth

(year-on-year, quarterly data, averages)

	Q1 2016-Q4 2019	Q1 2020-Q4 2021		
		overall	Q1 2020-Q1 2021	Q2 2021-Q4 2021
<b>Productivity</b>				
Euro area	0.6%	1.0%	1.8%	-0.4%
United States	0.9%	1.9%	2.7%	0.5%
<b>Nominal wages</b>				
Euro area	1.8%	1.7%	1.8%	1.6%
United States	2.6%	3.0%	2.6%	3.5%
<b>Real wages</b>				
Euro area	0.6%	0.3%	1.3%	-1.5%
United States	0.6%	0.0%	1.2%	-2.0%
<b>Unit labour costs</b>				
Euro area	1.1%	0.7%	0.0%	1.9%
United States	1.6%	1.1%	-0.1%	3.0%
<b>Real profits</b>				
Euro area	0.2%	1.1%	1.7%	0.2%
United States	0.2%	1.6%	1.5%	1.8%

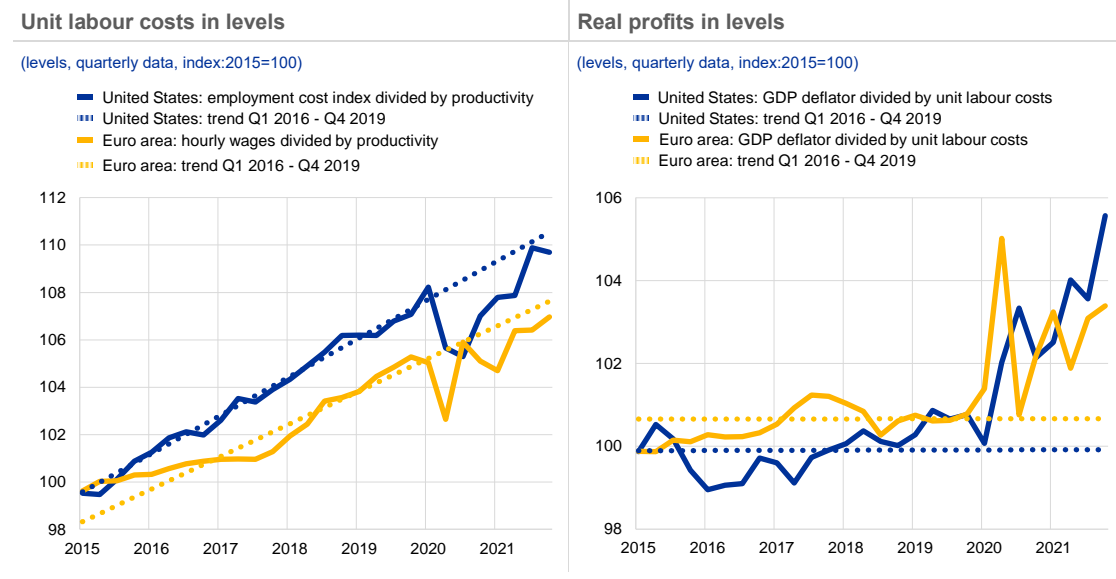
Sources: Eurostat, BLS and authors' calculations.

Note: See notes to Chart A and Chart B. The latest observations are for the fourth quarter of 2021.

A detailed look at the most recent developments points to some risks going forward. We divide the overall pandemic crisis and recovery into two periods, from the first quarter of 2020 to the first quarter of 2021, covering the shock and initial recovery, and from the second quarter of 2021 to the fourth quarter of 2021, when a more sustained recovery is visible with real GDP approaching or surpassing pre-crisis levels. ULC have accelerated recently, catching up to their 2016-19 trend in both economic areas after having fallen at the start of the pandemic. A further sustained deviation of nominal wage growth over productivity growth would imply clear inflationary pressures from the labour market side as companies might raise prices to protect profits. While growth in real profits appears to have slowed in the euro area in recent quarters, it picked up in the United States at the end of 2021 (see Table A).

## Chart B

### Unit labour costs and real profits



Sources: Eurostat, BLS and authors' calculations.

Notes: Unit labour costs measured by hourly compensation and the employment cost index (which also refers to hourly compensation) divided by hourly productivity, in the euro area and the United States respectively; real profits proxied by the GDP deflator divided by unit labour costs in both the euro area and the United States. See also notes to Chart A. The latest observations are for the fourth quarter of 2021.

## References

- Aaronson, D., Lewers, R. and Sullivan, D. (2021), “Labor Reallocation During the Covid-19 Pandemic”, *Chicago Fed Letter*, No 455, April.
- Albert, S., Foerster, A. and Sarte, P.-D. G. (2021), “Employment Effects of COVID-19 across States, Sectors”, *FRBSF Economic Letter*, 2021-32, November
- Andersson, M., Checherita-Westphal, C., Gomez-Salvador, R., Henkel, L. and Mohr, M. (2021), “Economic developments in the euro area and the United States in 2020”, *Economic Bulletin*, Issue 2, ECB.
- Andrews, D., Charlton, A. and Moore, A. (2021), “COVID-19, productivity and reallocation: Timely evidence from three OECD countries”, *OECD Economics Department Working Papers*, No 1676, OECD Publishing, Paris, July.
- Blanchard, O. J. and Diamond, P. (1989), “The Beveridge curve”, *Brookings Papers on Economic Activity*, Vol. 20, No 1, pp. 1-76.
- Bodnar, K. and O’Brien, D. (2021), “Labour supply developments in the euro area during the COVID-19 pandemic”, *Economic Bulletin*, Issue 7, ECB.
- Botelho, V., Consolo, A. and Dias da Silva, A. (2021), “Hours worked in the euro area”, *Economic Bulletin*, Issue 6, ECB.
- Botelho, V. and Neves, P., “The impact of the COVID-19 crisis on the euro area labour market for men and women”, *Economic Bulletin*, Issue 4, ECB.
- Clarida, R. H. (2021), “Outlooks, Outcomes, and Prospects for U.S. Monetary Policy”, speech delivered at the Peterson Institute for International Economics, Washington, D.C.
- Congressional Budget Office(2021), 10-year Economic Projections, July.
- Dey, M., Frazis, H., Piccone, D.S. and Loewenstein, M.A. (2021), “Teleworking and lost work during the pandemic: new evidence from the CPS”, *Monthly Labour Review*, Bureau of Labor Statistics, July.
- Duzhak, E.A. (2021), “How Do Business Cycles Affect Worker Groups Differently?”, *FRBSF Economic Letter*, 2021-25, September.
- Elsby, M.W.L., Michaels, R. and Solon, G. (2009), “The Ins and Outs of Cyclical Unemployment”, *American Economic Journal: Macroeconomics*, Vol. 1, No 1, January.
- Elsby, M. W. L., Hobijn B. and Sahin A.(2010), “The Labor Market in the Great Recession”, *Brookings Papers on Economic Activity*, Vol. 41, No 1 (Spring), pp. 1-69.

Fernald, J., Li, H. and Ochse, M. (2021), “Labor Productivity in a Pandemic”, *FRBSF Economic Letter*, 2021-22, August.

Foerster, A. and Seitelman, L.M. (2020), “Permanent and Transitory Effects of the 2008–09 Recession”, *FRBSF Economic Letter*, 2020-36, November.

Hall, R.E. and Kudlyak, M. (2021), “Comparing Pandemic Unemployment to Past U.S. Recoveries”, *FRBSF Economic Letter*, 2021-33, November.

International Monetary Fund, Research Department (2021), “Recessions and recoveries in labor markets: patterns, policies, and responses to the COVID-19 shock”, *World Economic Outlook*, Chapter 3, International Monetary Fund, April.

Lofton, O., Petrosky-Nadeau, N. and Seitelman, L. (2021), “Parental Participation in a Pandemic Labor Market”, *FRBSF Economic Letter*, 2021-10, April.

Shimer (2012), “Reassessing the Ins and Outs of Unemployment”, *Review of Economic Dynamics*, Vol. 15, No 2, April.

### **Acknowledgements**

The paper benefited from suggestions made by M. Balatti, and comments by B. Schnatz, S. Makrydakis and L. Stracca; Box 1, comparing the US and euro area employment and unemployment developments, benefited from comments made by D. Sondermann, A. Dias Da Silva and A. Consolo; Box 2, comparing US and euro area productivity and wage developments, benefited from suggestions made by T. Westermann and K. Masuch.

### **Ramon Gomez-Salvador**

European Central Bank; email: [ramon.gomezs salvador@ecb.europa.eu](mailto:ramon.gomezs salvador@ecb.europa.eu)

### **Michel Soudan**

European Central Bank; email: [michel.soudan@ecb.europa.eu](mailto:michel.soudan@ecb.europa.eu)

### **© European Central Bank, 2022**

Postal address 60640 Frankfurt am Main, Germany  
Telephone +49 69 1344 0  
Website [www.ecb.europa.eu](http://www.ecb.europa.eu)

All rights reserved. Reproduction for educational and non-commercial purposes is permitted provided that the source is acknowledged.

For specific terminology please refer to the [ECB glossary](#) (available in English only).

PDF ISBN 978-92-899-5239-2, ISSN 1725-6534, doi:10.2866/964976, QB-AQ-22-041-EN-N