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INFLATION IN THE UNITED STATES: RECENT
DEVELOPMENTS AND OUTLOOK

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ABSTRACT

Global inflation rates have increased since early 2021, especially in the United States, where there has been an upward surprise in recent months. Part of the US inflation increase is due to a statistical phenomenon stemming from the comparison of current and previous-year prices, which were marked by an across-the-board decline in activity. Further, the economic recovery has prompted a rise in prices in the sectors most affected by the pandemic, it has accentuated certain supply and logistics disruptions, and it has been accompanied by an increase in the price of the energy component. While these factors are considered to be transitory, three upside risks to prices may be identified: first, wage pressures arising from the labour supply and demand mismatch; second, a greater-than-expected inflationary effect of the fiscal stimulus introduced in response to the pandemic; and third, a possible de-anchoring of medium-term inflation expectations. In any event, these transitory effects are expected to feed through relatively moderately to euro area inflation.

Keywords: COVID-19, inflation, inflation expectations.

JEL classification: E31.

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Introduction

Since early 2021, inflation rates have been increasing globally (see Chart 1.1). This movement has been especially visible in the United States. There, inflation has reached record highs, posting 5.3% in August, which has taken the average for the first eight months of the year to 3.9%, far above the average of 1.8% recorded in the past decade. Given the significance of the US economy at the global level, it is important to analyse this phenomenon given its potential repercussions for the rest of the world, including the euro area. Against a background of high uncertainty, most analysts and the Federal Reserve itself consider the recent increase in US inflation to be attributable to eminently transitory phenomena, such as the normalisation of economic activity following the more damaging pandemic period (e.g. the buoyancy of the hospitality and transport services industries), including the temporary supply/demand mismatches in the initial stages of the economic recovery, and the increase in energy prices worldwide.¹ Their inflation forecasts have accordingly been revised considerably upwards for 2021, while the change in the subsequent years has been much more tempered (see Chart 1.2).

This article delves into these factors and discusses the risks of the current bout of high inflation becoming more persistent than anticipated. It also sets out the extent to which the US experience may be extrapolated to or potentially affect euro area inflation developments.

Recent US inflation developments

As mentioned, CPI inflation in 2021 has far outstripped the average of 1.2% posted in the second half of 2020. Moreover, inflation rates have surprised on the upside in recent months (see Chart 2.1). Largely, these dynamics are due to the momentum of energy prices. However, core inflation (CPI excluding energy and fresh food) also posted record high growth (4.3% in July, 2.8% on average in 2021 to date), showing

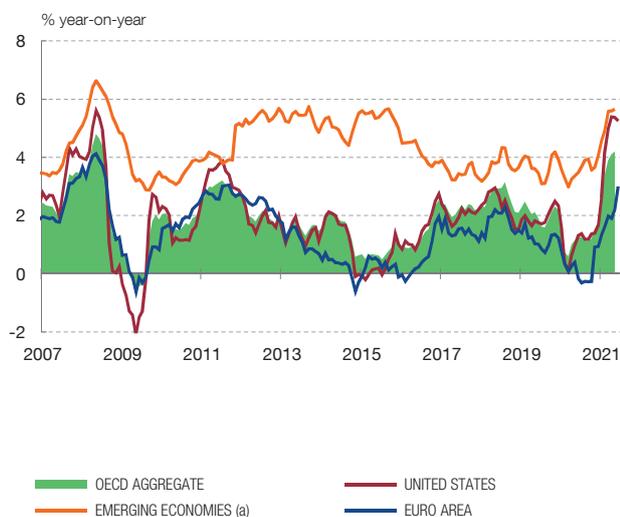
¹ For an analysis of the factors behind the rise in inflation in the United States, see, for example, the latest Federal Reserve monetary policy report (Federal Reserve, 2021) or Brainard (2021).

Chart 1

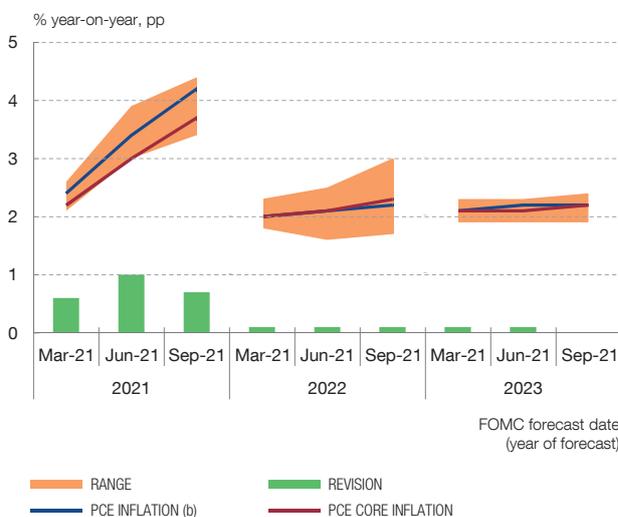
HISTORICAL DEVELOPMENTS IN INFLATION AND RECENT FOMC FORECASTS

Following a period of moderate inflation, consumer prices have visibly increased in 2021, particularly in the United States. The Federal Reserve has revised up its inflation forecast for 2021, although it attributes the rise to transitory factors.

1 INTERNATIONAL INFLATION COMPARISON (CPI)



2 FOMC INFLATION FORECASTS (MEDIAN, RANGE AND FORECASTS)



SOURCES: Refinitiv, OECD and Federal Reserve Board.

a Excludes China.

b The Federal Reserve uses inflation in the Personal Consumer Expenditures (PCE) deflator as the variable for its monetary policy target.



that the increase in inflation has not come about solely owing to higher energy prices.²

Part of this inflation increase in 2021 stems directly from a merely statistical effect, known as the base effect, as current prices are compared with those of the previous year, marked by an across-the-board decline in prices derived from the shutdown in activity in major sectors of the economy. The statistical decomposition³ of inflation rates shows the significance of base effects on the energy and services components (see Charts 2.2-2.4). Further, using the methodology of Shapiro (2020), the impact of the pandemic on core inflation components is explicitly quantified, having regard to the extent to which such components were affected by the pandemic.⁴ The

2 In the Personal Consumer Expenditures (PCE) deflator used by the Federal Reserve for its inflation target, there was a year-on-year increase of 4.2% in July, following an average rise of 1.7% in the second half of 2020; core PCE inflation rose to 3.6%. Both measures differ in terms of how they are calculated, coverage of goods and services, and the weighting thereof; in comparative terms, the CPI accords greater weight to housing and fuel, and the PCE to healthcare spending.

3 To analyse this merely statistical effect due to lower prices at the start of the pandemic, we compare inflation slippage one year back compared with the average of the five previous years (base effect) and the deviation by current inflation from this average (remainder). Using the same procedure it is also possible to obtain the base effect and the remainder on the various inflation components.

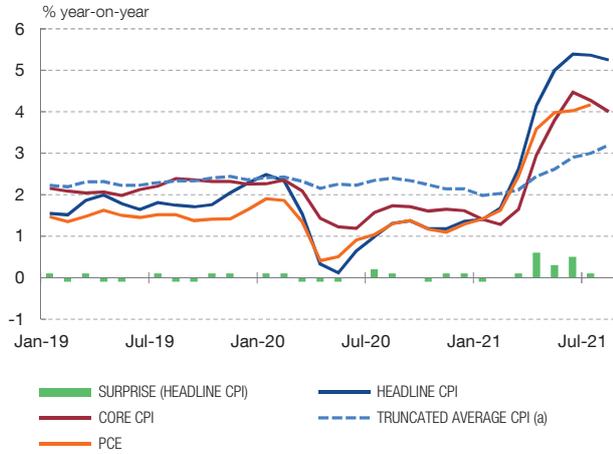
4 Specifically, regressions are estimated for the growth in two months of each of the components included in Chart 3.1 – with the exception of food and energy – on a dummy variable equal to 1 in March-April (May-June)

Chart 2

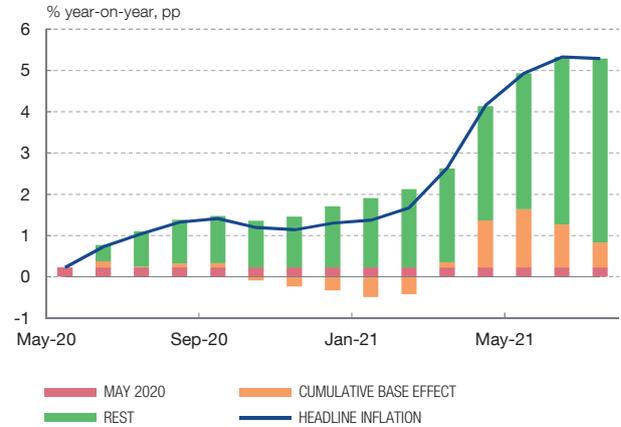
INFLATION IN THE UNITED STATES AND BASE EFFECTS

In 2021 H1, headline inflation outstripped analysts' expectations and reached high levels. The base effect, stemming from the comparison with 2020, is mainly concentrated in the energy component and the rest is generated by industrial goods.

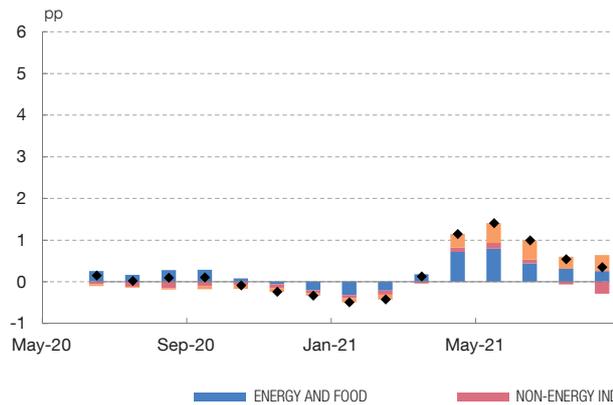
1 MEASURES OF HEADLINE AND CORE INFLATION



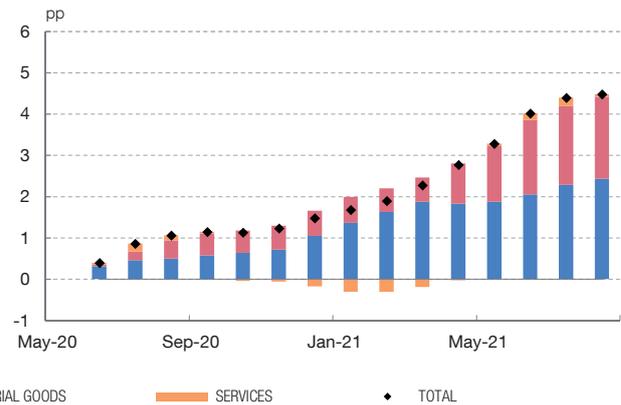
2 HEADLINE INFLATION. BASE EFFECTS AND REST



3 BASE EFFECTS



4 REST



SOURCES: BLS, Thomson Reuters, Federal Reserve Bank of Cleveland and Banco de España calculations.

a The truncated average eliminates components outside of the inflation distribution percentile range (8%-92%), i.e. it ignores the most and least inflationary components.



restrictions on mobility in 2020 are shown to have prompted price declines in those components most influenced by the lockdown measures, with a subsequent rebound as activity normalised (see Chart 3.1). As to genuine 2021 developments, the decomposition of CPI-based inflation shows that the highest contributions are from the energy segments, marked by dearer oil further to the gradual pick-up in demand

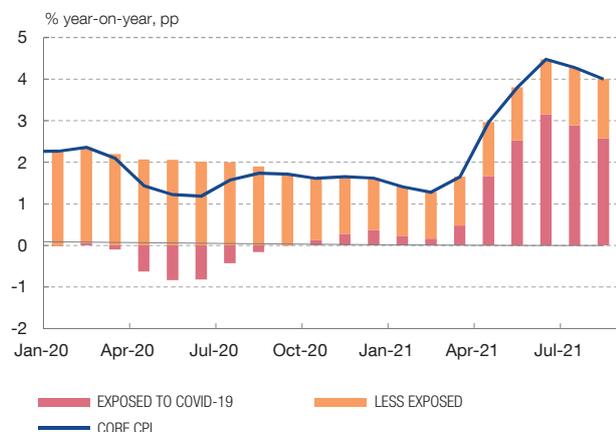
2020, i.e. the lockdown period (start of the lockdown-lifting period). The components are considered more exposed to the pandemic if the estimated lockdown (or start-of-lockdown-easing) coefficient is statistically significant at a confidence level of 99%.

Chart 3

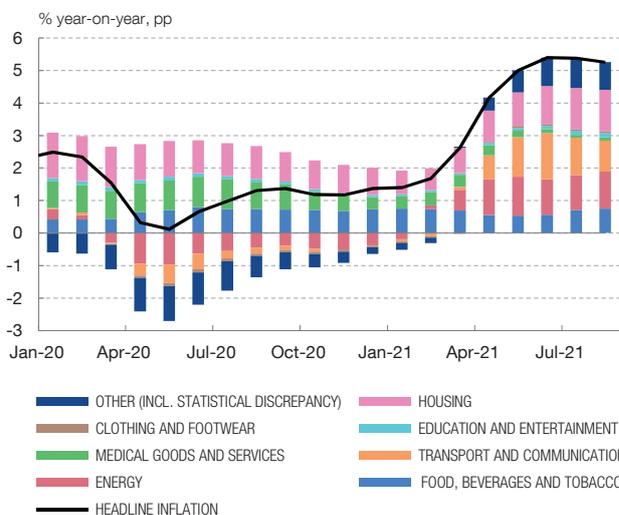
BREAKDOWN OF HEADLINE AND CORE CPI INFLATION

The COVID-19 containment measures significantly influenced many inflation components, which are now rising in step with the reopening. By component, the price increases are visible in energy and transport and communication.

1 BREAKDOWN OF CORE CPI (a)



2 CPI INFLATION AND COMPONENTS



SOURCES: BLS and Banco de España calculations based on Shapiro (2020).

a Components are considered more exposed to the pandemic if, in regressions for their two-month growth, the coefficient of the binary variable equal to 1 in March-April (May-June) 2020 (i.e. the lockdown period (start of the lockdown-lifting period)) is statistically significant at a confidence level of 99%.



and a limited response on the oil supply side, and from the non-energy industrial goods components, specifically transport and communication (see Chart 3.2).

Indeed, the progressive lifting of the lockdown measures from mid-2020, and the subsequent economic recovery, has prompted a pick-up in private consumption and, in part, the release of the pent-up demand for durable goods (see Chart 4.1); and more recently it has seen a surge in the demand for services requiring social contact (e.g. the hospitality industry). It should be recalled that in the early months of the pandemic households were forced to defer spending on many goods and services, and a considerable number of firms adjusted stocks in the face of the uncertain economic outlook, thereby leading to the build-up of extraordinary saving by many economic agents (Alonso et al., 2021).

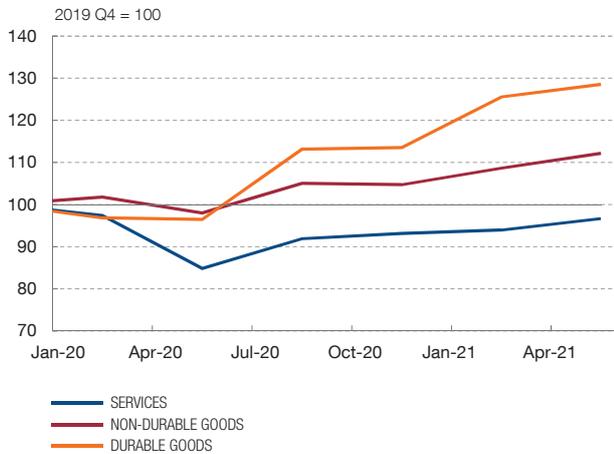
In this setting, however, the pick-up in business activity is proving slower and many firms are not capable of swiftly accommodating a strong increase in demand. This mismatch between the supply of and demand for goods is partly due to supply and logistics problems (see Chart 4.2), which are particularly marked in certain imported inputs (e.g. semiconductors, steel and timber) and which very visibly affect certain industries such as the automobile sector (Attinasi et al., 2021). An immediate consequence of the foregoing is higher producer prices, which may feed through, at

Chart 4

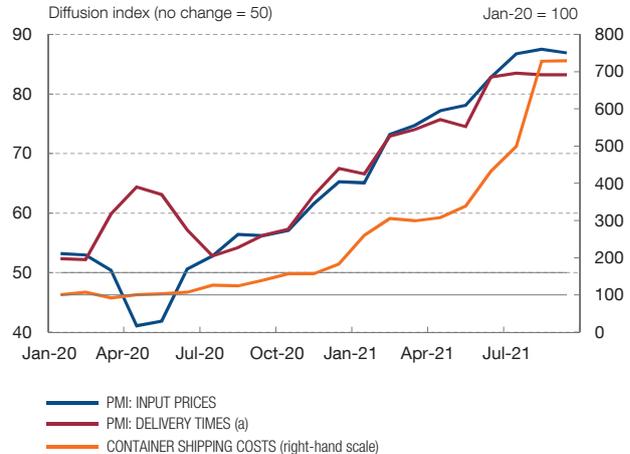
DEMAND RECOVERY AND SUPPLY BOTTLENECKS

The economic reopening has prompted mismatches between supply and demand in both goods and services. This is giving rise to certain supply and logistics problems, which partially feeds through to rising producer prices.

1 CONSUMER DEMAND FOR GOODS AND SERVICES



2 SHIPPING COSTS, INPUT PRICES AND DELIVERY TIMES



SOURCES: Refinitiv, Markit and Freightos.

a The series is inverted, such that an increase denotes longer delivery times.



least in part, to consumer prices (Johnson et al., 2016). In any event, supply and demand mismatches stemming from lockdown lifting are likely to ease as firms hire more staff and expand production (Brainard, 2021; Kataryniuk et al., 2021).

More persistent possible inflationary risks

While the influence of the transitory effects described would largely account for the recent rise in inflation, there are some upside risks that could imbue it with a more persistent nature. We highlight three such risks: wage pressures derived from the labour market situation; the potentially more-pronounced-than-expected inflationary effects of the substantial fiscal stimuli applied in response to the pandemic; and a possible de-anchoring of medium-term inflation expectations.

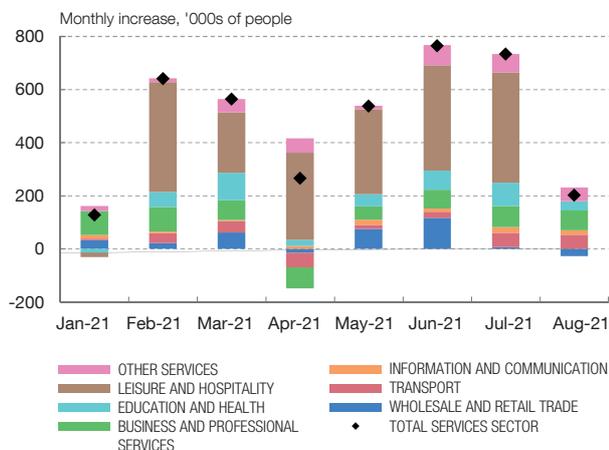
Firstly, the US labour market is experiencing a somewhat atypical recovery, since the pick-up in labour demand is not being matched on the supply side, in contrast to what occurred in previous economic recoveries. Hence, labour demand is increasing in step with the recovery, following the destruction of over 20 million jobs at the depths of the pandemic. Particularly of note are services, the sector which destroyed most employment during the pandemic and that which has created most jobs in 2021, in particular in those occupations most closely linked to leisure and hospitality (see Chart 5.1).

Chart 5

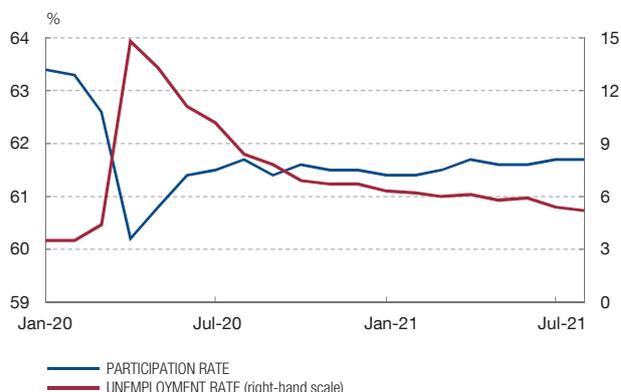
LABOUR MARKET DEVELOPMENTS

The US labour market is experiencing a somewhat atypical recovery, since the pick-up in labour demand is not being matched on the supply side.

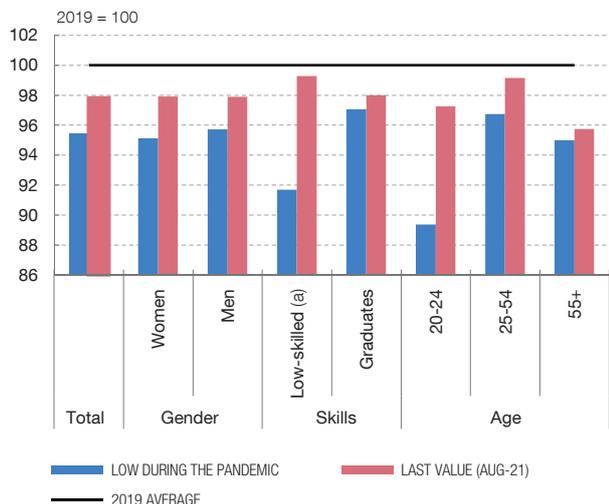
1 JOB CREATION IN THE SERVICES SECTOR



2 PARTICIPATION AND UNEMPLOYMENT RATE



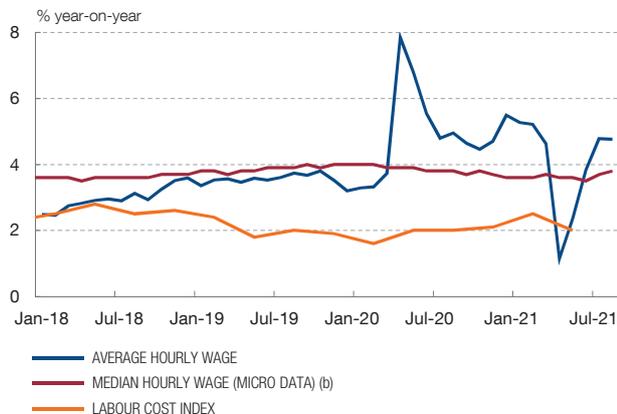
3 LABOUR MARKET PARTICIPATION FOR DIFFERENT GROUPS



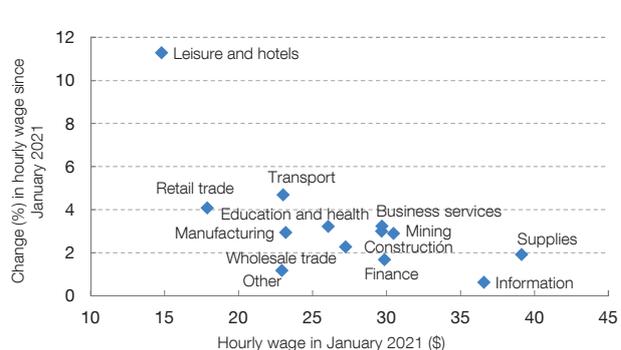
4 RESERVATION WAGE BY INCOME LEVEL



5 WAGE DEVELOPMENTS



6 HOURLY WAGE: SECTORAL DEVELOPMENTS IN 2021



SOURCES: BLS, BEA, Federal Reserve Bank of New York and Banco de España calculations.

a Includes workers without a full secondary education.

b This indicator, compiled by the Federal Reserve Bank of Atlanta, is based on micro data and controls for employment composition effects.



Conversely, labour supply has so far remained more contained than was to be expected. While unemployment has held on a declining trend since mid-2020, labour market participation is recovering more slowly and remains below pre-pandemic levels (see Chart 5.2). This phenomenon may be due to several non-mutually exclusive factors. First, the pandemic has meant that many workers over 55 have retired before they planned to, either voluntarily or because they were forced to (see Chart 5.3). That will have temporarily exacerbated the population ageing-linked structural decline in the participation rate (Kaplan et al., 2021). Second, many positions in the services sector occupied by low-skilled, low-wage workers (e.g. retail trade and hospitality) involve a high degree of social interaction; despite the increase in vaccination levels, the fear of infection has affected labour supply until very recently.⁵ Likewise, the difficulties of returning to work for those families having to look after children persist while schools and nurseries are still not fully open (Lofton et al., 2021; Furman et al., 2021). Lastly, household income-support fiscal policies may also have played a role by discouraging active job search by certain individuals (Petrosky-Nadeu and Valletta, 2021) and increasing the bargaining power of low-income workers, who have raised their reservation wage,⁶ as a result of more generous unemployment benefits⁷ (see Chart 5.4).

This labour supply/demand mismatch may give rise to wage pressures, as is already perceptible in certain types of worker and in certain occupations (see Chart 5.5). Lower-income workers' wages have risen more sharply, especially in recent months, against a background of labour shortages.⁸ Further, the rise in these workers' reservation wages has contributed to growth in the lowest wages. By sector of activity, these increases have been particularly marked for low-wage hires in services sector jobs (see Chart 5.6). However, there are still no clear signs that these wage pressures, centred on the sectors involving most social contact, have become widespread to the extent that they may feed through to consumer prices. Yet if labour supply does not recover in step with demand, there is a risk of wage pressures being generated in the medium term. Further, if the greater observed bargaining power of certain groups of workers coincides with a potential de-anchoring of inflation expectations (as is later discussed), that might strengthen the pass-through of a potential increase in labour costs to consumer prices, and vice versa (Bobeica et al., 2021).

A second factor potentially behind the rise in inflation being sharper than expected is the prospect of the successive expansionary fiscal policy packages exerting a

5 See Table 3 in the section on Employment in "Educational Attainment for Adults Not Working at Time of Survey, by Main Reason for Not Working and Source Used to Meet Spending Needs", Household Pulse Survey, published by the United States Census Bureau.

6 The reservation wage is defined as the minimum wage that an individual is willing to accept in a job.

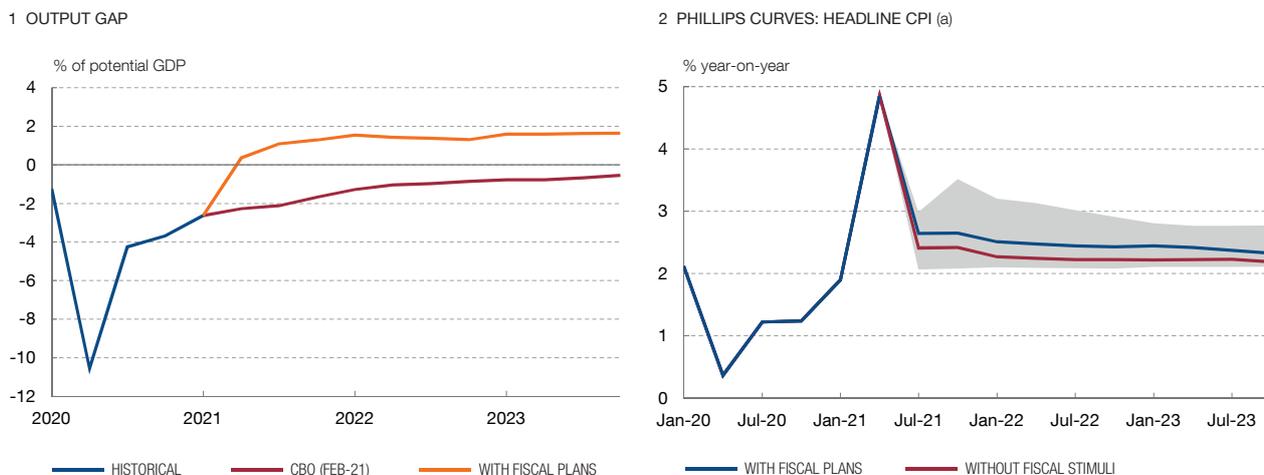
7 The successive fiscal stimulus plans approved in December 2020 and March 2021 improved unemployment benefits by various means: the benefit was increased by \$300 per week between January and September, the number of weeks that this benefit could be received was extended, and coverage was extended to self-employed workers.

8 The *Beige Book* compiles anecdotal evidence on the US labour shortage (various publications).

Chart 6

EFFECTS OF THE FISCAL PROGRAMMES

The fiscal impulse approved in the wake of the pandemic has been considerable; it would close the output gap in 2021 and simultaneously pose an upside risk to inflation. In any event, the fiscal plans would have a moderate impact on inflation.



SOURCES: Congressional Budget Office (CBO), Federal Reserve Bank of St. Louis and Banco de España calculations.

a The calculations, based on simulations using the NiGEM macroeconomic model, assume that agents' inflation expectations remain well anchored and an Okun coefficient of 0.5. The shaded area represents the range of specifications for each of the studies with fiscal plans and the lines represent the median forecast.



greater impact, relative to what was previously estimated.⁹ To shed some light on this factor, the effects of the fiscal stimuli on inflation are quantified below in two steps. First, using the NiGEM macroeconomic model, simulations are performed on the impact of the fiscal packages on the output gap: it is estimated that the fiscal packages will close the output gap as from late 2021, attaining levels close to 2% in 2022 (see Chart 6.1). Second, in line with the recent study by Bhadarawaj and Dvorkin (2020), Phillips curves are estimated for CPI inflation including as explanatory variables the lags of CPI inflation, the unemployment gap¹⁰ and inflation expectations. Specifically, the pass-through to inflation of the unemployment gap with (approved or announced) fiscal stimulus obtained on the basis of internal simulations is compared with the forecasts published by the US Congressional Budget Office (CBO) in February 2021, which do not include the effect of the fiscal packages. The

9 The American Rescue Plan was approved in March 2021, with an estimated budgetary cost of \$1.9 trillion (8.7% of GDP) this year. It extended and increased several of the measures included in previous fiscal plans to mitigate the economic effects of the pandemic. New multi-year fiscal packages were also announced, centred on government investment, tax deductions for low-income households and increased employee benefits that could entail an additional fiscal stimulus of 0.5% and 1.1% of GDP in 2022 and 2023, respectively.

10 The unemployment gap measures the difference between the unemployment rate and its long-term value; it therefore represents an alternative measure of the degree of slack in the economy. The empirical relationship between this indicator and the output gap is known as Okun's razor. To find the unemployment gap, the output gap obtained in the simulations is multiplied by -0.5, the Okun coefficient, in line with Blanchard (2021). In the interest of comparability, this transformation is also applied to the CBO output gap, despite the CBO also publishing its own output gap trajectory.

paths of inflation under both scenarios reveal that the fiscal stimulus would increase inflation in the medium term by 0.2 pp, putting this slightly above the Federal Reserve inflation target (see Chart 6.2).¹¹ However, the substantial fiscal packages could overstimulate the ongoing economic recovery and their economic impact could be greater than estimated owing to various factors. For instance, a steepening of the Phillips curve due to inflation persistently deviating above target (Jordà et al., 2019), non-linear effects owing to the size of the fiscal impulse and of the positive output gap (Giavazzi et al., 2000) and a possible de-anchoring of expectations owing to continued inflation surprises (Barlevy et al., 2021) could cause the fiscal stimulus packages to impact inflation more sharply than expected.

In any event, the main risk of the recent increase in inflation proving more persistent than expected would stem from a potential de-anchoring of inflation expectations in the medium and long term, which would trigger an inflationary spiral between higher inflation expectations and rising inflation rates. The different available inflation expectations indicators, and for various forecasting horizons, are analysed below. First, inflation projections for 2021 by economic specialists and international organisations have been revised substantially upwards since the beginning of the year. For instance, the consensus inflation forecasts for 2021 rose from 2.1% in January to 4.3% in September. By contrast, the revision for 2022 has been somewhat more moderate (see Chart 7.1), suggesting that analysts also expect the inflation upturn to be temporary. In parallel, against a backdrop of much uncertainty, the dispersion of these forecasts has increased in both years (see Chart 7.2).

According to the measures of survey-based inflation expectations, the recent rise in inflation has not translated into higher long-term expectations among economic agents. In the case of households, short-term expectations have been revised substantially upwards, in step with observed inflation dynamics (see Chart 7.3) and owing to their expectations formation mechanism, wherein fuel price increases amplify the perception of future headline inflation (Coibion and Gorodnichenko, 2015). By contrast, households have not significantly revised up their medium-term (5-year) inflation expectations, which remain at levels compatible with the monetary policy target.¹² Surveys of professional analysts' inflation expectations indicate a considerably more moderate and far less volatile rise in the short and long terms. One possible explanation for the disparities between the revisions of inflation expectations over different time horizons is the increasingly important role played by past inflation in the formation of long-term expectations (see Chart 7.4 for analysts' expectations).

11 The results are similar if the exercise is repeated with the July CBO forecasts, which incorporate the fiscal plans approved and a degree of the reopening effect. The average effect of the fiscal impulse on inflation using the July CBO forecasts is 0.25 pp, compared with 0.21 pp obtained in the simulations themselves.

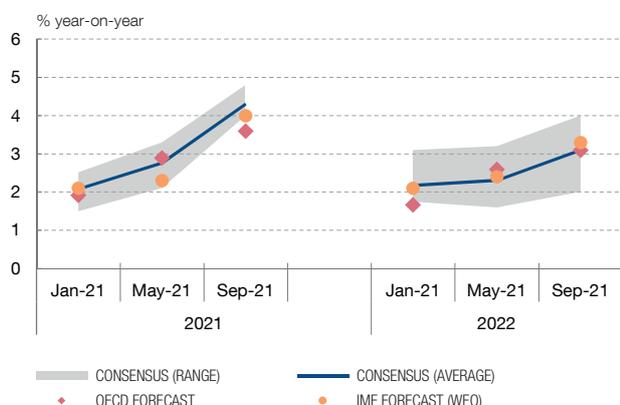
12 These measures refer to CPI inflation, which in recent years has outstripped PCE inflation (by around 0.25 pp on average).

Chart 7

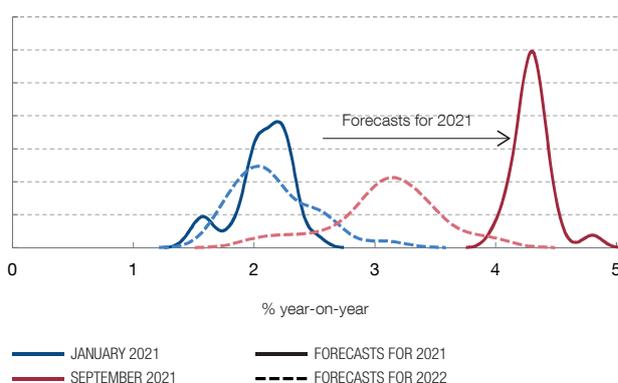
INFLATION FORECASTS AND EXPECTATIONS

Inflation forecasts have been revised up since the beginning of this year, although the 2021 forecast accounts for the bulk of the revisions. Various measures of inflation expectations indicate that these will remain well anchored in the long term.

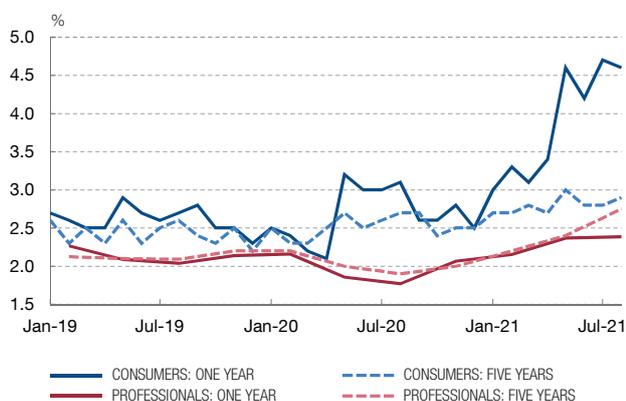
1 CONSENSUS INFLATION FORECASTS FOR 2021 AND 2022 (a)



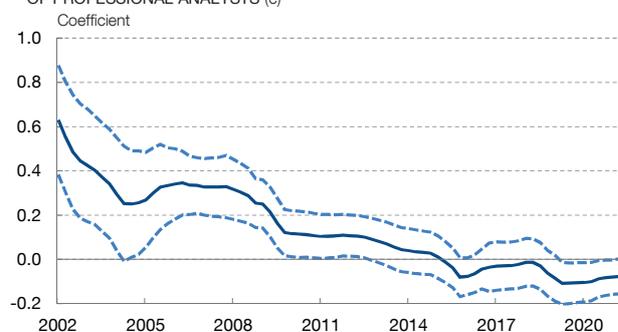
2 CPI INFLATION: KERNEL DISTRIBUTIONS FOR THE MONTHLY CONSENSUS (b)



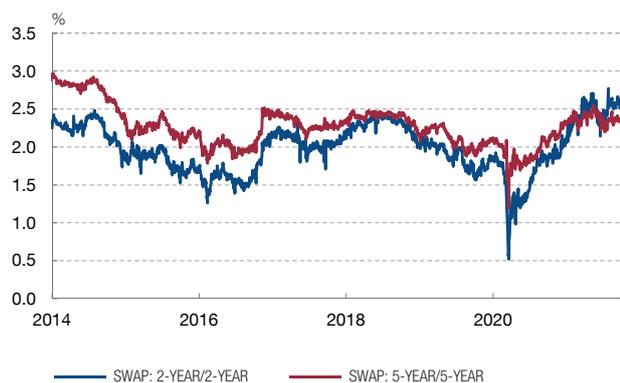
3 SURVEY-BASED INFLATION EXPECTATIONS



4 IMPACT OF HEADLINE INFLATION ON 10-YEAR EXPECTATIONS OF PROFESSIONAL ANALYSTS (c)



5 FINANCIAL MARKETS' INFLATION EXPECTATIONS



6 PROBABILITY OF INFLATION LEVEL BASED ON FINANCIAL OPTIONS (5-YEAR/5-YEAR) (d)



SOURCES: Federal Reserve Bank of New York, University of Michigan, Barclays, Consensus Forecast, OECD, IMF and Bloomberg.

- a The chart shows on the horizontal axis the forecasts for 2021 and 2022 in January, May and September 2021. The OECD forecasts (IMF) shown were formulated in December 2020 and in May and September 2021 (January, April and July 2021).
- b The kernel densities are smoothed estimates of the probability distribution histogram.
- c The chart shows the coefficients of the regressions of the inflation expected by professional analysts relative to past inflation in 7-year rolling windows. The regressions also include the inflation target of 2%, whose coefficient is not shown.
- d The probabilities are extracted from the risk-neutral densities obtained from inflation swaps using the Gimeno and Ibáñez methodology (2018).



Lastly, it is worth noting the developments in inflation expectations based on the prices of financial instruments. The recent increase in the price of inflation swaps over different horizons suggests that investors are discounting inflation holding above the monetary policy target for some time:¹³ from the lows reached at the depths of the pandemic, medium-term (2-year/2-year) and long-term (5-year/5-year) inflation swaps have climbed by around 200 and 100 bp, respectively, reaching values of close to 2.5% (see Chart 7.5). Likewise, expectations based on the risk-neutral densities extracted from US inflation swaps¹⁴ can be used to estimate the probability of extreme events occurring or to quantify the uncertainty surrounding future inflation. On the latest data, the probability of high inflation (over 3%) in five years is only somewhat greater than at the start of 2020 (see Chart 7.6).

It can thus be concluded that economic agents (households, analysts and markets) are also assuming that the rise in inflation will largely be transitory and have not, as yet, factored it in to their medium and long-term inflation expectations.

Possible implications for the euro area

The recent inflation upturn is a global phenomenon that is also observed in the euro area, albeit with a less marked increase than in the United States.¹⁵ The base effects, rising energy prices and supply problems affecting certain inputs (Attinasi et al. 2021; Schnabel, 2021) also appear to explain a considerable portion of the increase in euro area inflation. These effects would likewise be transitory and should dissipate in the medium term (Lane, 2021). In this vein, the recent September Eurosystem projections envisaged inflation of 2.2% in 2021, 1.7% in 2022 and 1.5% in 2023. Moreover, unlike the United States, no significant wage pressures are discernible yet in the euro area (Koeste and Gonçalves, 2021). Aside from the common global trends, economic developments specific to the United States affect the euro area through the two regions' trade and financial links.¹⁶ Thus, US fiscal stimuli have a bearing on external demand for euro area goods and services and may also have certain spillover effects on its inflation. All told, these effects on euro area inflation are expected to be relatively moderate. For instance, recent simulations by the ECB indicate that the US fiscal package approved in March could increase inflation in the euro area by around 0.15 pp in 2021-2023 (ECB, 2021; Lagarde, 2021).

30.9.2021.

13 Again, the swaps refer to CPI inflation; accordingly, the gap between PCE inflation and the monetary policy target implied by the swaps would be even narrower given the historical difference (see footnotes 2 and 9).

14 The inflation expectations estimates are based on the work of Gimeno and Ibañez (2018).

15 See "*Short-term factors of inflation in times of COVID-19 and the medium-term outlook in the euro area and Spain*", Analytical Article, forthcoming.

16 US economic shocks tend to spread to other regions' inflation essentially through the trade channel, due to changes in external demand, and the financial channel, for instance through changes in interest rates and exchange rates. See, for example, Feldkircher and Huber (2016), Bäurle et al. (2021) and Ca'Zorzi et al. (2021).

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