

IN-DEPTH ANALYSIS

Requested by the ECON committee

Monetary Dialogue Papers, September 2021



Is High Inflation the New Challenge for Central Banks?



Policy Department for Economic, Scientific and Quality of Life Policies
Directorate-General for Internal Policies
Authors: Luigi BONATTI, Roberto TAMBORINI
PE 695.455 - September 2021

EN

Is High Inflation the New Challenge for Central Banks?

Monetary Dialogue Papers
September 2021

Abstract

In this paper we briefly review the macroeconomic theory of inflation, relating it to the recent developments in the advanced economies. Then, we analyse the drivers of the rise in inflation observed in 2021 in the United States and in Europe, and we illustrate the factors that may affect the inflationary scenario of the advanced economies in the longer term. Finally, we discuss what challenges the Federal Reserve and the European Central Bank have to meet in the face of current inflationary pressures.

This paper was provided by the Policy Department for Economic, Scientific and Quality of Life Policies at the request of the committee on Economic and Monetary Affairs (ECON) ahead of the Monetary Dialogue with the ECB President on 27 September 2021.

This document was requested by the European Parliament's committee on Economic and Monetary Affairs (ECON).

AUTHORS

Luigi BONATTI, University of Trento
Roberto TAMBORINI, University of Trento

ADMINISTRATOR RESPONSIBLE

Drazen RAKIC

EDITORIAL ASSISTANTS

Roberto BIANCHINI

LINGUISTIC VERSIONS

Original: EN

ABOUT THE EDITOR

Policy departments provide in-house and external expertise to support European Parliament committees and other parliamentary bodies in shaping legislation and exercising democratic scrutiny over EU internal policies.

To contact the Policy Department or to subscribe for email alert updates, please write to:

Policy Department for Economic, Scientific and Quality of Life Policies

European Parliament

L-2929 - Luxembourg

Email: Poldep-Economy-Science@ep.europa.eu

Manuscript completed: September 2021

Date of publication: September 2021

© European Union, 2021

This document was prepared as part of a series on "Rise in Inflation: Temporary or Sign of a More Permanent Trend?", available on the internet at:

<https://www.europarl.europa.eu/committees/en/econ/econ-policies/monetary-dialogue>



Follow the Monetary Expert Panel on Twitter: [@EP_Monetary](https://twitter.com/EP_Monetary)

DISCLAIMER AND COPYRIGHT

The opinions expressed in this document are the sole responsibility of the authors and do not necessarily represent the official position of the European Parliament.

Reproduction and translation for non-commercial purposes are authorised, provided the source is acknowledged and the European Parliament is given prior notice and sent a copy.

For citation purposes, the publication should be referenced as: Bonatti, L. and Tamborini, R., *Financial Dominance: Is High Inflation the New Challenge for Central Banks?*, Publication for the committee on Economic and Monetary Affairs, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg, 2021.

The opinions expressed in this document are the sole responsibility of the authors and do not necessarily represent the official position of the European Parliament.

CONTENTS

LIST OF FIGURES	4
LIST OF TABLES	4
LIST OF ABBREVIATIONS	5
EXECUTIVE SUMMARY	6
1. INTRODUCTION	7
2. UNDERSTANDING INFLATION. WHERE DO WE STAND?	10
3. DRIVERS OF THE RECENT RISE IN INFLATION	15
3.1. Base effects	15
3.2. Core inflation and NEIG	16
4. SHOULD WE EXPECT A MORE PERSISTENT RISE IN INFLATION?	19
4.1. Wages	19
4.2. Expectations	20
5. FED <i>VERSUS</i> ECB: INFLATION AND POLICY CHALLENGES	23
6. CONCLUSION	26

LIST OF FIGURES

Figure 1:	United States inflation rate (Consumer Price Index for All Urban Consumers, CPI-U)	7
Figure 2:	Euro area inflation rate (Harmonised Index of Consumer Prices, HICP)	8
Figure 3:	Euro area countries' annual inflation rate (HICP) in July 2021	8
Figure 4:	The labour market Phillips curve (left) and the goods market Phillips curve (right)	12
Figure 5:	Base effects on inflation	15
Figure 6:	Contributions of base effects and other temporary factors to changes in annual HICP inflation in the euro area (December 2020 – June 2021)	16
Figure 7:	Euro area annual inflation and its main components (July 2011 – July 2021) percent	17
Figure 8:	Increase in labour compensation per employee (between Q4 2019 and Q1 2021)	19
Figure 9:	Term structure of inflation swap rates	21
Figure 10:	Euro area HICP: actual and projected, annual % change	24
Figure 11:	Market-based inflation expectations in the euro area, 2021	25

LIST OF TABLES

Table 1:	Euro area annual inflation and its main components (July 2020 and February 2021-July 2021)	18
----------	--	----

LIST OF ABBREVIATIONS

CPE	Compensation per employee
BIS	Bank for International Settlements
ECB	European Central Bank
GDP	Gross domestic product
GPL	General price level
HICP	Harmonised index of consumer prices
IMF	International Monetary Fund
NEIG	Non-energy industrial goods
PC	Phillips curve
US	United States

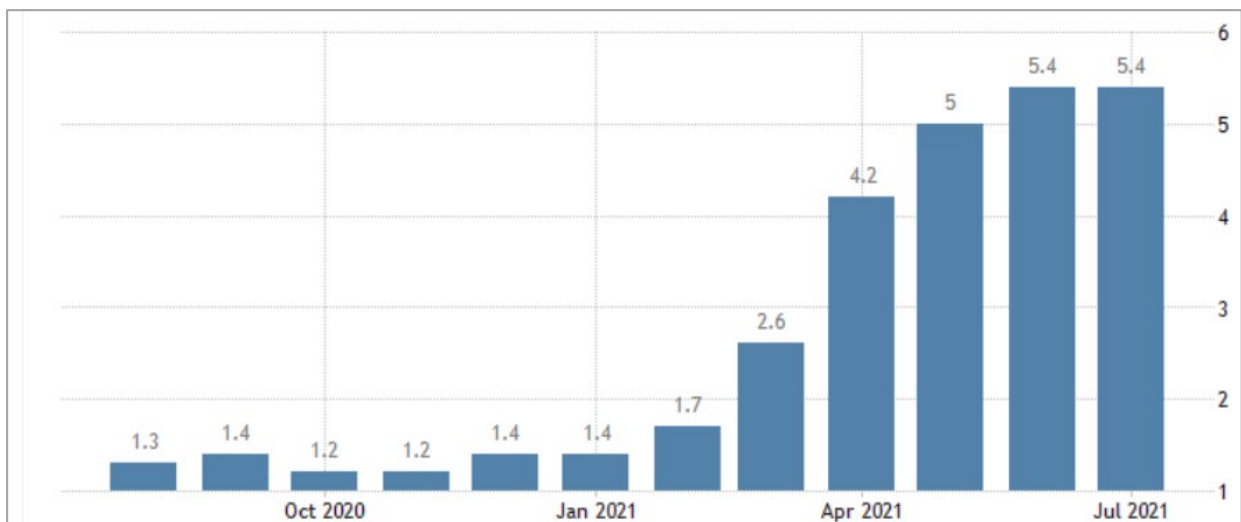
EXECUTIVE SUMMARY

- **This paper addresses three main issues under discussion** as the euro area's countries are on the way of overcoming the COVID-19 pandemic: (i) assess the ongoing developments on the **inflation front**; (ii) discuss whether the combination of return to normality with the strong policy stimuli under way may lead to **overheating the economies**; (iii) compare realistic **scenarios for policy purposes**.
- **Understanding and predicting inflation remain difficult tasks.** For the co-movements of prices recorded as "inflation" are the result of microeconomic forces operating at the level of different sectors of goods, services, and workers categories. Thus, the paper provides a detailed overview of these **micro- and meso-developments**.
- **The "consensus view" held by the majority of observers and main central banks is that no systematic common trends are detectable** across sectoral prices and wages, while in some sectors price pressures are present owing to specific demand-supply factors and labour market conditions. Overall, this view points to the conclusion that the recent spikes in inflation **will be temporary**.
- **The paper also points out a number of factors that might overturn this optimistic scenario,** triggering a more persistent rise of inflation with **risks of stagflation**. In particular: labour market conditions and wage bargaining, and de-anchoring of inflation expectations.
- On this account, too, the data and studies we survey **converge towards a scenario where temporary factors seem prevailing** over entrenched drivers, some of which appear in retreat with respect to the first semester of 2021. However, the interplay of **inflation expectations** with labour market and financial market conditions have historically proved **powerful boosters of sudden and unexpected inflation spirals**.
- **Though the outlook of a vibrant recovery with inflation remaining subdued has concrete bases, the future policy scenarios remain challenging.** In particular, the ECB will have to manage the post-pandemic scenario together with the revision of its policy strategy, with predictable interaction, or interference, between the two tasks. This will be made more problematic by the persistence of **the systematic inconsistency between its target and its projections** that has characterised the ECB in the last decade, making unlikely that expectations of inflation in the euro area will be anchored around the new ECB's symmetric 2% target.
- Overall, our view is that this is a time of **careful monitoring of economic developments**, against the background of the actual evolution of the pandemic, with **prudent, adaptive and flexible** policy choices, rather than one of strong, irreversible commitments into a still foggy future.

1. INTRODUCTION

As the COVID-19 vaccination campaign stepped up and the economic recovery picked up in the United States at the beginning of 2021, inflation started accelerating, going from an annual rate of 1.4 % in January to 5.4 % in July (see Figure 1). This has ignited a hot debate, with the policymakers and most analysts supporting the idea that the inflation hike is transitory, being largely due to base effects, bottlenecks in sectors affected by the pandemic, supply chain disruptions and higher energy prices, and some economists and commentators arguing that an inflation rate persistently higher than the level that was normal in recent decades is likely to materialise as a consequence of both macroeconomic policies and structural factors.

Figure 1: United States inflation rate (Consumer Price Index for All Urban Consumers, CPI-U)



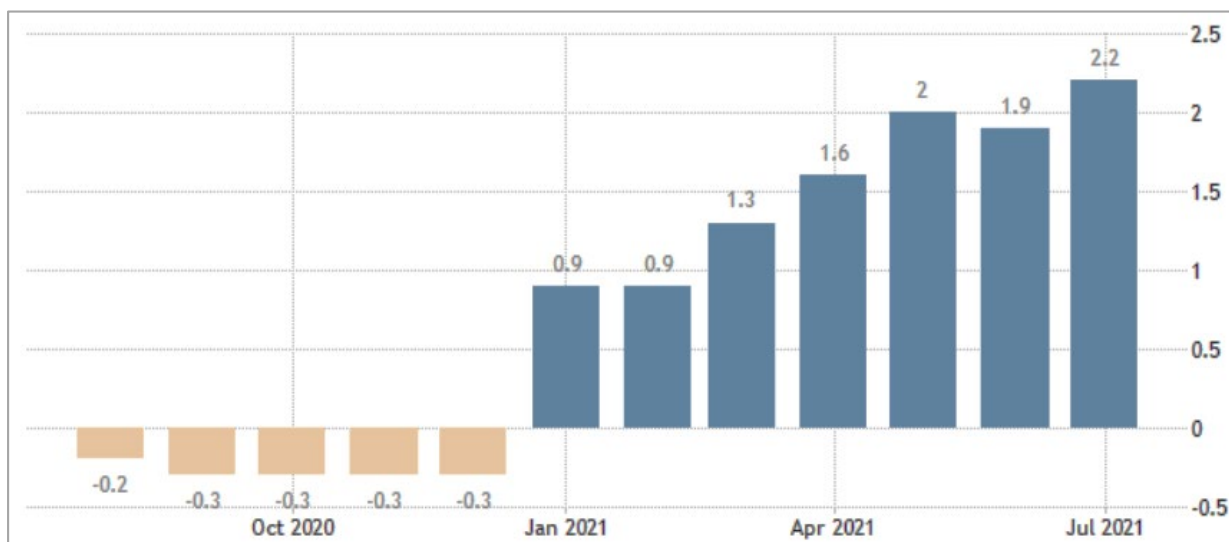
Source: Trading Economics. Available at: <https://tradingeconomics.com/usa/inflation-cpi>.

Also in the euro area, inflation has accelerated in recent months (see Figure 2), although to a lesser extent than in the United States, reflecting—at least partially—the fact that Europe lagged behind the United States in the first phase of the vaccination campaign, and consequently in the reopening of economic activities. As a result, headline inflation is expected to pick in the euro area after the summer, while in the United States prices have already shown evidence of cooling¹. The more modest increase in prices that characterised Europe in the first semester of 2021 relatively to the United States may also explain why in the former the debate on whether or not the current inflation spike is going to be short living, and how monetary policy should account for it, has not been so vivid up to now as in the latter. However, even in the euro area, differences of opinion are emerging on the possible resurgence of inflation and disagreements on the appropriate policy response to it. As is often the case, debate in the euro area is also conditioned by differences along national lines: dispersion of inflation rates across euro area countries as of July 2021 is sizeable (see Figure 3), which ignite different concerns and claims on policy in Member States².

¹ The US CPI rose a seasonally adjusted 0.5% in July from June, a much slower pace than its 0.9% increase in June from May.

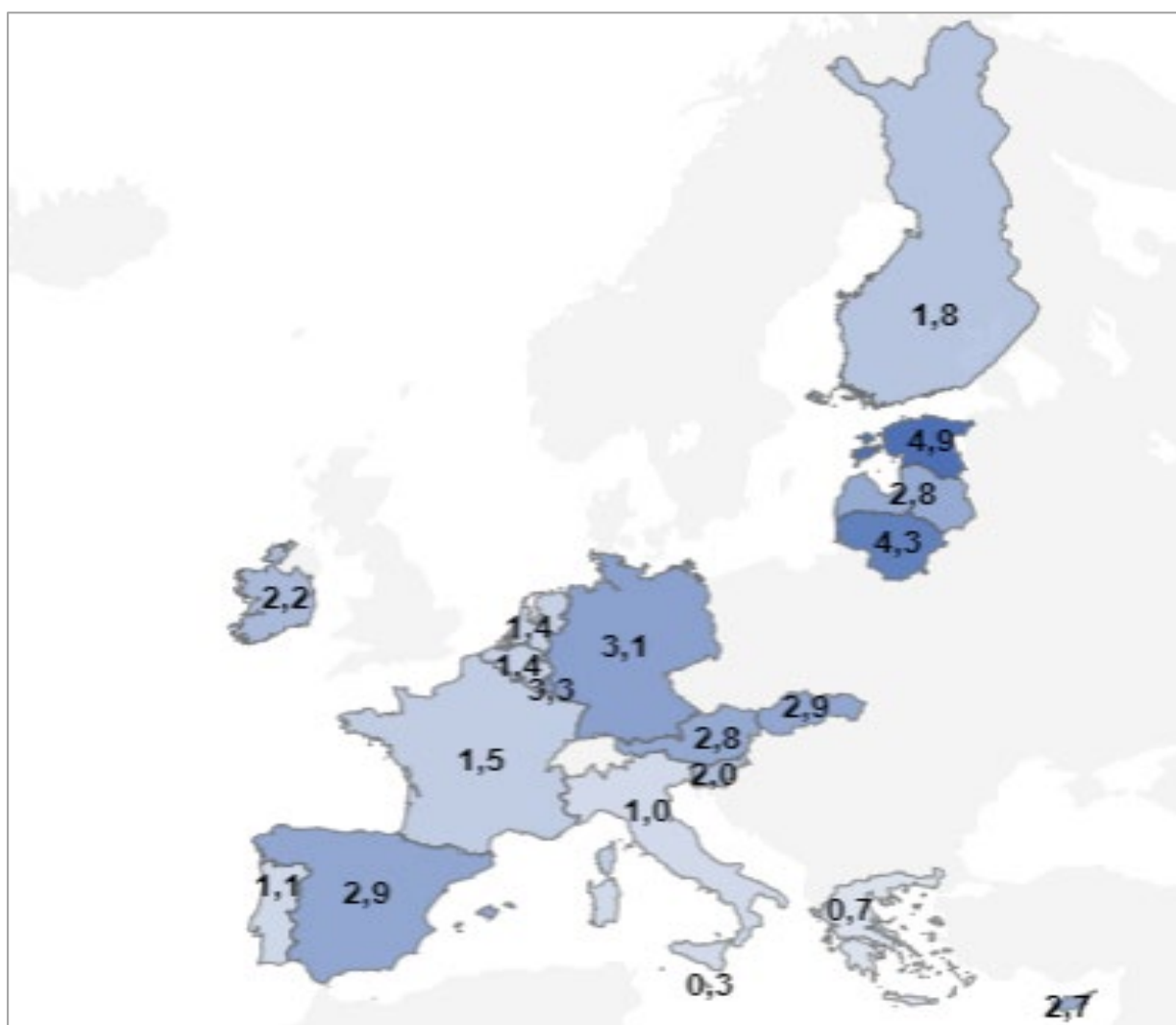
² It is not surprising that these differences emerge also in the ECB Governing Council. For instance, Jens Weidmann, President of the Bundesbank, voted against the Governing Council's decision on 22 July 2021, to maintain a persistently accommodative monetary policy stance by claiming that, in a context where the future path of inflation is uncertain, "the potentially excessively long projection of the future duration of the low interest rate environment went too far" (see Weidmann, 2021).

Figure 2: Euro area inflation rate (Harmonised Index of Consumer Prices, HICP)



Source: Trading Economics <https://tradingeconomics.com/euro-area/inflation-cpi>.

Figure 3: Euro area countries' annual inflation rate (HICP) in July 2021



Source: Eurostat.

What is certain is that the current burst in inflation has marked a change of mindset, since in the years preceding the pandemic inflation was a problem in the advanced economies for being too low, namely stubbornly below central banks' target and expected to remain low or falling in the future, thus keeping high the risk of deflationary spirals and forcing central banks to move to unconventional monetary policies. It is too early to establish whether this change of perspective will be long lasting, but in any case, it is apparent that the pandemic and the policies implemented to face it altered the environment which was familiar in the pre-COVID-19 era, making unlikely a mere return to the old normal. Hence, it is worth to discuss the developments outlined above with respect to inflation, with particular reference to their implications for the future of the euro area. The present paper is devoted to this discussion.

The second section of this paper briefly reviews the **macroeconomic theory of inflation**, relating it to the recent developments in the advanced economies; section three analyses the **drivers of the rise in inflation** observed in 2021 in the United States and in Europe; section four illustrates the **factors that may affect the inflationary scenario** of the advanced economies in the longer term; section five discusses what **challenges the Federal Reserve (Fed) and the European Central Bank (ECB)** have to meet in the face of inflation; section six concludes.

2. UNDERSTANDING INFLATION. WHERE DO WE STAND?

Inflation has been at centre stage all along the history of economic thought, nonetheless understanding and predicting inflation remain difficult tasks. Inflation is classified as a macroeconomic phenomenon, in the sense that the index numbers of prices gather composite baskets of goods and services, and inflation is commonly understood as an upward movement of prices of (the majority of) goods in the basket. More technically, inflation is registered when prices present a **common trend**.

At the same time, single prices move upwards or downwards for specific reasons. These are basically: (i) changes in demand and supply, (ii) changes in productions costs, (iii) changes in market structure, (iv) changes in price expectations. Common trends arise when these factors align themselves pushing single prices in the same direction. To this end, macroeconomic models of inflation monitor the behaviour of these factors at the *aggregate level*, but the fact that prices are eventually a microeconomic phenomenon should never be overlooked.

Today's most common macroeconomic specification of the determinants of inflation for empirical analysis is the following (see e.g. Hooper et al., 2019):

$$(1) \quad \pi_t = \alpha + \beta_1 \pi^e + \beta_2 x_t + \beta_3 Z_t + v_t$$

where π_t is current inflation, π^e is an expectation term to be specified, x_t is a measure of the business cycle or "economic slack", Z_t is a vector of other variables, and v_t are random shocks. The constant α may capture an autonomous drift in inflation. Though improperly, this relationship is generally called **Phillips curve** (PC) after the pioneering study of A. W. Phillips (1958)³.

As said above, great attention is paid to the micro-foundations of this kind of relationship. A prominent example is the so-called "New Keynesian" PC which is derived from a theory of optimal price-setting in an economy characterised by imperfect competition, i.e. where producers enjoy some market power, and a degree of price stickiness, i.e. some prices are not immediately adjusted to shocks that change market conditions (as a reference work, see Galí, 2008). The result is that π^e is inflation expected one period ahead (π_{t+1}^e), x_t is the output gap, i.e. the deviation of current production from its long-run equilibrium, and Z_t is an index of marginal costs. Clearly, market structure plays quite an important role.

The expectation component of current inflation, which is crucial as we shall see, can also take different forms, such as the forecast of current inflation itself (π_t^e) or a "hybrid" composition of forward and backward-looking forecasts (forecasts based on the projection of observed previous inflation, π_{t-1}, \dots). Price stickiness⁴ implies that the output gap is mostly driven by aggregate demand shocks (and their policy sources). The relevant coefficients β_2 and β_3 reflect both the degree of prices stickiness and of mark-up above marginal cost (typically in inverse proportion to the price elasticity of demand). Two are the most important components of marginal cost that impinge upon inflation, the cost of labour and the cost of intermediate goods and raw materials.

The same conceptual framework applies to the labour market more specifically (Galí, 2008, ch. 6). On the one hand, there exist various ways whereby imperfect competition in the goods market is mirrored by imperfectly competitive wage setting, as well as various forms of asymmetric information between

³ We say that calling the relationship (1) "Phillips curve" is inappropriate because the original PC drew an inverse relationship between the rate of change of nominal wages and the unemployment rate, hence it concerned the labour market alone, not the economy as a whole. More properly, (1) should be defined as an aggregate supply equation.

⁴ In the standard New Keynesian framework price stickiness is due to the (random) share of non-optimising price setters, who do not adjust prices and instead change the quantity produced (Calvo, 1983). Other sources of price stickiness may be costs incurred by firms in changing prices (e.g. Rotemberg, 1982), also known as "menu costs" (Akerlof and Yellen, 1985).

employers and employees, leading to contractual real wages that generate a permanent loss of employment relative to the perfectly competitive benchmark. These phenomena underpin the notion of a nonzero level of **structural unemployment** that may be regarded as an equilibrium state of the labour market, such that there are no pressures to change *real* wages⁵.

On the other hand, as was stressed by Keynes in the famous, and controversial, chapter 19 of the *General Theory*, wage contracts are set in **nominal** (e.g. euros per hour), not real, terms. The way in which nominal wages are set in the economy, in particular how their **indexation** to the general price level (GPL) takes place, is as important as how real wages are set. To remain within the New Keynesian framework, nominal wage stickiness mirrors price stickiness for similar reasons related to recontracting costs. Typically, nominal wage contracts are "staggered" (Taylor, 1980), namely they remain in force for a predetermined period, and they are not revised at the same time in all sectors.

To exemplify, consider the case in which employers and employees meet once at end of each year to undersign the contract in force for the whole subsequent year. Suppose that last year $t-1$ they have agreed on a certain real value of the wage rate (a share of the producer's surplus) for the year to come t , let us call it w_t^C . The contract should specify the nominal wage rate W_t^ϵ that employers will have to pay, and employees expect to earn, throughout the year. The simplest indexation rule to be inbuilt in the contract is therefore $W_t^\epsilon = w_t^C \times P_t^e$, where P_t^e is the GPL *expected* for year t at the time of the contract signature. Known the GPL at that time P_{t-1} , and since $P_t^e = P_{t-1}(1 + \pi_t^e)$, it follows that the critical forecast variable in wage contracts is **future inflation** over the time horizon of the contract.

This mechanism has three main consequences. First, the two parties should also agree on an inflation forecast. Second, unless both enjoy the virtue of perfect foresight, the inflation forecast on which they agree may turn out to be wrong. Third, in case of inflation forecast error, the contract cannot be renegotiated immediately so that, throughout the year t , employers pay and employees earn an **effective real wage** $w_t = W_t^\epsilon / P_{t-1}(1 + \pi_t)$ which differs from the contractual one w_t^C .

This wage contracting system is characterised by **imperfect indexation**, and it embeds some nominal wage stickiness to the extent that the contract cannot be freely renegotiated at will. For the opposite case of perfect wage flexibility to hold, wage contracts ought to be freely renegotiated at any time, obtaining **perfect indexation**. Yet whether or not wage contracting is staggered is irrelevant if all parties enjoy perfect foresight of inflation.

As a matter of fact, imperfect indexation systems and nominal wage stickiness display their most relevant consequences throughout the life of contracts, in the presence of inflation forecast errors or **inflation surprises**. It is easy to see that the effective real wage w_t is smaller than the contractual one whenever $\pi_t > \pi_t^e$, i.e. inflation is higher than expected, whilst it is larger whenever $\pi_t < \pi_t^e$, i.e. inflation is lower than expected. The first noteworthy consequence is therefore that inflation surprises, whether up or down, have **distributional effects** between firms and workers: with upward surprises workers lose and firms gain, with downward surprises the opposite occurs. A second consequence arises in connection with the reactions to these gains and losses, which plays an important role in the relationship between inflation and the business cycle.

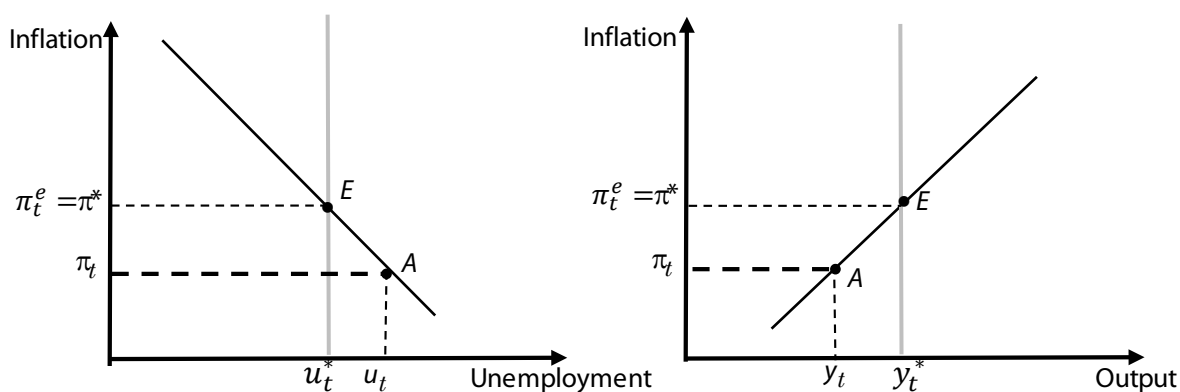
Let us focus on firms and consider the fact that as long as the wage contract is not changed, firms can nonetheless regulate their labour input (amount of hours worked) rather easily in response to the

⁵ This equilibrium unemployment also takes various other names, e.g. "natural rate of unemployment", "non-accelerating-inflation rate of unemployment" (NAIRU).

ongoing *effective real wage*. Consequently, upward inflation surprises ($w_t < w_t^c$) incentivise firms to expand employment and production, whereas downward surprises ($w_t > w_t^c$) push in the opposite direction. Thus, inflation surprises are one main force behind the so-called **cyclical unemployment**, i.e. fluctuations of unemployment around the rate of structural unemployment.

A simple diagrammatic representation of this type of labour market PC can be seen in the left-hand panel of Figure 4, where u_t is the unemployment rate, and u_t^* is the structural unemployment rate. The downward-sloping schedule relates spells of cyclical unemployment ($u_t - u_t^*$) to inflation forecast errors ($\pi_t - \pi_t^e$). The important message of this representation of the PC is that unemployment can deviate from its structural rate *only* as a consequence of inflation surprises. These, however, can only have a **temporary effect**; for when wage contracts expire, at least the party damaged by the unanticipated changes in inflation will call for a renegotiation that realigns the nominal wage rate with actual inflation (the schedule in Figure 4 shifts up or down vertically). This mechanism, if unchecked, may trigger **wage-price spirals** (upwards as in the 1970s or downwards as in the 1930s) that may drive inflation (or deflation) out of control. If changes in inflation were fully anticipated (which, as said above, would make imperfect indexation irrelevant), there would be no movements away from structural unemployment – an accommodation of the idea of the "vertical" PC (Friedman, 1968; Phelps, 1968) as a limit case.

Figure 4: The labour market Phillips curve (left) and the goods market Phillips curve (right)



Source: Authors' elaboration.

This representation of the labour market can also be seen as the complement to the relationship (1) between inflation and business cycle, as in the right-hand panel of Figure 4. The same factors that determine the rate of structural unemployment can be seen as determinants of a level of potential output y_t^* below the perfect competition benchmark⁶. Then the upward-sloping schedule relates output fluctuations around potential to inflation surprises (indeed, output fluctuations are driven by the changes in labour force utilisation portrayed on the left-hand panel)⁷. This general framework accommodates the main issues about inflation, the business cycle and the post-pandemic perspectives.

⁶ As is actually done by the European Commission to estimate potential output: Havik et al. (2014).

⁷ The role of inflation surprises as drivers of the business cycle was also established by Lucas (1973) though by means of different hypotheses.

In the first place, it can be seen immediately that a central problem is the so-called **anchoring** of inflation expectations (π_t^e). What level of inflation can rationally be expected to prevail each year? It is the fundamental tenet of today's prevailing theory of monetary policy that the anchorage of inflation expectations should be provided by the inflation target (π^*) set by the central bank (Woodford, 2003)⁸. In this theory, if the central bank controls the policy interest rate by means of a feedback rule responding to observed (possibly foreseen) inflation gaps from the target ($\pi_t - \pi^*$), while smoothing output gaps ($y_t - y_t^*$), then under suitable conditions the economy converges to an equilibrium with zero gaps (point E in Figure 4). One such feedback rule is the now standard Taylor rule (Taylor, 1993). As shown in Figure 4, this equilibrium of the economy is characterised by the structural levels of output and (un)employment while inflation expectations are in line with the central bank's target. Short-to-medium run fluctuations of output and inflation take place around this equilibrium values *to the extent that monetary policy does work* as it is supposed to do.

The two decades spanning the 1990s and early 2000's, dubbed Great Moderation (Stock and Watson, 2002), were widely regarded as a success of inflation targeting and stabilisation. Research and debate about inflation focused on the **flattening of the PC**, i.e. increasing evidence that inflation remained quite stable and close to targets *vis-à-vis* (contained) output fluctuations (e.g. Blanchard et al., 2015; Hooper et al., 2019). This was interpreted as the result of two phenomena. First, the substantial reduction of the structural slope of the PC (β_2 in relationship (1) above) plummeting from more than 1 in the mid-1970s to about 0.3. Second, the robust anchoring of expectations. The former fact was traced back to developments in market structures related to globalisation, such as a long-run fall in prices of goods coming from emerging economies, loss of unions' market power, and wage moderation (actually real wage growth well below productivity gains)⁹. For instance, if wages grow less than productivity, the marginal cost of production, embodied in the term Z_t in relationship (1), falls and, *ceteris paribus*, the impact of output fluctuations x_t on inflation is dampened.

The situation in most economies in the aftermath of the 2008-09 Great Recession, and to an even greater extent after the COVID-19 pandemic, can be represented in Figure 4 as one of large *negative* output, unemployment, and inflation gaps (e.g. point A). What can be said about the inflation response? In the Great Recession, the features of a flat PC seemed to persist in the US, so that a "missing deflation puzzle" emerged, where the collapse of about 10% of GDP relative to trend in 2009, and the upsurge on unemployment around 10%, was followed by a modest decline of 1.5% of inflation. Likewise, scholars registered a "missing reflation puzzle" as the joint monetary and fiscal stimuli activated by the US policymakers reset GDP and *job creation* on the previous track within a couple of years with almost no sign of wage and price tensions. The extent to which the pandemic may have **muted the factors flattening the PC**, or replaced them with factors working in the opposite direction, is central in the current debate about the post-pandemic inflation outlook.

In the euro area, however, concerns at the European Central Bank (ECB) and among scholars throughout the 2010s were of opposite sign: a deflationary drift with **de-anchoring of expectations** seemed under way (Draghi 2014, 2016). The consensus on the worldwide flattening of the PC was challenged, pointing to its "steepening" (e.g. Riggi and Venditti, 2014, 2015; Bank of Ireland, 2014; Oinonen and Paloviita, 2014). Parallely, direct evidence of the downward de-anchoring of expectations was detected in various studies (Buono and Formai, 2016; Fracasso and Probo, 2017; Nautz et al., 2017; Natoli and Sigalotti, 2017). In addition to anaemic recovery in the euro area for longer than in the US,

⁸ Think of the example of negotiation made above. Clearly, the inflation target of the central bank, *if credible*, would act as a benchmark or coordination device to achieve the agreement on the indexation of the nominal wage rate.

⁹ Gros (2019) provides a critical discussion of this consensus view.

the above anomalies behind the PC seemed to account for the persistent gap between actual and targeted inflation.

As will be seen in the subsequent sections, the de-anchoring of inflation expectations (now upwards) is drawing attention as a **possible amplifier** of post-pandemic inflationary pressures. To understand this point, let us take a step backward and ask the following question concerning expectations formation: under what conditions do agents have reasons to believe in the central bank's ability to achieve its inflation target? Indeed, it is not enough to posit that achieving the inflation target is one possible equilibrium of the economy. This question is addressed in the literature that introduces various forms of **boundedly-rational expectations**, where agents understand the process that generates inflation (e.g. a relationship like (1)) and use it to update their expectations in the light of the evidence¹⁰. As a consequence, confidence in the inflation target becomes a dynamic adaptive process, where it is crucial that the central bank is able to keep inflation (and output) on track as much as possible; for large and persistent deviations induce also expectations to de-anchor from the central bank's target.

On this account, it is also worth considering that, as shown by Tamborini (2019) and Passamani et al. (2021), the de-anchoring of inflation expectations may interact (or, from the econometrician's point of view, interfere) with the effect of the structural slope of the PC. If everybody in the economy uses a relationship like (1) to estimate the expected inflation π_t^e , which is a determinant of actual inflation itself, the result is that the latter will be determined by the output gap x_t and by the *forecast errors on* x_t . As a consequence, though the structural slope β_2 does not change, the PC *appears steeper* when agents overestimate the output gaps, amplifying their effect on inflation, whereas it *appears flatter* when agents underestimate the output gaps, dampening their effect on inflation.

The actual cyclical position of the economy is also to be considered. For instance, Passamani et al. (2021) explain the observed steepening of the euro area PC in the prolonged depression of the 2010s in connection with a sequence of overestimated *negative* output gaps. In other words, if in a slump **pessimism** about the future development of the economy takes hold, the consequence may be a stronger negative effect on inflation, at least until output forecast errors are corrected by (robust) contrary evidence. If we apply this scheme to the present conjuncture, we may expect to see a seemingly steeper PC, with stronger inflationary pressure of the recovery, if general **exuberance** boosts overestimation of *positive* output projections.

¹⁰ Examples are Evans and McGough (2018), García-Schmidt and Woodford, (2019), Corsello et al. (2019), Gobbi et al. (2019).

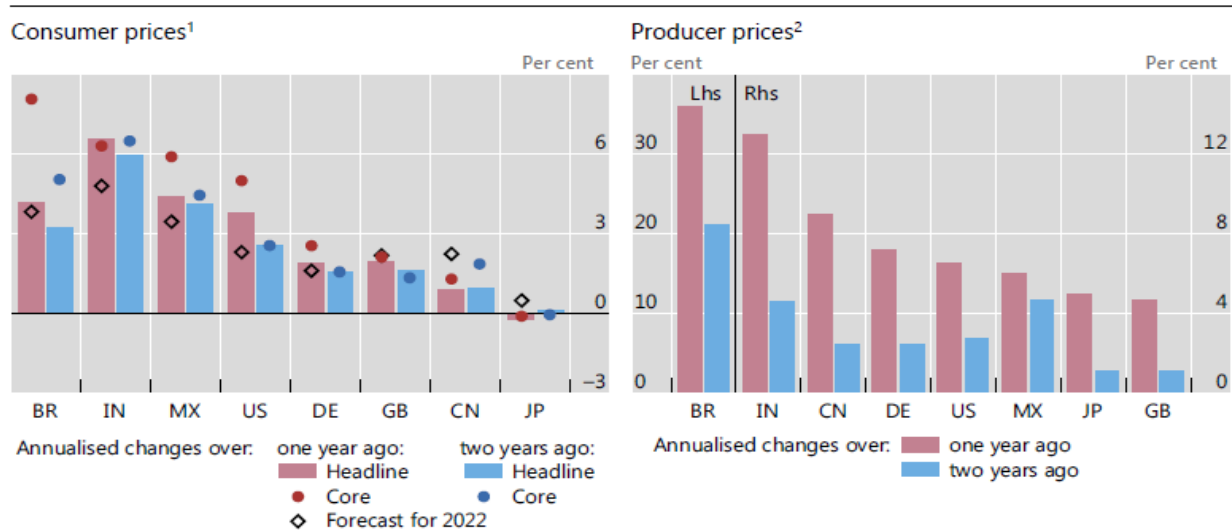
3. DRIVERS OF THE RECENT RISE IN INFLATION

In this section we try to understand what have been the drivers of the rise in inflation observed in 2021.

3.1. Base effects

The **base effects** that we consider here are those changes in the year-on-year inflation rate in a given month that stem from deviations of the month-on-month rate of change in the same month one year earlier (the base month) from the usual seasonal pattern. These effects can help explaining the surge in measured inflation that took place in the first semester of 2021: one year earlier was when the pandemic hit the advanced economies and caused an abrupt fall in aggregate demand that led to the rapid decline of the prices of many goods and services¹¹; prices which then bounced back as these economies recovered. **This pattern differs across sectors** and is particularly significant for the price of some services and commodities (see Budianto et al., 2021, and Figure 5).

Figure 5: Base effects on inflation



¹ Headline and core inflation as of May 2021 and forecasts as of June 2021. ² As of May 2021.

Source: Budianto et al. (2021).

Indeed, after the first human-to-human transmission of COVID-19 was announced on 22 January 2020, economic activity was severely disrupted in those service sectors that are more vulnerable to social distancing, lockdowns and drop of consumer confidence. Hotels and airfares were especially affected by the worldwide collapse of the demand for transport and travel—sectors accounting for two-thirds of global energy consumption—which triggered a more than 60% plunge in oil prices¹². Since May 2020 oil prices rebounded and are now back to pre-COVID-19 levels, while metal prices and food prices are close to 50% and 30% higher than pre-crisis levels (Danske Bank, 2021a).

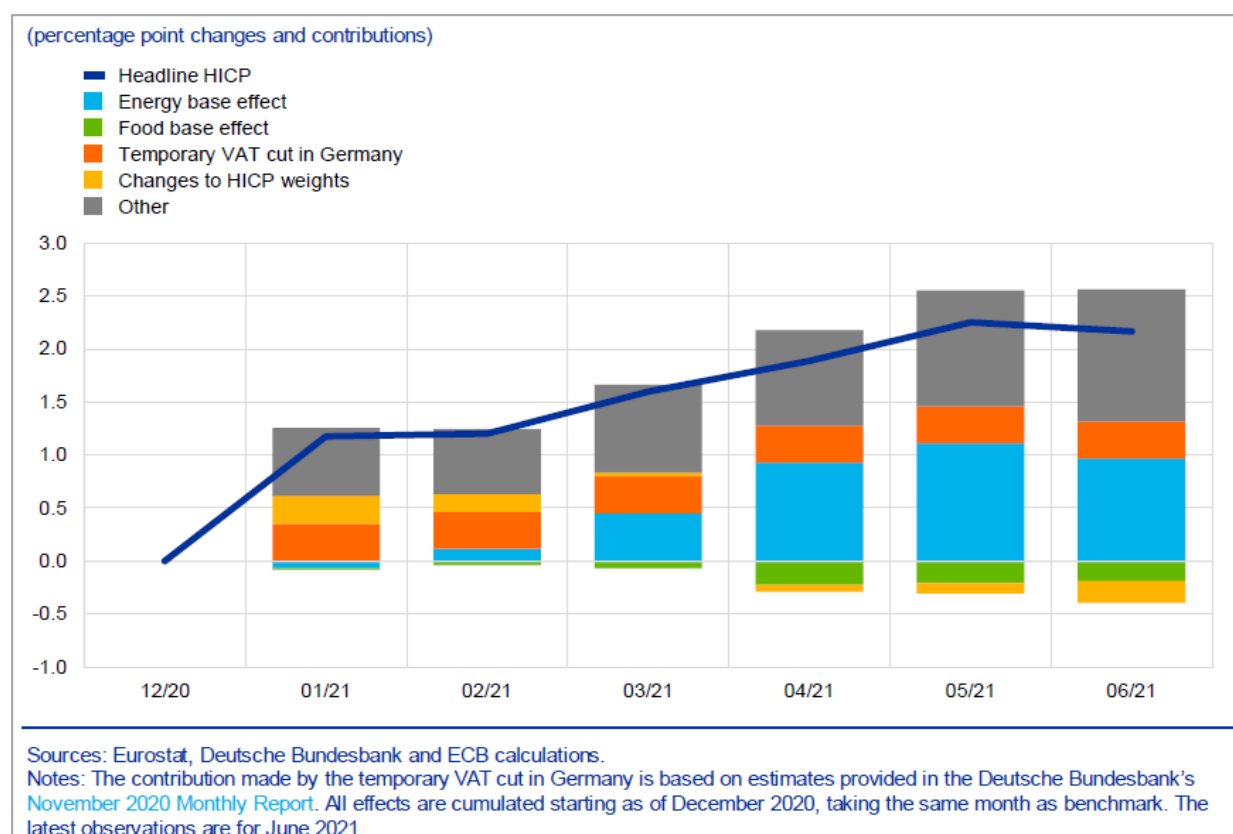
An assessment of how much the recent worldwide rise in inflation can be ascribed to base effects is provided by Budianto et al. (2021), that measure inflation over the past two years rather than

¹¹ By using an event study of inflation around global recessions and a factor-augmented vector auto-regression model, Ha et al. (2021) find that the decline in global inflation from January to May 2020 was four-fifths driven by the collapse in global demand and one-fifth by plunging oil prices (with some offsetting inflationary pressures from supply disruptions), while the subsequent surge in inflation was mostly driven by the sharp increase in global demand.

¹² See Wheeler et al. (2020), who notice that oil prices registered their largest one-month fall on record in March 2020, with the spot price of the European Brent falling by 85% between 22 January and 21 April 2020 (when it reached its trough), and the price of the West Texas Intermediate falling into negative territory on 20 April 2020.

comparing current prices with the depressed ones of one year ago. It emerges from this exercise that **"annualised price changes over the past two years are noticeably lower** than the latest year-on-year figure" (see Figure 5). Also, ECB (2021a) emphasises how the recent rise in headline inflation recorded in the euro area is **heavily influenced by base effects and other temporary factors** (see Figure 6). Base effects are even more relevant for Germany, whose inflation rate—the highest in July 2021 since December 1993, and the highest among the large euro area economies—is also affected by the reduction in value-added tax rates that was implemented from July to December 2020 in order to sustain domestic demand in the midst of the COVID-19 crisis (Statistisches Bundesamt, 2021).

Figure 6: Contributions of base effects and other temporary factors to changes in annual HICP inflation in the euro area (December 2020 – June 2021)



Source: ECB (2021a).

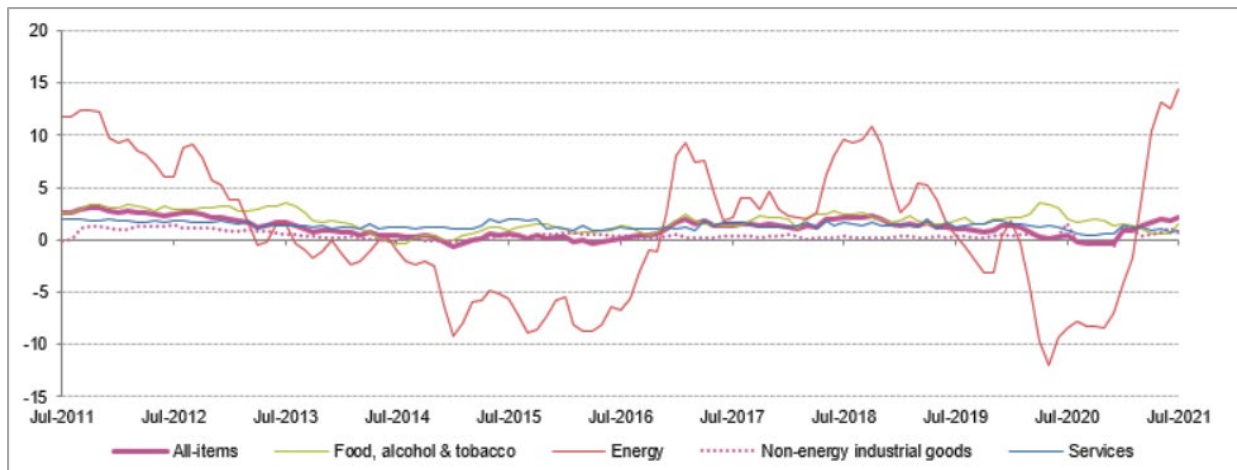
3.2. Core inflation and NEIG

As seen above, base effects have been very strong for oil prices, which is consistent with the fact that, historically, prices of food and energy are highly volatile and subject to large fluctuations. This is why analysts and policymakers focus on so-called **core inflation**, which excludes food and energy components from the consumer price index in calculating inflation, when they want to measure underlying inflation trends and predict future headline inflation in order to provide a reliable compass to guide monetary policy.

Hence, some commentators find reassuring that, although US all-items consumer price index was up 5.4% compared to the year earlier in July 2021 as in the previous month, **annual core inflation declined** from 4.45% in June to 4.2% in July, signalling that reopening problems such as labour shortages and supply chain disruptions begin to exert a lesser role in the US price-setting process. Core inflation numbers seem also to indicate that the euro area is not going to suffer from a too-high

inflation problem in the next future. Indeed, one can check (see Table 1) that—excluding energy, food, alcohol and tobacco—annual inflation in the euro area eased to 0.7% in July 2021, from higher levels in the previous months. Thus, the acceleration of the headline inflation rate recorded in July in the euro area with respect to the previous months is not due at all to the core components of the HICP: although their weight in the all-items price index are less than 10%, around 60% of the July's HICP annual rise can be attributed to energy prices. As a matter of fact, the fluctuation that characterised energy prices in the euro area during the pandemic was not much ampler than the others exhibited by these prices in the last decade (see Figure 7).

Figure 7: Euro area annual inflation and its main components (July 2011 – July 2021) percent



Source: Eurostat.

Prices of non-energy industrial goods (NEIG) and services are the two components of the core HICP index considered by the ECB, whose weights in the all-items HICP basket are now, respectively, 26.9% and 41.8% (see Table 1). The NEIG basket contains a range of manufactured goods, such as cars, computers, pharmaceutical and personal care products, clothing and footwear. Their prices are formed throughout pricing chains ("pipelines") that involve commodities, intermediate goods, imports, labour and other productive inputs. Prices of intermediate goods are particularly relevant for the early stages of these pipelines, and changes in these prices take time to achieve their maximum impact on NEIG prices.

As remarked by ECB (2021a), **NEIG pipeline price pressures have increased** over recent months in the euro area: "*Surging commodity price inflation, substantial increases in shipping costs and insufficient supply of some raw materials and intermediate products have led to input cost pressures for the euro area. Such input cost shocks create "pipeline" price pressures at the early stages of the production and distribution chain*" (p.63). In contrast, price pressures have so far been smaller at later stages of the pricing chain, with domestic producer price inflation for non-food consumer goods that appears subdued relative to that for intermediate goods, although well above its long-term average. Moreover, inflation of import prices for non-food consumer goods (imports of final goods account for around 12% of the NEIG basket) has been negative, mainly as a result of the appreciation of the euro compared with its level a year ago.

Table 1: Euro area annual inflation and its main components
(July 2020 and February 2021-July 2021)

	Weight (%) 2021	Jul 2020	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021
All-items HICP	1000.0	0.4	0.9	1.3	1.6	2.0	1.9	2.2
<i>All-items excluding:</i>								
<i>energy</i>	905.0	1.4	1.2	1.0	0.7	0.9	0.8	0.9
<i>energy, unprocessed food</i>	854.5	1.3	1.2	1.0	0.8	0.9	0.9	0.9
<i>energy, food, alcohol & tobacco</i>	687.4	1.2	1.1	0.9	0.7	1.0	0.9	0.7
Food, alcohol & tobacco	217.6	2.0	1.3	1.1	0.6	0.5	0.5	1.6
<i>processed food, alcohol & tobacco</i>	167.1	1.6	1.3	1.0	0.9	0.7	0.8	1.5
<i>unprocessed food</i>	50.5	3.1	1.5	1.6	-0.3	0.0	-0.3	1.9
Energy	95.0	-8.4	-1.7	4.3	10.4	13.1	12.6	14.3
Non-energy industrial goods	269.1	1.6	1.0	0.3	0.4	0.7	1.2	0.7
Services	418.3	0.9	1.2	1.3	0.9	1.1	0.7	0.9

Source: Eurostat.

It is also stressed by ECB (2021a) that upward pressures from recent input cost developments may still affect NEIG inflation, as the pass-through to consumer prices usually takes more than one year. However, the pass-through is not automatic, depending on many factors (consumer demand, capacity utilisation, the stock of inventories, firms' propensity to absorb cost pressures by reducing profit margins, the competitive environment), and a cost-push shock emerging at the early stage could well have no impact on final consumer prices, or on the contrary have a strong impact especially if—as it might be the case in the aftermath of the pandemic—consumers have some pent-up demand and unintended savings to finance it¹³.

In any case, ECB (2021a) concludes that **somewhat higher NEIG inflation would not lead to substantially stronger inflation pressure in the euro area**, since "NEIG inflation has tended to be relatively subdued in the euro area, averaging 0.6% from 1999 to 2019, compared with average HICP inflation excluding energy and food of 1.4% over the same period" (p.66). Indeed, "underlying inflation dynamics continue to be predominantly driven by services inflation (with a weight of around two-thirds in the HICP excluding energy and food), *for which wages, and not intermediate products or raw materials, represent the lion's share of input costs* [emphasis added]" (p.66).

¹³ The ECB staff estimates that the stock of accumulated excess savings in the euro area amounted to EUR 540 billion in the first quarter of 2021 (7.4% of annual disposable income in 2019).

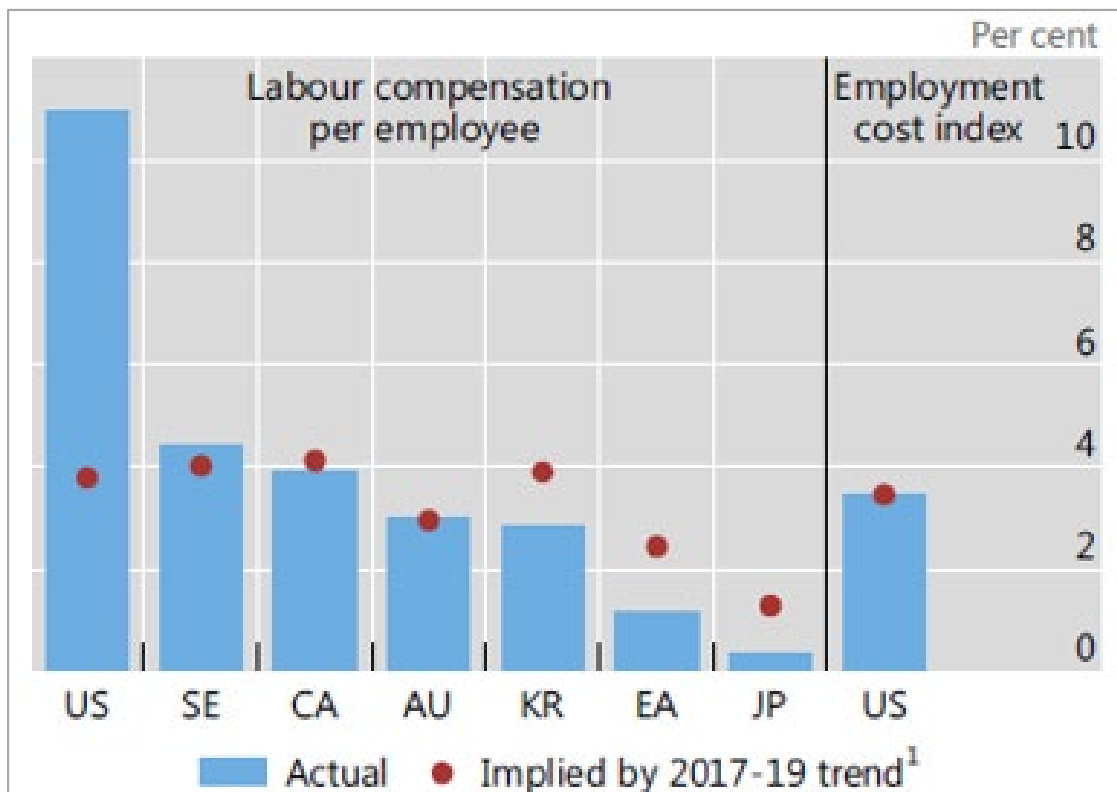
4. SHOULD WE EXPECT A MORE PERSISTENT RISE IN INFLATION?

This section focuses on the possibility that the ongoing increase in prices leads to a more persistent rise in inflation. It is widely recognised that such possibility can materialise if the current inflationary shock triggers **second-round effects** associated to i) **sustained wage increases** in excess of labour productivity growth (i.e., sustained increases in unit labour cost), ii) **de-anchoring of expectations**, iii) prolongation of very **expansionary monetary and fiscal policy**.

4.1. Wages

The ECB's chief Economist, Philip Lane, said recently that "*to generate persistent inflation you need a strong labour market*" (Lane, 2021). Consistently, one may argue that the labour slack consequent to the COVID-19 pandemic rules out the possibility that the ongoing increase in prices can give rise to significant wage pressures. Actually, the available evidence shows that up to now there are **few signs across the advanced economies of an acceleration in wage growth**. For instance, Budiando et al. (2021) show that increases in compensation per employee (CPE) are below their pre-pandemic trends in the euro area, Japan and Korea, whereas they are above their trend in the United States, where, however, they seem to reflect changes in labour force composition caused by the concentration of job losses among low-wage workers during the pandemic (see Figure 8)¹⁴.

Figure 8: Increase in labour compensation per employee (between Q4 2019 and Q1 2021)



¹ Per cent increase in measure of labour costs implied by extrapolating the linear trend of each series calculated between January 2017 and December 2019 to the latest observation.

Source: Budiando et al. (2021).

¹⁴ As Budiando et al. (2021) underline, the US Employment Cost Index wage measure, which controls for changes in labour force composition, gives no indication of an acceleration in wage growth.

Also, ECB (2021a) confirms overall the moderate wage outlook characterising the euro area, with some caution due to the fact that many wage indicators are affected by the job retention schemes introduced since the onset of the pandemic: indeed, growth in CPE rose from 1.0% in the fourth quarter of 2020 to 1.9% in the first quarter of 2021 (close to its long-run average of 2% since 1999), but this acceleration was the result of a slower growth in compensation per hour (from 5.2% in the fourth quarter of 2020 to 3.2% in the following quarter) compensated by the increase in hours worked coming from the reduced recourse to short-time work schemes. The decline in the annual growth rate of negotiated wages, going from 2.0% in the fourth quarter of 2020 to 1.4% in the first quarter of 2021 constitutes an additional evidence that wage increase remains contained in the euro area.

Finally, it is not surprising that base effects associated to the most recent CPE growth are strong and asymmetric across sectors, since the fall in CPE growth was particularly significant in the second quarter of 2020, with high-contact services that were more severely hit than low-contact services (ECB, 2021). Even in Germany, which has now the highest inflation rate among the large euro area economies, there is no evidence that wage pressure is building up: as documented by Wolff (2021), collectively agreed monthly earnings fell substantially in 2020, but in 2021 most wage settlements do not envisage sizeable wage increases, revealing some preference on the part of organised labour during the pandemic to **prioritize job security and safer labour conditions** (such as the possibility to work at home) over higher wages¹⁵.

However, the absence of a generalised upward push in wages in the euro area does not exclude that some **temporary labour shortages** might occasion wage increases in sectors that experience demand surges after re-opening. But, as remarked by Danske Bank (2021b), there are "*few signs of widespread labour shortages emerging in the euro area, as more workers will re-join the labour market with the expiration of furlough schemes*" (p.1).

Nevertheless, in a longer-term perspective, one could expect that those workers whose **real wages have been eroded by the pandemic and the recent price increases will seek to make up lost ground**. Furthermore, Bonatti et al. (2021) point out that, in a post-COVID economy that will be different from the pre-COVID economy, "the mismatches of skills required from and possessed by workers employed in different sectors, the wide regional disparities in income and employment opportunities, the low territorial mobility of people in Europe can make the labour market at the same time depressed and overheated: depressed due to low labour-market participation and "subsidised" underemployment, overheated due to the increase in the demand for skilled labour in the sectors and in the areas that are rapidly recovering" (p.27). In this context, "*substantial wage increases might be obtained by those groups of workers (such as public employees) that enjoy bargaining power and political protection. And this while at the same time other sectors and workers are suffering, with governments that will try to subsidize them indefinitely whether or not they have some real chance of recovery. If this scenario were to materialize in some euro area countries, the inflationary flare-up that will accompany the post-COVID recovery could turn into stagflation in such countries*" (p.28).

4.2. Expectations

The possibility that **stagflation** will not be relegated to a few particularly problematic countries but will be a more general phenomenon involving most advanced economies in the not-too-distant future is deemed probable by some commentators. Their argument is well summarised by Roubini (2021): the

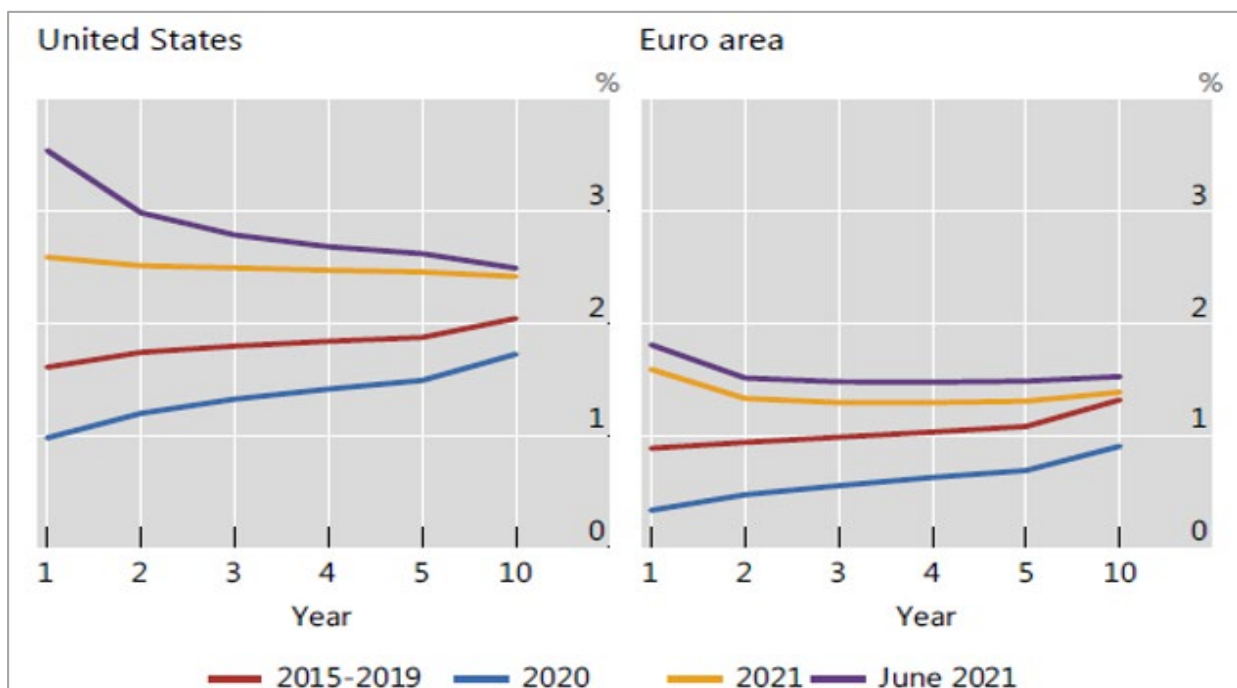
¹⁵ The latest IG Metall wage agreement (covering around 3.8 million industrial workers and usually a benchmark for other sectoral wage settlements) envisaged a 2.3% wage increase for the period to October 2022 (amounting to a 1.5% annual increase). However, the news that Germany's annual CPI inflation accelerated more than expected to hit a 13-year high at 3.8% in July prompted the leading services sector trade union Ver.di to call for strong pay rises.

unprecedentedly high private and public debt looming in the world economy after the pandemic crisis, coupled with some ongoing structural trends, will give central banks "little choice but to monetize massive fiscal deficits to forestall a debt crisis. With both public and private debts having soared, they are in a debt trap. As inflation rises over the next few years, central banks will face a dilemma. If they start phasing out unconventional policies and raising policy rates to fight inflation, they will risk triggering a massive debt crisis and severe recession; but if they maintain a loose monetary policy, they will risk double-digit inflation – and deep stagflation when the next negative supply shocks emerge"¹⁶.

And, so this narrative goes, there are many developments that make such shocks more likely: among them, **renewed protectionism** that give more pricing power to domestic firms and allow them to pass on higher production costs to consumers, **reshoring of manufacturing** to high-cost regions that the supply chain disruptions associated to the pandemic is accelerating, increasing costs due to **cybersecurity concerns** and to the green transition, **rising minimum wages** and other government measures that will strengthen labour bargaining power under the pressure of forces pushing for less inequality, **demographic ageing** in advanced economies and in China (see, e.g., Guilford, 2021).

It is significant, however, that **until now financial markets do not believe, neither in the United States nor in euro area, in a regime shift** that will bring the inflation rate to a level persistently and substantially higher than the central banks' 2% target. Indeed, market-based measures of inflation expectations that can be extracted from inflation-linked swaps or break-even inflation rates derived from inflation-linked bonds reveal that the term structure of inflation expectations shifted up in first months of 2021, with investors expecting higher inflation in the short run but anticipating that it will decline again in the medium run (see Figure 9).

Figure 9: Term structure of inflation swap rates



Source: Budiando et al. (2021).

US inflation swaps in June started at levels around 3% for 1-year contracts, approaching levels close to the Fed's target for longer maturities, whereas the euro area's term structure was entirely below 2%,

¹⁶ We delved into this problem also in Bonatti et al. (2020).

reaching 1.5% at the longer end. Thus, one may conclude that "the recent increase in medium-term inflation expectations seems better described as a normalisation in response to an improved economic outlook, with large relative price changes, rather than a sustained pickup in trend inflation" (Budianto et al., p.5).

This conclusion is consistent with the findings of Goel and Malik (2021), who utilise the information contained in the yield curve for the major advanced economies' government bonds to decompose the rise in nominal yields for different maturities that took place in the first months of 2021: on the basis of this decomposition, they find that in both the United States and the euro area the rise in inflation expectations was the primary driver of the rise in nominal yields over the near term, whereas the rise in real yields played a larger role (especially in the United States) in driving the rise in longer-term nominal yields.

Considering that the real yields are sensitive to the economy's growth prospects, the rise in longer-term nominal yields was probably reflecting more the improvement in the economic outlook brought about by the progress in vaccination and re-opening of most economic activities in the first part of 2021 than the anticipation of higher inflation in the medium to long run. The decline in long-term government bond yields across advanced economies since last May, concurrently with the spread of the Delta variant of COVID-19 in many countries and the consequent worldwide fall of optimism and risk appetite, occurred despite inflation in the United States and the euro area did not show clear signs of cooling. This may confirm that **investors are not particularly concerned about the possibility that inflation will remain at substantially higher levels in the future.**

One can summarise the discussion above by stating that investors have come around to the central banks' view that the current spike in price gains are transitory, fading as supply jams clear and the pressure on wages is relieved by the return of workers to the labour force. However, **one can question the financial markets' ability at predicting future inflation**, by showing in particular that long-term measures of inflation compensation derived from bond yields are better explained by a long backward average of inflation than by any indicator of forward inflation (Gagnon and Sarsenbayev, 2021a, 2021b). This contributes to make the inflation process more inertial, as it is especially true in the euro area, where inflation is highly persistent and its sensitivity to changes in underlying economic conditions is typically low (Abdih et al., 2018).

The fact that it takes time before changes in inflation become embedded in inflation expectations may help explaining why the latter have moved up only marginally in the euro area as prices have started increasing. But this fact implies also that, once a prolonged period of sustained rise in inflation has led to the de-anchoring of inflation expectations, the re-anchoring of these expectations around the central bank's target takes time and involve a high cost in terms of foregone output and high unemployment.

5. FED VERSUS ECB: INFLATION AND POLICY CHALLENGES

In the face of the ongoing prices increase, **US central bankers and their euro area counterparts have to deal with opposite credibility problems**: the former have to convince the public that they will not allow inflation to stay at a level significantly higher than 2% for too long, whereas the latter have to convince the public that they will not allow it to return to levels much lower than 2%, i.e. levels around which euro area inflation was stuck for years until a few months ago¹⁷.

According to most Fed officials, the peculiar nature of the recession triggered by the COVID-19 pandemic, with its supply chain disruptions and its uneven sectoral impact, has justified a tolerance towards inflation by the Federal Reserve that would have not been appropriate under normal circumstances. However, inflationary pressures have emerged more quickly and by a larger magnitude than they had initially forecast, thus convincing the majority of the Federal Open Market Committee's members at its July meeting that the US central bank should be ready to start tapering its monthly USD 120 billion bond-buying programme earlier than previously anticipated, namely by the end of 2021. In this way, they are trying to strike a balance, showing their determination to intervene if prices will continue to rise at the pace of recent months, but compatibly with the Fed's goal of achieving maximum employment, which could be jeopardised if the post-COVID recovery were stifled by a premature reduction in monetary stimulus.

Other risks implied by a partial removal of unconventional monetary measures in support of the US economy appear to be of second-order importance for the Fed officials. Firstly, when the announced tapering and the rise of policy rates will start, global investors will have already had a lot of time to adjust their portfolios, and if the policy tightening will be gradual and implemented in parallel with progress in the US economic recovery, it will probably not trigger instability at the core of the financial system. Only heavily indebted private and public entities at the periphery of the system are likely to be severely hit. Secondly, the worldwide appetite for safe dollar-denominated assets guarantees that the US Treasury will not be particularly in trouble in financing the huge federal deficits envisaged for the next years even in case of some monetary tightening by the Fed.

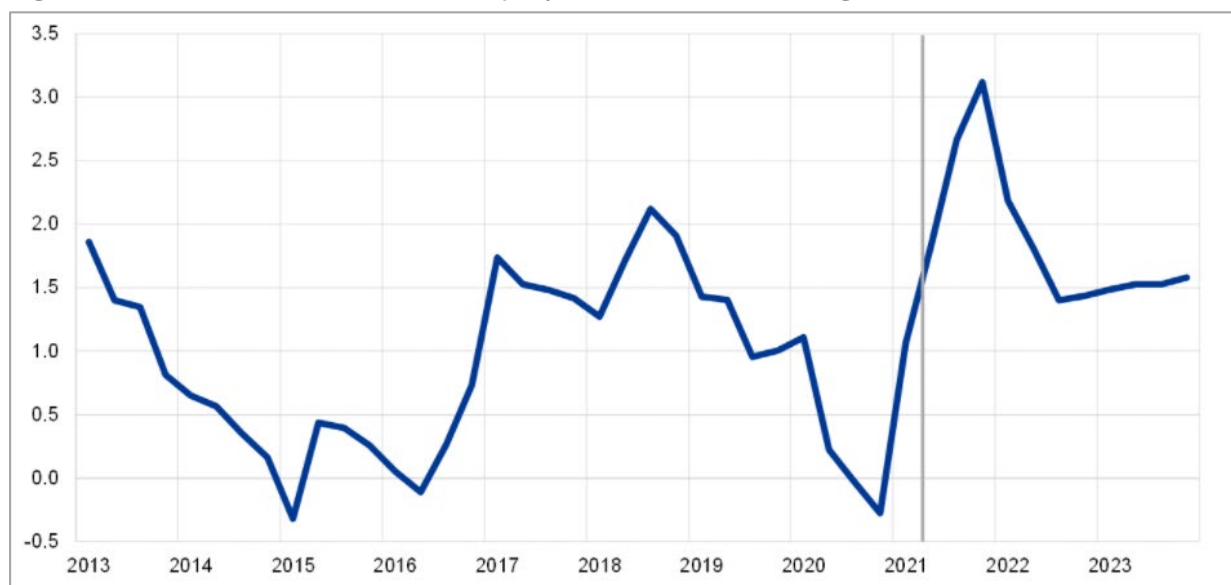
The ECB is in a more delicate position compared to the Fed, especially if the current trend of rising inflation were to continue in the euro area longer than predicted. To see why, consider that the ECB's strategy review was primarily meant to give credibility to its inflation target. Both the shift from "below, but close to, 2%" to a symmetric 2% inflation target, and the recalibration of the forward guidance on interest rates, were supposed to provide a clearer anchor for longer-term inflation expectations and prevent a premature tightening of monetary policy (as the ECB did in the past)¹⁸. However, it is hard to believe that the ECB will reach its 2% target on a durable basis if its own staff's baseline projections predict that the euro area's annual inflation rate—after having peaked at 2.2% in 2021—will decline to 1.7% in 2022 and 1.5% in 2023 (see Figure 10). One may think that reasonable people's expectations of inflation should gravitate around the central bank's predictions rather than around its target, thus undermining the credibility of the ECB's objective. Therefore, in spite of the strategy review, **the**

¹⁷ Patrick Krizan, an economist with Allianz SE in Munich, effectively summarises the difference: "The Fed was tested on the upside. And the ECB will be tested on the downside".

¹⁸ These are the safeguards that a recalibrated forward guidance should provide, according to the Governing Council of the ECB, in order to prevent a premature tightening of monetary policy: "A recalibrated forward guidance should contain three key conditions that should be met before interest rates were raised: first, inflation should reach the target well in advance of the end of the projection horizon, in order to ensure that the lift-off decision was based on firm foundations and not exposed to the volatility of longer-horizon projection errors; second, the Governing Council should be confident that the target would be reached on a durable basis; and, third, the Governing Council should not consider raising rates unless underlying inflation was also judged to have made satisfactory progress towards two per cent. This was an extra safeguard against a policy tightening in the face of cost-push shocks that might elevate headline inflation temporarily but fade quickly. Finally, a preamble should make clear that the new guidance was in the service of ensuring robust convergence to the target over the medium term" (ECB, 2021b).

systematic inconsistency between its target and its projections that has characterised the ECB in the last decade still persists, making unlikely that expectations of inflation in the euro area will be anchored around the ECB's symmetric 2% aim¹⁹.

Figure 10: Euro area HICP: actual and projected, annual % change



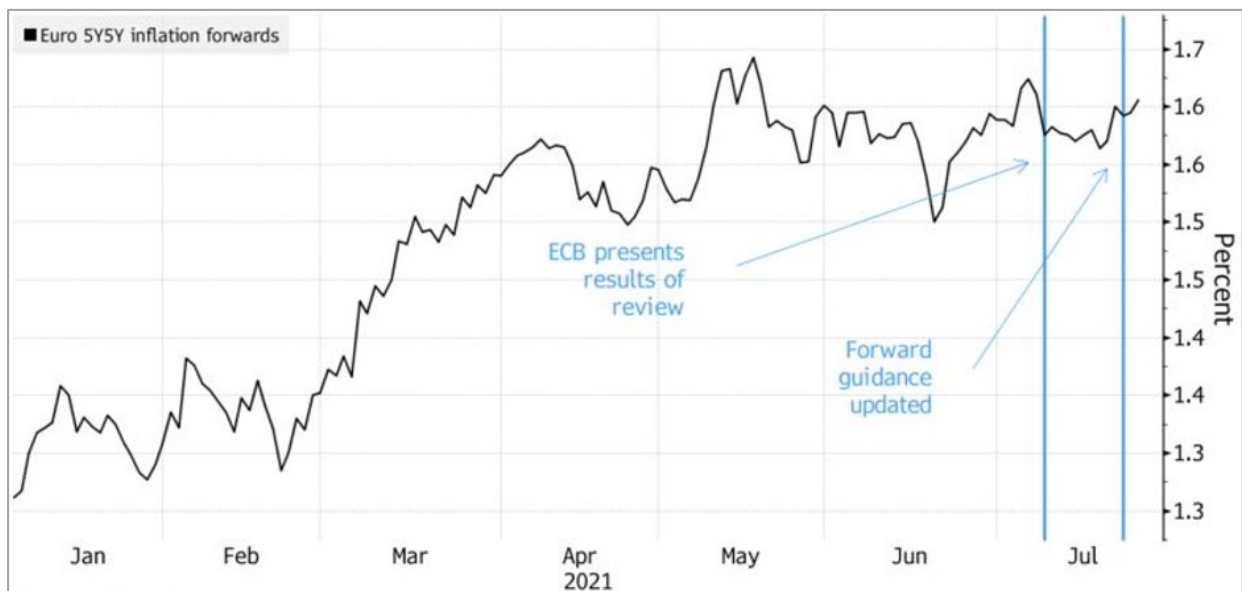
Note: The vertical line indicates the start of the projection horizon.

Source: Eurosystem staff macroeconomic projections for the euro area (September 2021).

In the light of what discussed above, it is not surprising—although people may need more time to learn the new ECB's strategy—that **there was no sign of changes in market-based inflation expectations** when the ECB announced the results of its strategy review and updated its forward guidance (see Figure 11). Paradoxically, ECB officials have to rely on some upside surprises, i.e., shocks pushing oil prices at levels higher than predicted, unexpected price-wage spirals and similar, in order to lift inflation above ECB Staff's baseline projections, thus breaking "*the vicious pre-pandemic circle of low demand and low inflation*", and "*bringing medium-term inflation closer to the Governing Council's aim*" (Schnabel, 2021).

¹⁹ Granziera et al. (2021) find evidence that ECB's medium term projections systematically overpredict (underpredict) inflation when the latter is lower (higher) than its target, and interpret this result by conjecturing that—because of the ECB mandate—the level of inflation at the time of forecasting might influence the way in which new information is incorporated in the forecast. They also note that this bias is consistent with a strategic behaviour of a central bank aiming at steering expectations towards the target. In contrast, Kontogeorgos and Lambrias (2019) conclude that the ECB projections for inflation are unbiased and efficient on average.

Figure 11: Market-based inflation expectations in the euro area, 2021



Source: Bloomberg.

However, a worse credibility problem will arise for the ECB if, contrary to its forecasts, demand and supply shocks associated to the post-pandemic structural factors mentioned in section 4 will push medium-term euro area inflation substantially and persistently above the 2% target. Differently than the Fed, that can afford to reverse its policy stance without fear of causing excessive turmoil in its jurisdiction, under these circumstances the ECB would probably be more in trouble. In a monetary union of sovereign states where some member countries are exposed to the risk of a public debt crisis, the central bank's choice of whether, when and how much to taper its purchases of government bonds and raise its policy rates to dampen inflationary pressures will inevitably appear controversial and highly political. Especially **in a scenario of rising prices** where the high-public debt countries tend to grow less than the low-public debt countries, **it would be very problematic for the ECB to find a balance among the different national interests and attitudes towards inflation.** This is a hazardous scenario for the future of the euro area, that the Recovery and Resilience Facility aims at averting, but that nobody at the moment can rule out as overly unrealistic²⁰.

²⁰ More on this in Bonatti et al. (2020).

6. CONCLUSION

In this paper we sought to address three main issues that are currently under widespread discussion as the euro area's countries are on the way of overcoming the COVID-19 pandemic, and their economies are recovering from its catastrophic effects. First, assess the ongoing developments on the inflation front, which shows signs of acceleration all over the world. Second, discuss whether the combination of return to normality of economic activity with the strong policy stimuli under way may lead to overheating the economies. Third, compare realistic scenarios for policy purposes.

To begin with, we have reminded in section 2 that understanding and predicting inflation remain difficult tasks. For the co-movements of prices that are recorded as "inflation" are at the same time the result of microeconomic forces that operate at the level of different sectors of goods, services, and workers categories.

Accordingly, in subsequent sections 3 and 4 we provided a detailed overview of these micro- and meso-developments. The "consensus view" by the majority of observers, and main central banks as well, seems to be that no systematic common trends are detectable across sectoral prices and wages, while in some sectors price pressures are in fact present owing to specific demand-supply factors and labour market conditions. Overall, this view points to the conclusion that the recent spikes in inflation consist of the natural oil in the wheels of recovering economies, and **are bound to be temporary deviations from trend**. It is often also stressed that in several countries, especially in the euro area, the pre-pandemic inflation trend was stagnating well below the central bank's target, so that the current acceleration is nothing else but **a long overdue catching-up with the target**.

In section 4, however, we also pointed out a number of **factors that might overturn the optimistic scenario**, triggering a more persistent rise of inflation with **risks of a "1970s" stagflation scenario**. We focused on two factors: labour market conditions and wage bargaining, and de-anchoring of inflation expectations (relevant to both the labour markets and the financial markets). On this front, too, the data and studies we surveyed **converge towards a scenario where temporary factors seem prevailing** over entrenched drivers, some of which seem in fact in retreat with respect to the first semester of 2021. We also warned that the interplay of **inflation expectations** with labour market and financial market conditions have historically proved **powerful boosters of sudden and unexpected inflation spirals**.

Finally, we argued in section 5 that, though the outlook of a vibrant recovery with inflation remaining subdued is concrete, the future policy scenarios remain challenging. Notably, the Fed and the ECB face two opposite risks, the former the upside risk of pushing inflation above target too much and too long, the latter the symmetric downside risk. Moreover, the ECB will also have to manage the post-pandemic scenario together with the revision of its policy strategy, with predictable interaction, or interference, between the two tasks. This will be made more problematic by the fact that **the systematic inconsistency between its target and its projections** that has characterised the ECB in the last decade **still persists**, making unlikely that expectations of inflation in the euro area will be anchored around the new ECB's symmetric 2% target.

Overall, our view is that this a time of **careful monitoring of economic developments**, against the background of the actual evolution of the pandemic, with **prudent, adaptive and flexible**, policy choices, rather than one of strong, irreversible commitments into a still foggy future.

REFERENCES

- Abdi, Y., Lin, L., Paret, A.-C. (2018). "Understanding Euro Area Inflation Dynamics: Why So Low for So Long?", IMF Working Paper, No. 18/188, available at: <https://www.imf.org/en/Publications/WP/Issues/2018/08/22/Understanding-Euro-Area-Inflation-Dynamics-Why-So-Low-for-So-Long-46134>
- Blanchard, O. J., Cerutti, E., Summers, L. (2015). "Inflation and Activity. Two Explorations and their Monetary Policy Implications". IMF Working Paper, No. 15/230, available at: <https://www.imf.org/external/pubs/ft/wp/2015/wp15230.pdf>.
- Bonatti, L., Fracasso, A., Tamborini, R. (2020). "Rethinking Monetary and Fiscal Policy in the Post-COVID Euro Area", Publication for the committee on Economic and Monetary Affairs, Monetary Dialogue Papers, European Parliament, Luxembourg, November, available at: <https://www.europarl.europa.eu/cmsdata/214967/01.TAMBORINI%20final.pdf>.
- Bonatti, L., Fracasso, A., Tamborini, R. (2021). "Monetary and Fiscal Spillovers Across the Atlantic The Role of Financial Markets", Publication for the committee on Economic and Monetary Affairs, Monetary Dialogue Papers, European Parliament, Luxembourg, June, available at: https://www.europarl.europa.eu/cmsdata/235688/01_TAMBORINI_formatted.pdf.
- Budianto, F., Lombardo, G., Mojon, B., Rees, D. (2021). "Global Reflation?", BIS Bulletin No. 43, available at: <https://www.bis.org/publ/bisbull43.htm>.
- Buono, I., Formai, S. (2016). "The Evolution of the Anchoring of Inflation Expectations", Bank of Italy, Occasional Papers, No. 321.
- Calvo, G. A. (1983). "Staggered Contracts in a Utility-Maximizing Framework", *Journal of Monetary Economics*, 12, 383-398.
- Corsello, F., Neri, S., Tagliabracci, A. (2019). "Anchored or De-anchored? That Is the Question", Bank of Italy, Occasional Papers, No. 516, available at: https://www.bancaditalia.it/pubblicazioni/qef/2019-0516/QEF_516_19.pdf?language_id=1.
- Danske Bank. (2021a). "Global Research – The Impact On Inflation Of A Commodities Super Cycle", 26 May, available at: https://externalcontent.blob.core.windows.net/pdfs/Global_Research_260521.pdf.
- Danske Bank. (2021b). "Research Euro Area - Mind the inflation gap", 8 June, available at: [https://research.danskebank.com/link/ResearchEuroarea080621/\\$file/Research_Euro_area_080621.pdf](https://research.danskebank.com/link/ResearchEuroarea080621/$file/Research_Euro_area_080621.pdf).
- Draghi, M. (2014). "Unemployment in the Euro Area", Speech at the Annual Central Bank Symposium in Jackson Hole, August 22, available at: <https://www.ecb.europa.eu/press/key/date/2014/html/sp140822.en.html>.
- Draghi, M. (2016). "How Central Banks Meet the Challenge of Low Inflation", Marjolin Lecture, SUERF Conference, Deutsche Bundesbank, available at: <https://www.ecb.europa.eu/press/key/date/2016/html/sp160204.en.html>.
- ECB. (2021a). Economic Bulletin, Issue 5, available at: <https://www.ecb.europa.eu/pub/economic-bulletin/html/eb202105.en.html>.

- ECB. (2021b). "Account of the monetary policy meeting of the Governing Council of the European Central Bank held in Frankfurt am Main on Wednesday and Thursday", 21-22 July, available at: <https://www.ecb.europa.eu/press/accounts/2021/html/ecb.mg210826~16a0691c87.en.html>.
- Evans, G. W., McGough, B. (2018). "Interest Rate Pegs in New Keynesian Models", *Journal of Money Credit and Banking*, 50, 939-965.
- Fracasso, A., Probo, R. (2017). "When Did Inflation Expectations in the EuroArea De-Anchor?", *Applied Economic Letters*, 24, 1481-1485.
- Friedman, M. (1968). "The Role of Monetary Policy", *American Economic Review*, 58, 1-17.
- Gagnon, J.E., Sarsenbayev, M. (2021a). "Bond yields Are not Good Predictors of Inflation", Peterson Institute for International Economics, Real time Economic Issues Watch, February 17, available at: <https://www.piie.com/blogs/realtime-economic-issues-watch/bond-yields-are-not-good-predictors-inflation>.
- Gagnon, J.E., Sarsenbayev, M. (2021b). "Bond markets Are Shrugging off Inflation Fears, but What Do They Know That We Don't?", Peterson Institute for International Economics, real-time Economic Issues Watch, March 23, available at: <https://www.piie.com/blogs/realtime-economic-issues-watch/bond-markets-are-shrugging-inflation-fears-what-do-they-know-we>.
- Gali, J. (2008). *Monetary Policy, Inflation, and the Business Cycle. An Introduction to the New Keynesian Framework*, Princeton: Princeton University Press.
- García-Schmidt, M., Woodford, M. (2019). "Are Low Interest Rates Deflationary? A Paradox of Perfect-Foresight Analysis" *American Economic Review*, 109, 86-120.
- Gobbi, L., Mazzocchi, R., Tamborini, R. (2019). "Monetary Policy, De-anchoring of Inflation Expectations, and the New Normal", *Journal of Macroeconomics*, vol. 61, Special Issue "Macroeconomics, Rationality and Institutions", 1-15.
- Goel, R., Malik, S. (2021). "What Is Driving the Rise In Advanced Economy Bond Yields?", IMF, Global Financial Stability Notes, No. 2021/03.
- Granziera, E., Jalasjoki, P., Paloviita, M. (2021). "The Bias and Efficiency of the ECB Inflation Projections: A State-Dependent Analysis", Bank of Finland, Research Discussion Papers No. 7/2021.
- Gros, D. (2019). "Global Trends in Inflation: Are Central Banks Barking up the Wrong Tree?", EU Parliament, Monetary Dialogue, September, available at: <https://www.europarl.europa.eu/cmsdata/207621/11.%20CEPS%20FINAL-original.pdf>.
- Guilford, G. (2021). "Inflation threat may be boosted by changes in globalization, demographics and e-commerce", *Wall Street Journal*, July 12.
- Ha, J., Kose, M. A., Ohnsorge, F. (2021). "Inflation During the Pandemic: What Happened? What is Next?", CEPR Discussion Paper No. 16328.
- Havik, K., Mc Morrow, K., Orlandi, F., Planas, C., Raciborski, R., Roeger, W., Rossi, A., Thum-Thysen, A., Vandermeulen, V. (2014). "The Production Function Methodology for Calculating Potential Growth Rates & Output Gaps", COM, European Economy, Economic Papers, No. 535.
- Hooper, P., Mishkin, F. S., Sufi, A. (2019). "Prospects for Inflation in a High Pressure Economy: Is the Phillips Curve Dead or Is It Just Hibernating?", NBER Working Paper, No. 25792, available at: <https://www.nber.org/papers/w25792>.

- Kontogeorgos, G., Lambrias, K. (2019). "An Analysis Of The Eurosystem/ECB Projections", European Central Bank, Working Paper Series No. 2291, available at: <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2291~6b06275781.en.pdf>.
- Lane, P. R. (2021). "Taking Stock: The ECB Strategy Review And Current Challenges For Monetary Policy", OMFIF virtual panel, May 5, available at: <https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp210505~01af2bde18.en.pdf>.
- Lucas, R. E. (1973). "Some International Evidence on Output-Inflation Trade-offs", *American Economic Review*, 63, 326-334.
- Natoli, F., Sigalotti, L. (2017). "Tail Comovement in Inflation Expectations as an Indicator of Anchoring", *International Journal of Central Banking*, forthcoming.
- Nautz, D., Pagenhardt, L., Strohsal, T. (2017). "The (De-)Anchoring of Inflation Expectations: New Evidence from the Euro Area", *The North American Journal of Economic and Finance*, 40, 103-115.
- Passamani, G., Sardone, A., Tamborini, R. (2021). "Inflation Puzzles, the Phillips Curve and Output Expectations: New Perspectives From The Euro Zone", *Empirica*, 1-31.
- Phelps, E. S. (1968). "Money Wage Dynamics and Labour Market Equilibrium", *Journal of Political Economy*, 76, 678-711.
- Phillips, A.W. (1958). "The Relationship Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957", *Economica*.
- Riggi, M., Venditti, F. (2014). "Surprise! Euro Area Inflation Has Fallen", Bank of Italy, Occasional Papers, No. 237, available at: https://www.bancaditalia.it/pubblicazioni/qef/2014-0237/QEF-237.pdf?language_id=1.
- Riggi, M., Venditti, F. (2015). "Failing to Forecast Low Inflation and Phillips Curve Instability: A Euro-Area Perspective", *International Finance*, 18, 47-68.
- Rotemberg, J. J. (1982). "Sticky Prices in the United States", *Journal of Political Economy*, 90, 1187-1211.
- Roubini, N. (2021), "The looming stagflationary debt crisis", Project Syndicate, June 30, available at: <https://www.project-syndicate.org/commentary/stagflation-debt-crisis-2020s-by-nouriel-roubini-2021-06>.
- Schnabel, I. (2021). "Escaping low inflation?", Speech by Isabel Schnabel, Member of the Executive Board of the ECB, at the Petersberger Sommerdialog, Frankfurt am Main, July 3, available at: <https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp210703~f221554ff2.en.html>.
- Staatliches Bundesamt. (2021). Press release #377 from 11 August 2021, available at: https://www.destatis.de/EN/Press/2021/08/PE21_377_611.html.
- Stock, J., Watson, M. (2002). "Has the Business Cycle Changed and Why?", *NBER Macroeconomic Annual*, 17, 159-218.

- Tamborini, R. (2019), "Beware of Pitfalls in the Review of Policy Strategy of the European Central Bank", Policy Brief, School of European Political Economy, LUISS Guido Carli, Rome, No. 5, available at: <https://sep.luiss.it/it/brief/2020/01/24/r-tamborini-beware-pitfalls-review-policy-strategy-european-central-bank>.
- Taylor, J.B. (1980). "Aggregate Dynamics and Staggered Contracts", *Journal of Political Economy*, 88, 1-24.
- Taylor, J. B. (1993). "Discretion Versus Policy Rules in Theory and Practice", *Carnegie-Rochester Conference Series on Public Policy*, 39, 195-214.
- Weidmann, J. (2021). "Inflation Rates Going in the Direction of 5%", Interview in the Frankfurter Allgemeine Zeitung, July 24, 2021, available at: <https://www.bundesbank.de/en/press/interviews/-inflation-rates-going-in-the-direction-of-5--869910>.
- Wheeler, C. M., Baffes, J., Kabundi, A., Kindberg-Hanlon, G., Nagle, P. S., Ohnsorge, F. (2020). "Adding Fuel to the Fire: Cheap Oil during the COVID-19 Pandemic", World Bank Policy Research Working Paper 9320, available at: <https://openknowledge.worldbank.org/bitstream/handle/10986/34129/Adding-Fuel-to-the-Fire-Cheap-Oil-during-the-COVID-19-Pandemic.pdf?sequence=4&isAllowed=y>.
- Wolff, G. B. (2021). "Inflation!?! Germany, the Euro and the European Central Bank", Bruegel, June 9, available at: <https://www.bruegel.org/2021/06/inflation-germany-the-euro-area-and-the-european-central-bank/>.
- Woodford, M. (2003). *Interest and Prices*, Princeton, Princeton University Press.

In this paper we briefly review the macroeconomic theory of inflation, relating it to the recent developments in the advanced economies. Then, we analyse the drivers of the rise in inflation observed in 2021 in the United States and in Europe, and we illustrate the factors that may affect the inflationary scenario of the advanced economies in the longer term. Finally, we discuss what challenges the Federal Reserve and the European Central Bank have to meet in the face of current inflationary pressures.

This paper was provided by the Policy Department for Economic, Scientific and Quality of Life Policies at the request of the committee on Economic and Monetary Affairs (ECON) ahead of the Monetary Dialogue with the ECB President on 27 September 2021.
