STUDY

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European Parliament

Rise in Inflation: Temporary or Sign of a More Permanent Trend?

Compilation of papers

Policy Department for Economic, Scientific and Quality of Life Policies
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Rise in Inflation: Temporary or Sign of a More Permanent Trend?

Compilation of papers

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

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Rise in Inflation: Much Ado About Nothing?

Christophe BLOT, Caroline BOZOU and Jérôme CREEL

Abstract

Euro area inflation reached 3% in August, a rapid increase from August 2020 when it was -0.3%. As the inflation rate now outpaces the ECB's medium-term target of 2%, could it become a concern for the central bank? After showing that the health crisis was unprecedented in its nature and sectoral characteristics, we study the determinants of inflation in the short term and then discuss various elements that could influence the trajectory of future inflation and mitigate inflation fears.

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.

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LIST OF ABBREVIATIONS

CBO	Congressional Budget Office
ECB	European Central Bank
EP	European Parliament
EU	European Union
GDP	Gross domestic product
GFC	Global financial crisis
HICP	Harmonised index of consumer prices
NGEU	Next Generation EU
US	United States
VAT	Value-added tax

EXECUTIVE SUMMARY

- **Recent inflation dynamics are linked to developments in the health crisis**. The health crisis is unprecedented in terms of its scale, its sectoral characteristics and its nature, which presents both the characteristics of a negative supply and demand shock.
- **The current recovery is accompanied by inflationary pressure**. Inflation is at 3% in August 2021 and is now above the European Central Bank (ECB)'s target. This dynamic could worry the ECB.
- **The short-term elements that explain inflation are: the rise in energy prices and the tensions on supply chains**.
- **The factors that could influence inflation in the medium term are numerous**. Some factors seem to be under control, others are more uncertain.
- A look at the recent data suggests that the upswing of inflation would be mainly related to energy prices, changes in value-added tax (VAT) tax rates and a recovery following the most dramatic yearly recession.
- At a disaggregated level, it seems that for most of goods, prices are often below the December 2019 level while prices for some services are higher.
- **The demand shock from European fiscal stimuli and labour market pressures should be small.** Fiscal policy has resembled extended automatic stabilisers rather than fiscal stimulus *per se*. The second-round effects of wages on inflation should be small because of the flattening of the Philips curve.
- **Inflationary pressures due to agents' dissaving behaviour could show a more uncertain path**. A surge in demand could fuel future price increases, especially if the difficulties of supply to adjust persist.
- **All in all, recent inflation developments remain below the price dynamics expected had the ECB's inflation target been met in the past**.

1. INTRODUCTION

The COVID-19 pandemic has triggered an unprecedented world economic crisis. In 2020, gross domestic product (GDP) has fallen by 6.7% in the euro area. From March 2020, the spread of the virus has led governments to impose restrictions on economic activity in most European countries, but people also chose voluntarily to reduce their mobility because of fear of contagion, as emphasised for the US by Goolsbee and Syverson (2021). It has led to a sharp fall in private consumption in 2020-Q2: -12.7% for the euro area, but the slump was close to -20% in Spain and -12% in Italy and France, while it reached 11% in Germany. After an economic rebound during the summer 2020 – GDP rose by 12.6% in the euro area –, the health situation deteriorated again at the end of the year but in a less synchronised manner. While France and Italy were in recession again, German growth remained positive but decreased in the first quarter of 2021. Even if economic activity is still under the threat of new variants, the development of vaccination enables to mitigate their spread suggesting a sustainable recovery. In 2021-Q2, GDP grew by 2.2%, and was still characterised by heterogeneity among countries, which also mirrors that countries that were more severely hit now benefit from higher growth rates.

The recession was not only exceptional by its size but also by its characteristics with some sectors much more severely hurt than others, notably services involving physical interactions such as transport, leisure, restaurants and accommodation. For those services, some constraints remain, but may be expected to be progressively lifted. While most of euro area countries have not yet fully recovered from their losses, the question arises as to the impact of the crisis on prices. Inflation has reached 3% in August (Figure 1), a rapid increase since the end of 2020 when it was -0.3%. The rise is partly related to energy prices, in particular oil, which has soared from USD 26 per barrel in April 2020 to USD 70 in August 2021. However, the nature of the shock may also affect the outlook for inflation. It has indeed a demand and a supply side component that are both entailing different consequences for prices. A negative supply shock would indeed increase inflation while a negative demand shock would lead to a reduction of inflation. Besides, the price dynamics will also depend on the long-lasting supply effect of the crisis as well as on the demand dynamics in 2022. Governments have indeed taken measures to support households' revenues during the crisis through the setup of partial activity. Since consumption was largely constrained, it resulted in over-savings. In 2020, the savings rate in the euro area increased by 6.7 points. Even if it is hard to precisely estimate the amount of the additional savings resulting from the COVID-19 crisis, the accumulation of financial assets might provide resources to be spent by the end of the year and in 2022; we may expect that private consumption would remain buoyant. Such a surge in demand could fuel future increase in prices. In the short term, shortages for some products could also trigger supply side difficulties to meet this additional demand as emphasised recently with semiconductors.

This paper discusses recent inflation developments in the euro area. As the inflation rate now outpaces the ECB's medium-term target at 2%, it may become a concern for the central bank. After showing that the health crisis was unprecedented in its nature and sectoral characteristics, we study the determinants of inflation in the short term and then discuss various elements that could influence the trajectory of future inflation.

Figure 1: Monthly variations in the harmonised index of consumer prices, euro area (annualised percent)

Source: Eurostat.

2. PARTICULARITY OF THE COVID-19 CRISIS: SUPPLY AND DEMAND SHOCK

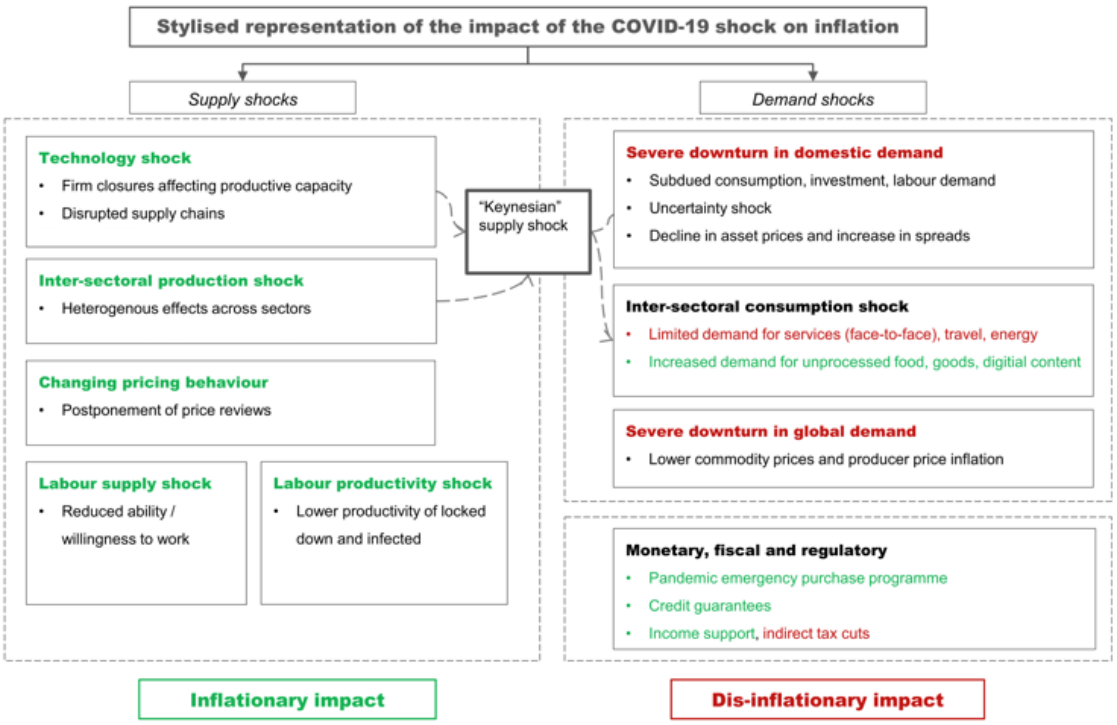
The COVID-19 pandemic resulted in a shock that differs from "an ordinary shock" in its composition and magnitude. Most economists agree that the shock has characteristics that resemble both a supply and a demand shock. A negative supply shock occurs when the economy's capacity to produce goods and services at a given price decreases, while a negative demand shock occurs when consumers' willingness or ability to purchase goods or services at a given price decreases.

The response of inflation to the health crisis and to the various measures adopted by governments has taken place through different channels.

In the first phase of the crisis, a supply shock appeared as a result of lockdown measures and successive firm closures to prevent the spread of the virus, partially interrupting production and disrupting supply chains. In this context, prices and activity varied in opposite direction and led to inflationary pressure. The labour market was also affected. Many sectors have been forced to suspend their activity in order to respect the social distancing measures (restaurants, cultural places...). Not all employees were able to work-at-home, which may have reduced the labour supply for people infected by the virus or forced to stay at home because schools were closed. The extent to which work could be done remotely thus influenced the decline in activity. Empirical studies have indeed shown that the ability to telework varies very strongly across sectors and workers (Barrot et al., 2020; Papanikolaou and Schmidt, 2020). Thus, the effect of the supply shock due to COVID-19 was stronger in sectors where telework was more difficult to implement.

Subsequently, the lockdown and the uncertainty about the evolution of the pandemic led households to reduce their consumption, thereby generating a demand shock. Some sectors have been particularly affected by the decline in demand, such as the tourism, energy and services sectors, while at the same time, other sectors such as unprocessed food, goods or digital content have seen demand increase without supply adjustment, which is creating inflationary pressure on prices. Table 1 summarises the different shocks that have impacted inflation during the COVID-19 pandemic.

Table 1: Supply and demand shocks during COVID-19 crisis



Source: Bobeica, Hartwig and Nickel (2021).

The identification of supply and demand shocks is important for understanding price dynamics. However, the assessment of the supply or demand shock in the context of the COVID-19 crisis is special because unlike an ordinary crisis where the depression in economic activity is widespread and all prices move in tandem, the COVID-19 crisis affected output and prices differently across sectors. The assessment of an aggregate supply or demand shock as suggested in the basic macroeconomic model (AS-AD) may be misleading in an application to the COVID-19 crisis and must at least be complemented by a sectoral analysis to be interpreted.

A growing number of empirical studies are being conducted in this direction, using disaggregated data to characterise the supply and demand shocks and thus determine the potential medium-term implications for the economy and provide recommendations for public policy. They find that both supply and demand dropped after the COVID-19 shock.

Using a disaggregated index of personal consumption expenditures for the United States, Sheremirov (2021) shows a positive relationship between prices and quantities at the beginning of the pandemic followed by a negative relationship in the later period, arguing for a demand shock followed by a supply shock. The recent price increase in the United States would therefore be justified by an insufficient supply linked to disruptions in the supply chain. This is particularly true for certain sectors such as the automotive industry, thus confirming its temporary nature. The question of identifying shocks also arises in the labour market. A study by Brianca et al. (2020) is conducted for the United States, using data on hours worked and wages to estimate labour demand and supply shocks. The study is conducted for the aggregate economy and for various sectors. They find that labour supply shocks account for a larger share of the decline in hours, although both shocks are notable. Overall, in the United States, empirical studies have shown that both supply and demand play an important role.

It is reasonable to assume that the same is true for the euro area, since the nature of the shock was practically identical worldwide.

A study conducted for France by Dauvin & Sampognaro (2021) identifies supply and demand shocks and evaluates their effects on value added. The identification of shocks is done using survey data, which provides information on the perception of firms on the shocks suffered since April 2020.They find that administrative closures alone explain 12 points of the decline in activity, while school closures and other supply problems (including supply problems) each explain 5 points of the decline in value added at the worst moment of the crisis. The final demand shock explains 11 percentage points of the decline in GDP observed during the worst phase of the containment.

Understanding the nature of the crisis is important for developing an inflation outlook. If the crisis is caused by a negative supply shock, inflationary pressures will appear. On the other hand, if the crisis is explained by a negative demand shock, deflationary pressures will appear as long as countries have not recovered from the crisis. While in the first phase of the COVID-19 crisis, general inflation was falling, which testifies in favour of a negative demand shock, there were nevertheless sectoral specificities where the demand shock seemed to be rather positive without supply being able to adjust directly, thus creating upward pressure on prices in these sectors. Thus, inflation in the euro area in the short term has been quite uneven across sectors. The ongoing recovery is accompanied by a rise in the general price level, explained by higher energy prices and disruptions in supply chains. This argues for a negative supply shock in the second part of the crisis. However, these supply effects are mostly temporary and should fade away after a few quarters.

3. RECENT DEVELOPMENT IN INFLATION: MUCH ADO ABOUT NOTHING?

In August 2021, the inflation rate in the euro jumped to 3%, thus exceeding the 2% target of the ECB, a situation which had not happened since the second semester of 2018. Yet, the objective does not suppose that inflation should always stand at 2%, but that it should be reached over the medium term, as reminded by ECB President Christine Lagarde during the 9 September 2021 press conference following the Governing Council's latest monetary decisions. It is therefore crucial not to focus on a single monthly figure but to analyse price dynamics over several quarters. As shown in Figure 2, inflation has been below 2% most of the time since 2012. The question is therefore to assess whether the recent jump is a transitory phenomenon or if it signals a risk of lasting inflation pressure. To provide some insights on this issue, it may first be useful to analyse the components of inflation during the recent period.

3.1. Global trend in the inflation in the euro area and in euro area countries

The headline inflation rate often exhibits important volatility due to certain components, notably energy and food prices. The recent upswing of oil prices has mechanically driven headline inflation upward. After a sharp decrease from March 2020 to the end of the year, the energy index has bounced back and, in August 2021, the year-over-year index for energy prices grew by more than 15%.

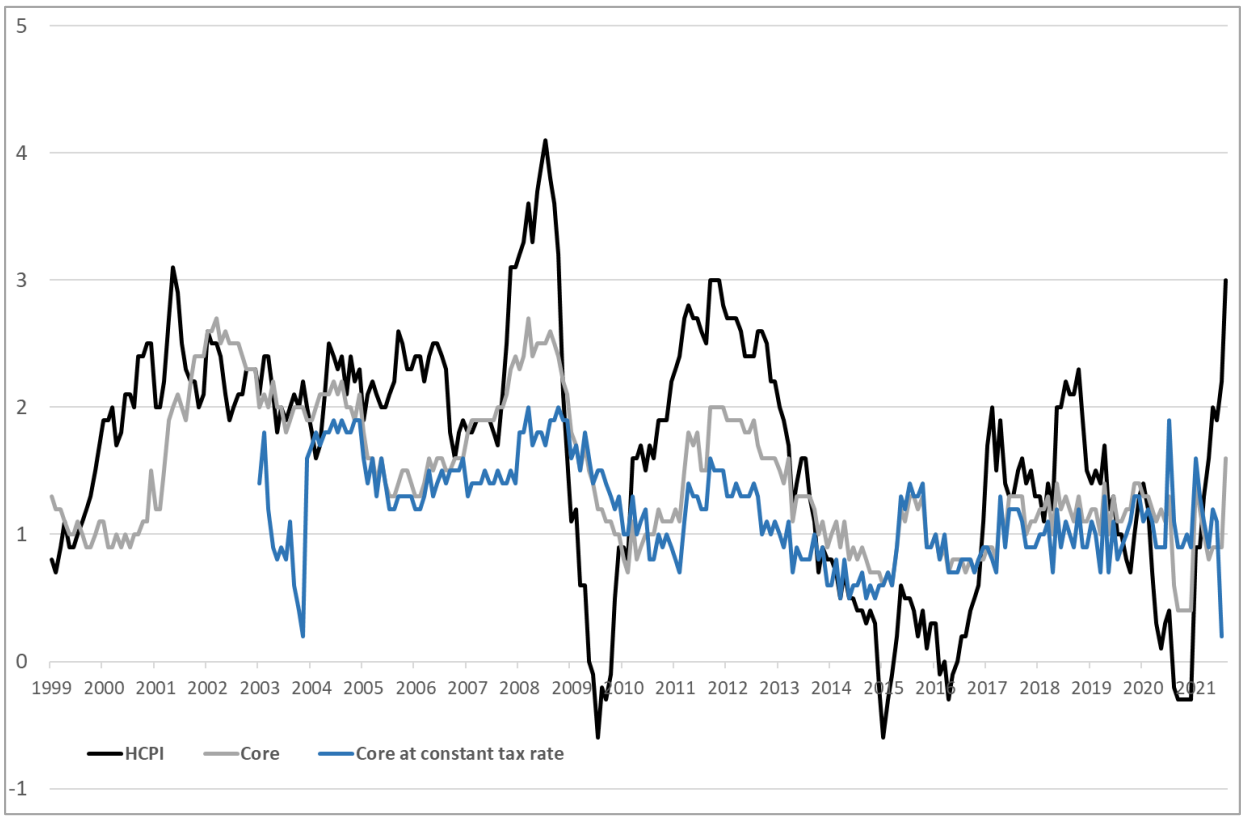
The core inflation index enables to assess inflation excluding the most volatile components. The diagnosis is then less alarming since inflation is significantly lower, at 1.6% (Figure 2). It must yet be noticed that a surge also occurred in August since the year-over-year growth has increased by 0.7 points.

Here again, some exceptional circumstances partly explain this upswing. Germany had temporarily reduced the VAT rate in July 2020. The reduction was only applicable until January 2021. The effect of these policy decisions clearly contributes to the dynamics of inflation in Germany since summer 2020. It amplified the decrease of prices during the second semester and now contributes to fuelling inflation, explaining why it has recently reached 3.4%. Eurostat provides estimations of constant tax rate inflation rates, which may provide a better insight on the scale effects of these changes in the VAT rate. In Germany, the adjusted inflation rate stood at 0.8% in June 2020 and now reaches 1.3% (in July 2021). There may still be some base effect and it is consequently hard to precisely gauge the underlying inflation trend. It may certainly have increased but less than highlighted by the most recent figures.

As Germany represents a significant part of the euro area, this policy decision also reflects in the consumer price index for the euro area. According to Eurostat, adjusted core inflation would have decreased in July[1]. Here again, the picture of inflation may be blurred by base effects. However, these features suggest that we should remain cautious before claiming that inflation is back in the euro area.

[1] The corrected inflation index does not only reflect the effect of the German tax cut and hike.

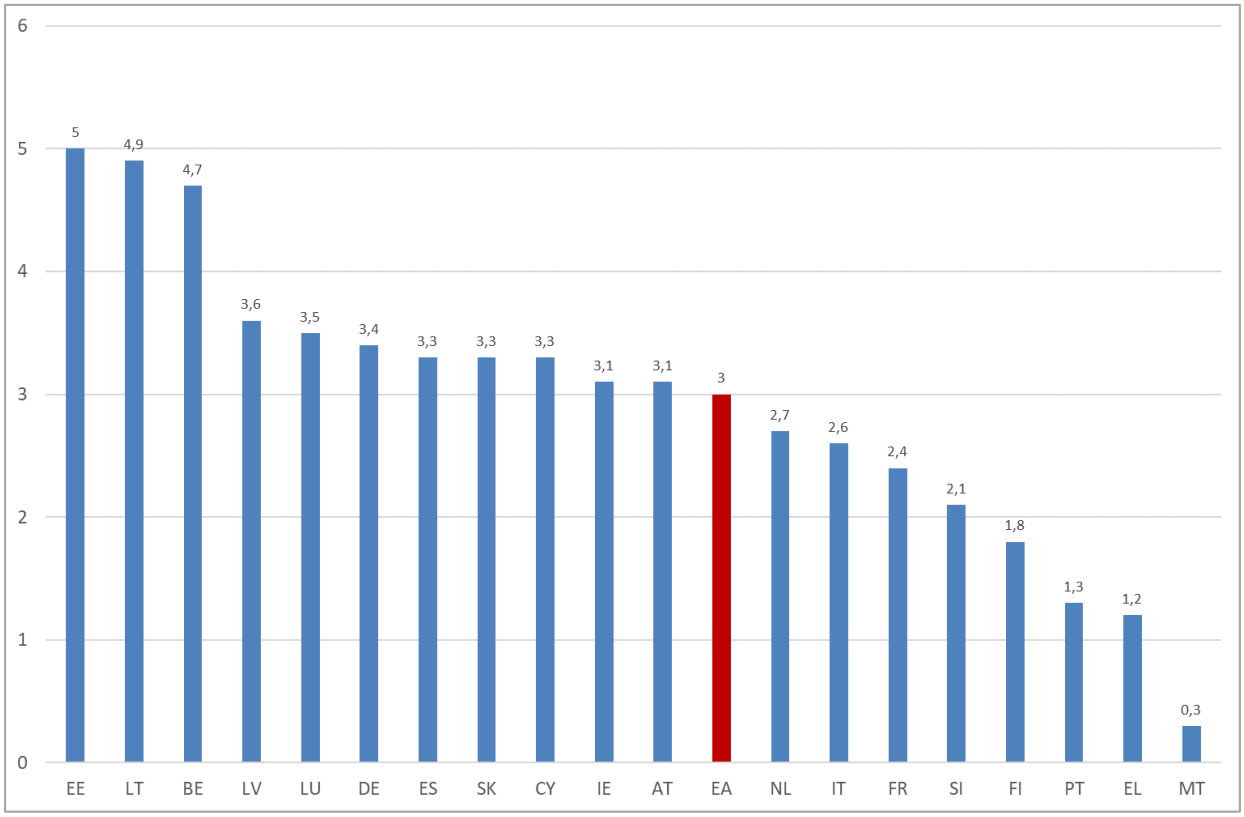
Figure 2: Inflation in the euro area (annualised percent)



Source: Eurostat.

Regarding the situation among euro area countries, we observe some significant heterogeneity reflecting policy decisions, as emphasised for instance for Germany, the weight of energy prices in the price index and the underlying dynamics of inflation. In August, the highest inflation is observed for Estonia with an inflation rate at 5% while it stands at 0.3% for Malta (Figure 3). Beyond exceptional and volatile factors, those differences do not reflect the severity of the crisis. While in 2021Q2, the Spanish GDP is 6.8% lower than its 2019Q4 level, inflation is much higher than in France where the crisis has been less severe (GDP is 3.2% lower than its 2019Q4 level). Despite a common trend related to oil prices, there is no clear signal of an inflation risk in all euro area countries. Even if countries have all been hit by the health crisis, the composition of the demand and supply shocks differ according to their industrial specialisation and to their exposure to the pandemic.

Figure 3: Inflation in euro area countries in August 2021 (annualised percent)



Source: Eurostat.

3.2. Inflation in the euro area at a disaggregated level

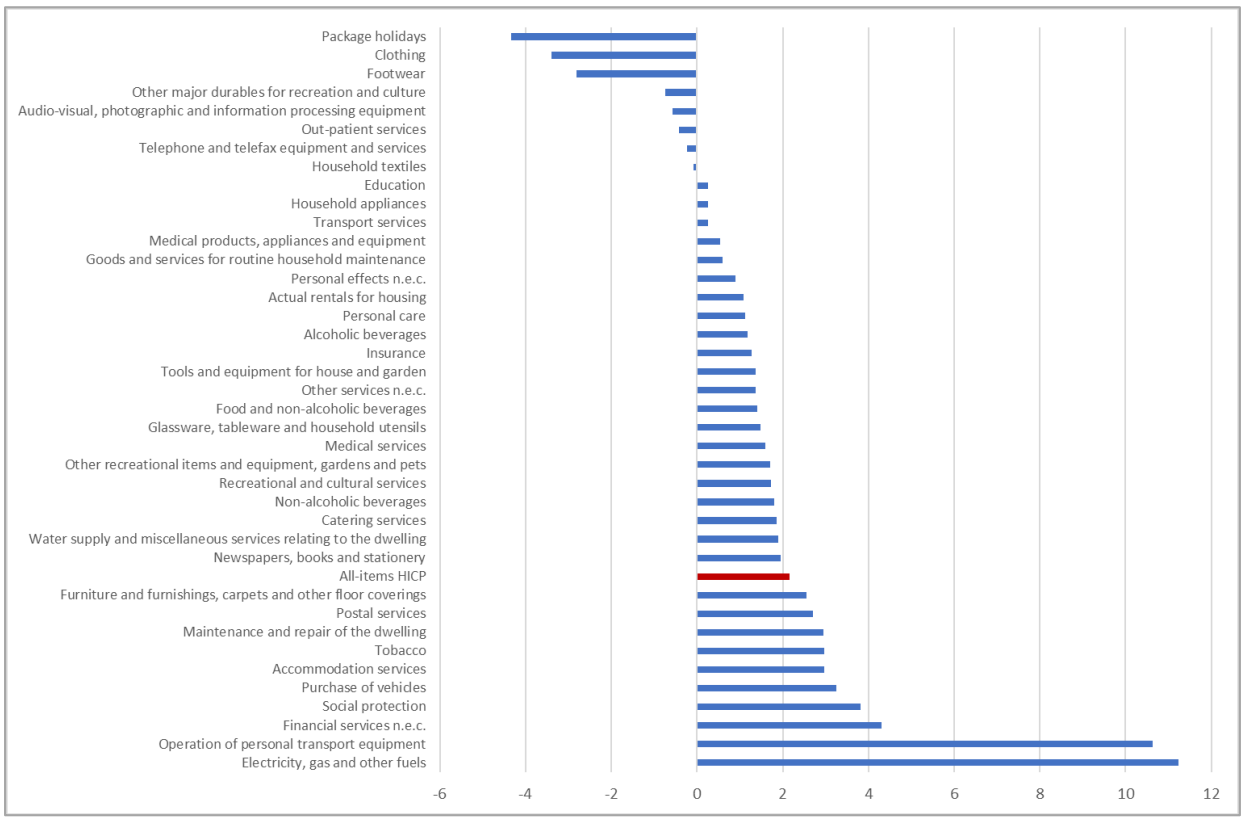
As emphasised in the previous section, the crisis is characterised by demand and supply shocks and by a strong heterogeneity across sectors. The aggregate price index may consequently capture those differences suggesting that a focus on disaggregated prices would also provide some insights into the short-term risk for inflation. To that end, we focus on a group of 40 goods and services. We may disentangle between three periods since the beginning of 2020. During the first semester, including the peak of the crisis when world GDP plummeted, inflation increased moderately in the euro area. The second semester of 2020 was characterised by the strong rebound of activity during the summer followed by a new wave of the pandemic triggering a new but milder recession. However, this period was characterised by a decrease of the inflation rate. Finally, since the beginning of the year 2021 inflation resumed.

Within industrial and service sectors, we observe a strong heterogeneity. For instance, the year-over-year food price increased in 2020-S1 (semester 1) and then progressively slowed down. Price for electricity, gas and other fuels declined in 2020-S1 and -S2 (measured year-over-year) and went up in 2021-S1. Among goods, the price of clothing and footwear decreased in all semesters while price of major durables goods for recreation and culture went up. While accommodation and catering services were strongly constrained and among the most hit sectors, we also observe differences. Prices increased year-over-year for accommodation services in 2020-S1 and then declined but they increased during those three semesters for catering.

Regarding the July 2021 figures, the most important price increases are observed for electricity, gas and other fuels, operation of transport equipment whose prices rose by more than 10% year-over-year, which are related to energy prices (Figure 4). In financial services and social services, we also notice that

prices have increased by 4.3% and 3.8% respectively. This increase may not be linked to energy prices. Conversely, prices for package holidays, clothing or other durables goods for recreation and culture have decreased.

Figure 4: Inflation at a disaggregated level in July 2021 (annualised percent)

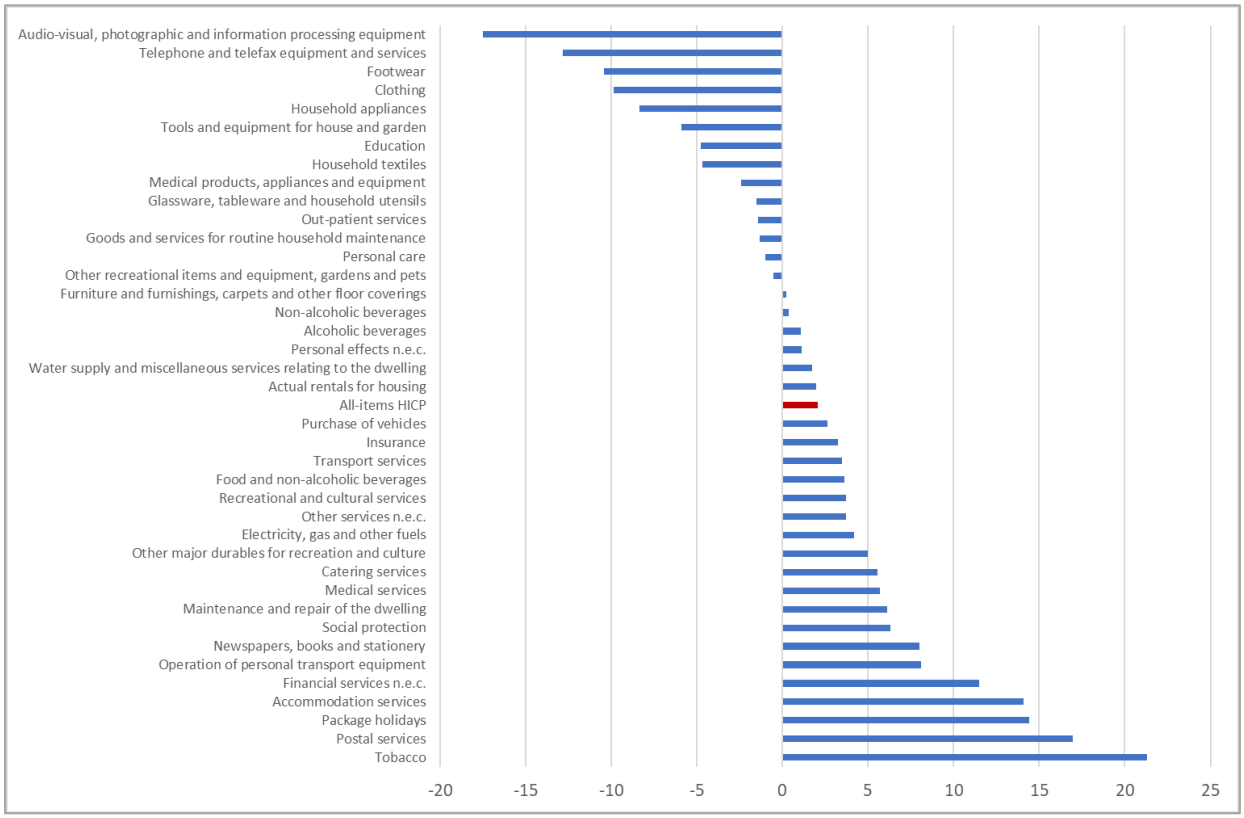


Source: Eurostat.

Considering these different stages of the crisis since its outbreak with price dynamics exhibiting periods of decrease and periods of increase, it may be useful to focus on the global change in prices since 2019-Q4 to highlight the sectors in which we observe the highest *price level* increase and decrease. Figure 5 shows that for instance, the administrated price for tobacco is 21.3% higher in July 2021 than in December 2019. Looking at the price increase since December 2019 mitigates the effect of energy prices, since the price for electricity, gas, and other fuels or for transport services increased by only 4.2% and 3.5% in that period, respectively. The most important price increase is observed for postal services, package holidays, accommodation services and financial services. There are several goods and services for which prices are below their pre-crisis level. This is notably the case for some durables goods such as audio-visual, photographic and information processing equipment, telephone and telefax equipment and services and non-durable goods (clothing and footwear).

From this disaggregated short-term perspective, it seems that price of goods has increased more moderately and are often below the pre-crisis level, with a notable exception for vehicles. Overall, the harmonised price index is only 2.6% higher than in December 2019.

Figure 5: Price increases and decreases at a disaggregated level since December 2019 (annualised percent)



Source: Eurostat.

At first sight, a look at the recent data suggests that the upswing of inflation would be mainly related to energy prices, changes in VAT tax rates and a recovery following the most dramatic yearly recession. At a disaggregated level, it seems that for most of goods, prices are often below the December 2019 level while prices for some services are higher.

4. INFLATION RISKS IN THE MEDIUM TO LONG TERM

The sudden rise in inflation proceeds from a long list of determinants, some of which may have longer-lasting effects on the euro area and the US economy. In the latter case, the impact on the euro area would only be indirect. However, recent US forecasts cast doubt on the duration of the surge in inflation.

Actually, in his remarks during the latest Jackson Hole Symposium this August, the Chairman of the Board of Governors of the Federal Reserve System, Mr Jerome Powell, has exposed the main inflation drivers in the US and given arguments against rising inflation risks in the US economy in the mid to long term. First, he pointed out that a limited number of products are responsible for the recent surge in inflation, notably energy prices. He also showed that spending on durable goods has recently soared, but not spending on services. Meanwhile, durable goods inflation has significantly increased and considerably more than services inflation. He continued by showing that since the mid-1990s, durable goods inflation has been negative, at an average of -2%, and he therefore forecasts that the recent surge may only be temporary, durable goods inflation turning back to its historical average after the surge of demand. Evidence of moderate wage increases in the US supports his view. As for inflation expectations, they actually move up but they remain at moderate levels, close to 2 or 3% annually at a 5 to 10-year horizon, and reverse earlier declines.

A parallel can be made with the situation of the euro area.

4.1. Shortages of final and intermediate goods

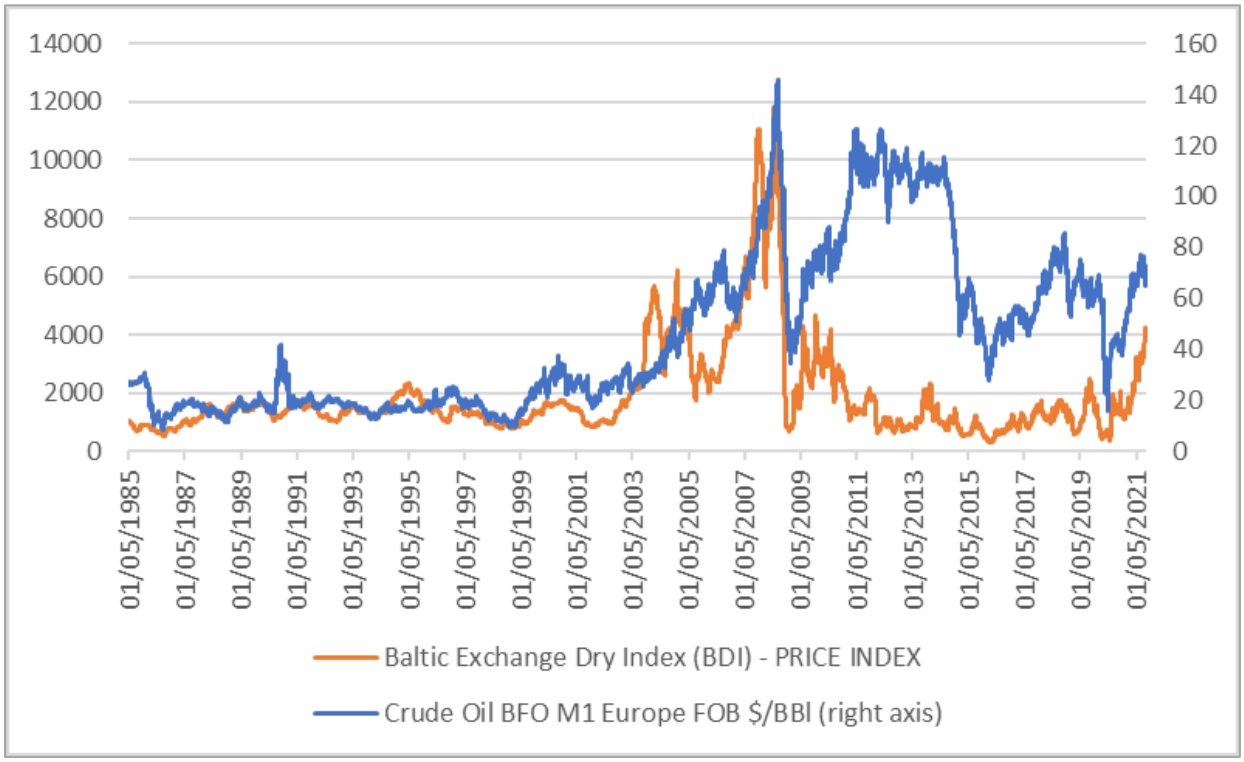
As already reported in section 2, the COVID-19 has generated disruptions in supply chains that have affected supply capacities and slowed down production. This point has been emblematically highlighted in the case of the German car industry, falling short of chips supply and being therefore partly paralysed. Part of this production slowdown may be attributed to congestion in shipping transportation, as exemplified by the recent surge in the cost of maritime freight. The latter can thus explain the increase in the price of some durable goods and raw materials. As Figure 6 shows, the Baltic Exchange Dry Index has doubled between March and August 2021, but it seems to have reached a peak, since it has been decreasing at the end of August.

In historical perspective though, the recent rise remains largely below the peak that occurred during the global financial crisis (GFC) of 2007-2009. Quite interestingly, it compares with the subsequent rise in the index that occurred during the recovery from the GFC. As reported in Figure 6, the sharp increase in the Baltic index after 2009 was relatively short-lived[2].

Another important element arises from Figure 6. Except between 2011 and 2014 when there seems to have been a disconnection between the cost of shipping transportation and the price of oil, both have been highly correlated in the past, as already reported (see e.g. Hummels, 2007). On the entire sample, the correlation has been 0.33. Between 1985 and 2009, the correlation was very strong at 0.83. Since 2015, it is equal to 0.53. If correlation remains in the future, shipping costs forecasts can be approximated by oil price forecasts. In this respect, it is interesting to notice that the US Energy Information Administration (in its Short-Term Energy Outlook of September 2021) expects a decline in the Brent and WTI oil prices of 3.7% and 5.1% respectively in 2022 (compared to 2021).

[2] Some responsibility in the inflation surge also lies in shipping companies that are not able to adjust their supplying capacities to demand during recovery phases.

Figure 6: Cost of shipping transportation (cereals, coal, ore) and oil price (May 1985 – August 2021)



Source: Thomson Reuters.

4.2. Demand shocks ahead?

While the former inflation driver was mostly driven by the supply side, there are obviously inflation drivers on the demand side. Actually, the large fiscal stimuli prepared by the Biden administration since January 2021 have made some fear a return to high inflation (Blanchard, 2021; Summers, 2021). Ball et al. (2021) give a different view: if the unemployment rate declined to 1.5% in 2023 in the US (it is still at 6% by the end of August 2021), they forecast that (median) inflation would grow to 2.5 or 3% as long as inflation expectations remain anchored. This would remain within the limits of the average inflation targeting set by the Federal Reserve.

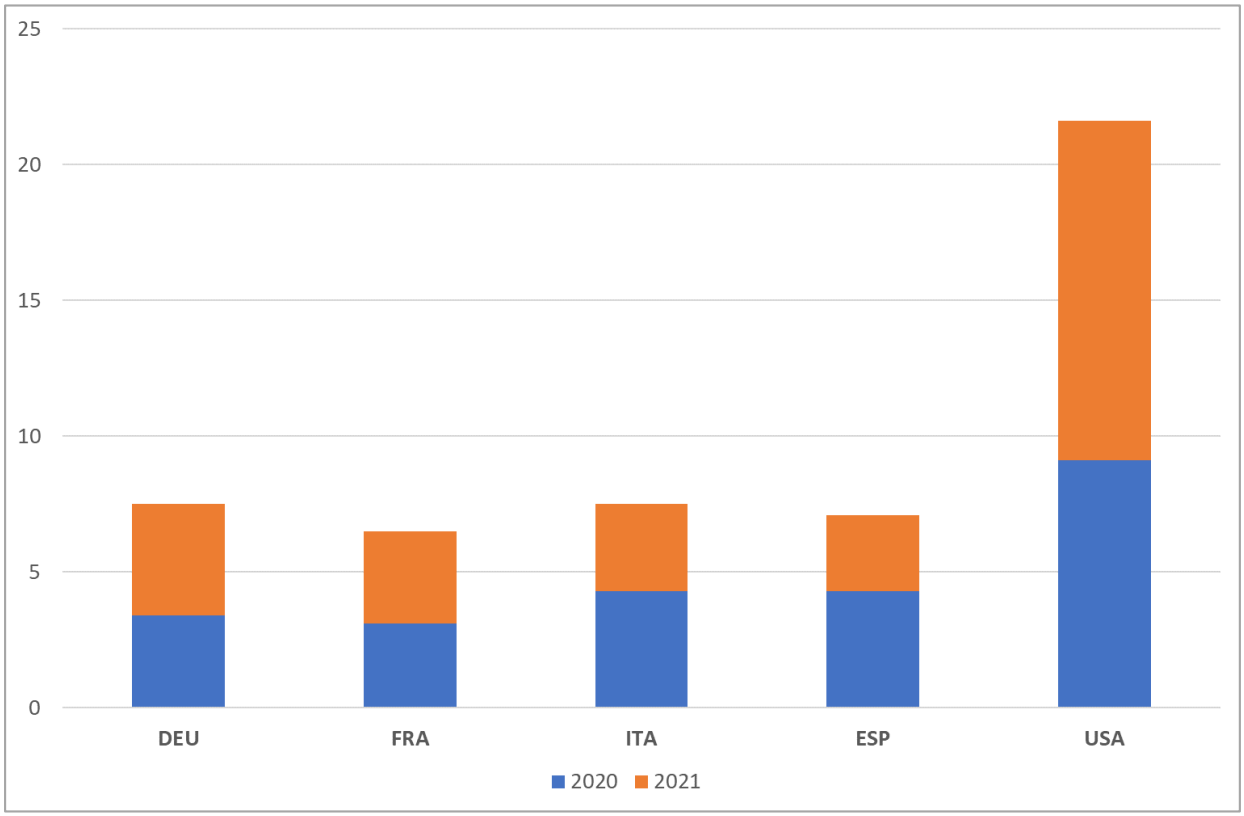
What about the euro area? Fiscal shocks since the COVID-19 crisis have been smaller than in the US (Figure 7). The cumulated fiscal measures implemented by the federal government in the US amount to 21.6% of US GDP[3]. Compared to the US fiscal stimulus, European fiscal measures are much more limited and represent for instance 6.5% of GDP in France and 7.5% of GDP in Italy and Germany. Higher public deficits have for their most part been oriented to the dampening of the supply and demand shocks arising from the public management of the pandemic (lockdowns, firm closures, supply disruptions, etc.). In this respect, they were more like extended automatic stabilisers than fiscal stimuli *per se*. For this reason, multiplier effects attributed to these policies are usually low (Gourinchas et al., 2021). Consequently, a risk of inflation due to fiscal policies is rather limited in the euro area. Moreover, and according to the Congressional Budget Office (CBO), the output gap of the US would become positive by the end of 2021, whereas it is still expected to remain negative in the euro area (OFCE

[3] This estimation only accounts for voted measures in March-April 2020, December 2020 and for the American Rescue Plan of Joe Biden in March 2021.

forecasts).

The major policy change that has occurred in the euro area since the pandemic is the creation and unfolding of Next Generation EU (NGEU). Enacted in 2020, it involves higher public spending from 2021 onwards. It is important to note that disbursements are highly predictable. The impact of NGEU on euro area inflation is rather unlikely. Not only has it not produced a substantial shift in inflation expectations so far (see below), it also involves a parallel shift of demand and potential output that should not produce a disequilibrium on the goods and services markets.

Figure 7: Cumulated fiscal measures voted by governments (in % of GDP)



Source: OFCE calculations from national sources.

Besides public finances, uncertainty remains as to the dissaving behaviour of European households. While the pandemic has been followed by sharp increases in savings, mainly from middle and top-income earners that could not consume goods and services during lockdown periods, the recovery has brought a return of consumption. There, a composition effect may arise. Consumption services, like tourism, may have decreased since the recovery because mobility limitations have remained within the European borders and also outside Europe and because uncertainty as to the intensity of the epidemic has remained high. This fettered consumption may be counter-balanced by sharper demand for restaurants, bars and durable goods. In this case, the inflation surge may last at least until consumption patterns return to their pre-crisis levels.

4.3. Labour shortages and wage increase?

The impact of a demand shock on inflation relates to the feature of the Phillips curve. In this respect, it also relates to the tensions on the labour market. The Phillips curve links inflation (or wage inflation) to unemployment negatively in the short to medium run. The historical curve states that the lower unemployment, the higher the inflation rate, and vice versa, but non-linearly: the cost of reducing unemployment in terms of inflation decreases with the level of unemployment. Consequently, after

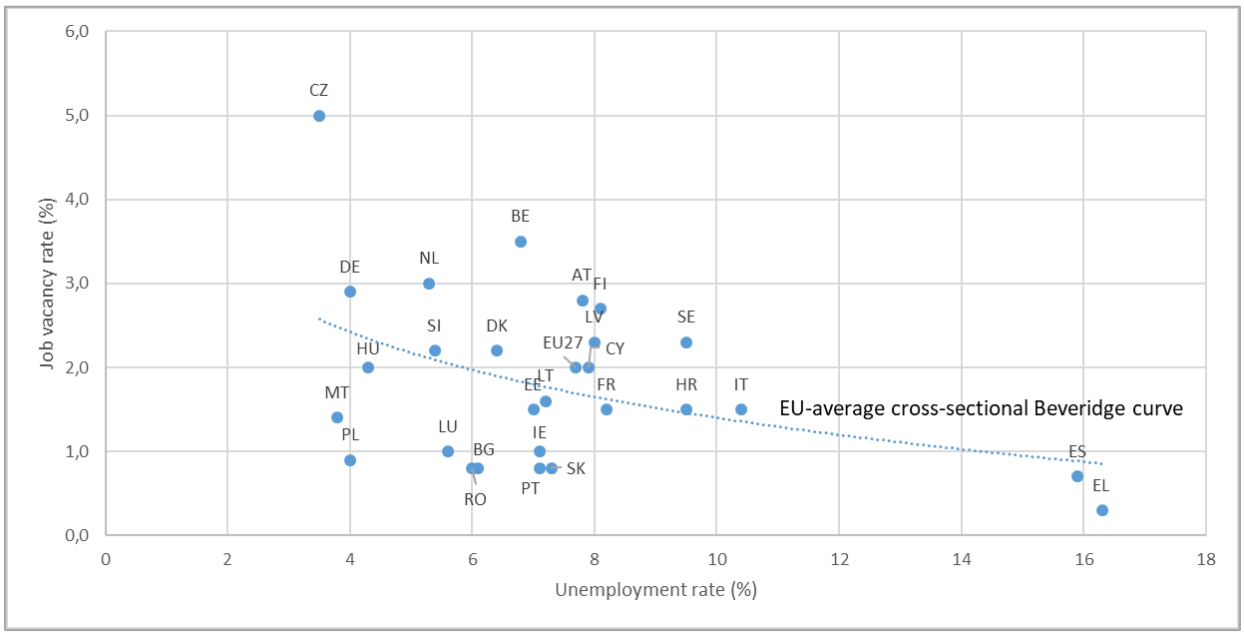
unemployment has already started to decrease, a further decline of unemployment is expected to generate higher inflation than at the beginning of the recovery.

We argued in the former subsection that the risk of inflation due to a demand shock was rather limited. This conclusion also draws on the current feature of the Phillips curve in the euro area. Recent estimates show that the inflation-unemployment trade-off remains significant but that the slope of the relationship has flattened (Bobeica et al., 2021). Consequently, the inflation cost of a reduction in unemployment is low. The flattening of the Phillips curve has many explanations, from international competition to lower trade union coverage that have both reduced nominal wage increases. Thus, second-round effects of inflation (to nominal wages) are quite unlikely.

Evidence of labour shortages in the European Union is widespread since the recovery from the pandemic (Eurofound, 2021). This phenomenon is not new: the average job vacancy rate in the EU in the first quarter of 2021 remains 0.3 percentage point below its level at the end of 2018. Labour shortages did not raise fears of inflation then.

Figure 8 depicts the relationship between job vacancy and unemployment rates in 2021. Countries with low unemployment rate tend to show (relatively) large job vacancy rate. The recovery generates higher labour demand than supply; hence, it induces more job vacancies. This relationship is known as the Beveridge curve. The EU27 Beveridge curve shows the diversity of EU Member States, some with high unemployment/low job vacancy rates (e.g. Greece, Spain) and some with low unemployment rate/(relatively) high job vacancy rate (e.g. Germany, Netherlands). All in all, there is also much deviation across EU Member States above and below the average EU Beveridge curve. The average job vacancy rate also hides inter-sectoral discrepancies, with the construction, information/communication and healthcare sectors driving up the average. These discrepancies across countries and across sectors should reduce the incidence of labour shortages as a substantial driver of aggregate inflation in the euro area. Actually, wage inflation may be limited to some sectors – those with high labour demand - and to newcomers (to attract new talents). At the macroeconomic level, it should not feed inflation substantially.

Figure 8: Beveridge points, EU27, 2021 Q1



Sources: Eurostat & CSO Ireland, authors' computations.

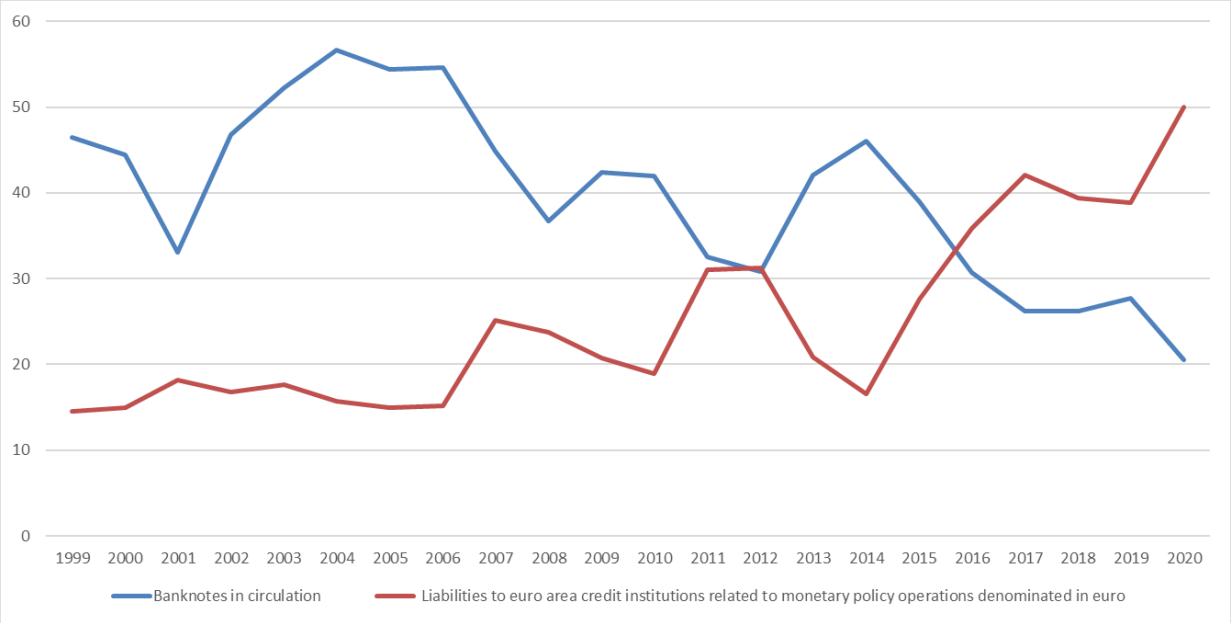
Note: Data for Denmark and France are not strictly comparable to other countries (despite similar data sources).

4.4. Is inflation always a monetary phenomenon?

There has been a long tradition among the advocates of the quantity theory of money to relate inflation to rising monetary aggregates like banknotes in circulation. Meanwhile, ECB monetary policies have been very expansionary since the GFC and there can be some confusion between these policies and inflation prospects. Confusion diminishes after decomposing the ECB's liabilities. Figure 9 shows the respective shares of banknotes and liabilities to euro area credit institutions in the ECB's balance sheet. Since 2015 and the start of quantitative easing in the euro area, the share of banknotes has declined steeply while banks have constituted larger reserves at the ECB.

A lower share of banknotes when monetary policy is very active may still hide an acceleration. While total ECB's liabilities increased by 50% between 2019 and 2020 (end of the year), banknotes in circulation increased much less, but still twice their former rates at 11%. This acceleration may fuel inflation according to the quantity theory of money but at the moment, inflation expectations in the euro area remain subdued. The ECB's Survey of Professional Forecasters for the third quarter of 2021 shows that inflation expectations have been revised upward significantly but that they remain below 2% at a 5-year horizon. This is consistent with expectations for real GDP growth at 1.4% on the same horizon, after a sharp but short-lived recovery anticipated in 2021 and 2022.

Figure 9: Composition of the ECB's liabilities (in percent of total liabilities)



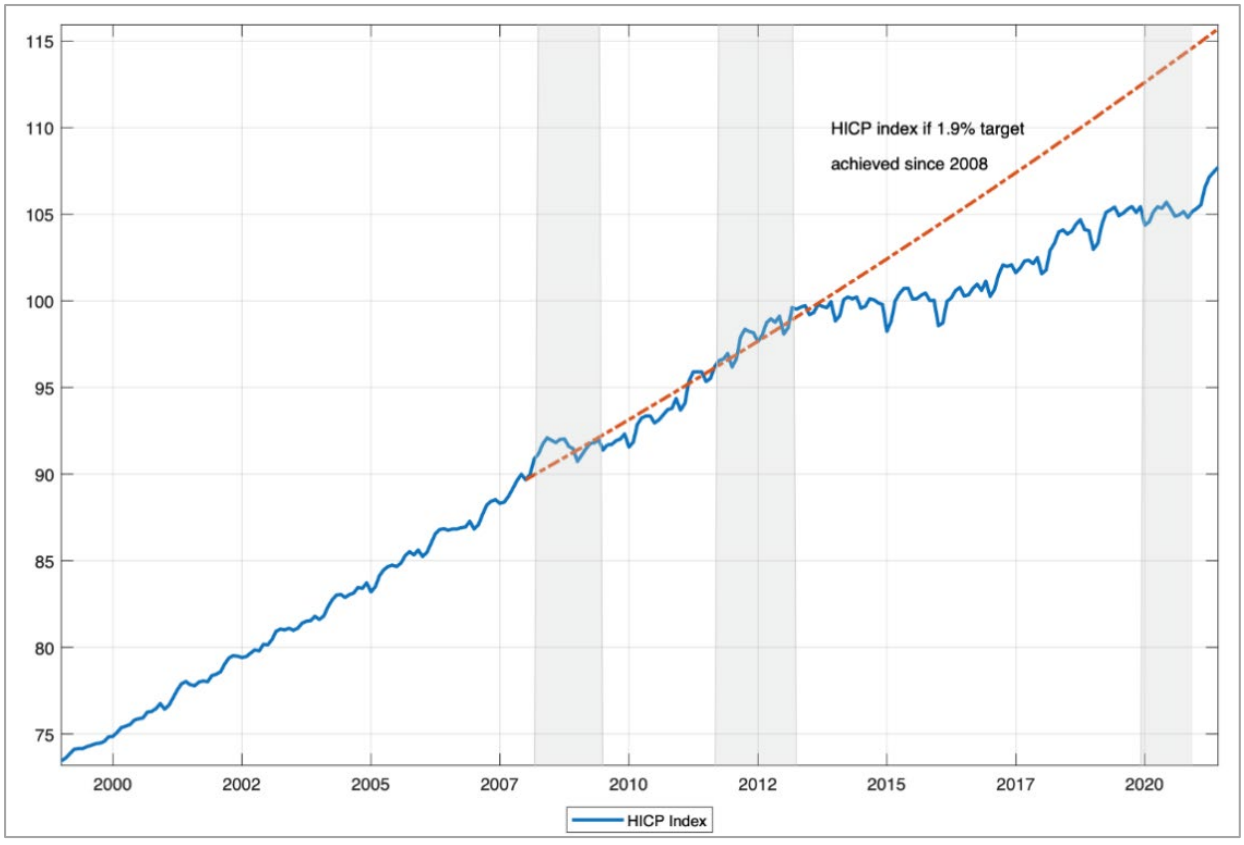
Source: ECB, authors' computations.

5. CONCLUSIONS

In this contribution, we have shown that euro area inflation in the short run was quite uneven across countries and across sectors. After negative supply and demand shocks due to the pandemic and its policy management, supply disruptions and a boom of postponed consumption have accompanied the ongoing recovery, hence a surge in inflation. Overall, the inflation rate seems under control, as exemplified by subdued inflation expectations.

To conclude with the topic, it is worth acknowledging that recent inflation does still fall short of expected price dynamics had the ECB's inflation target been achieved in the past. Figure 10 shows the harmonised index of consumer prices since 1999. While the index has risen more or less by (close to) 2% between 1999 and 2007, the index has departed from this trend since 2008. By the end of August 2021, the actual harmonised index of consumer prices in the euro area was 8% below the price index that would have been consistent with the achievement of the ECB's (old) inflation target.

Figure 10: HICP price level in the euro area and the expected price level if an annual inflation rate of 1.9% had been achieved in the euro area since 2008



Sources: Eurostat and Reichlin et al. (2021)'s calculations.

Note: Shaded areas correspond to recessions as dated by the CEPR.

Following this substantial departure from the inflation target in retrospect, a strategy of price level targeting could have been contemplated by the ECB (see e.g. Andrade et al., 2021). It would mean accepting larger inflation until the price level achieves its target. Once it would be the case, a strategy of inflation targeting could start back.

It is noteworthy that although the Federal Reserve has not yet embarked on a price level targeting strategy *per se*, it has developed an average inflation targeting strategy without a pre-determined horizon that may produce the same outcomes as price level targeting. Actually, the Fed will tolerate

long term deviations of inflation from the target and help drive inflation expectations up in the long run.

In contrast, in its review of the monetary policy strategy, the ECB has only communicated on possible transitory periods of inflation deviations from the target. While the ECB will now draw on the "symmetry of the inflation target (…) around 2 percent", where "transitory periods in which inflation is moderately above target" will be tolerated, it continues highlighting how short these deviations may be: "The Governing Council confirms the medium-term orientation of its monetary policy strategy. This allows for inevitable short-term deviations of inflation from the target". How sufficient will be this strategy to fix the deviations between inflation expectations by professional forecasters and the inflation target at 2%? Only time will tell.

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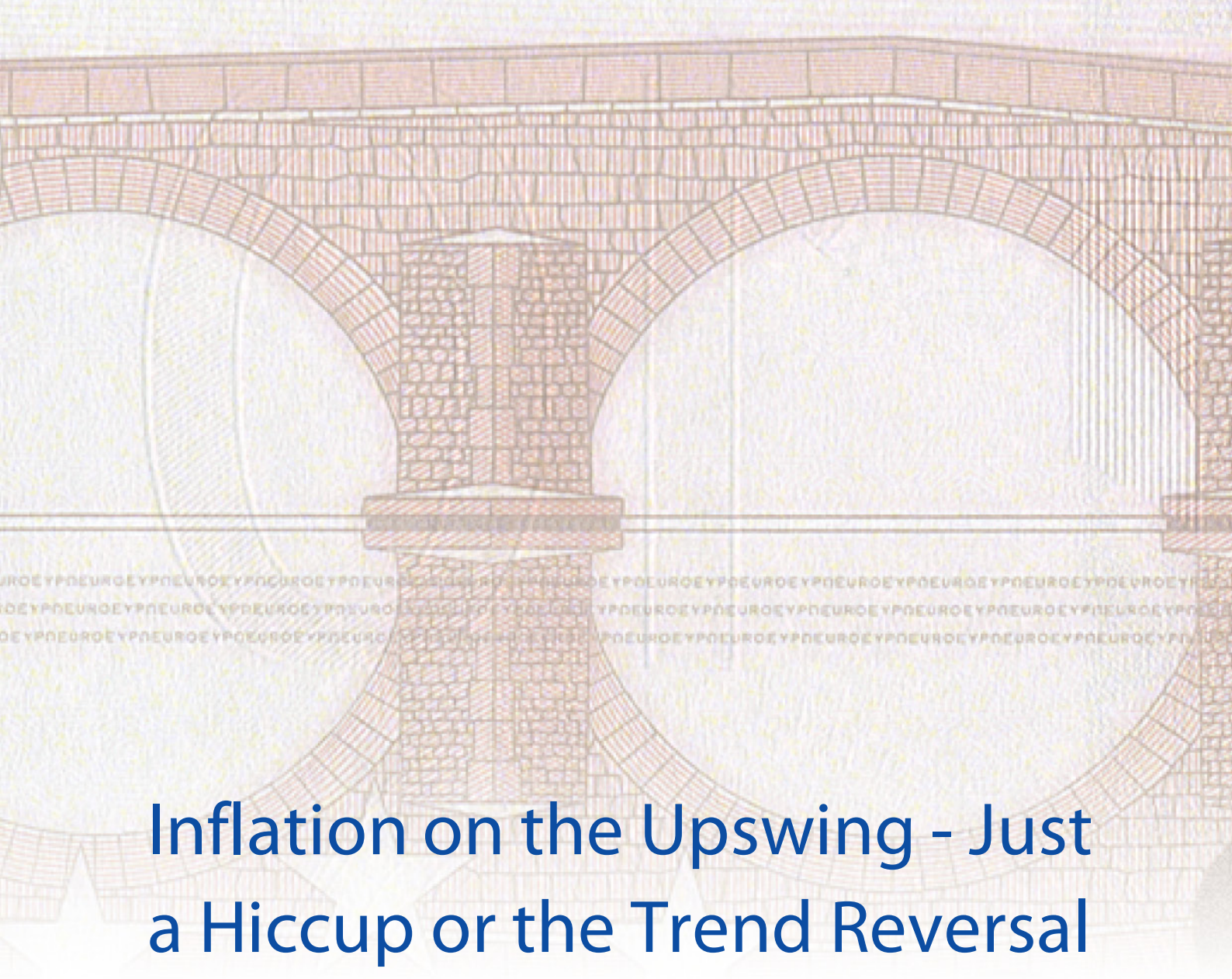

Inflation on the Upswing - Just a Hiccup or the Trend Reversal After All?

Kerstin BERNOTH and Gökhan IDER

Abstract

Although energy price volatility has recently been the largest contributor to movements in the headline inflation rate, there are other factors indicating that inflation in the euro area will remain elevated in the months ahead. However, most of them have only a temporary effect. A major risk to the further development of inflation is a rise in inflation expectations, which should be monitored critically.

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.

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LIST OF ABBREVIATIONS

AMECO	Annual macro-economic database of the European Commission
ECB	European Central Bank
EU	European Union
GDP	Gross domestic product
HICP	Harmonised index of consumer prices
IMF	International Monetary Fund
NAIRU	Non-accelerating inflation rate of unemployment
NAWRU	Non-accelerating wage rate of unemployment
NGEU	Next Generation EU
OECD	Organisation for Economic Co-operation and Development
RRF	Recovery and Resilience Facility
SPF	Survey of Professional Forecasters
VAT	Value-added tax
SPF	Survey of Professional Forecasters

EXECUTIVE SUMMARY

- **After rising steadily since the beginning of the year, headline inflation in the euro area stood at 3% in August 2021, the highest level since the end of 2011.** Much of this increase can be explained by temporary factors, such as the rebound in energy inflation and the withdrawal of VAT cuts.
- **Inflation dynamics in the euro area Member States show a large degree of heterogeneity, especially if energy prices are not taken into account.** Among the four largest economies, Germany tops the list in terms of rising core inflation, while Italy lags behind France and Spain.
- **There are several factors that could put further upward pressure on headline inflation in the medium term, which should now be monitored closely.**
- **The unemployment gap in the euro area is almost closed.** However, labour force participation fell sharply during the COVID-19 pandemic, so that the unemployment figures currently look too positive. When labour demand continues to rise as the economy recovers further, wage pressure should be noticeable but limited.
- **Only part of the pandemic-related excess savings accumulated by euro area households will be released in the form of pent-up consumption; the impact on headline inflation will therefore be limited.** The main reason is that majority of these excess savings are concentrated at high-income households, which have low levels of marginal propensity to consume. Instead, a not insignificant part of the impact of excess savings will be absorbed by asset price inflation.
- **Fiscal stimulus measures will help close the massive output gap that opened up during the COVID-19 pandemic.** Should the fiscal measures push output far beyond potential output, the rise in inflation could be quite sharp. However, this seems an unlikely scenario. It is more likely that these measures will temporarily raise core inflation moderately.
- **Core producer price inflation, at 6.7% in August 2021, is higher than ever before in the history of the euro area, mainly due to global supply constraints.** The impact on headline inflation is nevertheless likely to be limited, as services inflation remains in the euro area the dominant underlying dynamic for core inflation.
- **An analysis of the ECB's Survey of Professional Forecasters (SPF) shows that the increase in inflation currently observed in the euro area has not yet had any impact on medium-term inflation expectations, which are still firmly anchored.** The ECB thus enjoys a high degree of credibility.
- **We conclude that there are several reasons why inflation in the euro area is likely to remain persistently high in the coming quarters, especially as all these effects are at work simultaneously.** However, most of these effects are only temporary.
- **The biggest risk for the further development of inflation is a rise in inflation expectations, and these should now continue to be monitored critically.**

1. INTRODUCTION

The COVID-19 pandemic turned out to be an unprecedented shock to the euro area economy, resulting in sharp contractions in aggregate demand and production. As consumption, employment and energy prices declined significantly amid the lockdown restrictions in the spring of 2020, naturally, the fall in inflation followed. The annual rate of change in the Harmonised Index of Consumer Prices (HICP) dropped to 0.3% in April 2020 and remained around 0% until the end of 2020. After the near-0% inflation episodes of 2009 and 2014-16, which were preceded by the Great Recession and the European debt crisis, respectively, this was the third time headline inflation hovered around 0% for a considerable timespan since 2006 (Figure 1). With inflation well below the inflation target and the real economy collapsing in the wake of the pandemic, the European Central Bank (ECB) responded promptly by further expanding its unconventional monetary policy measures, including its large-scale asset purchase program. Governments in the euro area implemented various discretionary fiscal stimulus packages that include additional government spending, tax and debt deferrals, liquidity provisions and guarantees.

Figure 1: Inflation developments in the euro area

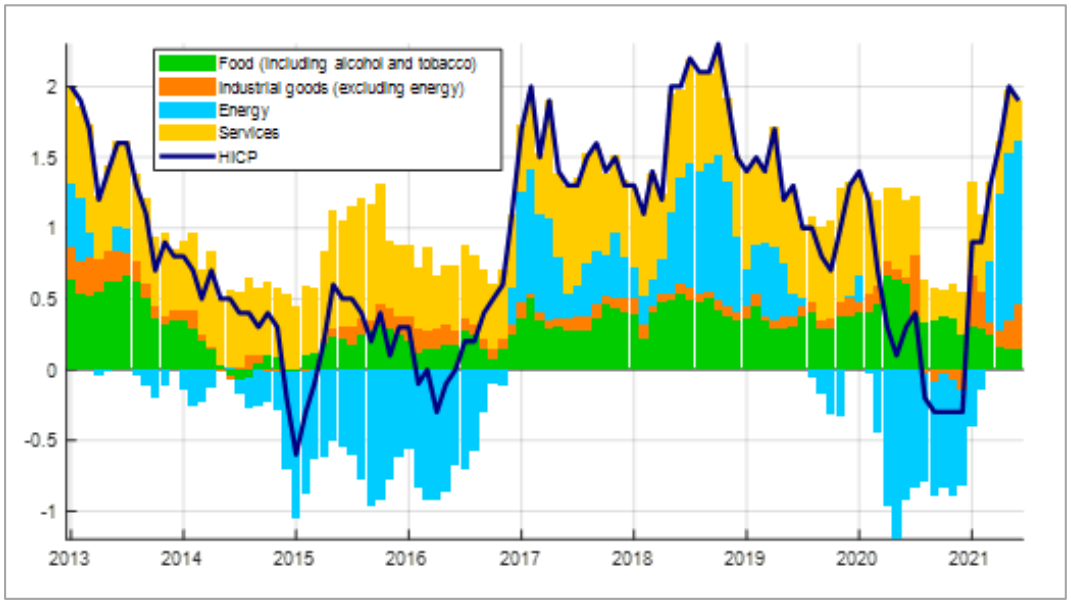
Source: ECB Statistical Data Warehouse.

January 2021 marked an end to the near zero inflation environment. Headline inflation in the euro area rose by 1.2 percentage points month-on-month to 0.9% year-on-year. This spike was mainly due to technical rather than economic reasons. As a part of their fiscal stimulus packages, several euro area governments reduced the value-added tax (VAT) in mid-2020 until the end of 2020. The reversal of the VAT rate cut in January 2021 is estimated to contribute to a rise in headline inflation by 0.4 percentage points in the euro area (CaixaBank Research, 2021). It is important to note that the base effect of the VAT cut has not yet fully materialised and could push inflation slightly up in the second half of 2021 as well. Moreover, a significant change in the relative weights of the various components that form the HICP has contributed to the rise in inflation at the beginning of 2021. Every year, Eurostat assigns component weights that reflect the previous year's household consumption. Due to the exceptional changes in consumption patterns since early 2020, the currently revised weights exhibit large shifts across categories. Therefore, a change that typically has little impact on the headline inflation rate caused an extra 0.3 percentage point spike in January 2021 and will continue to affect inflation rates throughout 2021 (European Central Bank, 2021a). Finally, there was a delay and cancellation of the typical retail discount sales in January. Its effect on inflation rates in 2021 was isolated to January, but it is likely to push inflation down in January 2022, assuming that usual seasonal discounts will occur

that year. Thus, the rise in inflation that we saw at the very beginning of 2021 is largely due to technical and one-off reasons and will therefore only be temporary.

However, in the course of the current year, the headline inflation rate has also continued to rise, climbing up to 3% in August 2021, the highest level since the end of 2011. In contrast, the inflation rate that excludes energy prices dropped in the same period from its highest level of 1.5% in January 2021 to just below 1% in July 2021 before jumping back up to 1.7% in August 2021 (Figure 1). Thus, the rise in headline inflation is largely fueled by the rebound in energy inflation (Figure 2). Oil and gas prices dropped sharply in early 2020, and then experienced a sluggish rise to their pre-pandemic levels by the end of 2020. This culminated in a significant base effect on energy inflation that will push the headline inflation rates up throughout 2021. However, its impact will mainly dissipate by the end of this year, and, therefore, is also temporary.

Figure 2: Contributions of the major sectors to euro area headline inflation

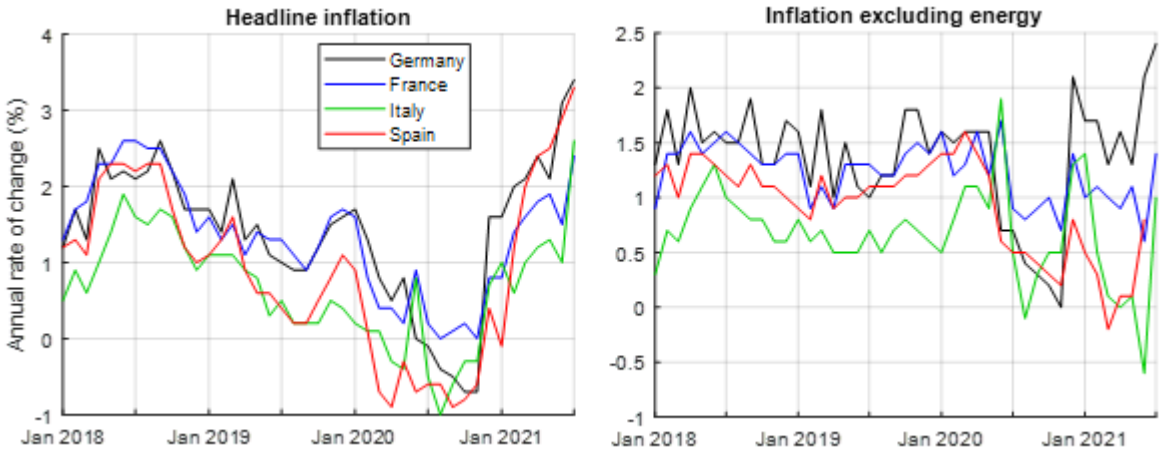


Source: Eurostat.

It is noteworthy that considerable heterogeneity exists across inflation developments in the individual economies. The standard deviation of inflation rates across euro area economies is currently at its highest level since December 2010. Looking at inflation developments in the four largest economies of the euro area, for example, we see that price increases in Italy have been very subdued in recent months, while they have been particularly strong in Germany and Spain (Figure 3). Rebound in energy inflation is the main factor behind the rapid rise in headline inflation in Spain. However, even when energy prices are excluded, Germany is on an inflationary trend since April 2021. This large heterogeneity in inflation developments does not only make it difficult for the ECB to pursue a uniform monetary policy; it also explains why, despite inflation still being in line with the inflation target in the aggregate[1], there is currently concern among the public and policymakers that inflation, at least in some euro area countries, could rise above the desired level in the future.

[1] It should be noted that the ECB has been aiming for a symmetric medium-term inflation target of 2% since its strategy review in July 2021.This means that after a sustained period of below-target inflation, as has been the case in recent quarters, an overshooting of inflation above 2% will be accepted.

Figure 3: Inflation (HICP) developments in the largest four economies



Source: ECB Statistical Data Warehouse.

Although the volatility in energy prices has lately been the major contributor to the movements of the headline inflation rate in the euro area, there are additional critical factors for the short- to medium-term inflation outlook. Domestic demand is viewed as the main driver of a potential robust recovery in the euro area. It is expected that as lockdown restrictions are eased, aggregate demand, especially for the services sector, will hike with the release of pent-up demand. The recent rise in global input costs due to supply bottlenecks is another important inflationary force. Inflation expectations of households and firms affect almost every aspect of the economy, from wage negotiations to consumption patterns, rendering it yet another crucial factor for the development of inflation. The slack in the euro area economy and the aggregate impact of the fiscal stimulus packages are also important determinants of inflation. Apart from the economic factors, progress with vaccinations in developed and emerging market countries, the emergence of the Delta variant and potential other variants are key to assess the medium-term inflation outlook.

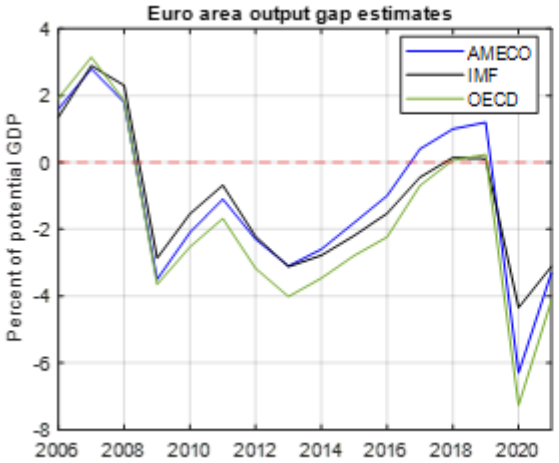
This paper takes a closer look at the above-mentioned factors affecting inflation over the short to medium term. First, we examine the degree of capacity utilisation in the euro area economies. We then analyse the extent to which inflationary pressures could arise from aggregate demand, which is likely to be triggered by pent-up consumption and fiscal stimulus. Next, we examine the impact of supply-side bottlenecks and pipeline pressures, which could affect headline inflation via producer inflation. Finally, the development of inflation expectations derived from the Survey of Professional Forecasters (SPF) and their anchoring in the ECB's inflation target are examined in detail.

2. ECONOMIC SITUATION AND ECONOMIC SCOPE

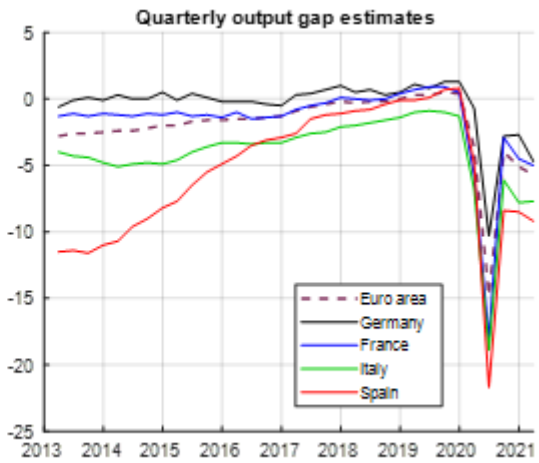
Inflationary pressures are significantly influenced by the cyclical situation or the margin of slack of an economy. The cyclical stance of an economy is often measured by the output gap, which is the difference between actual output and potential output. When actual output rises above potential output (positive output gap), upward pressure on factor costs increases, which ultimately results in consumer price inflation. Alternatively, economic activity is estimated by the slack in the labour market. During times of low slack, employers are competing over workers, and hence wages tend to rise. This increase in firms' input costs is likely to translate into higher prices. Labour market slack is estimated using the unemployment gap measure, which is the difference between actual unemployment and structural unemployment rates. Generally, estimates for the non-accelerating inflation rate of unemployment (NAIRU) and the non-accelerating wage rate of unemployment (NAWRU) are used as proxies for the structural unemployment rate. An unemployment rate higher than the NAIRU indicates slack in the labour market and the potential to expand employment without generating price increases (Eurofound, 2017)[2].

The euro area economy has been operating near its potential since 2018 until the COVID-19 crisis shook the world in early 2020. The sudden complete shutdown of the euro area economies in early 2020 and the following lockdown restrictions led to sizeable falls in production and capacity utilisation (Figure 4). As a result, the output gap widened into negative territory to around -15% in the second quarter of 2020, which is 12 percentage points lower than the gap during the Great Recession 2008/09 and the European debt crisis 2010-13.

Figure 4: Slack in the euro area economy



Sources: AMECO, IMF, OECD.



Source: Bloomberg Economics.

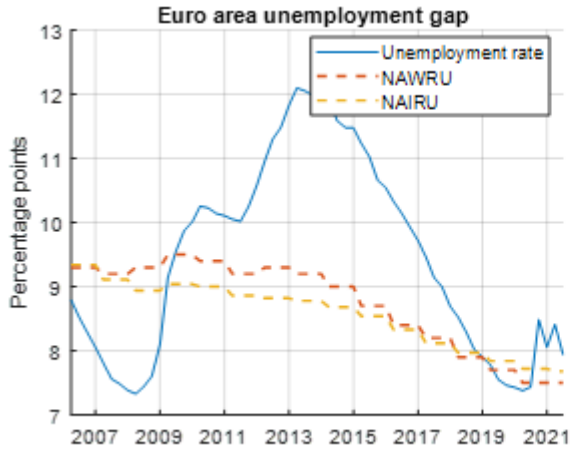
To combat the deflationary pressure generated from this unprecedented fall in economic activity, governments and the ECB reacted promptly with active and expansionary fiscal and monetary policy measures. Although the largest four economies in the euro area still have substantial margins of slack, the output gaps in Germany and France are recovering comparatively rapidly, whereas Italy and Spain are still lagging behind. This is one of the main drivers of the divergence in headline inflation apart from energy among these economies in 2021 (Figure 3). Current forecasts suggest that in major euro area

[2] It is important to note that although both measures are commonly used, they are difficult to estimate and subject to significant margins of error since potential output and structural unemployment rates are unobservable variables. Therefore, estimates for slack in the economy vary across methods that estimate potential output and proxies for structural unemployment.

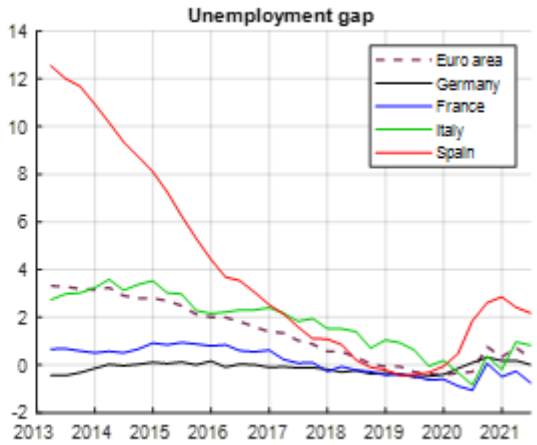
countries' output gaps will be closed by the end of 2022 (ECB, 2021d; European Commission, 2021 and DIW, 2021).

However, predictions about the further development of the output gap and therefore inflationary or deflationary pressures are only possible with high uncertainty. The impact of the COVID-19 crisis on production largely depends on the duration of the pandemic and restrictions, and there is considerable uncertainty over short- and long-term forecasts as future economic policies play a key role. The growth projections of potential output in the euro area remain well below the path suggested by pre-pandemic projections. In the event of a longer than expected compression of the economies, not only actual production but also potential output could fall. According to International Monetary Fund (IMF) and ECB estimates, the loss in the level of potential output due to the COVID-19 crisis could approach around 3% in 2021, which renders an assessment of inflationary pressures even more difficult and uncertain (European Central Bank, 2020a). Depending on whether potential output falls by more than actual output, this could even push up the output gap and induce inflationary instead of deflationary pressures.

Figure 5: Slack in the euro area labour market



Sources: AMECO database (NAWRU), OECD (NAIRU and unemployment rate).



Sources: Bloomberg Economics, OECD (euro area), authors' calculations.

Notes: Unemployment gap is computed as the difference between the actual unemployment rate and the NAIRU.

The substantial fall in the euro area output did not generate the expected proportional increase in the unemployment rate, largely due to the job retention schemes introduced by the governments of euro area Member States (Figure 5). Currently, the euro area unemployment gap is almost at its pre-pandemic level—near zero—suggesting that the labour market is tight. In a tight labour market, it would be expected that as lockdown restrictions are lifted and labour demand increases, wages and thus prices will tend to rise. However, there are a few factors suggesting that this conclusion is likely to be flawed. Brooks and Fortun (2020) show that the relationship between core inflation and the consensus unemployment gap is weak in the euro area, especially in the peripheral regions. The COVID-19 crisis caused a notable decrease in the labour force participation rate in the euro area, thus suppressing the increase in the unemployment rate (European Central Bank, 2020b). Additionally, employees who are supported by the short-work schemes had to reduce working hours, yet this change is not reflected in the unemployment rate. These factors exacerbated the decoupling of inflation and the unemployment gap, rendering any inference on inflation from the movements in the unemployment gap even more challenging. Although an accurate quantitative analysis about how the

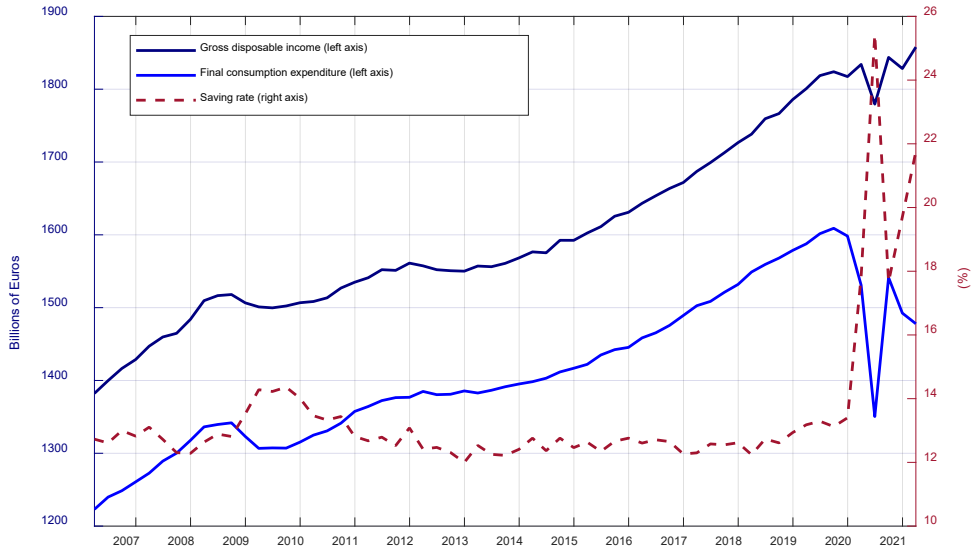
unemployment gap affects inflation is rather difficult, it could be argued that wages might rise in the second half of 2021 as labour demand increases and supply remains subdued. However, this effect is likely to be temporary as supply will catch up with demand when job retention schemes and pandemic-related transfers come to a halt. We therefore conclude that if the economy continues to recover, wage-induced inflationary pressures are likely to be noticeable but limited.

3. AGGREGATE DEMAND

3.1. Pent-up consumption

The saving rate in the euro area experienced a sharp increase in 2020Q1, and rose to an unprecedented level of 25% in 2020Q2 as the first COVID-19 pandemic-related restrictions came into effect. Although the saving rate has declined slightly since then, it currently remains at a historically high level that clearly exceeds the saving rates observed during the Great Recession 2008/09 and the European sovereign debt crisis 2010-13. This hike was mainly fueled by collapsing consumption rather than fluctuations in disposable income, suggesting that the resulting excess savings were largely involuntary as lockdown restrictions inhibited households' ability to spend in sectors like hospitality, transport and recreation. The fall in disposable income was limited because governments stepped in massively to offset the pandemic-related decreases in households' primary incomes (Figure 6).

Figure 6: Development of disposable income and savings



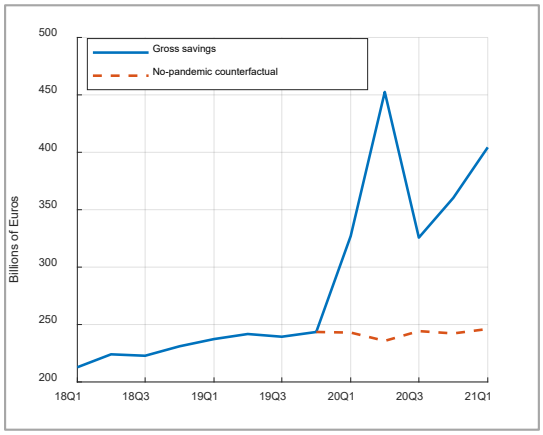
Sources: ECB Statistical Data Warehouse, authors' calculations.

Domestic demand in the euro area is expected to be the key driver of the post-pandemic recovery. We estimate that these excess savings, defined as the savings in excess of what would have been saved in normal times, amount to nearly EUR 650 billion up until 2021Q2, which is almost equivalent to the current output gap of 5% (Figure 5a)[3]. Aggregate demand is expected to rise once further pandemic-related restrictions have been lifted. However, the impact of pent-up demand on inflation depends heavily on how much of the excess savings households have accumulated since the beginning of 2020 will be spent in the coming quarters.

Figure 7: Saving dynamics of households during the COVID-19 crisis

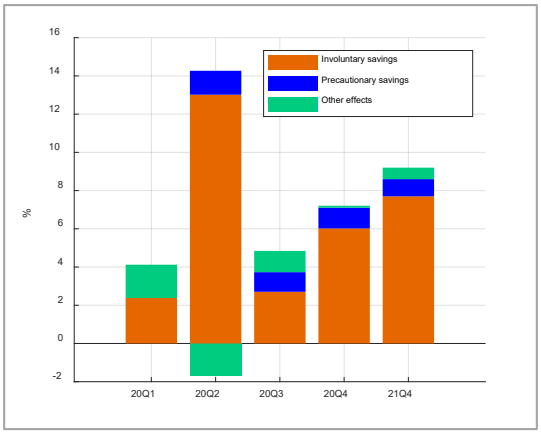
[3] We carried out a counterfactual analysis for the no-pandemic scenario to estimate gross excess savings. First, we assumed that the saving rates during 2020Q1-2021Q1 would be equal to the average saving rate in the euro area in 2019. Then, we calculated the amount of gross savings using the extrapolated saving rate and the actual gross disposable income during 2020Q1-2021Q1. Finally, we calculated the excess savings as actual gross savings minus the no-pandemic counterfactual gross savings for the period 2020Q1-2021Q1. There is no available data for 2021Q2. It should be noted that the accuracy of this analysis heavily depends on the extrapolated saving rate, and the average saving rate for 2019 is chosen as the no-pandemic counterfactual saving rate to consider the slight uptick in the saving rate of households since 2018.

(a) Savings in the euro area



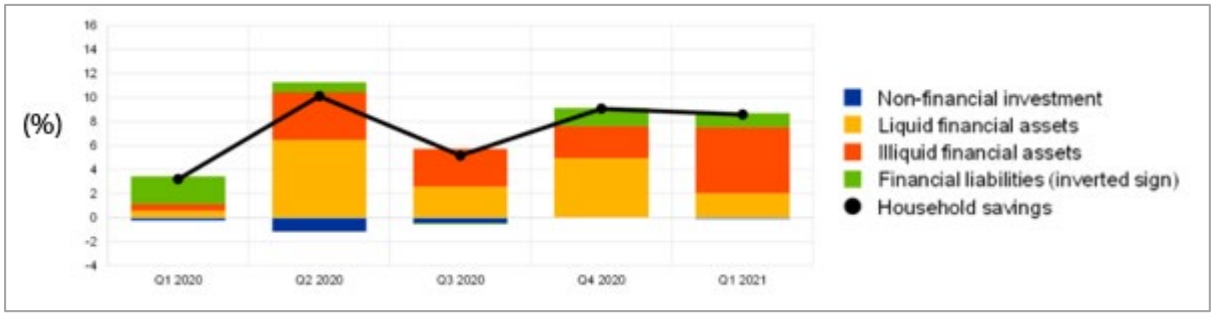
Sources: ECB Statistical Data Warehouse, authors' calculations.

(b) Change in the euro area saving rate compared to 2019Q4



Source: ECB Economic Bulletin Issue 5, 2021.

(c) Allocation of the extra savings in the euro area (compared to the saving rate in 2019Q4)



Source: ECB Economic Bulletin Issue 5, 2021.

Notes: The no-pandemic counterfactual in Figure 7a is calculated by extrapolating the average saving rate in 2019 and then multiplying it by the disposable income in 2020Q1-2021Q1.

The largest share of excess savings was involuntary due to pandemic-related restrictions and not precautionary due to high macroeconomic uncertainty during the pandemic. However, the longer the pandemic lasted, the larger the share of excess savings is held in illiquid rather than liquid assets (bank deposits) (Figure 7b, Figure 7c). This suggests that even if pandemic-related restrictions continue to be lifted, households will not deplete all of their savings. Moreover, it also matters in which income and wealth groups these excess savings are concentrated. Using data from Eurostat's 2015 experimental statistics on the share of disposable income and the median saving rate for each income quintile, we calculate the share of savings for different income groups (Table 1)[4]. We find that in normal times, more than 80% of gross savings are accumulated in the top two income quintiles. This is in line with the findings of the European Commission that a large share of pandemic-related excess savings is concentrated in high-income households (European Commission, Economic and Financial Affairs, 2021). Since high-income households' marginal propensity to consume is significantly lower than that of middle- and low-income households, we expect that only part of the pandemic-related excess

[4] The data is not provided for the euro area as a whole, therefore a weighted average of the variables is taken using the HICP country weights provided by Eurostat. A potential caveat of the analysis is that that there is no data for Italy, but we do not expect that including Italy would change the main finding as the share of disposable income and median saving rate are not highly heterogenous across euro area Member States.

savings will be released in the form of additional consumption and that the impact on headline inflation will be limited (Drescher et al., 2020 and Fisher et al., 2020). Instead, a not insignificant part of the impact of excess savings will be absorbed by asset price inflation.

Table 1: Analysis of saving dynamics across different income quintiles in the euro area

Income quintile	Share of disposable income (%)	Median saving rate (%)	Share of savings (%)
1	7.5	-5.2	-1.4
2	12.8	13.5	6.3
3	17.5	21.6	13.9
4	23.4	29.6	25.3
5	38.8	39.4	55.9

Sources: Eurostat experimental statistics (2015), authors' calculations.

3.2. Fiscal stimulus

Euro area countries implemented extensive discretionary fiscal stimulus packages to combat the detrimental impact of the COVID-19 pandemic on their economies. These packages are mainly constructed to support the firms and workers in sectors that were the most affected by pandemic-related restrictions. The fiscal instruments included in these packages are largely the same across euro area countries. They consist of budgetary measures (short-time work schemes, support to firms and households, public spending and investment, tax and social contribution cuts, tax deferrals) and liquidity support measures (loan guarantees, additional loans).

The budgetary measures in the fiscal stimulus packages of euro area countries amount to nearly EUR 1 trillion (8-9% of 2020 GDP)[5]. In addition to individual countries' fiscal programs, the European Union (EU) announced its landmark instrument for the recovery phase from the COVID-19 crisis, the Recovery and Resilience Facility (RRF), as a component of the Next Generation EU (NGEU) program. The RRF will provide grants to euro area countries totaling EUR 338 billion and loans totaling EUR 390 billion at current prices (Bruegel, 2021). The euro area's fiscal policy response to the crisis is on a scale that far exceeds even the discretionary fiscal measures taken during the Great Recession.

In addition to discretionary fiscal measures, euro area countries also took extensive liquidity support measures, which played an essential role in keeping small and medium-sized enterprises afloat and maintaining employment under pandemic-related constraints. The four largest economies, i.e., Germany, France, Italy and Spain, by far exceeded the size of budgetary measures in percent of GDP (Table 2). However, it should be noted that more than 90% of these liquidity measures is in the form of loan guarantees, so that the bulk of this fiscal support will not be reflected in the public budgets in the end.

[5] Calculations of DIW Berlin based on IMF database of country fiscal measures in response to the COVID-19 pandemic.

Table 2: Discretionary fiscal packages of euro area countries

	Budgetary measures (% of 2020 GDP)				Liquidity support (% of 2020 GDP)			
	Additional spending and foregone revenues			Accelerated spending / deferred revenue		Equity injections, loans, asset purchase, debt assumptions	Contingent liabilities	
	Subtotal	Health sector	Non-health sector		**Subtotal**		Guarantees	Quasi-fiscal operations
Germany	**11.0**	1.2	9.8		**27.8**	3.0	24.8	
France	**7.6**	0.8	6.8	3.1	**15.6**	0.9	14.7	
Italy	**8.5**	0.6	7.9	0.4	**35.3**	0.2	35.1	
Spain	**7.6**	1.3	6.3		**14.4**	0.1	13.4	0.9
The Netherlands	**4.5**	0.7	3.8	1.6	**8.2**		8.2	
Belgium	**8.0**	1.8	6.2	3.0	**11.8**	0.2	11.6	
Austria	**11.7**	0.6	11.1		**2.4**		2.4	
Portugal	**5.4**	0.9	4.5	0.5	**5.7**		5.7	
Greece	**13.7**	0.5	13.2	0.6	**3.9**	2.1	1.8	
Finland	**2.5**	0.8	1.7	0.9	**7.5**	0.7	5.1	1.7
Ireland	**9.0**	1.2	7.8	0.7	**1.9**	0.8	1.1	

Source: IMF Database of Fiscal Policy Responses to COVID-19 (announced measures as of April 2021).

Notes: The countries listed in the table amount to 97% of euro area GDP.

To assess the impact of the *liquidity-protecting* measures on the economy and thus on inflation, a counterfactual analysis would be needed to examine how many companies would have exited the market in the absence of these measures. This is beyond the scope of this paper. Therefore, we focus on the expected impact of *budgetary* measures on inflation, as their direct contribution to economic growth can be estimated using previously estimated fiscal multipliers. However, since there is no single, universal multiplier, it is not possible to make a precise statement. The multipliers differ for government spending, tax cuts, subsidies and transfers. Moreover, they vary widely over time and depend heavily on the state and characteristic of the economy. For instance, government spending multipliers tend to be higher during times of economic slack (recessions) and at the zero-lower bound (Blanchard et al., 2015). They also depend on the public debt level and macroeconomic uncertainty and have positive spillover effects across countries. (Pappa, 2020) Finally, the magnitude of the fiscal multiplier during the COVID-19 crisis may be different from that of previous recessions and crises simply because the pandemic had an unprecedented impact on the economy. Our overview analysis of the impact of stimulus packages on economies is therefore based on certain assumptions and can only be considered as a rough proxy.

Table 3: Impact of budgetary fiscal measures of countries on euro area output

Program spending estimate (EUR bn)	Multiplier estimates			Implied effects on output (in EUR bn and % of potential GDP)		
	Low	Medium	High	Low	Medium	High
1071.5	0.5	1.5	2.5	535.8	1607.3	2678.8
				4.7	14.1	23.5

Sources: IMF Database of Fiscal Policy Responses to COVID-19, authors' calculations.

Notes: The estimates for the range of the aggregate fiscal multiplier for the euro area come from an intensive literature review (see footnote 6). The implied effects on output are calculated by multiplying the fiscal multiplier with the aggregate program spending. The program spending estimate includes all the budgetary fiscal stimulus measures announced by euro area countries listed in Table 1 until April 2021. AMECO estimate for euro area potential GDP in 2021 is used here.

To calculate the aggregate effect of discretionary budgetary policies of euro area countries on economic growth, we conduct a literature review estimating the size of fiscal multipliers[6]. For the fiscal spending multipliers, we only consider the estimated multipliers in recessions and at the zero interest rate bound. Although fiscal multipliers vary widely across euro area countries and depend on various economic factors, we make the simplifying assumption of a single fiscal multiplier for the euro area. Table 3 shows the range of the estimated *cumulative* fiscal multiplier after two years under the assumptions mentioned above as well as the corresponding stimulus on economic growth. The latter is calculated by multiplying the fiscal multiplier by the sum of the euro area countries' program expenditures through April 2021, as listed in Table 2. The *cumulative* multiplier is defined as the cumulative change in GDP divided by the cumulative change in government consumption (as a percentage of GDP). For example, a value of 1.5 would indicate that, after two years, the cumulative increase in output, in euro terms, is one and a half the size of the cumulative increase in government consumption.

It is reasonable to assume that the effect of social distancing during the COVID-19 pandemic attenuated the fiscal multiplier. Thus, assuming that the multiplier during the recovery from the COVID-19 pandemic tends to be between the low end of 0.5 and the medium value of 1.5 — which is the most realistic scenario in our opinion — output would increase between EUR 540 billion and around EUR 1,600 billion over the next two years. This corresponds to about 5% to 14% of potential GDP. In light of the fact that the output gap was at around -15% in 2020Q2 (Figure 4), the discretionary fiscal stimuli would thus help to close the gap, but not push it into positive territory. However, in the unlikely case that the multiplier is at the upper limit of 2.5, the cumulative impact on output after two years would be EUR 2,679 billion, or around 24% of potential GDP. In this case, output would be driven far beyond potential output.

[6] Fiscal multipliers for government spending: Blanchard and Leigh (2013) report 1.5 for the euro area, Blanchard, Erceg and Linde (2015) report 2 for the aggregate euro area, Amendola et al. (2019) report 1 in normal times and 1.6-2.8 at the zero-lower bound in the euro area, Ramey (2019) report 0.3-2.0 from various different studies, Burriel et al. (2010) report 0.85 for the euro area. Fiscal multipliers for taxes: Guajardo et al. (2014) report 1 for a panel of OECD countries, Hayo and Uhl (2014) report 1 for Germany, Burriel et al. (2010) report 0.5, Coenen et al. (2012) report 0.15-0.4. Fiscal multipliers for transfers: Coenen et al. (2012) report 0.2-0.6 for general and around 2 for targeted transfers, Parraga Rodriguez (2016) report 0-1 for the euro area.

Let us assume that the expected increase in the output gap is linear over the eight quarters. This would mean that the output gap increases by 0.6 percentage point and 1.8 percentage point per quarter on average in the low and medium fiscal multiplier scenarios, and by 2.9 percentage points on average in the case of a fiscal multiplier at the upper end of the estimated range. According to the euro area Phillips curve estimates of Ball and Mazumder (2020), this would lead to an increase in annual core inflation of about 0.5 and 1.4 percentage point in the low and medium multiplier scenario and 2.3 percentage points in the high multiplier scenario, respectively.

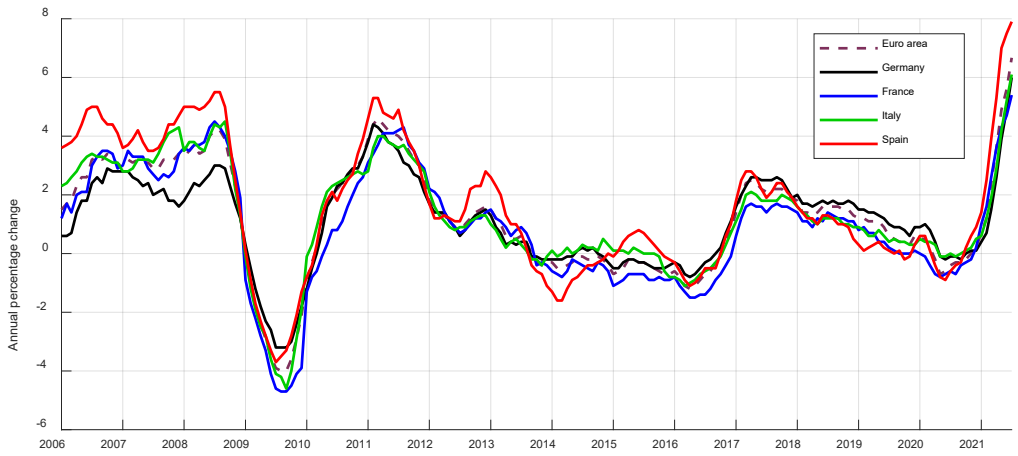
Thus, we conclude that the stimulus packages of the individual euro area countries help close the massive output gap that opened up during the COVID-19 pandemic. However, in the event that the fiscal measures push output far above potential output, the rise in inflation could be rather strong. But this seems the unlikely scenario; it is more likely that core inflation will be raised moderately by these measures. Moreover, as these fiscal stimulus measures are time-limited, headline inflation can be expected to rise only temporarily — provided that inflation expectations remain anchored despite now rising inflation, which we will discuss in more detail in chapter 5.

However, it is not only discretionary fiscal measures at the individual country level that have the potential to boost economic growth in euro area countries — so does the EU's medium-term stimulus package NGEU, including the RRF. To date, euro area Member States have requested about EUR 400 billion in grants and loans from this facility, with spending to be spread over six years (Bruegel, 2021). Watzka and Watt (2020) estimate that the overall impact of the increase in public investment financed by the RRF will be rather small for the euro area. GDP would increase by only 0.3 percentage points, so the impact on inflation is likely to be small.

4. SUPPLY SIDE CONSTRAINTS

Producer prices in the euro area have risen rapidly since the beginning of 2021. Although the rebound in energy price inflation is an important component of this increase, the rapid rise in core producer prices (excluding energy and construction) shows that there must be other important factors explaining this surge (Figure 8). Supply shortages of raw materials and intermediate products, surging commodity price inflation and unprecedented rises in shipping costs are the main drivers of this substantial increase in euro area core producer prices. Such factors, which exert price pressures on firms' inputs in the early stages of the production and distribution chain (pipeline pressures), may eventually affect the prices of consumer goods, albeit usually with a lag. Thus, underlying supply-side developments in core producer prices are crucial for an assessment of the medium-term inflation.

Figure 8: Producer price inflation (excluding construction and energy)

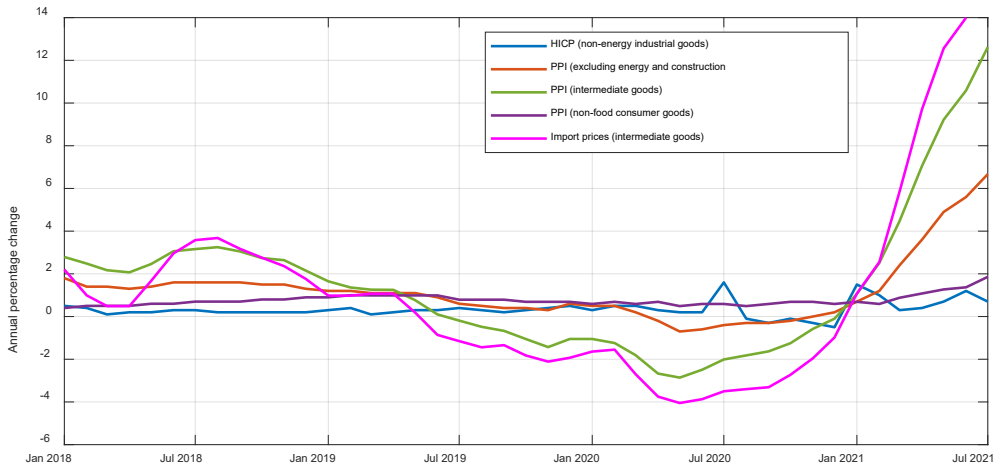


Sources: Eurostat, Bloomberg.

The component of consumer price inflation most likely to reflect the rise in core producer prices is the HICP for non-energy industrial goods (NEIG). It has not picked up so far in 2021 while both producer and import prices for intermediate goods have risen rapidly (Figure 9). However, this lag in the pass-through of pipeline pressures is normal, as production is generally not instantaneous in one step. The pass-through is expected to be through producer prices and import prices for intermediate goods, which affect producer prices for non-food consumer goods and, depending on retail and distribution margins, eventually consumer prices for non-energy industrial goods. Against this background, it is important to note that producer price inflation for non-food items rose to almost 2% in July 2021, up from just 0.6% in February. Our correlation analysis suggests that producer price inflation for intermediate goods is generally most closely related to producer price inflation for non-food goods, with a lag of 6-8 months (0.76 on average), while the lag for import price inflation for intermediate goods is 8-11 months (0.73 on average). In turn, the increase in producer prices for non-food items is most strongly associated with consumer prices for industrial goods excluding energy, with a lag of 7-8 months (0.52 on average)[7].

[7] A simple correlation analysis is conducted for the euro area using monthly data from 2002 to 2019. While this simple analysis cannot reveal a precise timeline for the pass-through of pipeline pressures to consumer prices as it does not control for demand-side factors and major global economic developments, it does indicate the process takes substantial time.

Figure 9: Euro area consumer, producer and import price developments



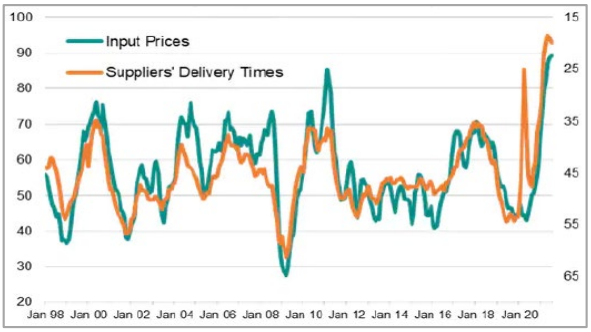
Sources: Eurostat, ECB Statistical Data Warehouse.

The speed and level of this pass-through to consumer prices depend on many factors, particularly on the duration of such pipeline pressures and firms' willingness to absorb the increase in input costs by suppressing profit margins[8]. Profit margins have shown a relatively high degree of resilience during the COVID-19 crisis, mostly due to the positive impact of job retention schemes (European Central Bank, 2021b). Therefore, the end of job retention schemes and wage increases can potentially accelerate the pass-through of pipeline pressures, albeit with limited impact if supply-side constraints disappear to some extent by then.

Figure 10: IHS Markit euro area manufacturing PMI survey indexes

(a) Euro area manufacturing sector backlogs of work

(b) Euro area manufacturing sector input prices (left scale) and supply delays (right scale, inverted)



Source: IHS Markit (2021a)

Notes: For the backlogs of work index, new orders index, output index and input prices index, readings of 50 indicate no change in the indicators on the prior month, readings above 50 indicate an increase and readings below 50 indicate a decrease. Readings of the suppliers' delivery times index below 50 indicate that it is taking longer for suppliers to hand over goods to factories, on average. The index is hence inverted to show the strong correlation between supply conditions and input price trends in the manufacturing sector.

[8] Share of long-term pricing contracts, high proportion of fixed prices, stock of inventories, capacity utilisation and the competitive environment are also important factors (European Central Bank, 2021c).

As the pandemic-related restrictions started to ease in May 2021, the baseline expectation was that supply disruptions would be resolved towards the end of 2021, and hence, production would catch up with the surging demand. Although this scenario is still possible, its likelihood has weakened considerably. The July 2021 data from the manufacturing Purchasing Managers' Index (PMI) survey from IHS Markit show that euro area manufacturers and their suppliers are still struggling to increase production capacity fast enough to meet demand. New orders exceed production in the euro area manufacturing sector to an unprecedented extent in the survey's history, and backlogs of work are thus increasing rapidly without losing steam (Figure 10a). Survey respondents cite supply delays and material shortages as the main reasons why euro area manufacturers cannot further increase production capacity (IHS Markit, 2021a). Suppliers' delivery times index and euro area PMI input price index are both at record-high levels, although their rates of increase finally showed signs of slowing down in July 2021 (Figure 10b). While this could indicate positive developments for euro area production capacity, emergence of the Delta variant exacerbated containment measures in many countries and led to notable falls in the manufacturing sector in July 2021, particularly in the Asia-Pacific region. This lack of production in key Asian countries is likely to once again hit the manufacturers in the euro area and generate higher input prices (IHS Markit, 2021b).

We conclude that there are still very many uncertainties surrounding the evolution of key supply-side factors that will determine how global pipeline pressures will affect euro area inflation. According to the ECB (2021c), the impact of a strong spillover of pipeline pressures to NEIG inflation on overall euro area inflation should nevertheless be limited, as services inflation remains the predominant underlying dynamic for core inflation (with a weight of about two-thirds in the core HICP). Nevertheless, global supply-side developments should be closely monitored by policymakers to keep inflation on track, especially at a time when actual euro area inflation rates are exceeding expectations month after month.

5. INFLATION EXPECTATIONS IN THE SHORT AND MEDIUM TERM

Especially in periods of rising inflation, as is currently the case, inflation expectations need to be carefully monitored. The development of inflation expectations and their anchoring are of great importance for the further development of actual inflation, as the expected inflation rate feeds into companies' wage and price decisions as well as households' consumption and investment decisions.

Temporary deviations in the actual inflation rate are acceptable as long as the expected inflation rate in the medium term is consistent with the objective of price stability. In the case of the euro area, the inflation target was defined as just below 2% in the medium term until July 2021, which could be redefined as a target corridor of 1.7% and 1.9%[9]. Since then, the ECB aims for a symmetrical medium-term inflation target of 2%, which means that negative and positive deviations of inflation from this target are now equally undesirable. Inflation expectations are anchored to a large extent by credible central bank monetary policy. Conversely, a significant deviation of the expected inflation rate from the target rate signals that confidence in the central bank's ability to fulfil its mandate is declining.

The trend in inflation expectations is reflected in detail in the Survey of Professional Forecasters (SPF). Since 1999, the ECB has been surveying around 60 participants on a quarterly basis to obtain their assessment of inflation developments over the next one to five years. The experts are each asked for their point forecast, i.e., their inflation expectation expressed as a single number, as well as for the probabilities with which inflation lies within certain predefined intervals. This survey approach exploits the fact that the average of independent expert forecasts is a good estimator of future developments (Surowiecki, 2004). In this section, we primarily analyse inflation expectations with a forecast horizon of one and two years, which corresponds to the definition of the short and medium term. However, we will also briefly outline the results for the inflation forecasts for the next four and five years[10].

The SPF allows us to analyse not only the point forecasts but also the density forecasts (histogram) of the individual experts, the latter being the basis for the construction of uncertainty measures. We derive three different measures of forecast uncertainty from the individual density forecasts of survey respondents (see Box 1 for a more detailed overview). First, static uncertainty, which measures the average variance of the individual probability distributions at a given time. Second, to measure how much the individual experts' point estimates vary over time, we calculate the average of the standard deviations of the individual point estimates over a rolling two-year window (*dynamic uncertainty*). And third, we calculate a measure that focuses on the cross-sectional dispersion of point forecast, measured as the average standard deviation of the experts' point estimates at a given time (*disagreement*)[11].

[9] See ECB (2003), "Press Seminar on the Evaluation of the ECB's Monetary Policy Strategy - Transcript of Questions and Answers". The fact that the ECB's inflation target is defined in terms of its inflation expectations is made clear by the statement of Otmar Issing, former Chief Economist of the ECB: "(...) this 'close to 2%' is not a change, it is a clarification of what we have done so far, what we have achieved - namely inflation expectations remaining in a narrow range of roughly 1.7% and 1.9% - and what we intend to do in our forward-looking monetary policy".

[10] Four calendar years ahead for surveys conducted in the Q1 and Q2 rounds, and five calendar years ahead for surveys conducted in the Q3 and Q4 rounds.

[11] All three measures require to address the open-ended lower-end and upper-end intervals in the SPF questionnaire. We follow Andrade et al. (2012) and close the open intervals by assuming that they have a width of twice the length of the closed intervals.

Box 1: Inflation uncertainty indicators

Based on the results of the SPF, a quarterly survey of around 60 participants conducted by the ECB since 1999, statistical uncertainty factors can be calculated. Let *n* denote the number of experts surveyed. Expert *i* specifies a probability p_{kit} whith which he expects inflation to be at time *t* in interval *k*.

Static uncertainty:

Static uncertainty θ_t is equal to the square root of the average variance σ_i^2 of the individual probability distributions at a given time:

$$\theta_t = \sqrt{\frac{1}{n}\sum_{i=1}^{n}\sigma_{it}^2}, \qquad t = 1, \dots, T.$$

When the individual probability distribution is broadly spread on average, the general uncertainty about the expected level of inflation is high. If the probability distribution is very narrow, uncertainty is generally low.

Dynamic uncertainty:

The dynamic uncertainty ϑ_t measures the average standard deviation of the experts' point estimates $\hat{\pi}_{it}$ over a two-year time window:

$$\vartheta_t = \frac{1}{n}\sum_{i=1}^{n}\left(\frac{1}{8}\sum_{\tau=-4}^{3}(\hat{\pi}_{it+\tau} - \bar{\pi}_i)^2\right), \qquad t = 1, \dots, T$$

where $\bar{\pi}_i$ denotes the average point estimate of an expert *i*. This indicator shows how much the experts' point estimates fluctuate over a two-year horizon. If the indicator is low, the experts' inflation expectations are relatively stable.

Disagreement:

The disagreement ρ_t measures the average standard deviation of the point estimates $\hat{\pi}_i$ at a given time:

$$\rho_t = \sqrt{1/n\sum_{i=1}^{n}(\hat{\pi}_{it} - \hat{\pi}_{At})^2}, \qquad t = 1, \dots, T$$

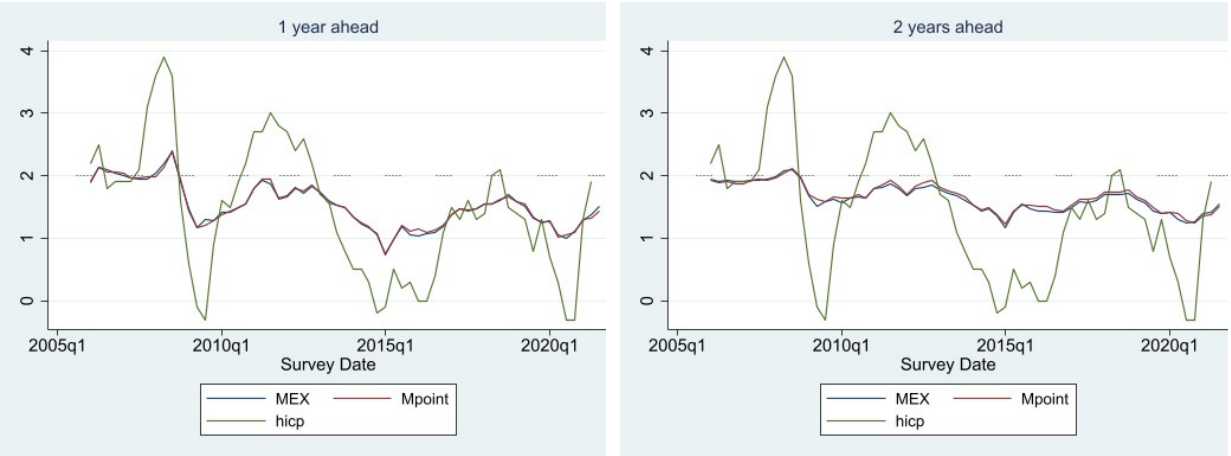
where $\hat{\pi}_A$ is the midpoint of the aggregate probability distribution and thus indicates the average inflation forecast of all experts. The further apart the experts' inflation forecasts, the higher the disagreement and the larger the indicator. The advantage of this measure over the ordinary standard deviation is that it corrects for the presence of outliers in the inflation survey—that is, overly positive or negative inflation forecasts.

Source: Authors' elaboration.

Figure 11 shows that the mean inflation forecast (MEX) calculated from the individual experts' probability distributions deviates only marginally from the average point inflation estimate across all experts (Mpoint). It can be seen that one-year-ahead inflation expectations exhibit somewhat higher volatility than two-year-ahead inflation forecasts. However, the pattern and the level are very similar. Since the outbreak of the global financial crisis in 2008Q4, average expected inflation has been

continuously below 2%. Despite an ultra-loose monetary policy, survey expectations for one- and two-year inflation were, with few exceptions, even consistently below the ECB's target range. While inflation expectations rose slightly after the announcement of an expanded asset purchase program in the first quarter of 2015, they started to decline again in 2019, almost reaching the 2015Q1 low of around 1% at the end of 2019. Since then, inflation forecasts have been continuously increasing again, but with around 1.5% in 2021Q3, are still well below the inflation target of 2%. Looking at inflation expectations for the next four to five years, we find that long-term inflation expectations exhibit extremely low volatility, with mean inflation expectations of around 1.8%, confirming that expectations are firmly anchored, especially in the long run.

Figure 11: Inflation forecast and actual inflation



Source: Survey of Professional Forcasters (ECB); Calculations of DIW Berlin.

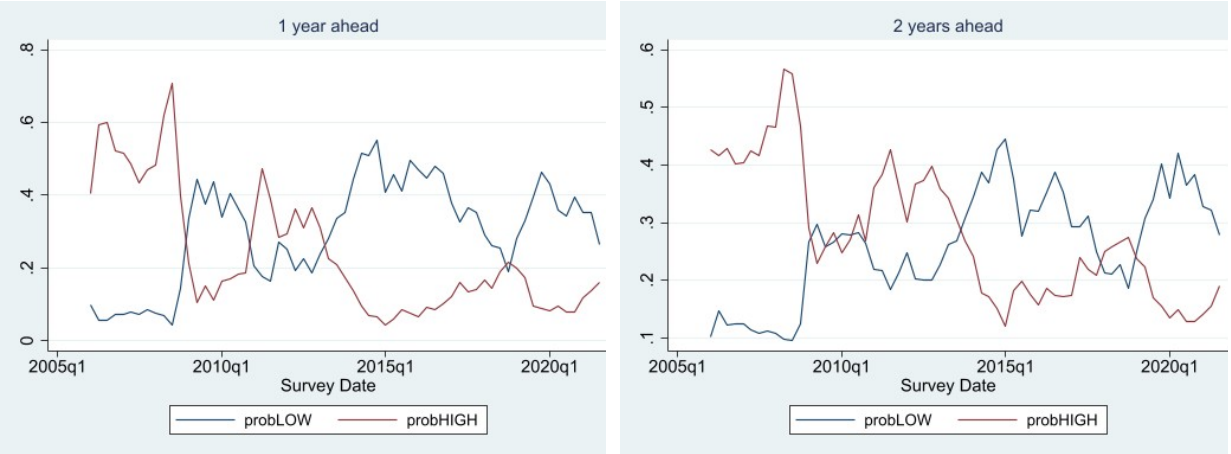
Notes: MEX denotes the average inflation forecast calculated from the individual experts' probability distributions, Mpoint the average point inflation estimate across all experts and hicp depicts the actual harmonized index of consumer prices at the survey date.

Figure 12 shows the average probability with which the experts expect inflation to deviate upward (>2% - probHIGH) and downward (<1.4% - probLOW) from the inflation target[12]. Since 2013Q4, with only a few exceptions during 2018, experts have, on average, stated that the probability of inflation being below the inflation target is higher than the probability of being above the inflation target. In 2020, the average probability of higher inflation than targeted was only 10% for the one-year and 14% for the two-year forecast horizon. In contrast, undershooting the inflation target was considered much more likely at around 43%.

The average probability of headline inflation being below the target has been steadily decreasing since 2021Q1, and, accordingly, the probability of inflation overshooting the target has been steadily increasing. However, nevertheless, the probability of low inflation still prevails over that of high inflation. It is not yet possible to conclude whether this trend will continue and thus signal the end of the expected period of low inflation.

[12] We have taken note that with the change in the inflation target in July 2021 to a symmetric target of 2%, a price increase of slightly above 2% can no longer be interpreted as a positive deviation from the inflation target. For simplicity, however, we do not adopt the definition of "high inflation" for the last observed survey in 2021Q3.

Figure 12: Probability of high and low inflation

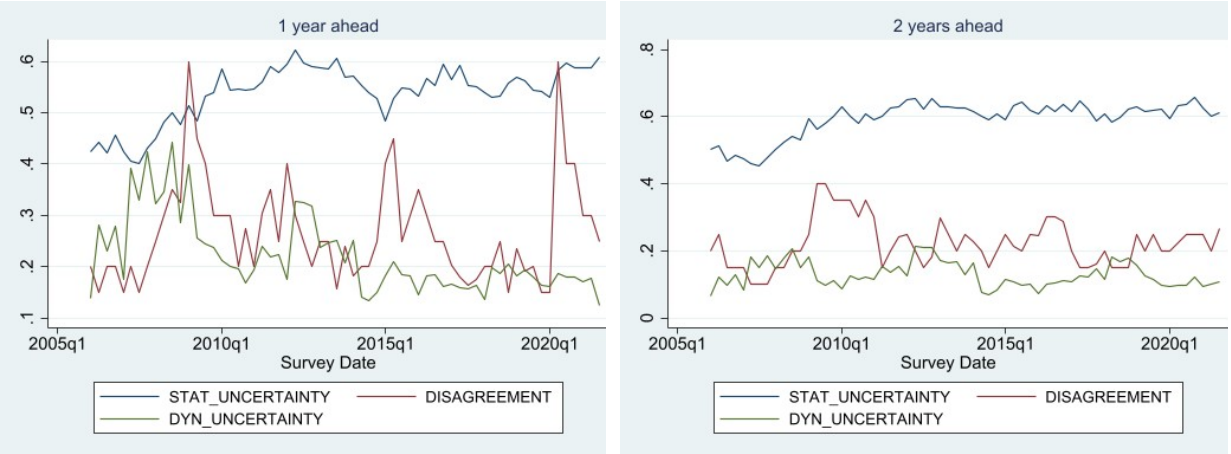


Source: Authors' elaboration.

Figure 13 shows the evolution of our three measures of uncertainty over time. It is striking that uncertainty in all three dimensions is much more volatile when it comes to inflation in one year than to inflation in two years. This suggests that inflation expectations are much more anchored in the medium term than in the short term, which in principle expresses a high degree of credibility of the ECB.

It can be seen that disagreement among respondents increases markedly in times of crisis. Similar to the situation during the global financial crisis between the fall of 2008 and the end of 2009, respondents' assessments of how inflation will evolve in the next year diverged widely in the first wave of the COVID-19 pandemic. A high degree of disagreement suggests that the decisions (on prices, wages, consumption) of individual economic agents in the euro area may also diverge considerably. Different inflation forecasts may also reflect regional differences, making it increasingly difficult for the ECB to define a uniform and optimal monetary policy for the euro area as a whole. In contrast, dispersion of expert assessments of inflation in the medium-term did not increase significantly during the COVID-19 crisis. This suggests that this crisis was expected to affect the economy primarily in the short run.

Figure 13: Uncertainty measures



Source: Authors' elaboration.

The situation is different with regard to the uncertainty surrounding individual inflation forecasts (*static uncertainty*). Since the outbreak of the global financial crisis, the average dispersion of expectations has increased and since remained at a higher level. Compared with before the crisis, the surveyed experts thus consider a significantly wider range of future inflation rates to be possible. The pandemic, by contrast, does not appear to have had any significant impact on this uncertainty.

In contrast, uncertainty about expected inflation in the next year of the individual experts (*dynamic uncertainty*) has tended to decline on average over time since its peak during the global financial crisis, reaching a similarly low level as uncertainty about inflation in two years. This means that the experts surveyed are currently revising their inflation expectations over time less frequently than they did during or before the financial crisis. This development reflects the success of a forward guidance-oriented communication strategy of the kind used by the ECB since July 2013: it was designed to reduce economic agents' uncertainty about future monetary policy decisions by providing explicit forward guidance. And even this uncertainty measure has not noticeably increased during the current COVID-19 pandemic.

In summary, the increase in inflation currently observed in the euro area has not yet had any impact on inflation expectations in the medium term and this aspect is not yet exerting any significant inflationary pressure. Only with regard to the development of inflation in the short term has the disagreement of expert assessments increased, which is likely to be due more to the high level of uncertainty surrounding the course of the pandemic than to the credibility of the ECB.

6. CONCLUSION

While central bankers and economic policymakers have been rather concerned in the past ten years about inflation in the euro area being too low in relation to the ECB's inflation target, this concern now seems to have reversed. Since January 2021, headline inflation in the euro area has been rising steadily and most recently climbed up to 3% in August 2021, the highest level since the end of 2011. In addition, inflation developments in the individual economies have diverged sharply. The standard deviation of inflation rates in the individual economies of the euro area is currently at its highest level since December 2010, and more than a few are calling for an end to the very lax monetary policy in the euro area. However, whether this is actually advisable depends on whether the current rise in inflation is of a more temporary nature or has actually heralded a sustained trend reversal.

Much of the current rise in inflation is due to one-off measures, such as the recovery of energy prices after their collapse during the COVID-19 pandemic or the reversal of VAT reductions in several euro area countries. As soon as these effects fade out, inflationary pressure in the euro area should therefore decline again. However, there are other factors that could also put further upward pressure on headline inflation in the medium term, which should now be monitored more closely.

One factor that is often discussed is the inflationary pressure that could come from the currently very tight labour market. The unemployment gap in the euro area is almost closed. This may result in upward wage pressure if the economy continues to recover and labour demand increases. However, it should be noted here that labour force participation fell sharply during the pandemic, which makes the unemployment figures look too positive at the moment. Furthermore, the correlation between the unemployment rate and inflation in the euro area is very weak, so that no clear statements can be made about price developments in this context.

An important driver of inflation is expected to be strong aggregate demand, which is seen as the main driver of a potentially robust recovery in the euro area in the coming quarters. We estimate that excess household savings amount to almost EUR 650 billion by 2021Q2, almost equal to the current 5% output gap. However, a significant portion of excess savings is held in illiquid rather than liquid assets. Although it may be different at times of COVID-19 crisis, in general about 80% of savings are concentrated in the top two income quintiles. Since high-income households' marginal propensity to consume is significantly lower than that of middle- and low-income households, we expect only a portion of pandemic-related excess savings to be released in the form of additional consumption and that the impact on headline inflation will therefore be limited. Instead, a not insignificant part of the impact of excess savings will be absorbed by asset price inflation.

However, aggregate demand will rise not only because of pent-up consumption, but also because of the massive stimulus packages of the individual euro area countries and at the EU level. Our calculations show that they will also contribute to closing the massive output gap that opened up during the COVID-19 pandemic. In the event that the fiscal measures push output far beyond potential output, the rise in inflation could be quite strong. However, this seems to be an unlikely scenario. It is more likely that core inflation will be lifted moderately by these measures. As the fiscal policy measures are time-limited, headline inflation is likely to rise only temporarily.

Finally, the recent increase in global input costs due to supply constraints is another important inflationary force. Euro area manufacturers and their suppliers are still reporting difficulties in increasing their production capacity fast enough to meet demand. The impact on headline inflation in the euro area is nevertheless likely to be limited, as services inflation remains the dominant underlying dynamic for core inflation.

We conclude that there are several reasons why inflation in the euro area will remain elevated in the coming months, especially since all these effects are working simultaneously. Although these factors very likely only have a temporary effect on inflation, there is the risk that this period of rising prices decouples the markets' inflation expectations. In this case, the temporary inflationary pressure could become more permanent. However, an analysis of the ECB's SPF shows that the currently observed increase in inflation in the euro area has not yet had an impact on medium-term inflation expectations. The ECB thus benefits from a high degree of credibility. Nevertheless, the development of inflation expectations must now be critically monitored further.

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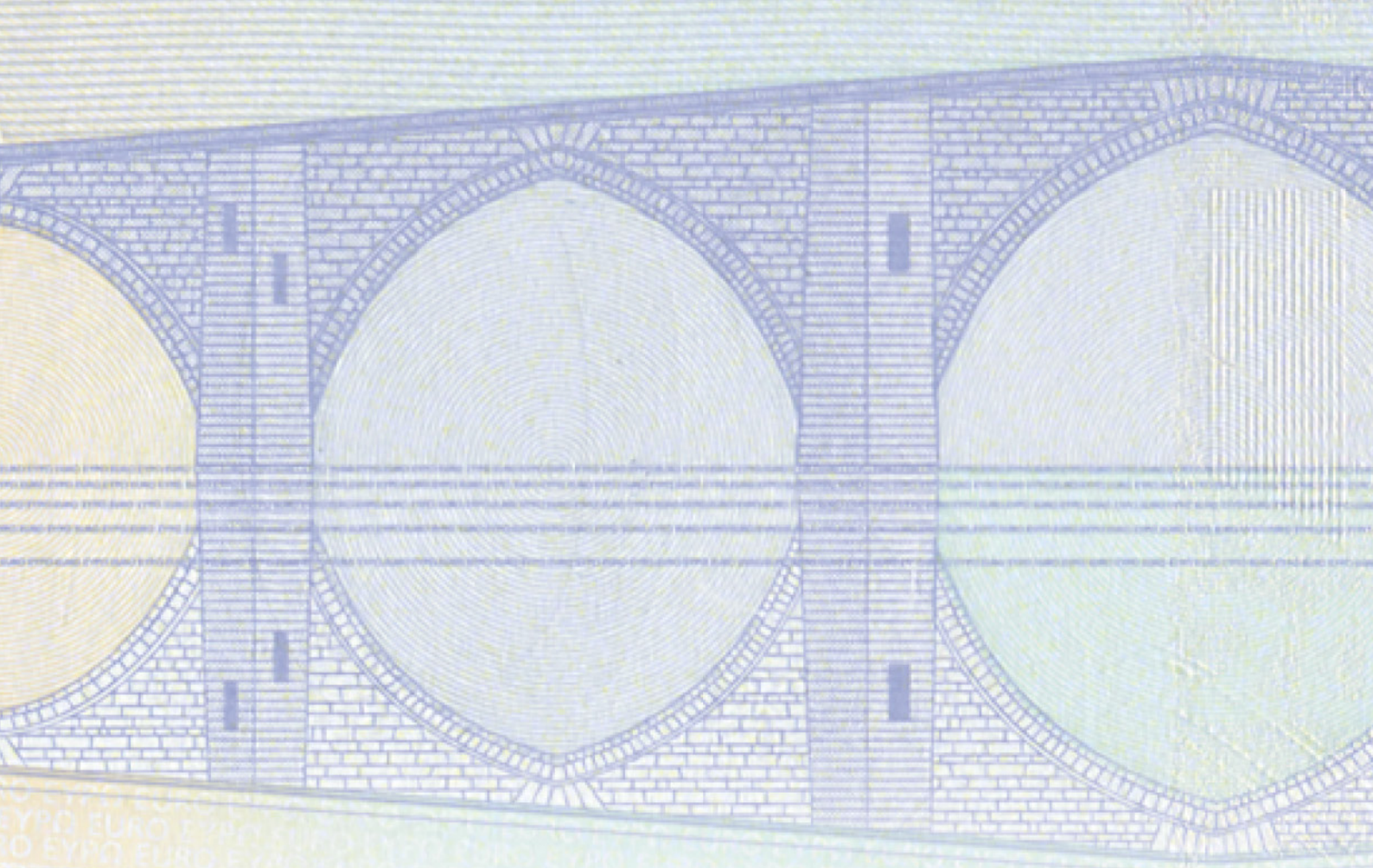

Should the ECB Be Worried About Inflation?

Karl WHELAN

Abstract

Inflation jumped to 3% in August raising questions about whether the ECB needs to alter its monetary policy. This paper reviews the recent evidence on euro area inflation and concludes the current increase is likely to be temporary, being driven by a rise in energy prices that is likely to end soon and a range of temporary factors relating to the pandemic.

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.

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LIST OF ABBREVIATIONS

CPI	Consumer price index
ECB	European Central Bank
HICP	Harmonised index of consumer prices
IMF	International Monetary Fund
PEPP	Pandemic emergency purchase programme

EXECUTIVE SUMMARY

- **Euro area HICP inflation jumped to 3% in August**. This has raised questions about whether the ECB will need to alter its monetary policy in response to rising inflation.
- **This paper reviews the recent evidence on euro area inflation**. It concludes the current increase in inflation is likely to be temporary.
- **The biggest factor driving the higher rate in inflation is an increase in energy prices.** Excluding energy prices, the euro area HICP rose 1.7% over the year ending in August.
- **This rise in energy prices is projected to end soon.** Energy prices fell during 2020 largely due to reduced demand for transportation because of lockdowns. As the global economy has recovered, energy prices have risen back above pre-pandemic levels. However, forecasts from the IMF and futures market contracts suggest energy prices are unlikely to rise much further.
- **HICP inflation excluding energy, food, alcohol and tobacco (core inflation) rose by 1.6% in August.** This was a sharp rise from previous months this year.
- **The sharp rise in year-over-year core HICP inflation during August was due to several temporary factors related to the pandemic emergency.** A temporary cut in German VAT in 2020 combined with the absence of traditional seasonal sales to affect some of the readings for core HICP inflation over the past year.
- **However, underlying core inflation remains below 2%.** Since the start of the pandemic, both the total HICP and the core HICP have grown at a pace slower than if they had grown in line with the ECB's 2% inflation target.
- **The rise in inflation will be of more concern to the ECB if it raises inflation expectations and gets passed into wage bargaining.** However, there is no evidence of this happening as of yet.
- **The forces that have produced low inflation over the past decade are unlikely to go away.** Research generally points to longer-term changes in technology, demographics and central bank policies as key factors. These have not changed with the onset of the pandemic.
- **To the extent that the current uptick in inflation triggers a limited increase in inflation expectations, it may have some positive side effects.** The ECB has substantially undershot its inflation target over the past decade. An uptick in inflation expectations may help ECB to keep inflation expectations anchored at its target rate. This may help it reach its inflation target and prompt the phasing out of its wide range of unconventional monetary policies.

1. INTRODUCTION

Over the last decade, the European Central Bank (ECB) has consistently undershot its target rate of inflation. Despite years of economic recovery following the global financial crisis and the subsequent euro crisis, inflation continued to regularly come in below 2%. These developments led the ECB to introduce unprecedented levels of monetary stimulus in an attempt to raise inflation towards its target level. With the onset of the global pandemic, the ECB was concerned that this large negative economic shock would move inflation even further below target so they supplemented their existing monetary policy measures with the enormous pandemic emergency purchase programme (PEPP). The ECB's message to the public throughout the pandemic period has been that they should expect a highly supportive monetary policy to be in place for many years.

Recent events, however, have raised some questions about whether the ECB may need to change course somewhat faster than had been expected. Successful vaccination programmes in advanced economies have allowed a re-opening of parts of the economy that were closed for much of last year and the pace of global recovery has been robust. In addition, several unusual circumstances created by the pandemic have produced a faster rebound in inflation than most had expected last year. Energy prices have recovered and supply disruptions and changes in demand patterns have led to increasing prices for various kinds of goods.

With household spending on many items suppressed over the past year by lockdowns and household balance sheets generally in better shape than prior to the pandemic, there is also the potential for high levels of demand to drive up prices. This prospect has been increased by the aggressive fiscal stimulus introduced in the United States (US). Indeed, the US consumer price index (CPI) was up 5.4% over the previous year in July, with "core" CPI inflation (excluding food and energy prices) up 4.5%.

While there have been concerns that US inflationary pressures could spill over to the rest of the word, inflationary pressures have generally been less evident in the euro area this year, perhaps due to much smaller scale of fiscal stimulus. However, Eurostat's August "flash" release of the harmonised index of consumer prices (HICP) showed that year-over-year inflation jumped to 3%, up from 2.2% in July. Much of the rise in inflation in recent months reflected higher energy prices but core HICP inflation also spiked upwards in August to 1.6% having generally been below 1% over the previous year.

While this level of core inflation is not a source of concern for the ECB, a continuing rise in inflation of the kind seen in recent months would be problematic. The ECB's recently concluded strategy review decided not to copy the Federal Reserve's commitment to so-called "average inflation targeting". Under that approach, the ECB could have decided to allow inflation to be above target, perhaps for several years, in light of the large cumulative undershooting of its inflation target in recent years. However, the review decided not to adopt average inflation targeting so any sustained move above 2% inflation would require a quick response from the ECB. A quick turnaround in the direction of monetary policy could prove difficult for the ECB to execute without provoking a potential recession or possible financial stability problems.

How likely is this scenario? In this paper, I review the evidence on recent inflationary developments and conclude that, at least for now, the ECB does not need to be concerned about inflation moving above its target in a sustained way that would require a substantial adjustment of monetary policy. The balance of the evidence points to current inflationary pressures as likely to ease in the coming year, though the mix of unusual elements in the post-pandemic economy makes forecasting the economy even more challenging than usual.

The paper is structured as follows. Section 2 briefly reviews some of the recent developments that have triggered an increase in global inflationary pressures. Section 3 presents the evidence on movements in total and core HICP inflation in the euro area since the beginning of the pandemic. It is argued that energy prices are likely to stabilise in the coming months and despite some volatile movements in core inflation over the past year, there is little yet to suggest it is heading for a sustained period of readings over 2%. Section 4 discusses some of the factors likely to influence the medium-term path of inflation. Overall, it is argued that global bottlenecks will ease over time and the underlying forces that have kept inflation low in recent years are likely to remain in place.

2. SOME GLOBAL INFLATIONARY PRESSURES

Before taking a closer look at the recent data on euro area inflation, it is worth flagging a number of factors that have combined to increase inflationary pressures across the advanced economies this year.

The onset of the pandemic saw a collapse in energy prices, most notably with falling oil prices due a collapse in demand as lockdowns greatly reduced all kinds of travel. As the global economy recovered, these initial price declines have been reversed and are now causing higher year-on-year inflation rates. We will discuss this in a euro area context in the next section.

The pandemic has also produced some unusual combinations of supply and demand for various products that have caused upward pressure on prices. On the supply side, the crisis led to factory shutdowns across the world in 2020 and ongoing COVID-19 breakouts continue to cause difficulties for manufacturers in various locations. The pandemic also produced unexpected changes in the global spending patterns. With many service providers closed and limited in-person shopping opportunities during lockdowns, households in advanced economies switched to purchasing goods online, most notably durable goods. This led to an increase in demand for products produced in Asia that took manufacturers and transportation firms by surprise.

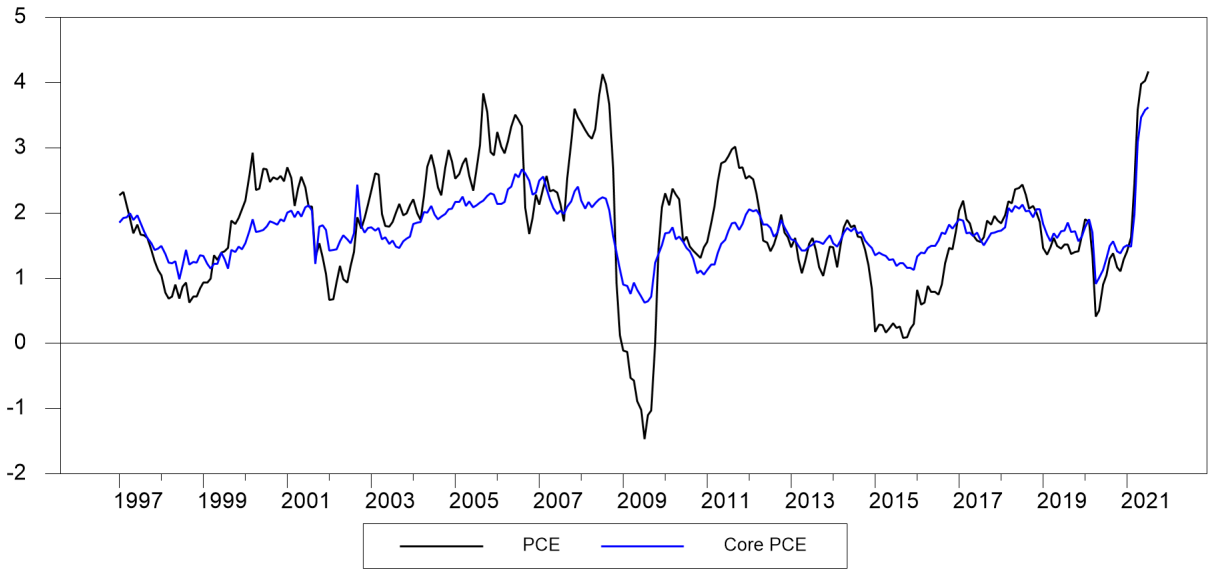
Prior the pandemic, the onset of a trade war between the US and China convinced many that global long-distance trade was likely to decline and this led to a reduction in orders for new container ships. This has left the supply of container shipping below what was needed to cope with the surge in the demand for manufactured goods. This change in global demand patterns has put severe pressure on shipping companies moving goods from Asia to the United States but shipment delays and parts shortages have had a global impact.

One important example is semiconductor chips. Supply disruptions have combined with a surge in online ordering of electronic products and strong demand for chip-heavy electric vehicles to lead to a shortage of supply components for many products. This has caused delivery delays and higher prices for various products. The combination of motor vehicle production shutdowns and increased demand for cars due to the ending of lockdowns triggered a surge in used car prices in the United States that had a large effect on consumer price inflation.

One factor influencing these trends has been the perhaps counter-intuitive outcome that, while some firms and households have been badly affected by the loss of income due to shutdowns, on average household balance sheets have strengthened over the past 18 months due to lower spending and active fiscal policies such as wage subsidy schemes that have offset much of the direct impact of the pandemic on average household disposable income. House prices have continued to rise and global stock markets are at all-time highs, further fuelling the strength of household balance sheets. This is particularly true in the United States, where there have been three rounds of stimulus cheques mailed directly to households, most of which were saved, thus building up household savings that could then be spent later on large items.

The combination of supply disruptions, surges in demand for specific products and strong household balance sheets has produced a spurt in US consumer price inflation. The US CPI rose to 5.4% in the year ending in July with the core CPI up 4.5% over the same period. The Federal Reserve's preferred inflation measures are the personal consumption expenditure deflators—these measures use updated expenditure weights and include prices for consumption categories that are not out-of-pocket expenditures for households—which have been running about one percentage point lower than the CPI measures but the sharp spike in recent months in these measures is also evident from Figure 1 below.

Figure 1: US personal consumption expenditure (PCE) inflation and PCE inflation minus food and energy



Source: Author's calculations using data from US Department of Commerce, Bureau of Economic Analysis.

3. RECENT EVIDENCE ON EURO AREA INFLATION

This section discusses the behaviour of euro area inflation since the onset of the pandemic in early 2020.

3.1. Energy prices and headline HICP

The black line in Figure 2 on the next page shows HICP inflation—as measured by the year-over year change in the HICP index—while the blue line shows the "core" inflation measure most commonly cited by the ECB, which is the HICP excluding energy, food, alcohol and tobacco. HICP inflation had been running at just over 1% during the months prior to the start of the pandemic emergency. However, the pandemic saw a quick turnaround in pricing behaviour and by late 2020 annual inflation measures were negative. These measures turned positive again in January 2021 and gradually rose in the following months before the August flash numbers showed a large spike with inflation rising to 3.0% compared with 2.2% in July.

Figure 2 makes clear that non-core prices were the principal driver of the volatility in HICP inflation over the past year. The figure also shows that this has not been an unusual event during the euro area's history. Core inflation has fluctuated in a much narrower range than total HICP inflation since the early 2000s.

So how should the ECB respond? The Federal Reserve has been explicit in recent years that it views core PCE prices as its key short-term measure of inflationary trends. The ECB tends to be less explicit about its attitude to core consumer price inflation, preferring generally to focus on a range of "underlying" inflation measures. However, the evidence from the past 20 years suggests there are good reasons to focus on core inflation when assessing the likely future direction of inflation.

Using the data in Figure 2, I used regression analysis to test whether the current value of HICP inflation or the current value of core HICP inflation was better at forecasting the value of inflation one year from now. The results (Table 1, Annex) clearly suggest that during the years the euro has been in existence, core inflation has been the better predictor. Indeed, the results show that, once you know core inflation, the current value for total HICP inflation does not provide any additional statistical explanatory power for forecasting the value of inflation a year from now.

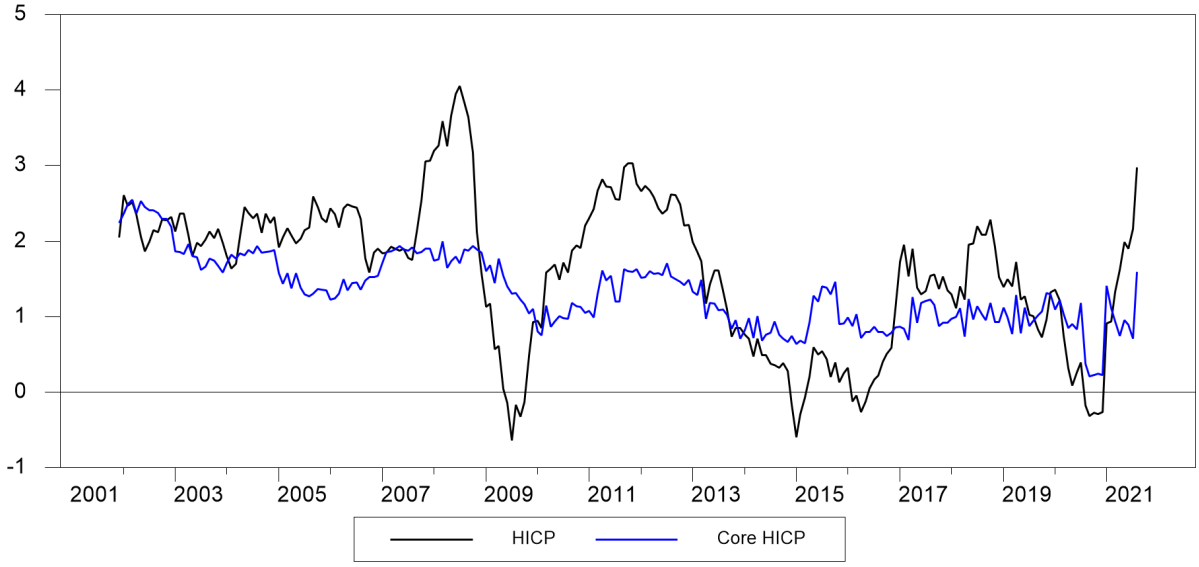
Of course, predicting the future based on past patterns does not always work well and it is possible that we are set for an extended period of higher inflation readings due to a sustained level of inflation in non-core prices. The current evidence suggests this is not going to be the case. The discrepancy between the core and total HICP inflation readings for August is almost entirely driven by the pickup in energy prices over the past year: HICP inflation excluding energy was 1.7% in August. As can be seen in Figure 3, energy prices fell sharply at the beginning of the pandemic but have now more than recovered these losses. At the moment, however, forecasters and market participants are forecasting that energy prices are likely to flatten or slightly fall over the coming year.

The International Monetary Fund's World Economic Outlook forecast published in July (IMF, 2021) assumes a slight drop in oil prices next year. Current futures contracts show financial market investors are currently in agreement with this projection[1]. There may continue to be some passthrough from higher wholesale energy prices to higher retail energy prices in the coming months but, if wholesale prices level out, we will likely see the same pattern in the HICP for energy

[1] Oil price futures contract prices can be found at: https://www.wsj.com/market-data/quotes/futures/CRUDE%20OIL%20-%20ELECTRONIC/contracts.

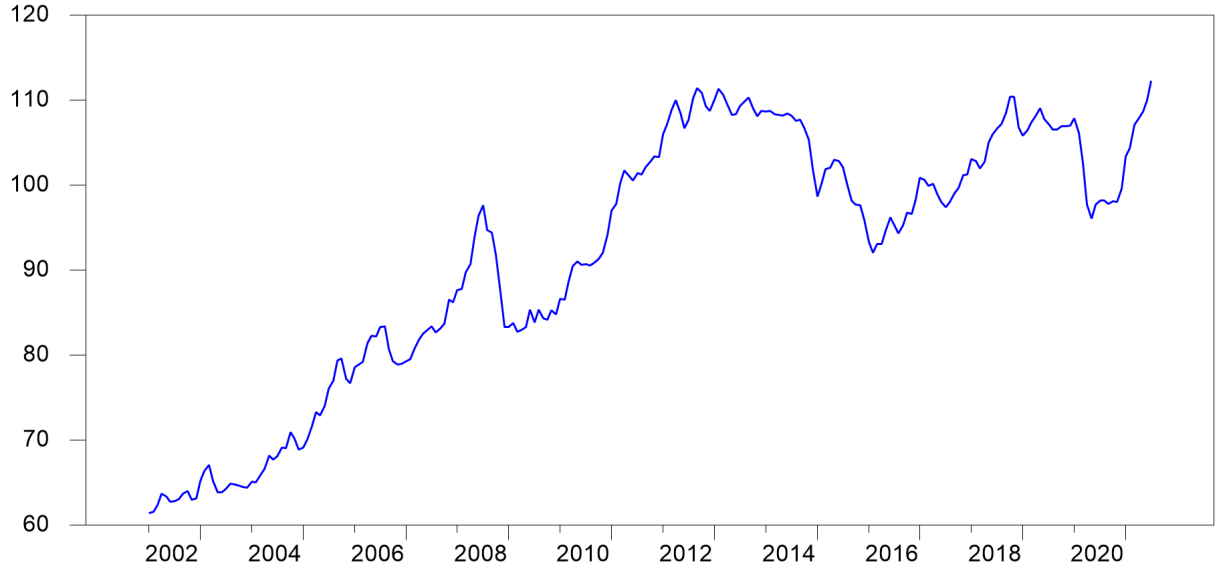
bottomed out in November 2020 so this component is likely to stop adding to headline inflation by early 2022.

Figure 2: Consumer inflation as measured by year-over-year percentage change in HICP and HICP excluding energy, food, alcohol and tobacco



Source: Author's calculations using data from Eurostat.

Figure 3: HICP energy price index



Source: Eurostat.

3.2. Core HICP inflation

While an apparently temporary increase in energy prices has been the principal driver of the current higher level of HICP inflation, the jump in core inflation to 1.7% in August would be a concern if it signalled the beginning of a series of increases in core inflation. However, a close look at the evidence suggests this is unlikely to be the case.

The year-over-year measure of core HICP inflation has been more volatile than usual over the past year with some large jumps in both the downwards and upwards directions. One complicating factor when interpreting these movements is that Eurostat does not publish a seasonally adjusted version of the HICP, despite there being well-known seasonal patterns in the series due to regularly timed sales and other factors. Thankfully, the ECB publish seasonally adjusted versions of the key series. Figure 4 shows the month-over-month percentage change in the ECB's seasonally adjusted series for total and core HICP. This shows a large drop in the total and core seasonally adjusted HICP in August 2020 and then large increases in January and July this year.

This volatility has been influenced by two temporary factors related to the pandemic. The first was a temporary change in value-added tax (VAT) rates in Germany. The standard rate of VAT in Germany was cut from 19% to 16% in summer 2020, contributing to a sharp decline in the HICP in August 2020. This cut was reversed in January 2021 and this was a major factor in the large increase in both the year-over-year HICP for that month as well as the spike in month-over-month seasonally adjusted HICP measures. August 2021 was the first month in which the temporary VAT cut affected the index from twelve months earlier, so this "base effect" influenced the big jump in the year-over-year measures of inflation for August even though there was little movement in the seasonally adjusted series in that month.

The second temporary factor was the cancellation of traditional seasonal sales. With retail outlets closed, traditional January and summer sales did not occur to the same extent this year as in the past, contributing to temporary spikes in both year-over-year HICP inflation and the monthly seasonally adjusted series in January and July.

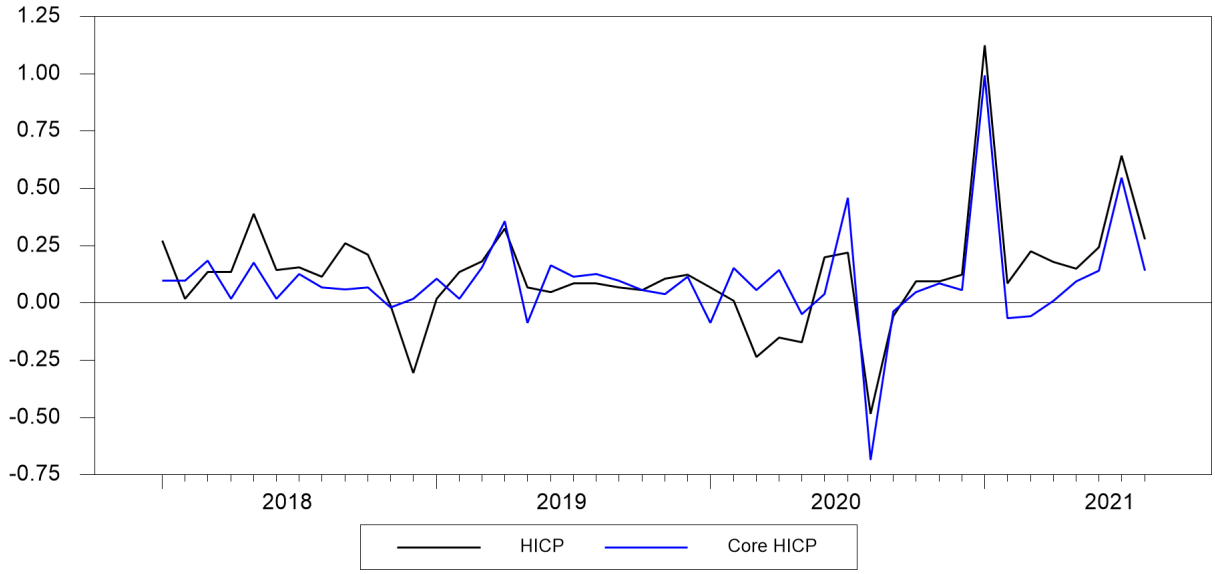
There have also been some complicating technical factors that have perhaps influenced the unusual

behaviour of core HICP inflation over the past year. One has been the increased prevalence of price imputations used in place of actual price quotes because of business closures. ECB (2021) reported that the share of price imputations in the core HICP index was 18% in January 2021 but had fallen to 5% in June. It is possible that some of the upward price adjustments seen over the summer was due to newly updated prices for services for which real quotes had not been available for some time. Another technical factor has been the change in HICP expenditure weights for 2021. Eurostat updates the weights for items in the theoretical "basket" each year based on consumption patterns during the previous year. With the pandemic inducing large changes in expenditure patterns in 2020, there has been a bigger than usual change in the expenditure weights this year and this is likely to occur again in 2022, perhaps inducing some spurious volatility [2].

To summarise, while there has been some volatility in core HICP inflation this year, there is little evidence to suggest that it is heading above a 2% trend. While there have been months in which exceptional events have triggered temporary jumps in year-over-year inflation, the data from other months show no sign of an underlying pickup in inflation. One way to "read through" the volatility due to the pandemic is to go back to February 2020 and calculate what the price level would be today if prices had grown steadily at the ECB's preferred rate of 2%. Figure 5 illustrates this counterfactual trend for the seasonally adjusted HICP and Figure 6 shows it for the seasonally adjusted core index. In both cases, prices in August 2021 remain below this hypothetical trend.

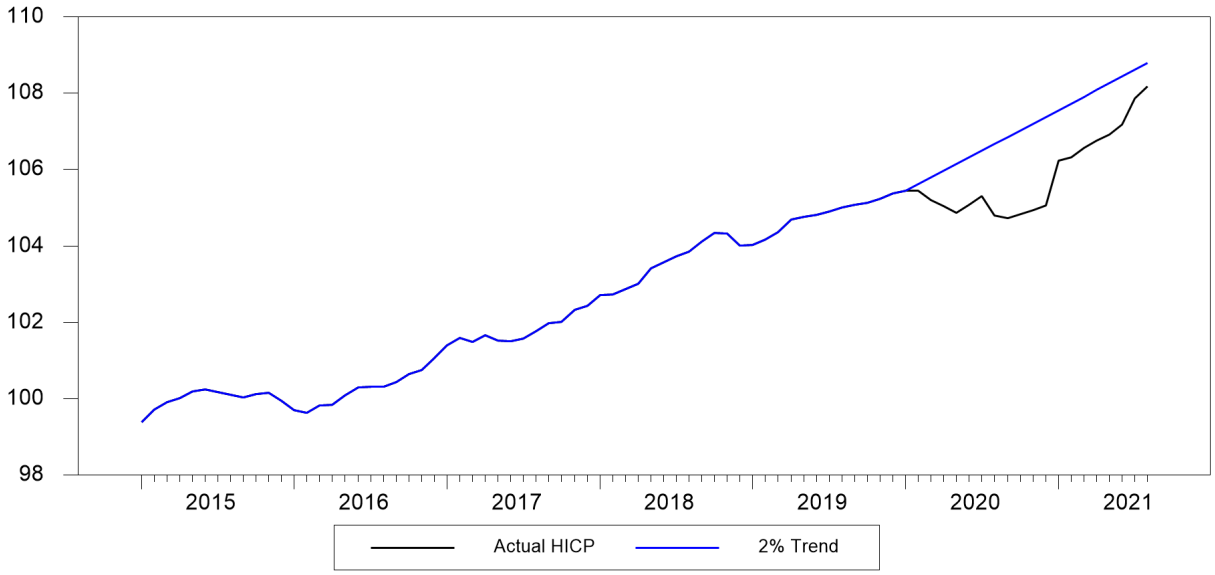
[2] See Claeys and Guetta-Jeanrenaud (2021) for a more detailed discussion of this issue.

Figure 4: One-month percentage change in seasonally adjusted HICP and core HICP



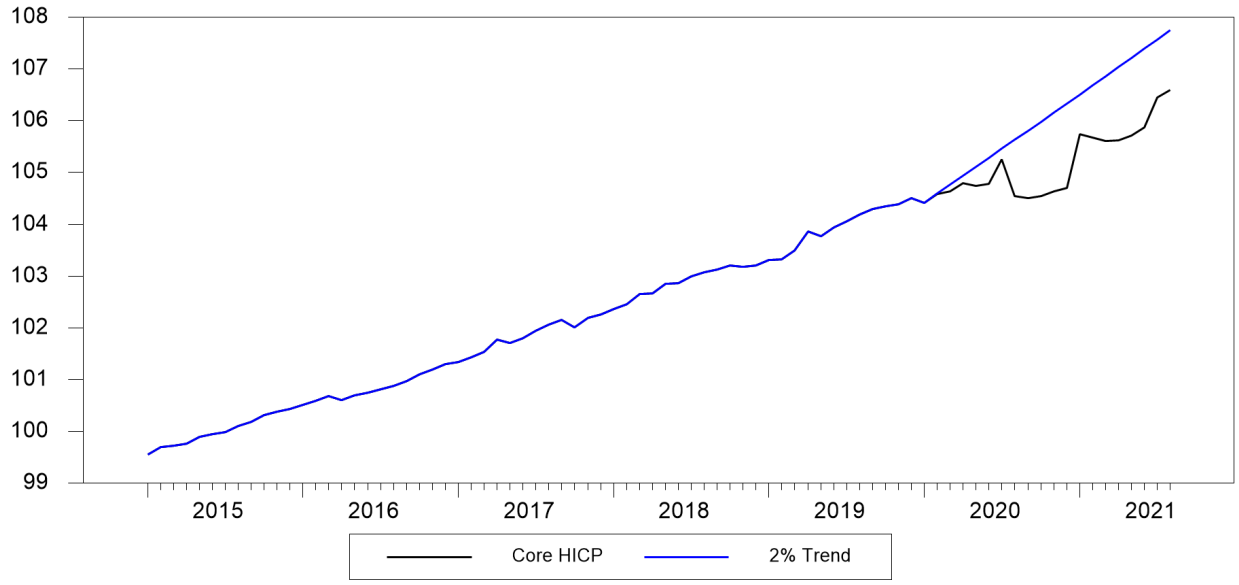
Source: Author's calculations based on data from the ECB's Statistical Data Warehouse.

Figure 5: Seasonally adjusted HICP and a counterfactual 2% trend starting in February 2020



Source: Author's calculations based on data from the ECB's Statistical Data Warehouse.

Figure 6: Seasonally adjusted core HICP and a counterfactual 2% trend starting in February 2020



Source: Author's calculations based on data from the ECB's Statistical Data Warehouse.

4. FACTORS INFLUENCING THE MEDIUM-TERM OUTLOOK

The previous arguments suggest that a closer examination of the data points to the current period of above-target HICP inflation as likely to be temporary. In particular, it seems unlikely that core HICP inflation will keep rising in the coming months. Beyond the near-term, however, a number of factors are worth keeping in mind.

The first is that the speed which the various temporary factors affecting global inflation will go away is uncertain and likely to vary according to each factor. For example, I argued above that the impact of VAT changes and the bounce-back in energy prices on inflation will likely wane in the coming months. However, some of the cost increases associated with bottlenecks may take longer. For example, it takes about three years from ordering a container ship for it to be delivered, so the shortage in this area may continue having an impact for some time to come.

Second, a key factor in determining whether any rise in inflation is temporary is whether the increase is perceived as such by the public or whether the increase ends up having "second round" effects by increasing expectations of future values of inflation and feeding into higher wage demands. At present, these second-round effects seem do not seem to be occurring. The expectation among economists and financial markets is that HICP inflation will return to lower levels in 2022. The most recent release of the ECB's Survey of Professional Foreceasters, published on 23 July, showed expected values of 1.5% for HICP inflation in 2022 and 2023 and similar values for core inflation. In their most recent Economic Bulletin, ECB (2021) report recent data from inflation-linked swaps contracts suggesting market expectations are also consistent with inflation just below 2% in the coming years. The ECB also report no evidence of higher inflation rates yet translating into higher wage inflation.

Third, as Fed Chair Jerome Powell (2021) stressed in his recent speech at the Jackson Hole conference, there has been a lot of research on the various forces that have produced the low inflationary environment of the past few decades. He argues that most of these forces are likely to still be with us over the next few years. Powell noted:

> "*The pattern of low inflation likely reflects sustained disinflationary forces, including technology, globalization and perhaps demographic factors, as well as a stronger and more successful commitment by central banks to maintain price stability ... While the underlying global disinflationary factors are likely to evolve over time, there is little reason to think that they have suddenly reversed or abated. It seems more likely that they will continue to weigh on inflation as the pandemic passes into history*".

To conclude, there is a possibility that the current rise in inflation represents a danger to the euro area economy. If it persists and the ECB decides to quickly reverse its current loose monetary policy, then there could be substantial negative consequences. However, there is no sign at present that the current uptick in inflation will persist. Indeed, it is possible that the current increase in inflation could turn out to be welcomed by central banks that have failed to reach their inflation targets over the past decade.

In the 1990s, Federal Reserve economists, Athanasios Orphanides and David Wilcox argued that central banks seeking to lower inflation should use the opportunity posed by temporary supply shocks that reduced inflation to lock in lower levels of inflation without having to slow the economy and raise unemployment. In more recent years, central banks such as the ECB have been losing credibility due to their failure to raise inflation to their target levels despite the application of ever-increasing amounts of monetary stimulus. The current burst of inflation, if it does have some influence on inflation expectations, could help to keep these expectations anchored at the ECB's target rate. This "opportunistic higher inflation" could help the ECB achieve its inflation target and smooth the path to

an orderly exit from the current unconventional monetary policies.

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ANNEX

Table 1: Coefficients from regressions of year-over-year HICP inflation on a constant term and lagged values of HICP inflation and core HICP inflation.

	One Month Lagged Values	Six Month Lagged Values	Twelve Month Lagged Values
Constant Term	0.15 (0.05)	0.53 (0.15)	0.56 (0.20)
HICP Inflation	1.0 (0.02)	0.63 (0.07)	0.06 (0.08)
Core HICP Inflation	-0.11 (0.05)	0.05 (0.14)	0.67 (0.18)

Source: Author's calculations based on data from Eurostat.

Notes: Standard errors in brackets. Sample is December 2002 to August 2021.

Rising Inflation: Transitory or Cause for Concern?

Joscha BECKMANN, Klaus-Jürgen GERN, Philipp HAUBER, Nils JANNSEN and Ulrich STOLZENBURG

Abstract

Consumer price inflation in the euro area has sharply risen to 3% in the course of 2021. This increase was mainly due to higher energy prices and other transitory factors. Recent macroeconomic forecasts generally expect inflation to return to below target values next year. However, there are several factors in place that could lead to more sustained upward pressure on prices, and materialisation of these upward risks could force the ECB to take difficult choices.

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.

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LIST OF ABBREVIATIONS

Core inflation	HICP excluding energy and unprocessed food
ECB	European Central Bank
EP	European Parliament
EU	European Union
GDP	Gross domestic product
HICP	Harmonised index of consumer prices
NEIG	Non-industry industrial goods
NGEU	NextGenerationEU

EXECUTIVE SUMMARY

- **Is inflation back?** After a long period of subdued inflation and strong downward pressure on prices in the beginning of the pandemic, inflation increased sharply to 3% in the course of 2021. The increase was driven to a large extent by base effects in energy prices and other transitory effects. However, there is a complex mixture of different factors in place that have the potential to put more sustained upward pressure on consumer prices.
- **Several demand and supply side factors could lead to further upward pressure on consumer prices.** Some of these factors have already led to increases of commodity prices, surging transportation costs or supply bottlenecks, but it is unclear how long they will prevail and to what extent they finally will pass-through to consumer prices. Other factors, such as the huge increase in purchasing power of private households due to the extra savings accumulated during the pandemic, as well as labour supply shortages, could further increase inflation during the ongoing recovery.
- **These factors have the potential to lead to more sustained price pressure in particular because they could reinforce each other.** If demand for consumer goods increases due to extra savings and, at the same time, production is limited due to supply bottlenecks this could result in higher price pressure. Firms that suffer from a deteriorated financial position due to the pandemic may pass-through rising costs, for example due to commodity price or wage increases, stronger to consumer prices than in the past. On top of this, an increase in inflation expectations can lead to persistently higher inflation via second-round effects.
- **Recent macroeconomic projections expect the recent hike in inflation to be transitory.** These forecasts rest on the assumption that above factors will fade out soon or that their impact will be small. Whether this assumption turns out to be correct, however, is uncertain. Inflation expectations or wages so far do not point to second-round effects. However, adjustment of expectations and second-round effects can follow with a lag.
- **Upwards risks for the inflation outlook dominate at the current juncture.** Inflation rates somewhat above target over the next years seems to be a reasonable alternative scenario to the baseline forecasts. On the contrary, a low-inflation scenario could materialise if commodity prices reverse and supply bottlenecks peak out soon. Such a scenario seems less likely for the near future as other factors would remain in place that bolster inflation.
- **While somewhat higher inflation would be welcomed by the European Central Bank (ECB), increases well above its inflation target would be challenging.** Within its new monetary policy strategy, the ECB can tolerate inflation rates somewhat above its target for some time. However, if inflation were to overshoot its target considerably, the ECB might face difficult trade-offs. On the one hand the ECB might be reluctant to substantially tighten its monetary policy stance if there is risk that this could cause stress in financial markets (especially on sovereign bond markets), to slow down the ongoing recovery from the pandemic, or to fall back into a low-inflation regime. On the other hand, if the ECB would react reluctantly to high inflation this could raise concerns about the credibility of the ECB to fulfil its primary objective – maintaining price stability – and lead to accelerating inflation due to rising inflationary expectations and second-round effects.

1. INTRODUCTION

Is inflation back? Harmonised index of consumer prices (HICP) inflation in the euro area has risen sharply up to 3% in recent months. This increase was preceded by a long period of subdued inflation and a marked decline with the beginning of the pandemic. The recent increase in inflation has been driven to a large extent by energy prices, which usually only have a temporary impact, and other transitory effects. Core inflation (HICP excluding energy and unprocessed food) is still below 2%. However, given that there are currently several factors in place with the potential to significantly impact inflation, the question arises whether the recent increase in inflation is only temporary or whether it marks the beginning of a period with persistently higher inflation.

Several demand and supply side factors could lead to further upward pressure on consumer prices. Some of these factors have already led to increases of commodity prices, surging transportation costs or price pressures due to supply bottlenecks, but it is unclear how long they will prevail and to what extent they will pass-through to consumer prices. Other factors, such as the huge increase in purchasing power of private households due to the extra savings accumulated during the pandemic, expansionary fiscal policy, or labour (supply) shortages could become more relevant for inflation dynamics during the ongoing recovery.

While most of these factors can usually be expected to only have a temporary impact on inflation, they have the potential to lead to more sustained upward pressure on prices at the current juncture. More sustained upward price pressure is more likely if these factors are propagated via higher inflation expectations so that second-round effects reinforce the initial increase in inflation. In the current economic environment, these factors could have higher effects on inflation than in normal times because the pandemic has weakened the financial position of firms in many industries. As a result, they may be more prone to pass-through higher input prices to consumer prices. Moreover, some of these factors could reinforce each other. Finally, the current rebound of activity falls into a period of very favourable financing conditions that could fuel additional upward pressure from the demand side.

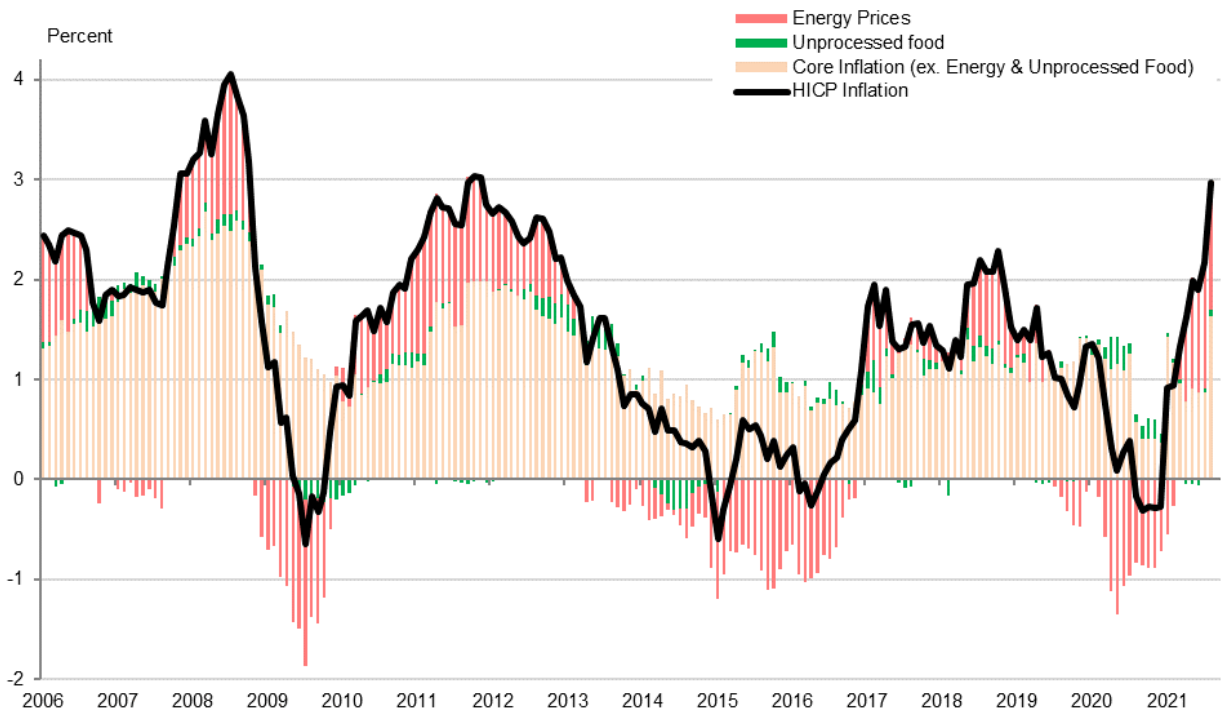
To what extent higher inflation will materialise also depends the monetary policy reaction. Central banks usually look through short-lived, reversable movements in inflation, but are more concerned about persistent increases in inflation, in particular, if they are fuelled by higher demand or second-round effects propagated via an increase in inflation expectations. The ECB signalled that it may be willing to tolerate inflation somewhat above its target for some time. However, if inflation increases well above target, the ECB may face a challenging trade-off as a substantial tightening could come with undesired side-effects.

In this paper, we analyse the recent increase in inflation and discuss factors that could lead to more sustained upward pressures on prices. We start with a comprehensive assessment of the recent increase in euro area inflation (Section 2). Next, we discuss several factors that have the potential to increase inflation on a sustained basis (Section 3). Building upon available projections, we then discuss the current inflation outlook as well as upward and downward risks (Section 4). We conclude with a brief discussion of implications for monetary policy (Section 5).

2. RECENT DEVELOPMENTS IN INFLATION DYNAMICS

Consumer price inflation in the euro area has increased recently after several years of subdued price pressure. Until 2008, the ECB was fairly successful in keeping consumer price inflation close to 2% (Figure 1). During the global financial crisis and in the following recovery, energy prices were particularly volatile, amplifying the cyclical shifts in core inflation at that time. Since 2012, at the peak of the sovereign debt crisis, core inflation went on a downward trend and headline inflation declined further, even into negative territory for some time, after the oil price dropped markedly in late 2014. Since then, the euro area experienced a period of subdued inflation, and the ECB struggled – with zero interest rates and various extraordinary monetary policy measures – to lead underlying inflation back to the target. Even from 2016 to 2019, when the euro area economy was expanding with rates in excess of potential growth and unemployment decreased steadily, core inflation was stuck at around 1%. With the COVID-19 crisis in 2020, consumer prices again fell below previous year's level. Main reasons were lower energy prices and a temporary value-added tax decrease in Germany in the second half of the year. Finally, in 2021, there was a steady increase in the annual rate of inflation on the back of several base effects. Core inflation, however, has not yet risen markedly beyond these base effects. Still, HICP inflation has risen sharply to 3% (year-over-year) in August, the highest rate since 2012, and the question arises whether the euro area is about to leave the low-inflation environment of the recent past.

Figure 1: HICP inflation in the euro area, 2006-2021



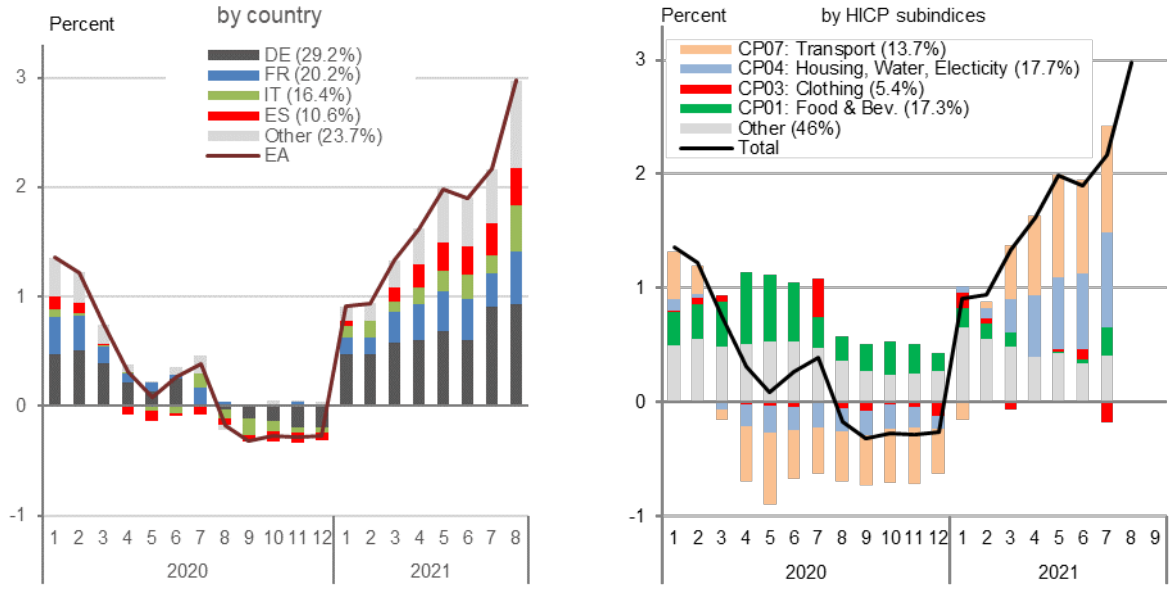
Source: ECB.

Notes: Monthly data, seasonally adjusted, change over previous year.

The sharp increase in consumer price inflation in the course of 2021 is due to several special factors and base effects that are transient in nature. Most relevant is the collapse of energy prices in early 2020, which despite their recovery in the second half of the year, considerably affects the year-over-year comparison throughout 2021. This base effect from energy prices contributes about 1.3

percentage points to headline inflation in mid-2021. Another base effect relates to the temporary value-added tax cut in Germany, which reduced euro area inflation by about 0.3 percentage points in the second half of 2020 and in turn adds the same percentage points to the (headline and core) inflation rate in the second half of 2021 (Figure 2a). Moreover, a newly introduced carbon tax in Germany adds about one tenth of a percentage point to euro area inflation throughout 2021. Also, there is a seasonal pattern in the price level of many countries with higher prices in the tourism season. In 2020, restrictions in the tourism sector as well as lower transport costs led to a deviation from this pattern with striking drops in inflation in countries like Spain or Greece. As a result, it is quite possible that in the course of a recovery of tourism activity, disproportionate price increases in related services will drive up inflation in 2021 and 2022. Finally, monthly fluctuations are partly due to shifts in the timing of summer sales in 2020 for clothing and footwear prices (in particular, in France, Italy and Belgium).

Figure 2: Decomposition of HICP inflation (a) by country and (b) products, 2020-2021



Source: Eurostat.

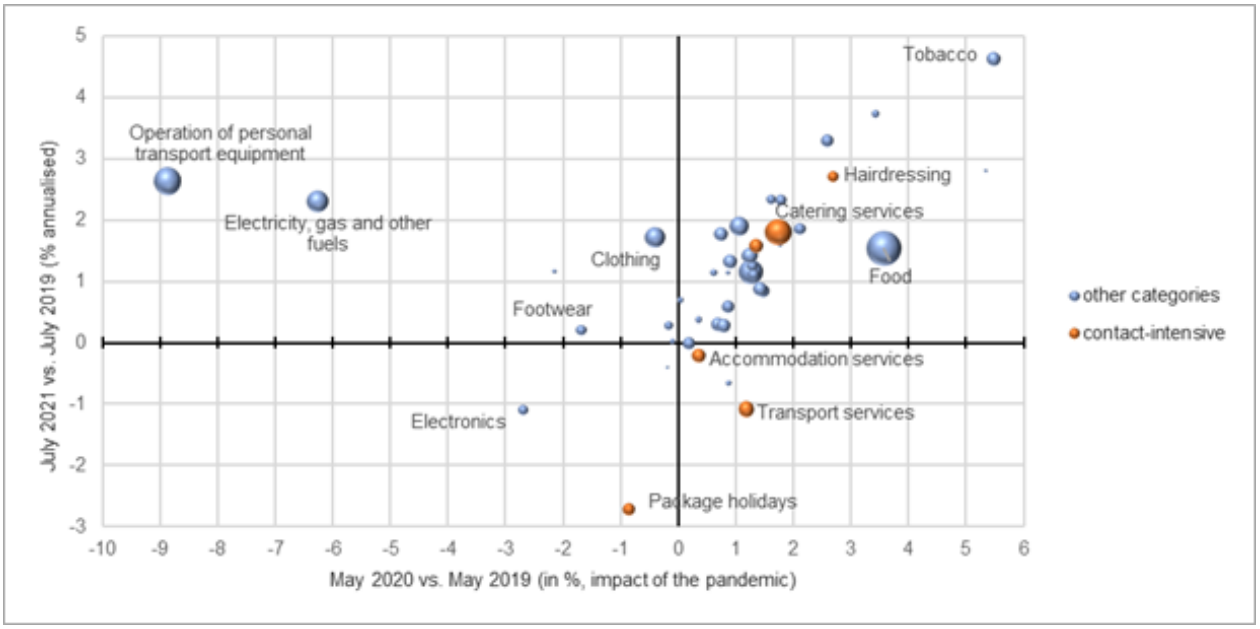
Notes: Contributions to overall HICP inflation rate (year-over-year) in the euro area. 2021 weights for countries and HICP sub-indices in brackets.

With respect to product groups, the rise in inflation so far can almost entirely be attributed to 2 out of 12 subcategories of the HICP index that are susceptible to changes in energy cost. These are "Housing, Water, Gas & Electricity" (CP04) and "Transport" (CP07), both of which were also major drivers of low inflation in 2020 (Figure 2b). On the contrary, food and non-alcoholic beverages (CP01) stabilised inflation in 2020 but did not contribute considerably to inflation in 2021. The other product groups have not yet shown a significant upward trend until recently.

Prices in some contact-intensive industries have not fully recovered from the pandemic. Economic activity in contact-intensive industries such as hairdressers, package holidays and services in catering, accommodation, recreation and culture as well as transport was hit hard by lockdown measures to curtail the spread of the virus. Prices in these industries make up around 18% of the HICP consumer basket. Both the immediate response to the pandemic as well as the subsequent recovery reveal some heterogeneity in terms of inflationary pressures within the group of contact-intensive sectors (Figure 3). Compared to a year earlier, package holidays were 0.9% cheaper in May 2020, but prices for accommodation services were up by 0.4%. As noted above, the biggest price falls came in energy-related categories of the HICP like personal transport equipment (incl. gasoline) and electricity,

gas and other fuels which fell by more than 5%. In line with the rebound in global energy prices, prices in these categories have increased markedly in July 2021 growing at an average annual rate of around 2.5% compared to July 2019. By the same measure, prices of package holidays as well as transport and accommodation services have not fully recovered with the average annual growth rate still below zero. Catering, recreational and cultural services were up by close to 2%, in line with the initial price response; at almost 3%, prices at hairdressing salons were also close to the year-on-year inflation rate seen in May 2020.

Figure 3: The impact of COVID-19 on contact-intensive and other HICP subcategories



Source: Eurostat; own calculations.

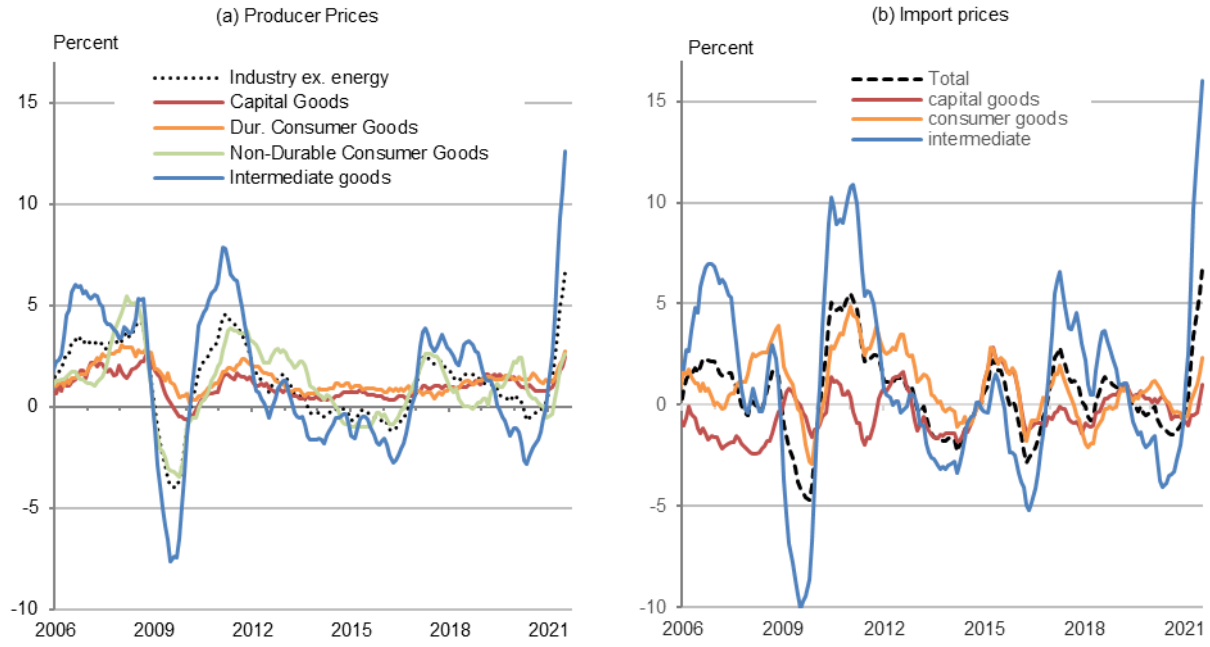
Notes: Price developments for 44 subcategories of HICP inflation rate during the pandemic. Bubbles sizes represent weights in the consumption basket. Contact-intensive categories include: hairdressing salons and personal grooming establishments, package holidays as well as accommodation, transport, catering, recreational and cultural services. Price changes between 2019 and 2021 are reported at an annualised basis. For example, an annualised increase by 1% indicates a price increase of 2% between 2019 and 2021.

An inclusion of owner-occupied housing costs in the consumption basket would make the HICP more sensitive to housing market developments. Privately owned residential property is both a store of value, i.e. an asset, as well as a consumption good since it provides a flow of housing services. The latter is currently not included in measures of consumer price inflation in the euro area, as the HICP only captures the cost of housing via rents and minor repairs. As a result of its recent strategic review, the ECB's Governing Council recognised that including owner-occupied housing costs in the consumption basket of the HICP would "better represent the inflation relevant to households"[1]. Such a modification of the HICP, however, would be a multi-year process. For almost all individual Member States, Eurostat already publishes indices of owner-occupied housing costs, which track residential property prices quite closely in some Member States like Spain, the Netherlands and France. This is in contrast to the United States where housing costs measured by rents and owners' equivalent rents are much less volatile than residential property prices. Due to the large co-movement between residential property prices and owner-occupied housing costs in some Member States (where owner-occupied housing is included in the consumption basket), measured inflation would rise more in periods of

[1] See https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210708~dc78cc4b0d.en.html.

substantial house price inflation if owner-occupied housing costs would be included in the HICP, even though the impact would have been moderate in the past[2].

Figure 4: (a) Producer prices and (b) import prices, 2006-2021



Source: ECB.

Notes: Monthly data, seasonally adjusted, change over previous year.

Soaring prices in early stages of the production chain suggest that more inflation is in the pipeline. Consumer price inflation has increased in 2021, but up to this point not in excess of what could be expected from the numerous transitory effects. Soaring prices for raw materials, transport costs, producer prices and import prices, however, suggest that there is additional price pressure in the pipeline that could materialise in the near future in rising consumer prices (Figure 4). In particular, prices of intermediate goods, which are a major component of non-energy producer prices and of import prices, have increased by double-digit rates and in excess of what has been observed over the past 15 years. Lately, the other components of producer prices and import prices – consumer goods and capital goods – have also picked up.

A rise in producer prices could materialise – with some delay – in higher consumer prices, though there is considerable uncertainty with respect to the pass-through. It is unclear to what extent price increases in early stages of the production process can be expected to translate into rising consumer price inflation, in particular to non-energy industrial goods inflation (NEIG inflation), which has a weight of about one quarter in the HICP basket. Empirical studies are scarce, but available evidence indicates that the pass-through of intermediate goods PPI to non-food consumer goods (first stage) has a pass-through of about one quarter and takes half a year, and that the further pass-through to NEIG inflation (second stage) takes at least another year (Koester et al., 2021). That said, there is considerable uncertainty whether firms along the production and distribution chain vary their pricing

[2] Gros and Shamsfakhr (2021) calculate that quarterly core inflation would have been around 30 to 40 basis points higher between 2017 and 2020 if the HICP included owner-occupied housing costs; from 2012 to 2013, however, when residential property prices were falling, core inflation including the cost of owner-occupied housing would have been lower than the official measure. Similarly, in an earlier assessment by the ECB, the inclusion of owner-occupied housing costs in the (overall) HICP was found to have an effect of up to 20 basis points in any individual quarter but no differences in average inflation over the period 2011 to 2016 (ECB, 2016).

behaviour over time depending on several factors like "capital utilisation, the stock of inventories, profit absorption and the competitive environment". The pass-through may also be dependent on whether producer prices remain on higher levels for an extended period of time or start to reverse soon.

The recent surge in consumer price inflation is a global phenomenon. On the back of rising energy prices and economic recovery, global inflation - defined as the median consumer price inflation among 81 countries - has increased and risen above pre-pandemic levels by the spring of 2021 (Ha et al., 2021). In the United States inflation has accelerated markedly with year-on-year inflation reaching 5%. Price increases, however, have been concentrated in a few categories where prices surged. One of the main drivers were prices of used cars and trucks which have increased by over 40% since February 2020, amid a rise in demand for private mobility and supply chain disruptions that hampered production of new vehicles. In addition, prices for services like hotel accommodation and air travel that dropped during the onset of the pandemic recovered to pre-crisis levels as the US economy reopened. Market-based inflation expectations for the coming five years, as measured by the difference between inflation-protected and nominal government bonds, have risen to their highest levels since 2008 but at 2.5% percent remain much lower than the current increases in the consumer price index.

3. FACTORS THAT CAN LEAD TO A SUSTAINED RISE IN MEDIUM-TERM INFLATION

The current economic environment seems to be conducive to higher inflation. The pandemic has led to a historical slump in economic activity but is very different from other economic crises and can be hardly classified into a demand and supply scheme that is frequently used in economic analysis. One important difference to other crises, such as banking crises, is that the economic slump is not the result of the build-up of imbalances before but that economic activity was interrupted due to the private or public containment measures. As a consequence, economic activity is rebounding as soon as containment measures are faded out and the economic recovery exhibits a much faster pace compared to other crises. In this regard, the impact of the COVID-19 crisis across industries was also very heterogeneous as some contact-intensive service industries were hit particularly hard. Moreover, despite the comprehensive fiscal support packages the financial health of many firms deteriorated since the beginning of the pandemic (Demmou et al., 2021). Therefore, these firms may be forced to pass-through higher input costs and increase output prices to a larger extent than in normal times. Finally, financial conditions have been and are very favourable for an extended period of time. While the impact of monetary policy, which is behind these favourable conditions, on inflation seems to have been rather week in the euro area since the global financial crisis, the impact may increase if other factors trigger higher inflation and in particular increase medium- to long run inflation expectations.

At the current juncture, there a several factors that could lead to a more sustained rise in inflation over the next years. Many of these factors are interdependent and could reinforce each other. However, to organise thoughts we start by discussing the factors separately. One important factor behind inflation dynamics are fluctuations in raw material prices. While increases or decreases in raw material prices usually only lead to short-lived, reversable movements in inflation, recently a discussion has intensified whether a commodities supercyle is underway leading to more persistent upward pressure on prices (Section 3.2). Moreover, the pandemic came along with unprecedented supply bottlenecks that have led to strong price increases for specific goods and which could last for an extended period of time (Section 3.3). The pandemic has led also to a huge increase in the savings ratio of private households due to restricted consumption possibilities. If a significant amount of the resulting extra savings would be used for consumption this could boost economic activity and prices (Section 3.4). The large fiscal stimulus packages that are underway will add to demand and could increase upward pressure on prices (Section 3.5). Furthermore, tight labour markets may lead to stronger increases in wages that could translate into higher inflation (Section 3.6). Most of these factors are temporary in their nature, even though they have the potential to lead to a more sustained upward pressure on prices than in the past decade. However, the upward pressure on prices may continue beyond these temporary periods if these factors trigger a sustained increase in inflation expectations. Due to the prominent role of inflation expectations for inflations dynamics, we start by discussing different measures of expectations and their recent developments (Section 3.1).

3.1. Inflation expectations

Inflation expectations play a dual role for monetary policy by affecting price and wage setting and reflecting the credibility to achieve its policy target. Inflation expectations are an important intermediate target for policymakers and a key indicator for the propagation of monetary policy shocks and have become even more important in times of unconventional monetary policy (Sousa and Yetmann, 2017). Central banks try to affect expectations by informing the public about the future stance of monetary policy (signalling channel), and one aim of asset purchases by the ECB has been to stabilise inflation expectations.

There is rich evidence that expectations affect behaviour of firms and households, implying that monetary policy can influence economic activity by managing expectations. Inflation expectations can have direct impact on the price-setting of firms, long-term interest rates and other financial market variables. Higher inflation expectations also lead to a higher probability that consumers purchase goods (Duca et al., 2018). In turn, inflation expectations can also be driven by a wide range of factors, such as wages, the expected path of the real economy, or financial variables. However, experimental and empirical evidence has so far struggled to provide clear evidence on how expectations are formed and can be directly influenced by monetary policy. Inflation expectations of households and firms do for example not systematically respond to all monetary policy announcements (Coibion et al., 2020; Lamla and Vinogradov, 2019). Short-run and long-run expectations are driven by different factors. The former predominantly reflects recent – including transitory – factors affecting inflation while the latter more reflects the credibility of the central bank to achieve its inflation target in the long-run. As a result, long-run inflation expectations are often anchored in the sense that short-run macroeconomic news are considered neutral by market participants (Nautz et al., 2019).

There are several measures available for inflation expectations. They can be distinguished into survey-based and market-based measures. Survey-based measures reflect the expectations (or forecasts) of either consumers or professionals while market-based measures are based on realised prices on financial markets [3]. In surveys, the mean across respondents is usually adopted as a measure of expectation given the existing evidence that the combination of forecasts reduces the resulting forecast error. Market-based measures can be derived based on a comparison of derivatives, such as inflation-linked swaps, with and without inflation adjustment.

Survey-based and market-based expectations are both subject to forecast errors. Market-based measures also contain risk premia which implies the need to disentangle the expectation and the risk component, while survey-based measures are often based on small samples with, for example, nationally representative surveys of firms missing (Coibion et al., 2020). Theoretical models have demonstrated that different kinds of information rigidities help to explain forecast errors. Sticky information models argue that forecasters partly are inattentive to shocks while noisy information models are based on the idea that market participants only receive noisy signals about the underlying shocks, which drive inflation (Coibion and Gorodnichenko, 2012). Nevertheless, both kind of measures contain useful information about future inflation (Meyler and Grothe, 2015).

Survey forecasts also provide information regarding uncertainty about future inflation. This is important given that central banks seek to reduce uncertainty about the future economic outlook. The standard deviation across individual forecasts provides additional information about the distribution of forecasts. Consensus Economics provides forecasts of professional forecasters for consumer price inflation for a broad range of countries and time horizons. Participants include both private banks and research institutes. Names of forecasters are published which increases the credibility of forecasts due to reputation effects (Beckmann and Czudaj, 2018). Consensus Economics also has a good track record compared to forecasts of the International Monetary Fund (An et al., 2018) [4].

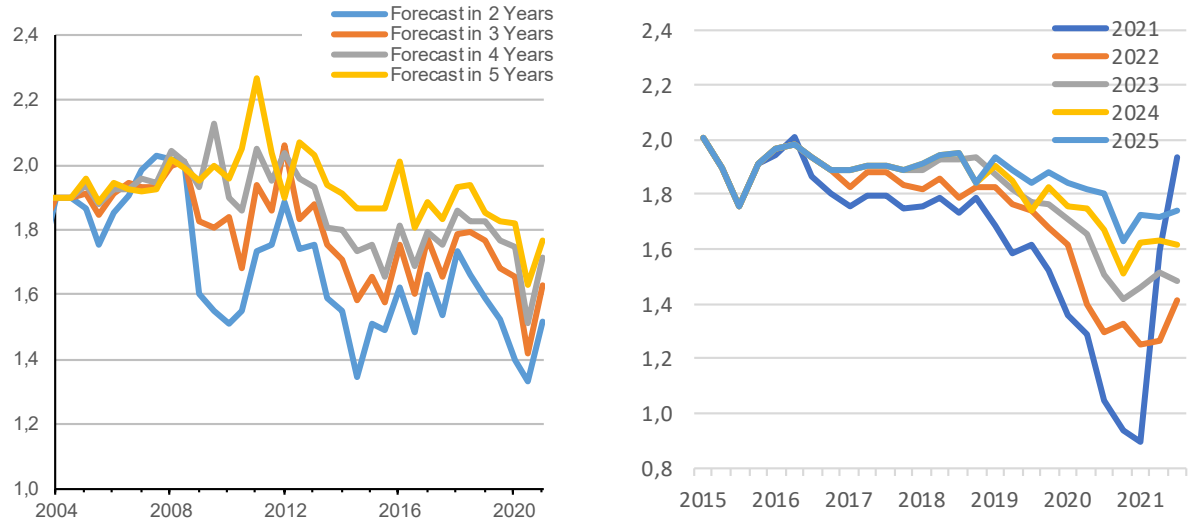
Euro area inflation forecasts of professionals have shifted upwards but do not exceed 2% in the next years. Consensus inflation forecasts have increased in particular for 2021. Since the beginning of

[3] Professional inflation expectations also have the potential to affect household expectations (Carroll, 2003).

[4] Consensus Economics provides forecasts for a given year at each month or quarter the survey is conducted (fixed event forecasts). Forecasts for the current and the next year are published monthly while long-term forecasts are published quarterly.

this year, forecasts were revised upwards from below 1% to about 2% (Figure 5b)[5]. While the long-run forecasts, e.g. for 2025, declined somewhat at the beginning of pandemic, possibly reflecting fears of a negative long-run impact on the economy, they increased again in the second half of 2020 and are now approaching the previous range of 1.8% to 2%, which was consistent with the inflation target of the ECB (Figure 5a). However, the 5-year forecasts (last value from July 2021) do not reflect the adjusted inflation target of the ECB, yet. These forecasts align with the most recent ECB survey of professional forecasters and market-based indicators (Figure 6a)[6]. Long-run market inflation expectations (10y/10y) declined already in 2019 and dipped at the beginning of the pandemic. Since then, long-run expectations recovered and are now in line with the new inflation target of the ECB. Consensus forecasts for core inflation in 2021 and 2022 are at 1.3% percent, respectively, indicating that professional forecasters think that the increase in inflation is largely due to transitory factors[7]. Overall, survey expectations over the next 5 years hardly exceed 2%. For example, the highest single forecast for inflation in 2026 across all participants of the Consensus Economics survey in July 2021 is 2.6%. Disagreement among forecasters – a measure of forecast uncertainty – is at moderate levels in historical comparison.

Figure 5: (a) Medium-run forecasts for the euro area, Consensus Economics, 2004-2021 and (b) Forecasts for 2021-2025 for the euro area, Consensus Economics



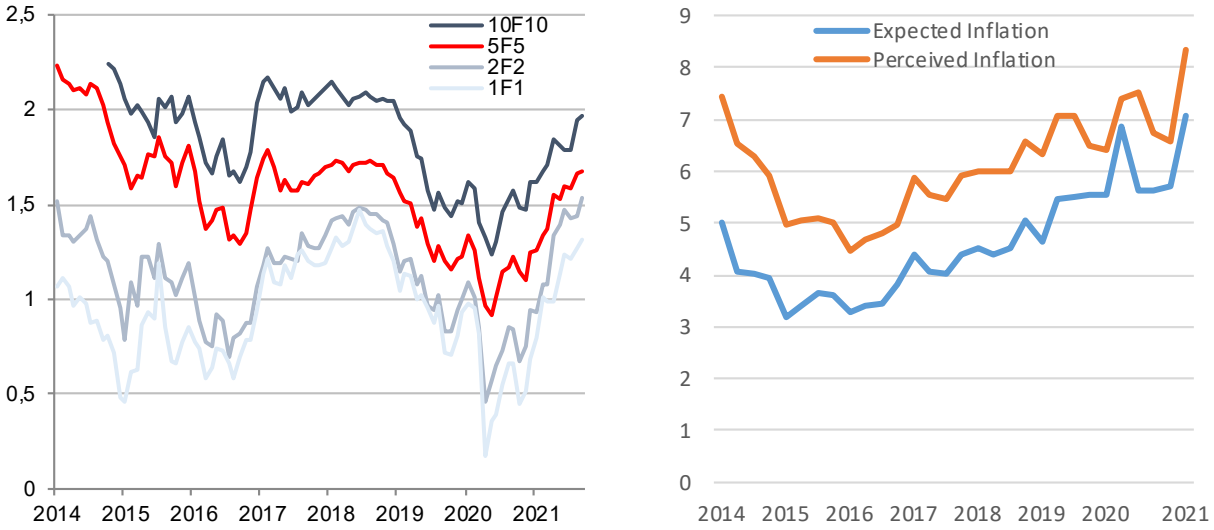
Source: Own illustration based on quarterly mean long-run forecasts from Consensus Economics. Figure a) provides fixed-horizon forecasts for the next 2-5 years while Figure b) shows fixed event-forecasts for 2021-2025.

[5] Figure 5b shows quarterly consensus forecasts because they provide consistent short- and long-run forecasts. Forecasts for the near term are updated on a monthly basis. The most recent mean forecast from August for inflation in the euro area in 2021 increased to 2.1% with a mean forecast for 2022 of 1,5%.

[6] Fluctuations in market-based measures compared to professional forecasts often reflect correlation with risk premia rather than changes in inflation expectations (Lane, 2021). However, the recent increase coincides with the changes of survey forecasts.

[7] Inflation forecasts among professionals also do not differ across the Member States over the medium run. There is a significant wedge between Germany and Greece for 2021 but forecasts across countries for the next years hardly differ more than 0.5 percent over the medium run. Inflation forecasts have recently strongly revised upwards for some countries, for example Germany, while forecasts for other countries clearly remain below 2 percent. This is also mostly true for the highest inflation forecasts across the different member states. The disagreement among professionals is at normal levels, despite for Greece.

Figure 6: (a) Market-based inflation expectations for the euro area and (b) Consumer inflation expectations



Source: Own illustration based on data from Datastream and the European Commission. Figure a) display market-based expectations based on forward inflation-linked swaps. Figure b) includes perceived price trends over the last 12 months ("Perceived Inflation") and expected price trends over next 12 months ("Expected Inflation") among consumers for the euro area.

Inflation expectations of consumers are significantly higher compared to professional and market-based forecasts. Consumer forecasts tend to be less accurate compared to professional forecasts and disagree more about the path of inflation (Coibion et al., 2020). However, even though consumer forecasts in the euro area systematically exceed actual inflation, a strong correlation between both can be observed (Arioli et al., 2017). According to the recent Consumer Survey of the European Commission both perceived over the last and expected inflation over the next 12 months have sharply increased from April to July 2021 (Figure 6b). The Figure also shows that perceived inflation exceeds the expected inflation rates throughout the sample.

Forecasters adjust their expectations according to incoming information and may do account for shifts in trend inflation with some delay. Forecasts can be revised quickly with incoming data when forecasters account for recent price developments and revise their expectations for the next months. This pattern emerged, for example, in inflation expectations in this year. However, both survey- and market-based measures are subject to substantial forecast errors and tend to miss shifts in trend inflation. For example, forecast errors were particularly large during the global financial crisis and there are some periods where errors exhibit some persistence, including the period between 2011 and 2014 when inflation was much lower than predicted for an extended period. Inflation has been both under- and overestimated in the recent past with absolute forecast errors of around 1 percent. Therefore, it is quite possible that forecasts systematically underestimate an upward trend in inflation and are unable to anticipate turning points in inflation dynamics. Overall, the path of different expectation measures should be closely monitored to account for heterogeneity across different measures and the gradual adjustment in expectations (Lane, 2021).

3.2. Prices of raw materials – a new supercycle?

The diagnosis of a new commodity supercycle is premature. Over the past twelve months, commodity prices have risen sharply across the board. This has fuelled the idea of a new "supercycle", i.e., a long-lasting and broad-based rise in commodity prices at rates well above the long-term trend

(Goldman Sachs, 2020). In that case, upward pressure on consumer prices emanating from raw materials would persist over a longer period of time and could not be regarded as transitory. However, the rise in commodity prices since last spring is so far partly only a rebound from extremely depressed levels and to a large extent the reflection of the rapid recovery of the global economy, especially in industry. It is also important to note that the market situation as well as the price level in historical comparison varies greatly for the individual raw materials.

Oil prices are not high by historical standards and a substantial further increase seems unlikely. In energy commodities, which account for around two thirds of the commodity market, demand has still some way to go to fully recover from the consequences of the pandemic. Oil consumption is expected to be 3.5% lower in 2021 than in 2019. The peak prices of more than USD 100 per barrel recorded around ten years ago are still a long way off. That the price of crude oil has returned to its pre-crisis level is mainly because production has been restricted by Organization of the Petroleum Exporting Countries (OPEC) in conjunction with Russia, although output has been reduced also elsewhere, including in the US. The policy of production restraint has been successful in bringing down inventories, which initially rose sharply during the crisis. Inventories are now below pre-pandemic levels, a situation that could lead to price spikes in case of unexpectedly strong demand or downward surprises in supply. There is, however, still a lot of spare production capacities, and OPEC has indicated that it is willing to meet rising global demand and has started to ease its production restrictions. In addition, fracking activity in the US is picking up again at the current price level. Supply from other countries is also expected to rise as there is every incentive to bring available resources to the market before global oil demand peaks amid progress in decarbonisation of the world economy later in this decade. All this makes a sustained further rise in the oil price in the coming years unlikely.

Metal prices are pushed up by supply constraints and strong demand partly related to stimulus programs and investments to accelerate the energy transition, which could lead to sustained price pressure. The situation is different for iron and steel and for nonferrous metals. Here, pre-crisis price levels have been significantly exceeded and prices remain historically high despite some moderation in recent weeks. A strong increase in demand met with temporarily reduced supply due to the negative impact of the pandemic on production. In the longer term, supply is limited by the fact that investment in production facilities has been cut back in the face of depressed price levels in recent years, and any expansion of capacity will take substantial time to materialise. Partly the increase in demand for metals is a result of economic stimulus programmes to boost the economy, which are expected to increase investment over several years. For the United States, there is already talk of a supercycle in the construction industry, which accounts for more than 40% of US steel consumption and thus also a significant share of global demand for iron ore and steel refiners (Morgan Stanley, 2021). The NextGenerationEU (NGEU) programme in the European Union, which runs until 2025, will also stimulate the construction industry. Demand for a number of nonferrous metals in particular (lithium, copper, aluminium, cobalt) is also expected to experience a strong structural increase in the coming years as a consequence of the expansion of renewable energies, the switch to electromobility and additional efforts to expand IT infrastructure, which are gathering momentum in many countries. Against this backdrop, there is a fundamental basis to the expectation of a sustained price increase in this raw material segment.

Food prices could contribute to higher inflation in the future. The prices of many agricultural raw materials have also risen significantly recently. For many products, such as cotton and rubber, they are, however, still within the fluctuation ranges seen in recent years. The drastic rise of lumber prices in Europe and North America until spring seems to have reversed and thus appears to have been a temporary phenomenon. However, important food quotations on the world market have risen close to

their historic highs, and in the case of corn and soybeans even significantly above them. This is mainly due to weather-related weak harvest prospects in important producer countries, with speculative market participants anticipating the resulting future supply bottlenecks and thus pricing them in at an early stage. In the past, price spikes on the food markets have regularly reversed when, in years with good harvests, production exceeded consumption again and stocks could be replenished. There is, however, a risk that unfavourable weather becomes the norm rather than the exception as a result of global warming, reducing productivity of staple food crops over the coming years on a global scale and driving up prices persistently.

3.3. Supply bottlenecks and transport costs

Persistent supply bottlenecks hamper production in manufacturing. A first wave of supply bottlenecks occurred in the beginning of the pandemic in spring 2020 mainly related to supply chain disruptions due to pandemic-related restrictions. While these problems largely faded out in summer 2020, supply bottlenecks intensified again at the beginning of the year and reached unprecedented levels according to different indicators. For example, the share of manufacturing firms reporting that a "shortage of material and/or equipment" is limiting their production reached a historical peak in the third quarter 2021 at roughly 40%. The problems become also visible in the recent disconnect between new orders and production in the manufacturing sector. As a consequence, survey indicators reflecting the backlog of orders and delivery times reached record-levels as well, recently.

There are several reasons behind the supply bottlenecks. Some of these reasons are directly related to the pandemic. In particular, the pandemic-related restrictions have led to a shift in consumption of private households from services – which have been less available (and less attractive) for consumers during the pandemic – towards durable consumption goods. As a consequence, demand for raw materials and intermediates, such as wood, metals, chemicals or semiconductors, has increased and as producers of these goods were not able to meet this demand immediately, so delivery times increased considerably. These shortages intensified also because many firms did not expect the strong rebound of economic activity after the economic slump at the beginning of the pandemic as recoveries following other economic crises used to be rather sluggish. For example, many car producers cut their orders for semiconductors at the beginning of the pandemic in the expectation that they would need to reduce production and as consequence were not able to respond when demand picked up. Finally, supply was restrained due to transportation bottlenecks. The regional heterogeneity in economic recovery triggered logistical problems in maritime transportation that were intensified by additional disturbances, such as the shut-down of significant port capacity in China due to COVID-19 outbreaks and a temporary blocking of the Suez Canal.

The complexity of the supply bottlenecks makes it unlikely that they disappear soon. Given that some of the supply bottlenecks are already in place since last year – and have intensified in the meantime – and that several factors contribute to the bottlenecks, it is likely that they will stay in place for some time. Following the global financial crisis when supply bottlenecks were a problem for the manufacturing industry as well – albeit at a much smaller scale compared to today – it took about one year after their peak to fade out according to survey data. However, while it is uncertain when they will disappear there are several reasons that they could ease in the near future. First of all, firms will adjust to the supply bottlenecks by increasing their production of intermediates and by adjusting their production chains. Second, to the extent that the impact of COVID-19 on the economy will ease, private consumption will readjust from durable goods back to services, lowering the demand for scarce intermediates. Third, to the extent that supply bottlenecks lead to price increases, demand for the affected consumer goods could be dampened and in turn demand for scarce intermediates would also

decrease.

The impact of supply bottlenecks on consumer price inflation is difficult to gauge. To what extent supply bottlenecks have contributed to the increase in inflation is difficult to entangle as their impact overlaps with other factors, such as surging raw material prices or COVID-related price increases. Moreover, the extent to which cost pressures of producers are passed-through to consumer prices can vary over time and may have weakened in the past decade (del Negro et al., 2020). Finally, price pressures from producer prices still in the pipeline may need some time to be passed-through to consumer prices (Koester et al., 2021). Many of the goods in short supply only account for a relatively small share in production costs, such as semiconductors in car production or transportation costs for most manufactured goods, but they can have a notable impact on consumer prices if they lead to a limited supply on a broader scale or if their prices are sky-rocketing (e.g., some container freight rates have risen by a factor of 10). The impact of supply bottlenecks will mainly show-up in non-energy consumer good inflation within the HICP. In August, inflation in this category increased to 2.7% from 0.7% in July, the largest increase since the introduction of the euro[8]. Given the share of non-energy consumer goods in the HICP of 27% in 2021, fluctuations in this category can have a significant impact on headline inflation. However, price fluctuations of non-energy consumer goods could reflect also other factors, such as the increase in raw material prices. If the supply bottlenecks remain significant for some time to come, the impact on prices could intensify in the near future, in particular as pass-through to consumer prices usually takes some time. However, once supply bottlenecks have peaked out, easing market tensions begin to put downward pressure on prices.

3.4. Extra savings

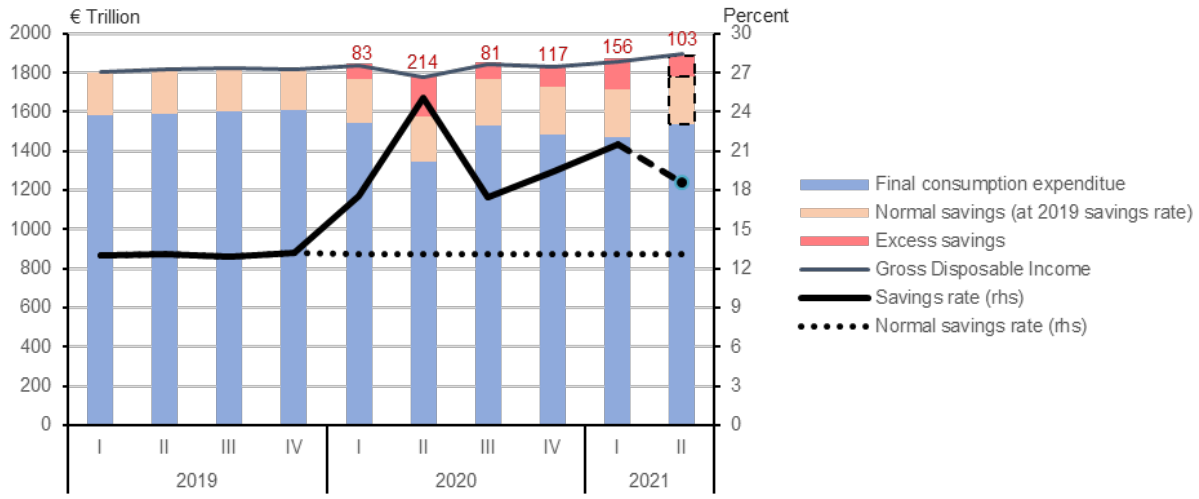
The COVID-19 crisis has led to an unprecedented increase in the savings ratio of private households. The pandemic triggered a slump in private consumption – due to either public containment measures or private self-restraint – while disposable income has been less affected not least due to fiscal transfers. As a consequence, the savings ratio of private households jumped from its pre-crisis level of about 13% to 25% in the second quarter 2020 (Figure 7). With the easing of the pandemic-related restrictions, private consumption started to recover and the savings ratio declined. However, in the early 2021 savings were still far above their pre-crisis level. In this period, private household accumulated excess savings (compared to savings that would have prevailed at pre-crisis savings rate) of about EUR 750 billion or more than 10% relative to disposable income in 2019.

Pent-up demand could lead to sustained upward pressure on inflation. If extra savings are spent to a large extent for consumption, this can put significant upward pressure on consumer prices due to the large size of these savings. To what extent pent-up demand will result in an increase of volumes or prices is unclear. However, extra savings may increase the willingness to pay of private households, particularly against the backdrop of forgone consumption since the beginning of the pandemic, so that the impact on prices might be higher than in normal times. Scenario analyses on the potential impact of pent-up demand are scarce. One analysis for key advanced economies (United States, United Kingdom, and Japan) suggests that if 70% of the extra savings will be spent until the end of 2023 this would increase inflation in these economies by roughly 0.5 percentage points in each year (Attinasi et al., 2021). An analysis for Germany suggests that in a scenario, in which 45% of extra savings will be spent within 2 years (starting at the beginning of 2022) the HICP inflation rate would be 0.1 percentage point higher in 2023 compared to a scenario, in which 35% will be spent within 3 years (Deutsche

[8] The increase is not result of a base effect as the inflation rate in July 2020 was 0.3%; on average the inflation rate between 1999 and 2019 was 0.6%.

Bundesbank, 2021). Relatively small effects of pent-up demand on inflation are in line with Phillips curve estimates that suggest a relatively small impact of the output gap on consumer prices (Annex A). However, to the extent that very large increases in demand have more than proportional effects on consumer prices (e.g. if supply cannot meet additional demand in the short-run) and that an increase in the output gap due to private consumption has more than proportional effects on consumer prices, analyses based on historical data may underestimate the potential impact of pent-up demand on inflation.

Figure 7: Excess household savings in the euro area, 2019-2021



Source: Eurostat; own calculations and representation. 2021 Q2 savings rate: Own estimate.

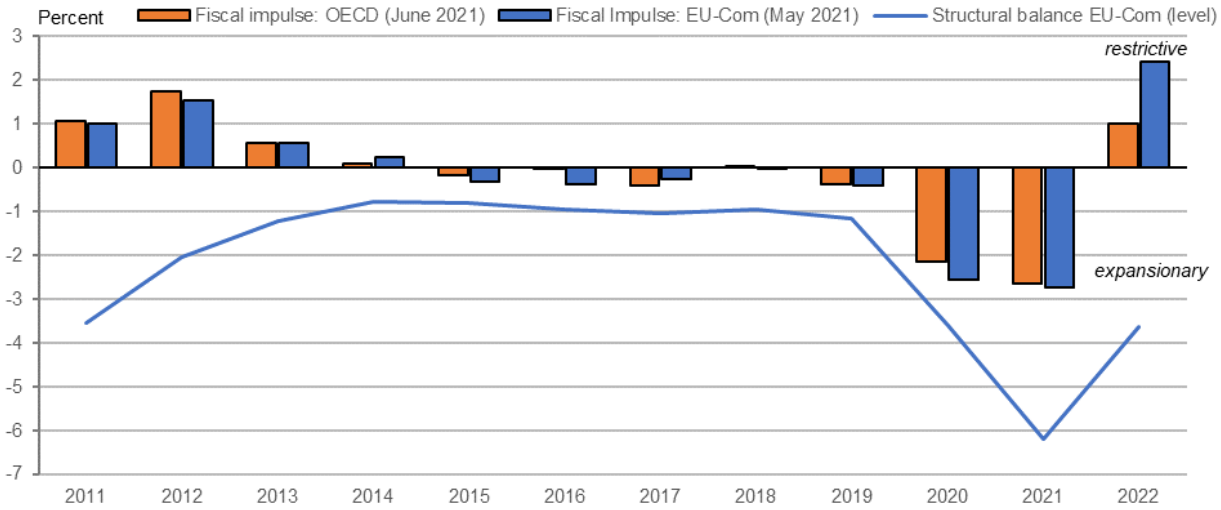
Macroeconomic forecasts usually assume that only a moderate share of extra savings will be spent for consumption. The additional savings increased the wealth of private households beyond what would have been expected before the crisis. Wealth effects on private consumption are estimated to be relatively low compared to income effects and vary across countries (de Bondt, 2019). However, the additional savings were accumulated to a large extent involuntarily (Dossche et al., 2021). Therefore, it is not obvious whether wealth effects estimated with historical data provide a good guidance for the impact of extra savings on consumption. When private households were to use these savings to the same share as they would use additional income the impact on private consumption would be large. While some surveys indicate that private households indeed plan to spent some of the extra savings for consumption (Deutsche Bundesbank, 2021), it is difficult to quantify the exact amount. In most macroeconomic projections, including the one of the ECB (2021), it is assumed that only smaller parts of these savings will be spent for consumption. One argument in favour of this assumption is that additional savings were accumulated to large extents by wealthier and older households who have typically a lower propensity to consume (Friz and Morice, 2021). Moreover, the decline in consumption was mainly driven by a decline in services consumption while consumption of durables rebounded already in the second half of 2020. Pent-up demand for services is less likely than for other goods because many services need time to consume so that the scope is smaller to make up for forgone consumption. Pent-up demand can be also be limited if some of the accumulated savings are used for housing investment or because self-employed and micro-enterprises, whose savings have been eroded during the pandemic, will increase their savings when their income increases again. However, to what extent accumulated savings will finally lead to additional private consumption is an open question.

3.5. Fiscal policy

Fiscal policy in the euro area is even more expansionary in 2021 than in 2020. Estimates of the output gap and fiscal variables by the European Commission (2021) and the OECD (2021) allow an assessment of the fiscal policy stance in the euro area. Of particular interest is the structural primary balance, i.e. the government budget balance, adjusted for cyclical effects, one-offs and changes in interest expenditure. The yearly change of this balance can be interpreted as the fiscal policy stance, as it is supposed to capture discretionary fiscal policy decisions. An increase in the primary structural balance indicates restrictive fiscal policy, a decline implies expansionary policies, and stability in the balance implies a neutral stance. Based on these numbers, the fiscal impulse in 2021 is expected to be even more expansionary than in 2020 as the primary structural balance declines by almost three percentage points (Figure 8). This appears excessive, given that economic activity has largely bounced back after the vaccination campaign in Europe gained grip and most restrictions were withdrawn. In this situation, when there is no lack of disposable income (but large amounts of extra savings), combined with a widespread desire to resume pre-crisis consumption patterns once the restrictions are gone, substantial fiscal stimulus is – arguably – not required to support the recovery. Moreover, governments are currently unrestricted by European fiscal rules, which have been deactivated under the general escape clause for 2021 and also 2022, so decision makers in some countries might be tempted to take more action than required. Against this background, euro area fiscal policy in 2021 may constitute another factor with the potential to contribute to inflationary pressures. For 2022, the fiscal plans indicate a consolidation, but there is high uncertainty what governments will actually do, and the expected level of the structural balance in 2022 (blue line) would still be far away from its pre-crisis level and from its medium-term objective (MTO). According to current fiscal rules, the MTO for the structural deficit is 0.5% for most countries.

The political debate points to a reform of the fiscal framework that allows for additional fiscal spending in the years ahead, adding another factor with the potential to contribute to inflationary pressures. There appears to be a widespread desire to reform the fiscal framework, and in particular to loosen and simplify the current set of fiscal rules (Ilzetzki, 2021). As the General escape clause is currently in place, there is an opportunity to reform the European fiscal framework off-duty before the rules laid down in the fiscal compact are applied again after the crisis (Gern et al., 2020). Under the impression of low inflation and interest rates over the past years, many governments will tend to loosen restrictions, allow for higher debt and for additional investment in the years ahead, for example to support digitalisation and decarbonisation. An instrument that is already put in place is the NGEU programme that was designed in 2020 to provide a joint fiscal crisis response. A major element is the Recovery and Resilience Facility, which distributes on average funds worth about 2.5% of GDP over the years 2021-2026 as grants to EU countries. However, the additional EU debt, which will require debt service from within EU countries one way or the other, will not be accounted for in national debt figures. Similarly, EU grants to national budgets allow for additional spending, by which fiscal rules are effectively loosened until 2026 (Darvas and Wolff, 2021). The NGEU programme can be interpreted as a major first step towards joint debt, less fiscal restrictions and additional expenditures – and it is conceivable that further steps will follow. A less restricted, more active role of fiscal policy and additional expenditures on a permanent basis would – *ceteris paribus* – contribute to inflationary pressure.

Figure 8: Fiscal impulse: change in the euro area structural primary balance, 2011-2022



Source: European Commission; OECD; own Calculations.

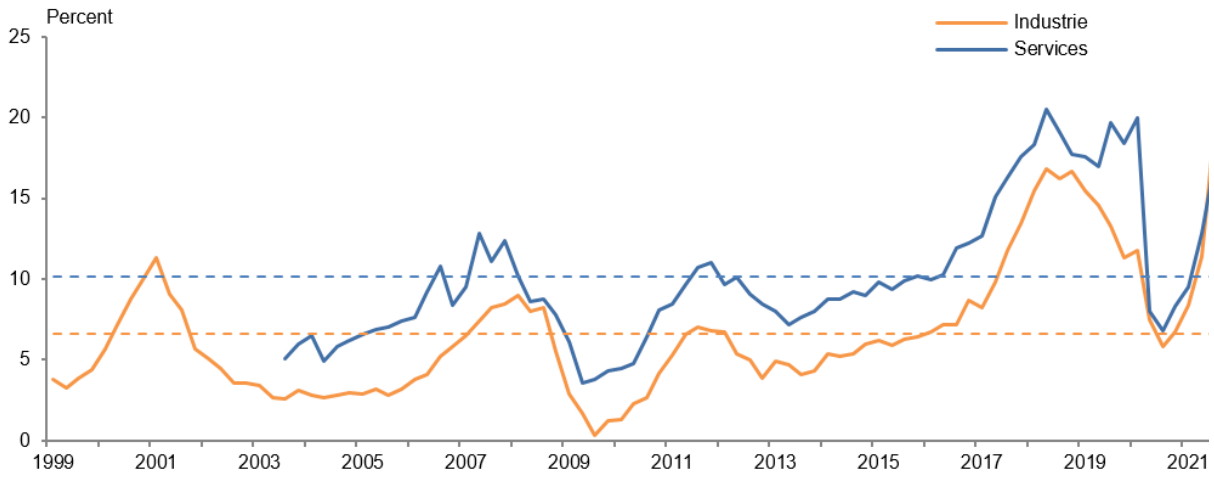
Notes: Yearly data, in relation to potential GDP. Bars: Change of the structural primary balance in percentage points.

The impact of fiscal policy on consumer prices also depends on the structure of revenues and expenditures. Expansionary fiscal policy can impact consumer prices by stimulating economic activity. The relationship between the output gap and inflation is on average, however, relatively loose so that only large swings in fiscal policy will have considerable effects on inflation. The impact also depends on the structure of fiscal policy. The short-run impact of an increase in public construction investment on inflation might be smaller than additional transfers that stimulate demand for consumer goods, for example. Against this backdrop, expansionary fiscal policy creates a supportive environment for increases in the price level, but does not seem to be a major driving force of inflation, in particular as current fiscal plans foresee a tightening in 2022.

3.6. Wages: tight labour markets and demographics

The labour market in the euro area has become tighter. Unemployment in the euro area has declined to a historical low in early 2020 with a rate of 7.3% (International Labour Organization, ILO definition). Only in early 2008, the unemployment rate reached a similarly low level, and it was considerably higher in the meantime, in particular in the years after the Euro debt crisis. During the COVID-19 crisis of 2020, short-time work schemes prevented massive job losses and a substantial increase in unemployment, and up to July 2021 the unemployment rate went down again to 7.6%, not far from previous historic lows. Correspondingly, the share of firms that report labour shortages to be a major factor hampering their production has returned to high levels for both industry and services lately (Figure 9).

Figure 9: Limits to production: labour, 1999-2021



Source: European Commission, Industry Survey and Services Survey.

Notes: Quarterly data, seasonally adjusted. Share of firms reporting labour shortages as a factor limiting their production. Dashed lines: Mean values since 1999.

Labour shortages will eventually translate to rising wages and prices. Tight labour markets tend to boost the bargaining power of workers and unions and increase the probability of substantial wage increases, which may in turn pass-through to consumer prices, depending on the market power and the price-setting behaviour of firms. Up until the second quarter of 2021, negotiated wages in the euro area (total economy) increased only moderately by 1.9% (year-over-year) and indicate no substantial upward trend. However, given that consumer prices are about to increase sharply in 2021, we can expect some degree of compensation for the loss of purchasing power in the wage negotiations in the months and quarters ahead. Moreover, once firms and workers generally perceive this crisis to be actually over, which may not have been the case by the second quarter of this year, and once the labour shortages become more pressing and permanent, we can expect even more dynamic increases of average wages, which then would feed into services inflation and, more generally, into consumer price inflation. Eventually, the labour shortages that are already visible will sooner or later translate into rising wages and prices. Looking forward, demographics in aging Europe point to an intensification of labour shortages in the medium and long run.

The relationship between wages and consumer prices varies over time. Empirical evidence suggests that the relationship between wages and inflation has weakened over the past decades (Bobeica et al., 2021; del Negro, 2020), even though it seems to be stronger for large euro area countries than for the US (Bobeica et al., 2019). Reasons behind this could be that prices react less sensitive to cost pressure (del Negro, 2020) and more generally better anchored inflation expectations and an increase in trade integration (Bobeica et al., 2021). The relationship between wages and consumer prices is shock-dependent and varies with the general macroeconomic environment. If wages increase due to a labour supply shock, the impact on consumer prices is relatively strong and takes place relatively early (Bobeica et al., 2019). Moreover, the pass-through from wages to inflation is systematically lower in periods of low inflation compared to high inflation (Bobeica et al., 2019).

4. INFLATION OUTLOOK AND KEY FACTORS

In recent macroeconomic projections moderate inflation rates in the euro area are the baseline scenario. In the macroeconomic projection of September 2021, the ECB forecasts an increase of HCIP inflation to 2.2% this year from 0.3% in 2020 (ECB, 2021a). The lower forecast of 1.2% for the HICP excluding energy, food and changes in indirect taxes indicates that the ECB assesses underlying inflation to be hardly affected. Headline inflation declines to 1.7% in 2022 and 1.5% in 2023, according to the ECB forecast, while HICP inflation excluding energy, food and changes in indirect taxes is expected to increase somewhat to 1.6% in 2023 due to the ongoing recovery from the pandemic. Earlier forecasts did not anticipate the acceleration of inflation in the course of this year but the forecasts were revised upwards with stronger than expected incoming data. The ECB forecast is broadly in line with other recent forecasts of international institutions or professional forecasters expecting an inflation rate of about 2% for this year, declining to about 1.5% in 2023 (Table 1). Therefore, the baseline scenario in these forecasts is that the increase in inflation in this year is mainly due to transitory factors that will fade out in the subsequent years.

Table 1: Recent forecasts for euro area HICP inflation

	Date of release	2020	2021	2022	2023
ECB staff projections	09/2021	0.3	2.2	1.7	1.5
Consensus Economics	08/2021		2.1	1.5	1.5
IMF	07/2021	-	1.8	1.3	1.4
Survey of Professional Forecasters	07/2021	-	1.9	1.5	1.5
European Commission	07/2021	0.3	1.9	1.4	-
OECD	05/2021	0.3	1.8	1.3	-

Source: ECB (2021a).

Macroeconomic projections rest on the assumption that the price-driving factors will fade out soon. The future path of commodity prices, supply bottlenecks or extra savings as well as the occurrence of future economic shocks is difficult to foresee. Therefore, in forecasts it is usually assumed that the impact of observed shocks is fading out and that other shocks will not take place in the forecasting period. For example, it is a standard assumption that commodity prices will roughly remain on their current level in the forecasting period. As a consequence, the impact of these factors on inflation fades out soon and inflation forecasts for one or more years ahead are approaching levels that the forecaster expects to be the underlying inflation trend. Given that the impact of economic slack or fluctuations in wages in the past was on average relatively small, this underlying inflation trend often approaches soon long-run inflation expectations that are close to the inflation target if the credibility of the central bank to reach its target is high. In this regard, the ECB as well as many other forecasters assume for their forecasts that the impact of supply bottlenecks will fade out in the next year and that only a moderate share of extra savings will be spent for consumption. Even though it is reasonable to make these assumptions for a forecast, given the high degree of uncertainty, it does not imply that such a scenario is much more likely than other scenarios.

Price-driving factors are temporary in principle, but can reinforce each other and can now have a larger impact on inflation than in normal times. Many of the factors that have the potential to further drive up inflation are temporary in principle so that their impact on inflation rate is typically

only short-lived. At the current juncture, these factors could, however, lead to more sustained price pressure than in the past because they could stay in place relatively long. For example, supply bottlenecks in maritime transport have begun already in 2020 and it is uncertain whether they will be largely resolved in the near term. It is also uncertain how long bottlenecks in other areas will persist. The size of extra savings is sufficiently large to fuel a consumption boom and thereby prices for some years if large parts of them will be spent for consumption. Moreover, the impact on inflation of these factors could reinforce each other. If supply chain disruptions and transportation bottlenecks limit the supply for consumer goods, pent-up demand could lead to stronger price increases. At the same time, firms may not hesitate to pass-through higher input prices because they expect that consumer have a higher willingness to pay due to extra savings and the forgone consumption since the beginning of the pandemic. Similarly, firms that suffer from a deteriorated financial position due to the pandemic may pass-through increasing costs, for example due to commodity price or wage increases, stronger to consumer prices than in the past.

Second-round effects can lead to more sustained upward pressure on inflation. While the direct impact of the factors described above at some point will eventually fade out, their impact will be prolonged if they trigger second-round effects via an increase in inflation expectations and wages. Second-round effects via wage increases could be supported by increasing labour shortages and a higher willingness of firms to pass-through cost pressures to consumer prices. An increase in inflation expectations could be supported by the new symmetric inflation target of the ECB and by the communication of the ECB that it may would tolerate an inflation rate somewhat above its target for some time. Higher long-run inflation expectations would not only impact price and wage setting behaviour but can in turn also lead to an additional impulse by lowering the real interest rate so that monetary policy could become more stimulating without any additional measures of the ECB.

Upwards risks for the inflation outlook dominate at the current juncture but a rapid easing of supply bottlenecks or a reversal in commodity prices would lead to downward pressure on consumer prices. Given that in recent forecasts it is assumed that the impact of the price-driving factors on future inflation is small and that second-round effects on inflation will be limited, the upward risks for these forecasts dominate at the current juncture. Against this backdrop, inflation rates somewhat above the inflation target of the ECB in the next years seems to be a reasonable alternative scenario to the baseline forecasts. The more inflation would rise above the inflation target and the more this would be fuelled by second-round effects, the more likely it would become that the ECB would tighten its policy markedly to dampen inflation. Changes in the monetary policy stance on prices usually take some time to unfold, their impact takes place with some delay so that the impact on inflation in the short-run would be limited. Downward pressure on prices will emerge after supply bottlenecks have peaked or if commodity prices would reverse and, at the same time, the impact of other factors would prove to be limited. A return to a low-inflation environment is less likely in the near-term also because there would be still other factors in place that could stimulate inflation.

Some of the factors could stimulate the housing market and in turn lead to an increase of costs for owner-occupied housing. Large extra savings as well as expansionary fiscal and monetary policy could also stimulate the housing market. The direct impact on the HICP would be rather small as costs of owner-occupied housing do not yet enter the HICP and rents react only very sluggishly to developments at the housing market. However, given that the ECB has recommended to account for costs of owner-occupied housing in the HICP, the relevance of housing market developments for the conduct of monetary policy will increase.

5. IMPLICATIONS FOR MONETARY POLICY

Higher price pressure coincides with challenging times for the ECB. The impact on prices of the COVID-19 crisis as well as of the different supply- and demand-side factors currently in place is difficult to disentangle and to forecast. Moreover, the recovery from the pandemic is not complete yet and the risk remains that COVID-19 will dampen activity once again in the coming months. Difficult trade-offs for monetary policy could arise if a weak economic performance would be accompanied by strong increases in inflation. Finally, it will be closely monitored by market participants how the ECB will implement its new monetary strategy, in particular after it did not reach its inflation target for an extended period of time in the past.

The driving factors of inflation are of different relevance for monetary policy. If commodity price increases lead to higher inflation this would be less of a concern for the ECB – even if they would bring inflation above the inflation target for a longer period of time – as their direct impact would fade out at some point. Moreover, there is little that monetary policy could do to directly alleviate cost pressures related to supply side disturbances. If inflationary pressure instead related to higher demand, e.g. due to the release of pent-up demand or expansionary fiscal policy, higher inflation would become more of a concern for the ECB. Also, second-round effects due to increases in inflation expectations and wages would increase the likelihood of an intervention by the ECB to avoid accelerating inflation dynamics.

After the long period of subdued inflation, moderately higher inflation rates would be welcomed by the ECB. In the past decade, inflation on average was persistently below the inflation target of the ECB. Therefore, moderately higher inflation rates and somewhat higher inflation expectations would be not a major concern the ECB. Actually, one aim of the new monetary strategy of the ECB with its symmetric inflation target is to anchor inflation expectations at a somewhat higher level to create more room for expansionary monetary policy with regard to the zero lower bound. To this end, the ECB signalled that it may tolerate inflation rates somewhat above its inflation target for some time (ECB, 2021b).

Theoretically, it is easier for monetary policy to dampen than to stimulate inflation. Experience after the global financial crisis showed that it can be very difficult for central banks to stimulate inflation and exit a low inflation environment. There can be different economic reasons behind that can be summarised as a decline in the natural interest rate that makes it more difficult for monetary policy to stimulate the economic activity, in particular when it approaches the zero lower bound with its interest rate policies (Fiedler et al. 2018)[9]. In contrast, central banks are less restricted in tightening monetary policy by interest rate increases. Against this backdrop, the ECB might be somewhat more reluctant to tighten monetary policy at the current juncture, to avoid falling back into a low inflation environment.

In practice, inflation rates well above the inflation target would be challenging for the ECB as a tightening of monetary policy can have undesired side-effects. Even if sustained price pressure leads to inflation considerably above target, the ECB might be reluctant to substantially tighten its monetary policy. First of all, a tightening of monetary policy could cause stress on financial markets, on sovereign bond markets in particular as the sustainability of public debt could be in doubt if the cost of debt was to rise significantly after the long period of very favourable financing conditions (Fiedler et al., 2020). Some of the measures implemented by the ECB aimed directly at pushing down interest rates

[9] There is also more general evidence that expansionary monetary policy has smaller effects than contractionary monetary policy. However, this effect seems to be stronger for economic activity than for prices (Angrist et al., 2016; Tenreyro and Thwaites, 2016; Deborttoli et al., 2020).

for sovereign bonds and to reduce stress at financial markets. Second, the ECB may want to avoid to slow down the ongoing recovery from the pandemic. Third, it is difficult to disentangle the transitory and more persistent drivers of inflation in real time and the ECB does not want to fall back into a low inflation regime. However, if the ECB would react to high inflation reluctantly this could raise concerns about the credibility of the ECB to fulfil its primary objective of maintaining price stability. In such a scenario, inflation expectations could increase and reinforce inflation, which would make even stronger monetary tightening necessary at a later stage. All in all, the ECB may face difficult trade-offs if inflation increases considerably above its target.

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ANNEX: THE PHILLIPS CURVE AS A TOOL TO ANALYSE INFLATION

Inflation is driven by multiple factors. A standard framework to analyse inflation dynamics is the Phillips curve. The Phillips curve links inflation π_t in time *t* to inflation expectations and a measure of slack in the economy g_t. All other factors can be summarised in the residual ε_t:

$$\pi_t = \alpha \cdot \pi_t^e + \beta \cdot g_t + \varepsilon_t$$

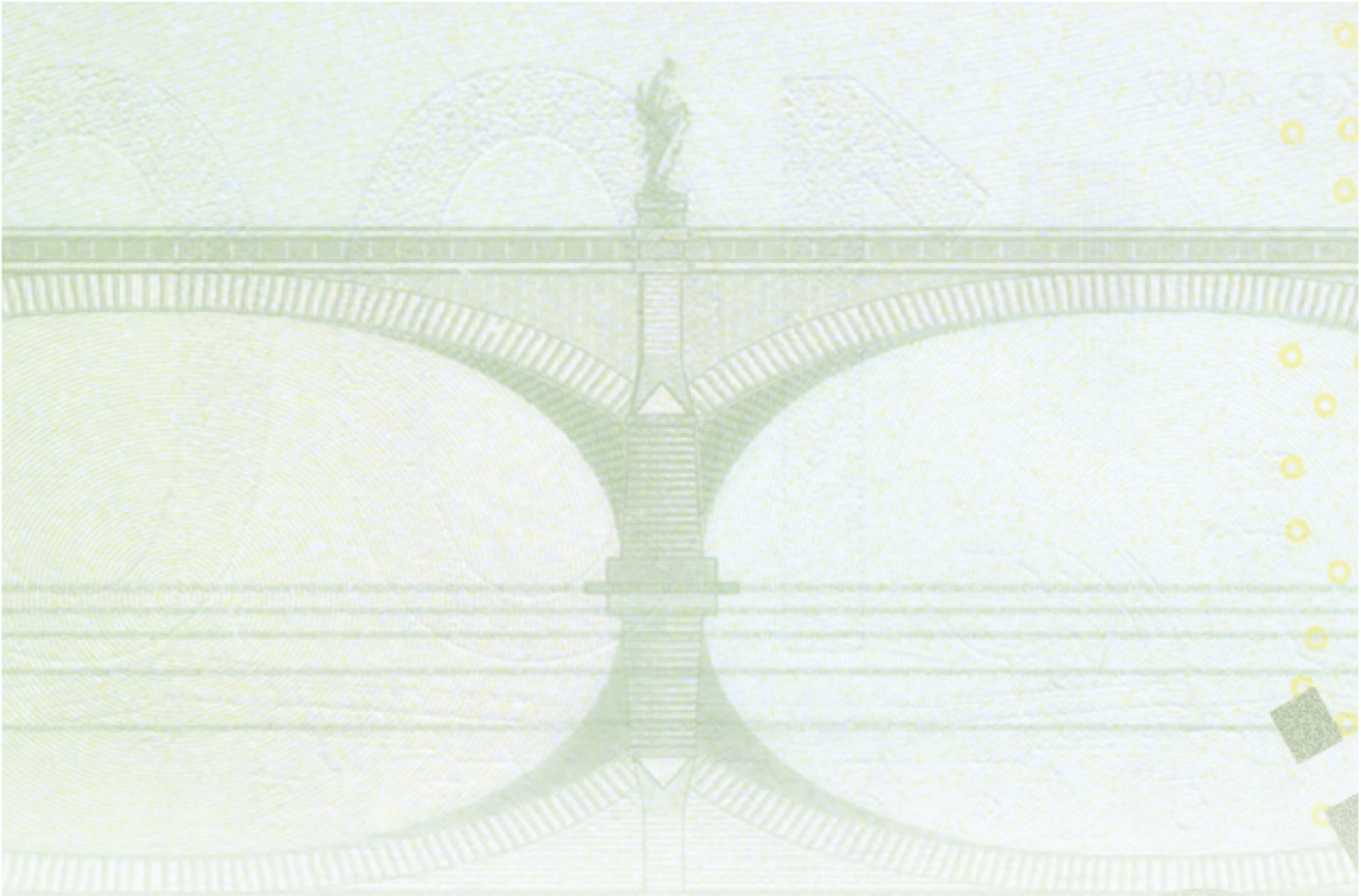
Other factors comprise import prices, desired mark-ups of firms or changes in taxes, for example. Many specifications include the core inflation rate instead of the headline inflation rate on the left-hand side, abstracting from energy and food prices. Energy and food prices are very volatile, influence the inflation rate usually only on a temporary basis, and are determined to larger extent abroad so that monetary policy usually does not react to fluctuations in these prices as the core inflation rate is a better measure of the underlying inflation trend (Ehrmann et al., 2018).

The Phillips curve framework can be used to identify the most important structural determinants of inflation or to forecast inflation. Both is relevant for monetary policy so that this framework is frequently applied at central banks. One important transmission mechanism of monetary policy to impact inflation is to influence slack in the economy. Therefore, it is important to assess the strength of the relationship between slack and inflation for the conduct monetary policy. Moreover, monetary policy can stabilise inflation at its target by anchoring long-run inflation expectations. The better inflation expectations are anchored at the target, the less inflation may react to shocks lowering the need for monetary policy interventions of central banks.

There is no single specification of the Phillips curve reflecting the variety of available measures for expectations, slack or other factors. Inflation expectations can be measured with different indicators, such as consumer or firm surveys, expectations implicit in prices of financial assets or surveys of long-run expectations of professional forecasters or market participants. Long-run inflation expectations can reflect the credibility of the central bank to achieve its inflation target over the medium term; other factors then can drive inflation below or above the inflation target for some time. If the Phillips curve is used for short-run forecasting, however, other measures of expectations reflecting short-run dynamics can be more useful. Economic slack can also be measured with different variables. One of the most common measures for economic slack is the output gap, i.e. the difference between actual gross domestic product (GDP) and potential output (the long-run sustainable level of GDP). Potential output, and therefore the output gap, cannot be observed but needs to be estimated. Estimates are provided, for example, by the European Commission, the OECD, or the IMF, but can vary considerably. Moreover, output gaps estimated in real-time are usually revised considerably when additional information becomes available. An alternative measure for economic slack is the unemployment gap, the difference between actual unemployment and the natural rate of unemployment, which has a more direct link to labour market developments. However, the natural rate of unemployment is not observable as well. Sometimes, slack is measured in terms of firm survey data. Using survey data avoids estimation uncertainty but it is questionable whether they provide accurate measures of slack for the whole economy, for example because capacity utilisation in some service industries is difficult to assess. Finally, Phillips curve specifications differ in whether and to what extent other factors are explicitly included, such as external factors. One approach to deal with the estimation uncertainty stemming from the large number of reasonable specifications is to use thick modelling approaches (Granger and Jeon, 2004) that estimate many alternative specifications and evaluate the central trends of the results (Eser et al., 2020).

The impact of slack in the economy on inflation has weakened in the last decades. Estimates of the Phillips curve usually find that economic slack has a significant impact on inflation (Eser et al., 2020).

However, the effect of slack on inflation has diminished over the past decades (BIS, 2017; Blanchard et al., 2015; IMF, 2013; Lodge and Mikolajun, 2016). One reason for this flattening of the Phillip curve could be an increasing impact of external factors. While the evidence whether global slack has a direct impact on domestic inflation is mixed, external factors can have an impact on domestic inflation via various channels, including increased competition on product and labour markets due to increased globalisation, the impact of external demand on domestic slack, or global factors, such as oil prices (Forbes, 2019). Another reason behind a lower responsiveness of inflation to slack in recent times could be that monetary policy was successful in anchoring inflation expectations (Bernanke, 2007) or offsetting the impact of demand shocks (Mcleay and Tenreyo, 2019). In this regard, it is important to note that estimates of the reduced form Phillips curves in the spirit of equation (1) can give only limited information about causal relationships. In fact, there are several factors (or economic shocks) that influence economic slack and inflation at the same time but in different ways and thereby weaken the measurable relationship in reduced-form specifications (Eser et al., 2020). The shock-dependency of the relationship between variables is well-established with regard to the economic impact of oil prices (Kilian 2009) and exchange rates (Forbes et al., 2019), for example, and has recently become more prominent in the discussion about the flattening of the Phillips curve. Studies that seek to identify causal relationship between slack and inflation usually find a more stable and a somewhat stronger impact of slack on inflation (Eser et al., 2020; Mcleay and Tenreyo, 2019). However, also in these estimates the impact of slack on inflation tends to be small, implying that monetary policy has to engineer large fluctuations in economic activity to cause small movements in inflation. In line with the multiple possibilities to specify Phillips curves and the challenges to identify the causal relationships the evidence on forecasting power of the Phillips curve is mixed, pointing to a moderate ability to forecast inflation (Banbura and Bobeica, 2020; Dotsey et al., 2018; ECB, 2014).



Is High Inflation the New Challenge for Central Banks?

Luigi BONATTI and Roberto TAMBORINI

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.

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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

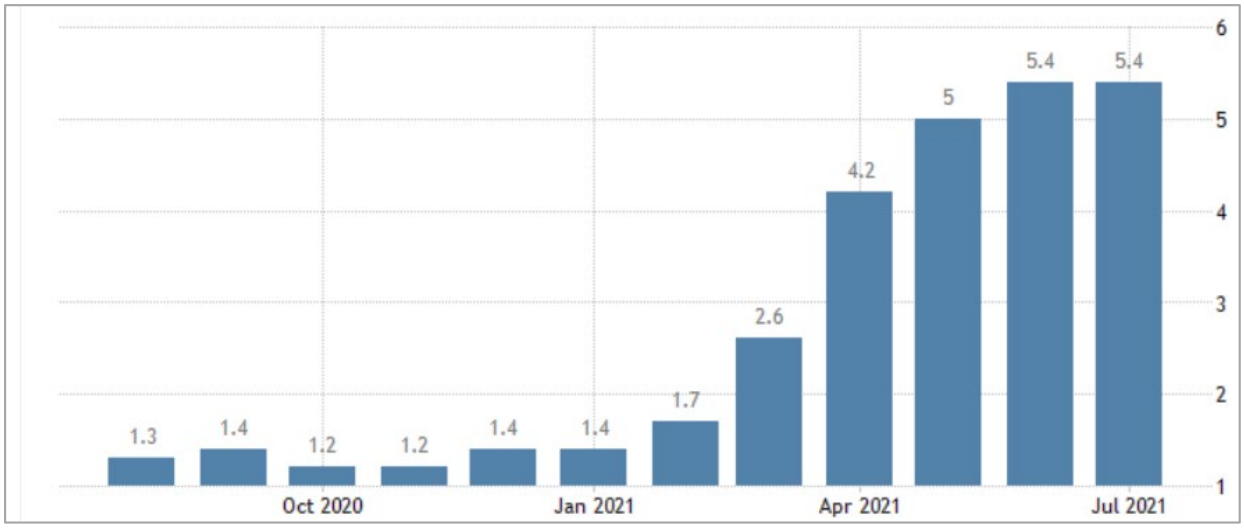
EXECUTIVE SUMMARY

- **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)



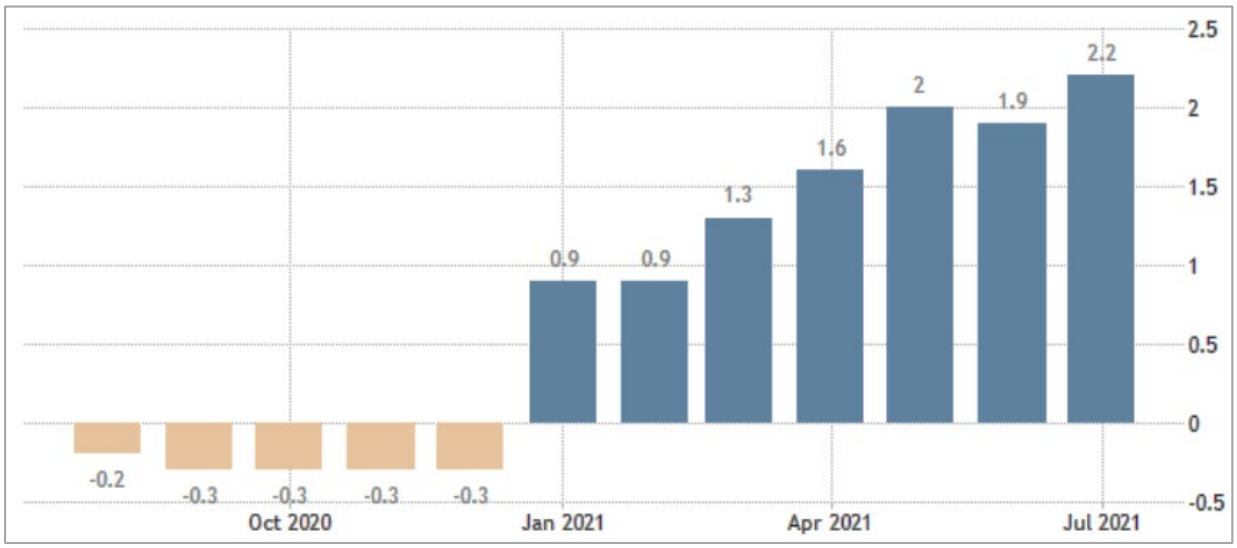
Source: Trading Economics. Available at: https://tradingeconomics.com/united-states/inflation-cpi.

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 cooling[1]. 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 States[2].

[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.

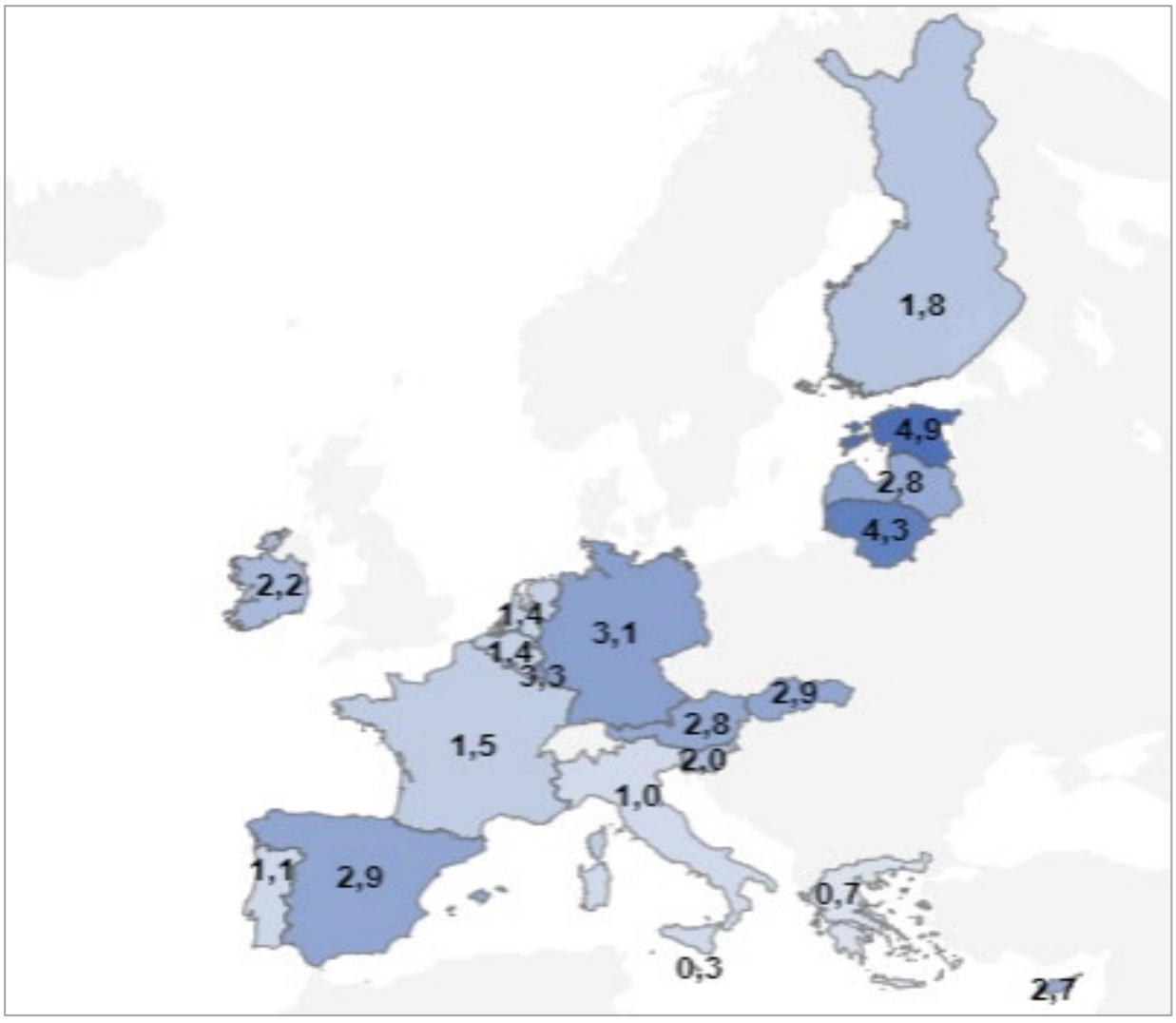
[2] It is not surprising that these differences emerge also in the ECB Governing Council. For instance, Jens Weidmann, President of the Bundesbank, voted against the Governing Council's decision on 22 July 2021, to maintain a persistently accommodative monetary policy stance by claiming that, in a context 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):

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

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 Galì, 2008). The result is that π^e is inflation expected one period ahead (π^e_{t+1}), 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^e_t) or a "hybrid" composition of forward and backward-looking forecasts (forecasts based on the projection of observed previous inflation, $\pi_{t-1}, \ldots$). Price stickiness[4] 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 (Galì, 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 the are no pressures to change *real* wages[5].

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 $W^{€}_t$ 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 $W^{€}_t = w_t^C \times P_t^e$, 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** $w_t = W^{€}_t / P_{t-1}(1+\pi_t)$ 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.

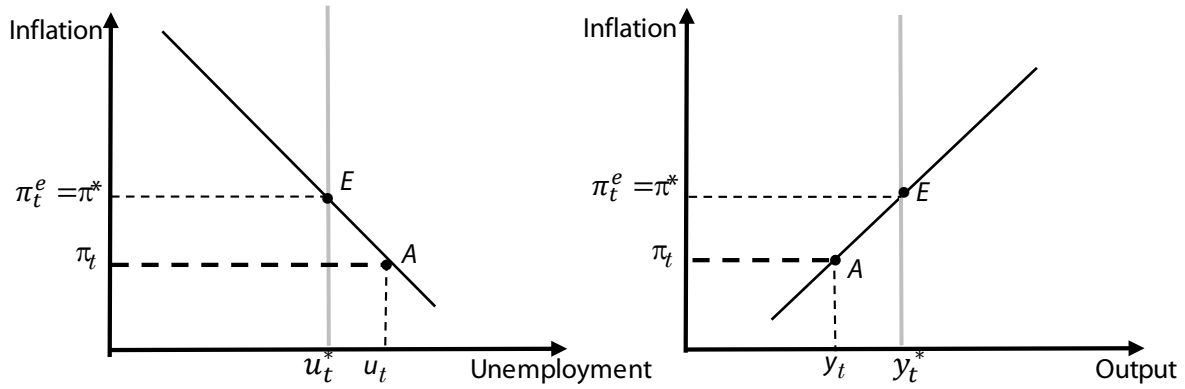
Let us focus on firms and consider the fact that as long as the wage contract is not changed, firms can nonetheless regulate their labour input (amount of hours worked) rather easily in response to the

[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 benchmark[6]. 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 evidence[10]. 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).

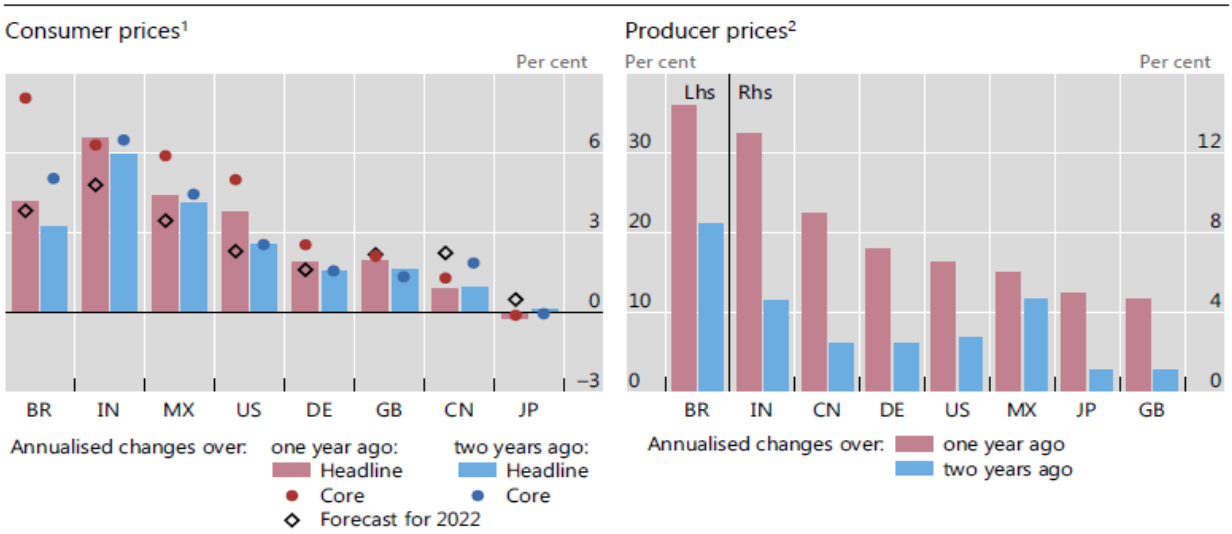
3. DRIVERS OF THE RECENT RISE IN INFLATION

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 services[11]; 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 prices[12]. 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).

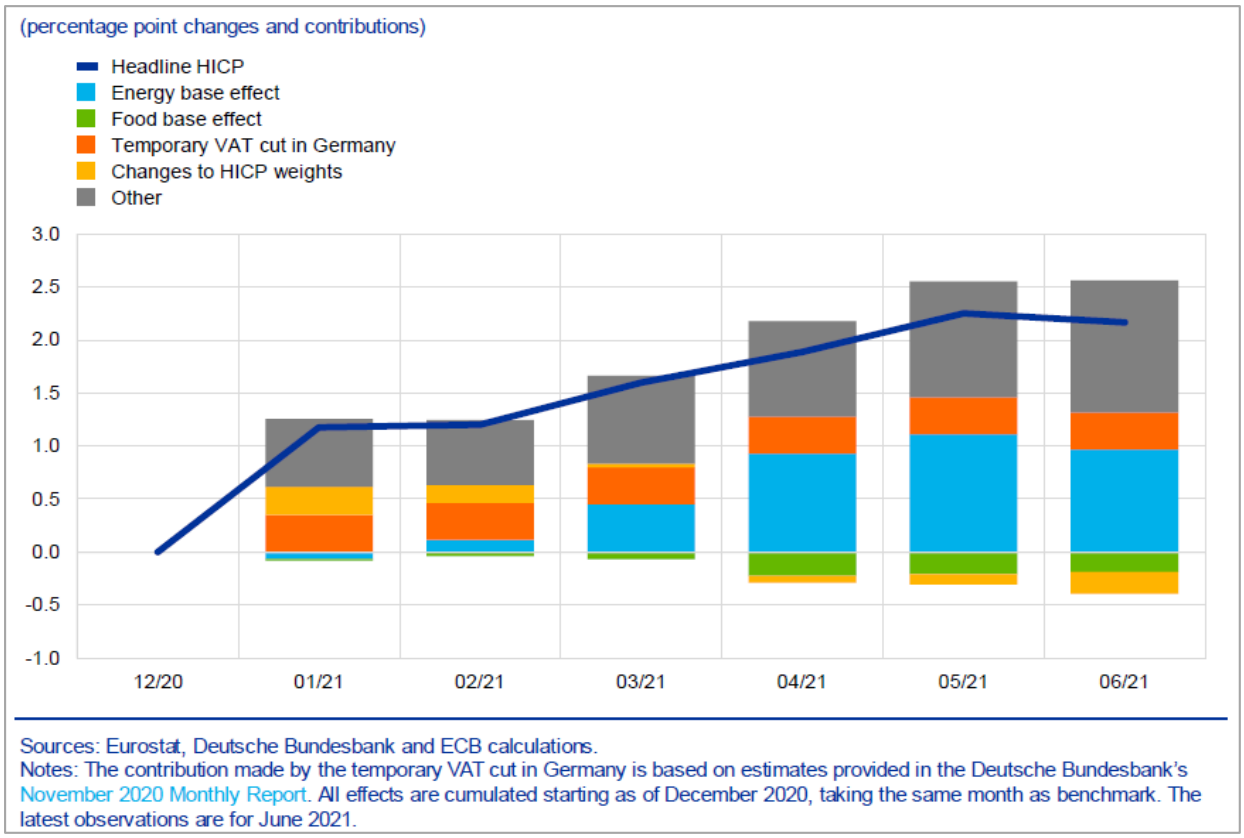
An assessment of how much the recent worldwide rise in inflation can be ascribed to base effects is provided by Budianto et al. (2021), that measure inflation over the past two years rather than

[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 (Statistiches 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).

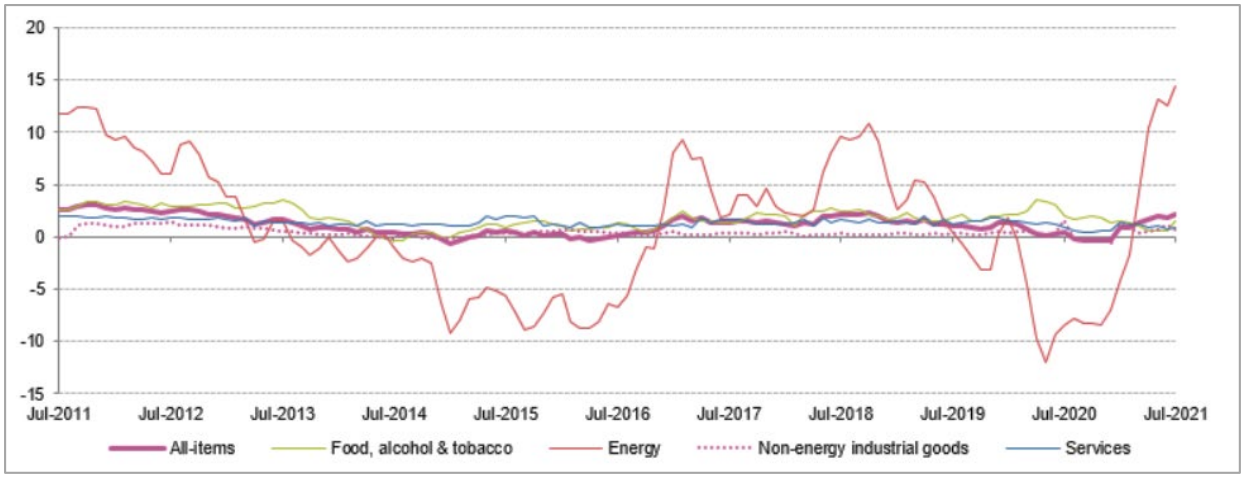
3.2. Core inflation and NEIG

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**
All-items excluding:								
energy	905.0	1.4	1.2	1.0	0.7	0.9	0.8	**0.9**
energy, unprocessed food	854.5	1.3	1.2	1.0	0.8	0.9	0.9	**0.9**
energy, food, alcohol & tobacco	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**
processed food, alcohol & tobacco	167.1	1.6	1.3	1.0	0.9	0.7	0.8	**1.5**
unprocessed food	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 it [13].

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).

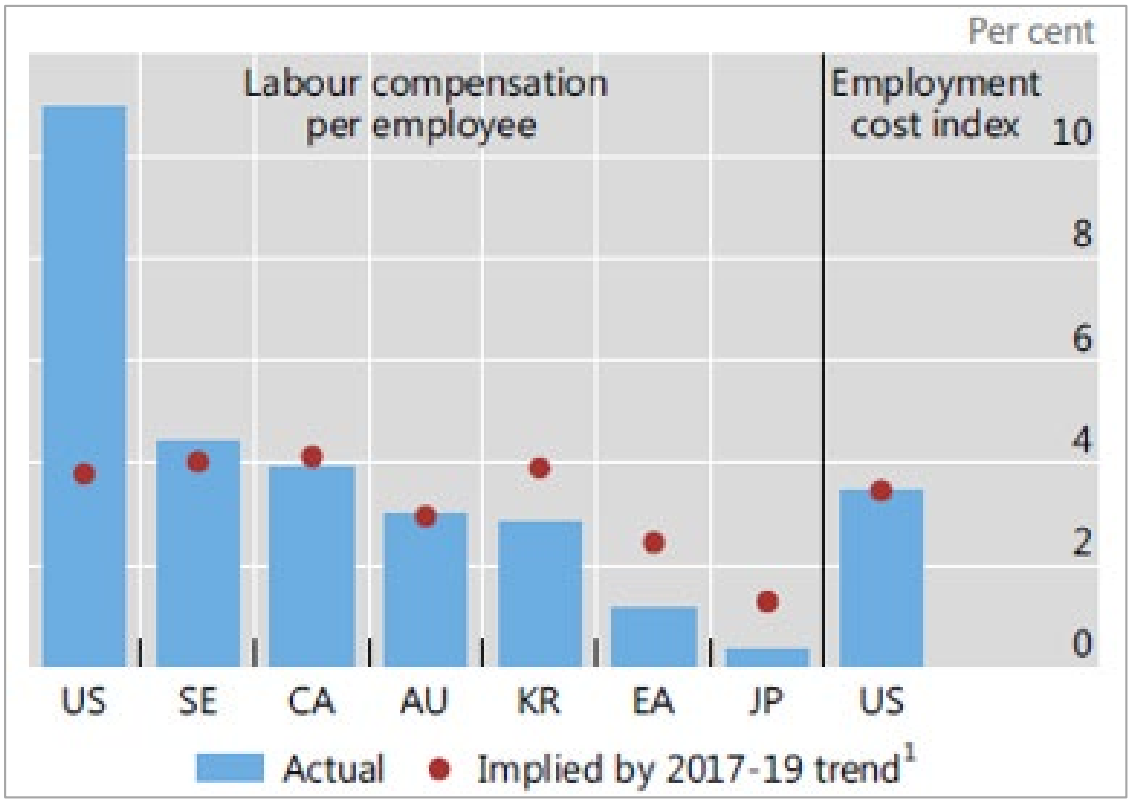
4. SHOULD WE EXPECT A MORE PERSISTENT RISE IN INFLATION?

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, Budianto 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: Budianto et al. (2021).

[14] As Budianto 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 wages [15].

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

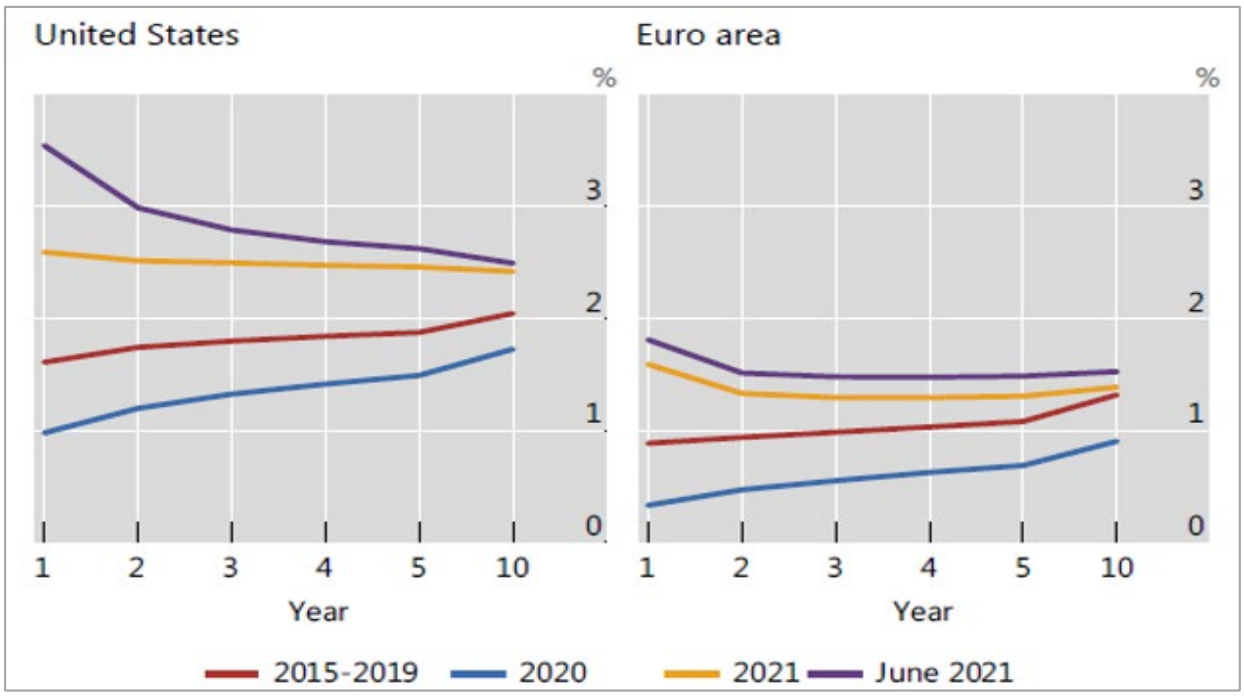
[15] The latest IG Metall wage agreement (covering around 3.8 million industrial workers and usually a benchmark for other sectoral wage settlements) envisaged a 2.3% wage increase for the period to October 2022 (amounting to a 1.5% annual increase). However, the news that Germany's annual CPI inflation 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: Budianto 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 ago[17].

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.

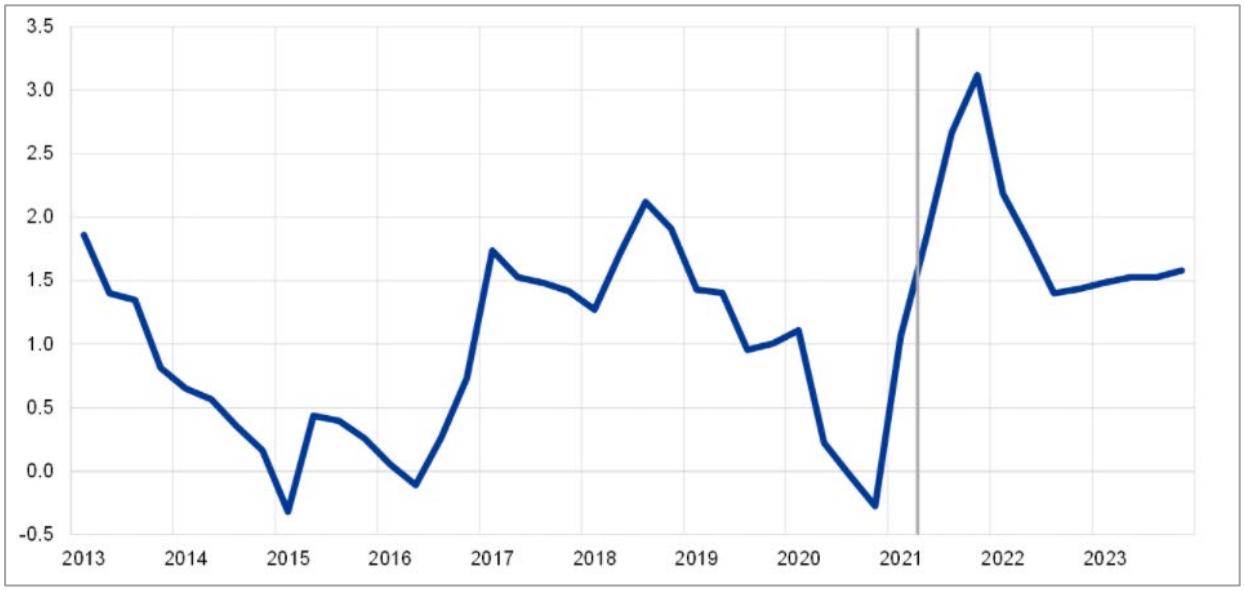
The ECB is in a more delicate position compared to the Fed, especially if the current trend of rising inflation were to continue in the euro area longer than predicted. To see why, consider that the ECB's strategy review was primarily meant to give credibility to its inflation target. Both the shift 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% aim [19].

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



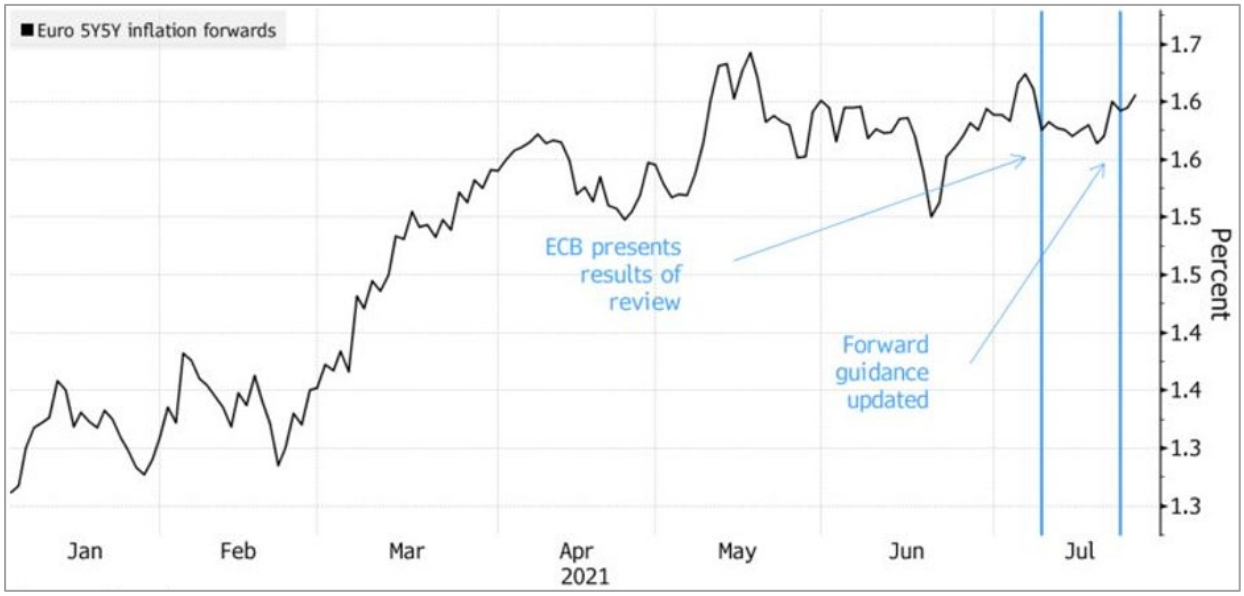
Note: The vertical line indicates the start of the projection horizon.

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 unrealistic[20].

[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 point 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.

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