

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



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Monetary Dialogue Papers
September 2021

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.

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

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Manuscript completed: September 2021
Date of publication: September 2021
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This document was prepared as part of a series on "Inflation on the upswing - Just a hiccup or the trend reversal after all?", available on the internet at:

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



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For citation purposes, the publication should be referenced as: Bernoth, K. and Ider, G., *Inflation on the Upswing – Just a Hiccup or a Trend Reversal After All?*, Publication for the committee on Economic and Monetary Affairs, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg, 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

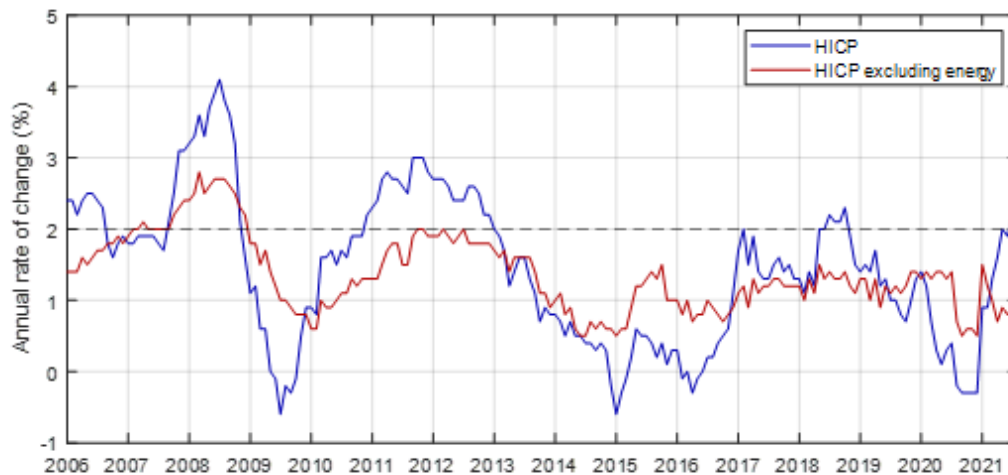
EXECUTIVE SUMMARY

- **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



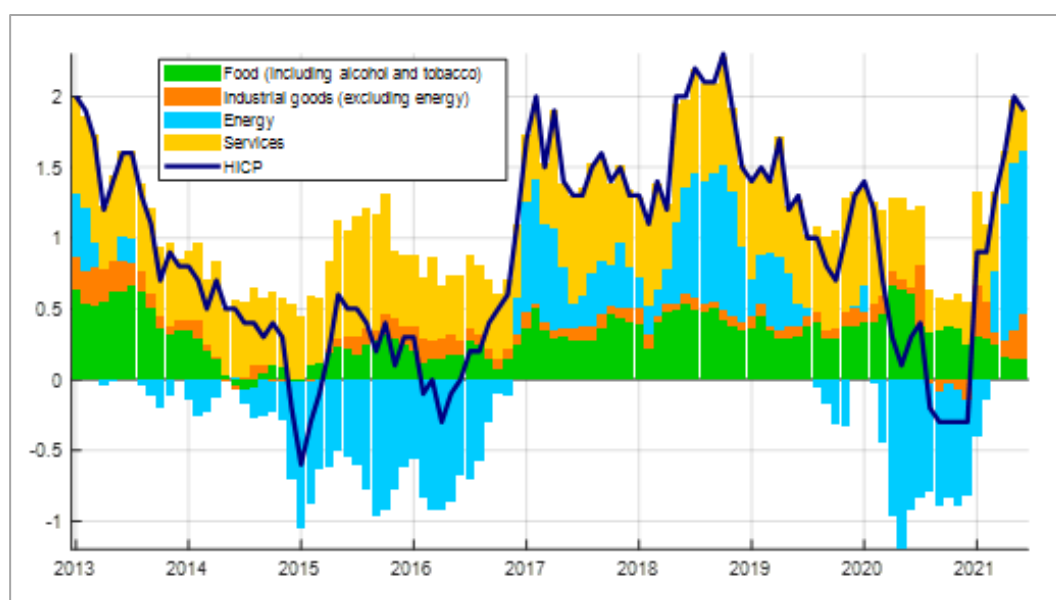
Source: ECB Statistical Data Warehouse.

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

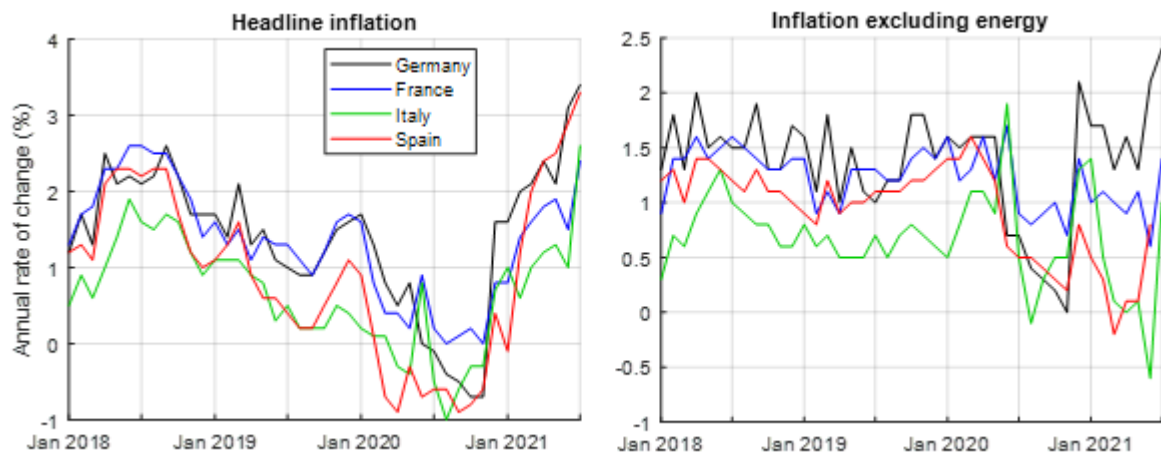


Source: Eurostat.

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 aggregate¹, 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.

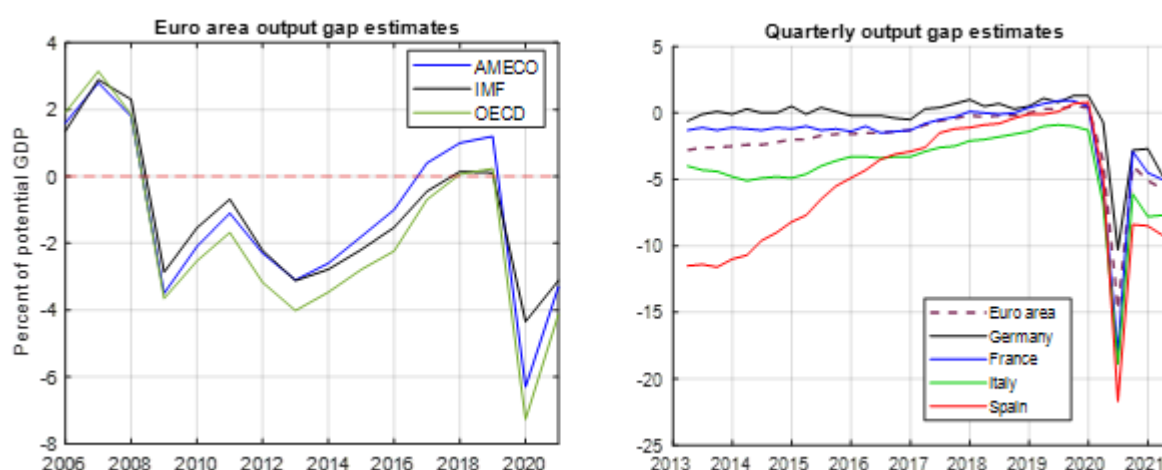
This paper takes a closer look at the above-mentioned factors affecting inflation over the short to medium term. First, we examine the degree of capacity utilisation in the euro area economies. We then analyse the extent to which inflationary pressures could arise from aggregate demand, which is likely 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.

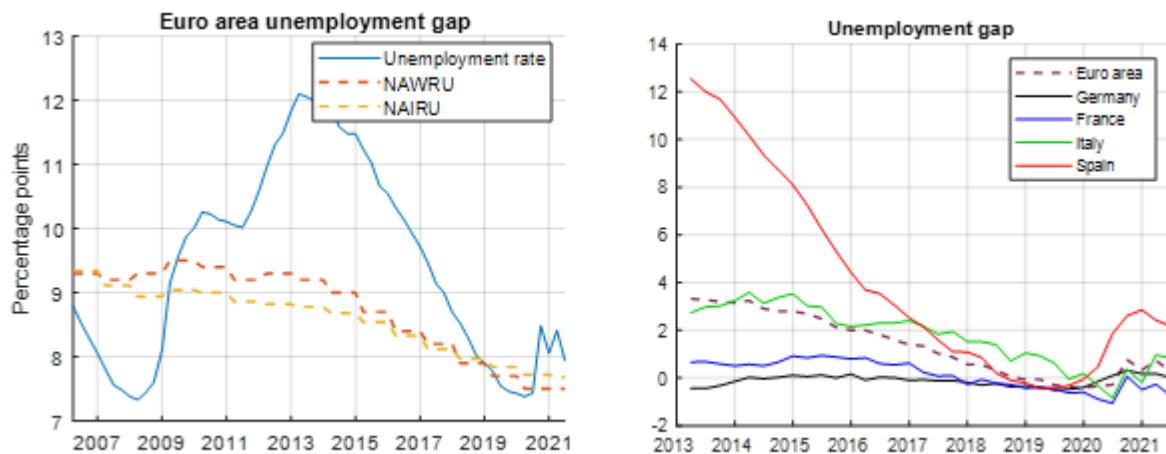
To combat the deflationary pressure generated from this unprecedented fall in economic activity, governments and the ECB reacted promptly with active and expansionary fiscal and monetary policy measures. Although the largest four economies in the euro area still have substantial margins of slack, the 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

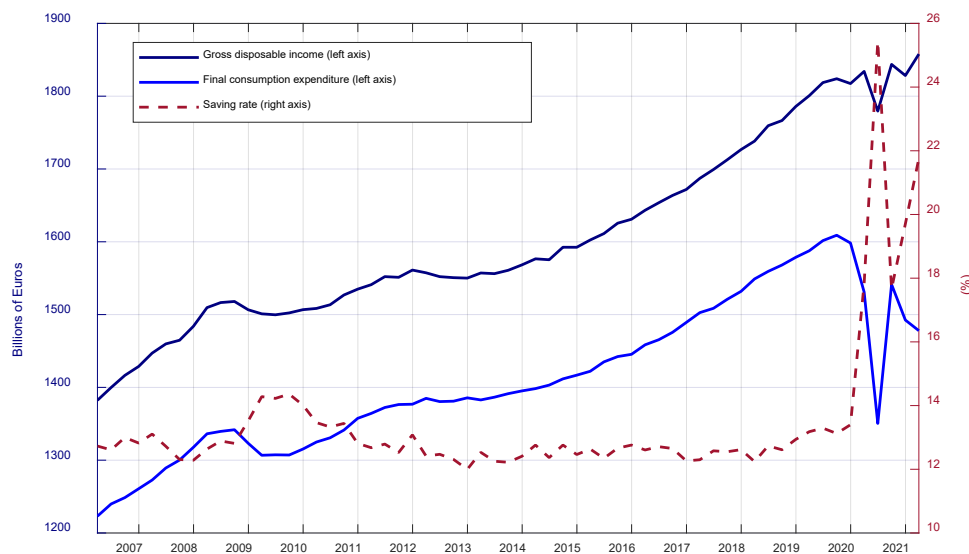
unemployment gap affects inflation is rather difficult, it could be argued that wages might rise in the second half of 2021 as labour demand increases and supply remains subdued. However, this effect is likely to be temporary as supply will catch up with demand when job retention schemes and pandemic-related 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



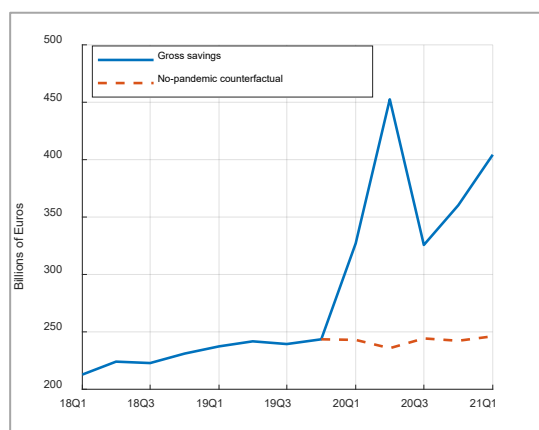
Sources: ECB Statistical Data Warehouse, authors' calculations.

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.

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.

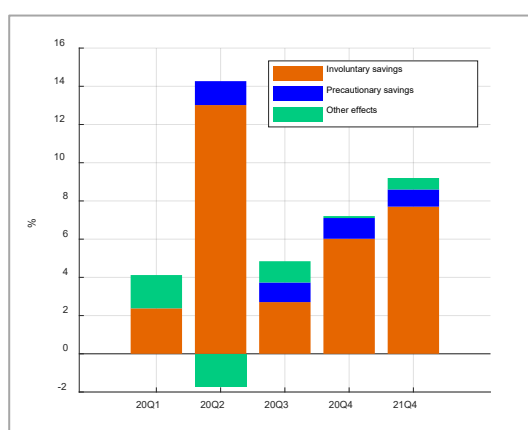
Figure 7: Saving dynamics of households during the COVID-19 crisis

(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

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 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 heterogeneous across euro area Member States.

of middle- and low-income households, we expect that only part of the pandemic-related excess 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				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 multipliers⁶. 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.

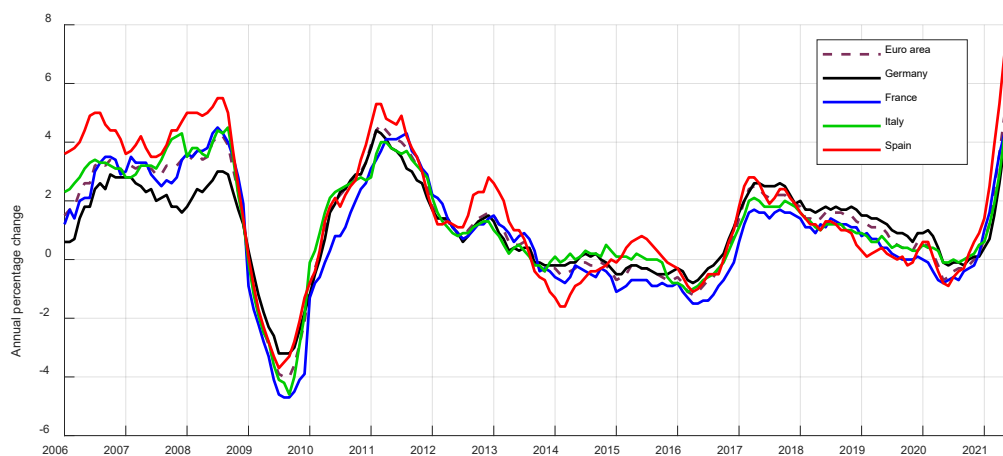
Thus, we conclude that the stimulus packages of the individual euro area countries help close the massive output gap that opened up during the COVID-19 pandemic. However, in the event that the fiscal measures push output far above potential output, the rise in inflation could be rather strong. But this 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)

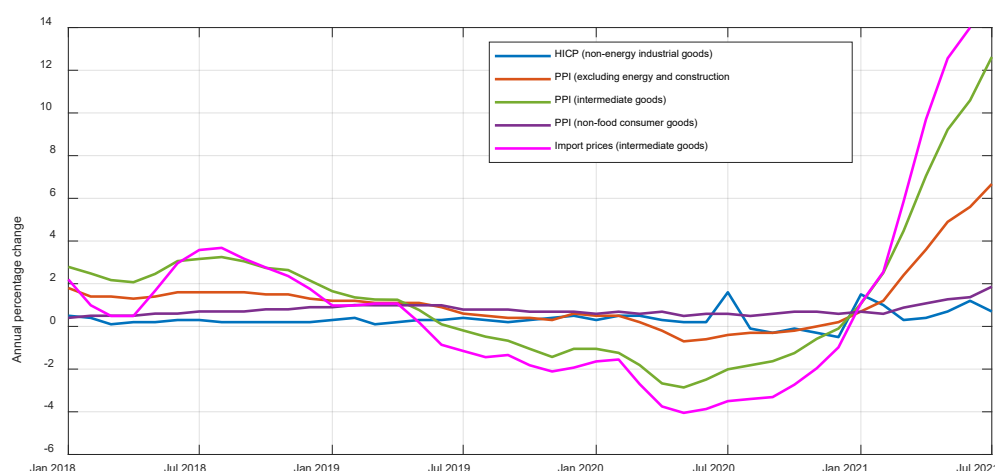


Sources: Eurostat, Bloomberg.

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.

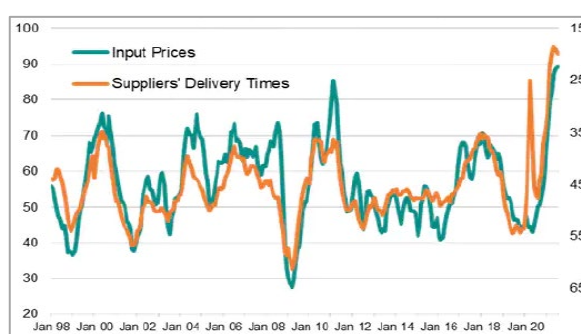
The speed and level of this pass-through to consumer prices depend on many factors, particularly on the duration of such pipeline pressures and firms' willingness to absorb the increase in input costs by suppressing profit margins⁸. Profit margins have shown a relatively high degree of resilience during 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 years¹⁰.

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} with 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:

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

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:

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

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:

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

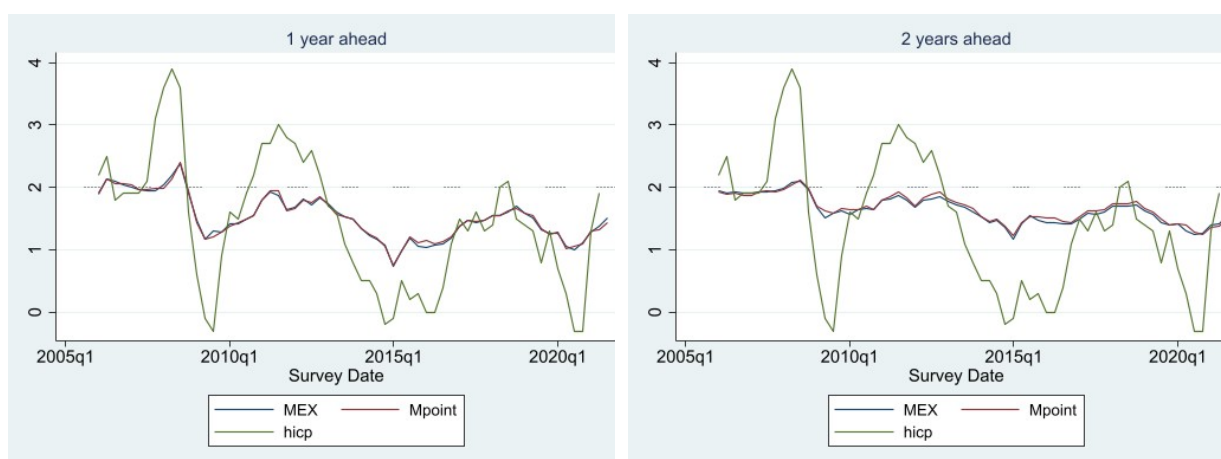
where $\hat{\pi}_A$ is the midpoint of the aggregate probability distribution and thus indicates the average inflation forecast of all experts. The further apart the experts' inflation forecasts, the higher the disagreement and the larger the indicator. The advantage of this measure over the ordinary 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 Forecasters (ECB); Calculations of DIW Berlin.

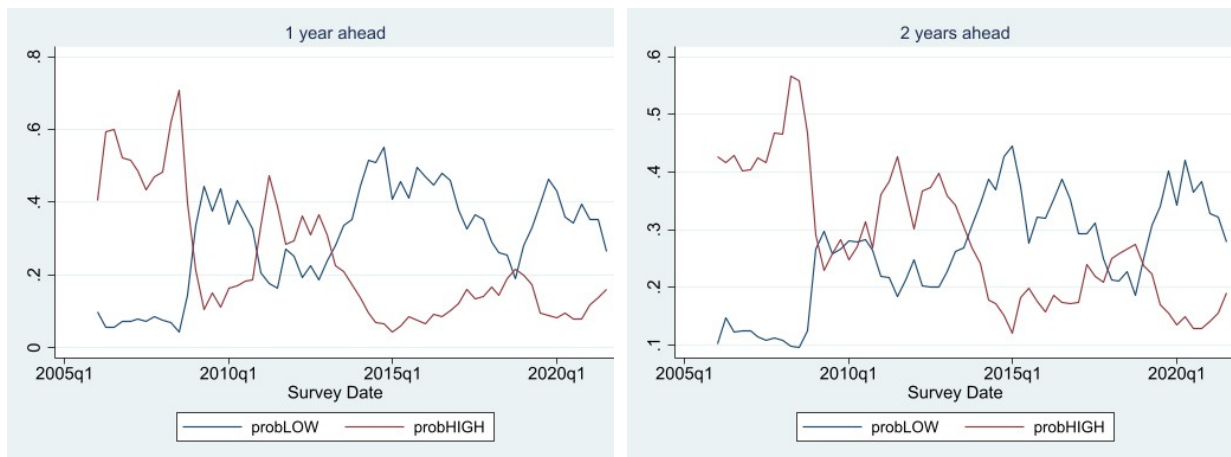
Notes: MEX denotes the average inflation forecast calculated from the individual experts' probability distributions, Mpoint the average point inflation estimate across all experts and hicp depicts the actual harmonized index of consumer prices at the survey date.

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 target¹². 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

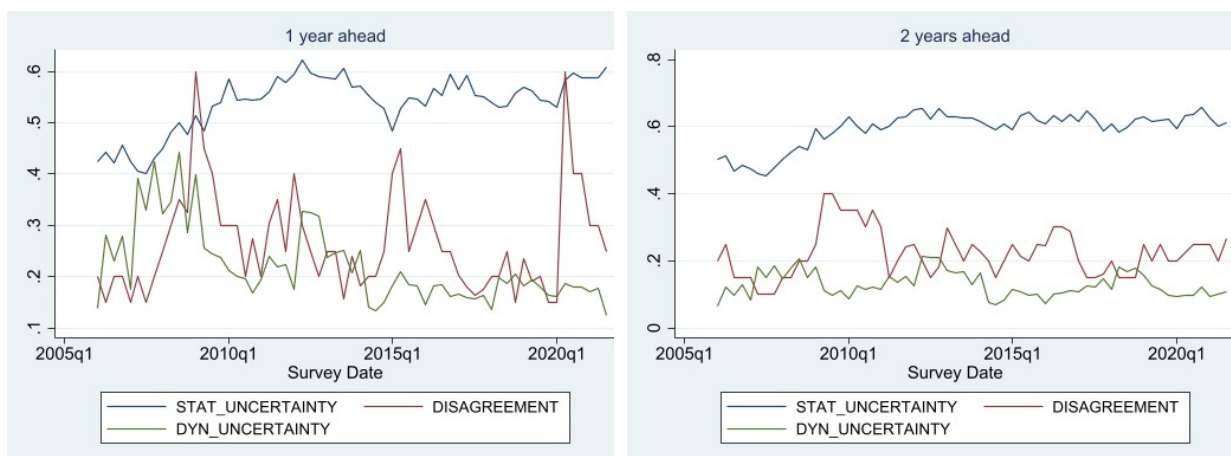


Source: Authors' elaboration.

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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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.
