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## Monetary policy and the return of inflation, questions and charts\*

Ignazio Visco  
Governor of the Bank of Italy

Frankfurt School of Finance & Management

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After at least three decades of moderate consumer price changes in advanced countries, inflation has returned to levels that are severely affecting the lives of all citizens (fig. 1). In this note, I will discuss five key issues that often take centre stage in the current macroeconomic debate. The first concerns the nature of the current inflation and its different sources in the two main advanced economies. The second is the claim that, in the euro area, monetary policy reacted too late to the acceleration in consumer prices. The third, closely related to this, focuses on whether or not the ECB made policy mistakes or forecasting errors and, if so, why these occurred. The fourth considers the supposed ineffectiveness of monetary policy and the channels through which it operates. The last issue tackles monetary policy prospects and asks whether, in the fight against inflation, the ECB should prefer to run the risk of doing too much rather than the risk of doing too little.

### 1. What is the nature of current inflation? What are the differences between the United States and the euro area?

Even though inflation is currently affecting many economies in an apparently similar manner, its underlying sources are different across countries, especially so if we compare the United States, where demand factors have been crucial in triggering the acceleration of prices, with the euro area, which has mostly been hit by a supply shock.

First, while fiscal policies were expansionary everywhere during the acute phase of the Covid-19 pandemic, in the United States they were especially bold: the public debt-to-GDP ratio rose by 25 percentage points in 2020-21, to over 130 per cent. In the euro area,

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\* This note mostly follows the Bishnodat Persaud Lecture that I gave on 11 February 2023 at the University of Warwick, during the Warwick Economics Summit. I wish to thank Jens Weidmann for the kind invitation to deliver this presentation at the Frankfurt School of Finance & Management and Rebecca Kelly, Pietro Rizza, Massimo Sbracia and Alessandro Secchi for their contributions and suggestions.

instead, the increase was limited to 15 percentage points, to slightly less than 100 per cent, despite a much deeper decline of nominal GDP in 2020 and a slower recovery in 2021. The exceptional support provided to US households is particularly evident when comparing the dynamics of GDP and disposable income (fig. 2): in 2020, just as the former recorded its sharpest collapse in real terms in the entire post-World War II period (-3.4 per cent), real disposable personal income grew by over 6 per cent, the largest rise since the mid-1980s. In the euro area, instead, household real disposable income declined, even though by a much smaller extent than GDP (-0.05 versus -6.3 per cent).

Second, the different dynamics of household disposable income across the two economies translated into different effects on demand. In the United States, GDP returned to its pre-crisis trend at the end of 2021, but aggregate data hid a large heterogeneity between sectors: while demand in the services sector was restrained by pandemic-related factors, the goods sector increasingly showed signs of overheating (fig. 3). In the spring of 2021, for example, personal consumption expenditure in the durable goods sector was already more than 30 per cent higher than its pre-crisis level. The fast recovery in US demand, in a phase in which global supply was still constrained due to the waves of the pandemic, caused bottlenecks in the international value chains, which drove up the prices of intermediate goods everywhere. In the euro area, instead, in the third quarter of last year (the latest for which we can estimate the decomposition of consumption) demand for both goods and services was still below the pre-pandemic trends.

Third, the labour market has been much tighter in the United States than in the euro area. The US unemployment rate still stands at just 3.4 per cent, a value last seen only in the late 1960s and about half the level of the euro area (6.6 per cent). The difference between the number of vacancies in the US non-farm sector and the number of people who are unemployed is, today, over 5 million, i.e. there are many more jobs available than there are people looking for them, while in the euro area the opposite is true, with the number of unemployed exceeding the number of job vacancies by about 6 million. Unsurprisingly, the annual change of US nominal wages (measured by the employment cost index) surpassed 4 per cent as early as in the third quarter of 2021, approached 6 per cent in 2022, and today still stands above 5 per cent, a level that is difficult to reconcile with an inflation target of 2 per cent (fig. 4). In the euro area, on the other hand, in spite of current requests for sizeable wage increases in some countries where labour markets are particularly tight, wage growth has so far remained, on average, moderate, at around 3 per cent, and there are no clear signs of a wage-price spiral as a whole.

Fourth, the energy shock had a very different role on the two sides of the Atlantic. Since the second half of 2020, oil prices rose gradually in both the United States and the euro area. The price of the natural gas delivered in the United States increased much more markedly, rising from around \$10 per megawatt hour before the pandemic to a peak of over \$30 last summer, before sliding back below \$10 (fig. 5). However, it was the price of the natural gas delivered in Europe that recorded the most extraordinary dynamics, dwarfing even the 1973 oil price increase (which itself had increased four-fold): from slightly above €10 per megawatt hour in early 2020, it rocketed to €180 before the war, soaring to a peak of €350 last summer and then falling sharply, hovering

around €50 in the last few days. This extreme volatility of gas prices was also the result of a “bullwhip effect”, which is the response of demand to uncertain supply, consisting of ordering more, ordering earlier and replenishing gas stocks.

As a consequence of these dynamics, US consumer price inflation increased from below 2 per cent in February 2021 to a peak of over 9 per cent last June (fig. 6), declining up to 6.4 per cent in January 2023. Core inflation (i.e. net of energy and food products) took the lion’s share of the rise, with a peak of 6.6 per cent last September and still in January at 5.6 per cent. In the euro area, on the other hand, headline inflation reached a record high of 10.6 per cent last October, from less than 1 per cent in February 2021, followed by a return to 8.6 per cent last January. Core inflation progressively rose, up to 5.3 per cent in January, reflecting the usual lags in the pass-through of energy prices. The upsurge in the latter was responsible for the largest share of the acceleration in consumer prices: considering the combination of both their direct and indirect effects, in 2022 about 60 per cent of headline inflation was attributable to higher energy prices. If we also add the effects of the rise in food prices, another consequence of the conflict in Ukraine, this share increases to 70 per cent.

## **2. Did the ECB respond too late to the acceleration in consumer prices? Is monetary policy “behind the curve” in the euro area?**

The Governing Council of the ECB began the process of monetary “normalisation” at the end of 2021, when it judged that the progress in economic recovery and towards the medium-term inflation target was sufficient to allow for the start of a step-by-step reduction in the pace of asset purchases. Why did we not start earlier? And why did we not begin to raise official rates before July 2022?

To answer these questions, it is useful to recall what the inflation situation was in June 2021, when we were about to conclude the ECB strategy review. While in the United States headline inflation was already above 5 per cent and core inflation was 4.5 per cent, pushed by the demand factors discussed above, in the euro area, despite already higher gas prices, headline inflation was still below 2 per cent and core inflation was less than 1 per cent. High inflation, therefore, seemed to be a phenomenon mostly concentrated in the United States. The main problem the Governing Council was tackling in that period was still how to increase the dynamics of consumer prices durably and sustain a rapid re-anchoring of inflation expectations from excessively low levels.

The situation began changing in September 2021, when gas prices went from the already high level of €50 per megawatt hour to about €100 (a “supply shock”). At that time, however, futures quotes predicted gas prices would remain at around that level during the winter season and then decline very sharply, to well below €50 by June 2022. The prediction of declining gas prices implicit in futures contracts remained more or less unchanged until late December 2021. With such a steep fall in gas prices in sight, inflation could not stay at high levels for long and, in fact, was projected to return swiftly to 2 per cent and below.

As it turned out, instead of declining by more than 50 per cent as expected at the end of September, gas prices increased by almost 100 per cent, averaging an unprecedented level of €200 during the summer of 2022. The Russian invasion of Ukraine had transformed a temporary shock into a persistent one, warranting an acceleration of the monetary normalisation.

In the early part of 2022, in fact, the process gained speed. However, we managed to avoid the potentially dangerous cliff-effects of too sharp a swing in our stance, not least in view of the major uncertainty caused by the conflict in Ukraine. The end of our purchases was anticipated to the 1st of July and, shortly after, we started raising our key official interest rates by a significant size, with the aim of frontloading the exit from their highly accommodative, indeed still negative, levels.

### **3. Did the ECB make policy mistakes or forecasting errors? And, if so, why?**

When discussing the high level of headline inflation reached in the euro area, some commentators have paid less attention to the sudden occurrence of the energy shock, its size and its persistence, pointing the finger instead at the delays of the central bank in initiating its monetary tightening. Critics citing this hypothetical mistake have also highlighted the large errors in the inflation projections made by the ECB/Eurosystem staff in 2022 (fig. 7).

The forecast errors in predicting consumer price changes over the last year were indeed sizeable and much larger than those observed in the past. Some have even argued that these large errors call into question the very credibility of the ECB, although other international institutions and private forecasters have made similarly large mistakes.

While the observed size of the errors may understandably cast doubt on the reliability of the models used for the projections, our analysis for Italy (with similar results for the analysis conducted by the ECB on the forecasts for the euro area as a whole) indicates that the effects of energy prices – the most important exogenous variables in the forecasting model, whose changes are usually inferred from the market price of futures contracts – explain, directly and indirectly (i.e. via their effects on production costs), 70 per cent of the overall error made in forecasting inflation in 2022. This share rises to 80 per cent when the effects of food prices, the other volatile component of the consumer price index, are also taken into account.

These results suggest that, although all models should be (and are) subject to continuous checks and improvements, the functioning of the economy has not changed dramatically over the last year. They do draw our attention, however, to the quality of the forecasts used as inputs.

Undoubtedly, the effects of global supply bottlenecks were underestimated, although demand in the euro area did not contribute greatly to them in any case. The key problem, however, was the generalised underestimation of the recent geopolitical tensions. The sharp drop in gas supplies from Russia observed since early 2021 was in fact

(probably mistakenly) attributed at first to the effects of a particularly cold winter in Russia and subsequently to the political pressure from the Russian government to accelerate the opening of the Nord Stream 2 gas pipeline. The new shock caused by the Russian invasion of Ukraine a year ago has, instead, dramatically changed this picture, triggering a sharp rise in volatility and pushing both current and expected gas prices to extremely high levels, fuelling inflation.

It may indeed be argued that an earlier rise in interest rates might have reduced the market uncertainty (and might have more effectively managed the initial rise in inflation expectations). On one hand, this claim is debatable, since it neglects to consider that the consequences of the uncertainty generated by the Russian invasion also needed to be properly evaluated and addressed. On the other, even if we suppose it to be true, I doubt that a few months' delay in the actual implementation of the decision to halt asset purchases and start raising official interest rates would have had substantial consequences on the evolution of consumer prices in the euro area, which, as I have mentioned, mostly reflect the costs of energy and food.

#### **4. Is the ECB's monetary policy ineffective?**

As is widely agreed, monetary policy affects the real economy, and inflation, with "long and variable" lags. While monetary actions and communications tend to affect financial markets' interest rates and asset prices almost immediately, their transmission to the financing conditions of households and businesses and, subsequently, to consumer prices, tends to be much more gradual as economic agents revise their decisions to consume and to invest slowly and, in some cases, infrequently. The initial conditions of the economy – including the level of debt, the degree of economic uncertainty, and many other domestic and global factors – also have important consequences on the distribution over time of the effects of a change in the monetary stance on inflation and growth.

Empirical evidence for the euro area shows that, on average, a change in key rates exerts its largest impact on GDP growth after about a year and a half and its maximum effect on inflation after one to two years. Therefore, most of the economic impact of the rate hikes that have been implemented so far is yet to be felt, suggesting that a degree of prudence is warranted, as their full results are about to be seen.

However, the initial effects of our policy measures are already discernible. Following our latest monetary policy decision, the overall increase of official rates since July has reached 300 basis points and has been fully and smoothly transmitted to market interest rates. Since the start of the reduction of monetary accommodation at the beginning of 2022, one-year risk-free rates (measured by overnight index swaps) have picked up from negative levels to 3.6 per cent, while ten-year rates have increased from barely positive values to 3.0 per cent. In real terms, using the inflation-linked swap (ILS) as a deflator, they currently stand at about 0.7 and 0.5 per cent respectively, from around -4 and -2 per cent at the end of 2021 (fig. 8). The fact that long-term interest rates started increasing well before our first key rate hike should not come as a surprise. It is indeed proof of

the credibility of our actions and our commitment to guaranteeing price stability, and it supports my claim as to the possibly limited effects of starting the rise in interest rates a few months earlier, notwithstanding the uncertainties linked to the war.

Further signs of the effectiveness of the Governing Council's actions are found in the dynamics of inflation expectations, whose levels are an important anchor for wage dynamics and actual inflation. In the euro area, short-term inflation expectations derived from financial market prices are falling sharply. ILS rates indicate that the expected inflation rate twelve months ahead now stands at 2.9 per cent, down from a peak of almost 9 per cent recorded in late August 2022 (fig. 9). The initial signs of a decline in inflation expectations are also broadly confirmed by surveys of firms and households.

At the same time, longer-term expectations, net of risk premia, remain at levels consistent with our 2 per cent price stability target, and tail-risks of excessive inflation are gradually dissipating (fig. 10). The anchoring of inflation expectations is also supported by the results of the January ECB surveys of analysts.

A quantification of the structural drivers of euro area and US inflation expectations, as measured by ILSs, obtained by breaking down their daily fluctuations into domestic and global shocks (fig. 11), confirms the different role of supply and demand factors on the two sides of the Atlantic and provides a measure of the effectiveness of the monetary tightening. The results of this analysis – which focuses on the effects of changes in policy, demand and supply with respect to historical regularities – show that, since the start of the war in Ukraine, the inflation rate predicted over a five-year horizon increased mostly in response to supply shocks in the euro area; the much smaller contribution of demand shocks rose progressively over the course of 2022, reflecting improved business cycle conditions. Results also document strong spillover effects of US monetary policy on euro area inflation expectations since the second half of 2022 and confirm the initial signs that the ECB's monetary policy tightening is having the desired soothing effects on the economy. In the United States, on the other hand, inflation expectations had been steadily sustained by domestic demand until the end of last October, and have since been reined in by contractionary monetary policy effects. The credibility that central banks have gained over time has not been lost and indeed is currently paying off.

## **5. Should the ECB prefer running the risk of doing too much compared to the risk of doing too little?**

There is no question that the tightening of the euro area monetary stance must continue to ensure that a temporary increase in inflation caused by a supply shock does not become a more persistent phenomenon sustained by demand factors. This said, in early February the Governing Council of the ECB assessed that the risks to the inflation outlook have become more balanced, while reiterating that uncertainty remains very high. In this context it has raised its key rates by 50 basis points and has announced the intention to raise them by a further 50 basis points in March. In any case, the pace of any further rate hike will continue to be decided on the basis of incoming data and their impact on the inflation outlook.

It will remain essential to continue balancing the risk of a too-gradual recalibration (*doing too little*), which could cause inflation to become entrenched in expectations and in wage-setting processes, with that of an excessive tightening (*doing too much*), which would result in significant repercussions for economic activity, financial stability and, ultimately, medium-term price developments. In line with our symmetrical price stability objective, I believe that equal weight should be given to both risks.

On the one hand, doing too little would come at a cost for the economy if this led to the need for a stronger and more prolonged restriction of monetary policy. On the other hand, however, the costs linked to the opposite risk may be relevant if “doing too much” were to determine an undershooting of the target and possibly even lead to serious debt-deflation phenomena, triggering nonlinear perilous amplifications. In the face of both of these risks, the central bank decisions should continue to be characterised by wisdom and balance and be guided by careful quantitative evaluations of incoming data.

When it comes to reducing inflation, a recession is not always inevitable. Communicating a strong commitment to bringing inflation down to target in a speedy manner is fundamental, but doing so by minimising the costs for the real economy is not any less important.

A cautious approach is also advisable due to a series of other considerations. The first is related to the high level of economic uncertainty and the Brainard principle, which states that when the central bank is uncertain about the effects of its actions, it should move conservatively. An exception to this principle is the case of uncertainty around the persistence of inflation: when persistence is high, in fact, a strong monetary reaction may be required to avoid high inflation becoming entrenched in agents’ mind-sets. While this possibility should be carefully monitored, data on market- and survey-based inflation expectations – including their recent decline at short horizons and their decreasing profile – and the marked deceleration of prices on a 3-month annualised basis (fig. 12), may call into question the persistence of inflation at high levels in the euro area, reinforcing the arguments in favour of gradual monetary normalisation.

The second concerns the “long and variable lags” of the monetary transmission process that I have already mentioned. Credit dynamics provide signals that are especially relevant in this respect. On a 3-month (annualised) basis, the growth of loans to firms in the euro area was negative in January (-1.3 per cent) from an almost double-digit expansion in October (9.8 per cent). Although this deceleration is the natural (and desired) consequence of monetary normalisation, both its size and speed require caution on the magnitude and time distribution of future interest rate hikes.

The potential risks to financial stability also require a good dose of caution. The unprecedented coordinated rises in official rates around the world may create spillover effects that are difficult to quantify but may not be negligible. Financial instability risks are particularly relevant in the Economic and Monetary Union, whose incomplete architecture – especially its decentralised fiscal policy and the delays in completing the banking and capital markets unions – exposes it to a possible fragmentation of financial markets.

Finally, in the current uncertain environment, models and forecasts should necessarily be taken *cum grano salis*, in particular when determining the “terminal” level of key interest rates. Quantitative assessments are still useful, but their insights have to be assessed together with the information that will gradually become available on inflation expectations and on the evolution of wages and profits.

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The monetary policy tightening started by the ECB in December 2021 has been crucial to respond to the risks stemming from high and rising inflation. Even before exerting its effects on aggregate demand, it has operated by contributing to containing inflation expectations, avoiding an increase to excessively high levels. This anchoring of expectations has therefore laid the foundations for preventing the occurrence of wage-price spirals.

Low and stable inflation expectations, however, do not completely eliminate the risk of “second-order effects”. To this end, labour and business in all euro-area countries must continue to behave responsibly. It has to be fully understood that the energy shock is like a tax on the euro area economy, which unfortunately cannot be returned to sender and cannot be circumvented through a fruitless race between wages and prices nor through an excessive and permanent increase in public debt. Wage negotiations, therefore, cannot go back in time to when they were purely backward-looking. Making up for the loss of purchasing power must, rather, rely on achieving sustained productivity growth, although targeted and temporary fiscal measures to alleviate the burden on more severely hit households and firms should obviously not be ruled out.

Today, gas prices in Europe are returning to more moderate levels and their volatility is declining, setting the stage for the convergence of inflation, over the medium term, to the ECB’s target of 2 per cent. In this context, the pricing strategies of businesses will play a central role. In particular, we will have to closely monitor whether, after the pass-through of the higher energy costs observed in 2022, firms will allow final prices to reflect the most recent declines, which would imply a less intense tightening of financial conditions. This will be a key step to achieve a durable reduction of underlying inflation.

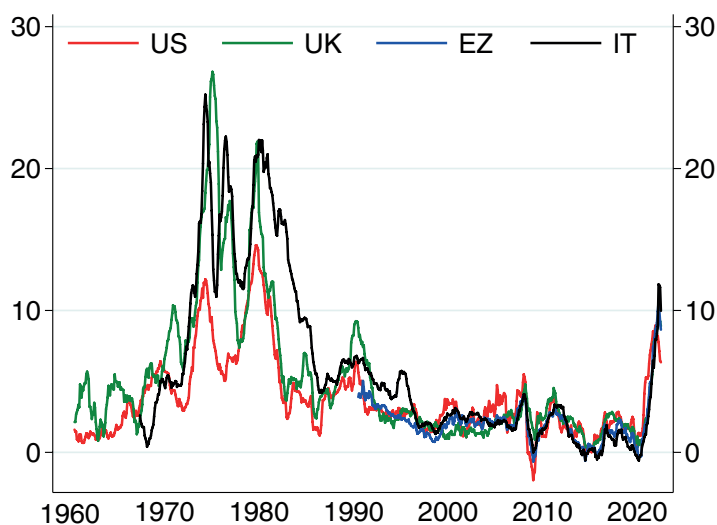
In this phase, monetary policy should not be left to work alone. The contribution of all policies, including perhaps some new versions of old-fashioned income policy recipes, could help to favour a more rapid convergence of inflation to the ECB target. The return to price stability will greatly benefit from fiscal policies and negotiations between workers and firms operating in the same direction as monetary policy.



## *FIGURES*

Figure 1

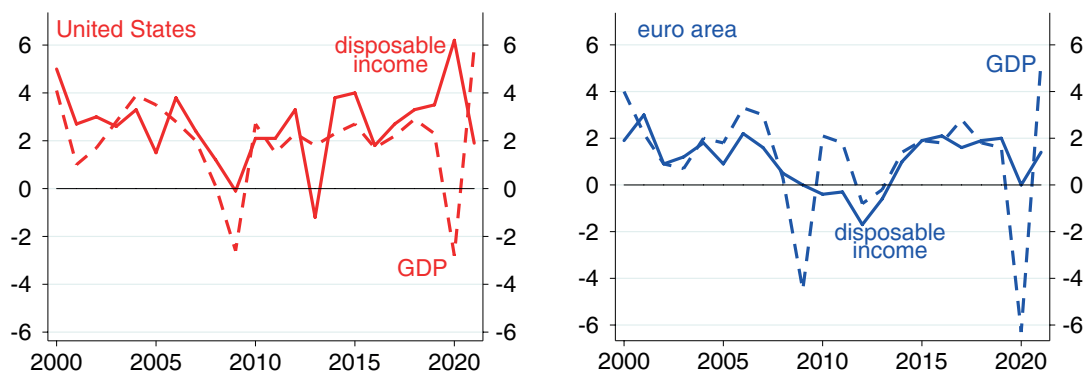
**The return of inflation**  
(monthly data; annual percentage changes)



Source: Eurostat, Istat, UK Office for National Statistics and US Bureau of Labor Statistics.  
Note: EZ denotes the euro area (changing composition after 1999 and weighted average of the 11 countries participating to the start of Third Stage of the Economic and Monetary Union prior to that date).

Figure 2

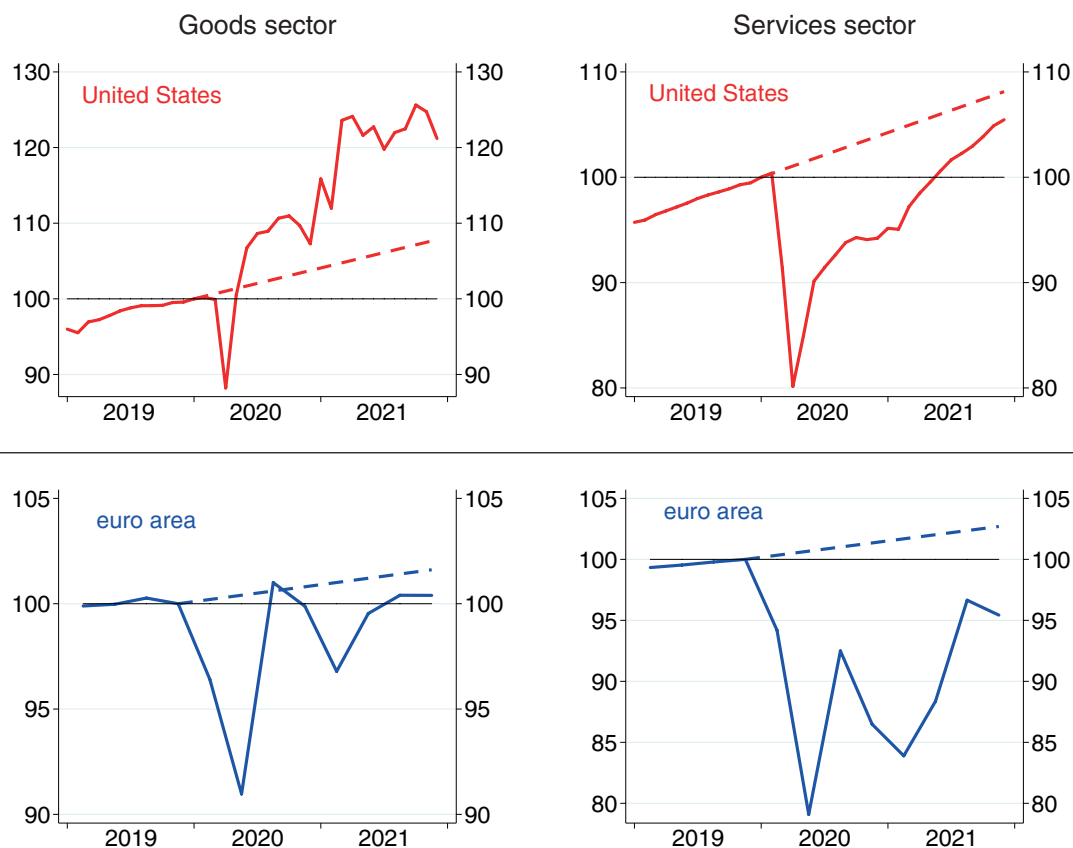
**Disposable income and GDP**  
(annual data; percentage changes)



Source: Eurostat and US Bureau of Economic Analysis.

Figure 3

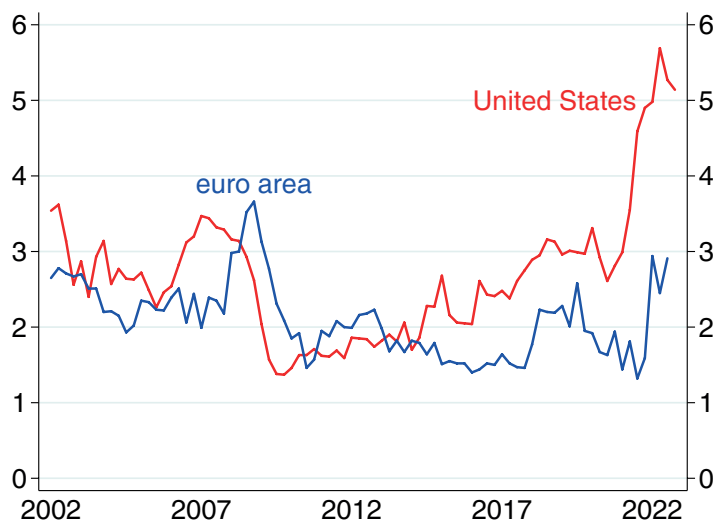
**Demand in the goods and services sectors**  
 (monthly and quarterly data; indices: Jan. 2020 / 2019 Q4 = 100)



Source: US Bureau of Economic Analysis and estimates based on Eurostat data.  
 Note: dashed lines show pre-pandemic trends.

Figure 4

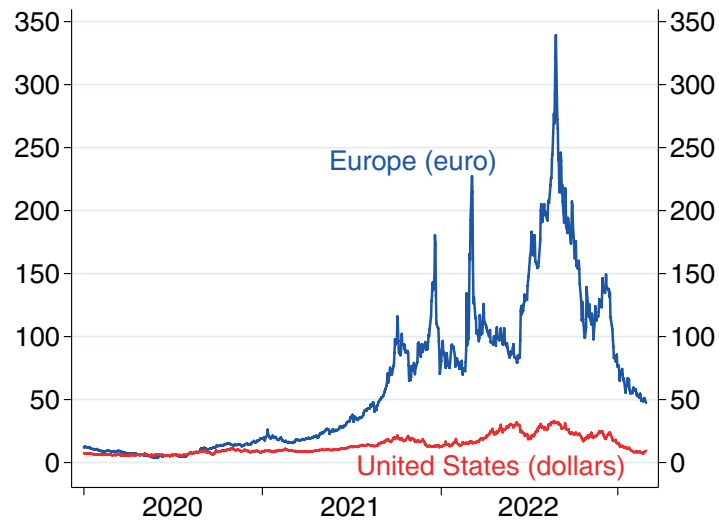
**Nominal wage growth**  
 (quarterly data; annual percentage changes)



Source: ECB and US Bureau of Labor Statistics.

Figure 5

### Natural gas prices (daily data)

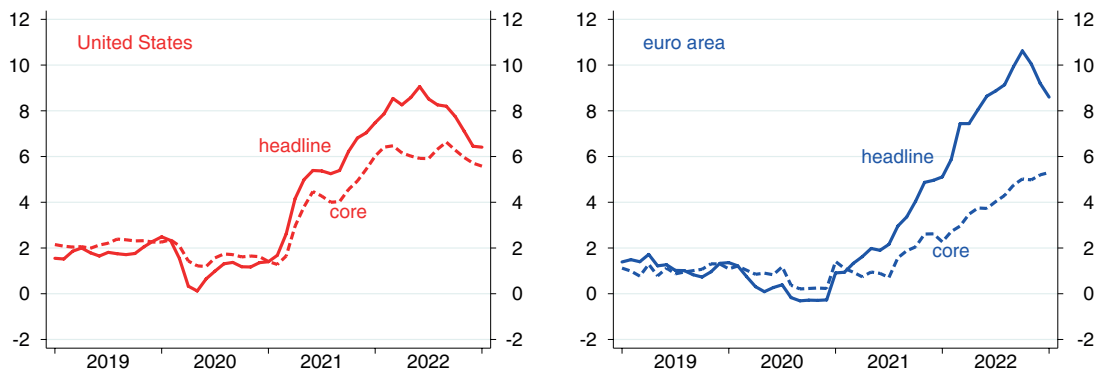


Source: Refinitiv.

Note: Title Transfer Facility (TTF) quotations for European gas and Henry Hub for US gas.

Figure 6

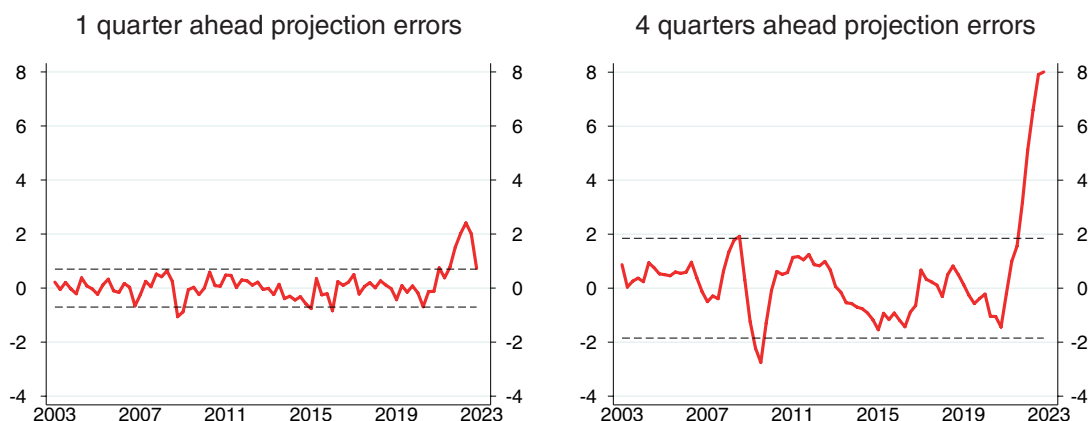
### Headline and core inflation (monthly data; annual percentage changes)



Source: Eurostat and US Bureau of Labor Statistics.

Figure 7

**ECB/Eurosystem projections errors for euro area headline inflation**  
(percentage points)

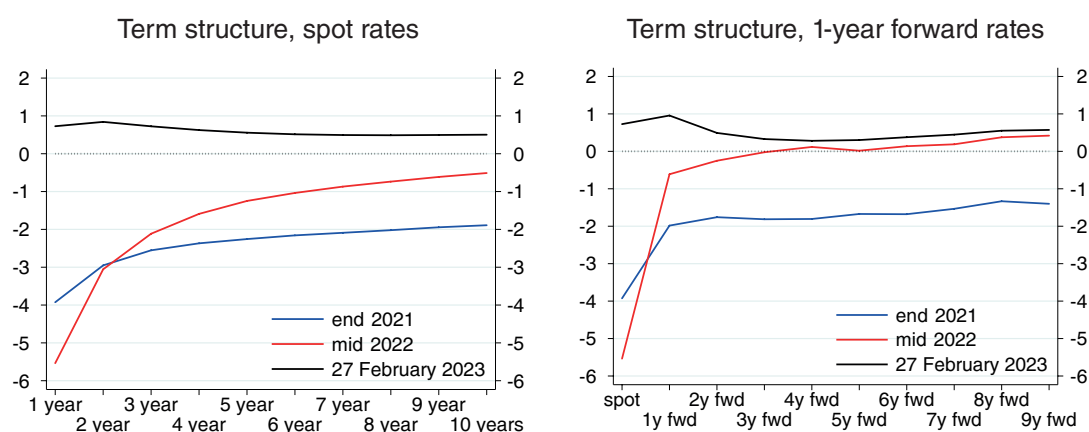


Source: Bank of Italy and ECB.

Note: dashed lines denote an interval around zero of plus/minus two standard deviations of projection errors realized in 2003-2020; latest observation: 2022 Q4.

Figure 8

**Real interest rates in the euro area**  
(per cent)

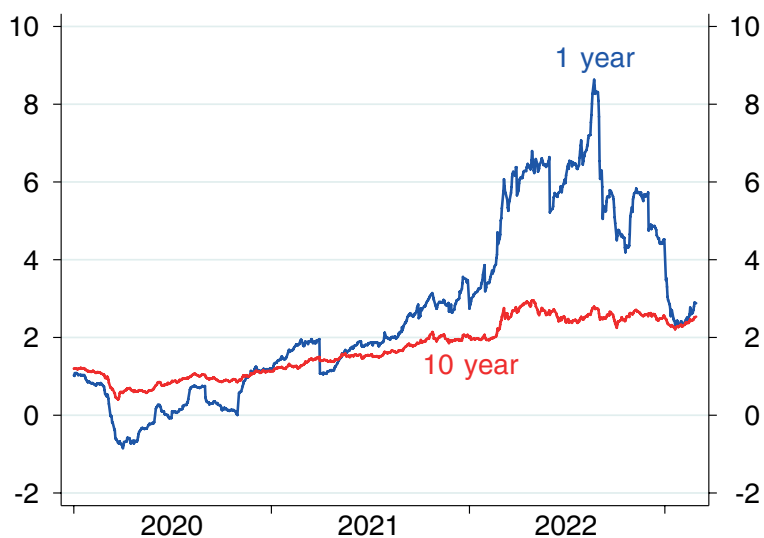


Source: based on Bloomberg and Refinitiv data.

Note: nominal OIS interest rates deflated by the corresponding inflation-linked swap rates.

Figure 9

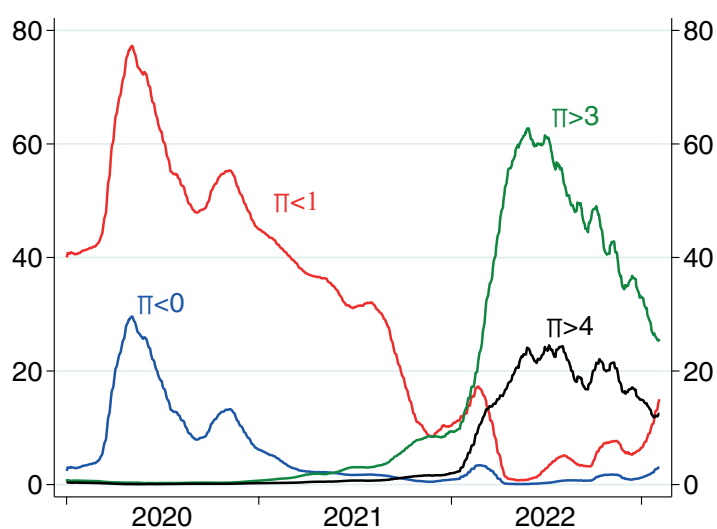
**Market-based inflation expectations in the euro area**  
(daily data; per cent)



Source: Bloomberg.  
Note: 1-year and 10-year inflation-linked swap rates.

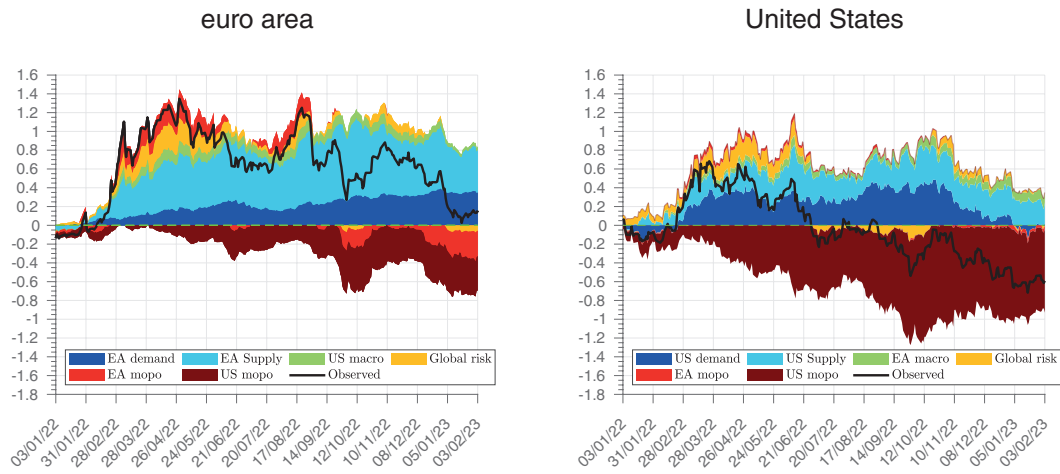
Figure 10

**Inflation tail risks in the euro area**  
(daily data; per cent)



Source: based on Bloomberg data.  
Note: probabilities inferred from inflation options;  $\pi < 0$  ( $\pi < 1$ ) is the probability of inflation being smaller than 0 (1) on average in the next 5 years;  $\pi > 3$  ( $\pi > 4$ ) is the probability of inflation being larger than 3 (4) on average in the next 5 years; 50-days moving averages.

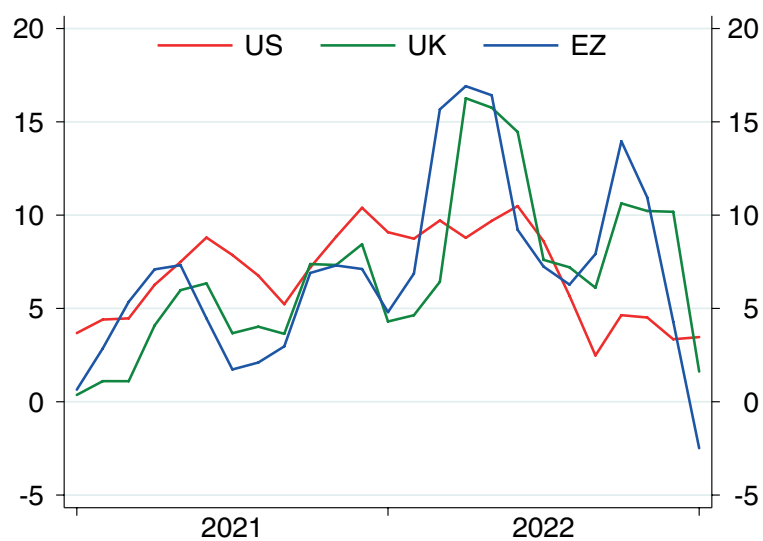
### Drivers of changes in inflation expectations (daily; percentage changes)



Source: C. Hoyneck and L. Rossi (2023), “The Drivers of Market-Based Inflation Expectations in the Euro Area and in the US”; mimeo, Bank of Italy, Rome.

Note: 5-year inflation swap rates; changes with respect to 3 January 2022.

### Inflation (monthly data; 3-month annualised percentage changes)



Source: Eurostat, UK Office for National Statistics and US Bureau of Labor Statistics.

Note: EZ denotes the euro area.