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## Bringing Inflation Back Under Control

In recent times, the euro area economy has been hit by a series of exceptional shocks that have pushed inflation far above the ECB's target of 2% over the medium term (for developments up to March 2022, see also Koester et al., 2022). While headline inflation has likely passed its peak and is expected to continue to decrease from high levels, it is still too high. Underlying inflation dynamics remain strong as the inflationary shocks continue to work their way through the economy. In addition to these extraordinary shocks, the euro area is also facing elevated uncertainty and therefore the central bank must pay particularly close attention to incoming data, to developments in underlying inflation, and to the strength of monetary policy transmission.

To bring inflation back under control in such an environment, it is essential to first assess and understand the causes of, and the outlook for, inflation. Secondly, and related to the outlook for inflation, it is crucial to evaluate underlying inflation dynamics to gauge medium-term inflationary pressures. And thirdly, monitoring how monetary policy is transmitted through to the economy is vital for central banks when calibrating their response to high inflation, particularly in view of the transmission lags from changes in monetary policy to inflation. This article elaborates on these three key aspects in the euro area.

### Inflation assessment in the current environment

The turnaround in inflation developments since the pandemic has been exceptional, with headline inflation moving from negative territory at the end of 2020 to double digits in less than two years (Figure 1). The surge in inflation was driven by a range of aggravating factors; the euro area economy was hit by a series of unprecedented shocks on both the sup-

ply and demand sides of the economy caused by external, but also domestic factors. In addition, the pass-through of these shocks into prices may have been faster and stronger than in the past and the shocks themselves more persistent (Rubene, 2023).

Adverse global supply shocks emanating from pandemic-induced lockdowns and Russia's invasion of Ukraine played a key role in driving prices higher, particularly for energy and food (Arce et al., 2023a). Given that energy constitutes a substantial share of euro area imports, the situation led to a significant deterioration in euro area terms of trade. These developments coincided with a hefty depreciation of the euro vis-à-vis the dollar, which exacerbated the terms of trade shock, as the vast majority of euro area oil imports are priced in dollars (Gunnella and Schuler, 2022; Lane, 2022a).

As can be seen in Figure 1, energy represented the bulk of the contribution to headline inflation when it peaked in October 2022, despite having a weight of only around 10% in the consumption basket underlying the harmonised index of consumer prices (HICP). Energy prices started increasing during 2021, and growth of HICP energy inflation peaked at over 40% in year-on-year terms in March 2022, following the Russian invasion of Ukraine (Kuik et al., 2022). The decrease in headline inflation since October 2022 has been driven by falling contributions from the energy component. Food inflation has also been particularly impacted by the conflict in Ukraine, with growing prices reflecting the past accumulation of cost pressures, especially from energy, and some weather-related effects, while food commodity prices and euro area farm gate prices have started to ease (Bodnár and Schuler, 2022).

Other goods and services may be less directly exposed to energy or global shocks; however, these factors indirectly feed into their prices through production costs, intermediate inputs and the tradability of goods. Goods and services can be categorised according to the share of energy in their total costs. As shown in Figure 2, energy-sensitive items have accounted for an increasing share of the overall inflation in non-energy industrial goods (NEIG) and services.

As the economy reopened following the pandemic, pent-up demand supported by an accumulation of savings exacerbated price pressures. The major dislocations of recent years resulted in supply-demand imbalances, creating an environment that enabled firms in some sectors to increase profit margins and workers to demand more income. Price pressures stemming from domestic sources can be assessed

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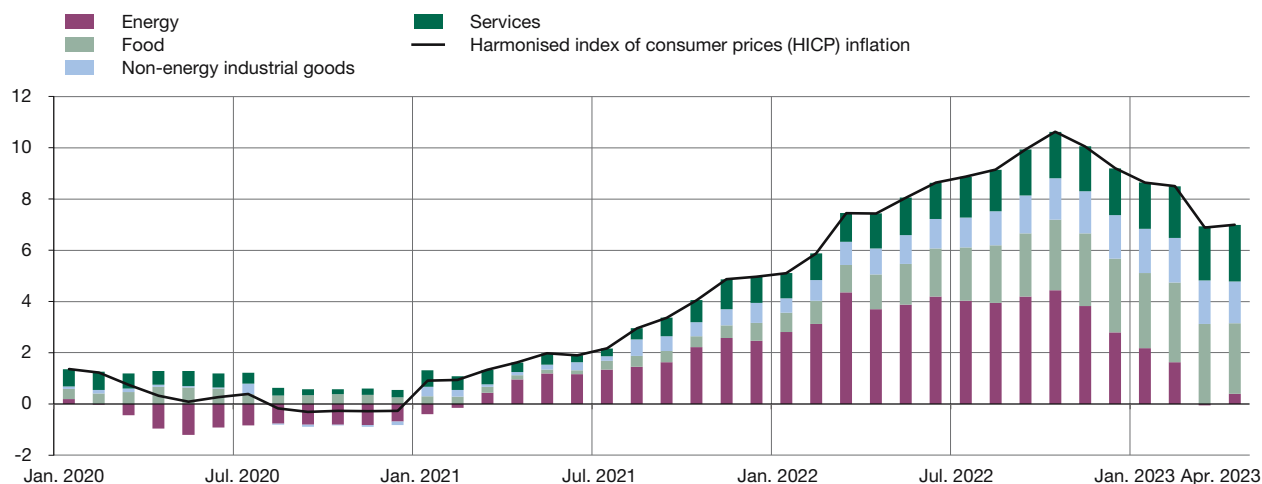
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Figure 1

**Headline inflation and main components**

annual percentage change and percentage point contributions



Note: The latest observations are for April 2023.

Sources: Eurostat and ECB calculations.

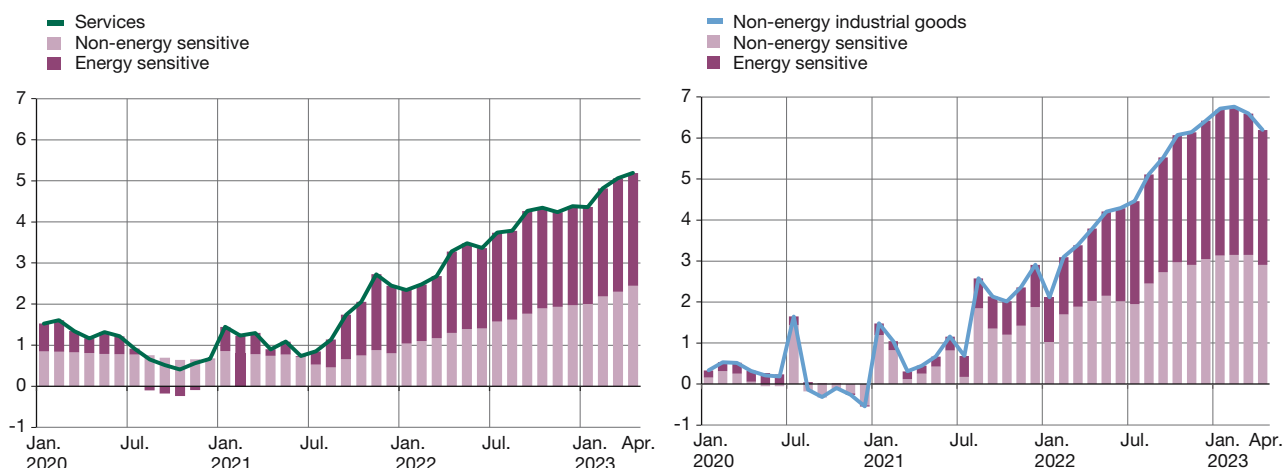
based on the GDP deflator, which is a measure of inflation for goods and services produced in the euro area. The GDP deflator essentially measures the “price” of the total value added per unit of real GDP, and it can therefore be decomposed into contributions from unit labour costs, unit profits and unit taxes, as shown in Figure 3. The chart illustrates that the strong increase in domestic price

pressures since 2021 has been driven by both wages and profits. Comparing the relative contribution of wages and profits from a historical perspective, recent developments in profits are most noteworthy, as the contribution of this component to the increase in domestic price pressures in 2022 was double what it was on average in the preceding two decades (Arce et al., 2023b).

Figure 2

**Goods and services inflation – decomposition into energy-sensitive items**

annual percentage change and percentage point contributions



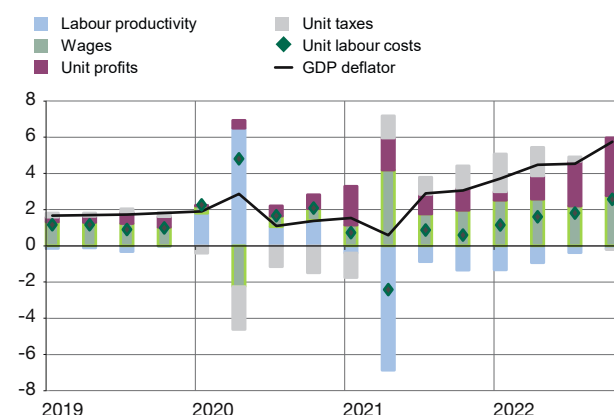
Notes: Energy-sensitive component based on items with a share of energy in total (direct and indirect) costs above the average energy share across all NEIG/services items. Shares of energy in total costs derived based on input-output tables. The latest observations are for April 2023.

Sources: Eurostat and ECB calculations.

Figure 3

**GDP deflator income side**

annual percentage changes and percentage point contributions



Note: The latest observations are for 2022 Q4.

Sources: Eurostat and ECB calculations.

To summarise, while much of the initial shock to inflation came from global supply shocks and supply-demand mismatches resulting from the massive economic dislocations, conditions are such that domestic factors are becoming again more prominent. In such an environment, monitoring underlying inflation and the outlook for inflation is essential.

**Underlying inflation and outlook**

Headline inflation (measured in the euro area by the HICP) tends to be most representative of the developments in the prices of goods and services faced by consumers in the euro area, making it a key input used by central banks in their assessment of price stability (European Central Bank, 2021). However, headline inflation can contain a lot of “noise” emanating from idiosyncratic shocks, relative price changes and other disturbances that can make the “signal” on medium-term inflation pressures difficult to measure (Ehrmann et al., 2018). Therefore, one of the main motivations for analysing underlying inflation is to distinguish volatile, transitory movements in the price level from more persistent ones. As Blinder (1997) put it: “What part of each monthly observation on inflation is durable and what part is fleeting?”. Major economic dislocations experienced in recent times not only increase the pure noise-to-signal ratio but can also introduce a “reverting” component to inflation, which is constituted of factors that are expected to fade, but can take longer to revert. Examples of such factors would be economic reopening effects following the pandemic or disruptions to supply chains caused by the war (Lane, 2023b).

Distinguishing medium-term underlying inflation can be challenging, but is a crucial task for policymakers, especially given the medium-term orientation of monetary policy and its

transmission lags. Ideally, monetary policy should respond only to generalised inflation, not to relative price movements. Responding to temporary price shocks may lead to greater output variation. By eliminating volatile components from the overall inflation measure used in policy formation, central banks should be able to focus on more persistent price developments that are shaped by changes in aggregate demand and economic capacity; these are developments which can be most effectively influenced by monetary policy over the medium term.

Because underlying inflation aims to provide a signal about medium-term inflationary pressures, it cannot be directly observed but must rather be estimated (see e.g. Rudd, 2020). With respect to measurement, there are three main methods. One is to exclude certain components, like food and energy, from the price index. These exclusion measures are widely used and are commonly understood as core inflation indicators. For instance, in the euro area HICP excluding energy and food (HICPX) is a frequently used measure of core inflation and is also forecast and published as part of the ECB’s staff projections.<sup>1</sup> A second approach to measuring core inflation uses statistical methods; these include, for example, averaging, trimmed mean, persistence-weighted and volatility-weighted measures (Bilke and Stracca, 2008). Finally, indices can be constructed using model-based approaches such as vector autoregressions (Quah and Vahey, 1995) or multivariate factor models using rich datasets (Banbura and Bobeica, 2020; Cristadoro et al., 2005). Desirable properties of underlying inflation measures are timeliness, transparency and simplicity (for communication) and they should be unbiased indicators of (and ideally lead) overall inflation. In this respect, different measures have advantages and disadvantages, and their performance can even change over time.<sup>2</sup> Therefore, monitoring a range of measures is beneficial.

Figure 4 shows a range of measures used at the ECB to monitor underlying inflation pressures alongside the outlook for inflation from the ECB staff projections and highlights a few salient points. First, underlying inflation has clearly increased since the middle of 2021. The range crossed the medium-term 2% inflation target threshold towards the end of 2021 – around when the ECB announced a normalisation of its policy stance by slowing and ultimately ending net purchases in its asset purchase programmes – and has stabilised somewhat since the middle of 2022 at between 4% to around 8%. Second, the width of the range has clearly broadened, underscoring the uncertainty prevailing and the large size of the shocks hitting the economy. Finally, ECB staff projections foresee a fall in inflation back towards the 2% medium-term target by the end of

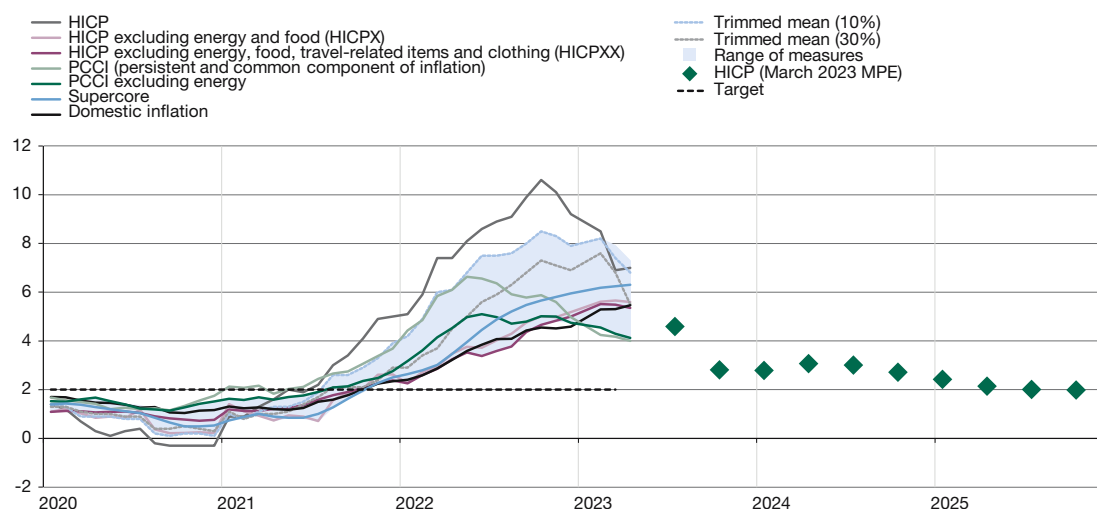
1 See for instance, ECB staff macroeconomic projections for the euro area, March 2023.

2 For more information, see European Central Bank (2021).

Figure 4

**Indicators of underlying inflation and inflation projections and expectations**

annual percentage changes



Note: The latest observations are for April 2023. MPE refers to ECB staff macroeconomics projections.

Sources: Eurostat and ECB calculations.

the projection horizon, which is significantly below the range of estimates for underlying inflation. This discrepancy between inflation projections and the range of underlying inflation measures highlights that in a time of large economic dislocations, when the reverting component becomes prominent, there is a need to consider broader determinants of underlying inflation dynamics, like wages and inflation expectations.

Wage growth and price inflation are intrinsically linked. When labour costs increase, firms can either absorb the cost by accepting lower profits or they can try to maintain profits by pushing the increased cost on to their prices. Figure 3 shows that based on the GDP deflator, both unit profits and unit labour costs contributed strongly to the increase in domestic price pressures. Moreover, unemployment remains at record low levels, and indicators of wage growth continue to suggest strong dynamics as workers bargain for higher pay in response to inflation. Figure 5 shows an experimental wage tracker developed by the ECB and national central banks using the latest information from collective bargaining agreements. It indicates that wage growth is now substantially higher than observed before the pandemic (around 3.5% as compared to around 2% at the beginning of 2020). Wage growth as reflected in latest agreements has shown a strong upward trend since the beginning of 2021 and latest agreements foresee negotiated wage growth of around 5% for a rolling window of the next 12 months. An increase in wage pressures is also reflected in the ECB staff projections, which assume that wages in terms of compensation

per employee (including negotiated wage growth as well as the wage drift, which is affected, for example, by changes in hours worked, special payments and effects of changes in minimum wages) will grow at an elevated rate of 5.3% on average in 2023 (before declining to averages of 4.4% in 2024 and 3.6% in 2025).<sup>3</sup>

Overall, ECB staff projections that forecast inflation returning towards target over the medium term are predicated on wage assumptions that are in line with the strong dynamics currently being observed and do not point to strong risks of a wage-price spiral. However, stronger than expected increases in wages or profits could drive up inflation, and in this context, tracking inflation expectations is crucial.

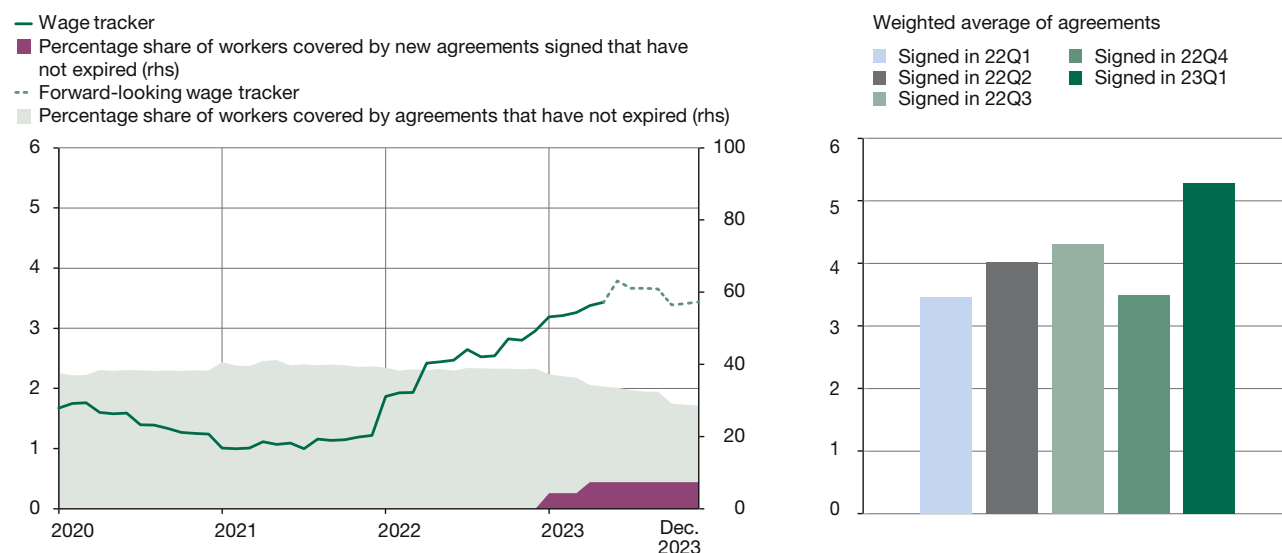
Inflation expectations matter a great deal for wage and price dynamics, and therefore policymakers monitor them closely to ensure that higher price expectations do not become embedded in wage agreements and price setting. There is a risk that wage and price-setting dynamics could lead to stronger second-round effects as higher profit margins, higher nominal wages and higher prices mutually reinforce each other, causing an upward price spiral. So far, medium-term inflation expectations remain anchored in the euro area. While consumer expectations of inflation three years ahead increased in March 2022 at the outbreak of the war, the changes have

<sup>3</sup> See ECB staff macroeconomic projections for the euro area, March 2023.

Figure 5

**Experimental forward-looking tracker of negotiated wage growth in the euro area**

annual percentage changes



Note: The euro area aggregate is based on data from Germany, France, Italy, Spain, the Netherlands, Austria and Greece.

Sources: ECB calculations based on micro-data on wage agreements provided by Bundesbank, Banco de España, the Dutch employer association AWWN, Banca d'Italia, Banque de France, Bank of Greece and Oesterreichische Nationalbank.

not been excessive (Figure 6, left-hand panel) and professional forecasters expect inflation to return close to target over the medium term (Figure 6, right-hand panel) (Gornicka et al., 2022). One of the reasons behind this stability is the ECB's firm commitment to price stability and the decisive monetary policy action taken to address high inflation.

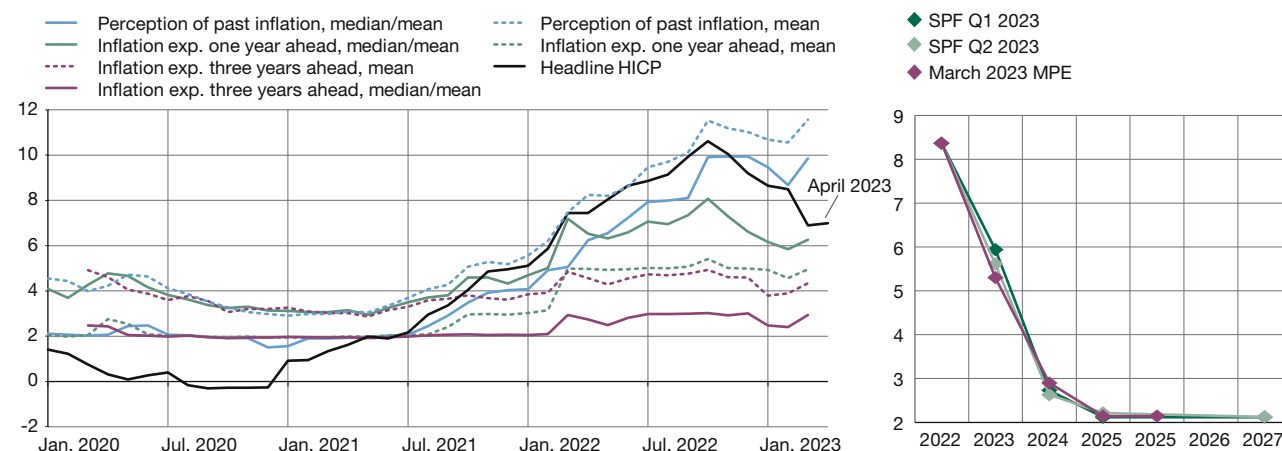
**Monetary policy response**

One way to interpret monetary policy by central banks is that they steer demand by adjusting policy rates around a natural rate of interest, which corresponds to the rate that defines a neutral policy stance when the economy is oper-

Figure 6

**Inflation projections and expectations**

annual percentage changes



Notes: Latest observation: March 2023 for Consumer Expectations Survey data (left-hand panel) and Q2 2023 for the Survey of Professional Forecasters (SPF, right-hand panel). Actual inflation for 2022 is shown on the right-hand panel, and projections follow for 2023-2027. MPE refers to ECB staff macroeconomics projections.

Sources: ECB Consumer Expectations Survey, Survey of Professional Forecasters and ECB staff calculations.

ating at potential and inflation is at its target value. If inflation moves above target, central banks should move interest rates higher into “restrictive territory” with respect to the neutral rate, which increases the cost of borrowing, reduces consumption and investment and ultimately dampens inflation. Monetary policy can do little to influence supply side constraints that diminish economic growth and at the same time push prices higher. These must be addressed by other policy areas.

In response to the high inflation environment, the ECB started to adjust its monetary policy stance at the end of 2021, bringing it initially from highly accommodative conditions into restrictive territory more recently. In December 2021, the ECB announced a slowdown in the pace and an eventual end to net purchases under their asset purchase programmes. The key ECB policy rates have been increased sequentially since between July 2022 and May 2023 by a total of 375 basis points. This tightening is the fastest and strongest increase in policy rates ever observed in the euro area and changes in monetary policy are being transmitted through to financial markets and bank lending conditions (European Central Bank, 2023).

While the changes in monetary policy have been unprecedented and the effects are starting to appear in financial conditions, the full impact of the change takes time to transmit. For instance, fixed rate loans insulate borrowers from the effects of rate hikes and the impact will only be felt when financial contracts expire. In addition, investment and consumption adjust only in a slow and staggered manner to changes in financial conditions and so the ultimate impact on GDP and inflation comes with a lag. Therefore, one of the key challenges when calibrating monetary policy is understanding how monetary policy transmits to the economy, taking into account that the transmission lags can be heterogeneous across sectors, can vary over time and can be state-dependent.<sup>4</sup> For this reason, the ECB uses a large range of models, monitors an array of indicators and meets on a regular basis to assess and, if necessary, adjust its monetary policy stance.

## Conclusion

The inflation landscape in the euro has changed dramatically in recent times. There has been a wide range of exceptional internal and external shocks to both supply and demand. To bring inflation under control, policymakers have substantially tightened monetary policy and stand ready to respond as necessary. In this challenging environment, it is especially important to remain vigilant to in-

coming data and information on underlying inflation and on how monetary policy is transmitting to inflation. So far, the evidence is that monetary policy is tightening financial conditions, reducing lending volumes and altering the behaviour of households and firms. While the total impact of monetary policy on inflation is yet to be fully realised, policymakers will ensure that inflation returns to the inflation target in a timely manner.

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4 For more details, see Lane (2022b) and Lane (2023a).