

Oscar Arce*
Gerrit Koester**
Beatrice Pierluigi***

CHALLENGES FOR GLOBAL MONETARY POLICY IN AN ENVIRONMENT OF HIGH INFLATION: THE CASE OF THE EURO AREA

The euro area has been particularly vulnerable to the shocks resulting from the pandemic and the war — contributing strongly to record-high inflation. This required a fast and decisive monetary policy reaction. The future monetary policy course will depend also on how these shocks, along with the fiscal and structural policies response, will affect the economic and inflation outlook.

Retos de la política monetaria global en un entorno de alta inflación: el caso de la zona euro

La zona euro ha sido especialmente vulnerable a los choques derivados de la pandemia y la guerra, lo que ha contribuido en gran medida a una inflación récord. Esto requirió una reacción rápida y decisiva de la política monetaria. El curso futuro de la política monetaria dependerá también de cómo estos choques, junto con la respuesta de las políticas fiscal y estructural, afectarán a las perspectivas económicas y de inflación.

Keywords: *pandemic, energy crisis, inflation, monetary policy, euro area.*

Palabras clave: *pandemia, crisis energética, inflación, política monetaria, zona euro.*

JEL: *E31, E52, E58, J30, P44.*

* Director General in the Directorate General Economics, European Central Bank.

** Senior Team Lead in the Prices and Costs Division, Directorate General Economics, European Central Bank.

*** Head of the Business Cycle Analysis Division, Directorate General Economics, European Central Bank.

The authors wish to thank Eduardo Gonçalves for excellent research assistance.

Final version December 2022.

<https://doi.org/10.32796/ice.2022.929.7531>

1. Introduction

Since 2020, the global and the euro area economy have been affected by an unprecedented succession of adverse shocks that have lifted inflation worldwide to historical highs. Some global economic developments linked to the pandemic and Russia's invasion of Ukraine have played a decisive role for pushing inflation up globally — but their effects across countries depended crucially on their economic structures.

This article discusses the determinants of the sharp increase in inflation in the euro area, observed between the second half of 2021 and the end of 2022, and the related challenges for monetary policy. This period was preceded by a long period of low inflation rates which started in 2012 (see Koester *et al.*, 2021) and by a sharp disinflation in 2020, during the first pandemic wave. This disinflationary episode motivated a strongly expansionary monetary policy to counter deflationary risks. Thus, when prices started to rise dynamically in the second half of 2021, linked to supply bottlenecks and reopening effects following the lifting of pandemic restrictions, euro area monetary policy was still highly accommodative. Monetary policy responded then fast and decisively to the surge in inflation. At the time of writing this article, monetary policy still aimed at reducing support for demand and at ensuring that inflation expectations remained anchored at their 2 % medium-term target. Looking forward, the future monetary policy course will in part depend on how the current shocks will interact with longer-term challenges, such as (de)-globalisation, digitalisation, climate change, energy transition, and ageing. *A priori*, the impact of these long-term trend developments on potential growth and inflation is not clear cut and it will also depend on the fiscal and structural policy responses.

This article discusses the challenges for monetary policy in the euro area in the current high inflation environment based on the following structure: Section 2 reviews the global economic shocks over the last years and discusses the vulnerabilities of the euro area with respect to these

shocks. Section 3 analyses the drivers of high inflation in the euro area, compares them with the United States and reviews to what extent high inflation has already affected inflation expectations. Section 4 discusses the challenges resulting from high inflation but also from structural changes in the economy for monetary policy in the short- and longer-term. Section 5 concludes.

2. An unprecedented succession of global shocks and the exposure of the euro area

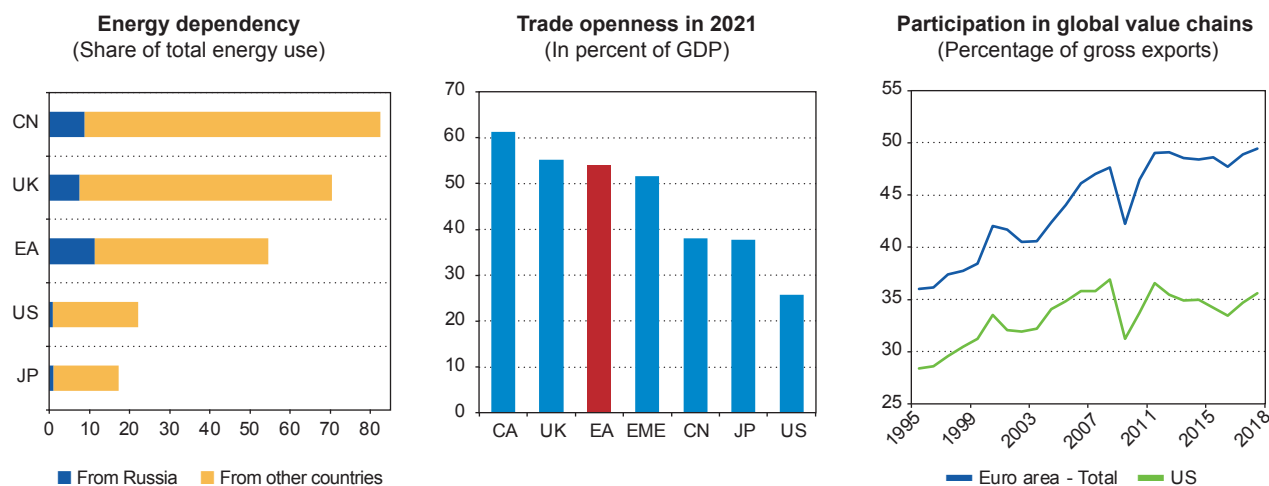
The global economy has since 2020 been hit by two major shocks. The first was the Coronavirus (COVID-19) pandemic. The shock was multidimensional, stemming from both external and domestic sources, hitting both demand and supply and affecting both the aggregate and the sector-specific level. At the same time, the pandemic shock was countered by an unprecedented policy response both at the national and the supranational level (Lane 2021, 2022a). This shock required a complete shutdown of businesses in its early phase, which in turn hindered trade and led to important supply bottlenecks which increased cost pressures and prices in many sectors. Pandemic-related supply bottlenecks started to emerge in late 2020 after the global economy rebounded faster than anticipated (Lane, 2022b). Shortages in production and high uncertainty related to lockdowns fuelled fast price increases as firms reacted to the threat of shortages by ordering more and earlier.¹ Later waves of the pandemic were instead prevalently characterised by lockdowns only in certain sectors as especially the most contact-intensive services sectors. As many companies reduced their capacity during these lockdowns, the subsequent reopening then triggered significant upward price pressures in those services.

While the consequences of the unprecedented pandemic shock were still affecting inflation, the global economy and most prominently Europe have been hit by

¹ For this, "bullwhip effect" see e.g. Rees and Rungcharoenkitkul (2021).

FIGURE 1

VULNERABILITIES OF THE EURO AREA TO GLOBAL ENERGY AND TRADE SHOCKS



NOTES: Middle figure: Trade openness is calculated as the share of exports and imports in goods and services to GDP. For the euro area, only extra euro area trade is considered. EME: emerging market economies. LHS figure: energy includes Mining and quarrying (energy producing products) and Coke and refined petroleum products.

SOURCES: Middle figure: IMF World Economic Outlook, Eurostat, ECB staff calculations; RHS and LHS figures: OECD TiVA (2021) and ECB staff calculations.

a massive shock to energy and food markets, triggered by Russia's invasion of Ukraine in February 2022. With respect to energy, even before the invasion, OPEC+ production cuts, the capital constraints on US shale producers and some temporary disruptions in other oil-producing regions were restricting supply. This resulted in a spike in energy prices since the second half of 2021.² But the invasion hugely aggravated the squeeze of supply and led to an increase of energy prices to extraordinary levels (see Adolfsen *et al.*, 2022). Also international food commodity markets were strongly affected by the Russian invasion of Ukraine (see Bodnár & Schuler, 2022). Those commodities for which

² The spike in energy prices was a major factor also in the ECB's underprediction of inflation — with errors in assumptions about energy prices explaining around 75 % of forecast errors one-quarter ahead over the period from the start of 2021 to the first quarter of 2022. For details, see Chahad *et al.* (2022).

Russia and Ukraine played a major role as suppliers like wheat and maize, in particular, saw very strong increases in prices. In addition to these direct effects, the high energy costs affected food commodity prices also via higher input costs as agricultural production and food processing are relatively energy-intensive and natural gas is an important input in fertiliser production. Rising transportation costs also affected food prices by making the replacement of commodities with those from more distant sources more costly.

Together the pandemic shock and the war and its effects on the geopolitical landscape have exposed the vulnerability of global value chains and are likely to change international economic integration looking ahead (Lagarde, 2022a) — which in turn can pose additional challenges for monetary policy (see Section 4).

The euro area has been especially exposed to this set of shocks mainly for two reasons (Figure 1). First,

the euro area depends very strongly on energy imports, with imports accounting for more than half of the energy use. Before the war, gas imports from Russia played a major role in energy consumption of the euro area — with a very strong dependency on Russian gas in Germany and Italy, among the largest economies of the area. This made the euro area especially vulnerable to the cut in supply from Russia and the increase in global energy prices (see Adolfsen *et al.*, 2022). Second, the euro area is a highly open economy — which makes it more vulnerable to disruptions in global markets. Trade openness in the euro area — measured as the sum of extra euro area imports and exports divided by GDP — is around 54 % of GDP, higher than in many other regions in the world and significantly higher than China (38 %) or the US (26 %).³ In other words, global shocks are affecting the euro area more than other large economies. Third, the euro area economy is especially deeply integrated in global value chains (see Cigna *et al.*, 2022). Pre-Covid global value chains accounted for around ½ of euro area gross exports compared to for example only around 1/3 in the US. This meant that the euro area could have been more affected by supply shortages in the earlier phase of the production process than other advanced economies. For the euro area, this larger exposure to global value chains also implied a higher adjustment cost of value chains to changes in the geopolitical landscape resulting from the pandemic and the war (see section 4).

3. Inflation developments and their drivers in the euro area

The succession of adverse external shocks from the pandemic and the war — materialising in a surge of energy and food prices, supply bottlenecks and reopening effects — pushed up headline inflation in the euro area from levels around 2 % in summer 2021 to

10.6 % in October⁴ (Figure 2) and 10.1 % in November 2022. Energy inflation alone accounted for around 40 % of headline inflation in the euro area in October and November 2022 and together energy and food inflation made up around 2/3 of headline inflation in the euro area in the same period. This has given energy and food inflation a far larger direct role in overall inflation developments in the euro area than in other economic regions. In the US for example, energy and food prices also increased very markedly since summer 2021 — but the overall effects on inflation have been way more muted (Blanchard, 2022; Cuquerella Ricarte *et al.*, 2022). In October and November, energy inflation contributed around 20 %, energy and food around 40 % to headline CPI inflation in the US.

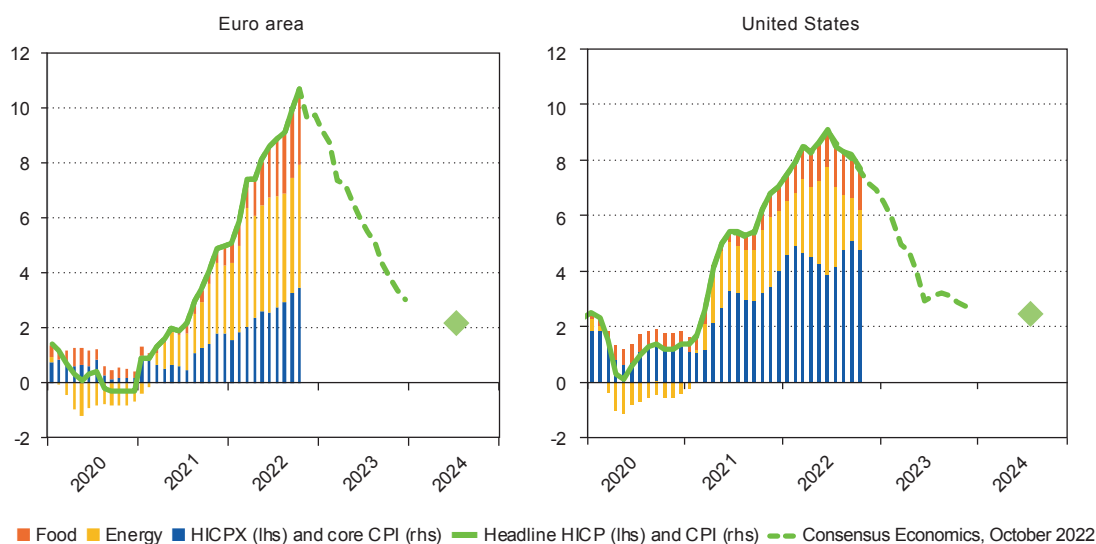
Underlying inflationary pressures have also been substantially increasing in the euro area since the start of 2022 — and HICP excluding energy and food inflation (HICPX) reached 5.0 % in October and November 2022. Persistent supply bottlenecks for industrial goods and input shortages, including shortages of labour due in part to the effects of the pandemic, contributed to a sharp increase in inflation. Since pandemic restrictions were lifted, a recovery in demand has also contributed to the current high rates of inflation, especially in the services sector. Components in the HICP basket that anecdotally were strongly affected by supply disruptions and components that were strongly affected by the effects of reopening following the lockdowns together contributed around half (2 ½ percentage points) of HICPX inflation in the euro area in September 2022 — the last month for which detailed data are available (see Gonçalves & Koester, 2022). Via indirect effects, HICP excluding energy and food inflation has also been affected by the huge shock in energy prices. While estimating these indirect effects of energy price increases on HICPX inflation is surrounded by quite some uncertainty, energy-intensive goods and services contributed around half of the increase in HICPX

³ When adding intra euro area trade then the trade openness of the euro area reaches 95 % of GDP.

⁴ Ranging from 7.1 % in France to 22.5 % in Estonia.

FIGURE 2

HEADLINE INFLATION, COMPONENTS AND MEDIUM-TERM OUTLOOK
IN THE EURO AREA AND THE UNITED STATES
(Annual percentage changes and pp contributions)



NOTES: Latest observations are for October 2022.

SOURCES: Consensus Economics, Haver, Eurostat and ECB staff calculations.

inflation (see also Figure 4).⁵ As monetary policy works mainly via the demand channel, it is important to assess to what extent developments in underlying inflation can be attributed to either supply or demand factors. A disaggregated approach to analysing the role of supply and demand factors in each HICPX component can help to form a view about the overall role of supply and demand factors in HICPX inflation in the euro area.⁶ Such a decomposition shows that the importance of demand factors has gradually increased over time and that, in the second half of 2022, supply and demand factors have played broadly similar roles in HICPX

inflation (Figure 3).⁷ Zooming in on the main components of HICPX inflation, supply factors play a larger role in Non-energy Industrial Goods (NEIG) inflation while demand factors play a larger role in services inflation (for details see Gonçalves & Koester, 2022).

Compared to the US, for which the analysis is done in terms of the Personal Consumption Expenditure (PCE) deflator underlying the price stability target of the Federal Reserve, the importance of demand for core inflation has increased more gradually and later in the euro area (Figure 3). In services inflation, where labour is usually by far the most important input cost, supply factors played a larger role in the US than in the euro area in absolute as well as in relative terms. This

⁵ One recent example for an econometric estimation of the direct and indirect effects of energy prices on inflation in the euro area is the study by Lopez *et al.* (2022). This illustrates that the indirect effects of gas prices on electricity prices but also on other HICP components including food and HICPX can be quite substantial and persistent.

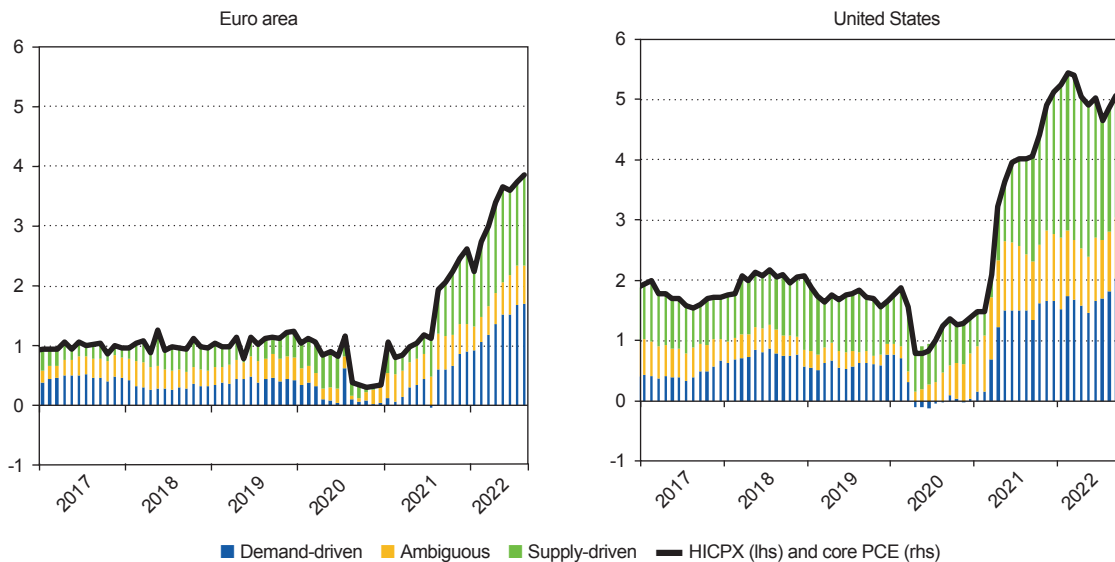
⁶ See for details on the approach Shapiro (2022) and for an application to the euro area Gonçalves and Koester (2022).

⁷ Robustness checks using HICPX series at constant tax rates (to account, for example, for the temporary cut in VAT in Germany in the second half of 2020) lead to similar results.

FIGURE 3

HICP EXCLUDING ENERGY AND FOOD IN THE EURO AREA AND PCE EXCLUDING ENERGY AND FOOD INFLATION IN THE US — DECOMPOSITION INTO SUPPLY- AND DEMAND-DRIVEN FACTORS

(Annual percentage changes; percentage point contributions)



NOTES: Seasonally adjusted data. Based on the approach developed by Shapiro (2022) — for an application to the euro area see Gonçalves and Koester (2022). HICPX and core PCE inflation reflect the sum of demand-driven, supply-driven and ambiguous components, calculated as the trailing sum of the last 12 monthly contributions. While price data for the euro area are available for September 2022, the latest observation is for August 2022 as the turnover series used as a proxy for activity are published with some delay. Latest observation is September 2022 for the United States.

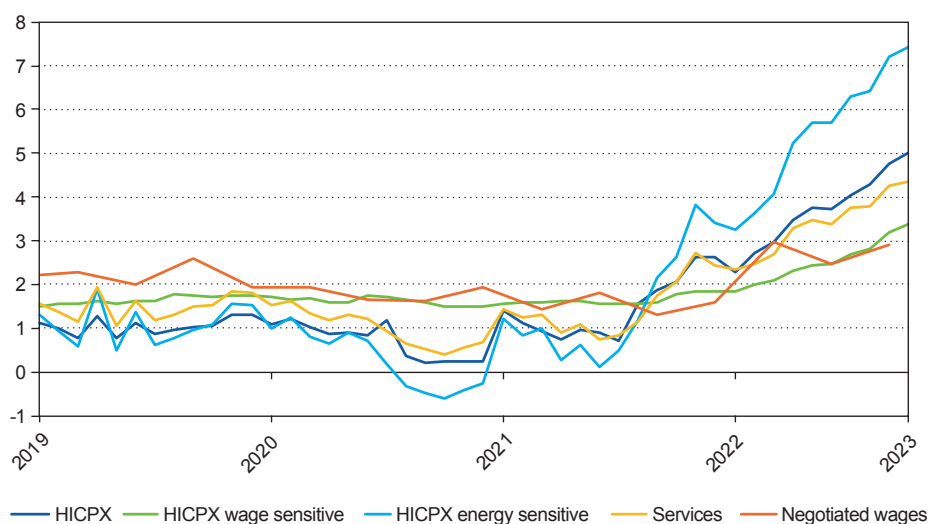
SOURCES: Eurostat and ECB staff calculations (lhs) and FRFS/Adam Shapiro (rhs).

can be partly linked to a tighter labour market and the more important impact of labour shortages on wages as a cost factor in the US than in the euro area.

Wage growth — usually a major driver of services inflation because of the dominant role of wages as input costs in many services — has increased in the euro area since the start of the year, but has remained overall moderate thus far. Since 2020 the most widely used measures of wage growth in the euro area like compensation per employee or compensation per hour have been affected by the changing impact of government support measures related to job retention schemes (Dias da Silva *et al.*, 2020). Therefore, signals from indicators of negotiated wages, which have not been directly affected by

developments in hours worked or the recording of benefits from job retention schemes introduced in response to the pandemic, have been especially important for monitoring wage developments in the past two years (Koester *et al.*, 2020). Growth in negotiated wages increased from an average 1.5 % in year-on-year terms in 2021 to 2.9 % in the third quarter of 2022. Looking ahead one key question is to what extent the current surge in inflation will also push up wage demands and wage agreements in the euro area. While the prevalence of formal and informal wage indexation to inflation is relatively limited in the euro area as a whole (Koester & Grapow, 2021), high inflation is still likely to be an important aspect for wage negotiations. In this context, a recent ECB survey of

FIGURE 4
INFLATION OF WAGE- AND ENERGY-SENSITIVE ITEMS IN HICPX
(Annual percentage changes)



NOTES: HICPX wage sensitive is a composite measure based on items with a share of wages in direct costs above 40 %. These items account for 28 % of overall HICPX. HICPX energy sensitive is a composite measure based on items with an above average (2.6 %) share of energy costs in direct costs. These items account for 31 % of overall HICPX. Latest observation: 2022Q3 (based on data up to August) for negotiated wages, October 2022 for HICPX and services inflation and September 2022 for the rest.

SOURCES: Eurostat and ECB staff calculations.

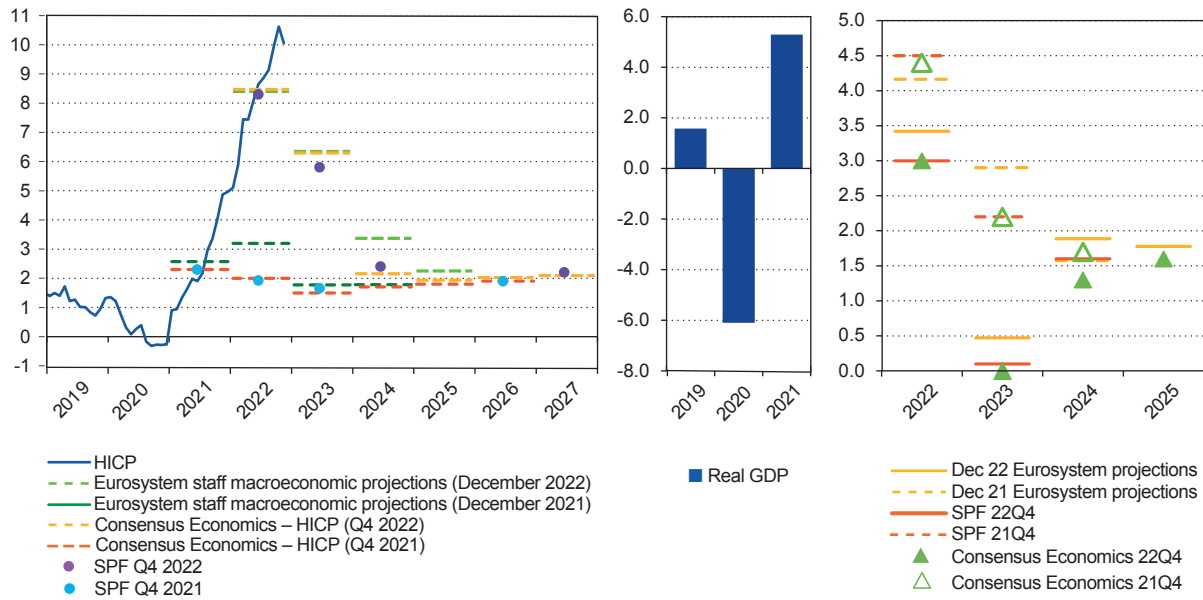
large European companies indicates that compensation for inflation has become an important factor in wage agreements and wage pressures for 2023 continued to build and were increasingly expected becoming an additional cost concern for many firms (De Bondt *et al.*, 2022). While some picking-up of wage growth needs to be seen also against the background of an extended period of low wage growth before the pandemic (see Nickel *et al.*, 2019), the risk that very high wage increases would further fuel inflation (in the form of the so-called second round effects) and lead to a wage-price spiral in the medium term is a matter of concern for the ECB and needs to be monitored very closely (Boissay *et al.*, 2022; Battistini, Grapow *et al.*, 2022).

As wage growth has remained moderate thus far, the cost pressures emerging from wages on consumer prices has been only limited in the euro area. This can

be illustrated by analysing inflation developments in HICP items with a high wage intensity. A composite measure aggregating all HICPX items with a share of direct wage input costs of above 40 % has moved broadly in line with negotiated wage growth since mid-2021 (Figure 4). In contrast, a measure aggregating all HICPX items where energy reflects a high share of input costs saw a much stronger increase, supporting the view that high inflation rates in HICPX in the euro area are so far not predominantly driven by high wage increases but much more by energy inflation. However, as wage growth is expected to increase, this is expected to be translated into higher services inflation going forward.

Over the medium to long term, inflation expectations play a key role in the achievement of a central bank's inflation target. Inflation expectations that are firmly

FIGURE 5
INFLATION EXPECTATIONS AND OUTLOOK FOR REAL GDP GROWTH
(Annual percentage changes)



SOURCES: Eurostat, Consensus Economics, Survey of Professional Forecasters, ECB staff macroeconomic projections for the euro area (https://www.ecb.europa.eu/pub/projections/html/ecb.projections202212_eurosystemstaff-6c1855c75b.en.html) and ECB staff calculations. The Survey of Professional Forecasters for the fourth quarter of 2022 was conducted between 30 September and 6 October 2022. The cut-off date for the Consensus Economics long-term forecasts was October 2022. The cut-off date for data included in the ECB staff macroeconomic projections was 23 November 2022. The latest observation for HICP is for November 2022.

anchored in line with the inflation target support the achievement of that goal by guiding wage and price-setting decisions in the economy. Deviations of inflation expectations from the inflation target may become self-reinforcing (ECB strategy review — work stream on inflation expectations, 2021). Latest readings of measures of longer-term inflation expectations reflect that most measures of longer-term inflation expectations currently stand at around 2 %, although some recent above-target revisions to some indicators warrant continued monitoring (Figure 5). According to the ECB’s Survey of Professional Forecasters (SPF), for the fourth quarter of 2022, longer-term inflation expectations (for 2027) were unchanged at 2.2 % with respect to the previous SPF round in the third quarter

of 2022 (see Figure 5 LHS). The same applies to the longer-term expectations from the October Consensus Economics survey (for 2027), at 2.1 %, and those from the December ECB Survey of Monetary Analysts (for 2026), at 2.0 %. According to the ECB’s Consumer Expectations Survey consumers’ 3-year ahead median inflation expectations increased to 3 % in March 2022 (*i.e.* after the outbreak of the Russian invasion to Ukraine) and continued to fluctuate around that level until late 2022 — remaining on a higher level than inflation expectations from professional forecasters.⁸

⁸ See “ECB Consumer Expectations Survey results – October 2022”; press release 7 December. <https://www.ecb.europa.eu/press/pr/date/2022/html/ecb.pr221207~cda8f02f9f.en.html>

Looking ahead it will be key to closely monitor especially the potential effects of the current spike in inflation on the evolution of indicators of longer-term inflation expectations. This is even more important given that households' inflation expectations tend to be influenced strongly by the prices of goods that they purchase frequently like *e.g.* fuel and groceries (D'Acunto *et al.*, 2022) — which currently record very high inflation rates.

As inflation reached record high levels, the real economy in the euro area started to slow-down significantly in the second half of 2022 and the outlook for real GDP growth worsened especially for 2023 (Figure 5 RHS). After the pandemic shock, the euro area had reached its pre-pandemic level of GDP again in the final quarter of 2021, also thanks to a significant fiscal policy support. While the pandemic-related support was fading out, after the outbreak of the war of Russia against Ukraine, euro area governments have implemented significant policy measures aimed at cushioning the cost-of-living crisis resulting from high inflation rates. Euro area governments have continued to pledge significant support also in 2023, while the EU fiscal rules are still suspended (see Checherita-Westphal, Hauptmeier *et al.*, 2022). The fiscal support has thus attenuated to some extent the impact of high inflation on income and economic activity. The other two important attenuating factors have been a robust labour market and the availability of savings accumulated during the lockdowns. Looking forward it remains uncertain how the three attenuating factors will play out.

The extraordinary fiscal support since 2020 has shifted from pandemic-related emergency measures to energy cost-related measures. The former packages have been effective in preventing a massive increase in the unemployment rate and a collapse of the health system in the earlier phase of the pandemic, thus have been assessed to have been sufficiently targeted (Dias da Silva *et al.*, 2020). By contrast, the energy cost-related measures aiming mostly at capping price increases have been far less targeted until 2022 (see

Checherita-Westphal, Freier *et al.*, 2022). Since the energy-crisis affects disproportionately more vulnerable households, the un-targeted nature of the measures implies a lower degree of effectiveness (Charalampakis *et al.*, 2022). Looking forward, as the fiscal space has been considerably eroded and remains unevenly distributed in the euro area, it would be important to implement policies that are more targeted to the most affected part of the society. This can also help to avoid that, in a supply-constrained environment, fiscal policies exacerbate inflationary pressures and force the central bank to tighten its policy by more than would otherwise be necessary (Lagarde, 2022b).

As regards the labour market, in the early phase of the pandemic the widespread use of job retention schemes has cushioned the impact of the shock on employment and on disposable income (Dias da Silva *et al.*, 2020). This facilitated an adjustment via a temporary reduction of hours worked rather than via layoffs. Since then, the euro area has enjoyed a job-rich recovery, which however was largely driven by net job creation in the public sector (Consolo & Dias da Silva, 2022). Since employment generally lags economic activity, the downgraded economic outlook is expected to lead to a weakening of the employment outlook as well.

As disposable income was stabilised during the pandemic but lockdowns prevented consumption especially of contact-intensive services, households' savings strongly increased (Dossche & Zlatanos, 2020; Dossche *et al.*, 2021). In mid-2022 euro area households had still accumulated savings in excess of their pre-pandemic level of around EUR 900 billion, or around 12 % of their nominal disposable income. When focusing on liquid financial assets, households accumulated excess deposits of around 360 billion (Battistini, Bobasu *et al.*, 2022). While these savings can be used to cushion the energy shock, the concentration of accumulated savings among higher-income households limits the extent to which this buffer can support aggregate private consumption (Dossche *et al.*, 2022; Martínez-Carrascal, 2022).

At the time of writing this article, the uncertainty regarding the economic outlook in the euro area and globally was extremely high. Confidence indicators in the euro area were hovering at historically low levels. In this environment, risks to the economic growth outlook were on the downside, especially in the near term, while risks to the inflation outlook are on the upside. For economic growth, a long-lasting war in Ukraine remained a significant risk and could lead to persistently higher energy and food costs. A weakening world economy and tighter global monetary and financial conditions, including those of the eurozone, were expected to be an additional drag on growth in the euro area. For inflation, the major risk in the short term was a further rise in retail energy prices. Over the medium term, inflation may turn out to be higher than expected if the case of further increases in the prices of energy and food commodities and a stronger pass-through to consumer prices, a persistent worsening of the production capacity of the euro area economy, a persistent rise in inflation expectations above the medium-term target, or higher than anticipated wage rises. By contrast, a decline in energy costs or a further weakening of demand would lower price pressures.

4. Short- and longer-term challenges for the euro area economy and monetary policy

In an environment of undesirably high inflation, increasing and broadening inflationary pressures, monetary policy needed to react quickly. To ensure the timely return of inflation to the 2 % medium-term inflation target the ECB had to guard against the risk of a persistent upward shift in inflation expectations and second-round effects that cause too-high inflation to become entrenched.

The normalisation path of the ECB monetary policy started in December 2021 with the announcement of the end of the pandemic emergency purchase programme (PEPP), which took place at the end of March 2022 (Böninghausen *et al.*, 2023). This has been followed in July 2022 by the termination of the

net purchases conducted under the asset purchase programme (APP), which had started in mid-2014. In the same month, the ECB Governing Council decided to exit negative interest rates in one step with a 50 basis points increase. In September, October and December, interest rates were further increased by a cumulative amount of 200 basis points. In December the Governing Council — judged that rates would still have to rise significantly at a steady pace to reach sufficiently restrictive levels to ensure a timely return of inflation to 2 %. The Governing Council also emphasized that keeping interest rates at restrictive levels will over time reduce inflation by dampening demand and will also guard against the risk of a persistent upward shift in inflation expectations. While stressing that the interest rate remained the key policy instrument to fight inflation, the Governing Council also put forward the principles for normalizing the Eurosystem's monetary policy securities holdings, which will start in early March 2023.

Future policy rate decisions will continue to be data-dependent and follow a meeting-by-meeting approach, which implies that the future policy rate path would be based on the evolving outlook for inflation and the economy.

As monetary policy takes considerable time to transmit to the economy and given the large role of energy in determining inflation outcomes, the ECB Governing Council still expected high inflation rates throughout 2023. But the ongoing path of monetary policy tightening would increasingly contribute to bringing down inflation in the medium term, which nonetheless is projected to remain above 2 % on average in 2025, according to the December 2022 macroeconomic projections elaborated by the Eurosystem staff.

The first immediate impact of the ongoing policy tightening process has been an upward shift of the risk-free rates forward curve. At the same time bank funding costs have increased, reflecting, among other factors, changes in the risk-free rates. The cost of bank borrowing for firms and for house purchases also increased considerably since mid-2022. Higher

financing costs are then transmitted to the real economy mostly via housing, business investment and consumption of durable goods. In turn, by dampening demand, higher rates would reduce inflationary pressures in the medium term.

The longer and larger the deviation from the 2 % target, the greater the risk that medium term inflation expectations become unanchored. Thus, a monetary policy that stabilises inflation at target in a timely manner also stabilises expectations at target (Lane, 2022a,b). Ensuring that the monetary policy stance will dampen excessive demand pressures to return inflation to the target in a timely manner, price and wage setters would understand that demand conditions will not sustain excessive price and wage increases. Moreover, a clear communication on the determination to adjust monetary policy in response to the evolving inflation outlook also helps households, firms, experts and markets to look through the highly uncertain environment and thereby helps to maintain the anchor for inflation expectations (Lane, 2022b).

The pandemic, the war, and their consequences will likely interact with the longer-term structural challenges, which are affecting the euro area and the global economy.

First and foremost, these two shocks have led to a stalling of the global integration process — which can change the role of global developments for the euro area and hence affect the landscape for monetary policy. In the process of globalisation foreign demand had become a more important driver of the euro area economy based on stronger integration and the increase of the rest of the world in the share of the world economy and globalisation has had an influence not only on the trend of growth and inflation but also on the amplitude and volatility of cyclical fluctuations (ECB strategy review — work stream on globalisation, 2021). In the recent decades globalization has overall constituted a positive productivity and labour supply shock, which affected relative prices and factor costs, while resulting in a lower aggregate

price level. This was reflected in the behaviour of traded manufacturing goods, which had a disinflationary impact on the euro area inflation in the pre-pandemic period. Geopolitical tensions could trigger a partial reversal of globalisation. This would be welfare and productivity reducing, while raising production costs and the aggregate price level. Similarly, more persistent supply shortages, due for example to new-pandemic waves or a long-lasting war, could mean that it might take longer for inflationary effects of the supply bottlenecks shocks to fade out. This could happen if post-pandemic manufacturing chains would be organised in a way that is more tolerant of higher costs — by a partial re-shoring or a shortening of the length of supply chains (see Koester *et al.*, 2021, part 5). Such a shortening of supply chains could lead to an increase in the role for inventories, which could raise the volatility of the business cycle and thereby pose an additional challenge to monetary policy making (see Lagarde, 2022a,b).

Second, the two shocks have shown the crucial need to advance with the digital transformation. Investment in digital technologies accelerated after the outbreak of the pandemic, with especially larger firms as well as firms in the services sector taking up such technologies (see Andersson *et al.*, 2022). However, the journey is far from complete as the large proportion of small and medium-sized enterprises tend to switch to new technologies more slowly than larger firms. Moreover, a still incomplete single market in services; a preference for debt financing, due in part to the tax-deductibility of interest payments; and to some extent factors related to regulation and costs are hindering a fast progress towards a digital economy. The literature shows that digitalisation is often associated with a negative impact on the price of some goods and services and on overall inflation (ECB strategy review — work stream on digitalisation, 2021). Overall digitalisation may significantly affect the incidence of shocks and their transmission, with heterogeneity across the euro area, via its impact on key variables (such as productivity,

potential output and inflation) and their measurement. Thereby it adds to the uncertainty and complexity faced by policymakers.

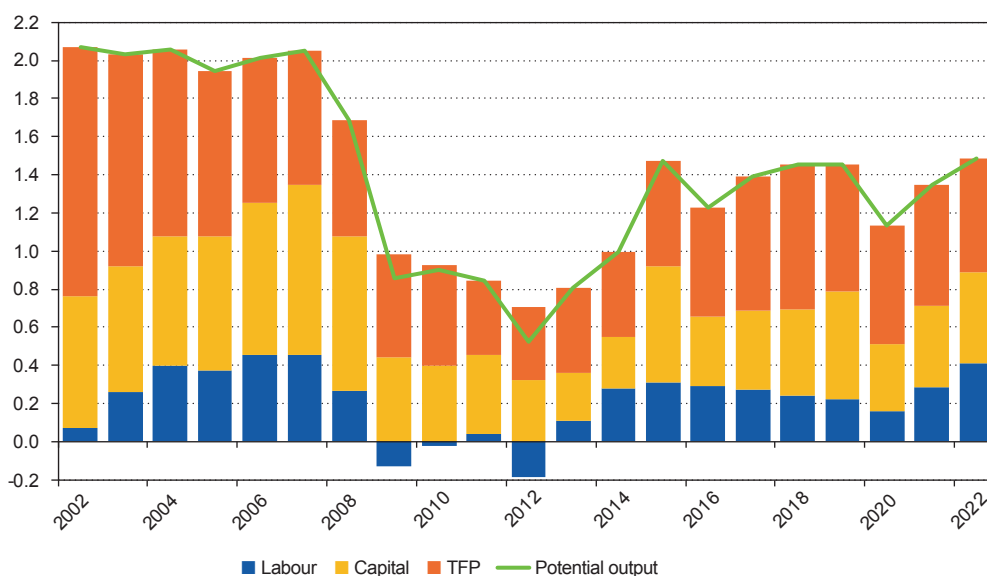
Third, the energy crisis triggered by the war in Ukraine has revealed the importance of accelerating the design and implementation of climate change policies. Both climate change and climate policies are likely to impact energy prices, changes in relative prices and the dynamics in overall inflation for a protracted period of time. The impact of climate change on inflation works both via a higher frequency of extreme weather events (droughts, floods, etc.) and via global warming. Extreme events are expected to increase the volatility in relative prices as they affect both the supply (reduced capacity) and demand (lower wealth and confidence), while global warming might reduce productivity and potential output and therefore put upward pressures on prices. Empirical studies suggest that, so far, climate change has mainly had an impact on relative prices but it has had limited aggregate impact on inflation in advanced countries so far (Parker, 2018; Faccia *et al.*, 2021). Inflation and output will also be directly affected by the policies implemented to mitigate future climate change by limiting greenhouse gas emissions. Since carbon pricing is the main instrument in achieving lower emissions, this is expected to lead to upward pressures on consumer energy prices and increased energy price volatility, via higher costs and higher taxes on fossil fuels in the transition phase. Long-lasting relative price adjustments and higher inflation volatility complicates the conduct of monetary policy as agents might find it more difficult to anchor their longer-term expectations in a highly volatile environment. In addition, climate change could complicate the assessment of the monetary policy stance. This is because climate change is potentially a source of more frequent, intense and persistent shocks to the economy whose nature (supply and demand) will be hard to identify. As a consequence, climate change may increase the prevalence of output and price stabilisation trade-offs, also as uncertainty about the magnitude of the effects of climate change and the horizon over which

they will play out on the economy may compound these effects (Workstream on climate change 2021).

Fourth, population ageing is adding to the challenges for the euro area and its monetary policy. The on-going trend in population ageing in the euro area has a negative impact on potential labour supply, total factor productivity and thus potential output. The increased scarcity of labour and the longer life expectancy — in particular life expectancy after pensionable age — should induce households to save more out of their income in view of covering a longer period without labour income. As emphasised by the secular stagnation hypothesis this will drive down the natural rate of interest — which would limit the room for manoeuvre for monetary policy (Papetti, 2019; Lis *et al.*, 2020). However, an alternative view, that focuses on the compositional shift of the age distribution (Goodhart & Pradhan, 2020), emphasises that the number of working people savings will fall relative to pensioners, who are de-cumulating their savings. This in turn will drive up the natural rate. As pensioners are mainly consumers (rather than net savers) who do not participate in the production process, this should translate in stronger general price pressures. The dissaving argument has been, however, challenged by the observation that retired people still tend to save for a number of reasons, including family bequests and lifespan uncertainty. Moreover, the inflationary pressures will also depend on the relative change of savings versus investment. Since ageing is likely to reduce both savings and investment the impact on the natural rate of interest and on inflation continue to be subject to debate both conceptually and empirically. Based on current expectations, the demographic change is likely to reinforce the existing downward trend of the natural rate of interest, at least until the sizeable cohort of baby boomers have retired (by around 2035 in the euro area), and then to gradually reverse the trend thereafter, although substantial uncertainty remains. Until 2035, population ageing is expected to continue having a disinflationary

FIGURE 6

EURO AREA POTENTIAL OUTPUT GROWTH
(Annual percentage changes and percentage point contributions)



SOURCE: European Commission.

impact, mainly through downward pressure on wage dynamics — a trend which may be reversed thereafter. Macroeconomic stabilisation may become more complicated, as population ageing limits the available policy space and contributes to larger cross-country heterogeneity in the euro area (for details see Holm-Hadulla *et al.*, 2021 — box 1).

All structural changes discussed above (de-globalisation, digitalisation, climate change and ageing) will have an impact on the euro area potential growth and the natural real interest rate.⁹ Thereby they will likely affect monetary policy for which potential output and output gaps are useful indicators to assess the business cycle and to forecast inflation developments. While some of

these changes will most likely reduce potential growth (de-globalisation, ageing), others will likely increase it. To the extent that digitalisation and greening policy will trigger new investment and technologies these will have a positive impact on potential output. The pandemic has been assessed as bringing temporarily down potential output growth (Figure 6). This is however very different from the assessment of potential output growth after the financial crisis of 2008-09, when potential output growth in the euro area was assessed to have been halved and needed a protracted period to recover. After the financial crisis, potential output has not been able to return to the pre-crisis growth rates, due to a permanent downward shift of the contributions from capital accumulation (investment) and total factor productivity. It remains a matter of on-going research where the long-term structural trends will impact potential growth of the euro area.

⁹ For a discussion of the implications of changes in the natural rate of interest on monetary policy see also the recent work by Billi *et al.* (2022), which however focuses on periods with inflation at or below the target.

However, the EU supranational policies implemented during the pandemic — Next Generation EU, Recovery and Resilience Plans — have properly identified the investment needs of the euro area (see Bańkowski *et al.*, 2022). The implementation of those plans would be key for boosting investment and potential growth. In this context the investment in green technology and acceleration of digital uptake could be a silver lining. Large investment in climate-friendly technologies could significantly push the technological frontier outwards and thereby accelerate environmental protection efforts. A big acceleration of digital uptake could also be fundamental to improving technology adoption of laggards, particularly with regard to (very) small and medium-sized enterprises that play an important role in many EU countries (see for details also Holm-Hadulla *et al.*, 2021 — box 2).

5. Conclusion

The euro area is a very open economy, which is deeply integrated in global value chains and highly dependent on energy imports. This has made the euro area especially vulnerable to the global economic shocks resulting from the pandemic and the war of Russia against Ukraine.

The vulnerability of the euro area is reflected in headline inflation reaching historical highs in recent months — with energy and food inflation accounting for the lion's share — while the outlook for economic growth is threatened especially by high energy prices.

But also underlying price pressures in the domestic economy are broadening and increasing — with demand factors playing a significant role in the euro area following the recovery from the pandemic. Wage growth has increased gradually over the last quarters, but so far labour costs have not become a major driver of domestic inflationary pressures in the euro area. In addition, while expectations of consumers and professionals foresee inflation to remain elevated for

quite some time, longer-term inflation expectations have remained well-anchored at levels around 2 % — although further above-target revisions to some indicators warrant continued monitoring.

As inflation in the euro area is far too high, the challenge for monetary policy is now to ensure the timely return of inflation to the ECB's 2 % medium-term inflation target. To ensure this, monetary policy is aimed at reducing support for demand and guarding against the risk of a persistent upward shift in inflation expectations. Monetary policy in the euro area will therefore need to continue along the envisaged monetary policy tightening path, following a meeting-by-meeting approach.

But there are also challenges to monetary policy going in the medium-term. For example, economic structures and international economic integration are likely to change looking ahead — which could lead to increases in the volatility of the business cycle complicating monetary policy making. In the longer-term structural changes linked to climate change and climate-related policies but also to demographic change, digitalisation and geopolitical factors add to the challenges for monetary policy making, giving rise to increasingly challenging trade-offs.

Bibliographic references

- Adolfson, J. F., Kuik, F., Lis, E. M., & Schuler, T. (2022). The impact of the war in Ukraine on euro area energy markets. *ECB Economic Bulletin*, Issue 4.
- Andersson, M., Di Stefano, C., Sun, Y., & Vinci, F. (2022). The recovery in business investment – drivers, opportunities, challenges and risks. *ECB Economic Bulletin*, Issue 5.
- Bańkowski, K., Bouabdallah, O., Domingues Semeano, J., Dorrucchi, E., Freier, M., Jacquinet, P., Modery, W., Rodríguez-Vives, M., Valenta, V., & Zorell, N. (2022). *The economic impact of Next Generation EU: a euro area perspective* (ECB Occasional Paper Series No. 291). European Central Bank.
- Battistini, N., Bobasu, A., & Gareis, J. (2022). The recent drivers of household savings across the wealth distribution. *ECB Economic Bulletin*, Issue 3.
- Battistini, N., Grapow, H., Hahn, E., & Soudan, M. (2022). Wage Share Dynamics and Second-Round Effects on

- Inflation after Energy Price Surges in the 1970s and Today. *ECB Economic Bulletin*, Issue 5.
- Billi, R., Galí, J., & Nakov, A. (2022). *Optimal monetary policy with $r^* < 0$* (BSE Working Paper No. 1333). Barcelona School of Economics.
- Blanchard, O. (2022, October 22). The United States and the eurozone face different challenges in battling inflation. *Peterson Institute for International Economics*. <https://www.piie.com/blogs/realtime-economics/united-states-and-eurozone-face-different-challenges-battling-inflation>
- Bodnár, K., & Schuler, T. (2022). The surge in euro area food inflation and the impact of the Russia-Ukraine war. *ECB Economic Bulletin*, Issue 4.
- Boissay, F., De Fiore, F., Igan, D., Pierres-Tejada, A., & Rees, D. (2022). Are Major Advanced Economies on the Verge of a Wage-Price Spiral? *BIS Bulletin* No. 53.
- Böninghausen, B., Fernández Brennan, L., McCabe, L., & Schumacher, J. (2023). The pandemic emergency purchase programme – an initial review. Forthcoming *ECB Economic Bulletin*, Issue 8, January.
- Chahad, M., Hofmann-Drahonsky, A.-C., Meunier, B., Page, A., & Tirpák, M. (2022). What explains recent errors in the inflation projections of Eurosystem and ECB staff? *ECB Economic Bulletin*, Issue 3.
- Charalampakis, E., Fagandini, B., Henkel, L., & Osbat, C. (2022). The impact of the recent rise in inflation on low-income households. *ECB Economic Bulletin*, Issue 7.
- Checherita-Westphal, C., Freier, M., & Muggenthaler, P. (2022). Euro area fiscal policy response to the war in Ukraine and its macroeconomic impact. *ECB Economic Bulletin*, Issue 5. https://www.ecb.europa.eu/pub/economic-bulletin/focus/2022/html/ecb.ebbox202205_07~6db6f2c297.en.html
- Checherita-Westphal, C., Hauptmeier, S., & Leiner-Killingner, N. (2022). The Euro Area in Between Crises? Considerations on Fiscal Policies and Rules. *Intereconomics*, 57(5), 278-282. <https://www.intereconomics.eu/>
- Cigna, S., Gunnella, V., & Quaglietti, L. (2022). *Global value chains: measurement, trends and drivers* (ECB Occasional Paper No. 289). European Central Bank. <https://ideas.repec.org/p/ecb/ecbops/2022289.html>
- Consolo, A., & Dias da Silva, A. (2022). The role of public employment during the COVID-19 crisis. *ECB Economic Bulletin*, Issue 6. https://www.ecb.europa.eu/pub/economic-bulletin/focus/2022/html/ecb.ebbox202206_01~abbe041537.en.html
- Cuquerella Ricarte, S., Gomez-Salvador, R., & Koester, G. (2022). Recent inflation developments in the United States and the euro area – an update. *ECB Economic Bulletin*, Issue 1.
- D'Acunto, F., Malmendier, U., & Weber, M. (2022). *What Do the Data Tell Us About Inflation Expectations?* (Chicago Booth Research Paper No. 22-09). Chicago Booth: Fama-Miller Center for Research in Finance and The University of Chicago, Booth School of Business.
- De Bondt, G., Charalampakis, E., Kuik, F., & Morris, R. (2022). Main findings from the ECB's recent contacts with non-financial companies. *ECB Economic Bulletin*, Issue 7.
- Dias da Silva, A., Dossche, M., Dreher, F., Foroni, C., & Koester, G. (2020). Short-time work schemes and their effects on wages and disposable income. *ECB Economic Bulletin*, Issue 4. https://www.ecb.europa.eu/pub/economic-bulletin/focus/2020/html/ecb.ebbox202004_06~6b0e718192.en.html
- Dossche, M., Georgarakos, D., Kolndrekaj, A., & Tavares, F. (2022). Household saving during the COVID-19 pandemic and implications for the recovery of consumption. *ECB Economic Bulletin*, Issue 5. https://www.ecb.europa.eu/pub/economic-bulletin/focus/2022/html/ecb.ebbox202205_03~d262f01c8b.en.html
- Dossche, M., Krustev, G., & Zlatanov, S. (2021). COVID-19 and the increase in household savings: an update. *ECB Economic Bulletin*, Issue 5.
- Dossche, M., & Zlatanov, S. (2020). COVID-19 and the increase in household savings: precautionary or forced? *ECB Economic Bulletin*, Issue 6.
- ECB. (2022, December 7). *ECB's Consumer Expectations Survey results – October 2022* [Press release]. <https://www.ecb.europa.eu/press/pr/date/2022/html/ecb.pr221207~cda8f02f9f.en.html>
- ECB strategy review - Work stream on climate change. (2021). *Climate change and monetary policy in the euro area* (ECB Occasional Paper No. 271). <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op271~36775d43c8.en.pdf?c29941b5e2dbeb3168b6e48f362a2b87>
- ECB strategy review - Work stream on digitalisation. (2021). *Digitalisation: channels, impacts and implications for monetary policy in the euro area* (ECB Occasional Paper No. 266). <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op266~1056aea77c.en.pdf?a4a819d709aa302f5922913b09f0ef17>
- ECB strategy review - Work stream on globalisation. (2021). *The implications of globalisation for the ECB monetary policy strategy* (ECB Occasional Paper No. 263). <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op263~9b56a71297.en.pdf?f6955c17225be78acec84b6f7c7f19b2>
- ECB strategy review - Work stream on inflation expectations. (2021). *Inflation expectations and their role in Eurosystem forecasting* (ECB Occasional Paper No. 264).
- ECB strategy review - Work stream on monetary-fiscal policy interactions. (2021). *Monetary-fiscal policy interactions in the euro area* (ECB Occasional Paper No. 273). <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op273~fae24ce432.en.pdf?3c28f10d4f90b8363f32d117cbca3380>

- Faccia, D., Parker, M., & Stracca, L. (2021). *Feeling the heat: extreme temperatures and price stability* (ECB Working Paper No. 2626).
- Gonçalves, E., & Koester, G. (2022). The role of demand and supply in underlying inflation – decomposing HICPX inflation into components. *ECB Economic Bulletin*, Issue 7.
- Goodhart, C., & Pradhan, M. (2020). *The Great Demographic Reversal: Ageing Societies, Waning Inequality, and an Inflation Revival*. Palgrave.
- Gunnella, V., Jarvis, V., Morris, R., & Tóth, M. (2022). Natural gas dependence and risks to euro area activity. *ECB Economic Bulletin*, Issue 1.
- Holm-Hadulla, F., Musso, A., Rodriguez Palenzuela, D., & Vlassopoulos, T. (2021). *Evolution of the ECB's analytical framework* (ECB Occasional Paper No. 277).
- Koester, G., Benatti, N., & Vlad, A. (2020). Assessing wage dynamics during the COVID-19 pandemic: can data on negotiated wages help? *ECB Economic Bulletin*, Issue 8.
- Koester, G., & Grapow, H. (2021). The prevalence of private sector wage indexation in the euro area and its potential role for the impact of inflation on wages. *ECB Economic Bulletin*, Issue 7.
- Koester, G., Lis, E., Nickel, C., Osbat, C., & Smets, F. (2021). *Understanding low inflation in the euro area from 2013 to 2019: cyclical and structural drivers* (ECB Occasional Paper No. 280).
- Lagarde, C. (2022a, September 20). *Monetary policy in the euro area* [Speech]. Karl Otto Pöhl Lecture.
- Lagarde, C. (2022b, November 4). *Monetary policy in a high inflation environment: commitment and clarity* [Speech]. Lecture by Christine Lagarde, President of the ECB, organised by Eesti Pank and dedicated to Professor Ragnar Nurkse, Tallinn.
- Lane, P. R. (2021, April 1). Inflation dynamics during a pandemic. *The ECB blog*. <https://www.ecb.europa.eu/press/blog/date/2021/html/ecb.blog210401~6407b23d87.en.html>
- Lane, P. R. (2022a, February 10). Bottlenecks and monetary policy. *The ECB blog*. <https://www.ecb.europa.eu/press/blog/date/2022/html/ecb.blog220210~1590dd90d6.en.html>
- Lane, P. R. (2022b, October 11). *The transmission of monetary policy* [Speech]. Conference on “EU and US Perspectives: New Directions for Economic Policy”, New York.
- Lis, E., Nickel, C., & Papetti, A. (2020). *Demographics and inflation in the euro area: a two-sector new Keynesian perspective* (ECB Working Paper No. 2382).
- López, L., Párraga, S., & Santabàrbara, D. (2022). The pass-through of higher of natural gas prices to inflation in the euro area and Spain. *Bank of Spain Economic Bulletin* No. 3, Box 4. <https://www.bde.es/f/webbde/SES/Secciones/Publicaciones/InformesBoletinesRevistas/BoletinEconomico/22/T3/Files/be2203-it-Box4.pdf>
- Martínez-Carrascal, C. (2022). The impact of the surge in inflation and the war on Spanish households' economic outlook. *Bank of Spain Analytical Articles* No. 3. <https://www.bde.es/f/webbde/SES/Secciones/Publicaciones/InformesBoletinesRevistas/ArticulosAnaliticos/22/T3/Files/be2203-art24e.pdf>
- Nickel, C., Bobeica, E., Koester, G., Lis, E., & Porqueddu, M. (Editors). (2019). *Understanding low wage growth in the euro area and European countries* (ECB Occasional Paper No. 232).
- Nickel, C., Koester, G., & Lis, E. (2022). Inflation Developments in the Euro Area Since the Onset of the Pandemic. *Intereconomics: Review of European Economic Policy*, 57(2), 69-75. https://ideas.repec.org/a/spr/intere/v57y2022i2d10.1007_s10272-022-1032-y.html y <https://ideas.repec.org/s/spr/intere.html>
- Papetti, A. (2019). *Demographics and the natural real interest rate: historical and projected paths for the euro area* (ECB Working Paper No. 2258).
- Parker, M. (2018). How global is “global inflation”? *Journal of Macroeconomics*, 58, 174-197.
- Rees, D., & Rungcharoenkitkul, P. (2021). Bottlenecks: causes and macroeconomic implications. *BIS Bulletin* No. 48. Bank for International Settlements. November.
- Shapiro, A. H. (2022). *Decomposing Supply and Demand Driven Inflation* (Federal Reserve Bank of San Francisco Working Papers No. 18). September. <https://www.frbsf.org/economic-research/publications/working-papers/2022/18/>