

Addressing inflationary risks in the face of high energy prices: what can the ECB do?



Supporting monetary policy scrutiny

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Abstract

Inflationary pressures in the euro area slightly eased over the last few months, mainly due to the decrease in energy prices. However, the core inflation rate still remains well above the ECB's target. A rise in inflation expectations is still a major risk to further increase in inflation, and thus should be monitored closely. We find that contractionary monetary policy by the ECB and the Fed decreases energy prices and the headline price level in the euro area.

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LIST OF ABBREVIATIONS

APP	Asset purchase programme
ECB	European Central Bank
Fed	Federal Reserve
HICP	Harmonised index of consumer prices
MRO	Main refinancing operations
NEIG	Non-energy industrial goods
OIS	Overnight index swap
PPI	Producer price inflation
SOE	Small open economy
SPF	Survey of professional forecasters
US	United States
USD	US dollar
SVAR	Structural vector autoregression

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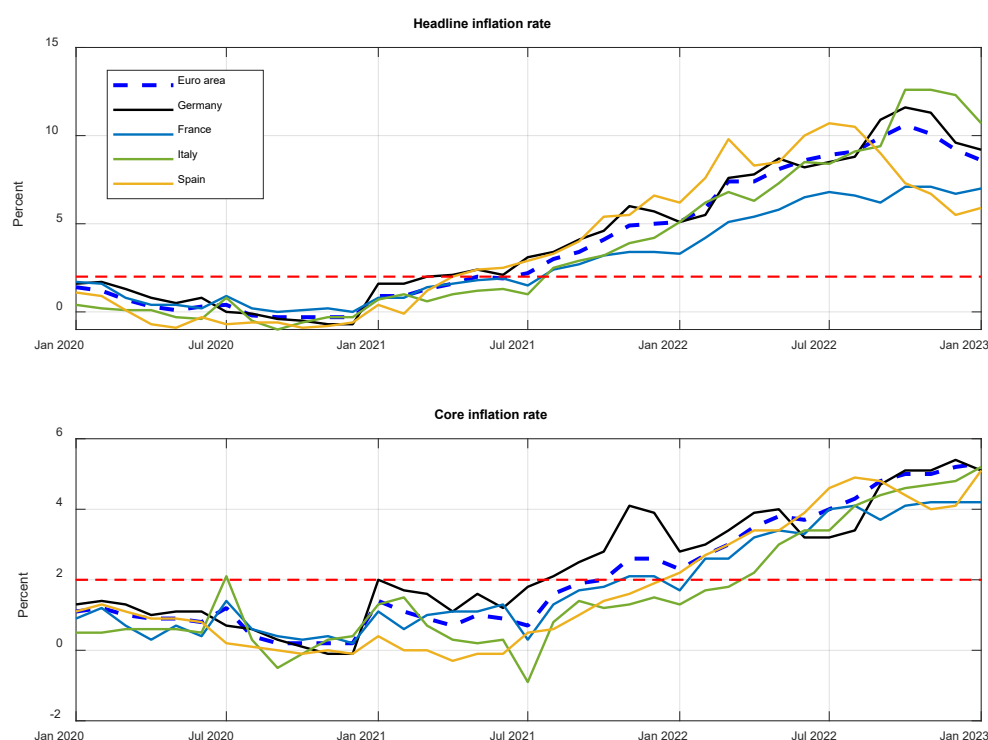
EXECUTIVE SUMMARY

- **The headline harmonised index of consumer price (HICP) inflation rate has decreased from its peak at 10.6% in October 2022 to 8.5% (estimated) in February 2023.** The main driver of the drop is the falling energy prices.
- **The core inflation rate has been steadily rising since mid-2021 and recently hit a record high of 5.6%, as estimated for February 2023, which is 3.6 percentage points higher than the ECB's 2% headline inflation target.**
- **Supply-side pressures have eased considerably after the surge in commodity prices following the Russian invasion of Ukraine.** Energy and food commodity prices are below their levels prior to the war. Global supply chain conditions improved significantly in 2022. These developments led to a large drop in producer price inflation in the euro area.
- **Household and market inflation expectations are at all-time highs but are close to the target of 2% over the medium-term.** The tightening of monetary policy by the ECB after mid-2022 seems to have curbed the rise in inflation expectations.
- **Market forecasts for euro area annual wage growth in 2023 are about 4%, close to the latest observed value in the data.** Although this level does not directly point to a wage-price spiral, this does not mean the ECB should not continue on the tight monetary policy path it set.
- **Since July 2022, in response to the rising inflation, the ECB has hiked its policy rates by 300 basis points and announced the reduction of its balance sheet.**
- **ECB can lower energy prices by raising interest rates, and this “energy-price channel” is an important transmission mechanism.** The short-term decrease in the headline consumer price index is mostly due to the fall in energy prices. This finding is contrary to the narrative that the ECB cannot decrease energy prices with its policy decisions.
- **Tightening US monetary policy has a deflationary effect on the euro area economy.** Therefore, the narrative that a stronger US dollar induced by contractionary US monetary policy has an inflationary effect on the euro area economy is not entirely accurate, as it does not consider the fall in global energy prices in response.

1. INTRODUCTION

In the past ten years, central bankers and economic policymakers have been concerned about deflation rather than inflation in the euro area. However, since the COVID-19 pandemic, the cause of concern has been reversed. Following the re-opening of the economy in 2021, inflation has picked up rapidly. The annual rate of change in the harmonised index of consumer prices (HICP) has been over 2% since July 2021, and rose to new historical highs month-after-month following the Russian invasion of Ukraine in February 2022 (see top panel in Figure 1). Since its peak in October, the inflation rate has declined slightly from 10.6% to 8.5% in February 2023, mostly due to the fall in energy prices, but remains at a much higher level than the European Central Bank (ECB)'s inflation target.

Figure 1: Inflation developments in the euro area



Source: Eurostat.

The inflationary pressures observed have been at historical levels in every Member State in the currency union, albeit with considerable differences in the headline inflation rates, which are mainly a result of the distinct characteristics of the energy markets in each country. The developments in the core inflation rate (excluding energy, food, alcohol and tobacco prices) are more homogenous across euro area Member States. Since July 2021, the core inflation rate has been steadily rising in the euro area, and hit a fresh record high of 5.6% in the flash estimate for February 2023 (see bottom panel in Figure 1). In response to the rising headline and core inflation in 2022, the ECB started to implement a contractionary monetary policy by hiking the policy rates and announcing the reduction of its balance sheet. The (flash) estimates for the headline and core inflation rates for February came in 0.3% higher than the market expectation, and this will likely increase the pressure on the ECB to further tighten monetary policy.

The debate surrounding the monetary policy response to the current inflationary pressure has been largely centred around whether the ECB has the right tools to combat an inflationary shock originating

from supply-side constraints and high energy prices. However, the data suggests that this no longer characterises the current inflationary episode experienced in the euro area. Although energy prices still stand at high levels, their contribution to inflation decreased notably and the price direction is likely to be downward rather than upward. Furthermore, commodity prices have fallen, global supply pressures have eased, and the Chinese economy has re-opened once again. All these deflationary factors are positive for the euro area economy, and the headline inflation rate dropped in recent months. Nonetheless, the core inflation rate continues its upward trend.

This paper takes a closer look at the medium-term inflation prospects in the euro area, and evaluates the main arguments for and against the tight monetary policy by the ECB. First, we examine the drivers of inflation over the last year. Second, we look at the main arguments of the ECB for implementing contractionary monetary policy. Third, we show that ECB rate hikes decrease consumer energy prices in the euro area by reducing the global energy price, contrary to assumptions made by proponents against contractionary ECB policy. Finally, we document that monetary policy tightening in the United States (US) actually lowers the consumer energy prices and the inflation rate in the euro area, contrary to the narrative around the implications of a strong US dollar (USD).

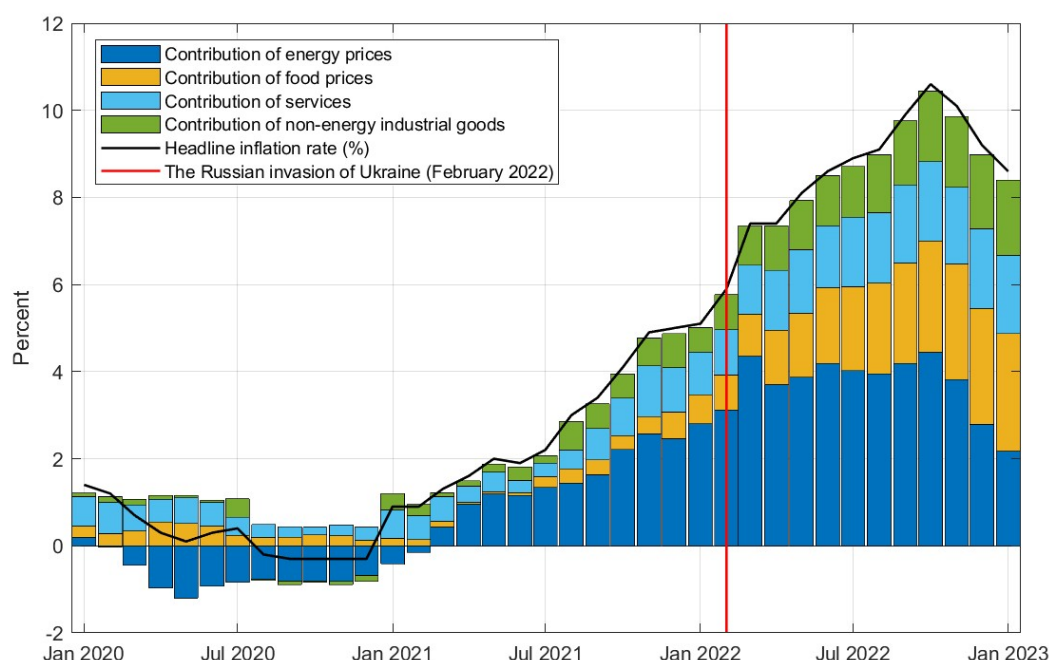
2. MEDIUM-TERM INFLATION PROSPECTS

This section provides an overview of the euro area inflation developments over the last year. The first part shows that the nature of the inflation dynamics in the euro area has begun to shift from supply- to demand-driven. The second part documents that supply-side pressures on the consumer prices in the euro area has weakened considerably in the second half of 2022, and is likely to weaken more in the medium-term. The third part looks at the main reasons why the ECB decided to implement contractionary monetary policy.

2.1. Overview of inflation developments

Initially, energy prices were the major driver of inflation in the euro area but the energy contribution to the headline inflation rate has been in decline since October following its peak after the Russian invasion of Ukraine (see Figure 2). In March 2022, the energy contribution to inflation was 4.35% when the headline inflation stood at 7.4%. This means that around 60% of the increase in the HICP was due to the rise in energy prices. However, since then the contributions of food prices, services, and non-energy industrial goods (NEIG) have increased substantially. The rise in the contribution of food prices is mainly due to the surge in food commodity prices induced by the war (see Figure 5 – FAO Food Price Index), which increased from 0.67% in January 2022 to 2.7% in January 2023. In the same time span, the aggregate contribution of services and NEIG increased from 1.5% to 3.5%. Only the inflation rate due to services and NEIG is considerably over the ECB's 2% inflation target. The evaluation of the contributions to the headline inflation rate suggests that the narrative that the current inflationary episode is largely driven by energy prices no longer holds.

Figure 2: Contributions to the headline inflation rate in the euro area



Source: Eurostat.

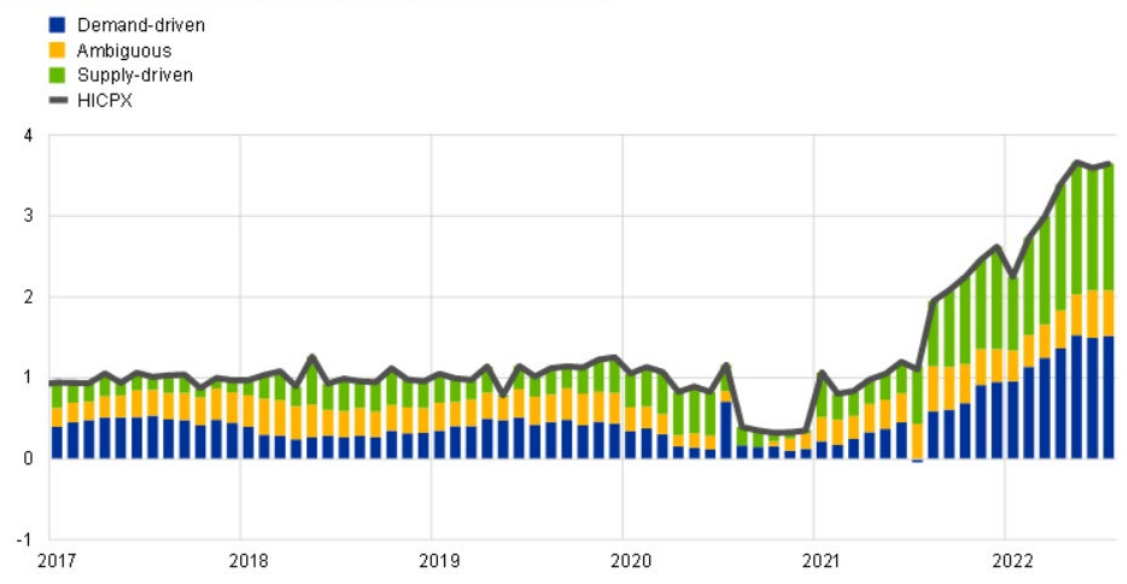
Notes: The vertical red line is placed to mark February 2022, the month of the Russian invasion of Ukraine.

Conventional wisdom is that monetary policy is effective against demand-driven inflationary pressures. Although the extensive contribution of services and NEIG to the headline inflation rate is an indication that not only supply-driven factors contribute to the high inflation rate, it does not directly translate to

demand-driven factors. Gonçalves and Kuester (2022) show that an important share of the core inflation rate in the euro area is driven by demand factors (see Figure 3). The current demand-driven share of inflation is likely to be considerably higher than the reported value of around 1.5% for July 2022, the latest observation in their analysis.

Figure 3: Core inflation rate: decomposition into supply and demand-driven factors

(annual percentage changes; percentage point contributions)



Source: Gonçalves and Kuester (2022).

Notes: This analysis is based on the approach developed by Shapiro (2022) for the US. The latest observation is for July 2022.

The euro area economy has been hit by a series of supply shocks, first with the pandemic and then with the Russian invasion of Ukraine. However, expansionary fiscal and monetary policy in response managed to maintain demand at a similar level to the pre-pandemic level.¹ The fiscal intervention in the euro area in response to the pandemic played an essential role in stabilising the economy against such an unprecedented shock. The effects of expansionary fiscal policy through transfers to households (e.g. direct/indirect social transfers, income-protecting measures) can materialise with a lag, especially in an environment with lockdowns where households cannot spend their disposable income and/or excess savings. This would lead to a sustained rather than a one-off inflationary impact of such policies as the economy re-opens. It is difficult to quantify the impact of expansionary fiscal policy on the euro area inflation through its positive effect on aggregate demand, however it is likely to be important. In the US, the narrative is that inflation picked up mostly due to demand-induced factors, such as the massive fiscal response.² Although the fiscal intervention in the euro area was smaller than in the US (in % of GDP), the announced packages were still substantial in size.³

As the economy re-opened after the lockdowns, the imbalance between supply and demand generated inflationary pressures in the euro area, just like in the rest of the world. Over the second half

¹ Real private consumption in the euro area in 2022Q3 is EUR 1.328 trillion, whereas it was EUR 1.330 trillion in 2019Q4 (OECD national accounts data).

² De Soyres, Santacreu and Young (2022) conclude that “The [US] policy was successful at boosting consumption which, together with relatively inelastic supply, may have led to supply chain bottlenecks and price tensions”.

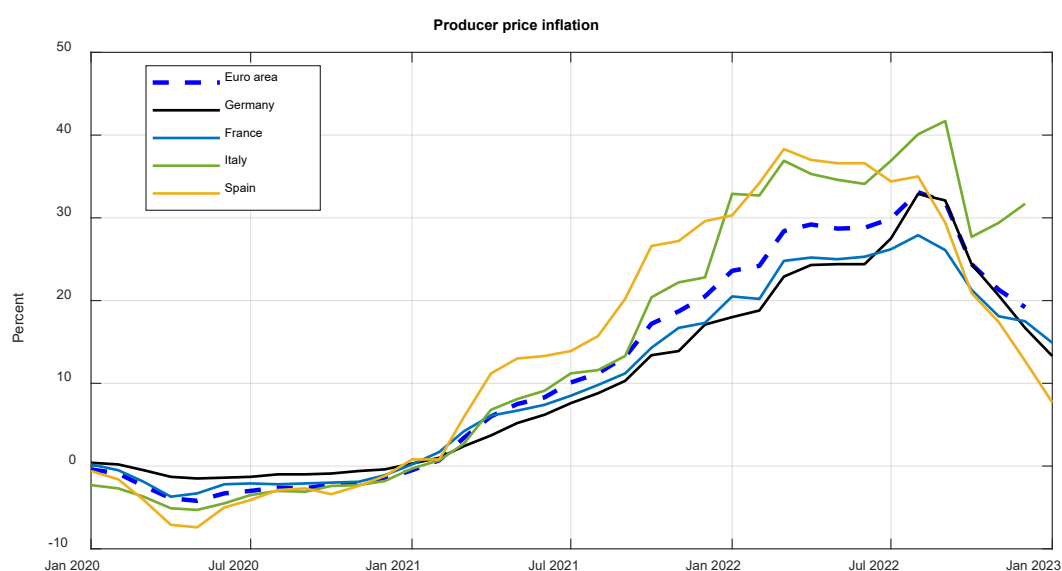
³ According to the July 2021 (latest) update of the International Monetary Fund’s fiscal monitor database of country fiscal measures in response to the COVID-19 pandemic, the additional spending made are (as % of GDP): 13.6% for Germany, 9.6% for France, 10.9% for Italy, 7.6% for Spain, 10.3% for the Netherlands, 11.7% for Austria.

of last year, as supply pressures eased and energy prices declined, the contribution of demand-driven factors to the inflation in the euro area increased. However, it is difficult to imagine this will continue as the ECB maintains the tight monetary policy path it is currently on.

2.2. Producer price inflation

The impact of supply-side constraints and energy prices passes through stronger and faster to producer prices, therefore producer price inflation (PPI) is a better measure to gauge the current importance of such factors on the underlying inflation dynamics. Figure 4 shows that PPI in the euro area declined from 33.1% at its peak in August 2022 to 19.2% in December 2022 (the latest value). This steady drop in the PPI is observed in Germany, France and Spain, but not in Italy, which experienced a sharp increase in December 2022, pulling the euro area PPI up. However, the important takeaway here is that the PPI is in a decreasing trend which is likely to continue without the absence of a new external shock.

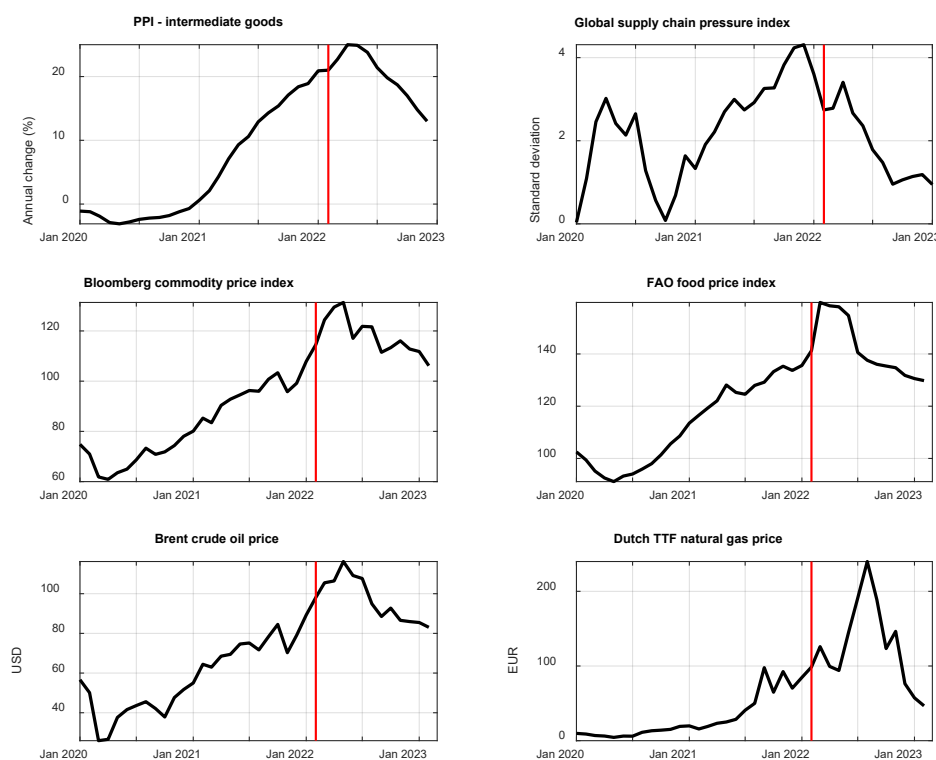
Figure 4: Producer price inflation (total industry excluding construction)



Source: Eurostat.

The PPI is, by construction, heavily influenced by commodity prices as they are inputs in the production process. The general trend in 2022 is that a surge in commodity prices was experienced after the Russian invasion of Ukraine, which was then followed by a steady decline in the prices (see Figure 5): the FAO food price index peaked in March 2022, Brent crude oil price peaked in May 2022, and the Bloomberg commodity price index peaked in May 2022.⁴ Importantly, the intermediate goods price inflation peaked in April 2022. Although the global supply chain pressure index and the natural gas price did not peak in 2022Q2 as the others, they are also in a steady and notable decreasing trend. Moreover, according to the market forecasts (from the Bloomberg commodity price survey), the current decreasing trend in the Brent crude oil price and the natural gas price will continue over the medium-term.

⁴ FAO food price index is a weighted price index of a basket of food commodities, and is reported by the Food and Agriculture Organization of the United Nations. Bloomberg commodity price index is a weighted price index of a basket of commodities, computed using the prices of futures contracts on 23 physical commodities in the markets.

Figure 5: Global supply chain pressures, commodity and energy prices

Source: Eurostat, Federal Reserve Bank of New York, Bloomberg, Macrobond Financial AB.

Notes: The vertical red lines are placed to mark February 2022, the month of the Russian invasion of Ukraine.

The fall in commodity prices will lead to a decrease in the headline inflation rate, this in turn will slightly lift the pressure off the ECB to implement further rate hikes. Whether this would be the right policy or not depends on the developments in the core inflation rate, which is currently substantially above the 2% inflation target of the ECB and is itself sufficient for the ECB to tighten monetary policy.

2.3. Inflation expectations and wage developments

The main reasoning ECB policymakers provide in the support of contractionary monetary policy is the risk of de-anchoring of inflation expectations. A prominent member of the ECB's Executive Board, Isabel Schnabel, stated on 27 August 2022 during her Jackson Hole speech:

"The second observation tilting the trade-off facing monetary policy towards more forceful action relates to central banks' credibility ... We are witnessing a steady and sustained rise in medium and long-term inflation expectations in parts of the population that risks increasing inflation persistence beyond the initial shock ... Policymakers should also not pause at the first sign of a potential turn in inflationary pressure, such as an easing of supply chain disruptions. Rather, they need to signal their strong determination to bring inflation back to target quickly."

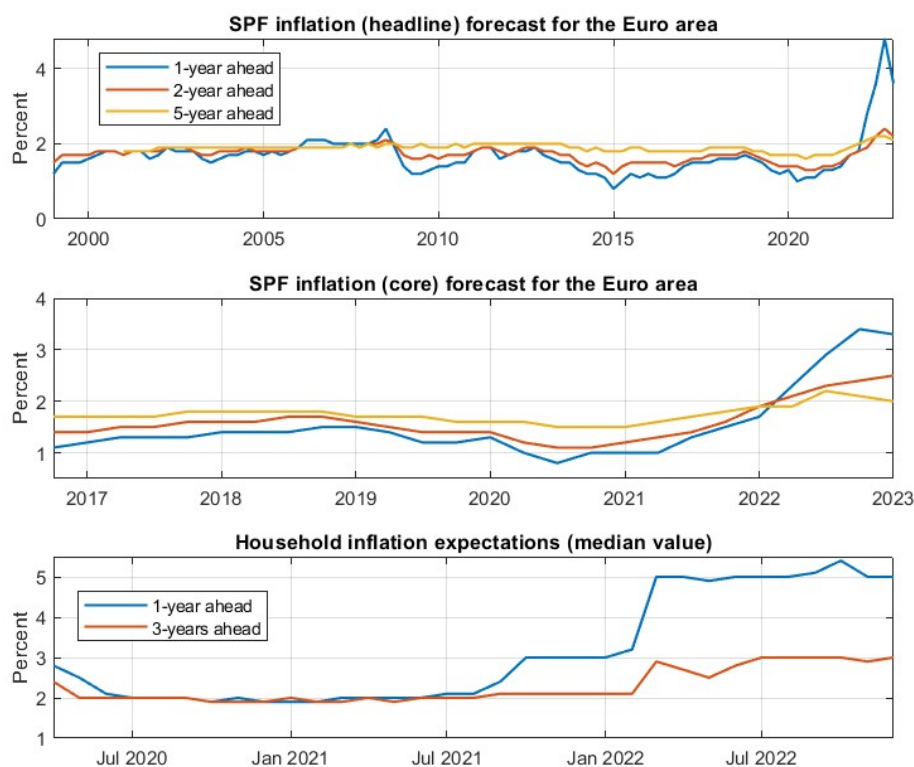
Policymakers are right to worry over rising market and household inflation expectations. If economic agents no longer trust the central bank, high inflation expectations can be entrenched, and inflation will turn out to be significantly more persistent and difficult to bring back down to the target. Moreover,

if a central bank does not react to rising inflation expectations before a significant loss in credibility, it might later render a more forceful monetary policy necessary.

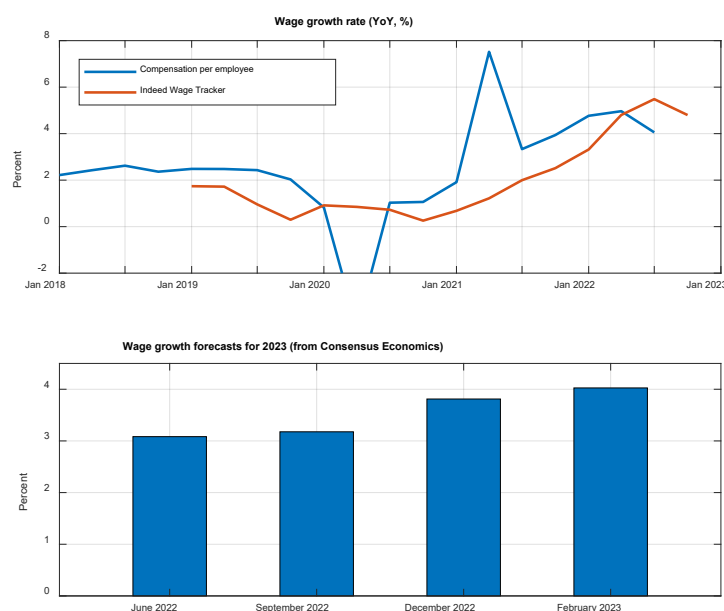
Figure 6 presents the market and household inflation expectations in the euro area. There are encouraging and worrying signals for the ECB. First, the one-year ahead headline inflation forecast from the 2023Q1 survey of professional forecasters (SPF) stands at 3.6%. This is considerably higher than the inflation target, yet it dropped from a 4.8% peak in 2022Q4. Second, although 2-year (medium-term) and 5-year (long-term) headline inflation forecasts are at record highs, they stand slightly above 2%, suggesting long-term expectations are still anchored. Third, the 1-year and 2-years ahead core inflation forecasts stand well above 2%, the target for headline inflation. Fourth, household inflation expectations are more un-anchored than market forecasts (expectations). The 1-year and 3-years ahead household expectations are 5% and 3%, respectively.

Although inflation expectations remain higher than ever before, the decline in market-based inflation expectations in 2023Q1 suggests that the contractionary monetary policy of the ECB starting in July 2022 curbed a further rise in expectations, which is critical to avoid another potential driver of persistent inflationary pressures: the wage-price spiral. If medium- and long-term inflation expectations become un-anchored, the risks of a wage-price spiral will significantly increase. As economic agents are forward-looking, they might seek further inflation compensation from their employers. This can, in turn, lead to more demand thus further price rises, and to firms increasing their prices due to the increase in labour costs, and eventually feed into a vicious circle.

Figure 6: Inflation expectations in the euro area



Source: ECB.

Figure 7: Wage growth developments and forecasts in the euro area

Source: Eurostat, Macrobond Financial AB, Consensus Economics.

Figure 7 presents the annual wage growth rate in the euro area (top panel) and the wage growth forecasts of market participants from the Consensus Economics survey (bottom panel). The two wage growth measures indicate an increase from 1-2% since the onset of 2021 to around 4-5% in mid-2022, which coincides with the rise in 1-year ahead household inflation expectations. However, the growth rate slowed down towards the end of 2022. Market-based wage growth forecasts currently stand at 4% for the end of 2023, and have been rising gradually in the last two quarters of 2023. These results point to further increases in wages but not to levels that are likely to set into motion a harmful wage-price dynamic. However, this does not mean that the ECB should not continue with its contractionary policy, as the result of such a counterfactual would most likely be rising inflation expectations, and thus wage growth expectations.

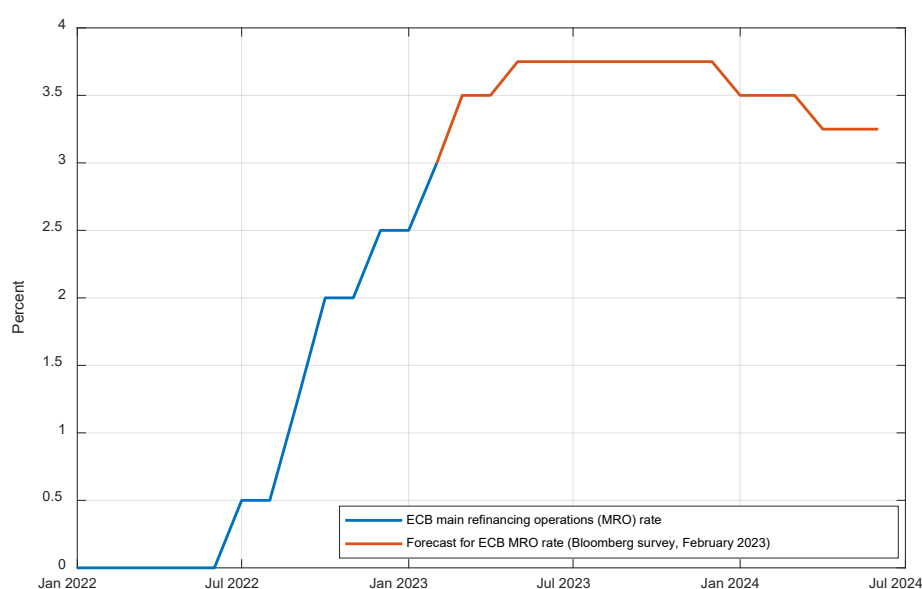
3. EFFECTIVENESS OF ECB POLICY AGAINST HIGH ENERGY PRICES

This section investigates the effects of monetary policy decisions on energy prices. In the first part, an overview of ECB monetary policy decisions over the last year is presented. The second part studies the effects of ECB decisions on energy prices in the euro area⁵. In addition, the third part presents the effects of the Federal Reserve (Fed) policy decisions on the euro area. This analysis is entirely based on the work of Ider et al. (2023).

3.1. Monetary policy decisions of the ECB

After a long period at the zero lower bound, on 21 July 2022, the ECB decided to raise the key interest rates by 50 basis points. This was the first in a series of rate hikes by the ECB: 75 basis points in September, 75 basis points in October, 50 basis points in December, and lately 50 basis points in February 2023. The current interest rate on the main refinancing operations (MRO) stands at 3%, however market forecasts indicate that the MRO rate will be raised to 3.75% by mid-2023, providing a market estimate of the terminal rate (see Figure 8). It is, however, important to note that the latest Bloomberg survey was conducted on 13 February 2023. The upside surprises in the preliminary euro area February headline and core inflation data released on 2 March 2023 might have raised the interest rate expectations in the market. In addition to the rate hikes, the ECB announced that its balance sheet related to the asset purchase programme (APP) will be reduced starting in March 2023.

Figure 8: ECB main refinancing operations (MRO) rate and market forecasts



Source: Bloomberg.

The main tool the ECB has in the fight against inflation is increasing its policy rates. A large amount of literature studies the effects of rate hikes on the economy, and it is well-established that contractionary monetary policy lowers economic activity and the price level (Gertler and Karadi, 2015; Jarocinski and

⁵ The Bayesian proxy SVAR model results and the impulse response functions of the euro area are presented in Annex I.

Karadi, 2020; Miranda-Agrippino and Ricco, 2021; Bauer and Swanson, 2022). Therefore, it is expected that central banks raise the interest rate when inflation is running over its target. However, during this inflationary episode, there has been a narrative suggesting that the ECB should not raise rates since the current inflation is mainly driven by energy prices.⁶ The literature is scarce on the effects of monetary policy on energy prices, therefore the rest of the paper aims to close this gap and provide empirical evidence for informed policy discussions.

3.2. Impact of ECB monetary policy on energy prices

We begin the analysis of ECB monetary policy decisions on energy prices with a high-frequency event study. This method is especially appropriate to investigate the causal effects of monetary policy on commodity prices, as the analysis focuses on a tight window around the policy announcements. This eliminates the possibility that the variation in the commodity price is confounded by other news, and yields unbiased estimates of the impact of monetary policy decisions. The focus here is on the oil price (which is traded in USD) and the natural gas price (which is traded in euros). Moreover, this analysis can shed light on the commonly made assumption that euro area energy demand, thus ECB monetary policy, cannot affect global energy prices. The implicit assumption made here is that the euro area is a small open economy (SOE) in the global energy markets, such as the oil market.

In order to study the impact of ECB monetary policy on the energy price, the following event study regression is estimated:

$$p_t = \alpha + \beta mps_t + \varepsilon_t$$

where p_t is the intraday variation in the oil price or the daily variation in the natural gas price, and mps_t is the monetary policy surprise for each ECB policy announcement on day t . The variation in the energy price is measured around the same tight window around the policy announcement in which the monetary policy surprise is measured. The monetary policy surprise is used as a proxy for a monetary policy shock, and is the intraday variation in the three-month overnight index swap (OIS) rate. Following Jarocinski and Karadi (2020), the “poor man’s sign restrictions” method is applied to the surprises to purge any central bank information effects in the surprise series. The intraday variation in the oil price is the change in the ICE Brent crude oil front-month futures (LCOc1) price, which is the benchmark global spot price quoted in the financial news, and has the highest liquidity. The daily variation in the natural gas price is the change in the ICE Dutch TTF price for the 1-month and the 1-year futures contracts.⁷

Table 1 presents the event study results for the impact of ECB policy announcements on the natural gas price. Each column presents the estimates for the combination of a different Dutch TTF maturity and a different sample period. The sample starts from October 2007 due to data availability for daily natural gas futures price data. The results clearly show that contractionary monetary policy decisions by the ECB decrease the natural gas price, both in the short- and medium-term (i.e. $\hat{\beta}$ is negative and statistically significant for both the 1-month and the 1-year futures). This result is robust to the inclusion of the pandemic period in the sample (see Columns 3 and 4). The natural gas market in Europe is considered to be a local market, therefore these results are not indicative of the potential impact of ECB policy decisions on an energy commodity that is traded globally, such as the Brent crude oil.

⁶ e.g. the opinion piece “Interest rate hikes are not the answer to Europe’s inflation problem” by Patrick Kaczmarczyk (on the London School of Economics blog)

⁷ The intraday variation in the three-month OIS rate around ECB policy announcements is provided by the EA-MPD database from Altavilla et al. (2019). The intraday variation in the LCOc1 around ECB policy announcements is computed by the authors using tick data from the Refinitiv Tick History database. Daily ICE Dutch TTF data is from Bloomberg.

Table 1: Coefficient estimate β for the natural gas price event study regressions for the ECB

	1-month TTF	1-year TTF	1-month TTF	1-year TTF
$\hat{\beta}$	-17.42 *** (4.50)	-12.32 *** (3.12)	-13.85 *** (3.92)	-13.41 *** (3.23)
R^2 (%)	2.68	2.61	1.39	2.69
Sample	2007:10 – 2019:12	2007:10 – 2019:12	2007:10 – 2021:12	2007:10 – 2021:12
N	127	127	143	143

Source: Authors' own elaboration.

Note: Daily ICE Dutch TTF data is available from October 2007. Daily change in the natural gas price is computed as the difference between the closing price of the ECB policy announcement day and the closing price of the previous day. Monetary policy surprise is the high frequency change in the three month Overnight Index Swap (OIS) rate with poor man's sign restrictions as in Jarocinski and Karadi (2020). Heteroskedasticity-consistent standard errors are reported in parentheses.

Table 2 presents the event study results for the impact of ECB policy announcements on the global oil price, the Brent crude oil price. The first column is for the longest sample the data is available for. The second column is for the sample excluding the pandemic period. The third column is for a sample that starts in January 2002. The reason for this sample addition is that in their event study analyses, in order to take into account the liquidity concerns for euro area OIS contracts prior to 2002, Altavilla et al. (2019), Andrade and Ferroni (2021), Kerssenfischer (2022) use the sample starting from 2002. The results show that contractionary monetary policy decisions by the ECB lead to a decline in the global oil price (i.e. $\hat{\beta}$ is negative and statistically significant for all sample periods). This is strong evidence against the prevalent assumption that the euro area is a SOE in the global energy market.

Table 2: Coefficient estimate β for the Brent crude oil price event study regressions for the ECB

	(1)	(2)	(3)
$\hat{\beta}$	-2.10 * (1.10)	-1.80 * (1.08)	-3.48 ** (1.14)
R^2 (%)	1.48	1.07	2.60
Sample	1999:1 – 2021:12	1999:1 – 2019:12	2002:1 – 2021:12
N	278	262	212

Source: Authors' own elaboration.

Note: Each column presents the event study regression for a different sample period. Monetary policy surprise is the high frequency change in the three month Overnight Index Swap (OIS) rate with poor man's sign restrictions as in Jarocinski and Karadi (2020). Heteroskedasticity-consistent standard errors are reported in parentheses.

The results for the high-frequency event study regressions for the global oil price and the natural gas price in Europe show that the ECB can lower energy-driven inflation by raising its policy rates. This finding is contrary to the widely-made assumption that ECB monetary policy cannot affect energy prices.

Although the method of high-frequency event study produces clean results and provides accurate information on the immediate impact of ECB monetary policy decisions on energy prices, it is not possible to make inference on the persistence of the effects. In order to study the dynamic effects of ECB monetary policy actions, a structural vector autoregression (SVAR) model for the euro area economy is set up.⁸ The main findings are twofold. First, a monetary tightening by the ECB leads to a strong fall in the global oil price. This provides further evidence that the ECB can decrease the global energy price through increasing the policy rate. Second, in response to the contractionary monetary policy, the consumer energy prices (HICP-energy) decline considerably more than the HICP. The effect is fairly persistent and important for the headline inflation rate.⁹

Furthermore, counterfactual experiments are conducted to quantify the significance of “the energy-price channel”¹⁰ of monetary policy in the euro area. Irrespective of the counterfactual method employed, the results show that the HICP-energy – and to a lower extent the HICP – would react considerably less to contractionary ECB monetary policy if the global oil price would not change in response. The impact of ECB policy on the global oil price is, therefore, found to be substantial and critical to bring down inflation back to target amidst energy-driven inflationary pressures.

The energy-price channel of monetary policy is often overlooked. A standard monetary policy model for the euro area maintains the simplifying assumption that the euro area is a SOE, which implicitly leads to the restriction that ECB monetary policy cannot affect global energy prices. The SOE assumption could potentially cause models to underestimate the impact of ECB monetary policy decisions on domestic energy prices, and thus on inflation. Moreover, the results suggest that the current narrative held by some economists that ECB policy cannot affect energy prices is based on false assumptions. This is critical when evaluating the rate hikes of the ECB, as this narrative has been the main argument against contractionary policy even prior to the Russian invasion of Ukraine which led to a sudden energy supply crunch.

3.3. Impact of US monetary policy on energy prices

The recent surge in inflation in the euro area emerged against the backdrop of inflationary pressures in the US, which led to the Fed hiking interest rates prior to the ECB. This led to a strong depreciation of the euro against the US dollar, inviting the narrative that the strong dollar will result in greater inflationary pressures in the euro area, especially through energy imports such as oil that are traded in USD. However, this narrative does not account for the fact that US contractionary monetary policy decreases global (energy) commodity prices. This is a transmission channel of spillovers of US monetary policy first documented by Degasperi, Hong and Ricco (2023). Therefore, a SVAR model, similar to the one for the euro area, is set up for the US economy.¹¹ In order to study the effects of US monetary policy on euro area inflation, the model is augmented with euro area HICP, HICP-energy and the industrial production index.¹²

⁸ See Annex I for the detailed analysis.

⁹ From the magnitudes of the responses of HICP-energy and HICP, and the fact that the expenditure weight of HICP-energy is around 10% of the aggregate consumer basket that is used to compute the HICP, it can be inferred that the decrease in HICP in the short-term is largely due to the fall in HICP-energy.

¹⁰ Throughout the paper, the transmission of monetary policy through the energy prices is called “the energy-price channel”.

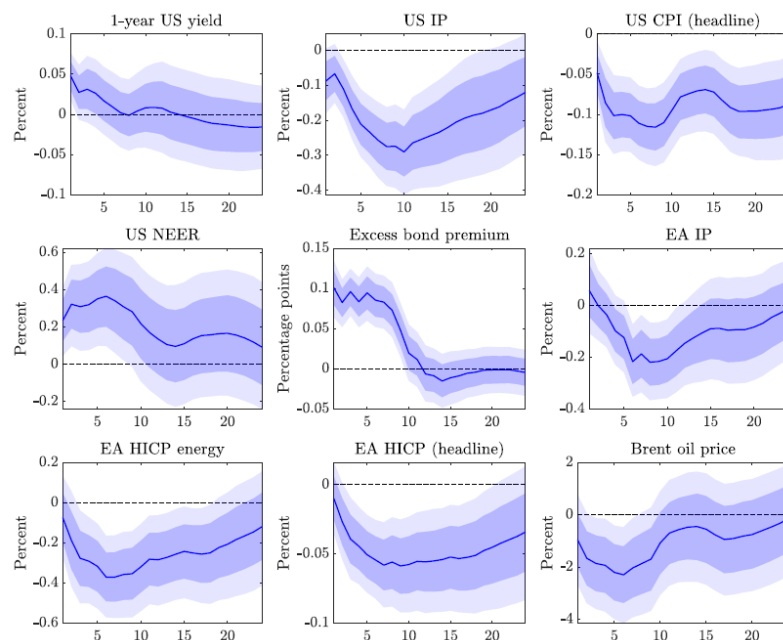
¹¹ The SVAR model for the US economy is estimated on a longer sample from January 1990 to December 2019. The time series for the monetary policy surprises in the US is available from an earlier date than for the ECB. The results for the US are robust to using the same sample as the euro area.

¹² See Annex I for a detailed analysis.

Figure 9 presents the estimates of the effects of a one standard deviation contractionary US monetary policy shock. In line with standard theory and the monetary policy literature, economic activity and consumer prices in the US decline, and the USD appreciates against other currencies. Importantly, for the purpose of this paper, the global oil price declines by around 2%, similar to the impact of the ECB. This leads to a fall in the consumer energy prices in the US as well as the euro area. This finding suggests that the appreciation of the USD is not the dominant channel through US monetary policy transmission to euro area consumer prices works.

The fall in euro area consumer energy prices and the headline price index is obviously not solely due to the Fed's impact on the global oil price, but also due to decreases in other import and domestic prices. However, it is clear these results indicate that a tightening in US monetary policy actually lowers inflation in the euro area, potentially reducing the pressure the ECB faces in times of high inflation. This result is not unique to this study. Breitenlechner, Georgiadis and Schumann (2022), and Degasperi, Hong and Ricco (2023) document that a tightening in US monetary policy lowers the headline price index in advanced economies. From the results, it can be inferred that the contraction in aggregate demand (global and domestic) and the fall in commodity prices dominate the impact of higher import prices.¹³ This finding is particularly important for the current debate as the energy price contribution in the euro area headline inflation is declining. Contractionary US monetary policy does not only reduce US demand but also the global demand, therefore deflationary pressure on commodity prices is likely to persist in the medium-term.

Figure 9: US monetary policy spillovers to the euro area



Source: Authors' own elaboration.

Notes: Impulse response functions to a one standard deviation monetary policy shock. Point-wise posteriors means are reported along with 68% and 90% point-wise probability bands. Horizontal axis is horizon in months.

¹³ Ider et al. (2023) additionally show this through counterfactual exercises. In order to gauge the importance of the global oil price response, the same counterfactual exercise (using the three available methods) undertaken for ECB monetary policy is repeated for the US. The results document that the impact of US monetary policy on global oil price is an important transmission channel of the spillover to the consumer energy and aggregate consumer prices in the euro area.

4. CONCLUSION

The supply-side factors contributing to the headline inflation in the euro area have eased considerably. The energy contribution is at a level last observed in mid-2021 (see Figure 1). The energy and food commodity prices have all declined to levels below prior to the Russian invasion of Ukraine, and global supply chain conditions significantly improved in 2022 (see Figure 5). These are considerable deflationary developments, and the headline inflation rate has steadily declined since its peak of 10.6% in October 2022. However, the core inflation rate continues its trend upward without any sign of slowing down, and currently stands 3.6 percentage points above the ECB's inflation target. Naturally, the markets expected the ECB to put an end to the loose monetary policy stance, and the ECB responded in 2022 by raising the policy rates by 300 basis points and announcing the start of the reduction of its balance sheet.

Since autumn 2021, two narratives have been circulating the debate on how the ECB should respond to rising inflation: (1) the ECB cannot decrease energy prices by increasing the interest rates, (2) the USD appreciation induced by tight US monetary policy is inflationary for the euro area economy, and thus the ECB should hike rates to protect the euro against the USD. The empirical evidence presented in this paper (entirely based on the work of Ider et al., 2023) strongly suggests that both of these narratives are incorrect: (1) the ECB can decrease energy prices by increasing the interest rates, and (2) contractionary US monetary policy is actually deflationary for the euro area economy, and one of the main channels of transmission is through the negative effect on the global energy prices.

The current headline and core inflation rates are both significantly higher than the ECB's target, and this increases the risk of de-anchoring inflation expectations that might lead to persistent inflationary pressures. Therefore, the ECB should tighten monetary policy even amidst easing supply-side pressures. The debate should not be about whether the ECB should maintain its current contractionary policy but about to what level the ECB should hike the rates. What should the terminal rate for the ECB be?

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ANNEX I: THE BAYESIAN PROXY SVAR MODEL - EURO AREA

This section studies how the effects of ECB monetary policy play out dynamically at business cycle frequency. To this end, a Bayesian proxy structural vector autoregressive (BP-SVAR) model is set up and estimated for the euro area economy (see Box 1 for details on the model).

Figure 10 presents the estimates of the effects of a one standard deviation ECB contractionary monetary policy shock for the euro area. In line with the standard theory and the monetary policy literature, industrial production and consumer prices fall significantly, and the euro appreciates against the US dollar. The main result of interest here is the sizable fall in the consumer energy price index (HICP-energy) and the global oil price. The HICP-energy falls significantly and considerably more than the headline consumer price index (HICP), particularly in the short-term. The expenditure weight of the HICP-energy is around 10% of the aggregate consumer basket that is used to compute the HICP. Therefore, it can be inferred that the short-term decline in the HICP is most likely due to the fall in the HICP-energy. An important driver of the drop in the HICP-energy is the large decrease in the global oil price in response to the contractionary monetary policy shock. The global oil price drops by 2.5% on impact, and thus should have a major contribution to the fall in consumer energy prices in the euro area.

This finding of the dynamic model provides further evidence (additional to the results of the event study) that contractionary monetary policy decisions by the ECB decrease global and consumer energy prices. Therefore, it can be concluded that “the energy-price channel” of monetary policy is important for its effects on inflation in the euro area. Building on this finding, the next step is to conduct counterfactual experiments to quantify the importance of the energy-price channel on inflation. Three different empirical counterfactual methods are utilised in this respect: the Structural Shock Counterfactual (SSC), the Structural Scenario Analysis (SSA) and the Minimum Relative Entropy (MRE).¹⁴ These methods provide a framework to simulate a counterfactual monetary policy shock with restrictions on the impulse responses. Specifically, the imposed restriction here is on the response of the global oil price to the monetary policy shock: the global oil price does not change in response to a contractionary monetary policy shock by the ECB.

¹⁴ Check Ider et al. (2023) for a detailed description of the counterfactual methods.

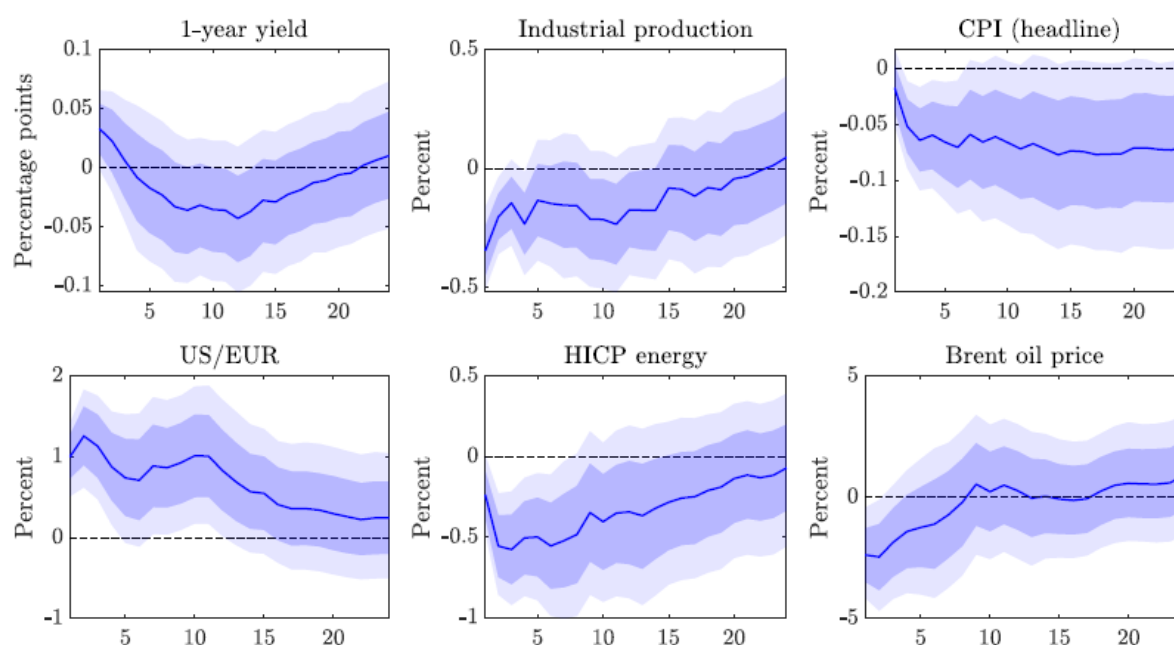
Box 1: Specification of the BP-SVAR model for the euro area economy

The BP-SVAR model for the euro area economy is estimated on a sample from January 1999 to February 2020, thus excluding the extraordinary volatility in the data induced by the Covid-19 pandemic. The model includes a constant, and has 12 lags of the endogenous variables as is usual for VAR models with data at monthly frequency. All variables enter the model in log-levels ($\times 100$), except for the interest rate, the credit spread, and the proxy which enter in levels. Flat priors are used for estimating the SVAR parameters. In addition, a relevance threshold is imposed to express the prior that the proxy is informative to identify monetary policy shocks. A prior of $\gamma = 0.1$ is set, imposing a threshold that the identified structural monetary policy shocks account for at least 10% of the variance in the proxy. This is a weak requirement relative to the threshold imposed in the literature.

The model contains seven variables, and the high-frequency monetary policy surprises to identify an ECB monetary policy shock. Following a large literature on monetary policy shock identification using high-frequency data, the following variables are included in the model: an interest rate as an indicator for the monetary policy stance, industrial production as a proxy for economic activity, a measure of the price level, as well as a credit spread as a proxy for financial conditions (Gertler and Karadi, 2015; Jarocinski and Karadi, 2020; Bauer and Swanson, 2022). To this standard monetary model we add the euro-US dollar (EUR-USD) exchange rate, the global oil price and a measure of consumer energy prices.

Specifically, the model includes the 1-year constant maturity yield on the German Bund as the monetary policy indicator. As the sample contains a considerable period of time at the zero lower bound (ZLB), it is important to use an interest rate that remains a valid measure of the monetary policy stance at the ZLB. Economic activity is measured by the euro area industrial production index (excluding construction). The (headline) HICP is used as the measure of the overall price level. The BBB corporate bond spread in the euro area is used to capture financial conditions. The Brent crude oil price is used as a measure of the global oil price. The energy index of the HICP is used as a measure of consumer energy prices in the euro area.

Source: Authors' own elaboration. The raw data is from EA-MPD introduced by Altavilla et al. (2019), Macrobond Financial AB, Eurostat, Energy Information Administration (EIA), and Federal Reserve Economic Data (FRED).

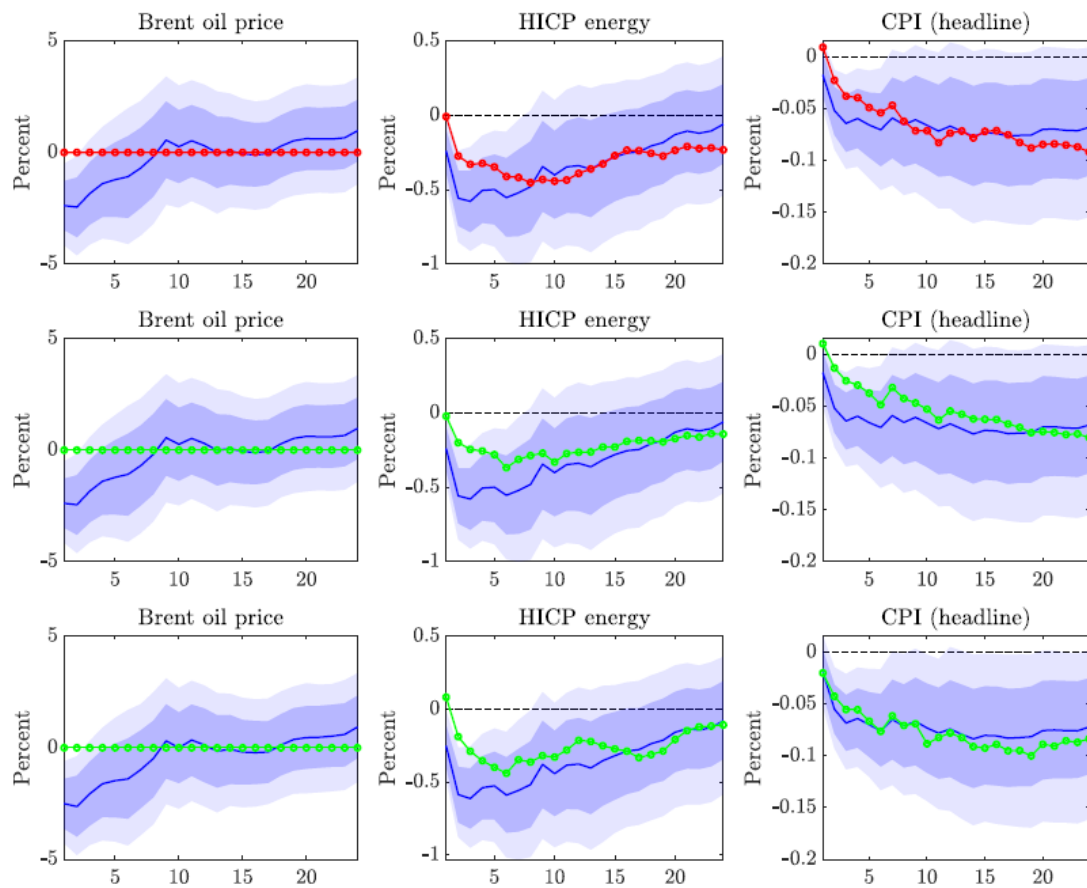
Figure 10: Euro area BP-SVAR model

Source: Authors' own elaboration.

Notes: Impulse response functions to a one standard deviation monetary policy shock. Point-wise posteriors means are reported along with 68% and 90% point-wise probability bands. Horizontal axis is horizon in months. The impulse response for the credit spread is not reported due to spatial constraints (see Ider et al., 2023).

Figure 11 presents the results of the counterfactual exercises using the three methods defined above.¹⁵ Irrespective of the method employed, it becomes apparent that the consumer energy prices in the euro area (HICP-energy) – and to a lower extent the headline HICP – react considerably less to a contractionary monetary policy shock if this shock would not affect the global oil price. The impact of ECB monetary policy on the global oil price is, therefore, found to be substantial, and critical to bring down inflation back to the target.

¹⁵ Solely the impulse responses of interest are reported for two reasons: (1) the counterfactual impulse responses of the other variables in the model do not exhibit sizable differences to their baseline responses; (2) including the full set of impulse responses for the three counterfactual methods produces convoluted plots. The full set of results are reported in Ider et al. (2023).

Figure 11: Counterfactual exercise: shutting down the oil price response

Source: Authors' own elaboration.

Notes: Red lines refer to the MRE counterfactual (the first row), green lines to the SSA (the second row) and the SSC (the third row). Impulse response functions to a one standard deviation monetary policy shock. Point-wise posteriors means are reported along with 68% and 90% point-wise probability bands. Horizontal axis is horizon in months.

Inflationary pressures in the euro area slightly eased over the last few months, mainly due to the decrease in energy prices. However, the core inflation rate still remains well above the ECB's target. A rise in inflation expectations is still a major risk to further increase in inflation, and thus should be monitored closely. We find that contractionary monetary policy by the ECB and the Fed decreases energy prices and the headline price level in the euro area.

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