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Soft or strong: the art of monetary tightening

Christophe Blot, Jérôme Creel

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IN-DEPTH ANALYSIS

Requested by the ECON Committee

Monetary Dialogue Papers, September 2022



Soft or strong: the art of monetary tightening



Policy Department for Economic, Scientific and Quality of Life Policies
Directorate-General for Internal Policies
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Soft or strong: the art of monetary tightening

Monetary Dialogue Papers
September 2022

Abstract

The rise of inflation has sparked tightening measures by the ECB. The paper discusses the causes of this rise and the factors that impinge on the effectiveness of ECB policy at curbing inflation. Drawing on own assessment of the respective trends in these factors, we recommend a careful approach to monetary policy.

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CONTENTS

LIST OF ABBREVIATIONS	4
LIST OF FIGURES	5
LIST OF TABLES	5
EXECUTIVE SUMMARY	6
1. INTRODUCTION	7
2. WHAT DRIVES INFLATION?	9
2.1. A monetary phenomenon?	9
2.2. Is current inflation related to supply or demand shocks?	12
3. WHAT CAN MONETARY POLICY DO TO DAMPEN INFLATION?	16
3.1. The nature of shocks	17
3.2. The duration (or persistence) and size of shocks	17
3.3. The internal or external source of inflation	17
3.4. The link between inflation, unemployment and output and the sacrifice ratio	18
3.5. Internal heterogeneity	18
3.6. The anchoring of expectations or the credibility argument	19
3.7. Leading or follower player?	22
4. CONCLUSIONS AND CONSIDERATIONS ON WHAT THE ECB SHOULD DO	23
REFERENCES	26

LIST OF ABBREVIATIONS

CPI	Consumer price index
ECB	European Central Bank
EP	European Parliament
EU	European Union
GDP	Gross domestic product
HICP	Harmonised index of consumer prices
IMF	International Monetary Fund
QE	Quantitative Easing

LIST OF FIGURES

Figure 1:	Inflation and unemployment rate in the euro area since 1999	8
Figure 2:	Consumer price index, all items (in variation from previous year, in %)	10
Figure 3:	M1 and M3 in the euro area (in EUR billions)	11
Figure 4:	ECB balance sheet (total liabilities) and money in circulation (in EUR billions)	11
Figure 5:	The contribution to inflation in the euro area	13
Figure 6:	Core inflation in the euro area and in the United States	13
Figure 7:	Factors limiting production in the euro area	14
Figure 8:	Main indices of inflation in the euro area	15
Figure 9:	Policy rate in the euro area according to a standard Taylor rule	16
Figure 10:	Discrepancy in HICP inflation rates across Member States of the euro area	19
Figure 11:	Inflation expectations in the euro area	21

LIST OF TABLES

Table 1:	Inflation expectations anchoring in the euro area	21
Table 2:	Recommendations in the face of the current situation	25

EXECUTIVE SUMMARY

- **One year ago, the rise of inflation was expected to be temporary. Yet inflation has turned to be higher than expected and more persistent**, leading the ECB to increase the policy rate in July 2022 and announcing “further normalisation”. Despite heterogeneity across euro area countries, the minimum inflation rate – registered for France – reaches 6%. Will a monetary policy tightening be successful for curbing the inflation rate without side effects? It depends on the nature of the shock.
- **It is very unlikely that the current episode of inflation stems from the monetary expansion implemented from 2009 to 2021 and notably from the quantitative easing.**
- **The current inflation in the euro area is largely explained by a global supply shock.** The rise of energy prices contributes significantly to inflation. The post-COVID recovery has also triggered disruption in the supply chains. Firms clearly indicate that shortage of materials and/or equipment and recruitment difficulties limit their production capacities and may consequently put upward pressure on prices. Nonetheless, there are signs that inflation also comes from the demand side even if the role of demand factors is less important than in the United States.
- **Central banks face a trade-off when inflation is driven by supply shocks since the reduction of inflation comes with a risk of recession.** It may even be ineffective if it is an external energy shock unless the implementation of monetary policy in the euro area is coordinated with other central banks.
- **As long as the shock is long-lasting, a tightening might be warranted to avoid second-round effects.** Not reacting to the current level of inflation might damage the ECB credibility. Even if the ability of central banks to manage inflation expectations is limited, mistrust might be growing towards the ECB as this institution is in charge of ensuring price stability in the euro area.
- **The ECB may also avoid too much discrepancy vis-à-vis the level of interest rate in the United States if it wants to limit imported inflation through a euro depreciation.** All in all, the ECB must fulfil its mandate and a more restrictive monetary policy is not escapable but we recommend a soft and slow tightening to avoid triggering a recession that would add to social pain with only moderate effect on the inflation rate.

1. INTRODUCTION

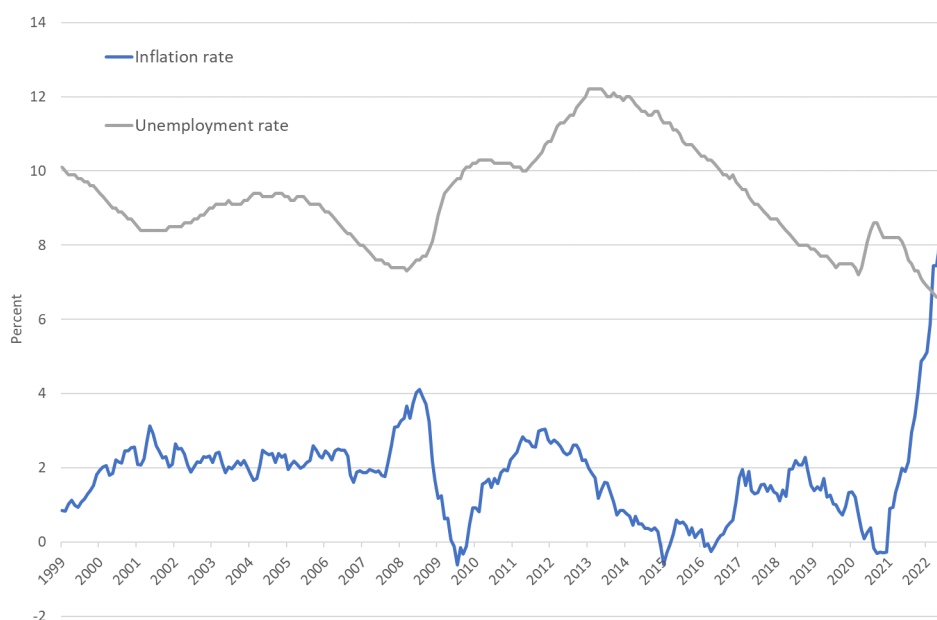
A few months ago, most central banks were still concerned about low inflation. The outbreak of the COVID-19 pandemic has been characterised by a reduction in the inflation rate. In 2020, the annual inflation rate has even reached a record low, at 0.2%, since the launch of the euro. Actually, the risk of deflation in the euro area and to a lesser extent in the United States remained pervasive since the global financial crisis in 2009. On average, the inflation rate stood at 1.2% between 2009 and 2020 in the euro area and 1.6% in the United States, far from the 2% inflation target of the European Central Bank (ECB) and the Federal Reserve. Inflation was seen as a distant memory and main thoughts focused on how to implement monetary policy in this low inflation environment. In its monetary policy strategy review, released in July 2021, the ECB claimed: "The experience gained since 2003 has reinforced the macroeconomic importance of an inflation buffer." Amid the background papers of this review, Koester et al. (2021) devoted their analysis on the low inflation period, claiming that some cyclical factors – persistent economic slack – and structural factors – such as globalisation, digitalisation and demographic factors – played a role. In 2017, despite the recovery – the GDP growth rate reached 2.8% – inflation did not exceed 1.5%.

Yet, this time is really different, and the 2021 economic rebound was accompanied by a surge of inflation to a record level not seen in most countries since the early 1980's (Figure 1). The shock was initially considered as temporary but it seems now that inflation has turned out to be higher than expected and more persistent.¹ According to Eurostat's flash estimate for August 2022, the inflation rate reached 9.1%, with the lowest rate observed in France (6.5%) and the highest observed in Estonia (25.2%). Meanwhile, the unemployment rate has continuously declined since August 2020 and stands now at 6.6%: a record low level since 1999, notably reflecting a rapid post-pandemic recovery. The annualised growth rate amounted to 3.9% in 2022-Q2.

Considering that the primary objective of the ECB's monetary policy is to maintain price stability and that "The Governing Council considers that price stability is best maintained by aiming for two per cent inflation over the medium term.", it may not be surprising that a first 0.5-point interest rate increase was decided in July. The Governing Council also clearly signalled that the normalisation would continue: "further normalisation of interest rates will be appropriate". This stance of monetary policy may at first sight be fully warranted. However, there are growing concerns about the economic climate. The war in Ukraine has amplified the rising trend of energy prices and triggered new uncertainties related to geopolitical risks. In its July update of the World Economic Outlook, the International Monetary Fund (IMF) expected a rapid slowdown of world growth as several negative shocks have materialised recently: uncertainty, energy prices and tighter financial conditions. In the euro area, annual growth would reach 2.6% in 2022 and 1.2% in 2023. Before the invasion of Ukraine by Russia, GDP was expected to increase by 3.9% in 2022 and 2.5% in 2023.

¹ This diagnosis was shared by Blot et al. (2021a) in the Monetary Dialogue.

Figure 1: Inflation and unemployment rate in the euro area since 1999



Source: Eurostat.

As the transmission of monetary policy strongly hinges on its impact on demand, a restrictive monetary policy might amplify the economic slowdown illustrating the trade-off faced by central banks in situations of high inflation and low growth. In June 2008, the ECB already faced a similar situation. Inflation was rising – with a peak slightly above 4% – and growth seemed to be solid despite growing financial turmoil. It was yet decided to increase the interest rate in July before being forced to back down a few weeks later. Undoubtedly the current situation is different as the nature of the shocks affecting the world economy is different. It is yet important to precisely assess the roots of the current inflation to set the appropriate stance for monetary policy. Should the ECB fear to backload the normalisation of monetary policy with the risk to let the inflation becoming uncontrollable or should it fear to be too much aggressive with the risk to break the recovery? The answer to this question will depend on a long list of features: the nature of the shocks: are there demand or supply shocks? Are those shocks transitory or long-lasting? Besides, even if interest rate hikes are necessary, should the ECB “normalise” its monetary policy, and should it become restrictive? What should the objective be for the policy rate in the coming months?

Before we come to these questions, we think it is worth recalling that former monetary policies like quantitative easing have only a limited responsibility in the current surge of inflation. We explain why in the next part and we also discuss other (and main) sources of current inflation rates in the euro area. Then we discuss the capacity of central banks, and the ECB in particular, to dampen inflation via tightening policies. Finally, we conclude with some recommendations regarding the future stance of ECB monetary policy.

2. WHAT DRIVES INFLATION?

2.1. A monetary phenomenon?

Some may ask whether the surge of world inflation is related to monetary expansion, hence to the decisions that central bankers have undertaken recently.

The advent of the global financial crisis in 2007-2009, the European sovereign debt crisis in 2011-2013 and the COVID-19 pandemic have all urged central bankers to resort to expansionary and unconventional measures like quantitative easing (QE). What is QE about, what are its (main) channels of transmission and how can it produce consumer inflation?

QE consists primarily in massive purchases of bonds (most importantly public bonds, otherwise low-risk private bonds) from private banks on secondary financial markets. QE is therefore mostly directed towards the management of financial portfolios. One prominent channel of transmission of QE is indeed the “portfolio channel”. While banks withdraw their holdings of public bonds or “safe” private bonds, they substitute them with stocks or riskier private bonds. Consequently, QE is expected to increase the prices of stocks and bonds. The effect on domestic demand is then indirect and related to the easing of financing conditions.

The rise of financial prices has no direct and immediate link to consumer inflation, unless higher financial prices generate a large private wealth effect via households’ consumption. In a survey of the literature, Paiella (2009) points to a “consensus view” that financial wealth effects exist, they are larger in the US and the UK than in continental Europe, and that the housing wealth effects are larger than the corresponding financial wealth effects. Paiella and Pistaferri (2017) confirm the latter point using Italian household-level data. Also with Italian data, Bottazzi et al. (2020) show that a fall of one euro in risky financial wealth resulted in cuts to annual total consumption of 9 cents. This cut was halved for non-durable goods consumption and was even smaller for food spending. With Swedish data, Di Maggio et al. (2020) show that the marginal propensity to consume unrealised capital gains is way higher for the bottom 50% of the wealth distribution than for the top 30% of the wealth distribution, but they acknowledge that the bottom 50% of the wealth distribution holds less than 7% of total stockholdings. All in all, it seems quite unreasonable to expect that a financial wealth effect in the euro area may trigger a rise in the inflation rate of non-durable goods. This wealth effect may yet add to the aggregate demand effect of monetary policy and inflation may arise if the aggregate domestic demand exceeds supply.

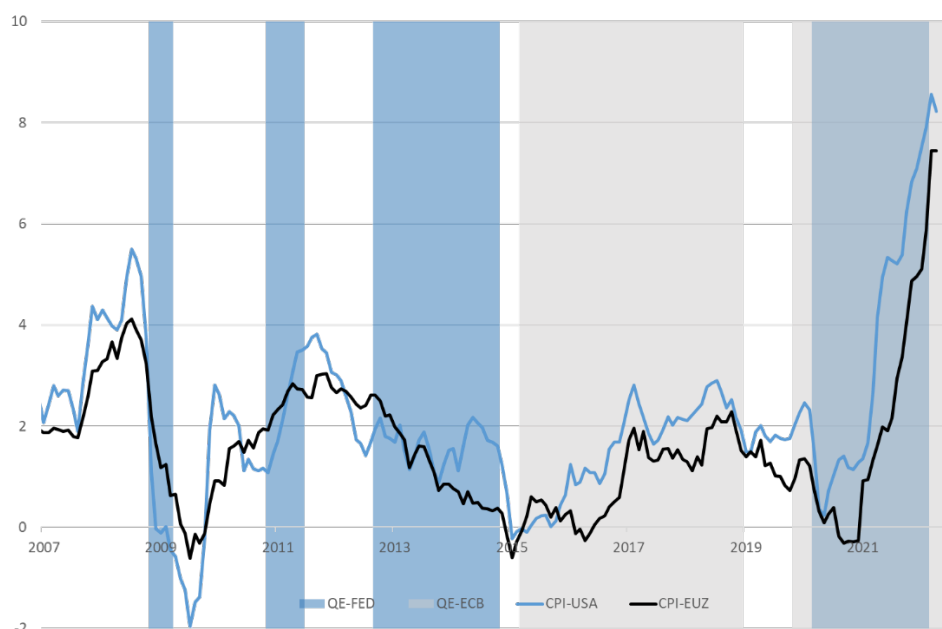
Under QE, it may well be that banks substitute their holdings of public bonds or “safe” private bonds with non-European public or private bonds. Consequently, QE would be expected to depreciate the currency and generate an exchange rate channel of monetary policy. The mere existence of this exchange rate channel in the euro area is open to debate. Dedola et al. (2021) show that a *relative* QE expansion between the ECB and the Federal Reserve would cause a depreciation of the euro: a rise of the ECB balance sheet by 20% of GDP, for a constant Fed balance sheet, would trigger a depreciation of 7% of the euro vis-à-vis the US dollar². In contrast, Gürkaynak et al. (2021) find that monetary policy surprises have a very limited or a non-significant impact on the exchange rate, when either Fed or ECB surprises are used under an event-study approach. More importantly, they find many abnormal episodes during which a monetary contraction leads to a depreciation of the currency. It may be added that whatever the evolution of the exchange rate after ECB monetary policy changes, the exchange

² With all Fed QE announcements between 2008 and 2012 and most ECB QE announcements after 2014, *relative* QE expansion between both central banks have been frequent, except during the COVID-19 crisis.

rate pass-through to consumer inflation (via imported products) in the EU has been found to be lower than in the 1990s, as Ortega and Osbat (2020) report. Nevertheless, they also show that there are large heterogeneities across countries and sectors and that unconventional policy measures have tended to increase the exchange rate pass-through. All in all, QE measures may have weighed on consumer inflation via imported inflation, but if they did, they should have intervened a year or a year and a half after measures were announced or implemented. On that issue, it would be surprising that the recent depreciation of the euro would result from QE measures.

This latter point raises a timing issue. If QE measures had finally led to higher consumer inflation, this effect should have started being visible in 2009, then in 2013 in the US, and in 2016 in the euro area. This is clearly not the case in 2009 and 2013 in the US³, and although inflation picked up a bit in 2017-2018 in the euro area, it was short-lived and occurred quite late after the start of QE in March 2015 (see Figure 2). Considering the surge of inflation in the US and Europe since 2021, attributing it to QE would require a very large financial wealth effect working primarily on the bottom of the wealth distribution for which the marginal propensity to consume is the highest. This is very unlikely. As for the exchange rate channel, it could not work during the pandemic because the ECB and the Federal Reserve were both expanding their balance sheets: the *relative* QE expansion was very limited. Finally, the 2009-2020 period was generally characterised by weak aggregate demand, explaining notably why inflation was muted during the period.

Figure 2: Consumer price index, all items (in variation from previous year, in %)



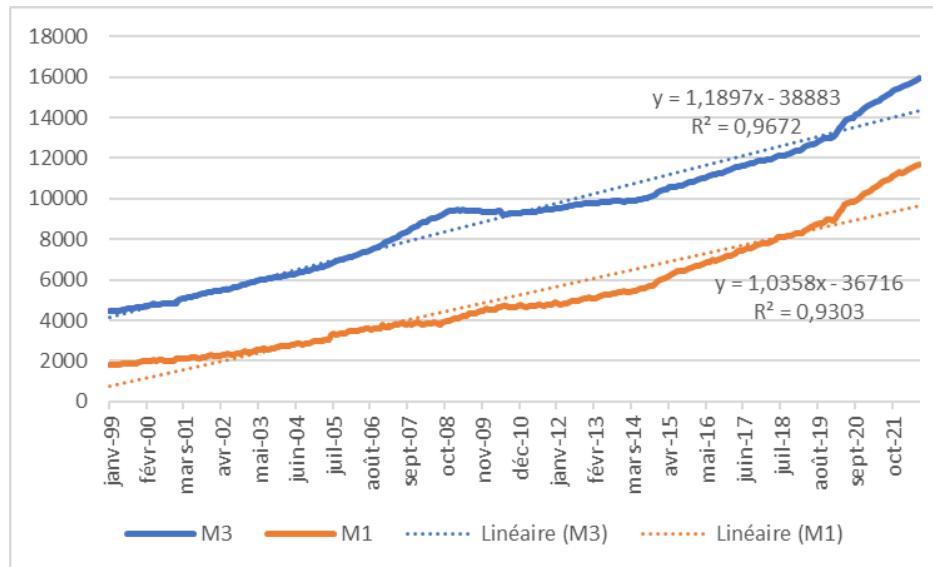
Sources: Eurostat, Bureau of Labor Statistics.

Beyond the portfolio and the exchange rate channels of monetary policy, there is another argument for a direct link between QE and consumer inflation: high liquidity from QE (via purchases of bonds held by banks) transmitted to an increase in money that, following the quantity theory of money, would have raised prices (in the long run). Beyond the fact that this argument mixes (almost

³ Under QE tightening after 2017, inflation has been decreasing actually.

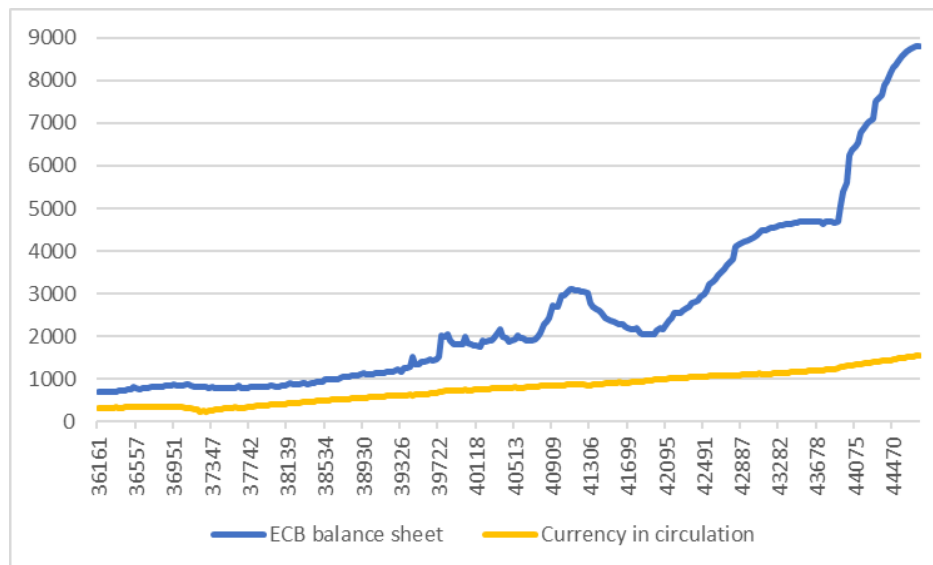
immediately) a financial transaction (savings' allocation) with a real transaction (consumption), it is not supported by the data. First and foremost, the rise in liquidity, as evidenced by monetary aggregates (M1 and M3, Figure 3), has been smoothed despite the hikes of QE measures. Stated differently, M1 and M3 did not accelerate during the implementation of QE. Last, money in circulation (M0) has become a smaller and smaller share of ECB liabilities over the years, as evidenced in Figure 4.

Figure 3: M1 and M3 in the euro area (in EUR billions)



Source: ECB.

Figure 4: ECB balance sheet (total liabilities) and money in circulation (in EUR billions)



Sources: Datastream and ECB.

2.2. Is current inflation related to supply or demand shocks?

It must first be stressed that the current surge of inflation is a global phenomenon which was notably fuelled by energy prices.⁴ Oil prices increased rapidly from the low level observed during the lockdown in spring 2020. The rise in oil demand was stronger than the rise in oil production triggering a first increase from USD 27 in April 2020 to USD 86 before the invasion of Ukraine by Russia. Besides, not only did oil prices increase but also gas prices rose to unprecedented levels. On European spot gas markets, the average price in 2019-2020 was EUR 11.5 per megawatt hour. Since 2021-Q3, it stands above EUR 90 and in August 2022 the average price reached EUR 235 (data for Dutch TTF Natural Gas Futures uploaded from Datastream). For the euro area, the yearly increase of the index for energy prices exceeds 30% since February 2022, accounting for nearly half of total inflation rate in 2022-Q2 (Figure 5).

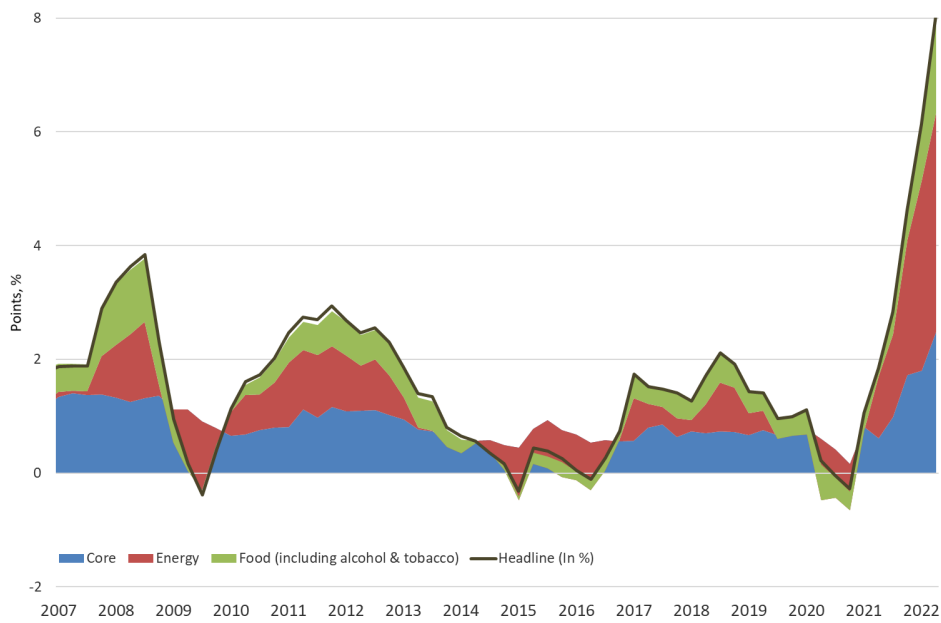
Climate conditions and the geopolitical situation also triggered a rise in the price of food, which contributed to inflation: 1.7 point in 2022-Q2. The contribution of energy and food prices amounts to 5.5 points for an inflation rate of 8% in 2022-Q2. The current inflation in the euro area is therefore explained by a global external shock.

It may yet be noticed that the contribution of core inflation – excluding energy, food & alcoholic beverage prices – has also increased suggesting that inflation is not only driven by an energy shock. In July 2022, core inflation has also reached a record level of 4%, whereas it was only 0.7% a year ago. It remains that core inflation remains lower in the euro area compared to the United States (Figure 6) suggesting some important differences between the two areas.

Beyond the role of energy prices, do other supply factors matter or is the rise in inflation related to demand? On the one hand, the consequences of the pandemic on the world economy have not come to an end. Even if strongest lockdown measures have been progressively phased out, some factories are still shut down (notably in Asia) triggering supply chain disruptions as most economies are interconnected. Labour force may also have been reduced due to stay-at-home orders in case of infection to COVID-19. Consequently, shipping costs have increased, and delivery times have been extended. Business surveys indicate that production is limited due to shortage of materials and/or equipment and firms also report difficulties to fill jobs (Figure 7). The current period clearly contrasts with the Great Recession in 2009 where, according to firms in the euro area, demand was the main factor limiting production.

⁴ In the United States, inflation measured by the consumer price index amounted to 8.5% in July. It has exceeded 10% in the United Kingdom. Among industrial countries, inflation is slightly lower – but reaches yet high levels – in Canada (7.6%), South Korea (6%) except for Japan (2.6%). In Emerging countries, inflation stands at 10% for instance in Brazil, 6.7% in India, 8.2% in Mexico and nearly 80% in Turkey.

Figure 5: The contribution to inflation in the euro area



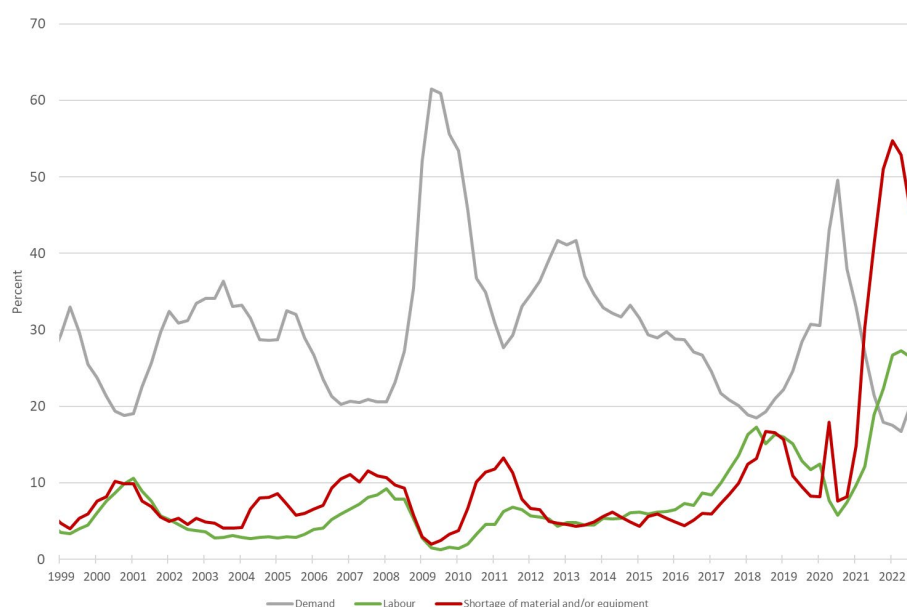
Source: Eurostat.

Figure 6: Core inflation in the euro area and in the United States



Sources: Eurostat, Bureau of Labor Statistics.

Figure 7: Factors limiting production in the euro area



Source: European Commission (Business survey).

On the other hand, activity was still undershooting in some services with more physical contacts. Households' consumption of goods has rapidly resumed in the US whereas expenditures for recreation or food services remained lower. Considering the size of the US economy, the switch toward the consumption of goods is not only a demand shock in the United States but may also trigger production constraints for the world economy as supply is partly soaked up by US demand. In 2022-Q2, the US consumption of goods is indeed 15% higher than in 2019-Q4 whereas it is only 0.9% higher for services.⁵ In the euro area, households' losses in labour incomes have been compensated through the partial activity schemes and governments have also implemented stimulus measures for firms and to stimulate demand. These measures may have also boosted inflation in a context of supply chain disruptions.

However, it is hard to disentangle the role of supply and demand factors. In a recent analysis, Akindi et al. (2022) have assessed the extent to which supply factors help to explain the inflation rate for goods. To that end, they estimate the respective contributions of the global supply chain pressure index (GSCPI) computed by economists from the Federal Reserve and of oil prices on inflation.⁶ They show that in the United States and the euro area, consumer price index (CPI) inflation on industrial goods is well captured by the role of these supply and external (energy) factors. However, it may be noticed that the price of goods of services have also increased whereas the role of international factors should be less important (Figure 8). In July, the inflation rate of services has reached a record at 3.7% suggesting that the contribution of demand factors should also be considered. For the United States, a model-based analysis carried out by di Giovanni (2022) suggests that the aggregate demand shock would account for 60% of inflation.⁷ However, the euro area is not the United States and even if the fiscal

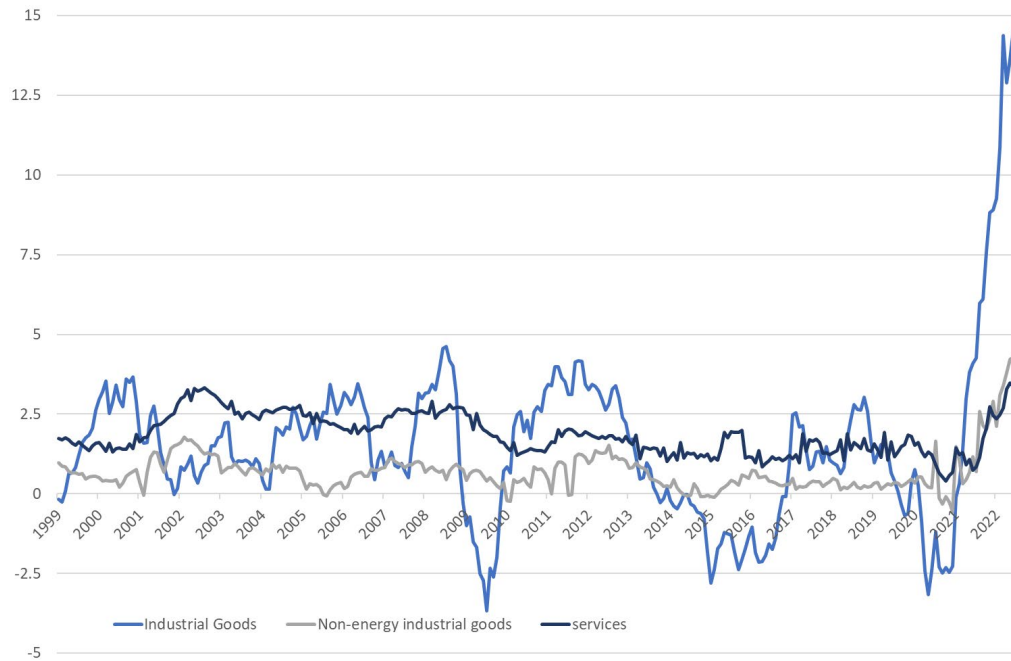
⁵ For recreation services and food services, the level of households' consumption is respectively 11% and 9% lower than in the end of 2019. In Germany and France, consumption of goods in 2022-Q2 remains lower in 2022-Q2 than in 2019-Q4: respectively -2.2% and -2.6% lower.

⁶ For assessing the role of oil prices, they disentangle the contribution of supply and demand factors on the oil market.

⁷ In the United States, the debate on inflation ignited after the Biden's election and its proposal for the American Rescue Plan. Lawrence Summers and Olivier Blanchard notably warned that it would feed inflation.

stimulus played a crucial role for limiting losses of incomes, the total package of measures implemented in 2020 and 2021 was much lower than all the measures from which US households have benefited.⁸

Figure 8: Main indices of inflation in the euro area



Source: Eurostat.

All in all, one major contribution to the current surge of inflation in the euro area lies on the supply side, but it may be excessive to attribute all this surge to supply chain disruptions and oil and gas prices. There are signs that inflation comes from the demand side via e.g., the catch-up in activity of some services. The role of demand may however be less important than it is in the United States.

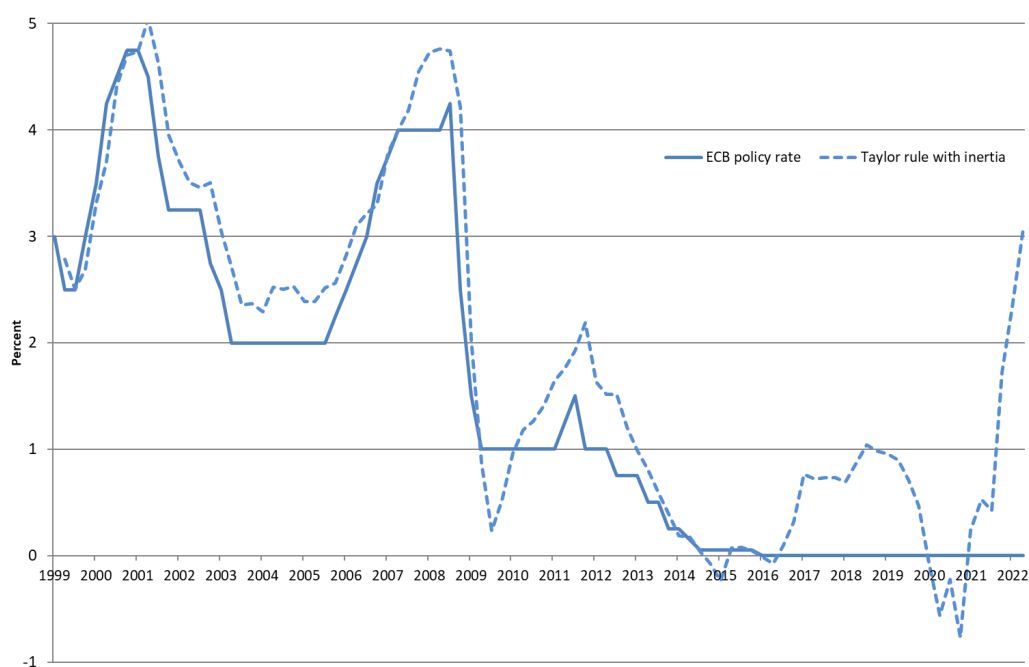
⁸ See Blot and Plane (2021) for a comparison of fiscal plans implemented in 2020 and 2021 in the United States and main euro area countries. Measures in favour of households plus partial activity schemes have amounted to more than 9% of 2019-GDP in the United States whereas it did not exceed 3% in Germany, France, Italy and Spain.

3. WHAT CAN MONETARY POLICY DO TO DAMPEN INFLATION?

In the previous section, we have argued that it is difficult to blame ECB monetary policy for the recent surge of inflation. Not only has QE been largely connected with finance rather than with the real economy but the sources of inflation have largely come from the rise in energy prices, the costs of transportation and bottlenecks on which monetary policy has no direct responsibility.

However, euro area inflation rate is well above the ECB inflation target and according to the Treaty, the first task of monetary policy is to promote price stability. By the way, the simulation of a standard Taylor rule indicates that an interest rate increase is warranted (Figure 9). The Taylor rule assumes that the usual tool of central banks is the policy rate that they can raise to increase borrowing costs to firms and households and therefore dampen economic activity. Although the difference between the Taylor-rule-induced policy rate and the actual policy rate can be useful to provide a simple assessment of the stance of monetary policy, it is an imperfect guide to provide recommendation for central banks. It does notably not account for the sources of inflation although they may matter to understand the subsequent effect of a monetary policy tightening or easing on the economy. In other words, the question is whether raising the policy rate to 3% would lead to a reduction of the inflation rate in the euro area?

Figure 9: Policy rate in the euro area according to a standard Taylor rule



Sources: Eurostat, European Commission (AMECO) and authors calculations.

Note: The interest rate implied by the Taylor rule is computed according to the following equation: $i_t = 0.75 \times i_{t-1} + 0.25 \times [i^* + 1.5 \times (\pi_t - \bar{\pi}) + 0.5 \times (y_t - \bar{y}_t)]$ with $i^* = 1.5$ and $\bar{\pi}$, the inflation target set at 2%. Finally, $y_t - \bar{y}_t$ is the output gap as measured by the European Commission (AMECO).

It depends on the several factors that determine how effective monetary policy may be at reducing inflation. These factors are listed below and most are well-known.

3.1. The nature of shocks

A macroeconomic shock may come from the domestic supply side of the economy, from the domestic demand side, or from both of them as the recent pandemic has shown. After a positive demand shock, like a fiscal stimulus, a rise in the policy rate is expected to slow down demand for credit and then slow down aggregate demand. In this setting, monetary policy will be stabilising. After a negative supply shock, like a drop in productivity, a rise in the policy rate will intensify the difficulties of firms via higher borrowing costs, will lead to lower demand for credit and to lower activity. In this setting, tighter monetary policy will be destabilising. Inflation might still be reduced through the effect of monetary policy on demand but at the cost of a potential recession. In that case, it does not address the sources of inflation, as inflation stems from a lack of production capacities. It may even amplify the supply constraint if the increase in the interest rate deters firms from investing in production capacities. Yet, it may be worth reminding that the mandate of the central bank does not disentangle demand-driven from supply-driven inflation. In the end, after a demand shock, monetary policy tightening is the optimal decision whereas after a supply shock, the same policy decision has inevitable negative side-effects.

3.2. The duration (or persistence) and size of shocks

Modifying the policy rate will shift economic behaviours and generate (transaction) costs to economic agents. The more stable the policy rate, the lower these costs. If a macroeconomic shock is assumed to be permanent or at least highly persistent, the policy reaction is expected to see its direct costs (modifying the policy rate) compensated by the benefits of macroeconomic stabilisation. In contrast, if the shock is perceived as temporary, the policy reaction may be sub-optimal: it is costly without accelerating macroeconomic stabilisation (that would have occurred anyway). This argument may notably be combined with the nature of the shock. For a temporary supply shock, it would not be optimal for central banks to tighten monetary policy as the rise of inflation will be short-lived. However, even temporary shocks may have long-lasting effects on inflation if they trigger second-round effects. In that case, monetary policy tightening may be an option. Besides, there may be some uncertainty regarding the duration of the shock. If the shock is perceived as temporary but turns to be persistent, the central bank may be constrained to tighten more severely when it realizes its initial diagnosis was wrong.

Finally, the size of shock also matters: the larger the shock, the larger the reaction to it and the higher the incurred (transaction) costs. Arguments about the advent of the Great Moderation of prices and high stability sometimes revolve around “good luck”: between the mid-1980s and mid-2000s, the low variance of the shocks to the economy has played a role in the Great Moderation and has permitted central banks to use their policy rate smoothly and parsimoniously. This time will certainly be different.

3.3. The internal or external source of inflation

Monetary policy is expected to be more effective at dampening inflation if it is driven domestically than if it is imported. After a domestic shock, monetary policy has full weight on the economy to help it stabilise. After an external shock, an energy price shock for instance, monetary policy has a weight on the world economy that is proportionate to its size. After a rise in the price of oil – a supply shock -, the rise in the policy rate will reduce aggregate demand (not exactly stabilising in the short run as point 3.1 already discussed), that in turn will reduce global demand for oil in proportion to the size of the domestic economy. But even the largest economy makes a tiny share of global demand for oil. Hence, domestic monetary policy, even in a large country, will not make the price of oil fall on its own. Here again, monetary policy may fix the consequences – as inflation can be brought to the target insofar as

domestic demand is reduced – but not the *causes* of inflation. In that case, policy coordination may be the best option as it would help to reduce world demand. It is indeed better to provide a world soft tightening than a more aggressive domestic tightening.

3.4. The link between inflation, unemployment and output and the sacrifice ratio

According to the Phillips curve, there would be a negative empirical relationship between the inflation and unemployment rates, hence the possibility of a policy trade-off between them. According to Okun's law, there would be a negative relationship between the variation in the unemployment rate and the output. From these two relationships, it is therefore possible to compute a sacrifice ratio. This ratio measures the cost of reducing the inflation rate in terms of higher unemployment rate (or lower economic activity). The lower the sacrifice ratio, the lower the cost of disinflation in terms of unemployment and output and the lower the requested rise in the interest rate. In contrast, if the Phillips curve is flat, as it is sometimes claimed, the cost of disinflation in terms of unemployment and output will be much higher: the central bank will have to raise its policy rate steeply to achieve a lower inflation rate while having to tolerate a substantial cost to the real economy.

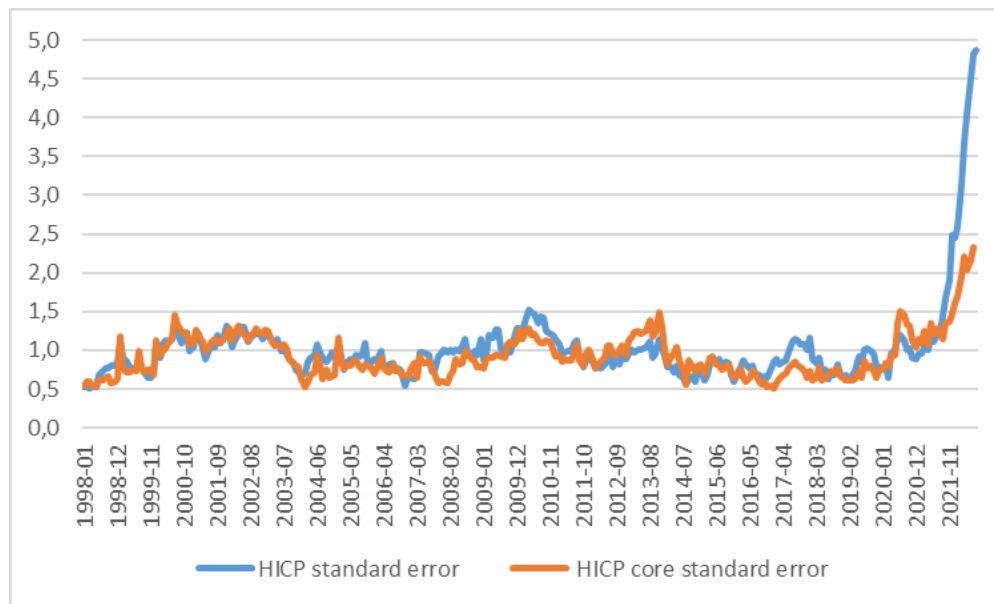
3.5. Internal heterogeneity

Monetary policy will be effective if it tends to reduce inflation uniformly across sectors and regions (or countries), otherwise it will produce biases like an incentive to produce in sectors where prices are the highest (where there are higher markups) or an incentive to produce in countries where prices are the lowest (where price competitiveness is higher). Hence, the lower internal heterogeneity, the more effective monetary policy for it produces fewer changes in private behaviours (like shifts in production across sectors or countries). Heterogeneity across sectors and/or across regions (or countries) that is being discussed here relates to the differences in the economic structure of sectors or countries: degrees of openness, price elasticities, share of imported energy in the energy mix, etc.

This kind of heterogeneity also bears on the effectiveness of monetary policy at limiting inflation through a different channel specific to a monetary union. High structural heterogeneity across sectors and/or regions may also reveal large differences in inflation across sectors and/or regions: imported inflation will be high in a large energy-importing country. In a monetary union like the euro area, though, the single monetary policy will act "on average": it will target an inflation rate which is the (weighted) average of all-sector and all-country inflation rates. If these inflation rates deviate across sectors and countries, targeting the average inflation rate will create dissatisfaction. Sectors and countries with large inflation will find that monetary policy reaction is too mild, whereas sectors and countries with low inflation will find it is too strong.

While it is very clear from the data that heterogeneity of inflation rates across euro area countries has increased recently, even for core inflation (hence excluding energy and food prices) (Figure 10), inflation is above 2% in *all* euro area countries. This latter fact calls for a monetary tightening.

Figure 10: Discrepancy in HICP inflation rates across Member States of the euro area



Sources: Datastream and Eurostat.

Notes: Discrepancy has been computed as the standard error of individual countries' monthly inflation rates, whether the headline HICP or the core HICP. The measure is corrected for the actual number of countries per year, hence following the sequential changes in euro area membership from 11 countries in 1999 to 19 since 2015. The measure is not weighted for the size of countries.

3.6. The anchoring of expectations or the credibility argument

Policy actions may be driven by the requirement to preserve credibility, as Schnabel (2022) has forcefully argued in August 2022 at the Jackson Hole meeting. If no policy action is taken or if central banks react too slowly to inflation, inflation may continue, and the people may blame the central bank for this situation. They may withdraw their trust in the ability of the central bank to achieve price stability and this may lead to an entrenchment of current inflation into higher inflation expectations. Higher inflation expectations would then produce "second-round effects" like rising (real) wages that would generate more costs and volatility in the economy. Consequently, monetary policy will be perceived as effective if it is able to anchor inflation expectations. Hence policy action along the Taylor principle: the policy rate should increase by more than the inflation rate to raise the real interest rate.

The lasting effect of the current episode of inflation may crucially depend on the anchoring of expectations. As reminded in Blot et al. (2022), inflation expectations may only be proxied with various indicators: market-based, survey from professional forecasters or from households and firms. In the euro area, these indicators point to an increase of expected inflation. The 1-year ahead inflation rate expectation from the ECB Survey of Professional Forecasters (SPF) is above 3.5% in 2022-Q3. However, at short horizons, it does not indicate that expectations are de-anchoring but more probably that professional forecasters expect that the current shock will drive inflation up in 2023.

Anchoring may be captured with the analysis of long-term expectations. There is evidence that these indicators have also increased but moderately when expectations are measured from professional forecasters. Market-based expectations suggest a rapid increase from a record low level at 1% in 2020-Q2 to 2.3% in 2022-Q3. This change may also be seen as a re-anchoring of expectations above but close to the 2% target. Empirical analyses generally consider that inflation expectations are anchored if they show little or no reaction to new information (shock anchoring) or if there is a weak relationship

between observed and expected inflation (level anchoring).⁹ Following Ehrmann (2015), we assess anchoring properties of inflation expectations from professional forecasters in the euro area by accounting for potential non-linearities. To that end, we estimate the two following equations between 1999:Q1 and 2021:Q4:

$$(1) E_t(\pi_{t+k}) = \alpha + \beta_1 \cdot \pi_{t-1} + \beta_2 \cdot (\pi_{t-1})^2 + \gamma \cdot \mu_t^M + \theta \cdot Z_t + \epsilon_t$$

$$(2) E_t(\pi_{t+k}) = \alpha + \beta_1 \cdot \pi_{t-1} + \gamma_1 \cdot D^{high} \cdot \pi_{t-1} + \gamma \cdot \mu_t^M + \theta \cdot Z_t + \eta_t$$

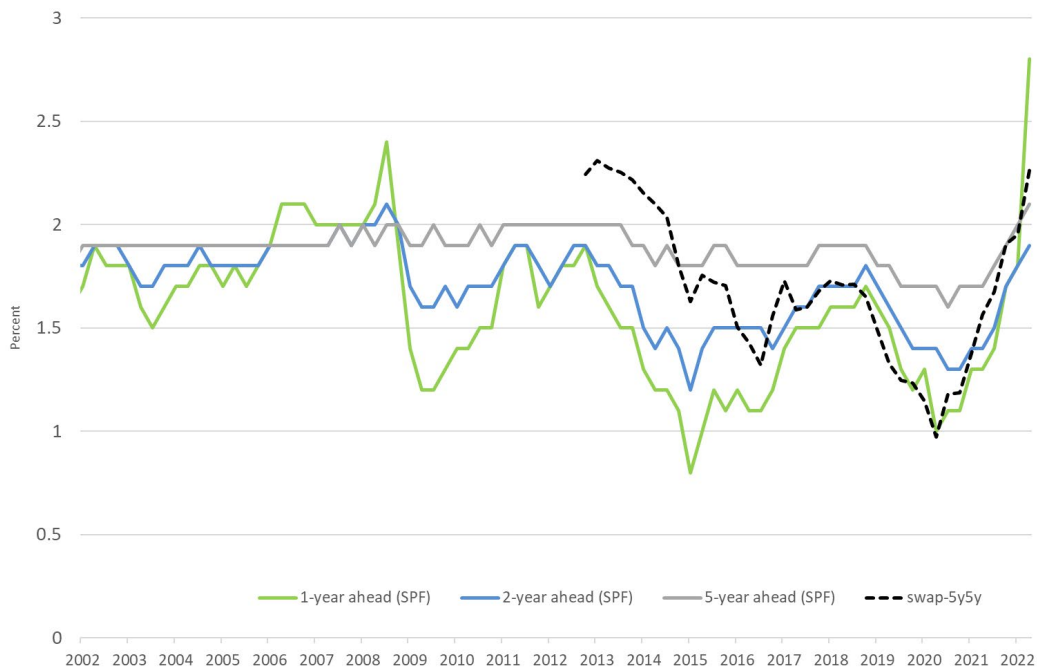
where $E_t(\pi_{t+k})$ stands for expected inflation k-year ahead and π_t is the inflation rate of the euro area at time (t). In equation [1], non-linearity is measured by square inflation and captured by β_2 . In equation [2], we disentangle regimes of high-inflation and “not-high-inflation”. D^{high} is a dummy variable equal to 1 when inflation is above 1.9% for at least three quarters.¹⁰ The vector Z_t includes some control variables (growth of oil prices and the quarterly GDP growth rate) and μ_t^M is a monetary policy shock as measured in Altavilla et al. (2019). Thus, we may assess whether inflation expectations are level-anchored at the 1-year ahead, 2-year ahead and 5-year ahead horizons but also whether monetary policy influences expectations. This hypothesis is also crucial regarding the credibility argument. The monetary policy tightening may indeed be warranted if it helps central banks to reduce inflation expectations when they lie above their target.

The results of equation [1] and [2] are shown in Table 1. At short-term horizons (4-quarter and 8-quarter), realised inflation has a significant effect on expected inflation. The effect does however vanish at the 5-year ahead horizon but only for the estimation of equation [1]. As stressed above, in the short-term forecasters may consider that short-term shocks will still drive inflation in the year after. The effect of inflation is lower for the 8-quarter horizon certainly reflecting the view that the effect of short-term shocks will be attenuated. With specification [2], there are signs that expected inflation is not anchored as an increase of inflation may still be followed by a rise of expected inflation. Besides, proxies for non-linearities are not significant and this suggests that de-anchoring may not necessarily happen when the environment is characterised by “high-inflation”. It may be noticed that over the period of estimation, inflation has never reached levels observed today so that we cannot exclude that non-linearities may be observed for higher levels of inflation.

⁹ See Ball and Mazumder (2011).

¹⁰ The threshold has been set to the median-level of inflation rate in the euro area. However, as we consider that a “high-inflation” regime is characterized by an inflation rate above the threshold for at least three quarters, we identify “high-inflation” regime for 37% of the sample.

Figure 11: Inflation expectations in the euro area



Sources: ECB (SPF), Refinitiv Eikon Datastream.

Table 1: Inflation expectations anchoring in the euro area

	4-quarter ahead	4-quarter ahead	8-quarter ahead	8-quarter ahead	5-year ahead	5-year ahead
π_{t-1}	0.258*** [0.07]	0.295*** [0.04]	0.157*** [0.05]	0.167*** [0.03]	0.042 [0.03]	0.053*** [0.02]
$(\pi_{t-1})^2$	0.009 [0.02]		0.004 [0.01]		0.003 [0.01]	
$D^{high}.\pi_{t-1}$		0.00 [0.03]		0.004 [0.02]		-0.002 [0.01]
μ_t^M	0.002 [0.00]	0.002 [0.00]	-0.003 [0.00]	-0.003 [0.00]	-0.002 [0.00]	-0.003 [0.00]
Constant	1.100*** [0.04]	1.082*** [0.03]	1.417*** [0.05]	1.413*** [0.04]	1.797*** [0.03]	1.791*** [0.04]
Number of obs.	88	88	88	88	84	84

Source: Authors' estimations.

Note: Equations are estimated over the period 1999:Q1-2021:Q4 with the Newey-West estimator to account for a potential residuals auto-correlation. Standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01.

Finally, our results suggest that monetary policy captured here by high-frequency shocks does not influence professional forecasters' expectations.¹¹ A monetary policy tightening would therefore not help to reinforce the credibility of monetary policy. These results echo those of Coibion et al. (2020) who find that households' and firms' expectations do not respond much to monetary policy.

However, it may still be argued that it is the job of central banks to promote price stability and they would be blamed if they stay inactive when inflation strongly exceeds the target over a protracted period. Credibility is not only a matter of inflation expectations but is also related to trust in institutions in charge of a given objective.

3.7. Leading or follower player?

There are obviously interconnections between monetary policies in the world economy. Actually, shifts in the Fed's and ECB's monetary policies have spillover effects to the rest of the world. This works on macroeconomic (e.g. world GDP) and financial variables (e.g. global capital flows) (see Miranda-Agrippino and Nenova, 2022). A US monetary policy shock has also an impact on the exchange rate: it appreciates the US dollar (see Degasperis et al., 2021). The asynchronous stances of monetary policies between the Fed and the ECB (the Fed increased its policy rate earlier) may drive a depreciation of the euro that may in turn feed imported inflation and capital outflows. Under a mandate of price stability, the ECB may thus avoid too much discrepancy between its stance of monetary policy and the Federal Reserve's stance. Raising interest rates may be a way to limit imported inflation through a euro depreciation, to keep credibility (point 3.6) and limit capital volatility.

¹¹ Analysing shock anchoring of expectations with high-frequency data, Blot et al. (2022) also found that monetary policy shocks do not significantly affect inflation expectations for various horizons (see Table 1).

4. CONCLUSIONS AND CONSIDERATIONS ON WHAT THE ECB SHOULD DO

In this note, we have argued that monetary policy has not been responsible *directly* for the surge of inflation, though it might have had some *indirect* effects via demand. Nevertheless, the exchange rate channel and wealth effect channel have been of second-order. More than half of the current inflation surge in the euro area can be attributed to the rise in the prices of energy, food and transportation.

Having said that, it is obvious that the inflation rates in all euro area countries, whether headline or core inflation rates, are above the inflation target set by the ECB, that the institution confirmed in its recent review of the monetary strategy. It is therefore almost self-evident, within this institutional framework, that the ECB will keep on tightening¹².

While the naïve application of a Taylor rule (setting the policy rate according to deviations of the actual inflation rate *vis-à-vis* target and of the actual GDP from its potential) advocates a steep and fast rise in the ECB policy rate, there are reasons to believe that this strategy may not be sufficient to curb inflation. Hence, it questions whether the tightening of monetary policy is needed.

We have discussed seven factors that have an impact on the effectiveness of monetary policy at curbing inflation. Drawing on our own assessment of their respective current trends, we can summarise our findings on the recommended stance of monetary policy (see Table 2). First, while the inflation surge is mainly driven by supply factors, there are still some demand-driven factors that a monetary tightening might help curb, but only a *soft* tightening as a strong one risks undershooting the inflation target in the medium run. On that issue, it may be observed that the demand shock plays a more important role in the United States, justifying why the Federal Reserve chose to act more rapidly.

Second, whereas the shock was initially perceived to be temporary, it seems now that this diagnosis was wrong. The inflation rate exceeded 2% in 2021 and will still be above the target in 2022. According to most recent ECB forecasts, headline inflation will remain above the 2% target at least until 2024 (mid-2024 to be on-target), which calls for fast and strong (frontloading) monetary tightening. Uncertainty still prevails but it may be better for the ECB to increase interest rates moderately now than to be forced to increase them substantially later.

Third, with all Member States above the inflation target, the argument about internal heterogeneity is downsized: despite internal heterogeneity across Member States, all euro area countries need a decline in inflation that soft monetary tightening might help reach. Last, the conservative decisions that the Fed is about to take, despite the costs to households that Chair Powell has acknowledged at the Jackson Hole meeting, will make it hard for the ECB to postpone similar monetary decisions: asynchronous policy decisions across the Atlantic may fuel the depreciation of the euro. Yet we argued in section 2.1 that the exchange rate channel is rather limited.

Fourth, the rise of inflation is undoubtedly a world phenomenon driven by energy prices. A monetary policy tightening might prove to be ineffective to tame inflation except if it is coordinated. It will be more effective and less costly if all major central banks increase interest rates moderately than if only the ECB tightens its monetary policy.

Let us now turn to the reasons for a more careful approach by the ECB motivated by the risk that it may not be able to curb inflation in a context where we may also expect a slowdown of economic growth. The first reason are actually the incurred costs to households *and* firms of a monetary tightening. The

¹² This is not the place to discuss about the ECB institutional framework. On this, the interested reader may turn to Blot et al. (2020 and 2021b) and Lengwiler and Orphanides (2021).

fact that it is acknowledged *ex ante* by policymakers does not relieve the pain, and ever more so if the pain is not equally felt. The costs of monetary tightening might bear on liquidity-constrained households and firms, more reliant on credit than on financial markets, and may increase inequality. It cannot be excluded that those suffering from the high cost of living will also be more exposed to the risk of unemployment. If the ECB cannot curb inflation, these agents will suffer from a double pain. At the macroeconomic level, there are still debates on the sensitiveness of output to inflation deviations: is the Phillips curve flat, flattening, steep or steeping? While that may sound too academic, it has an impact on the ability of the central bank to dampen inflation. The flatter the Phillips curve, the more tightening is being required to achieve a given reduction in inflation. And the more tightening, the bigger the sacrifice ratio. Finally, the argument goes that monetary tightening, fast and strong, is required to limit the spillovers of actual inflation to inflation expectations on which households, financial and non-financial firms may base their future behaviours. Our preliminary assessment concludes that monetary policy decisions do not have a significant impact on inflation expectations, though. Credibility is certainly crucial but it is not clear that it can be achieved by a fast and strong tightening.

All in all, the ECB must fulfil its mandate and monetary tightening is not escapable. However, considering the sources of inflation in the current situation, the impact of monetary tightening on current inflation should not be over-stated. A soft monetary policy tightening may be needed to avoid a mistrust in the institution in charge of promoting price stability in the euro area. Whatever the time lags between decisions and implementation¹³ – and the answer to the question whether the ECB should have done more before cannot be paralleled with the US where the fiscal expansion in 2020-2021 was much more substantial -, it is certainly important to communicate to the public at large that the ECB can only do a little to curb inflation, unless it tolerates a high sacrifice ratio, likely leading to a deep recession in the euro area.

¹³ According to the empirical literature, it takes usually between 12 and 18 months before a monetary decision has an impact on the economy.

Table 2: Recommendations in the face of the current situation

Factors with an impact on the effectiveness of monetary policy	Current trends in the factors (euroarea)	Recommended tightening of ECB monetary policy
Nature of the shock	Supply shock but part of the shock is also on demand	Soft but fast
Duration & size of the shock	Persistent and large	Strong and fast
Internal or external source of inflation	External	Soft and coordinated
Sacrifice ratio	High (flat Phillips curve, less interest-sensitive economies, hence large side-effects)	Soft and slow
Internal heterogeneity	High but all countries are above the inflation target	Soft but fast
Credibility	At stake (inflation expectations on the rise, declining trust in institutions but elevating risk of social unrest (high sacrifice ratio, see above) and no (large) impact of monetary policy on expectations	Soft and slow
Leader or follower	Follower, but exchange-rate channel is limited	Soft

Source: Authors' own elaboration.

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The rise of inflation has sparked tightening measures by the ECB. The paper discusses the causes of this rise and the factors that impinge on the effectiveness of ECB policy at curbing inflation. Drawing on own assessment of the respective trends in these factors, we recommend a careful approach to monetary policy.

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