

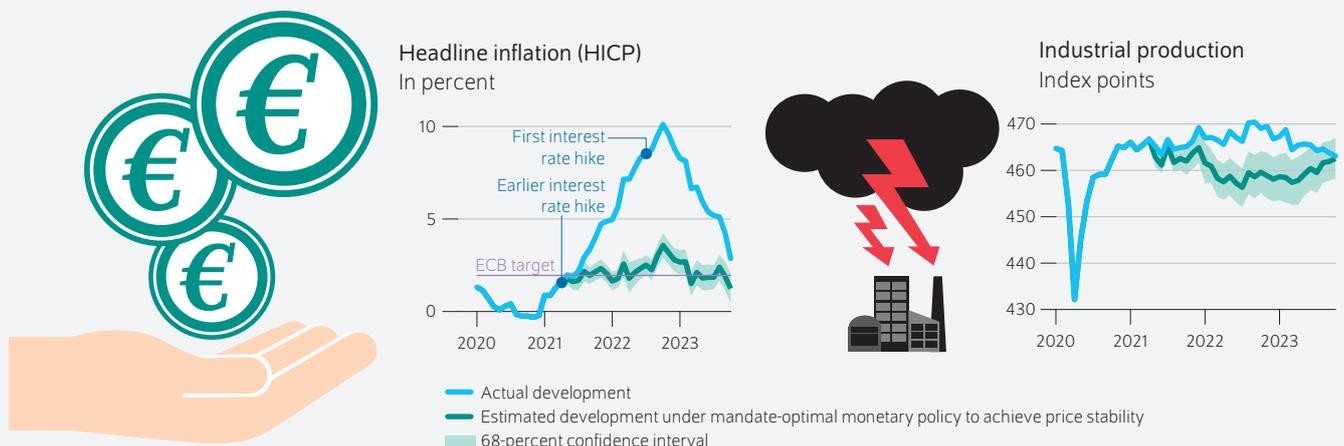
AT A GLANCE

## Monetary policy during the energy price crisis: ECB could have contained inflation earlier

By Gökhan Ider, Alexander Kriwoluzky, Frederik Kurcz, and Ben Schumann

- Energy prices fueled consumer price inflation in the euro area following the coronavirus pandemic and the Russian invasion of Ukraine
- Study empirically investigates the ECB's monetary policy strategy during the inflation surge and analyzes how it should have responded according to its primary mandate
- Analysis shows that the ECB's prolonged expansionary policy supported the economic recovery, but also contributed to the rise in inflation in the euro area
- Counterfactual analysis shows that a sharp increase in interest rates at the beginning of the inflation surge would have prevented the strong rise in consumer and energy prices
- As the ECB also have to consider national economic aspects when combating rising prices, it makes sense to take steps toward a fiscal and capital markets union

**Had the ECB raised key interest rates earlier, inflation would have been lower and the recession would have been short**



Source: Eurostat; authors' calculations.

1. This would have required a short-term rise in key interest rate of 100 basis points.

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### FROM THE AUTHORS

*“When inflation rises during economically difficult times, the ECB must successfully square the circle. Interest rate hikes, which contain inflation, also burden the economy. However, our calculations show that the rise in prices during the most recent inflation surge could have been dampened more quickly had the ECB raised interest rates earlier, and the economy would have recovered by the end of 2023.”*

— Ben Schumann —

# Monetary policy during the energy price crisis: ECB could have contained inflation earlier

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## ABSTRACT

Following the end of the coronavirus pandemic, the European Central Bank (ECB) was confronted with an unprecedented increase in energy prices. This led to consumer price inflation in the euro area far beyond the ECB's inflation target of two percent, at times up to 10 percent. At the same time, the euro area economy was threatened by a recession, which resulted in the ECB facing conflicting objectives of stabilizing the economy and combating inflation. Estimates show that while the ECB's policy strategy of maintaining a low level of interest rates did improve the economy, it also exacerbated the rise in energy prices. The empirical analysis demonstrates that an interest rate hike at the beginning of the energy crisis would have stabilized inflation more effectively. Tightening monetary policy would have curbed energy demand and caused the euro to appreciate, which would have led to a more rapid decline in energy prices. In this counterfactual scenario, the euro area would have had to endure a brief recession, but the overall economic situation would have stabilized by the fourth quarter of 2023. The ECB would likely have been better able to follow its price stability mandate if a capital markets and fiscal union existed in the euro area.

Few issues stir up emotions in Germany as much as inflation. It affects everyone: People's savings lose value, their real wages decline. Moreover, the European Central Bank's (ECB) conventional response to a rise in inflation may have a drastic impact on individual households; home loans will become more expensive and job security will become more at risk. Thus, how to best contain inflation is a hotly contested topic.

In essence, the optimal response is always a trade-off between combating inflation on the one hand and the consequences of combating it, i.e., dampened economic development and the associated rise in unemployment, on the other. When confronted with this trade-off, policymakers tend to decide to tolerate rising inflation rather than the real economic consequences of combating it; as German Chancellor Helmut Schmidt said in 1972, "Better five percent inflation than five percent unemployment."<sup>1</sup>

However, policymakers frequently do not consider the damaging effects of inflation on the population, such as a loss of purchasing power of savings; lower real purchasing power of salaries and pensions; the corresponding adjustments in the economy; and the implied redistribution of wealth from creditors to debtors.

When the ECB was founded in 1998, great value was placed on its primary objective of price stability—two percent inflation over the medium term of around two years—and necessary independence from politics. While supporting general economic policies is its secondary objective, the ECB's mandate clearly states that the secondary objective may only be pursued if this does not compromise the primary objective.<sup>2</sup>

Thus, the ECB's decision to not increase interest rates amid rising inflation in early 2022 stirred up controversy. ECB

<sup>1</sup> In a July 28, 1972, interview with the *Süddeutsche Zeitung*, Helmut Schmidt said, "It seems to be that the German people—to put it bluntly—can better deal with a five percent increase in prices than five percent unemployment." The abridged quotation is from the October 14, 2006, issue of *Der Spiegel* (in German; available online. Accessed on October 2, 2024. This applies to all other online sources in this report).

<sup>2</sup> Michael Ioannidis et al., "The mandate of the ECB: Legal considerations in the ECB's monetary policy strategy review," *ECB Occasional Paper Series* no. 276 (2021).

Box 1

Model and data

We use a structural vector autoregressive time series model (SVAR) to investigate how the monetary policy decisions of the ECB have impacted consumer prices, energy prices, and industrial production in the euro area since January 2020. Mathematically, the model can be written as:

$$BY_t = c + AY_{t-1} + \dots + A_p Y_{t-p} + \varepsilon_t$$

where vector  $Y_t$  indicates the values of the endogenous variables at time  $t$ , whereby  $Y_{t-1}$  indicates the values of these variables in the previous period. Thus, the development of all variables in the common system depends on the value of the other variables at time  $t$  and the value of the variables in the past  $p$  periods. These mutual interdependencies are characterized by the matrices  $B$  and  $A$ . Vector  $\varepsilon_t$  describes the "structural shocks" that the economy is exposed to in each period and are the drivers of the dynamic system.

The SVAR model in this Weekly Report builds off an empirical model from an earlier Weekly Report and models the common development of ten macroeconomic variables.<sup>1</sup> Monthly data are used for the estimation. The sampling period was from January 2002 to October 2023, including the coronavirus pandemic. To account for the impact of pandemic-related factors and to estimate their economic effects, we use a process particularly developed for this purpose.<sup>2</sup>

1 Gökhan Ider et al., "And Yet They Move: Energy Prices Fall When Key Interest Rates Increase, Despite Countervailing Effects," *DIW Weekly Report* no. 8 (2023): 73-80 (available online).  
 2 Danilo Cascaldi-Garcia, "Pandemic priors," *International Finance Discussion Paper* 1352 (2022).

The SVAR model makes it possible to decompose the ECB's monetary policy and the associated interest rate path into two components. First is the monetary policy rule, which represents the endogenous components of monetary policy, describes how the interest rate policy of the ECB responds historically and systematically to changes in inflation, economic output, and other endogenous variables. Second is the exogenous component that describes monetary policy shocks, or unexpected deviations from this systematic rule. To estimate the causal effects of unexpected conventional monetary policy shocks and shocks due to monetary policy announcements (forward guidance), the changes in financial market expectations are measured over short-term interest rates (three months) as well as longer-term interest rates (two years) in a 30-minute time window around the ECB's monetary policy decisions. If the expectations change in this time window, then there is an unexpected and thus exogenous component in the ECB's decision with which the financial markets, and thus companies and households, did not expect.<sup>3</sup> Based on this identifying assumption, the historical decomposition makes it possible to calculate the role of the exogenous component and thus the impact of deviations from the monetary policy rule.<sup>4</sup>

3 For a more detailed explanation of the methods, see Gökhan Ider et al., "Friend, Not Foe – Energy Prices and European Monetary Policy," *DIW Discussion Papers* no. 2089 (2024) (available online).  
 4 Lutz Kilian and Helmut Lutkepohl, *Structural Vector Autoregressive Analysis* (Cambridge University Press: 2017).

President Christine Lagarde defended the decision, saying that an interest rate hike could not stop the increase in prices. This statement was based on the fact that the price increases in the euro area were primarily due to higher energy prices. A widely held opinion was that an interest rate hike would miss the mark: Although it would curb overall economic demand and thus economic development in the euro area, it would have no impact on energy prices, which are primarily determined on the world market.<sup>3</sup> This assumption allowed the ECB to—despite its primary mandate and excessive inflation—choose a strategy that did not endanger the economic recovery of the euro area. Using a time series model, this Weekly Report investigates the effects of this monetary policy strategy. Furthermore, it empirically analyses which monetary policy strategy the ECB could have used to provide the optimal response to rising energy prices while stabilizing inflation at two percent, and what impact this strategy would have had on the economic development of the euro area.

3 However, studies show that this view is based on erroneous assumptions and that the ECB's decisions do influence energy prices within the euro area as well as global energy prices, cf. Gökhan Ider et al., "And Yet They Move: Energy Prices Fall When Key Interest Rates Increase, Despite Countervailing Effects," *DIW Weekly Report* no. 8 (2023): 73-80 (available online).

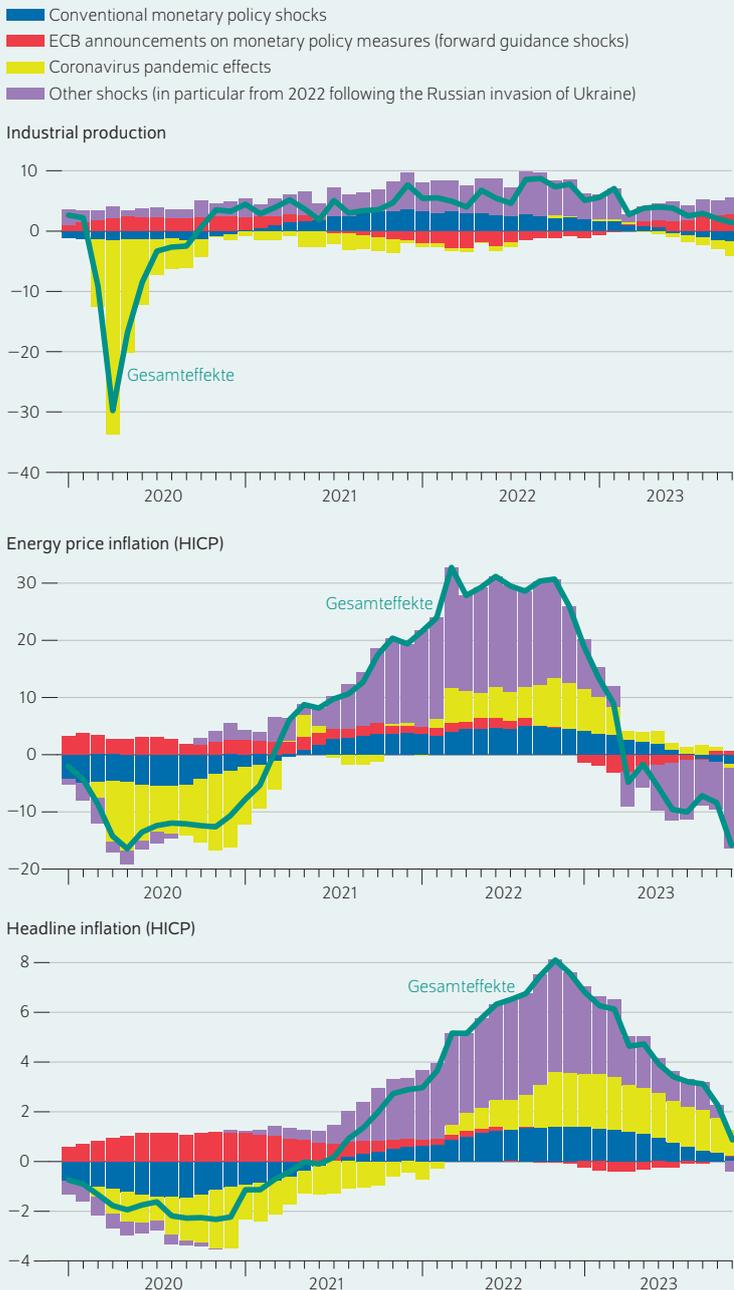
A brief introduction to empirical monetary policy analysis

We use an empirical model to analyze the macroeconomic effects of the ECB's monetary policy response to the most recent surge in inflation.<sup>4</sup> This model incorporates the dynamic relationships between the macroeconomic variables and, furthermore, makes it possible to calculate the causal effects of the ECB's monetary policy strategy. These effects can in turn be broken down into two parts using the empirical model. One part is the policy rule, which represents the endogenous component of monetary policy and describes how the ECB's interest rate policy responds historically and systematically to changes in inflation and economic output. The other part is an exogenous component that includes monetary policy shocks, unexpected deviations from this systematic rule, such as the ECB's decision to raise

4 This Weekly Report is based on Gökhan Ider, Alexander Kriwoluzky, Frederik Kurcz, and Ben Schumann, "Friend, Not Foe – Energy Prices and European Monetary Policy," *DIW Discussion Papers* no. 2089 (2024) (available online). The paper also contains a thorough description of the methodology.

Figure 1

**Effects of monetary policy shocks on industrial production and inflation in the euro area**  
In percent



Sources: Eurostat; authors' calculations.

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While the ECB's measures stabilized the economy, they also contributed to inflation and the rise in energy prices.

interest rates in April 2011 despite the ongoing effects of the financial crisis.

This Weekly Report first estimates the contribution of the exogenous component of monetary policy on the European economy and investigates how the economy would have developed without the exogenous component, meaning without a deviation from its historical, systematic monetary policy. This sheds light on to what extent the policy strategy chosen was historically unusual and what its impact was. We then examine what impact the optimal design of the endogenous component would have had on the development of the economy.

**ECB policy contributed to economic recovery**

We employ a process called historical decompositions to analyze if and to what extent the ECB deviated from its traditional monetary policy rule during the previous inflation surge and what the macroeconomic effects of this deviation are (Box 1). This makes it possible to decompose the time series of variables into a trend that is independent of monetary policy shocks and current short-term economic developments as well as into deviations from this trend. These deviations from the trend, in turn, can be explained by structural shocks, such as exogenous events (like the coronavirus pandemic), unexpected changes in the supply of and demand for goods and services, and unexpected monetary policy shocks. The ECB can change short-term interest rates unexpectedly, which is generally described as a conventional monetary policy shock. It can also influence longer-term interest rates by applying “forward guidance,” or making a surprise announcement on its future monetary policy intentions.

The results of the historical decomposition show that economic activity in the euro area, measured by industrial production, experienced a sharp decline and was well below the trend rate at the onset of the pandemic. The model correctly attributes this decline to the effects of the coronavirus pandemic (Figure 1). The ECB responded to these extraordinary circumstances and passed surprising, expansionary monetary policy measures to stimulate aggregate demand and support the recovery of the European economy, such as the extensive Pandemic Emergency Purchase Programme (PEPP). The effects of the monetary policy shocks associated with these measures were consistently very positive during the first two years of the coronavirus pandemic (Figure 1). Without the ECB's expansionary policy, industrial production would have been up to 2.5 percent lower and the economic recovery would have taken much longer.

**Monetary policy strategy exacerbated the energy price crisis and boosted inflation**

However, while the ECB's continued expansionary monetary policy supported the economic recovery, it also played a key role in the rise in inflation after the pandemic. At the beginning of 2020, inflation in the euro area declined initially due to the effects of the pandemic on the economy, but increased

rapidly again as expansionary monetary and fiscal policy, the end to lockdown measures, and other factors led to a quick economic recovery. At the beginning of 2022, inflation was over three percentage points higher than the two percent target and rose subsequently to an unprecedented level. The historical decomposition analysis shows that pandemic-related factors and other non-monetary shocks, such as Russia's tightened energy supply since 2021 and the Russian invasion of Ukraine in February 2022, were primarily responsible for the surge in inflation. However, the ECB's expansionary monetary policy also played a major role.

In particular, the ECB's lack of response to the rise in inflation actually represented a deviation from its monetary policy rule. Thus, the monetary policy followed by the ECB during the 2022 inflation surge was unusually expansionary. The results show that without the deviation from the empirically estimated historical monetary policy rule, energy and consumer price inflation would have been much lower. In October 2022, for example, when consumer price inflation was eight percentage points above the two percent target, nearly 1.8 percentage points of this increase were due to monetary policy shocks and thus the ECB. The situation is similar for energy prices, where, for example, up to five percentage points of the observed price increase of 30 percent in January 2022 can be attributed to expansionary monetary policy measures.

### Economic development under an optimal monetary policy rule

While the first analysis provides insight into the importance of the unexpected, exogenous component of monetary policy during the last surge of inflation, the second part of this Weekly Report analyzes the endogenous component, i.e., the systematic reaction of the interest rates to changes in the economy. This component plays a particularly important role in firms' and households' expectations regarding future economic development. Prices and wages are set or negotiated in view of expected inflation. At the same time, firms and households make decisions about long-term investments and consumption, forming their expectations of future interest rates and economic activity depending on the perceived monetary policy rule. If monetary policy now systematically operates in such a way that households and firms are firmly convinced that the ECB will resolutely counter deviations in inflation from the two percent target, they will not expect high inflation rates and will adjust their expectations about future interest rates as well as their consumption and investment decisions accordingly.

For the following analysis, it is assumed that the ECB is focusing solely on its primary mandate of price stability and that there are no deviations from this objective. Thus, the ECB influences short and longer-term interest rates in such a way that inflation is at two percent in the medium term and ignores everything else, such as general economic developments. The analysis uses an empirical model that makes it possible to answer the counterfactual question of how the

#### Box 2

### Estimating economic development under mandate-optimal monetary policy

To calculate the economic development that would have occurred under a mandate-optimal monetary policy, we assume that the ECB selects its systematic interest rate policy and thus its monetary policy in a way that it can optimally achieve its primary mandate of price stability. This means that the ECB aims to minimize deviations from the inflation target of two percent. This can be expressed in a loss function:

$$\min L_t = \sum_{i=0}^T w_i (\pi_{\{t+i\}} - 2).$$

This loss function cumulates the inflation deviation from the two percent target, whereby the various weights ( $w_i$ ) are selected in such a way that inflation deviations in the "medium term" are given a particularly high weighting. This accounts for the fact that the ECB defines its primary mandate as price stability in the "medium term," which, in practice, is considered to be four to six quarters. Empirical methods can be used to calculate an optimal monetary policy rule.<sup>1</sup> Based on this, it is possible to simulate how the euro area economy would have developed from April 2021 onward if the ECB's declared objective had been to achieve the primary mandate in the most optimal way. This means that the economy in this scenario continues to be exposed to the same exogenous shocks, including the coronavirus pandemic and the energy price crisis. However, the ECB responds differently to these events in this scenario, which is why the macroeconomic impact of these exogenous shocks is different. At the same time, the ECB's alternative monetary policy changes the existing economic development even without the resulting change in the effects of the new exogenous shocks. This is because a change in the monetary policy rule also influences dynamic adjustment processes within the economy that were already initiated before the change. The sum of these responses to new exogenous shocks and the already existing dynamic adjustment processes results in an interest rate path for the short and longer-term interest rates, which influences the overall economic situation and the financial markets and ultimately leads to the ECB optimally achieving its primary mandate.<sup>2</sup>

<sup>1</sup> Tomas E. Caravello et al., "Evaluating Policy Counterfactuals: A VAR-Plus Approach," *NBER Working Paper* 32988 (2024).

<sup>2</sup> For a more detailed description of the methods, see Gökhan Ider et al., "Friend, Not Foe – Energy Prices and European Monetary Policy," *DIW Discussion Papers* no. 2089 (2024) (available online).

economy in the euro area would have developed if the ECB had focused chiefly on its primary mandate, an inflation target of about two percent (Box 2).

In this counterfactual scenario, the economy faces the same shocks as was the reality—the coronavirus pandemic and the energy price crisis—but the ECB responds systematically to

Figure 2

**Economic development under actual and optimal monetary policy**  
In percent



Sources: Macrobond; Eurostat; Energy Information Agency; authors' calculations.

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Had the ECB strictly followed its primary mandate of price stability, inflation would have been much lower and industrial production would have only experienced a brief slump.

these events exclusively according to its mandate of price stability. This response results in an interest rate path for the short and longer-term interest rates that influences the overall economic situation and the financial markets and ultimately leads to the ECB optimally achieving its primary mandate (Box 2).

**Earlier ECB intervention could have prevented the inflation surge**

The development of interest rates under a mandate-optimal policy rule differs greatly from their actual development. In particular, the ECB should have implemented a strong initial interest rate hike by increasing the short-term and long-term interest rates by up to 100 basis points. According to the estimates, the ECB could have prevented the sharp rise in inflation with this strategy.

One reason for this is that the ECB's interest rate policy, contrary to the ECB's assumptions described above, directly influences energy prices and the higher interest rates are very quickly reflected in noticeably lower energy prices. For example, a change in the monetary policy course would have caused demand for energy in the euro area to drop drastically while simultaneously appreciating the euro. This would have further dampened energy price inflation in the euro area.<sup>5</sup> Another reason is that an announcement that the ECB would pursue a policy aimed primarily and vigorously at stabilizing inflation at two percent would also have meant that inflation expectations would not have risen so sharply. This in turn would have reduced inflationary pressures, as producers, among others, would have forecast lower future costs. Due to the less pronounced rise in inflation, the ECB would have then avoided higher interest rates from 2023 onward.

**Combating inflation would have led to only a short-term economic slump**

Such a change in monetary policy would have led to an initial sharper drop in production as measured by industrial production. Considering the relative volatility of GDP and industrial production, we see that GDP would have been around three percent below its actual level at the trough of the crisis if the ECB had stabilized inflation at around two percent (Figure 2). However, this slump would have been brief; total production would have returned to its actual level by the end of 2023. This shows that the conflicting objectives faced by the ECB during the energy crisis were of a short-term nature. This surprising result is because, contrary to its own statements and assumptions, the ECB can in fact directly influence energy prices by curbing energy demand and appreciating the euro.<sup>6</sup> Thus, the ECB could have counteracted the rise in inflation driven by the increase in energy

<sup>5</sup> Ider et al., "And Yet They Move."

<sup>6</sup> Ider et al., "And Yet They Move"; Alexander Roth and Felix Schmidt, "Not only a mild winter: German consumers change their behavior to save natural gas," *Joule* 7, no. 6 (2023): 1081–1086 (available online).

prices without causing a long-term weakening in the economy and creating unemployment.

### Conclusion: ECB caught between price stability and limited capacity for action

The results of this Weekly Report suggest that the ECB contributed to a further increase in prices with its hesitant action, including both the exogenous components that fueled the rise in prices and the ECB's wait-and-see response. With a stricter and more vigorous monetary policy course, the ECB would have been able to prevent inflation rising to 10 percent at the cost of a brief recession at a time in which the economy was already weakened by the coronavirus pandemic and the Russian invasion of Ukraine. The ECB may have not wanted to exacerbate the situation. In addition, concerns about the stability of the financial sector may also have prompted the ECB to not raise interest rates too quickly. The ECB's false assumption that it cannot influence energy prices may have led it to put more weight on stabilizing the economic and political situation in the euro area, rather than following its primary mandate of price stability.

Ultimately, however, the analysis also shows that it has become more challenging for the ECB to fulfill its primary mandate of price stability in the economic environment at that time. This is because it would have needed the freedom to not have to consider the economic situation in the largest economies (Germany, France, and Italy) as well as their national debt and financial markets when raising interest rates. However, the ECB does not have this freedom because the euro countries are far from having a common financial policy. Instead, it falls to the ECB to implement an economic policy for the entire euro area and to conceal its various design flaws.<sup>7</sup> First and foremost, this includes the lack of a capital markets union and of a fiscal union with a common bond for all euro area countries. Only then will the ECB be able to effectively fight inflation in the future. Otherwise, it will continue to face the impossible challenge of squaring the circle.

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<sup>7</sup> Former ECB President Mario Draghi also recently made similar suggestions for improvement, cf. Mario Draghi, "The future of European competitiveness," European Commission (2024) (available online).

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