

European inflation: united in diversity

The 20 economies that make up the euro area have a single currency, the euro, with a common monetary policy and, implicitly, a fixed exchange rate. However, in the last two years the euro area has suffered significant discrepancies in the inflation rates of its member countries (see first chart). This dispersion is significant: *de facto*, it leads to differences in the transmission of monetary policy and the terms of trade, because it affects the «real» (i.e. inflation-adjusted) interest rate and exchange rate: 1 euro is 1 euro in both Vienna and Paris, but the purchasing power of that euro depends on the cost of living in each city; similarly, an ECB interest rate of 4% does not have the same effect in an economy where inflation is running at 10% (real interest rate of -6%) as it does in another where it is 2% (real rate of +2%). Thus, the inflation gaps that have opened up in the last two years impact the ECB’s decision-making process (see second chart) and pose a challenge for the euro area as a whole. But what is behind this dispersion?

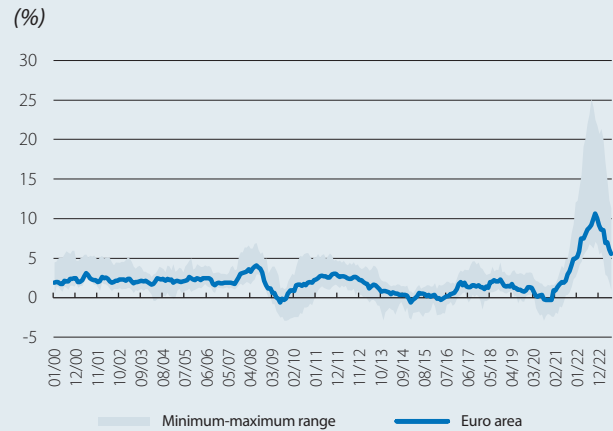
Dispersion: size of inflation matters

In more ordinary times, the range of inflation rates within the euro area spanned from a low of 0% to a high of 3%; in 2022, this range widened to 7%-25%. Some of this dispersion was due to small economies that have suffered very high inflation rates (especially the Baltic countries, with a peak of 25% in Estonia and 22% in Latvia and Lithuania). Yet, the dispersion metrics are not so high if we take into account the relative weight of each economy in the consumer price basket of the euro area as a whole (see third chart).¹

On the other hand, part of the dispersion between countries reflects a unit effect: if the level of inflation is multiplied by 5 (as was the case of the European average), the value of dispersion metrics such as the standard deviation is also multiplied by 5. For this reason we must also analyse the current situation using relative dispersion metrics, such as the coefficient of variation, which normalises the standard deviation against the mean average level of inflation. As can be seen in the third chart, this indicator is at more normal levels, suggesting that the dispersion between countries is not so abnormal when viewed in the context of widespread high inflation across the euro area.²

1. Formally, the standard deviation of inflation rates when weighted by the size of each economy is less than the unweighted standard deviation (i.e. when assigning the same weight to all euro area economies).
 2. The observation that the dispersion between economies increases with the level of inflation can also be interpreted as evidence of differences in the degree of nominal rigidities between euro area countries.

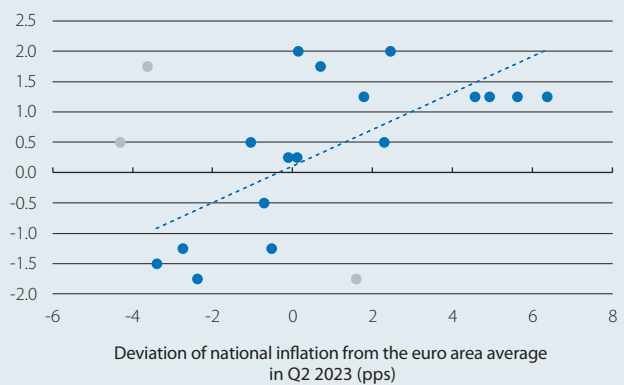
Euro area: headline inflation



Note: The chart shows the minimum and maximum headline inflation rate (in year-on-year terms) among euro area member countries, as well as that of the bloc as a whole.
Source: CaixaBank Research, based on data from Eurostat.

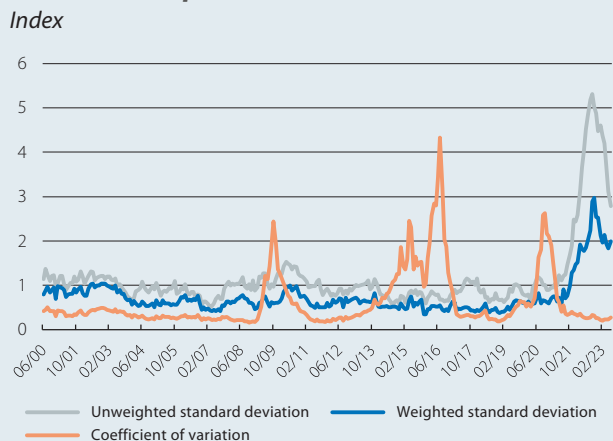
Euro area: inflation and tone of national central banks

Tone of the national central bank (Hawk-Dove ranking)



Notes: Econstream’s Hawk-Dove ranking lists national central bank chairs from most «dovish» (negative index) to most «hawkish» (positive index). The grey dots represent three «atypical» cases that do not fit well with the relationship: Belgium, Italy and Luxembourg.
Source: CaixaBank Research, based on data from Eurostat and www.econstream-media.com.

Euro area: dispersion of headline inflation



Notes: The unweighted standard deviation assigns the same weight to all euro area countries while the weighted standard deviation takes into account the relative weight of each country in the HICP basket of the euro area as a whole. The coefficient of variation corresponds to the weighted standard deviation divided by the mean average inflation of the euro area in a 6-month moving average.
Source: CaixaBank Research, based on data from Eurostat.

Causes of the dispersion...

Context is key, and this is also shown by the fact that the bulk of the dispersion is explained by differences in energy inflation (see fourth chart), although recently there has been somewhat more dispersion in inflation relating to services.³

The importance of energy and the inflation «unit effect» are consistent with the idea that behind the dispersion between countries lies the same origin: a common and major shock – namely, the war in Ukraine and its impact on energy and food prices – being transmitted to each country to differing degrees, depending on their exposure to the crisis unleashed by the war and to the various different economic policy responses. Thus, countries with a lower dependence on Russian gas and/or a higher production of renewable energy have, generally speaking, seen their prices less stressed. In the same vein, there has been significant disparity in the policies implemented to tackle the crisis, in terms of both their cost⁴ and their design, ranging from incentives for energy saving, to interventions (or lack thereof) in the price system,⁵ to direct support for households and businesses.

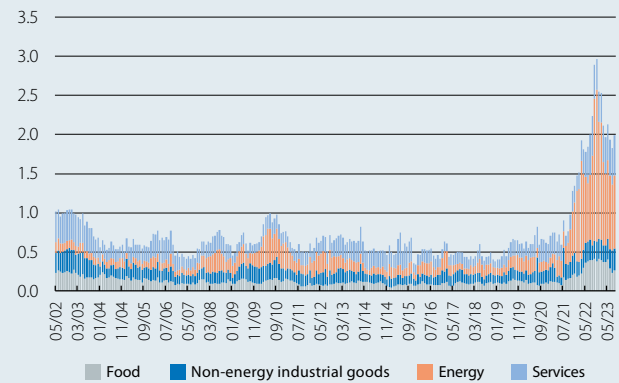
Another way to verify the common origin of this inflation disparity is to analyse the synchrony between inflation in the various countries of the euro area. There are statistical techniques which, taking advantage of the correlation between inflation rates across European economies, allow us to extract a common factor between those national inflation rates. As the last chart shows, the evolution of this common factor explains a large part of the individual dynamics of each country. Indeed, this has intensified in the last two years and it is not just limited to energy prices: with data up to June 2023, the common factor behind the inflation of industrial goods, services and food across euro area countries has also been reinforced.

... and consequences

If the dispersion between countries has its origins in a common shock, which is not only related to energy but also translates into strong common dynamics among the underlying prices of each country, then the differences ought to normalise as inflation itself declines across the

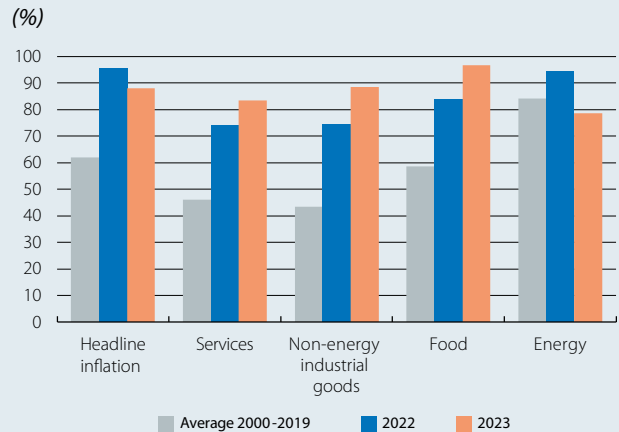
3. The recent greater contribution from services is also apparent in the breakdown of the coefficient of variation.
 4. According to Bruegel, public support packages range from over 7% of GDP in Germany to less than 1% in Finland.
 5. For instance, France opted for direct interventions in gas prices. Thus, the country initially experienced a less pronounced rally in energy prices in the short term, but they are now taking longer to fall back down again in the medium term: at the peak of the crisis, the energy CPI of the euro area was 30% higher than in early 2022, compared to «only» 15% higher in the case of France; today, the euro area figure has eased to 10%, but remains at around 15% in France.

Euro area: contributions to the standard deviation of inflation (pps)



Source: CaixaBank Research, based on data from Eurostat.

Euro area: variance in countries' inflation explained by common factors *



Notes: * We perform a principal component analysis for inflation (headline inflation and by component) for Germany, Austria, Belgium, Spain, Finland, France, Greece, Ireland, Italy, the Netherlands and Portugal. The chart presents the variance between the countries that is explained by the first principal component, calculated in 24-month rolling windows.
 Source: CaixaBank Research, based on data from Eurostat.

euro area as a whole. However, this does not mean there will be a normalisation of the differences between countries' price levels. Indeed, there are indications that the dispersion in inflation rates has led to greater convergence in price levels across euro area countries, and this convergence could accentuate inequalities if it is not accompanied by a convergence in income and productivity.⁶

6. See C. Buelens (2023). «The great dispersion: euro area inflation differentials on the aftermath of the pandemic and the war». QREA, vol. 23, nº 2.