

Box 4

Inflation differentials within the euro area

Within the euro area, inflation rates can generally be expected to differ between countries for a number of reasons.¹ First, country-specific events may cause inflation rates in one country to deviate from those in the others. Second, common shocks may affect inflation at the national level in different ways, given that underlying trade and consumption patterns, production structures, tax systems, as well as financial and institutional structures vary across the euro area countries. Third, differences in inflation may also reflect, to some extent, the ongoing convergence of price levels among the euro area countries. The single monetary policy, the existence of a Single Market and cross-border price transparency have reduced the scope for substantial price differentials for tradable products. With regard to goods and services which are less easily tradable, the long-term convergence in productivity and living standards across the euro area should also lead to price level convergence, with inflation differentials arising during the transition period.

Statistical measures suggest that inflation differentials within the euro area have widened

The euro area economies have experienced a considerable degree of inflation rate convergence during the past decade.² Indeed, the criteria set out in the “Maastricht Treaty” played a key role in the successful convergence towards a high degree of price stability in the participating countries. However, it appears that inflation dispersion among the euro area countries has increased since mid-1997.

There are various ways to measure inflation divergence within the euro area and the chart below presents some of the most commonly used measures of inflation dispersion. The simplest measure is the spread between the highest and lowest HICP inflation rate observed among the euro area countries, which declined from the beginning of the observation period up to mid-1997 and then showed a tendency to increase. Because this spread concentrates on the extreme values of the distribution, it arguably gives excessive weight to the two countries which differ most in terms of inflation performance at any given point in time. Another simple measure of divergence is the spread between the (unweighted) average of the three countries with the highest and lowest HICP inflation rates respectively. This provides a more representative picture by reducing the impact of outliers.

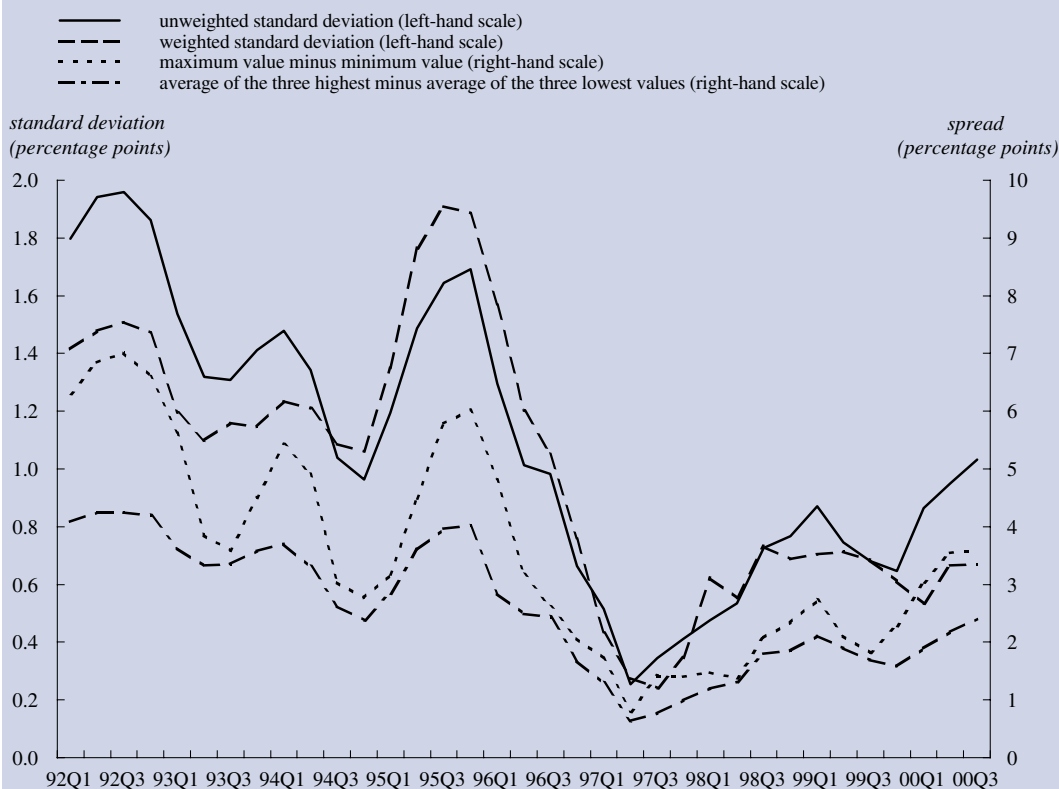
The standard deviation of inflation rates across countries may be used as another measure of inflation divergence in the euro area. The chart shows the weighted and unweighted standard deviations of HICP inflation from the euro area average. The weighted standard deviation takes into account the size of the countries in the calculation of dispersion, while the unweighted measure gives equal importance to all countries. As with the maximum-minimum spreads, the dispersion as measured by the standard deviations tended to fall up to mid-1997 and to rise thereafter, although the weighted standard deviation has been broadly stable since mid-1998. Thus, all selected measures seem to suggest that HICP inflation converged up to mid-1997, clearly supported by the process of convergence towards price stability as required by the Maastricht Treaty. The degree of inflation dispersion seems to have increased somewhat thereafter.

In order to understand better the factors behind the increase in inflation divergence over the past few years, it may be worth focusing on the various components of the HICP starting in the third quarter of 1997 (see the table below). A number of patterns can be observed. First, the widest and most volatile inflation differentials have emerged in product groups such as *food* and *energy*. Food prices have traditionally been the most vulnerable to specific shocks linked to differences in weather conditions and seasonal patterns. During the observation period, dispersion measures point to relatively large differences in unprocessed food price

¹ For an overview of the factors underlying inflation differentials within a monetary union, see the article entitled “Inflation differentials in a monetary union” in the October 1999 issue of the ECB Monthly Bulletin.

² For an overview of longer-term differentials in consumer price inflation, see the article entitled “Longer-term developments and cyclical variations in key economic indicators across euro area countries” in the July 1999 issue of the ECB Monthly Bulletin.

Statistical measures of HICP inflation dispersion within the euro area



Sources: Eurostat and ECB calculations.

increases, but there is no clear trend in the dispersion. The higher dispersion in price increases for processed food in the course of 2000 is partly due to indirect tax rate hikes in one member country. With regard to energy price inflation, a clear upward trend in divergence is noticeable. This appears to have been caused by the recent steep rise in oil prices and the protracted depreciation of the euro, against a background of differing trade structures and energy consumption patterns among the euro area countries. Different national policy responses to the oil price shock may also have added to the divergence. Second, *non-energy industrial goods* included in the HICP not only show the smallest, but also the least volatile inflation differentials. For non-energy industrial goods the degree of inflation divergence has not increased recently, despite varying degrees of national exposure to higher import and energy prices – although only a partial pass-through of these factors has been seen so far. This seems to reflect the effect of competition in the tradable goods sector, especially in the context of a single market with a single currency. Third, in respect of *services* price inflation, all dispersion measures show a clear upward trend. Widening services price inflation differentials may be explained by increasing differences in national unit labour cost developments and different national cyclical movements, both of which affect profit margins. Partly, they also reflect the differential price effects of uneven progress in labour market reform and deregulating telecommunications and utilities markets across the euro area countries. Moreover, higher oil prices may have been passed on to prices for transport services to varying degrees.

Overall, the recent widening of inflation spreads within the euro area can be associated, firstly, with differences in exposure to, and the pass-through of, oil price developments, reinforced by various changes in administered prices and indirect taxation at the national level and, secondly, with an increase in services price inflation differentials, which seems to reflect differences in domestic cost and price pressures. Provided that oil prices stabilise or fall in the next few quarters as indicated by futures markets, that part of the recent widening of inflation differentials which is associated with the steep rise in energy prices is likely to prove temporary.

Dispersion of HICP inflation and its components within the euro area¹⁾

(statistical measures of dispersion in percentage points)

	1997 Q3	1998 Q3	1999 Q3	2000 Q3
HICP				
Maximum value minus minimum value	1.4	2.1	1.9	3.7
Average of the three highest minus average of the three lowest values	0.8	1.8	1.7	2.4
Unweighted standard deviation	0.3	0.7	0.7	1.0
Weighted standard deviation	0.2	0.7	0.7	0.6
Unprocessed food				
Maximum value minus minimum value	6.2	6.6	5.6	4.7
Average of the three highest minus average of the three lowest values	4.4	4.6	4.6	3.3
Unweighted standard deviation	1.8	1.9	1.9	1.4
Weighted standard deviation	1.9	1.3	1.5	1.6
Processed food				
Maximum value minus minimum value	4.7	3.9	3.9	7.2
Average of the three highest minus average of the three lowest values	3.5	2.1	3.0	3.9
Unweighted standard deviation	1.5	1.0	1.2	1.9
Weighted standard deviation	1.2	0.3	1.3	1.0
Energy				
Maximum value minus minimum value	8.1	6.6	9.6	13.3
Average of the three highest minus average of the three lowest values	3.8	4.4	6.0	8.5
Unweighted standard deviation	2.1	1.8	2.6	3.4
Weighted standard deviation	1.7	1.1	2.4	1.7
Non-energy industrial goods				
Maximum value minus minimum value	3.1	2.3	2.7	2.6
Average of the three highest minus average of the three lowest values	2.1	1.6	2.2	1.9
Unweighted standard deviation	0.9	0.7	0.9	0.8
Weighted standard deviation	0.6	0.7	0.6	0.8
Services				
Maximum value minus minimum value	2.5	2.7	3.2	5.6
Average of the three highest minus average of the three lowest values	2.1	2.4	2.4	3.7
Unweighted standard deviation	0.8	0.9	1.0	1.5
Weighted standard deviation	0.7	0.9	1.0	1.1

Sources: Eurostat and ECB calculations.

1) The table compares the latest available quarterly information with the same period in previous years.

The role of the single monetary policy and national economic policies

Differences in inflation developments between euro area countries do not necessarily warrant concern, as long as they remain relatively small and temporary or they reflect a catching-up of productivity and living standards in certain euro area countries. By contrast, if one country were to show a sizeable, growing and unsustainable divergence in inflation from the level in other euro area countries, this would be a cause for concern to national policy-makers. The single monetary policy of the ECB has to be geared towards the objective of price stability for the euro area as a whole and cannot influence the dispersion of inflation rates across the euro area. Should action be required, national policy-makers would need to respond. In this context, national fiscal policies would have to be able to play their part. Sound public finances would provide scope for the automatic stabilisers to play their role. In an environment of strong output growth, national fiscal policy should avoid giving any unwarranted expansionary impulse to the economy. A key contribution may also be expected from the social partners, as they need to ensure that wage developments remain conducive to domestic price stability and a high level of employment. In addition, it is of vital importance to continue to implement reforms in product, labour and capital markets aimed at increasing the overall flexibility of the economy. This would also enhance individual economies' capacity to absorb and respond to shocks, whether country-specific or euro area-wide.