

## Box 3

## BASE EFFECTS AND THEIR IMPACT ON HICP INFLATION IN 2010

Movements in HICP inflation are often analysed in terms of annual rates of change, which show by how much the index has changed in 12 months by comparing the value attained in one month with the value it had in the same month one year earlier. The use of such a statistical measure implies that annual HICP inflation fluctuations are very much affected by index movements taking place 12 months earlier, commonly known as “base effects”. As a result, when assessing changes in annual HICP inflation, it is useful to decompose them into a base effect component and a component related to recent month-on-month inflationary developments. The base effect component tends to be particularly influential during periods when inflation volatility was high one year earlier, for instance induced by sharp movements in commodity prices. Over the past two years, energy and food prices have accounted for much of the sharp fluctuations in HICP inflation, as the wide swings in oil and food commodity prices in global markets have been passed on to consumer prices. Base effects in these two components are likely to continue to have a significant influence on headline inflation in the months to come, as the large energy price falls towards the end of 2008 and the food price declines in the course of 2009 drop out of the annual comparison only one year later. As discussed in this box, the contributions of such base effects need to be taken into account when assessing prospective developments in HICP inflation in the course of 2010.

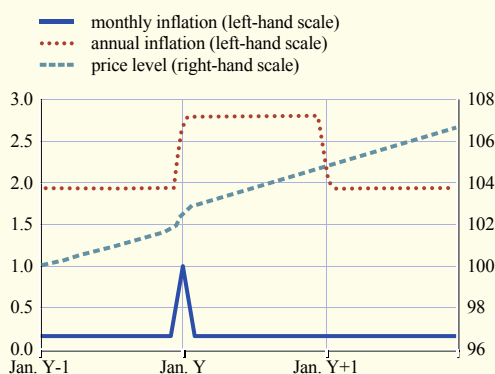
## Definition

Base effects are a recurring feature when analysing changes in annual growth rates. They occur when variations in the annual growth rate of an economic indicator depend on some atypical influence that affected the indicator’s movement 12 months earlier, rather than being caused by month-on-month developments.<sup>1</sup> To illustrate this distinction with a simple example, month-on-month inflation is assumed to be 0.16% in every month except in January of the year Y, when, owing to a one-off event, such as a hike in the VAT rate, it rises to 1.0% (see Chart A). As a consequence, inflation calculated in year-on-year terms increases from 1.9% in December Y-1 to 2.8% in January Y, staying there for one year before falling back to 1.9% in January Y+1. The fall in the annual inflation rate in January Y+1 is said to be explained by a downward base effect due to the unusual increase in the price level one year earlier dropping out of the annual comparison.

Although this concept is intuitive, identifying and estimating base effects in practice is not straightforward. Defining a base effect as

Chart A The base effect: an illustration

(percentage changes and index: January Y-1 = 100)



Source: ECB calculations.

<sup>1</sup> Technically, a base effect can be defined as the contribution to the change in the year-on-year inflation rate in a particular month that stems from a deviation of the month-on-month rate of change in the base month (i.e. the same month one year earlier) from its usual or normal pattern, taking account of seasonal fluctuations. See the box entitled “Accounting for recent and prospective movements in HICP inflation: the role of base effects” in the December 2008 issue of the Monthly Bulletin, and the references therein.

being driven by atypical influences one year earlier involves the calculation of a deviation of the month-on-month rate of change in the base period from its usual pattern, but there is usually no particular way of distinguishing between typical and atypical effects. For the purposes of this box, the usual pattern of month-on-month changes in the HICP is computed for each month by adding an estimated seasonal effect to the average month-on-month change observed since January 1995.

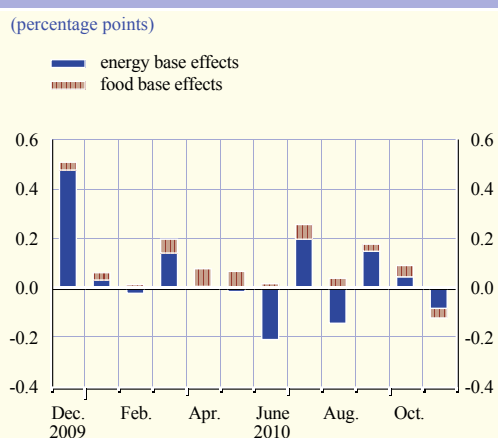
### Impact of base effects on the profile of euro area inflation in 2010

In 2010, base effects are expected to make a non-negligible contribution to overall inflation developments, although more moderate than in the previous year. Chart B shows the expected contributions of base effects from the energy and food components to the monthly changes in the annual inflation rate in the 12 months to November 2010.

Some notable features can be inferred from the chart. Overall, the contribution of food and energy base effects to monthly changes in annual inflation is expected to be positive. Base effects from the energy component are estimated to be the strongest in terms of the monthly change in annual HICP inflation between November 2009 and December 2009 (around 0.5 percentage point). Thereafter, they are expected to reflect the volatile pattern in energy price developments observed in the course of 2009. At the same time, base effects from (both processed and unprocessed) food prices are expected to make a positive contribution to monthly developments in annual HICP inflation in each month up to October 2010, as a consequence of the subdued developments in the month-on-month rates of growth in processed food prices and in meat prices within the unprocessed food component in the course of 2009, reflecting the unwinding of the global food commodity price shock.

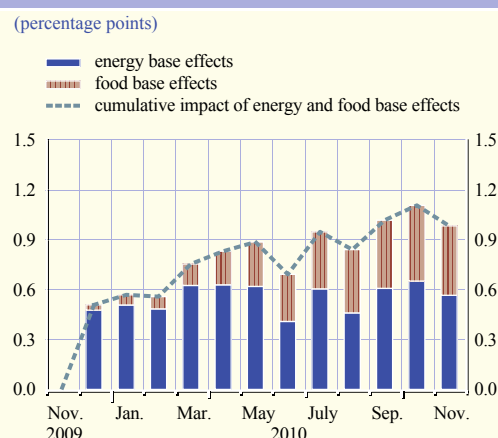
Chart C cumulates the base effect contribution to the changes in the annual growth rates of the HICP over the next 12 months, starting in November 2009. As seen in the chart, total base effects from the energy and food components are projected to have a cumulated upward

**Chart B Contribution of energy and food base effects to the monthly changes in annual HICP inflation**



Sources: Eurostat and ECB calculations.

**Chart C Cumulative impact of energy and food base effects**



Sources: Eurostat and ECB calculations.

impact of around 1.0 percentage point on annual HICP inflation from November 2009 to November 2010. While the base effect initially stems mainly from changes in energy prices, over time the relevance of the food price base effect increases, almost matching that of the energy prices at the end of that period.

Overall, these upward base effects arising from changes in food and energy prices are likely to contribute to shaping the outlook for developments in annual HICP inflation over the coming months. However, the extent of the rise in inflation is uncertain and cannot be assessed mechanically on the basis of base effects alone. The profile of the annual growth rate in the HICP will depend on the impact of changes in economic fundamentals, such as the strength of consumer demand and labour cost growth, as well as future developments in commodity prices and how these are passed on to euro area consumers. Should the pace of the recovery in activity remain subdued in the euro area and elsewhere, as is currently envisaged, economic fundamentals will contribute to keeping headline HICP inflation moderate in the near term. Therefore, the expected increase in headline HICP inflation in 2010, from an estimated annual rate of 0.9% in December 2009, should not be interpreted as a resurgence of underlying inflationary pressures.