

Box 2

Analysis of HICP developments based on seasonally adjusted data

In line with the Eurosystem's definition of price stability in terms of annual rates of change, the "Economic developments in the euro area" section of the ECB Monthly Bulletin regularly analyses HICP developments in terms of year-on-year changes (i.e. the percentage change in the level of a variable compared with the level a year earlier). Annual rates of change have the advantage of being well known and understood by the general public. Nevertheless, it is useful to supplement the analysis of developments in the annual rates of change with the analysis of short-term dynamics in consumer prices. The most important reason for this is that an annual inflation rate for a given month reflects developments in prices over a relatively long time span (of 12 months), as opposed to reflecting only the most recent price dynamics. This also implies that the development in the annual rate of change from one month to the next reflects not only price developments in the latest month, but also developments in the same month of the previous year, thereby giving rise to "base effects".

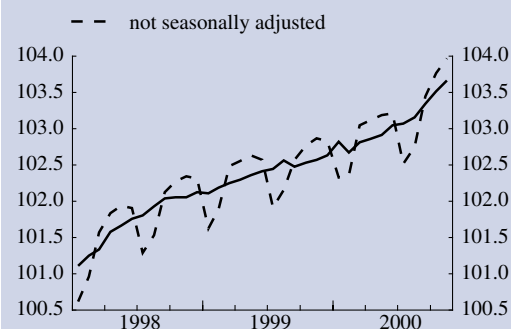
However, while annual percentage changes are generally not affected by seasonal variations, month-on-month or other changes over a year can be significantly affected by seasonal factors and are, therefore, only useful when using seasonally adjusted data. Seasonal adjustment corrects for the regular movements in the time series which occur every year during the same period. Although seasonal patterns in overall price statistics are generally less pronounced than in some other macroeconomic variables, such as measures of output and turnover, reasons for seasonal variation in consumer price statistics include fluctuations in the availability of food items, end-of-season sales or regular changes in administered prices (e.g. those associated with annual fiscal budgets). In September 2000, the ECB published a document entitled "Seasonal adjustment of monetary aggregates and Consumer Price Indices (HICP) for the euro area", which is available on the ECB website and discusses in detail the adjustment carried out by the ECB.

Seasonally adjusted data for the overall HICP in the euro area are compiled as the sum of the seasonally adjusted euro area-wide HICP components. More specifically, the seasonally adjusted HICP index is based on four seasonally adjusted components (unprocessed food, processed food, non-energy industrial goods and services) and the energy component, which is unadjusted, since no significant, stable seasonal variation could be identified for this component. For the analysis of price developments, this approach ensures consistency between the developments in the overall HICP and its components and facilitates explanation of euro area-wide developments (for further information see Box 3 entitled "An analysis of price developments: the breakdown of the overall HICP into its main components" in the December 2000 issue of the ECB Monthly Bulletin). Chart A shows the unadjusted and seasonally adjusted HICP results for non-energy industrial goods

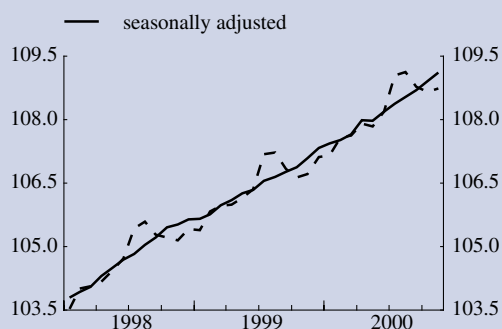
Chart A: Seasonal patterns in two main HICP components

(index: 1996 = 100; monthly data)

Non-energy industrial goods



Services

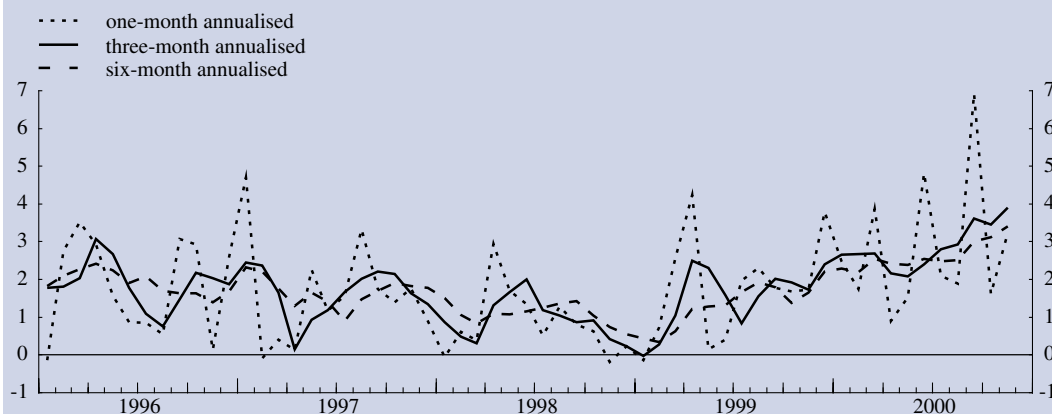


Sources: Eurostat and ECB calculations.

and services, two components which account for around 70% of the total HICP weight and which display a considerable and very regular seasonal pattern. However, since patterns around mid-year tend to move in the opposite direction, to some extent they cancel each other out, making the seasonal pattern in the overall index less pronounced.

Chart B: Short-term movements in the overall HICP

(annualised rates of change; seasonally adjusted; monthly data)

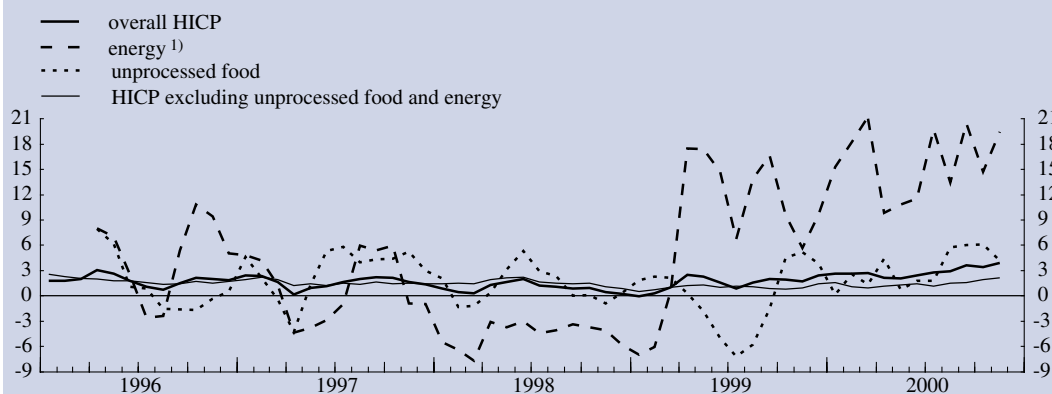


Sources: Eurostat and ECB calculations.

Based on seasonally adjusted data, several measures of short-term developments in the HICP can be calculated. As an example, one-month, three-month and six-month annualised rates of change are presented in Chart B. These rates of change can be interpreted as the annual rate of increase which would result if the price increase recorded over the latest one-month, three-month and six-month periods was sustained for a full year. It can be noted that since early 1999, all three measures have shown a broad upward movement. In addition, the very short-term developments in prices measured by the one-month annualised rates tend to be very volatile. Annualised changes over six months are the least volatile of the measures presented in Chart B, but this measure captures more than just the most recent price developments. The longer-term measures show short-term dynamics in prices with a time-lag which increases with the length of the period over which these measures are calculated. While many instances of this can be observed for the data shown in Chart B, it can be most clearly seen in 1998 and early 1999. More specifically, the one-month annualised rate reached a local peak in April 1998, as did the three-month rate in June 1998 and the six-month rate in September 1998. Similarly, the one-month annualised rate reached a local trough in November 1998, as did the three-month rate in January 1999 and the six-month rate in February 1999.

Chart C: Short-term movements in the HICP and its components

(three-month annualised rates of change; seasonally adjusted, unless otherwise indicated; monthly data)



Sources: Eurostat and ECB calculations.

1) Energy is not seasonally adjusted.

Looking at the three-month annualised rates of change in the components of the overall HICP, it is clear that energy prices have been a major factor behind the rise in short-term price increases since early 1999 (see Chart C). However, since mid-1999, unprocessed food prices, the other highly volatile component of the HICP, have also contributed to this upward movement. From the chart it can also be seen that the three-month rates show a decline in unprocessed food prices in mid-1999 and a clear rise in mid-2000. This indicates that the rise in the annual rate of change in unprocessed food prices in mid-2000 reflects both the rise in unprocessed food prices at that time as well as the base effect stemming from the declining price level one year earlier. By comparison, the three-month rate in the HICP, excluding these more volatile components, has remained much more stable throughout the last five years, although it has risen somewhat recently.

From now on, the seasonally adjusted HICP will be included in Table 4.1 of the “Euro area statistics” section of the ECB Monthly Bulletin.