

Box 3

**THE ANCHORING OF LONG-TERM INFLATION EXPECTATIONS IN THE EURO AREA**

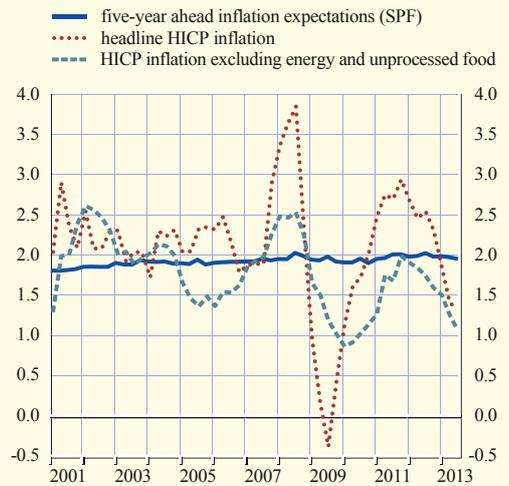
Long-term inflation expectations in the euro area have remained quite stable over recent years. The average five-year ahead expectation in the Survey of Professional Forecasters (SPF) has remained between around 1.9% and 2.0%, moving only at the second decimal. At the same time, headline HICP inflation has been subject to fairly large fluctuations (see Chart A). A weak nexus between long-term inflation expectations and actual inflation can be seen as one indication of anchored expectations. Against this background, this box assesses the link between long-term inflation expectations and developments in actual inflation and in short-term inflation expectations.

**The link with actual inflation developments**

Data available for the period of Monetary Union point to a relatively weak link between long-term inflation expectations surveyed in a particular quarter and the latest actual inflation rate known at the time of the survey. More specifically, a linear fit between long-term inflation expectations and actual HICP inflation produces a relatively flat slope (demonstrating a weak link between the two variables), and reflects a low statistical fit for the estimated relationship (see Chart B). Both the link and fit increase with the length of the moving averages of past inflation used in explaining long-term inflation expectations (similar results are obtained when using underlying, rather than headline inflation). For instance, the slope increases significantly when a 20-quarter moving average is used and is highest when using the cumulative average inflation rate, which measures the cumulative average of annual inflation rates calculated for each quarter in the period from the first quarter of 1999 to the third quarter of 2013. The cumulative average inflation rate can be

**Chart A Long-term inflation expectations and HICP inflation**

(annual percentage changes; Q1 2001 to Q3 2013)



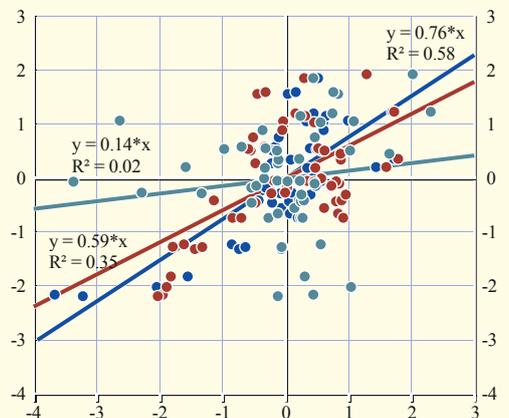
Sources: Eurostat, ECB and SPF.  
Note: For HICP inflation, the value for the third quarter of 2013 includes the flash estimate for September 2013.

**Chart B Link between long-term inflation expectations and HICP inflation measures**

(percentages; Q1 2001 to Q3 2013)

x-axis: HICP inflation (actual, 20-quarter moving average and cumulative average since Q1 1999), with a lag of one quarter  
y-axis: long-term inflation expectations (SPF)

- cumulative average HICP inflation
- 20-quarter moving average of headline HICP inflation
- actual headline HICP inflation



Source: ECB calculations.  
Note: The variables have been standardised by subtracting their mean and dividing by their standard deviation.

seen as a proxy for the track record – and the resulting credibility – of the ECB’s monetary policy in terms of the inflation outcome.

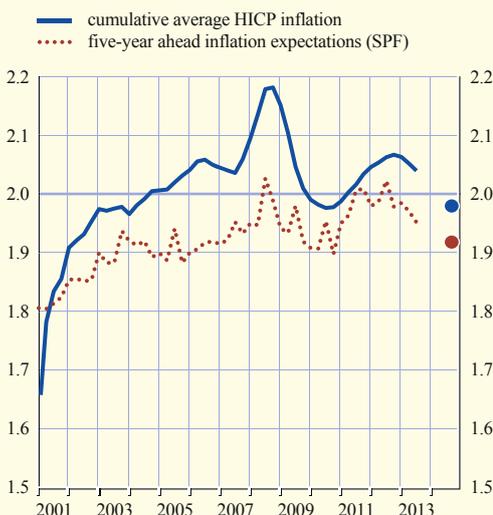
The relationship between long-term inflation expectations and the cumulative average inflation rate over time is shown in Chart C. The September 2013 ECB staff macroeconomic projections for the euro area expect an HICP inflation rate of 1.5% in 2013 and 1.3% in 2014, implying a further slight moderation in cumulative average inflation to below 2% at the end of 2014. On the basis of the historical relationship between this average and longer-term inflation expectations, the latter are likely to decline somewhat further over the projection horizon, while remaining in the range between 1.9% and 2.0%.

### The link with short-term inflation expectations

The absence of a link between long-term inflation expectations and short-term actual

**Chart C Long-term inflation expectations and the cumulative average of headline HICP inflation**

(annual percentage changes; Q1 2001 to Q3 2013; forecast for 2014)

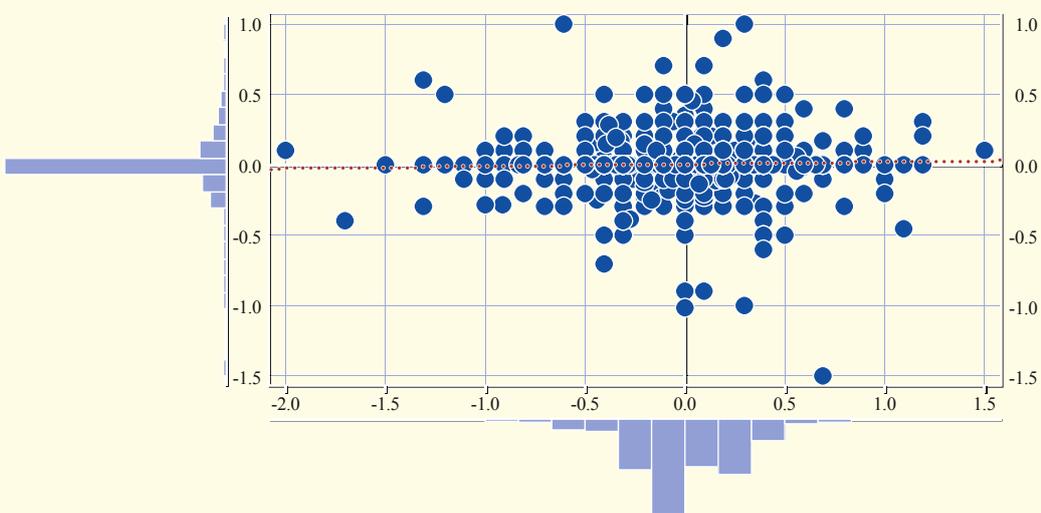


Sources: SPF and ECB calculations.  
Notes: The blue dot represents the cumulative inflation value for 2014 based on the September 2013 ECB staff macroeconomic projection. The red dot represents a regression-based forecast for five-year ahead expectations. For HICP inflation, the value for the third quarter of 2013 includes the flash estimate for September 2013.

**Chart D Changes in one-year ahead and five-year ahead inflation expectations (SPF)**

(percentage points; Q1 2001 to Q3 2013)

x-axis: revisions to one-year-ahead inflation expectations  
y-axis: revisions to long-term inflation expectations



Sources: ECB and SPF.  
Notes: Each data point represents the change in the short-term (x-axis) and long-term (y-axis) inflation expectations of a particular panellist from one survey round to the next. The bars next to the x-axis and y-axis comprise histograms of revisions to one-year ahead and five-year ahead inflation expectations respectively.

inflation developments suggests that agents look through transitory influences on inflation, such as those stemming from commodity price shocks, when forming their long-term inflation expectations. This assertion can be confirmed by considering the link between short-term and long-term inflation expectations: if long-term expectations are well anchored, then five-year ahead inflation expectations should not be correlated with revisions to one-year ahead inflation expectations.

The link between short-term and long-term expectations is assessed on the basis of the individual responses of panellists in the SPF. Each data point in Chart D represents the change in expectations of a particular panellist from one round to the next.<sup>1</sup> The line fitted to the data points is almost horizontal, implying that participants do not revise, on average, their long-term inflation expectations when they reassess their shorter-term projections.<sup>2</sup> This is also reflected in the very different shape of the distribution of revisions to short-term expectations from that of the distribution of revisions to longer-term expectations.

Overall, the analysis presented in this box for the euro area supports the notion that in forming and revising their long-term inflation expectations, agents look through short-term movements in past and expected inflation, but take into account the track record of inflation performance.

- 1 The sample spans the period from the first quarter of 2001 to the third quarter of 2013 and, for consistency, includes only those participants that provided the one-year ahead and five-year ahead expectations in consecutive survey rounds.
- 2 The slope of the linear fit in Chart D is 0.02. The average absolute correlation across SPF participants between revisions to one-year ahead inflation forecasts and revisions to long-term inflation forecasts is somewhat higher but still relatively small, standing at 0.33. It captures the extent to which long-term inflation expectations move in response to changes in shorter-term inflation expectations, irrespective of whether these changes are upwards or downwards.