

## THE FORECASTING PERFORMANCE OF EXPERT SURVEYS

The expectations of economic agents regarding the future development of key macroeconomic variables play a crucial role in shaping their economic decisions, such as those concerning consumption or investment, which, in turn, affect macroeconomic outcomes. Given such interdependence, it is of interest to investigate the actual predictive ability of economic agents, in particular those who conduct systematic macroeconomic analysis and produce economic forecasts as part of their business.

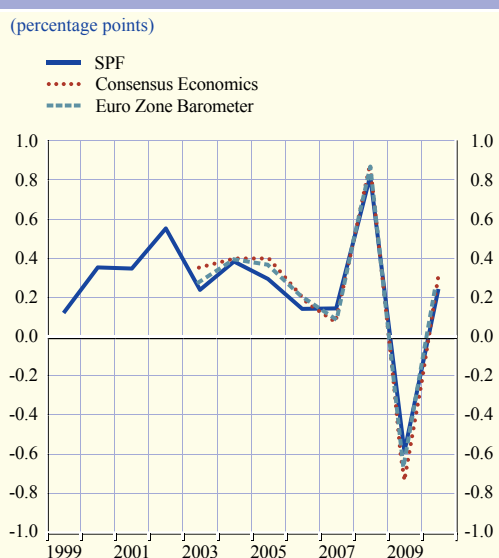
Various surveys are available that assess the expectations of private agents. Some of these surveys typically ask panels of professional forecasters, such as financial market participants or research institutes, for their forecasts of the main economic indicators for one or more countries or regions and at several time horizons. This box investigates the accuracy of forecasts for euro area inflation, GDP growth and the unemployment rate provided by three long-established surveys, namely the ECB Survey of Professional Forecasters (SPF), Consensus Economics and the Euro Zone Barometer.<sup>1</sup>

### Inflation expectations

Chart A shows the forecast errors (computed as the realised values minus the predicted values) for the forecasts made every January for the coming year by the three surveys. The forecast errors from the three surveys are extremely close and are positive for every year, with the exception of 2009, a year in which oil prices fell sharply. Results are also broadly similar when considering the forecasts made in the January of a given year for the following year, although in this case the errors for 2008 and 2009 are around 1.5 percentage points, in absolute value, as opposed to 0.8 percentage point for the current year.

The period for which forecast errors from all three surveys are available is from 2003 to 2010 for the current year, and from 2004 to 2010 for the following year. Over these periods, the mean error is positive and around 0.2 percentage point for both the current and following year (see Chart Ba), meaning that SPF, Consensus Economics and Euro Zone Barometer expectations for the current and following years have underestimated actual inflation, on average, over the last seven to eight years.

Chart A Inflation forecast errors (current year)

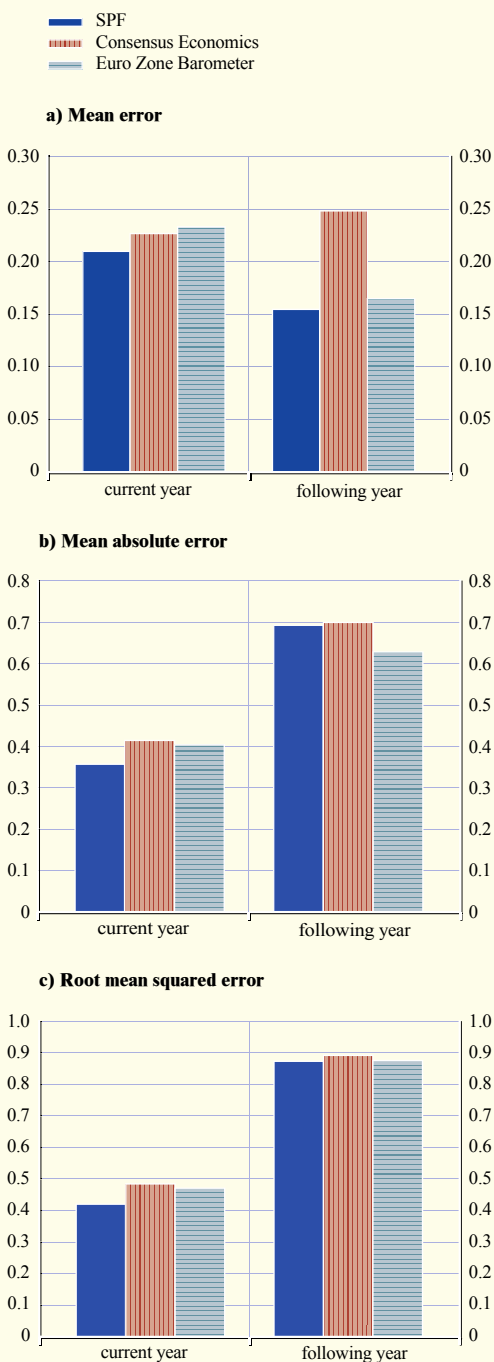


Source: ECB staff calculations.

<sup>1</sup> Consensus Economics and the Euro Zone Barometer are conducted on a monthly basis, while the SPF is a quarterly survey. This box focuses only on those rounds which are comparable in terms of available information at the time of the survey and forecast horizon.

Chart B Average inflation forecast errors

(percentage points; current year: 2003-10 average; following year: 2004-10 average)



Source: ECB staff calculations.

However, this underestimation of inflation in the euro area has to be assessed in the light of the influence of several factors. In fact, since 1999 HICP inflation has been affected by several unexpected upside shocks. The main explanation for the systematic underestimation of the inflation rate seems to be the oil price, which turned out to be higher than the level implied by oil futures throughout the whole period, with the exception of 2009. Rises in food price inflation during certain periods also help to explain positive forecast errors. In 2001, for instance, unprocessed food prices were driven up by the BSE and foot-and-mouth diseases and, in 2008, processed food prices increased following rises in commodity prices in the previous year. Such developments are the most difficult to forecast. In fact, when considering HICP inflation excluding energy and unprocessed food prices, the downward bias of the expectations decreases, at least for the period from 1999 to 2006.<sup>2</sup> Finally, events such as unexpected indirect tax increases and the effects of the euro cash changeover in 2002 also caused positive inflation forecast errors.

The mean error statistic averages out positive and negative errors. In order to compare the quality of forecasts, it is thus more appropriate to refer to the mean absolute error (MAE). The differences in performance across the surveys are small also when considering this indicator. The MAEs computed over the 2003-10 and 2004-10 periods are between 0.3 percentage point and 0.4 percentage point for the current year, while they are between 0.6 percentage point and 0.7 percentage point for the following year (see Chart Bb). The picture looks very similar when considering the root mean squared error (RMSE), which provides another measure of the size of the errors, but giving greater weight to the outliers (see Chart Bc). In general, the similarity of the performance across the surveys may also reflect the fact that several of the respondents participate in more than one of the surveys.

<sup>2</sup> This analysis was carried out using SPF data. See Bowles, C., Friz, R., Genre, V., Kenny, G., Meyler, A. and Rautanen, T., "The ECB survey of professional forecasters (SPF) – A review after eight years' experience", *Occasional Paper Series*, No 59, ECB, 2007.

With respect to longer horizons, Chart C reports forecasts from Consensus Economics for six to ten years ahead (denoted by green diamonds), together with the corresponding actual average inflation rate for six to ten years ahead (denoted by red dots) and the inflation rate at the time the forecasts were made (denoted by the blue line). According to forecasts made in April 1991 for the average 1996-2000 inflation rate, forecasters expected significantly higher inflation than the actual outcome. Consensus Economics' inflation expectations for the euro area six to ten years ahead steadily decreased from above 3% in 1991, when the inflation rate was around 4%, to just below 2% in 1999. The fall in expectations probably reflected the decline in actual inflation in the context of the run-up to Stage Three of EMU. Indeed, it should be recalled that, on 13 October 1998, the Governing Council of the ECB announced the quantitative definition of price stability as "a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%". Since then, Consensus Economics' inflation expectations six to ten years ahead have remained at this level.

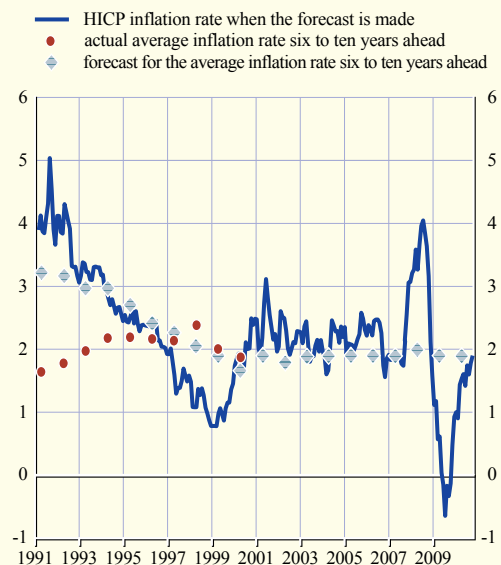
### Real GDP growth expectations

While inflation forecast errors have generally been one-sided, growth forecast errors do not display any systematic pattern. Chart D shows the forecast errors for euro area real GDP growth, based on forecasts made every January for the coming year. Again, differences between the surveys are minor. Growth was overestimated in the 2001-03 period and during the 2008-10 financial crisis, while it was underestimated in the years immediately preceding the crisis.

The profile of the forecast errors for GDP growth indicates that, in contrast to inflation, growth has been hit by more symmetric shocks. The 9/11 terrorist attacks, the tensions generated by the war in Iraq, and the bursting of the dot.com bubble negatively affected

**Chart C Consensus Economics forecast and euro area HICP inflation rate**

(annual percentage changes)

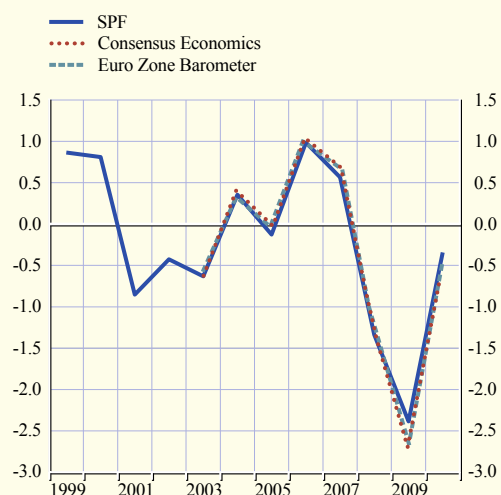


Source: ECB staff calculations.

Notes: Euro area inflation expectations for six to ten years ahead between 1990 and 2002 have been constructed by aggregating country data provided by Consensus Economics (see Castelnovo et al., 2003). Expectations for the euro area as a whole have been provided by Consensus Economics as of 2003. The data are taken from the April surveys.

**Chart D Real GDP growth forecast errors (current year)**

(percentage points)



Source: ECB staff calculations.

euro area growth in the early 2000s, contributing to negative prediction errors. In the subsequent period, i.e. the run-up to the financial crisis, which was characterised by strong global expansion and booming asset prices fuelled by surging leverage, GDP growth was underestimated. With respect to the financial crisis, the factors explaining the large forecast error include: i) the collapse of Lehman Brothers, which was an unexpected shock with a global dimension; ii) the subsequent unprecedented plunge in confidence, which led to a sharp retrenchment in consumption and investment; iii) the unexpected global spread of the crisis accompanying this, as well as the associated collapse in global trade; iv) earlier expectations that the euro area might have started to decouple from the United States, which may initially have led to an underestimation of the speed of the transmission of US financial shocks and their repercussions overseas; v) a possible general underestimation of the impact of financial shocks on economic activity.

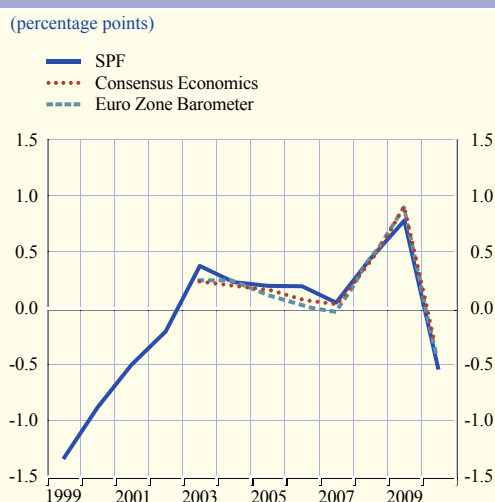
The mean errors over the 2003-10 and 2004-10 periods for forecasts made every January for the coming year and the following year are around -0.4 and -1 percentage point, respectively. This result is driven by the large negative errors in 2008 and 2009. With respect to MAEs and RMSEs, the three surveys are even closer to each other than in the case of inflation errors, and the general result is that activity forecasts have been less accurate than inflation forecasts. In fact, the MAE for current year forecasts is slightly below 0.9 percentage point, while it is around 1.6 percentage points for forecasts for the following year. RMSEs are slightly above 1 percentage point and slightly below 2.5 percentage points for forecasts for the current and following year, respectively.

### Expectations for the unemployment rate

Chart E shows forecast errors for the euro area unemployment rate for January forecasts made for the current year. In the period between 1999 and 2002, when only SPF forecasts were available, the unemployment rate was overestimated. In the following years up to 2008, all three surveys slightly underestimated the unemployment rate.

The largest error in the unemployment rate forecast, which was related to the financial crisis, was seen in 2009. This can largely be explained by a swift labour market response in those euro area economies which previously had large proportions of employees on temporary contracts. However, given that one would expect the unemployment forecast errors to mirror those for activity, and given that forecasts overestimated growth by around 2.5 percentage points in 2009, the underestimation of the unemployment rate for 2009 of around 1 percentage point was actually modest. In contrast, the unemployment rate was overestimated in 2010. This reflects a number of positive surprises in labour markets, most notably the German labour market, which was able to retain more workers than expected.

Chart E Unemployment forecast errors (current year)



Sources: ECB staff calculations.

With respect to forecasting performance statistics, the MAE for current year forecasts is around 0.3 percentage point, while it is around 0.8 percentage point for forecasts for the following year. The RMSEs are 0.4 and 1 percentage point for current and following year forecasts, respectively.

To sum up, the three surveys considered are broadly comparable in terms of forecasting performance. Overall, an analysis of the accuracy of survey-based expectations suggests that, over the past decade, with the exception of 2009, professional forecasters systematically underestimated inflation. This can be explained by the fact that euro area inflation has been hit by several unexpected one-sided shocks, notably those stemming from global commodity markets. There is less evidence of such systematic errors for GDP growth, which was both overestimated and underestimated during the period under consideration. Finally, the unemployment rate has not been overestimated since 2003, with the notable exception of 2010.