

## How informative survey data on private sector inflation expectations are for monetary policymakers

In recent years, economic agents' inflation expectations have risen up the agenda of the debate on monetary policy. While measures of long-term inflation expectations are mainly used to indicate the credibility of a central bank's stability target, shorter-term expectations are considered indicators of short to medium-term price pressures.

This article presents various survey measures of private sector inflation expectations and analyses how informative they are for monetary policymakers. On balance, analysis of the survey data shows that they contain a whole range of information that is valuable for monetary policy. Nevertheless, to interpret the data properly, they need to be analysed in a broader context alongside other indicators. By contrast, gearing monetary policy decisions primarily to private sector forecasts is problematic for a number of reasons.

### The monetary policy implications of expectations

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For central banks such as the Eurosystem whose primary objective is price stability, expectations of future price developments take on a particular importance. When forming their longer-term expectations, economic agents will disregard current price developments and focus on the central bank's stability target only if they are convinced that the

*Anchoring  
expectations  
facilitates  
stability-  
oriented  
monetary policy*

central bank will achieve price stability in the medium term. If that is the case, then temporary price shocks, such as an increase in the rate of VAT, will not have a bearing on longer-term expectations, meaning that the central bank can accept temporary fluctuations in the inflation rate (assuming there are no second-round effects) without endangering its credibility. Consequently, modern central banks observe and analyse private-sector inflation expectations very attentively.

### Measuring inflation expectations

*Deriving inflation expectations from survey data*

Expectations cannot be observed directly, however, meaning that suitable indicators must first be found. One possible approach is to ask economic agents directly about their expectations. A number of such surveys are carried out for both the euro area and its member states. The number of participants, the frequency of the surveys and the price expectations horizon vary between studies.<sup>1</sup> Three notable surveys are the consumer surveys carried out on behalf of the European Commission, the expert surveys conducted by the London-based company Consensus Economics and the Eurosystem survey of professional forecasters.<sup>2</sup>

*Consumer surveys and expert polls*

At first glance, the results of consumer surveys appear particularly relevant for monetary policy because it is likely that households' expectations will be reflected in their spending and saving decisions and that, through the social partners, they will also impact wage formation. However, the European Commission consumer survey does not yield point

predictions for the rate of change in the national consumer price indices; instead, it merely provides qualitative data on the expected trend in consumer prices. Moreover, the wording of the multiple-choice answers poses certain problems that must be taken into account when interpreting the results. Consequently, some observers recommend that, when constructing measures of inflation expectations, one should disregard the results of consumer surveys in favour of expert forecasts. The arguments in favour of using the latter are that they have already been quantified, are regularly published and hence may also have conditioned households' and enterprises' inflation expectations.<sup>3</sup>

Alternatively, measures of expected price developments can be derived from financial market data. For example, data on market participants' inflation expectations may be obtained by comparing the yield spreads between conventional nominal bonds and inflation-indexed bonds with the same maturity (break-even inflation rates) or analysing inflation-linked swap rates. However, interpreting financial-market-based indicators such as these is complicated by the fact that, in addition to the expected inflation rate, they also include time-varying inflation risk premia and liquidity premia. A further obstacle is that the relevant financial instruments did not become

*Deriving inflation expectations from financial market data*

<sup>1</sup> For a summary, see Measures of inflation expectations in the euro area, ECB Monthly Bulletin, July 2006, pp 59-68.

<sup>2</sup> There are also several other national surveys, such as the surveys for Germany conducted by the Centre for European Economic Research.

<sup>3</sup> See J Döpke et al, European inflation expectations dynamics, Deutsche Bundesbank Research Centre Discussion Paper, Series 1: Economic Studies, No 37/2005.

available until the introduction of the euro. Hence, it is not yet possible to conduct a longer-term assessment of their information content for the euro area.<sup>4</sup>

Accordingly, this article will focus on survey measures of inflation expectations. In particular, it draws on the expert forecasts over various time horizons conducted by Consensus Economics and consumers' expectations from the European Commission survey, both of which cover the euro area as well as Germany and other individual euro-area member states and thus allow a disaggregated analysis. Another benefit of using these particular survey data is that they have been available since the mid to late 1980s, providing a sufficient number of observations for a time series analysis. In contrast to the two data sources used in this analysis, the data from the Eurosystem survey of professional forecasters are available only from 1999 onwards and relate to the euro area as a whole.

### Longer-term inflation expectations as indicators of central bank credibility

#### *Quantitative definition of price stability*

In recent years, many central banks have introduced a quantitative definition of price stability in order to stabilise longer-term inflation expectations and to provide economic agents with a guideline for price and wage-setting. In 1998, the ECB Governing Council also took this line, defining price stability as "a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%". In addition, price stability was "to be maintained over the medium

term".<sup>5</sup> This qualifier allows for the fact that prices are subject to short-term fluctuations outside the control of monetary policy. Following a review of its monetary policy strategy in 2003, the Governing Council further clarified that, in the pursuit of price stability, it aims to maintain inflation rates below but close to 2% over the medium term.<sup>6</sup>

Survey data on long-term inflation expectations provide indications about the degree to which respondents actually take account of the central bank's medium-term objective when forming their expectations. From a central bank's perspective, these data can therefore be used to gauge the credibility of its stability commitment. Since the autumn of 1989, the London-based company Consensus Economics has conducted surveys which also include long-term forecasts for various horizons of between two and ten years every six months alongside its regular monthly surveys (see the table on page 18). For the major industrialised countries, the forecasts rely on a panel of experts recruited from those countries' leading banks, securities firms, economic research institutions and economic service providers.<sup>7</sup> Although forecasts for the euro area have been produced only since December 2002, forecasts for the five largest euro-

*Measures of long-term inflation expectations*

<sup>4</sup> See ECB (2006), loc cit and M Hurd and J Relleen, New information from inflation swaps and index-linked bonds, Bank of England Quarterly Bulletin, Spring 2006, pp 24-34.

<sup>5</sup> See ECB, A stability-oriented monetary policy strategy for the ESCB, Press release, 13 October 1998.

<sup>6</sup> See ECB, The ECB's monetary policy strategy, Press release, 8 May 2003 and ECB, The monetary policy of the ECB, Frankfurt 2004, p 52.

<sup>7</sup> For Germany, 32 institutions are currently polled, including economic research institutions, banks from all sections of the German banking system and several foreign financial institutions operating in Germany.

### Characteristics of the Consensus Economics expert forecasts

Survey	Frequency	Time horizon	Available data	Countries surveyed
Regular survey	Monthly	Current and following calendar year	Individual expert forecasts	From Oct-Nov 1989 for all euro-area member states except LU 1 and GR 2; from July 1993 for GR 2; from Dec 2002 onwards for the euro area
Special survey "Quarterly forecasts"	Quarterly (March, June, September, December)	One to six quarters	Average of the individual forecasts	From Nov 1989 for DE 3, FR 4, IT 5; from Dec 1994 for NL 6 and ES 7; from Dec 2002 for the euro area
Special survey "Long-term forecasts"	Six-monthly (April and October)	Two, three, four, five years; six to ten years	Average of the individual forecasts	From Oct 1989 for DE 3, FR 4, IT 5; from April 1995 for NL 6 and ES 7; from April 2003 for the euro area

1 Luxembourg. — 2 Greece. — 3 Germany. — 4 France. — 5 Italy. — 6 Netherlands. — 7 Spain.

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area countries (which have a combined weighting of 85% in the euro-area inflation rate calculation) can be used to approximate the period prior to that date.

The chart on page 19 plots the course of the Consensus inflation forecasts with a horizon of six to ten years for the euro area, Germany and other major industrialised countries and also shows the trend in the actual inflation rate since the start of the 1990s.<sup>8</sup> It illustrates that, in many instances, expectations have stabilised at a low level since the mid to late 1990s. The volatility of the survey expectations around their mean values can be used to determine how well inflation expectations are anchored. Accordingly, well-anchored expectations would be those exhibiting a low level of volatility more or less consistent with

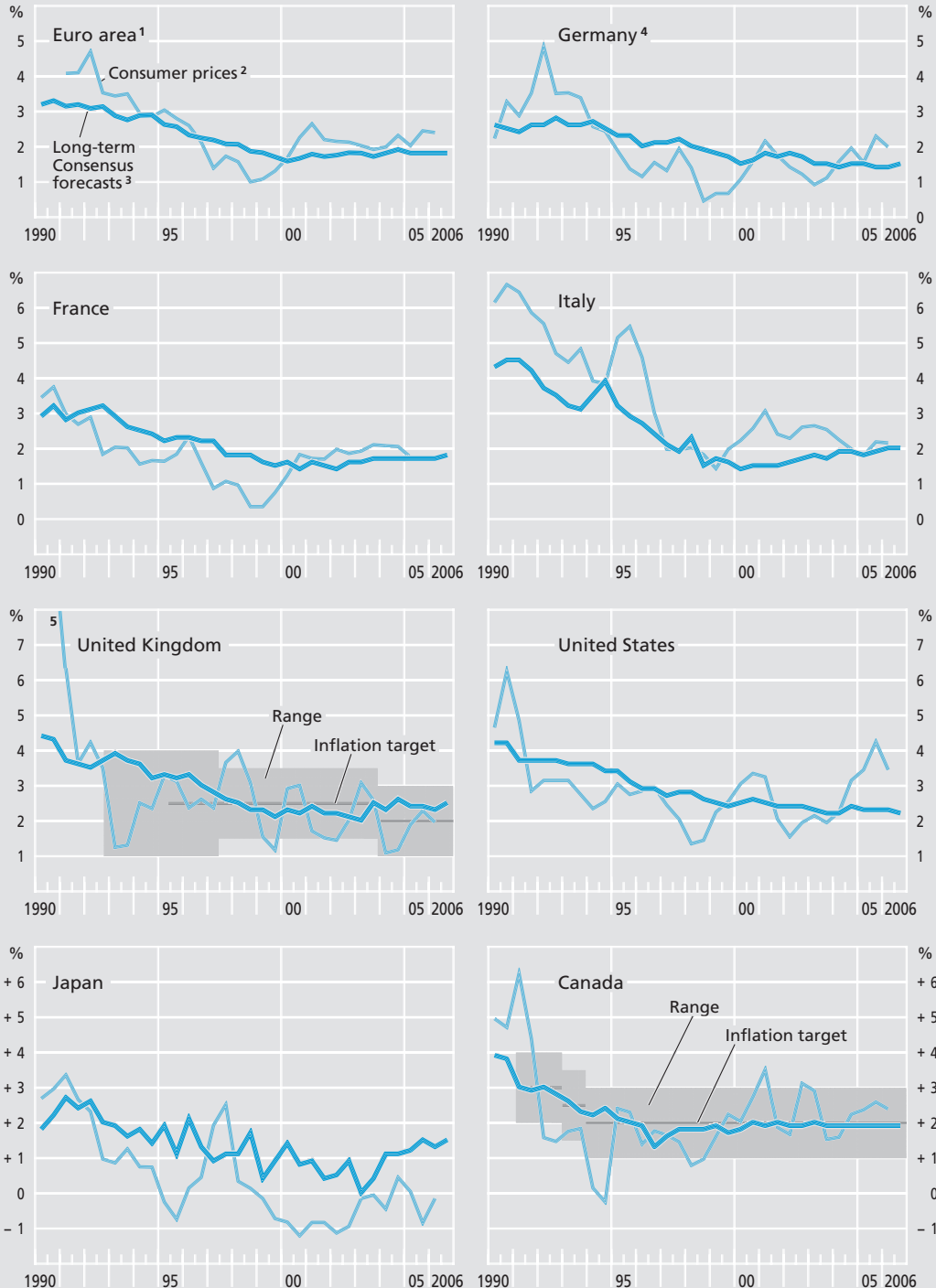
the central bank's target definition.<sup>9</sup> However, in a monetary union, the situation might arise where, owing to structural differences, inflation rates of individual member states remain above or below the average for the currency area as a whole over the longer term. If the economic agents are expecting such ongoing structural inflation differentials, then the longer-term inflation expectations for the country concerned will deviate from the target for the entire currency area; however, this should not be construed as a sign that monetary policy is suffering from a credibility deficit.

<sup>8</sup> As Consensus Economics conducts the long-term forecasts in April and October, these months' values were also used to plot the realised inflation rates.

<sup>9</sup> See E Castelnuovo et al, Definition of Price Stability, Range and Point Targets: The Anchoring of Long-Term Inflation Expectations, ECB Working Paper No 273, September 2003.

## Long-term inflation expectations and realised inflation

Six-monthly (values for April and October)



1 Prior to 2003, weighted average of the data for the five largest euro-area countries. — 2 Year-on-year change; euro area: HICP from 2003; UK: Retail Price Index until end-2003, HICP from 2004. — 3 Forecasts for a time horizon of six to ten years. Source: Consensus Economics. — 4 Forecasts and consumer prices for Western Germany up to and including April 1996. — 5 October 1990: 10.9%.

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### Statistical indicators for the stability of long-term Consensus inflation forecasts \*

Six-monthly data, observation period 1990 H1 to 2006 H1

Observation period	Euro area <sup>1</sup>	Germany <sup>2</sup>	France	Italy	UK	USA	Japan	Canada
Average long-term inflation expectations								
1990–1994	–	2.69	2.96	3.94	3.86	3.84	2.14	2.99
1995–1998	2.33	2.21	2.18	2.48	2.98	3.00	1.50	1.89
1999–2006	1.86	1.69	1.70	1.80	2.39	2.48	0.95	2.00
Standard deviation of inflation expectations								
1990–1994	–	0.11	0.28	0.52	0.36	0.26	0.43	0.58
1995–1998	0.26	0.15	0.23	0.55	0.38	0.25	0.44	0.25
1999–2006	0.08	0.15	0.11	0.18	0.16	0.11	0.45	0.08
Average absolute change in expectations from previous period								
1990–1994	–	0.11	0.21	0.27	0.22	0.09	0.33	0.23
1995–1998	0.13	0.13	0.10	0.40	0.16	0.13	0.54	0.20
1999–2006	0.07	0.10	0.09	0.10	0.16	0.07	0.46	0.07
Standard deviation of actual inflation								
1990–1994	–	0.75	0.77	1.03	3.31	1.26	1.04	2.21
1995–1998	0.73	0.46	0.64	1.57	0.59	0.66	1.10	0.57
1999–2006	0.42	0.52	0.50	0.40	0.70	0.77	0.49	0.60
Standard deviation of expectations over standard deviation of actual inflation								
1990–1994	–	0.15	0.37	0.50	0.11	0.21	0.41	0.26
1995–1998	0.35	0.32	0.36	0.35	0.66	0.38	0.40	0.43
1999–2006	0.20	0.29	0.21	0.45	0.23	0.15	0.92	0.13

\* Time horizon: six to ten years. — <sup>1</sup> Euro area from 2003, previously weighted average of data for the five largest member countries. — <sup>2</sup> Forecasts and consumer

prices up to and including 1996 H1 are for Western Germany.

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... do not  
indicate  
instabilities

During the period from 1999 to the present, the long-term Consensus forecasts for the euro area were below 2% on average, although the inflation rates frequently exceeded the 2% boundary owing to a series of different upward price shocks. Since the mid to late 1990s, expectations in Canada and the United Kingdom have also matched these countries' respective inflation targets.<sup>10</sup> In the United States, where the central bank has still not formulated a quantitative target, long-term inflation expectations appear to have stabilised around the 2.5% level. Looking at the values from the various measures of volatility during the period from 1999 to 2006, we find that the variability of inflation expectations has been very low, particularly in the euro area, the USA and Canada, with only

slight differences between the individual countries.

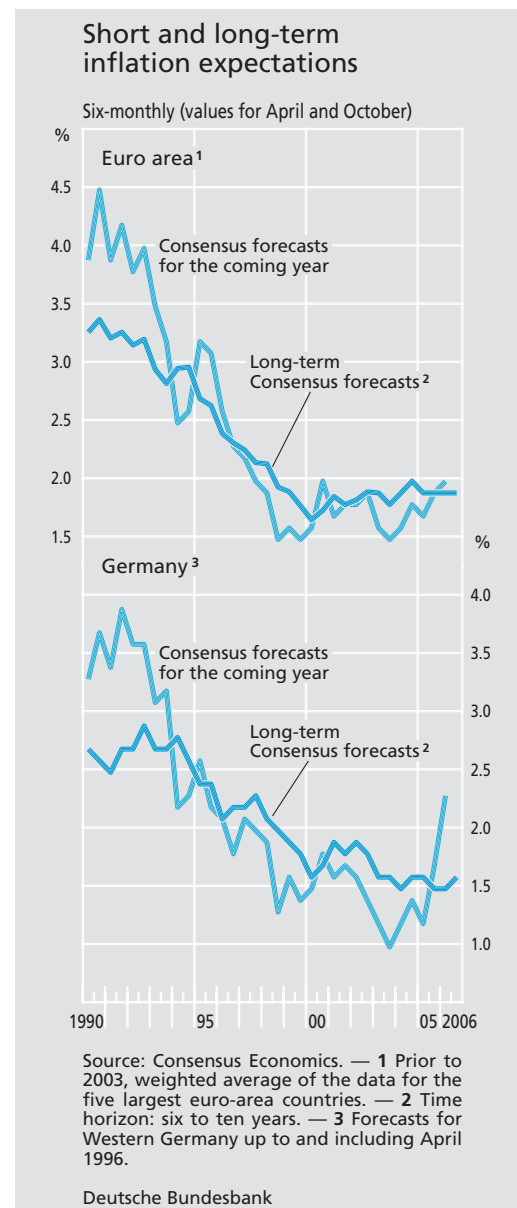
Another measure of a central bank's credibility is whether – and, if so, to what extent – changes in short-term inflation expectations (which reflect the effects of temporary price shocks) have an impact on long-term expectations. Statistically, the short-term inflation expectations of the experts surveyed by Consensus Economics have been far more volatile than their long-term expectations since the start of the 1990s. This is illustrated by the chart on page 21, which uses the Consensus forecasts for the following year as measures of short-term inflation expectations.

<sup>10</sup> It should be noted that the UK inflation target (which had been set at 2.5% from 1992 to 2003) was lowered to 2% in December 2003.

If long-term expectations are firmly anchored, there should be no significant correlation between changes in these two variables. Corresponding statistical tests show that for the first half of the estimation period (1990-1998), only Germany and Italy display no significant correlation between movements in long and short-term expectations (despite their respective inflation expectations being at very different levels). By the second half of the estimation period (1999-2006), this can also be said of the other countries under review. Nor does this test indicate that, for the euro-area as a whole, long-term inflation expectations react noticeably to changes in short-term expectations (see table on page 22).<sup>11</sup>

*Inflation expectations and interest rate policy*

However, these results cannot be interpreted as implying that, in a scenario of rising short-term inflation expectations, no monetary policy intervention is required as long as long-term inflation expectations seem to be anchored firmly at the central bank's target level. The fundamental obstacle to doing so is that long-term inflation expectations depend on assumptions regarding future monetary policy, among other things. It is therefore likely that long-term inflation expectations remain at a persistently low level precisely because market participants anticipate that, given inflationary risks, interest rate rises will form part of sound monetary policy in the near future. In this case, gearing monetary policy to long-term inflation expectations alone would result in flawed decision-making. Consequently, the central bank must consult other indicators, such as real economic and monetary developments.



By contrast, if both long and short-term inflation expectations rise above the level targeted by the central bank, this clearly indicates that some economic agents are already shifting their focus away from the stability objective when forming their expectations. In turn, the extent to which the rise in inflation expect-

<sup>11</sup> Note, however, that the limited number of observations mean that a degree of caution is advisable when interpreting the results.

**Estimated reaction of changes in long-term inflation expectations to changes in short-term inflation expectations \***

	Estimation period					
	1990–2006		1990–1998		1999–2006	
Euro area 1					0.01	(0.06)
Germany	0.02	(0.05)	0.06	(0.04)	–0.03	(0.07)
France	0.25**	(0.08)	0.26**	(0.09)	–0.42*	(0.18)
Italy	0.09	(0.07)	0.09	(0.08)	0.12	(0.12)
UK	0.22**	(0.06)	0.26**	(0.06)	0.22	(0.32)
USA	0.22**	(0.04)	0.34**	(0.04)	0.08	(0.05)
Japan	0.27	(0.18)	0.46**	(0.15)	0.02	(0.28)
Canada	0.21**	(0.06)	0.27**	(0.07)	0.01	(0.06)

\* Estimation method: seemingly unrelated regression; standard deviation in parenthesis; \*\*/\* denote significance at the 1%/5% level; long-term inflation expectations refer to Consensus inflation forecasts with a time horizon of six to ten years; short-term expectations refer to Consensus forecasts for the following year. — 1 Aggregate of five largest member countries until the end of 2002.

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ations is a reflection of real risks to price stability can be clarified only by a thorough analysis of all relevant indicators.

**Inflation expectations as indicators of future price developments**

*Informative value of short-term inflation expectations*

Whereas longer-term private sector inflation expectations can be consulted as an indicator of a central bank’s credibility (in terms of meeting its stability target), expectations over shorter horizons are of interest to central banks because they contain clues about economic agents’ assessment of the price outlook in the short to medium term.

*Survey data used*

In this article, we use the data on expected price developments from the European Com-

mission’s consumer surveys (which have a 12 month time horizon) and the Consensus forecasts (with a corresponding horizon) to construct measures of short-term inflation expectations. Alongside the regular monthly surveys, once every quarter Consensus Economics also asks the expert panels to provide additional forecasts for the next one to six quarters (see table on page 18). Whereas the regular monthly forecasts refer to the current year and the following year and thus do not have a fixed horizon, the quarterly forecasts enable us to construct time series on the polled experts’ inflation expectations with a fixed time horizon of four quarters. This matches the time horizon of the consumer survey data. As there are no data available on either the probability distributions or the dispersion of the individual forecasts, the following analysis can assess only the characteristics of the point forecasts.<sup>12</sup>

The chart on page 23 shows the path of the one-year-ahead Consensus inflation forecasts for Germany and the euro area. The charts compare the forecasts conducted in the corresponding quarter of the previous year (t-4) with the actual inflation rate in quarter t. Hence, the difference between the two time series at time t denotes the forecast error. An initial glance reveals that the experts polled failed to predict accurately both the decline in the rate of price increase in the run-up to monetary union and the turning-point in price developments at the start of 1999.

*Consensus inflation forecasts for following four quarters*

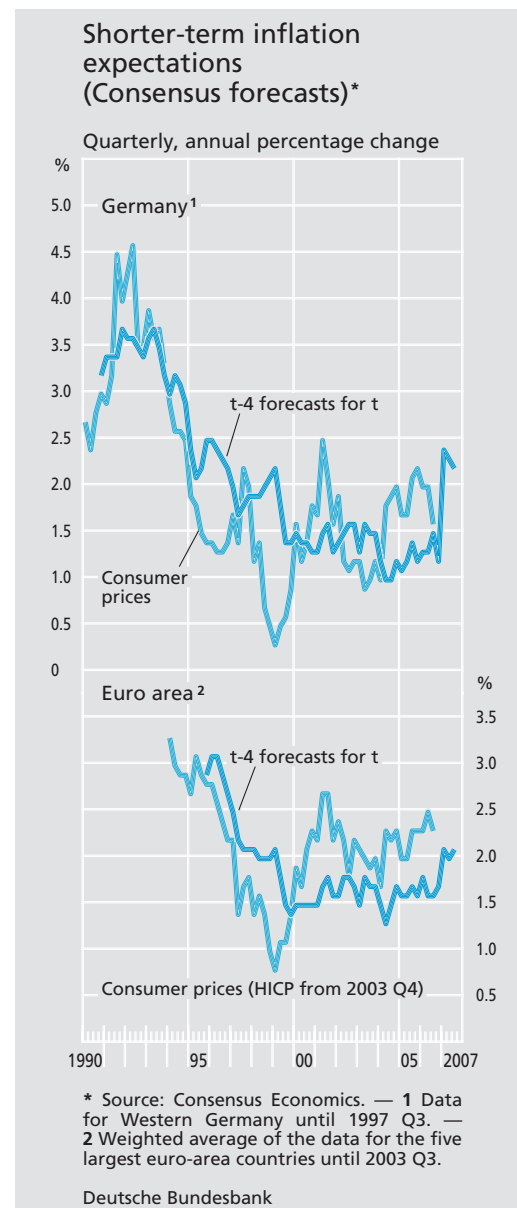
<sup>12</sup> For the significance of forecast uncertainty, see G Boero et al, Uncertainty and disagreement in economic prediction: the Bank of England Survey of External Forecasters, April 2006, <http://www2.warwick.ac.uk/fac/soc/economics/staff/faculty/wallis/publications>.



Whereas actual inflation was over-estimated until the end of 1999, inflation expectations since then have tended to be somewhat below the realised inflation rate. This was due to a whole range of unpredictable upward price shocks, such as the strong price movements on the international energy and commodity markets, the impact of animal diseases on food prices and changes to administered prices. By contrast, the noticeable leap in inflation expectations for Germany by 1.2 percentage points in the first quarter of 2006 clearly reflects the anticipated effects of the planned VAT rise on 1 January 2007.

*European  
Commission  
consumer  
surveys*

Data from the consumer surveys which are conducted every month in EU member states on behalf of the European Commission provide an alternative measure of short-term private sector inflation expectations. National institutes are charged with actually carrying out the surveys; in Germany, this responsibility falls to the GfK Group. In the larger member states, a sample of 2,000 people is selected using a special method. An even larger sample of 3,300 people is polled in France. The survey does not aim to elicit point predictions for a specific price index but is instead formulated to allow respondents to identify a general trend by opting for one of six response categories (see the table on page 24). Experience has validated this method, showing that the households questioned are likely to be better placed to comment on the expected direction of future price movements than to give point forecasts for a specific time horizon. Owing to the large sample size and the polling institutions' selection criteria, the survey results are usually interpreted as identify-



ing tendencies in the development of the respective national consumer price index.<sup>13</sup>

The raw data available from the Commission represent the percentage shares of respond-

*Converting the  
data to quanti-  
tative values*

<sup>13</sup> However, this assumes that the consumer prices to which the surveyed households refer in their answers correspond (on average) to the prices of the basket of goods on which the statistical institutions base their calculations of the national consumer price indices.

**European Commission's consumer survey: questions on price developments and the response categories**

How do you think that consumer prices have developed over the last 12 months?	By comparison with the past 12 months, how do you expect that consumer prices will develop in the next 12 months?
They have ...	They will ...
risen a lot	increase more rapidly
risen moderately	increase at the same rate
risen slightly	increase at a slower rater
stayed about the same	stay about the same
fallen	fall
don't know	don't know

Sources: European Commission.

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ents opting for each of the categories.<sup>14</sup> The literature proposes various methods for converting these data into quantitative values concerning the absolute level of inflation expectations. In particular, it should be remembered that the survey question links the assessment of future inflation patterns with the perceived price developments over the previous 12 months. Hence, the responses must be interpreted relative to the current inflation rate, or rather to the rate of price increase perceived by consumers.<sup>15</sup> The conversion method used here is the one proposed by Berk (1999) and uses the assessment of the trend in past price developments, which is also collected in the consumer survey, to measure perceived inflation. However, these data can also be quantified only under certain simplifying assumptions; consequently, the

results should be interpreted with a modicum of caution.<sup>16</sup>

In order to calculate the euro-area aggregate, the data available for the individual countries are weighted according to the respective country's share of euro-area consumer spending.<sup>17</sup> Here, too, the expectations reported in the corresponding month a year before (t-12) are compared with the actual rates of change in the consumer price index in month t.<sup>18</sup> An initial assessment suggests that the households polled appear to have underestimated the inflation rate when it was rising, for example in the early 1990s and again between March 1999 and May 2001. Moreover, the turning-points in inflation expectations lag behind those of the actual price developments (April 1992, February 1999). Both phenomena indicate that expectations regarding future price developments depend noticeably on past movements. In other words, they are to some extent backward-looking.

*Course of quantified consumer expectations*

<sup>14</sup> Individual household data are not available.

<sup>15</sup> Hence, the balance statistic published by the European Commission cannot be used directly to measure polled households' inflation expectations. See ECB, Assessing recent movements in consumers' inflation expectations, Monthly Bulletin, September 2006, p 52.

<sup>16</sup> See J Berk (1999), Measuring Inflation Expectations: A Survey Data Approach, in Applied Economics, 3, pp 1467-1480, and C Gerberding (2006), Household versus expert forecasts of inflation: New evidence from European survey data, in National Bank of Poland (ed), The role of inflation expectations in modelling and monetary policy making, forthcoming.

<sup>17</sup> For further details of the methodology, see European Commission: The Joint Harmonised EU Programme of Business and Consumer Surveys – User Guide, September 2006.

<sup>18</sup> From the start of 1998 onwards, the rates of change in the German CPI relate to the country as a whole; for euro-area data, the transition from a weighted average of national CPIs to the HICP occurred at the start of 1999.

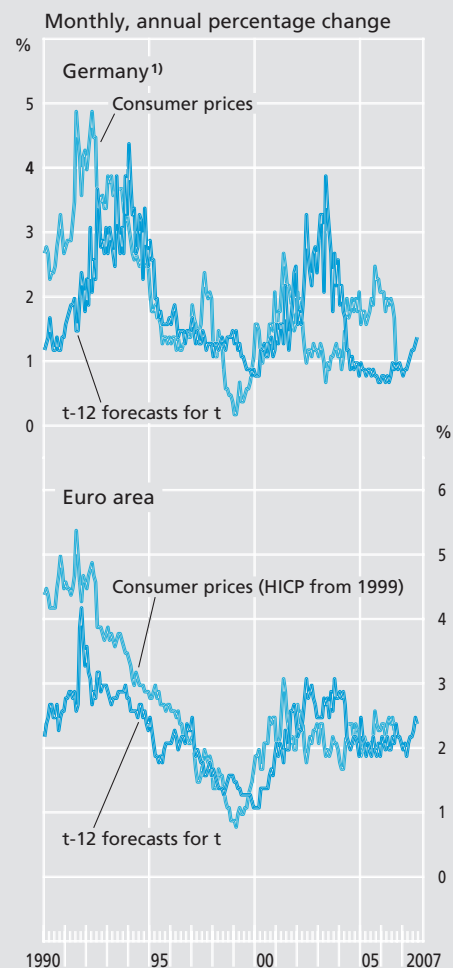
*Impact of  
changeover to  
euro notes and  
coins and  
expected VAT  
increase*

By contrast, the expectations for May 2002 to March 2004 (collected one year previously) were significantly above the actual inflation rates. This overestimation reflects consumers' fears of a surge in prices (which took root even before the changeover to euro notes and coins) and is also symptomatic of the sharp rise in their perception of the inflation rate from early 2002, which receded only very gradually.<sup>19</sup> On the other hand, it should be noted that, unlike the experts polled by Consensus Economics, the households surveyed correctly anticipated the decline in the inflation rate from mid-1993 to early 1999. Furthermore, the rise in inflation expectations in evidence since April 2006 suggests that German household respondents are incorporating the impact of the imminent VAT increase in their answers. These observations suggest that forward-looking elements are also a factor when forming expectations.

*Indicators  
of predictive  
content*

A range of statistical measures can be applied to assess the predictive content of inflation expectations. The mean forecast error indicates whether the expectations were met on average over a fixed period. Measured against this yardstick, the experts polled by Consensus Economics systematically underestimated the rate of price increases in the euro area between 1999 and 2006, whereas the other measures of expectations considered here were correct on average. The mean absolute forecast error or the root mean square forecast error are typically used to gauge the forecasts' accuracy. In this respect, the forecasts by the panel of experts for Germany fared better than the expectations generated by German households.

### Shorter-term inflation expectations (consumer survey)



Source: European Commission and own calculations.— 1 Data for Western Germany until the end of 1997.

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However, this does not hold for the euro-area forecasts in the period under review.

Another measure of predictive content is Theil's inequality coefficient, which expresses the survey data's forecast error relative to the

*Leading  
indicator  
properties of  
survey data*

<sup>19</sup> See Deutsche Bundesbank, Consumer prices and the changeover from the Deutsche Mark to the euro, Monthly Report, July 2002, pp 15-24, and Deutsche Bundesbank, The euro and prices two years on, Monthly Report, January 2004, pp 15-28.

### Predictive content of the inflation expectations obtained from the consumer survey and of the Consensus forecasts

Price expectations according to the ...	Germany		Euro area	
	1990 Q4 to 2006 Q2	1999 Q1 to 2006 Q2	1995 Q4 to 2006 Q2	1999 Q1 to 2006 Q2
	<b>Mean forecast error</b>			
consumer survey	0.16	-0.04	-0.02	-0.03
Consensus forecasts 1	-0.12	0.07	0.10	0.38**
	<b>Mean absolute forecast error</b>			
consumer survey	0.81	0.90	0.40	0.44
Consensus forecasts 1	0.57	0.58	0.57	0.55
	<b>Root mean square forecast error</b>			
consumer survey	1.02	1.05	0.48	0.53
Consensus forecasts 1	0.70	0.69	0.63	0.62
	<b>Theil's inequality coefficient 2</b>			
consumer survey	1.16	1.35	0.82	0.93
Consensus forecasts 1	0.79	0.90	1.04	1.11
	<b>Granger causality test, H<sub>0</sub>: expectations incorporate no additional information on future inflation (P values)</b>			
consumer survey	0.72	0.13	0.82	0.85
Consensus forecasts 1	0.00	0.00	0.08	0.00

\*\* denotes significance at the 1% level. — 1 From 1995 Q4 to 2003 Q3, the euro-area forecasts are a weighted average of the forecasts for the five largest euro-area member states. — 2 The Theil inequality coefficient indicates the

survey data forecast error relative to the naive extrapolative forecast (no change in the inflation rate). Values less than 1 imply that the consumer and expert forecasts outperform the naive extrapolative forecasts.

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naïve forecast ("inflation forecast = latest inflation rate"). Judged against this criterion, the Consensus inflation forecasts for Germany and the consumer expectations for the euro area were more accurate in the estimation periods considered here than a naïve, purely backward-looking forecast, but the same cannot be said of the experts' forecasts for the euro area. Finally, by conducting a Granger causality test, it is possible to check whether the survey expectations incorporate information about future price developments beyond that already contained in past inflation rates. While the test results are positive for the Consensus inflation forecasts over the estimation periods observed here, they tend to be negative for the consumer expectations.

Although the experts' forecasts exhibit leading indicator properties for future realised inflation, it does not follow that these data are suitable for use as key indicators or benchmarks of monetary policy. Taking monetary policy decisions on the basis of private sector forecasts would be problematic, if only because they always include an assumption regarding future monetary policy. However, if a central bank follows economic agents' expectations, which themselves are founded on assumptions regarding the central bank's behaviour, then circularity problems and instability may arise.<sup>20</sup> Hence, central banks

*Problem of circularity*

20 See M Woodford (1994), Non-standard indicators for monetary policy: can their usefulness be judged from regressions? in N G Mankiw (ed): Monetary Policy, Chicago and London, pp 95-115, and B S Bernanke and M Woodford (1997), Inflation Forecasts and Monetary Policy, NBER Working Paper No 6157.

have to analyse private sector inflation expectations in a broader context together with other relevant data pertaining to the assessment of future price developments.

*Survey data contain clues about shock perception*

Quite independently of the leading indicator properties for price developments, there are several reasons why survey data on economic agents' inflation expectations are of use to central banks. First, the data provide clues about how the experts or consumers surveyed perceive shocks. For example, the fact that the long-term Consensus forecasts for the euro area have been below the actual inflation rate virtually since the start of monetary union can be viewed as an indication that the experts polled considered the recurring upward price shocks to be transitory and evidently did not anticipate second-round effects either. Second, the survey data on shorter-term inflation expectations make it possible to verify whether the private sector's as-

essment of the price outlook corresponds to that of the central bank.

## Summary

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On balance, it may be said that survey data pertaining to private sector inflation expectations contain a wide range of information that is useful for monetary policy. Nevertheless, to interpret the data properly, they have to be viewed in a broader context alongside other indicators. Furthermore, taking monetary policy decisions primarily on the basis of private sector inflation forecasts can be summarily ruled out, since such forecasts themselves hinge on expectations regarding future monetary policy. Given such constraints, it is eminently sensible for a central bank to give a certain direction to market participants' expectations by clearly defining its stability objective and formulating a consistent monetary policy strategy.

*Managing expectations by clarifying targets and strategy*