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## ECB Credibility and Transparency

Petra M. Geraats

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# ECB Credibility and Transparency\*

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## Abstract

During the ECB's first decade, average inflation in the euro area has been low, but it has failed to meet the ECB's criterion of below but close to 2% over the medium term. Although this could be attributed to unanticipated shocks, the analysis in this paper points to some structural shortcomings. In particular, there has been an upward trend in medium and long term inflation expectations in the euro area, which have even reached over 2%, and the credibility of the ECB achieving price stability in the medium term has gradually eroded to critically low levels. In addition, there is evidence that medium and long term inflation expectations are negatively affected by the inflation experience of the euro area. However, this paper argues that these problems could be overcome embracing by greater transparency, especially about the ECB's objectives, macroeconomic forecasts and decision-making.

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\*This paper has been prepared for euro@10. It has benefited from discussions I had with Francesco Giavazzi, Charles Wyplosz and a few ECB Executive Board members during the preparation of the latest MECB report. Needless to say, all views expressed in this paper are my own.

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# 1 Introduction

The European Central Bank (ECB) was established on 1 June 1998 as the head of the European System of Central Banks (ESCB) and has been responsible for monetary policy in the euro area since 1 January 1999. During its first decade, the ECB has been successful in many respects. Highlights include the formation of a monetary union on 1 January 1999, which gradually expanded from 11 to 15 European countries. At the same time, a new single currency, the euro, was created as an electronic means of payment. This was followed by the introduction of euro banknotes and coins on 1 January 2002. Furthermore, the euro area economy has performed remarkably well during its first decade: inflation has been low at an average level of 2.0%, while average real GDP growth has been robust at 2.2%.<sup>1</sup>

The ECB's achievements so far have defied the pessimistic views of some critics, who sometimes gave the impression that the European monetary union was a grand economic experiment that was doomed to fail. On the other hand, the ECB's successes have not met the optimistic hopes of some supporters, who seemed to consider it a panacea for a European economy beset by structural shortcomings. Moreover, the ECB has fallen short of meeting its primary objective, gauged by its own criteria.

The primary objective of the ECB is to maintain price stability. This is enshrined in article 105(1) of the Treaty establishing the European Community, as amended by the 1992 'Maastricht' Treaty on European Union, but it leaves open how to interpret 'price stability'. To mitigate this ambiguity, the ECB has defined price stability as "a year-on-year increase in the Harmonized Index of Consumer Prices (HICP) for the euro area of below 2%" and decided that "price stability is to be maintained over the medium term" (ECB 1998*b*). Using the ECB's quantitative definition, the euro zone failed to exhibit price stability most of the time. Figure 1 shows that euro area inflation has often been above the 2% ceiling during the last decade. To be precise, year-on-year HICP inflation in the euro area exceeded 2% for 56% of the months from January 1999 to April 2008.

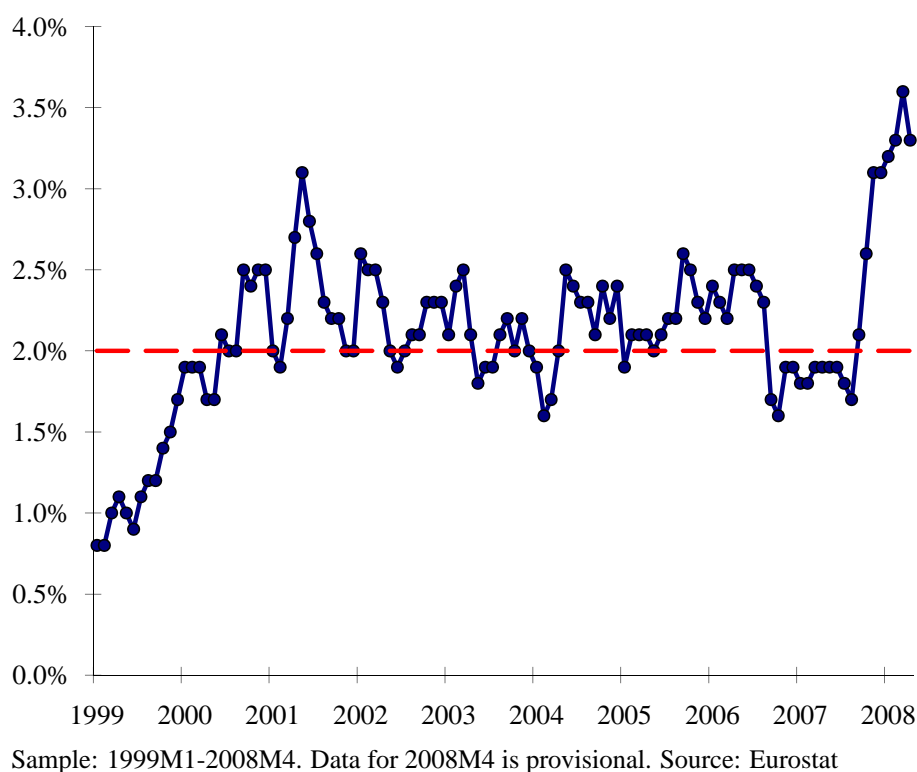
Using annual data, the verdict is even more damning. Figure 2 reveals that average HICP inflation in the euro area has been above 2% for 8 out of 9 years from 1999 to 2007. The only year for which average inflation was below 2% was 1999, but monetary policy transmission lags make it hard to attribute 1999 inflation to the ECB's actions. Excluding 1999, average euro area HICP inflation has been 2.2% using annual data.

The picture looks different when we use an alternative annual measure of inflation, namely the increase in euro area HICP per annum. To capture the increase in HICP during year  $t$ , we take the (geometric) average of the HICP index for December in year

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<sup>1</sup>These averages are based on 1999-2007 annual data from Eurostat using the contemporaneous composition of the euro area (i.e. ranging from 11 countries in 1999 to 13 in 2007).

Figure 1: Euro area HICP inflation (year-on-year)

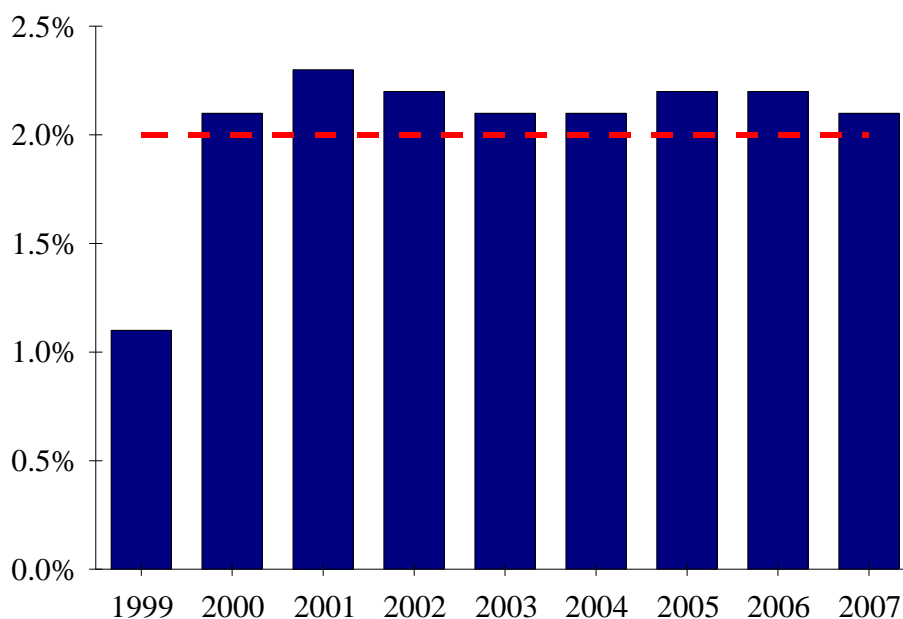


$t$  and January in year  $t + 1$  to approximate the HICP index at the end of year  $t$ , and compare this to the HICP index at the end of year  $t - 1$ .<sup>2</sup> Figure 3 shows that by this measure, the increase in euro area HICP has been above 2% in 6 out of 9 years. Price stability, according to the ECB's quantitative definition, was achieved in 1999, 2003 and 2006. But on average, the increase in euro area HICP was 2.2% per year from 1999 to 2007. In 2007 it even reached 3.14%. So, no matter which measure is used, the overall conclusion remains the same. Based on its own quantitative definition, the ECB has failed to maintain price stability over the medium term.

While average inflation has been higher than the ECB's objective, economic activity has been in line with the ECB's assumption of a medium-term trend growth rate for real GDP of 2% to 2.5% (ECB 1998a). Figure 4 shows that real GDP growth in the euro area has been quite healthy and only dipped below 1.5% in 2002 and 2003. This economic

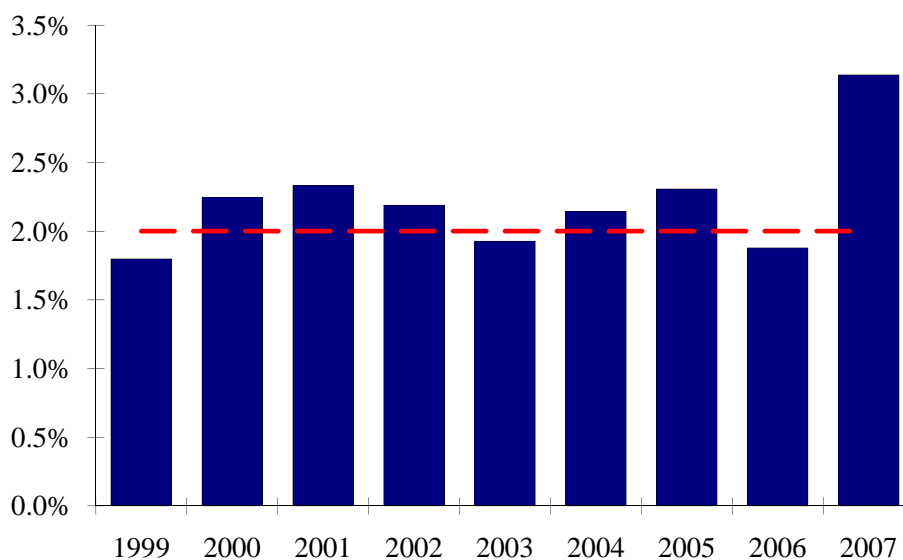
<sup>2</sup>Formally, the percent increase in HICP per annum is calculated as  $\pi_t = (HICP_t/HICP_{t-1} - 1) * 100\%$ , where  $HICP_t \equiv \sqrt{HICP_{12,t}HICP_{1,t+1}}$  and  $HICP_{m,t}$  denotes the HICP index in month  $m$  of year  $t$ . In contrast, the inflation measure based on annual data equals  $\bar{\pi}_t = (\overline{HICP}_t/\overline{HICP}_{t-1} - 1) * 100\%$ , where  $\overline{HICP}_t$  denotes the average HICP index for year  $t$ . Thus,  $\bar{\pi}_t$  is effectively an average of year-on-year inflation during year  $t$ , which is distorted by price developments in year  $t - 1$  (so-called 'base' effects).

Figure 2: Euro area HICP inflation (annual average)



Source: Eurostat

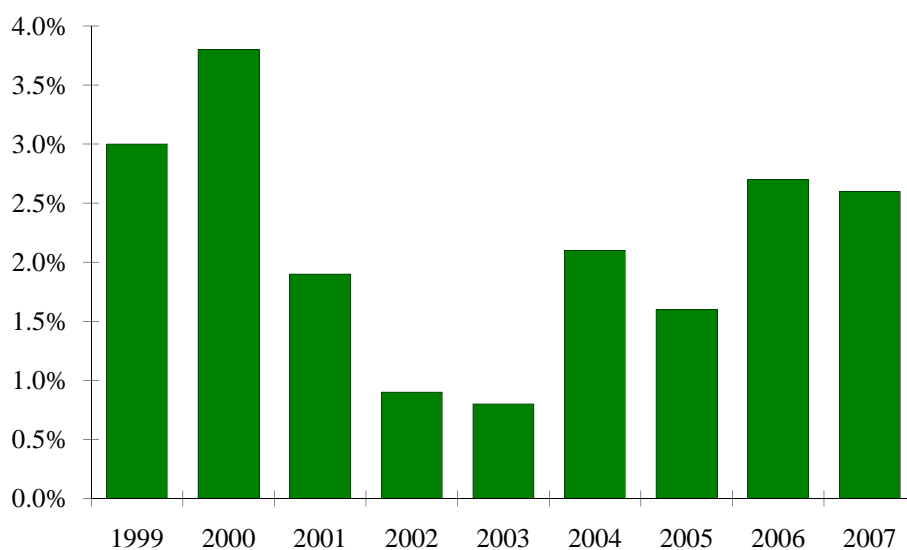
Figure 3: Increase in euro area HICP (per annum)



Source: Eurostat and author's calculations (see footnote 2)

slowdown reduced the yearly increase in euro area HICP from 2.3% in 2001 to 1.9% in 2003 (see figure 3). In the meantime, the ECB had embarked on a monetary easing that lowered its main refinancing (or 'refi') rate from 4.75% in April 2001 to 2% in June 2003, as is shown in figure 5. While the refi rate was maintained at 2% for over two years, inflation per annum rose again above the 2% ceiling. As a result, monetary policy was

Figure 4: Euro area real GDP growth (annual average)



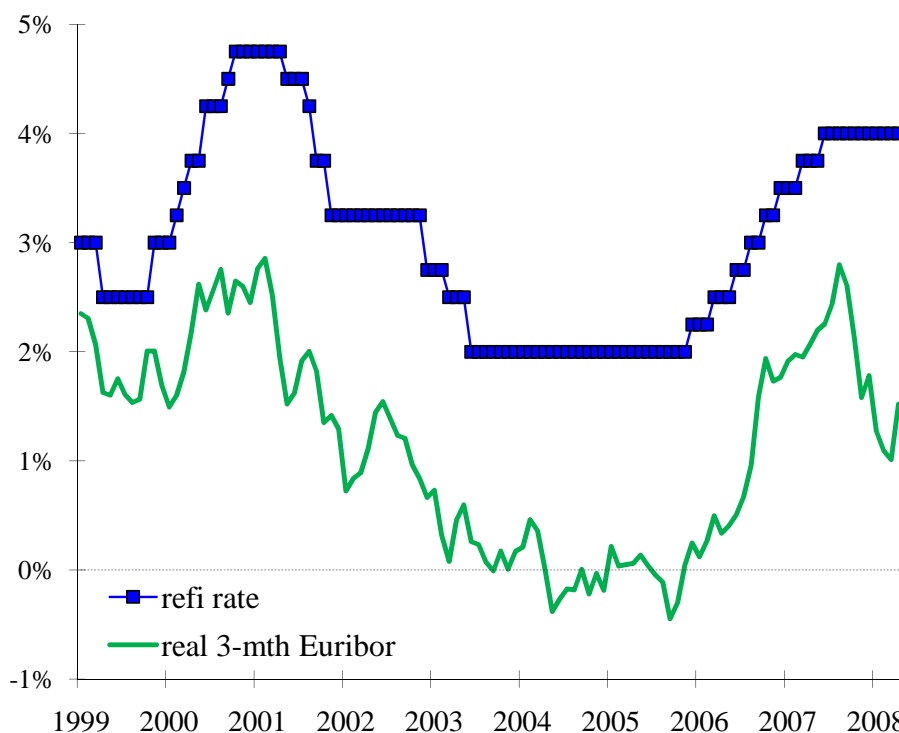
Source: Eurostat

very expansionary and short-term real interest rates, as measured by real three-month Euribor, even turned negative. The highly accommodative monetary policy stance was gradually removed as the ECB steadily increased the refi rate from 2% in December 2005 to 4% in June 2007. But this did not prevent inflation per annum from soaring to 3.1% in 2007, partly as a result of sharply rising food and oil prices.

Unanticipated adverse shocks may also explain why the ECB has not managed to maintain price stability (according to its own quantitative definition) during its first decade. Since unforeseeable shocks make an evaluation based on ex post performance problematic, it is better to assess the ECB's success by checking whether the private sector expects the ECB to deliver price stability in the medium term. In other words, how credible is it that the ECB achieves its primary objective? Section 2 analyzes ECB credibility and finds that it has steadily eroded over time as (average) euro area inflation has been creeping up. The private sector now appears to doubt the ECB's ability to secure price stability in the medium term. Presuming the ECB maintains an unwavering commitment to meeting its primary objective, this suggests that it has not been successful in persuading the public of its intentions. So, there appears to be a compelling case to improve ECB transparency. Section 3 analyzes to what extent the ECB discloses information that is pertinent to understanding monetary policymaking, and it identifies areas in which there is scope for improvement.<sup>3</sup> The findings are further discussed in section 4, which considers the role of transmission uncertainty and the possibility of time-inconsistency in the ECB's

<sup>3</sup>Some of the material in this section has been drawn from Geraats, Giavazzi and Wyplosz (2008).

Figure 5: ECB main refinancing rate and real three-month Euribor



Note: The refi rate is the end of month fixed tender rate (before June 2000) or minimum bid rate (from June 2000) for ECB main refinancing operations. Real three-month Euribor is a monthly average. Sample: 1999M1-2008M4.

Source: ECB Statistical Data Warehouse

medium-term oriented monetary policy strategy. Section 5 concludes that the ECB could greatly benefit from adopting a higher degree of transparency to overcome the decline in its credibility and succeed during its second decade.

## 2 ECB Credibility

To assess how credible the private sector considers the ECB's objective to deliver price stability over the medium term, two types of measures are discussed. Section 2.1 considers euro area inflation expectations, including market measures extracted from financial asset prices and estimates based on surveys. Section 2.2 analyzes an alternative measure of ECB credibility that is specifically catered to its price stability objective. For a nice overview and discussion of (market and survey) measures of euro area inflation expectations, see ECB (2006).



Figure 6: Long term euro-area break-even inflation



Note: Five-day moving average of seasonally adjusted zero coupon break-even inflation. Sample: 6-Feb-2004 - 6-May-2008. Source: ECB Statistics

## 2.1 Inflation Expectations

The ECB considers it very important that medium to long-term inflation expectations in the euro area remain solidly anchored at levels consistent with price stability.<sup>4</sup> A popular measure of market expectations is the ‘break-even’ inflation rate that is the difference in the yield on nominal and inflation-indexed government bonds. This measure has the advantage that it is available in real time and based on financial market transactions. On the other hand, break-even inflation reflects not only inflation expectations, but also inflation risk premia and (differences in) liquidity and term premia (between nominal and inflation-indexed government bonds).<sup>5</sup> So, the level of break-even inflation is only an imperfect proxy for inflation expectations.

Figure 6 shows long term break-even inflation rates computed from seasonally adjusted estimates of the zero coupon yield curves for nominal and inflation-indexed government bonds in the euro area.<sup>6</sup> Although the ten-year spot rate and five-year forward rate five years ahead for euro area break-even inflation have been very volatile, they clearly

<sup>4</sup>This has been repeatedly stressed in the Introductory Statement of the monthly ECB press conference since October 2005.

<sup>5</sup>In addition, euro area inflation-indexed bonds have an indexation lag of three months, so break-even inflation also captures inflation realized in the past quarter. Another issue is that the bonds are linked to euro area HICP excluding tobacco. As a result, the inflation-indexed bonds do not completely compensate for euro area HICP inflation.

<sup>6</sup>The estimation of a seasonally adjusted term structure of zero coupon break-even inflation is described by Ejsing, García and Werner (2007).

declined from over 2.4% in mid 2004 to around 2.15% in mid 2005, and have shown an upward trend since early 2007. The recent increase in the ten-year spot rate for break even inflation, which measures the average from 0 to 10 years into the future, could be due to a sharp short run rise in inflation that is unavoidable due to food and energy price developments. For instance, an expected one-year increase in inflation from 2% to 3% would increase average ten-year inflation expectations by 10 basis points. However, there has also been a large increase in the five-year forward rate for break-even inflation five years ahead, which measures the average from 5 to 10 years into the future and is therefore not directly affected by (unavoidable) short run inflation fluctuations. This makes the five-year forward break-even inflation rate five years ahead a better measure of long term inflation expectations. Nevertheless, changes in break-even inflation may not be due to movements in inflation expectations but to shifts in risk premia. So, it is difficult to interpret the recent rise in long term break-even inflation in the euro area, especially in the aftermath of the financial market turmoil of August 2007.

The problems associated with market expectations of inflation implied by nominal and real bond yields can be overcome by using surveys that directly ask about inflation expectations. Such survey measures have the drawback that they are not available at high frequency or in real time. In addition, in contrast to financial market transactions which often put large sums at stake, survey participants have no incentive to provide high quality estimates. However, surveys are likely to provide a more accurate measure of the level of inflation expectations than break-even inflation rates distorted by risk premia.

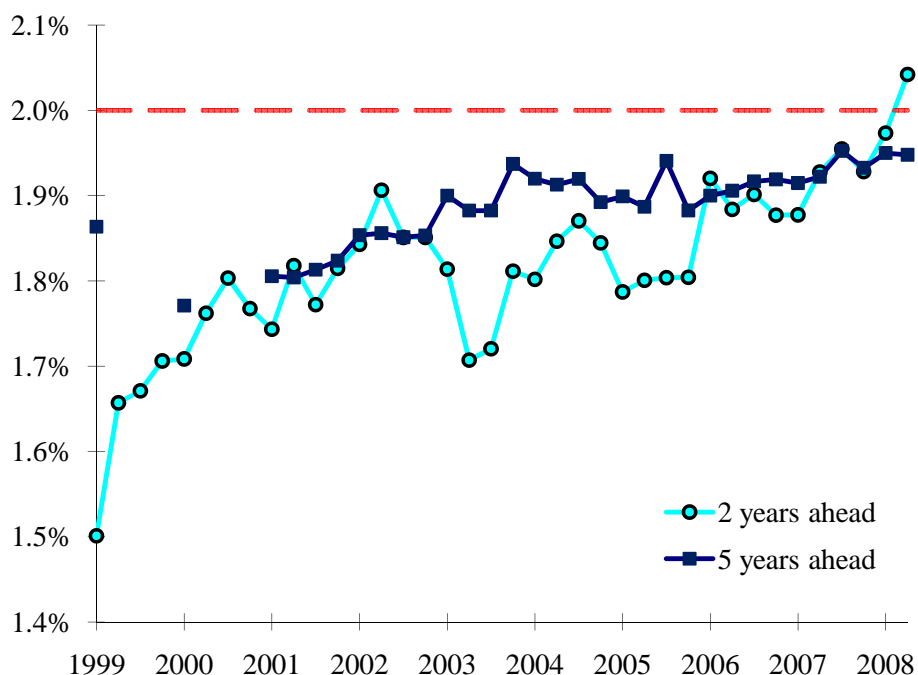
The ECB conducts a Survey of Professional Forecasters (SPF) that asks a panel of approximately 75 European professional forecasters once a quarter about their euro area macroeconomic forecasts at horizons of about one, two and five years ahead.<sup>7</sup> Figure 7 shows the mean of the SPF estimates for euro area HICP inflation in two and five years. Five-year ahead inflation expectations have gradually risen from around 1.8% in 2000 to 1.95% in 2008, staying only barely below the 2% limit that the ECB deems consistent with price stability. Medium term inflation expectations have mostly been lower but more volatile than longer term inflation expectations, with an average of 1.82% and 1.89%, and a mean absolute change of 0.040 and 0.017 per quarter (since 2001), for two-year and five-year ahead inflation estimates, respectively. Nevertheless, two-year ahead euro area inflation expectations have also clearly exhibited an upward trend during the last decade. In the second quarter of 2008, these medium term inflation forecasts even breached the 2% ceiling, so they are no longer consistent with the ECB's objective of price stability.

The high level of longer-term HICP inflation expectations for the euro area is con-

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<sup>7</sup>For a detailed description and evaluation of the ECB SPF, see García (2003) and Bowles, Friz, Genre, Kenny, Meyler and Rautanen (2007). Note that in 1999 and 2000 the SPF only asked about the five-year horizon in the first quarter.

Figure 7: Euro-area inflation expectations



Note: Average two- and five-year ahead point estimates for euro area HICP inflation. Sample: 1999Q1-2008Q2 for two years ahead; 1999Q1, 2000Q1 and 2001Q1-2008Q2 for five years ahead. Source: ECB Survey of Professional Forecasters

firmed by other surveys. In April 2008 the Euro Zone Barometer estimate for 2011 and the Consensus Economics forecast for 2014-2018 were both 2.0%.<sup>8</sup> So, longer term expectations for euro area HICP inflation have now reached the upper limit of the ECB's quantitative definition of price stability.

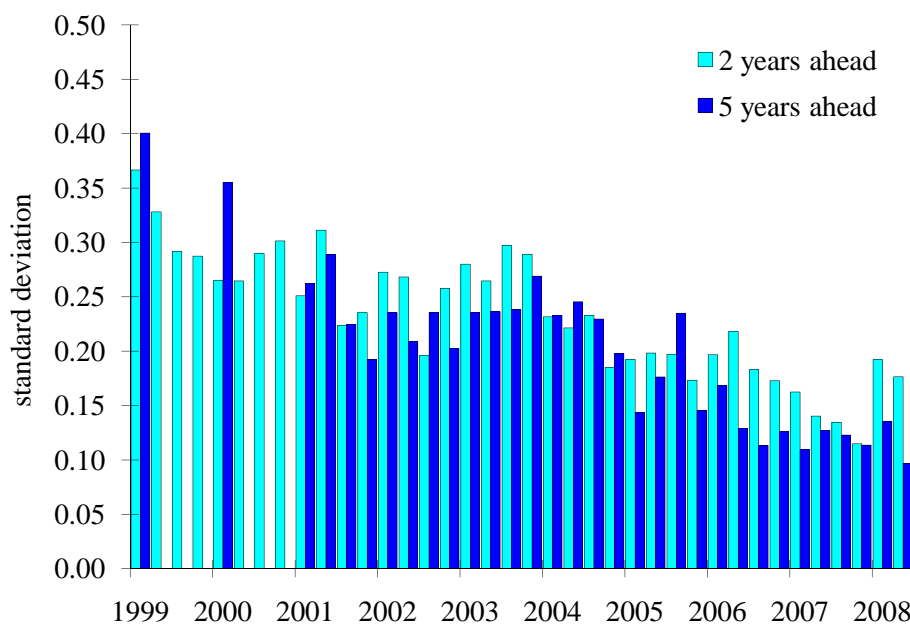
In addition to the mean it is useful to consider the standard deviation of the individual SPF forecast estimates, which measures the dispersion or disagreement among the forecasters. Figure 8 shows that the standard deviation of the SPF inflation estimates has declined over time from around 0.3 to 0.15.<sup>9</sup> Forecast dispersion tends to be a bit higher for two-year than for five-year ahead inflation estimates, with an average of 0.23 and 0.20, respectively, which is in line with the greater volatility of the former. The reduction in dispersion over time indicates a stronger consensus among professional forecasters, but their medium and long term inflation expectations for the euro area have been reaching ever higher levels.

Regarding the dispersion of long term SPF inflation estimates, the lower quartile of

<sup>8</sup>See *ECB Monthly Bulletin*, May 2008, Box 6.

<sup>9</sup>Note that one outlying observation for two-year ahead inflation has been excluded in 2003Q2, which significantly reduces the standard deviation from 0.5 to 0.3, but has little effect on the mean.

Figure 8: Dispersion of euro area inflation expectations



Note: Standard deviation of two- and five-year ahead point estimates for euro area HICP inflation, excluding one outlier in 2003Q2 for two-year ahead inflation. Sample: 1999Q1-2008Q2 for two years ahead; 1999Q1, 2000Q1 and 2001Q1-2008Q2 for five years ahead. Source: ECB Survey of Professional Forecasters

the five-year ahead forecasts has gradually increased from 1.6% to 1.9%, while the upper quartile has stayed at 2.0% (see Bowles et al. 2007) . So, the fraction of SPF respondents that expect long-term inflation in the euro area to be at or above 2% has been 25%. In other words, a quarter of SPF participants believe that the ECB will fail to achieve its objective of price stability in the long term.

Bowles et al. (2007) report some additional interesting findings based on individual SPF forecasts. They find that there is no significant correlation between changes in one-year and five-year ahead SPF inflation forecasts, which suggests that short term fluctuations are generally not expected to have a persistent effect on long term inflation. Nevertheless, individual SPF respondents frequently update their long term inflation expectations and the fraction that change their five-year ahead inflation forecasts compared to the previous quarter has remained approximately 30% since 2002. This suggests that professional forecasters continue to face considerable uncertainty about the long term inflation prospects for the euro area.

## 2.2 Uncertainty and Credibility

An interesting feature of the ECB Survey of Professional Forecasters is that participants are asked not only to provide a point estimate of inflation but also to assign probabilities to ranges of inflation outcomes. Thus, quantitative measures of forecast uncertainty can be constructed. In particular, the standard deviation of the individual and aggregate SPF forecast distributions could be used as a measure of individual and aggregate forecast uncertainty, respectively. Although the dispersion of five-year ahead SPF inflation estimates has declined from 0.3 to 0.1 (as shown in figure 8), Bowles et al. (2007) find that individual forecast uncertainty has increased mildly, while aggregate forecast uncertainty has remained roughly stable at 0.6.<sup>10</sup>

Moreover, the aggregate SPF probability distribution for inflation allows us to compute the likelihood that the SPF respondents collectively attach to a realization of euro area HICP inflation of at least 0% and less than 2%, consistent with the ECB's quantitative definition of price stability. Following Geraats et al. (2008), the SPF probability of euro area HICP inflation in the 0-2% range in two to five years can be interpreted as a quantitative measure of the credibility of the ECB in meeting its primary objective in the medium to long term.<sup>11</sup> This measure has the advantage that it depends on both the mean and standard deviation of the SPF forecast density. So, it captures not only the expected level of future inflation but also inflation uncertainty. For instance, suppose that private sector forecasters believe that the ECB aims for an average level of 1.8% inflation, but that they start doubting the ECB's commitment to keeping inflation stable. Then, their point estimate for inflation may not be affected, but the probability they assign to an inflation outcome of 0-2% is bound to drop, reflecting their doubts. Thus, the probability measure of credibility is preferable to the level of inflation expectations.<sup>12</sup>

Figure 9 shows that ECB credibility has gradually declined during the last decade. The SPF probability of euro area HICP inflation in the 0-2% range in five years has dropped from a respectable level of over 60% in 1999 to a paltry 49.4% in the second quarter of 2008. This means that based on the collective judgment of SPF respondents, there is a less than even chance of the ECB delivering price stability in the long run. At a two-year horizon, ECB credibility has fallen even further from more than 80% in the first quarter of 1999 to less than 40% in the second quarter of 2008. This shows that according to the professional forecasters polled by the ECB it has become increasingly unlikely for the

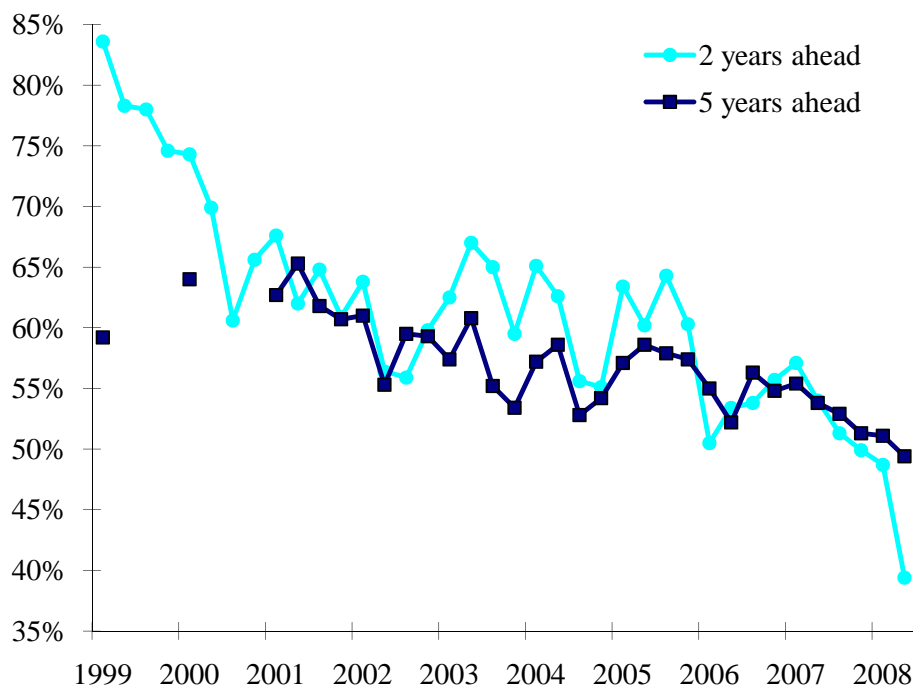
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<sup>10</sup>Note that these measures are related. To be precise, the variance of the aggregate forecast distribution (aggregate uncertainty) equals the average variance of the individual forecast distributions (average individual uncertainty) plus the variance of the individual point estimates (forecast dispersion).

<sup>11</sup>To be precise, the credibility measure captures the range of [0%, 1.95%) as it adds the probability mass for the ranges 0.0-0.4%, 0.5-0.9%, 1.0-1.4% and 1.5-1.9% from the aggregate SPF probability distributions available at <http://www.ecb.int/stats/prices/indic/forecast/html/index.en.html>.

<sup>12</sup>The interpretation of the credibility measure is further discussed in section 4.

Figure 9: ECB credibility



Note: SPF probability of euro area HICP inflation of at least 0% and less than 2.0%. Sample: 1999Q1-2008Q2 for two years ahead; 1999Q1, 2000Q1 and 2001Q1-2008Q2 for five years ahead. Source: ECB Survey of Professional Forecasters and author's calculations.

ECB to achieve price stability in the euro area in the medium to long term.

Similarly, one could construct a more narrow measure of ECB credibility that uses the SPF probability that HICP inflation in the euro area will be between 1.5% and 2% in two to five years' time.<sup>13</sup> This measure is motivated by the clarification in May 2003 that the ECB aims to maintain euro area HICP inflation below but close to 2% over the medium term (which is further discussed in section 3.1). Gauged by this narrow measure, ECB credibility has been more stable, but at the low average level of 40% and 38% for a two-year and five-year horizon, respectively. Nevertheless, the narrow credibility measures have also declined recently and for a two-year horizon it sunk to an unprecedented low of 28.5% in the second quarter of 2008. So, in the opinion of the SPF forecasters it has become very unlikely that euro area inflation will be below but close to 2% in the medium term.

Not surprisingly, the (broad) SPF measure for ECB credibility is (strongly) negatively correlated with the SPF inflation expectations at the corresponding horizon.<sup>14</sup> But more

<sup>13</sup>To be precise, this measure captures the range of [1.45%, 1.95%) as it equals the probability mass for the 1.5-1.9% range of the aggregate SPF probability distribution.

<sup>14</sup>To be precise, the correlation between SPF inflation expectations and ECB credibility at a two-year

Table 1: Correlation between break-even inflation and SPF measures

Correlation	Break-even inflation	
	10-year spot rate	5-year forward rate 5 years ahead
SPF inflation expectations		
- two years ahead	0.404	0.348
- five years ahead	0.363	0.330
SPF probability of 0-2% inflation		
- two years ahead	-0.441*	-0.317
- five years ahead	-0.527**	-0.435*
SPF probability of 1.5-2% inflation		
- two years ahead	-0.571**	-0.462*
- five years ahead	-0.547**	-0.591**

Note: Pearson correlation coefficients. SPF measures are for euro area HICP inflation. Break-even inflation is average seasonally adjusted euro area zero-coupon break-even inflation in the second half of the first month of the quarter. Asterisks indicate correlation significant at \* 10% and \*\* 5%. Sample: 2004Q2-2008Q2. Source: ECB Statistics and Survey of Professional Forecasters, and author's calculations.

interesting is whether these survey measures are correlated with market measures of inflation expectations.

Table 1 shows (Pearson) correlation coefficients between the SPF measures and break-even inflation. Since the SPF survey is conducted in the second half of the first month of each quarter, break-even inflation is computed as the average over the same half-month period using the seasonally adjusted data shown in figure 6. As expected, there is a positive relation between SPF inflation expectations for the medium to long term and long term break-even inflation, although this is not statistically significant. The correlations between the SPF probabilities and break-even inflation are negative and mostly significant. The relation is weakest for the SPF probability two years ahead and the five-year forward break-even inflation rate five years ahead, which is not surprising since their horizons do not overlap. For all four cases, the narrow credibility measure exhibits the strongest correlation with break-even inflation. Compared to the broad credibility measure this suggests that the SPF probability in the region of 0-1.5% inflation provides little value added. All in all, the results in table 1 indicate that ECB credibility is more important for financial markets than the level of inflation expectations. This is not surprising since the credibility measures also take into account uncertainty about inflation, which affects inflation risk and five-year horizon is -0.95 and -0.85 for the broad measure, and -0.31 and -0.29 for the narrow measure.

Table 2: Correlation between SPF measures and past inflation

Correlation	Euro area HICP inflation	
	Previous quarter	History
SPF inflation expectations		
- two years ahead	0.665***	0.630***
- five years ahead	0.163	0.479***
SPF probability of 0-2% inflation		
- two years ahead	-0.729***	-0.733***
- five years ahead	-0.276	-0.461***
SPF probability of 1.5-2% inflation		
- two years ahead	-0.374**	-0.514***
- five years ahead	0.078	-0.089

Note: Pearson correlation coefficients. SPF measures are for euro area HICP inflation. Inflation  $\pi_q$  is average year-on-year inflation over the previous quarter. Inflation history satisfies  $H_q = \pi_q - 2\% + 0.75H_{q-1}$ , where  $H_0 = 0$ . Asterisks indicate correlation coefficients significant at \*\* 5% and \*\*\* 1%. Sample: 1999Q1-2008Q2 for two-year ahead SPF measures, and 1999Q1, 2000Q1 and 2001Q1-2008Q2 for five-year ahead measures. Source: ECB Survey of Professional Forecasters, Eurostat and author's calculations.

premia.<sup>15</sup>

The decline in ECB credibility raises the question whether it may be due to its poor inflation performance in comparison to its own criteria. To investigate this, table 2 shows the correlation between the SPF measures and euro area HICP inflation. Since the SPF survey is conducted every quarter immediately after the release of HICP inflation for the last month of the previous quarter, the average of year-on-year euro area HICP inflation over the previous quarter is used. This is positively related with SPF inflation expectations and negatively with nearly all the SPF inflation range probabilities. The level of inflation during the previous quarter is strongly and significantly correlated with the SPF measures for the two-year horizon, but this does not hold for the five-year horizon. This suggests that past inflation only affects medium term inflation prospects without destabilizing longer term inflation expectations. However, this presumes that the inflation experience before the previous quarter is immaterial.

To analyze whether the inflation history matters, a measure is constructed that depends on the extent to which past inflation has deviated from the 2% ceiling of the ECB's

<sup>15</sup>In fact, a measure of 'inflation risk' could be constructed by taking the SPF probability that inflation is at least 2%. This measure of inflation risk is the (near) complement of the broad credibility measure (in case of some deflation risk).



price stability objective. In particular, inflation history is defined as a geometrically declining weighted average of the inflation differential for past quarters.<sup>16</sup> This means that a deviation from 2% inflation in the past is not completely ‘forgotten’. In particular, when inflation has been in excess of 2%, the measure of inflation history will still be positive even if inflation equaled 2% in the previous quarter. Similarly, inflation outcomes below 2% lead to a persistent reduction in the inflation history measure, although the effect diminishes over time as past inflation experiences are gradually discounted. Thus, the measure for euro area inflation history is inversely related to the ‘reputation’ that the ECB has built up through its inflation performance over time.

The results in table 2 show the relation between the SPF measures and inflation history for a conservative persistence or ‘retention’ coefficient of 0.75, which implies that a fraction of only 0.32 and 0.10 of excess inflation is ‘remembered’ after one and two years, respectively. The two-year ahead SPF measures continue to exhibit a highly significant correlation with inflation history. In addition, both recent inflation and inflation history appear to have a larger effect on two-year than on five-year ahead SPF measures, which helps to explain the greater volatility of the former. Furthermore, in contrast to the results for inflation in the previous quarter, five-year ahead SPF inflation expectations and the five-year ahead SPF probability of 0-2% inflation show a strong, significant correlation with inflation history. These results are robust and remain significant as long as the retention coefficient remains at plausible levels of at least 0.64. These findings suggest that the memory of past inflation raises long-term inflation expectations and reduces ECB credibility.<sup>17</sup>

Only the narrow credibility measure five years ahead is not significantly correlated with inflation history. This suggests that the long-term credibility of the ECB has not been affected by the experience of high inflation in the euro area. However, this conclusion is incorrect because the broad credibility measure has dropped at the same time. In particular, a relatively stable probability of 1.5-2% inflation together with a decline in the probability of 0-2% inflation implies that the mode of the forecast density remains within the 1.5-2% range while the probability mass shifts to the right to inflation levels exceeding 2%.<sup>18</sup> This makes the forecast density more skewed to the right, reflecting a

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<sup>16</sup>To be precise, the inflation history for quarter  $q$  is defined as  $H_q \equiv \sum_{i=0}^{q-1} \rho^i (\pi_{q-i} - 2)$  for  $q = 1, 2, \dots$ , where  $\pi_q$  is average year-on-year inflation (in percent) in quarter  $q - 1$  (which is not observed until quarter  $q$ ),  $q = 1$  corresponds to 1999Q1, and  $\rho$  is the persistence coefficient ( $0 < \rho < 1$ ). Note that  $H_q = \rho H_{q-1} + \pi_q - 2$ , where  $H_0 = 0$ . For  $\rho = 0$ ,  $H_q$  would yield the same correlations as  $\pi_q$  in the first column of table 2.

<sup>17</sup>It would be interesting to investigate this further and perform more formal econometric analysis, but the small sample (with only 30 continuous observations for the five-year ahead SPF measures) makes it hard to get reliable regression results.

<sup>18</sup>This presumes that the probability of inflation below 0% (i.e. deflation) remains negligibly small,

rise in perceived inflation risks. So, when inflation estimates are below but close to 2%, the broad probability measure provides a more robust indication of ECB credibility since it also captures changes in perception about the balance of inflation risks.

Combining the results in table 2 for all the SPF measures suggests that for the medium term, a high inflation history tends to shift the forecast density to the right, thereby raising inflation expectations and reducing the inflation probabilities. But for the long term, high inflation in the past does not tend to affect the mode of the forecast density, although it appears to make the forecast density more skewed to the right, thereby increasing inflation expectations and reducing the 0-2% inflation probability. As a result, high inflation in the euro area appears to have a persistent negative effect on ECB credibility.

This helps to explain the upward trend in two- and five-year ahead SPF inflation expectations (illustrated in figure 7) and the decline in the two- and five-year ahead SPF probabilities of 0-2% inflation (shown in figure 9). Although the ECB has repeatedly stressed the importance of ensuring that medium and long-term inflation expectations remain firmly anchored in line with price stability, the analysis in this section reveals that during its first decade, ECB credibility has steadily drifted down.

### **3 ECB Transparency**

The decline in credibility suggests that the ECB could have benefited from greater transparency, which refers to a reduction in asymmetric information about monetary policy-making. The disclosure of monetary policy information has the obvious advantage that it reduces private sector uncertainty and enhances the predictability of monetary policy actions and macroeconomic outcomes. In addition, it directly affects expectations in financial markets and the labor market, which are critical to monetary policy outcomes. In particular, greater transparency makes it easier for economic agents to understand monetary policy and align their expectations with the central bank's intentions, thereby greatly enhancing the effectiveness of monetary policy. Furthermore, transparency allows the private sector to infer the central bank's intentions from monetary policy actions and outcomes, which gives the central bank a powerful incentive to deliver price stability. After all, any attempt to pursue inflationary policy would be quickly detected and penalized by financial markets (through higher long-term nominal interest rates) and by unions (through higher wage demands). Thus, transparency effectively allows the private sector to hold the central bank accountable.<sup>19</sup>

During its first decade, the ECB has accomplished significant transparency improvements. In an international comparison of 100 central banks by Dincer and Eichengreen

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which is a reasonable assumption for the medium to long term, especially when inflation has been high.

<sup>19</sup>For a further explanation of the effects of transparency, see for instance Geraats (2002, 2006).

(2007) using the transparency index by Eijffinger and Geraats (2006), the ECB even ranks in the top 10. Nevertheless, it still falls short in comparison with the top three central banks, which are the Swedish Riksbank, the Reserve Bank of New Zealand and the Bank of England. The Eijffinger and Geraats (2006) index, which covers the political, economic, procedural, policy and operational aspects of monetary policymaking, indicates that the ECB has made most progress in economic transparency, which refers to the economic information that is used for the policy decision, but still performs poorly on procedural transparency, which pertains to the way monetary policy decisions are taken.

Sections 3.1, 3.2 and 3.3 analyze ECB transparency about its monetary policy objectives, macroeconomic forecasts and policy rate decisions, respectively.<sup>20</sup> A more extensive, recent review of ECB transparency is provided by Geraats et al. (2008). For an interesting early exchange, see Buiter (1999) and Issing (1999).

### 3.1 Policy Objectives

The objectives of the ESCB are stipulated by article 105(1) of the Treaty establishing the European Community, as amended by the 1992 ‘Maastricht’ Treaty on European Union. The primary objective is to maintain price stability, which the ECB has defined as “a year-on-year increase in the Harmonized Index of Consumer Prices (HICP) for the euro area of below 2%” together with the clarification that “price stability is to be maintained over the medium term” (ECB 1998*b*). In addition, article 105(1) of the Treaty specifies that “without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Community with a view to contributing to the achievement of the objectives of the Community as laid down in Article 2.” These include “a harmonious and balanced development of economic activities, sustainable and non-inflationary growth respecting the environment, a high degree of convergence of economic performance, a high level of employment and of social protection, the raising of the standard of living and quality of life, and economic and social cohesion and solidarity among Member States.”

In the pursuit of its objectives, the ECB enjoys a high degree of independence, which is also enshrined in the Treaty (in particular article 107). In fact, the ECB is one of the most independent central banks in the world.<sup>21</sup> So, it is protected from political pressures in the pursuit of its primary objective of price stability.

The ECB deserves to be commended for clarifying some of the woolly words of the Treaty. Nevertheless, the specification of the ECB’s objectives remains rather opaque.

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<sup>20</sup>In terms of the five aspects distinguished by Geraats (2002), section 3.1 pertains to political transparency, 3.2 to economic and operational transparency, and 3.3 to procedural and policy transparency. This structure is more natural in light of the ECB’s main communication instruments.

<sup>21</sup>Arnone, Laurens, Segalotto and Sommer (2007) find that the ECB has the highest degree of (political and economic) central bank autonomy, together with Latvia, in a sample of 163 central banks.

First of all, its quantitative objective of price stability implies a range of 0-2% for euro area HICP inflation, without indicating any preferred or focal point. For instance, the ECB may be pretty much indifferent between inflation outcomes within the range, or perhaps aim for the midpoint of 1%. However, using the quantitative reference value for monetary growth (ECB 1998a) that is part of the ECB's monetary policy strategy (see section 3.3), it is possible to narrow down the inflation range to 1-2%.<sup>22</sup>

Furthermore, the ECB's preference for the upper part of the 0-2% range was made explicit in May 2003 when it formally announced that "in the pursuit of price stability it will aim to maintain inflation rates close to 2% over the medium term" (ECB 2003). What this entails was suggested by ECB chief economist Otmar Issing: "This 'close to 2%' is not a change, it is a clarification of what we have done so far, what we have achieved – namely inflation expectations remaining in a narrow range of between roughly 1.7% and 1.9% – and what we intend to do in our forward-looking monetary policy."<sup>23</sup> However, these intentions have not been realized – long-term euro area inflation expectations as measured by the ECB SPF have mostly drifted above 1.9% since 2004 (as shown in figure 7). Moreover, medium-term SPF inflation expectations have been well above 1.9% since the second quarter of 2007, reaching as high as 2.04% in the second quarter of 2008. In the same quarter, the SPF probability of 1.5-1.9% inflation in two years fell to an all time low of 28.5%. So, using Issing's criterion of inflation expectations around 1.7% to 1.9%, the ECB has failed to maintain price stability over the medium term.

A second respect in which the ECB's objectives are ambiguous is the relevant horizon of the 'medium term'. This horizon determines how quickly the ECB aims to bring inflation back to below but close to 2% after an unanticipated shock. In economics, the medium term often refers to a period of between two to five years. It is only recently that ECB President Trichet clarified that 'medium term' means 18 months to two years.<sup>24</sup> So, the two-year ahead SPF measures are the most appropriate for evaluating whether inflation expectations remain firmly anchored at levels consistent with price stability for the medium term. However, these expectations have trended upward during the last decade and recently breached the 2% ceiling.

Furthermore, two-year ahead SPF inflation expectations have been quite volatile (see figure 7) and two-year ahead SPF measures are significantly correlated with recent in-

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<sup>22</sup>The ECB set a reference value for M3 growth ( $\hat{M}$ ) of 4.5% based on the assumption of a medium-term trend growth of real GDP ( $\hat{Y}$ ) and of M3 income velocity ( $\hat{V}$ ) in the range of 2% to 2.5% and -1% to -0.5%, respectively. Thus, the quantity equation ( $\hat{M} + \hat{V} = \pi + \hat{Y}$ ) implies a range for inflation ( $\pi$ ) of 1-2%.

<sup>23</sup>Statement in response to a question at the press seminar on the evaluation of the ECB's monetary policy strategy, 8 May 2003.

<sup>24</sup>See the question and answer session of the hearing at the Economic and Monetary Affairs Committee of the European Parliament in Brussels on 26 March 2008, and of the ECB press conference on 5 June 2008.

flation (see table 2), which is in contrast to the five-year horizon. This suggests that the professional forecasters in the SPF panel do not believe that the ECB can or will stabilize inflation in two years. The reason could be that monetary policy transmission lags prevent the ECB from completely offsetting shocks over this horizon, or that the ECB actually prefers to accommodate shocks to some extent. In either case, the ECB has not been effective in stabilizing inflation expectations over Trichet's medium term.

A third respect in which the ECB's objectives are opaque is the nature of its secondary goals according to article 105(1) of the Treaty. Supporting the general economic policies of the European Union to contribute to its economic objectives could legitimize a role for economic growth considerations. However, President Trichet has repeatedly responded to questions about this at the ECB press conferences that the Governing Council has only 'one needle in its compass' when setting interest rates for the euro area, and that is price stability.<sup>25</sup> Prospects for economic growth only matter to the extent that they are relevant for price stability.<sup>26</sup> In addition, the ECB argues that it contributes to economic growth and job creation by (being credible in) maintaining price stability in the medium and long run.

In any case, the role of secondary objectives is intrinsically related to the horizon of the primary objective. There is only scope for tending to other goals if the price stability horizon is longer than the monetary policy transmission lag, which is not the case for Trichet's notion of medium term.

Notwithstanding the focus on its primary objective, the ECB has recently shown a deep concern for the smooth functioning of money markets. Its swift liquidity interventions during the summer and fall of 2007 prevented money markets from seizing up. However, the ECB has emphasized that such liquidity operations are conducted to preserve the proper functioning of money markets, which is important for the effective implementation of monetary policy, and they do not influence the determination of the monetary policy stance, which is solely based on the objective of price stability.<sup>27</sup> The E(S)CB Statutes (article 12) also clearly separate these two tasks: the ECB Governing Council is responsible for formulating monetary policy, the Executive Board for implementing it. So, the Governing Council decides the refi rate and the Executive Board directs liquidity operations to ensure this interest rate prevails in money markets. As a result, liquidity interventions are conducted to support the ECB's primary objective.

To conclude, the ECB's primary objective is to maintain euro area HICP inflation

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<sup>25</sup>See for instance the question and answer session of the ECB press conference on 3 June 2004, 6 September 2007 and 6 December 2007.

<sup>26</sup>This suggests that the ECB comes close to being a strict inflation targeter (or 'inflation nutter'), whose monetary policy objective function only depends on inflation stabilization.

<sup>27</sup>ECB President Trichet in the introductory speech at the hearing at the Economic and Monetary Affairs Committee of the European Parliament in Brussels on 26 March 2008.

below but close to 2% over the medium term. Using Issing's criterion and Trichet's medium term, this entails maintaining inflation expectations between 1.7% to 1.9% for a horizon of 1.5 to 2 years ahead. However, two-year ahead inflation expectations have been far from stable and have even moved above 2%. Although five-year ahead inflation expectations have been less volatile, they have also drifted up and have stayed above 1.9% for over two years. So, medium- and long-term inflation expectations suggest that the ECB's aim for inflation is actually very close to 2% and that its horizon exceeds two years. This suggests that the ECB would benefit from clarifying its price stability objective by providing a firmer anchor for inflation expectations than the fuzzy 'below but close to 2%' and by specifying an horizon that is more realistic. This would also yield more specific performance criteria for the evaluation of monetary policy and thereby improve ECB accountability.

### **3.2 Macroeconomic Forecasts**

The formulation of ECB monetary policy relies on an extensive amount of economic information, which is communicated in the ECB's Monthly Bulletin. This voluminous document is published one week after the monthly monetary policy meeting and provides a detailed description of macroeconomic and financial developments. In addition, it includes informative boxes and articles on interesting topics, and once a quarter, the E(S)CB macroeconomic projections. Potential risks to financial stability in the euro area are elaborately examined in the Financial Stability Review, which the ECB has published twice a year since December 2004.

Since changes in the policy rate have their main impact on inflation in about two years, macroeconomic forecasts are crucial for the determination of the monetary policy stance. The ECB started to publish macroeconomic projections for the euro area in December 2000, at the urging of the Committee on Economic and Monetary Affairs of the European Parliament.<sup>28</sup> The projections, which are based on a euro area-wide macroeconomic model (Fagan, Henry and Mestre 2001), were initially issued semi-annually and constructed in a collaborative effort by Eurosystem staff. But updated projections produced by ECB staff have been released in the intervening quarters since September 2004, so that the ECB now provides quarterly projections by E(S)CB staff in March, June, September and December. This means that a new E(S)CB forecast is available for every quarterly release of national accounts data, which enhances transparency. In addition, the E(S)CB staff projections have gained greater prominence since June 2004, when the ECB started to publish them on the day of the monetary policy meeting and discuss them in the Introductory Statement of the press conference.

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<sup>28</sup>See European Parliament Resolutions A5-0035/1999 and A5-0169/2000.

The quarterly staff projections are available for euro area HICP inflation and real GDP growth, including its main expenditure components, for the current and next (two) calendar years (in December). The projections for each calendar year are presented as a range that equals twice the average absolute value of past forecast errors, but they provide no indication of the central tendency, its quarterly dynamics, anticipated changes in uncertainty or the balance of risks surrounding the projections. These are significant shortcomings, especially because uncertainty and asymmetry are important features of macroeconomic probability estimates by professional forecasters (García and Manzanares 2007). The ECB would benefit from following the practice first introduced by the Bank of England to present forecasts in ‘fan charts’ for at least two years ahead, showing the dynamics and (possibly asymmetric) risks throughout the medium term.<sup>29</sup>

Initially, the E(S)CB projections were based on the technical assumption that short-term interest rates, measured by three-month Euribor, remain constant over the projection horizon, while the projected path for long-term interest rates, measured by euro area ten-year nominal government bond yields, is in line with market expectations extracted from the yield curve. But this leads to an internal inconsistency in the projections since financial markets seldom anticipate short term rates to stay the same for so long. This problem has been overcome in the staff projections since June 2006 by assuming that the path of short-term interest rates is in line with forward rates derived from the yield curve. Oil and non-energy commodity prices are also assumed to develop in line with market expectations (derived from futures prices), while bilateral exchange rates, which are notoriously hard to predict, are assumed to remain constant over the projection horizon. Finally, fiscal policy assumptions are based on national budget plans in the euro area.

Besides these key assumptions, which are explicitly stated, the macroeconomic projections also incorporate the professional judgment of E(S)CB staff, which this does not necessarily correspond to the views of the Governing Council. In fact, the ECB has consistently emphasized that the Governing Council does not underwrite the staff projections.<sup>30</sup> But to understand the policy rate decisions, it is important to know the macroeconomic outlook of the Governing Council. Since December 2005, the discussion of the staff projections in the Introductory Statement has included an explicit statement of the Governing Council’s views on the ‘balance of risks’ to the projections or outlook. However, it is hard to interpret this balance of risks since the staff projections are only presented as a range without a central tendency. This could be remedied by publishing fan charts of macroeconomic projections endorsed by the Governing Council, similar to

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<sup>29</sup>In the Introductory Statement of the ECB press conference on 5 June 2008, it was even pointed out that the latest projections of annual growth rates misleadingly mask quarterly dynamics.

<sup>30</sup>This has been repeatedly mentioned in the ECB press conferences at which the staff projections are discussed.

the established practice at the Bank of England.

In addition, the E(S)CB projections are based on market expectations for interest rates that may not be in line with the policy intentions of the Governing Council.<sup>31</sup> This means that the macroeconomic projections are not unconditional forecasts and the Governing Council may expect to achieve different outcomes for inflation and output growth based on its intended policy. So, transparency could be further improved by releasing macroeconomic forecasts by the Governing Council that are based on its projected policy path, just like the Swedish Riksbank.

Although the quarterly E(S)CB staff projections are not endorsed by the Governing Council, it pays ‘great attention’ to them and considers them an ‘important input’.<sup>32</sup> Their role in the policymaking process has been summarized as follows by ECB President Trichet: “We take these Eurosystem staff projections as an important information, we consider it, then we make our own judgement and we take our decision.”<sup>33</sup>

However, as pointed out by Geraats et al. (2008), it can be hard to understand the policy decisions based on the staff projections, even when combined with the Governing Council’s balance of risk. For instance, the ECB staff projections for euro area HICP inflation that were released on 31 August 2006 were 2.3-2.5% for 2006 and 1.9-2.9% for 2007. The midpoints of these inflation projections were unprecedentedly high and well above the 2% ceiling deemed consistent with price stability. In addition, the Governing Council considered the risks to this inflation outlook to be on the upside. This suggested an urgent need for a policy tightening beyond market expectations, which showed an increase in average three-month Euribor from 3.1% in 2006 to 3.9% in 2007. Nevertheless, the Governing Council decided to maintain the refi rate at 3% for another month.<sup>34</sup> This is puzzling, especially since it had raised the refi rate to 2.75% in June 2006 when staff projections for inflation and output based on the same average Euribor path were slightly lower. Clearly, it would be useful to have better information about the Governing Council’s medium term macroeconomic outlook to better understand its monetary policy decisions.

Medium term macroeconomic projections are useful since they are informative about shocks that are anticipated by the ECB and reflected in its monetary policy actions. Thus, they help the private sector to infer the ECB’s intentions from its interest rate decisions.<sup>35</sup>

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<sup>31</sup>This has been regularly stressed in the Introductory Statements that discuss the projections.

<sup>32</sup>See for instance the answers by President Trichet at the ECB press conference of 31 August 2006, 8 February 2007 and 8 March 2007.

<sup>33</sup>See the question and answer session of the ECB press conference of 7 December 2006.

<sup>34</sup>Similarly, in June 2008 the staff projections for inflation were 3.2-3.6% for 2008 and 1.8-3.0% for 2009, based on an average three-month Euribor of 4.9% in 2008 and 4.3% in 2009, with upside risks to the inflation outlook according to the Governing Council, yet it decided to keep the refi rate at 4%.

<sup>35</sup>See Geraats (2005) for a formal analysis.



But short term macroeconomic forecasts are also valuable, because they provide information about unforeseen sudden shocks that affect monetary policy outcomes. So, an explanation of unanticipated short term fluctuations could help the private sector to better infer the ECB's policy intentions from euro area inflation outcomes. Using the terminology of Geraats (2002), these two different roles of medium and short term macroeconomic forecasts refer to economic and operational transparency, respectively. Empirical evidence suggests that the publication of forecasts is indeed beneficial as it helps to reduce inflation and lower the sacrifice ratio (Chortareas, Stasavage and Sterne 2002, 2003). In addition, greater transparency tends to make private sector inflation expectations less sensitive to past inflation outcomes (van der Crujisen and Demertzis 2007).

The experience of summer 2006 mentioned above makes clear that the ECB could use some improvement in economic transparency, in particular by communicating the judgement of the Governing Council to the extent that this is not reflected in the staff projections but relevant for its monetary policy decisions. Furthermore, the analysis in section 2 has shown that medium and long term inflation expectations and 0-2% inflation probabilities are strongly correlated with past inflation outcomes. This suggests that the ECB would benefit from enhancing operational transparency to help prevent the private sector from mistaking unforeseen inflation shocks for shifts in policy intentions.

Operational transparency could be enhanced by the explanation of revisions to macroeconomic projections, the discussion of past forecast errors, and a regular evaluation of monetary policy. The Swedish Riksbank provides a leading example.<sup>36</sup> It routinely explains revisions to its macroeconomic projections, discussing all relevant and even counteracting factors. In addition, it evaluates the performance of its forecasts every year. Furthermore, it performs an annual monetary policy assessment that carefully accounts for any deviations of macroeconomic outcomes from its objectives and rigorously identifies the main driving forces behind them. Such thorough reviews could help the ECB to mitigate the effect of high inflation on its credibility.

### **3.3 Interest Rate Decisions**

The way in which the ECB uses its economic information to reach its policy objectives is in principle described by its monetary policy strategy. The ECB decided to adopt a two-pillar strategy (ECB 1998b) that is characterized by (i) a prominent role for money that centers on a quantitative reference value for monetary, and (ii) a broadly-based assessment of the outlook for price developments and the risks to price stability in the euro area. This hybrid of monetary and inflation targeting lead to confusion. First, monetary aggregates

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<sup>36</sup>See the Riksbank's *Monetary Policy Report* and its annual review entitled *Material for assessing monetary policy*.

are notoriously noisy, so it is hard to gauge whether the monetary pillar, which uses only a point target for money (M3) growth, actually signals a risk to price stability. Second, in case of conflicting signals, the strategy failed to specify which pillar prevails. The latter problem has been partly overcome by the clarification that “the monetary analysis mainly serves as a means of cross-checking, from a medium to long-term perspective, the short to medium-term indications coming from economic analysis” (ECB 2003). Nevertheless, the two-pillar strategy leaves the ECB with a wide degree of discretion and is inadequate to fully understand its monetary policy decisions. So, it is essential to provide sufficient information to allow the private sector to learn the ECB’s monetary policy reaction over time.

In this respect, the minutes of monetary policy meetings are an invaluable source, since they detail policymakers’ assessments of the current macroeconomic situation and outlook, and their discussion of the policy options. However, the ECB has not published the minutes of the Governing Council’s monetary policy meetings.<sup>37</sup> In principle, the ECB could make up for this by resorting to other communication tools, such as the Monthly Bulletin and the Introductory Statement at the ECB press conference following the monthly monetary policy meeting.<sup>38</sup>

Although the Monthly Bulletin presents the economic information used by the Governing Council, it does not reveal the Governing Council’s interpretation of it (with the exception of the editorial, which is essentially the same as the Introductory Statement). In fact, the Introductory Statement provides the only formal account that sheds some light on the considerations of the Governing Council, mainly in the form of a brief discussion of risks to (the outlook for) price stability and economic growth, summarized as a ‘balance of risks’. But the Introductory Statement, which under the first ECB President was sometimes jokingly dubbed ‘Duisenberg minutes’, contains no information about (the diversity of opinions during) the actual policy deliberations. Journalists sometimes manage to extract precious nuggets from an often evasive President Trichet during the question and answer session of the ECB press conference, for instance which policy options were considered and whether the policy decision was unanimous,<sup>39</sup> and financial markets react significantly to answers involving the Governing Council’s policy rate discussions (Ehrmann and Fratzscher 2007b).

Nevertheless, the information about the monetary policy deliberations that is provided

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<sup>37</sup>Note that article 10(4) of the E(S)CB Statutes states that “The proceedings of the meetings shall be confidential. The Governing Council may decide to make the outcome of its deliberations public”. But the latter leaves the ECB sufficient flexibility to release (unattributed, non-verbatim) minutes.

<sup>38</sup>Ehrmann and Fratzscher (2007a) argue that the different communication strategies of the ECB, Bank of England and US Federal Reserve are similarly effective based on short-term predictability and financial market responses.

<sup>39</sup>For instance, see the ECB press conference of 6 December 2007.

by the ECB Introductory Statement and press conference pales in comparison to the minutes of the US Federal Reserve, the Bank of England and the Swedish Riksbank. Instead of identifying the key variables that the monetary policymakers considered decisive for the interest rate decision, and documenting the reservations of any dissenters, the ECB resorts to its mantra that the Governing Council is monitoring all developments very closely and made its decision by consensus. This deprives the private sector of a priceless opportunity to better understand the ECB's monetary policy reaction, which is important for ECB credibility and predictability over the medium term.

The ECB's opacity extends to its decision procedure. Although article 10(2) of the E(S)CB Statutes requires that the Governing Council decides about monetary policy "by a simply majority of the members having a voting right", the Governing Council does not vote about its interest rate decisions.<sup>40</sup> Instead, its monetary policy actions are decided 'by consensus'. Although consensus need not mean unanimity, it suggests the absence of strong disagreements. However, evidence from other central banks shows that disagreements about monetary policy decisions are actually very common. In particular, Geraats et al. (2008) analyzed eight central banks that publish their voting records and found that the rate of unanimity about monetary policy actions ranges from 85% to only 42%, with a median of 60%. So, if the ECB Governing Council only decides to adjust the refi rate if there is no (strong) disagreement, it is likely to be much more inertial than a central bank acting by a simple majority. Perhaps, this helps to explain why the ECB left the refi rate at 2% for over two years (from June 2003 to December 2005) before it started removing this highly accommodative policy stance; or why the Governing Council did not decide to raise the refi rate at the end of August 2006 despite unprecedentedly high E(S)CB inflation projections.<sup>41</sup>

Another reason for publishing the voting patterns of the Governing Council is that they help to improve the public's understanding of monetary policy. In particular, the direction of dissents against a particular decision provides information about the policy inclination or bias. In addition, the number of dissents indicates the likelihood of a policy move in that direction. Furthermore, the number of dissents provides an indication of the ambiguity of the macroeconomic signals (presuming all members share the same objectives), which allows the public to exploit the degree of unanimity to more efficiently learn the monetary policy reaction. As a result, the publication of voting patterns enhances both short and medium term predictability of monetary policy. Empirical evidence has confirmed that the publication of voting records makes monetary policy more predictable

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<sup>40</sup>During the question and answer session of the ECB press conference of 10 January 2008, President Trichet declared: "As you know, we do not vote and have never voted in the past."

<sup>41</sup>It is plausible that the inertia caused by consensus decision-making are stronger for rate hikes, which would lead to an inflationary bias.

Gerlach-Kristen (2004).

The desirability of the publication of the ECB's voting patterns does not extend to individual voting records. Although knowing the identity of the voters, especially of dissenters, is likely to be useful for predicting monetary policy actions as well as enabling individual accountability, it could negatively affect voting behavior in the Governing Council because it could subject national central bank governors to greater political pressures from their national governments.<sup>42</sup> Considering the continued sensitivity of national sentiments in the euro zone, it is therefore prudent to only publish the voting patterns (or 'balance of votes') of the Governing Council but to refrain from releasing individual voting records.

Once the Governing Council has made its decision about the policy rate, it is promptly communicated and briefly explained in the Introductory Statement. But this does not provide a complete description of the policy stance. The reason is that the policy rate is adjusted in discrete steps of typically 25 basis points, so the policy decision (say, to maintain a rate of 4%) may differ from the desired policy rate (e.g. 4.1%). Clearly, it would be useful to convey this information, for example through a policy 'tilt', 'bias' or 'inclination' that provides a qualitative indication of the policy stance relative to the policy decision.<sup>43</sup>

Although a policy inclination could be used to convey the current policy stance, it may be desirable to provide guidance over a longer horizon. For instance, Geraats et al. (2008) find that financial markets failed to foresee the steady removal of the prolonged accommodative policy stance, even after the first rate hike in December 2005. They argue that monetary policy would have been less expansionary if financial markets had anticipated the ECB's path of rate rises, which would have contributed to lower inflation.

In general, the publication of a projected interest rate path provides an important tool for central banks to influence market expectations and thereby enhance the effectiveness of monetary policy. In fact, the effect of a change in the policy rate depends critically on how prolonged it is (anticipated to be). As a result, for a forward-looking central bank, the projected policy path is an integral part of the monetary policy stance. Of course, this projection is subject to considerable uncertainty and would therefore most suitably be presented in the form of a fan chart, as is done by Norges Bank and the Swedish Riksbank. Both central banks also use scenarios to explain how monetary policy would be affected by specific circumstances (e.g. high oil prices or wage growth). This makes it much easier for the private sector to understand monetary policy reactions. In addition, it illustrates

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<sup>42</sup>This argument is formalized by Gersbach and Hahn (2005).

<sup>43</sup>Although the voting patterns could reveal a policy bias, they will fail to correctly signal the policy inclination if the distribution of desired policy rates across policymakers is quite narrow (e.g. 4.0-4.1%) or skewed (e.g. all 4.1%, except for one outlier of 3.8%).

the conditionality of the interest rate projections and underscores that the interest rate path is not a commitment but is adjusted in response to macroeconomic circumstances. Using short term interest rates (e.g. three-month Euribor) instead of the policy rate would also help to prevent the interest rate path from being perceived as a commitment.

The interest rate path could also be used for the macroeconomic projections, so that they actually reflect the outcomes anticipated by the policymakers. But macroeconomic forecasts based on the interest rate path (and therefore the optimal policy path itself) require assumptions about how financial markets will react when the interest rate path differs from their expectations. This issue does not arise when market expectations are used for interest rates since they are already consistent with other asset prices. But for an interest rate path, the projections need to incorporate the financial market reactions to deviations from market expectations, to ensure internal consistency. Since such financial market reactions tend to be highly uncertain, they add additional noise to the forecast when compared to projections based on market interest rates.

This suggests that it may not always be worthwhile to publish (forecasts based on) a projected interest rate path. In fact, if the signal provided by the interest rate path is noisy compared to private signals of agents, publication of the path could even be detrimental as markets rely on it to coordinate their actions, thereby inducing greater economic volatility (Morris and Shin 2002). In addition, the focus of markets on the projected interest rate path would reduce the informativeness of market signals (Morris and Shin 2005). Nevertheless, whenever market expectations differ significantly from policy intentions, the central bank could greatly benefit from publishing the projected interest rate path to facilitate the alignment of expectations and increase the effectiveness of monetary policy. Moreover, focusing on the policy path helps to avoid a potential pitfall of the ECB's forward-looking monetary policy strategy that is discussed in the next section and may explain the difficulty the ECB has experienced in achieving price stability.

## **4 Discussion**

As shown in section 1, euro area inflation has been above 2% for most of the ECB's first decade. One reasonable explanation for this is that sudden surges of adverse shocks disturbed the monetary policy transmission process and lead to outcomes different from the ECB's intentions. In addition, greater volatility of commodity, energy and food prices and, more recently, turbulence in financial markets, could have lead to more inflation uncertainty and thereby explain the decline in the credibility measures shown in section 2.2. In particular, the anticipation of a prolonged period of larger transmission disturbances would lead to a drop in the SPF inflation probabilities for two and five years ahead.

This underscores the importance of a careful interpretation of the measure for credibility (like any other statistic). To be precise, the credibility measure equals the probability, according to the collective judgment of the SPF respondents, that the outcome for euro area HICP inflation is consistent with the ECB's objective of price stability. This means that it captures not only the willingness (commitment) and skill (competence) of the ECB, but also luck (good fortune) in the form of facing no sudden shocks to the monetary policy transmission process. As a result, it would be inappropriate to interpret the credibility measure as an indication of the ECB's *commitment* to price stability. Instead, it captures the ECB's *ability to achieve* price stability in the euro area, which relies on its commitment, competence as well as good fortune.

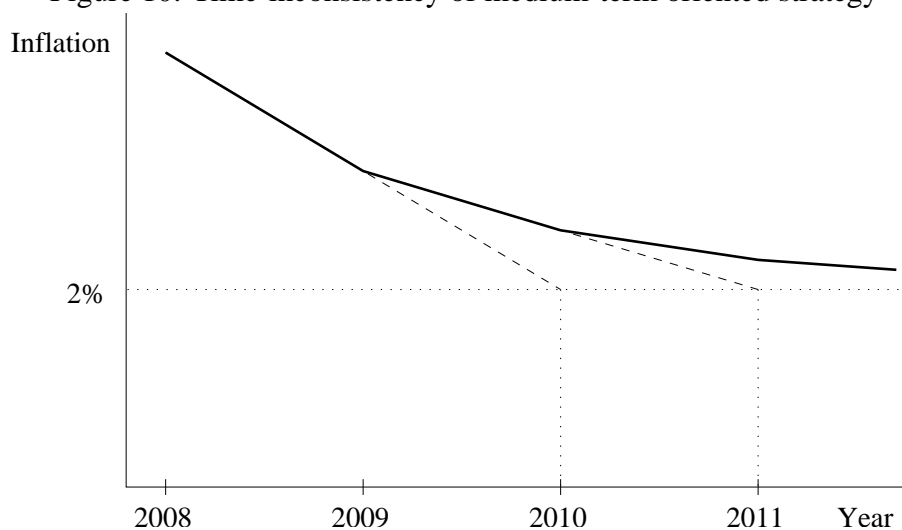
The ECB has only limited control over inflation. It sets the refi rate and conducts open market operations to try to ensure that this rate prevails in money markets. The resulting short-term interest rates have their effect on longer-term interest rates through market expectations. These longer-term interest rates affect aggregate demand and thereby inflation, which is also determined by the expectations of price and wage setters. Although private sector expectations could be influenced by ECB communication policy to bring them in line with its intentions, there are often many shocks completely beyond the ECB's control that disturb the transmission of its monetary policy.

So, perhaps (part of) the drop in the credibility measures is due to transmission uncertainty. But it is harder to explain the persistent decline during the last decade in this way. In addition, it is difficult to invoke transmission uncertainty to account for the upward trend in medium term inflation expectations shown in section 2.1. Furthermore, there is no reason why the level of long term inflation expectations would be affected by any transmission disturbances. So, the relentless rise in five-year ahead inflation expectations in the euro area is an unmistakable indication of the erosion of ECB credibility.

The high average level of euro area inflation during the last decade and the increase in medium to long term inflation expectations give rise to the question whether there may be some structural weaknesses in the ECB's monetary policy framework. As section 3 has shown, the ECB suffers from some significant transparency deficiencies. Providing greater clarity about its objectives, macroeconomic forecasts, and especially, its decision-making would help the private sector to better understand ECB monetary policy, which is likely to bolster its credibility.

It could be argued that the ECB has no need for greater transparency because financial markets have largely been able to predict its next policy decision. However, this is undoubtedly attributable to the ECB's traffic-light system of code-word communication, which signals an imminent rate change by including 'strong vigilance' in the Introductory Statement (see Geraats et al. (2008, box 6)). So, financial markets have managed to predict the ECB's next policy move without really understanding its monetary policy-

Figure 10: Time-inconsistency of medium-term oriented strategy



Note: Intended inflation path (dashed line) and actual inflation path (solid line) when monetary policy is set each year to achieve price stability (2%) in the medium term (2 years ahead).

making. But by delaying policy decisions to avoid market surprises, it becomes harder for the public to understand the ECB's monetary policy reaction. As a result, the ECB's focus on short-term predictability could actually undermine its transparency and thereby its predictability (and credibility) in the medium and long run.

However, there is also a major vulnerability in the ECB's forward-looking monetary policy strategy. The ECB aims to maintain price stability over the medium term, which amounts to achieving (slightly below) 2% inflation in about 2 years (using Trichet's definition). So, if there is an adverse shock in 2008 that drives two-year ahead inflation projections to say 3%, then the ECB decides to raise the refi rate to bring inflation back to (slightly below) 2% in 2010. But when the ECB reviews the refi rate in 2009 and has a fresh look at the forecasts, it finds that (presuming no further shocks) there is leeway to loosen monetary policy to achieve price stability over the medium term, so it reduces the refi rate (relative to the policy path that was optimal in 2007) to reach (slightly below) 2% in 2011. Clearly, the ECB's medium-term oriented monetary policy strategy is prone to time-inconsistency.<sup>44</sup> The problem is that the 'medium term' is a moving horizon, that is always two years ahead and never actually reached.

The effect of time-inconsistency, which is illustrated in figure 10, is that the ECB's primary objective of price stability is achieved too slowly. As a result, once inflation is

<sup>44</sup>Leitemo (2003) discusses this issue in the context of inflation-forecast targeting, although he focuses on constant-interest-rate projections.

above the 2% ceiling for price stability, it is likely to take longer than two years before it is brought back to 2%, which makes it rational for two-year ahead inflation expectations to exceed 2% (like in the second quarter of 2008). Another symptom of time-inconsistency is that inflation expectations two years ahead are likely to depend significantly on recent inflation, while the effect on inflation expectations five years ahead is much smaller, which is consistent with the findings in table 2.

The time-inconsistency problem of the medium-term oriented strategy can be prevented by focusing on the policy path and only updating it in response to new information.<sup>45</sup> Furthermore, by publishing the projected interest rate path and carefully explaining whenever it is revised, the ECB could persuade the private sector that it is not succumbing to time-inconsistency. In this way, the ECB would be better able to anchor medium term inflation expectations and secure price stability.

## 5 Conclusions

Despite all the challenges of managing monetary policy in a continent-wide currency area with a new single currency, the euro area economy has performed remarkably well during its first decade: on average, inflation has been low while economic growth has remained robust. Although the ECB's performance has definitely been better than the fears expressed by its fiercest critics, it has also fallen short of the high hopes cherished by some of its strongest supporters. Moreover, with respect to its primary objective of price stability, the ECB has failed to meet the high standard it set itself, namely euro area HICP inflation below but close to 2% over the medium term.

Although the higher level of inflation may be attributed to unanticipated adverse circumstances, the analysis in this paper points to some structural shortcomings. First of all, there has been an upward trend in euro area inflation expectations for the medium and long term. Two year ahead inflation expectations have even breached the 2% ceiling for price stability. So, medium and long run inflation expectations are far from solidly anchored.

Furthermore, the credibility of the ECB achieving price stability in the medium term has gradually eroded to critically low levels. The probability that professional forecasters (polled by the ECB) attach to euro area inflation within 0-2% in two to five years has steadily declined to less than 50%. This means that they consider it more likely than not that the ECB will fail to achieve price stability in the medium term.

Another worrisome sign is that medium and long term inflation expectations and forecast probabilities for 0-2% inflation are significantly correlated with the inflation history

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<sup>45</sup>See Bjørnland, Ekeli, Geraats and Leitemo (2004, chapter 3) for a further discussion.



of the euro area. So, high levels of euro area inflation are not forgotten but have a persistent negative effect on ECB credibility. This suggests that the ECB's credibility problems could aggravate due to the high levels of inflation in 2008.

However, this paper argues that the loss of ECB credibility could be overcome by embracing greater transparency. In particular, it is recommended to further clarify the ECB's objectives, since the fuzzy 'below but close to 2%' provides a flimsy anchor. In addition, the ECB would benefit from presenting more detailed macroeconomic projections and to shed more light on its policy deliberations by releasing minutes and voting patterns, so that the public is able to better understand monetary policy actions and outcomes. It is also pointed out that by always diligently aiming for inflation below but close to 2% two years ahead, the ECB is prone to suffering from time-inconsistency that prevents it from achieving price stability over the medium term. This potential pitfall of its medium-term oriented monetary policy strategy can be prevented by focusing on the projected policy path and only updating it in response to new information.

In a speech on the experience with the European Monetary Union so far, ECB President Trichet declared:<sup>46</sup>

“As a result, over the past ten years, the inflation rate in the euro area has remained on average in a tight vicinity of 2%, although it has occasionally risen above levels that the ECB considers consistent with conditions of price stability. It is remarkable that even amidst such adverse and potentially unsettling disturbances, financial markets and the public at large have not lost faith that, in line with our strategy, we would reaffirm price stability over the medium term.”

However, this paper shows that euro area inflation has been close, but mostly above 2%. In addition, the high levels of inflation have had a negative impact on ECB credibility, and inflation expectations and probabilities from surveys indicate that the private sector no longer believes that the ECB will achieve price stability in the medium term. So, the experience of the ECB's first decade has not been as favorable as suggested by President Trichet.

For the ECB to succeed in its next decade, it should exert greater efforts to explain its monetary policy actions and outcomes so that the public is able to verify that they are consistent with the ECB's stated objectives. Thus, a higher degree of ECB transparency can overcome the problem of its low credibility.

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<sup>46</sup>ECB President Trichet in the speech “Toward the First Decade of Economic and Monetary Union: Experiences and Perspectives”, Vienna, 28 April 2008.

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