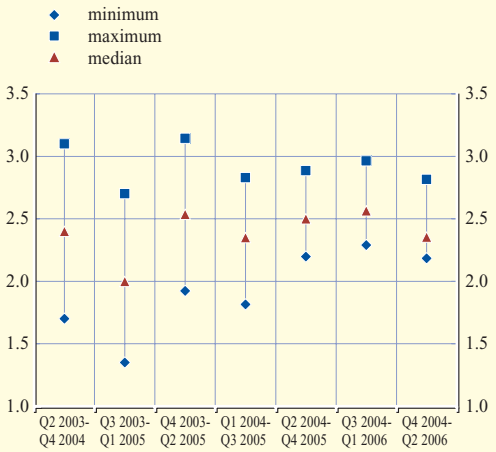
Box 1

## INFLATION FORECASTS DERIVED FROM MONETARY INDICATORS

Monetary developments in the course of 2004 point to a need for continued vigilance with regard to risks to price stability over the medium term. For example, M3 growth has strengthened since mid-2004, measures of excess liquidity (whether corrected or not for the estimated impact of portfolio shifts) have increased further over recent quarters, and the substantial contribution of M1 to the high level of M3 growth and the increased co-movement of the growth of MFI loans to the private sector and M3 growth point to a possibly large impact of the low level of interest rates on monetary developments.

**The range of annualised HICP inflation forecasts over six quarters from bivariate leading indicator models**

(annualised percentage growth rates; real-time results of the last seven quarters)




Source: ECB estimates.
Note: The chart shows the range of the annualised inflation forecasts of seven bivariate leading indicator models of inflation. Each forecast is based on information available at the time the forecast was made. For example, the forecast for Q4 2004 to Q2 2006 contains information on money and inflation up to and including Q4 2004. For the methodology underlying the inflation forecasts of the seven models see the reference in footnote 1 of this box.

The qualitative assessment that these developments imply risks to price stability from the monetary side can be underpinned by the quantitative results of simple leading indicator models of inflation which use information from a number of monetary indicators. These leading indicator models forecast average inflation over a specific horizon using past values of inflation and past values of a monetary indicator. In a simulated out-of-sample exercise conducted with this methodology, it has been shown that monetary and credit aggregates can provide useful information about medium-term inflation prospects in the euro area.[1] Moreover, at longer horizons

1 See S. Nicoletti-Altimari, "Does money lead inflation in the euro area?", ECB Working Paper No 63, May 2001.

the information content of monetary indicators for future inflation is superior to that of other non-monetary indicators.

The chart presents forecasts of annualised HICP inflation over six quarters, which have been made using the methodology described above on the basis of past inflation figures and seven monetary indicators.[2] The chart shows the range of the respective inflation forecasts (bounded by the minimum and maximum of the forecasts derived using the various indicator models), together with the median of the forecasts for each of the last seven quarters. This real-time assessment only uses information available at the time the forecast was made and a comparison of the various vintages of forecasts shown in the chart thus illustrates in a simple way how the assessment of risks to price stability derived from monetary developments has evolved over time.

Two observations can be made with regard to this illustrative exercise. First, the median and the minimum of the inflation forecasts have been above 2% throughout 2004. Second, the breadth of the range of forecasts was considerably smaller in 2004 than in 2003. This narrowing of the range reflects the convergence of developments in money growth and loan growth and the recent co-movements of the growth in M3 and M3 corrected for the estimated impact of portfolio shifts (see Chart 4 in the main text).

This exercise would suggest that there are upside risks to price stability stemming from monetary developments. Moreover, the confidence attached to this interpretation has risen, as the dispersion of signals from the various monetary indicators has diminished. However, in interpreting the results of this exercise, the high uncertainty that surrounds such forecasts and the simplicity of the underlying tools need to be kept in mind.

2 The monetary indicators considered are: M1 growth, M2 growth, M3 growth, the growth of M3 corrected for the estimated impact of portfolio shifts, the growth of MFI loans to the private sector, a P-star measure of excess liquidity based on M3 and a P-star measure of excess liquidity based on M3 corrected for the estimated impact of portfolio shifts. For further details of the P-star measures and the P-star model framework, see the reference given in footnote 1 of this box.