

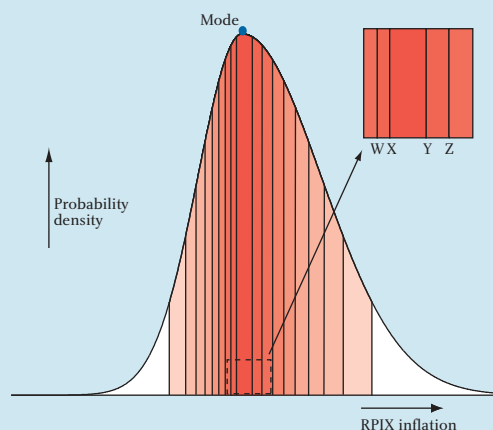
The MPC's fan charts⁽¹⁾

Nobody can predict the future evolution of the economy with absolute certainty. It is more realistic for forecasters to recognise that uncertainty when describing their projections. Consequently, the forecasts for GDP growth and RPIX inflation described in the *Inflation Report* are always presented in probability terms. And the fan charts are graphical representations of those probabilities.

The MPC's view of the likely outcome for inflation in any future quarter can be represented by a probability density function. Chart A is an example of such a function. The area under the curve between any two points shows the MPC's view on the probability of RPIX inflation lying within that range. More specifically, the area covered by the darkest red band in the centre of the chart represents a 10% probability. So there is a 10% probability that inflation will lie between X and Y in Chart A. This band contains the MPC's view of the single most likely outcome, which is the highest point on the curve—the mode. Moving away from the central band, the area covered by each pair of successive identically shaded bands—one on each side of the mode—also represents a 10% probability. So in Chart A, the probability of inflation lying between W and Z is 20%. The coloured bands cover 90% of the area under the curve, so there is judged to be a 10% chance that the outcome for RPIX inflation will be outside the shaded range.

Each forecast, the Committee must make a decision about the balance of risks. If members collectively thought that the risks were evenly spread around the mode, then the curve would be symmetrical. If the MPC believed there was a higher probability that inflation would be above the mode than below, then the area under the curve would be skewed to the right, as in Chart A. The opposite would be true if they thought outcomes below the mode were more probable.

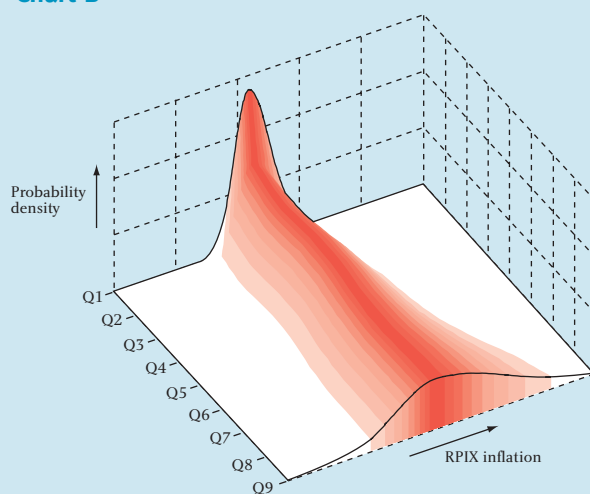
Chart A



The width of the coloured bands is an indication of how uncertain the Committee is about the prospects for inflation. The Committee uses the experience of past forecast errors to inform its judgment. But the MPC does not mechanically extrapolate those errors in order to calibrate its uncertainty for each forecast. Rather it makes a subjective assessment, based on the economic conditions prevailing at the time.

In preparing the *Inflation Report*, a probability distribution, as in Chart A, is produced for all of the nine quarters in the forecast. Putting those distributions together in three dimensions would give a probability 'hill', as in Chart B. The ridge of that hill is the mode and corresponds to the MPC's central projection. The further ahead in time, the less certain the MPC tends to be about the future, so each distribution becomes wider and flatter. Consequently the ridge of the hill declines in height through time, and the slopes on the side of the hill become less steep. The fan charts (an example is shown in Chart C), which are regularly shown in the *Inflation Report*, are two-dimensional pictures of that hill, viewed from above.

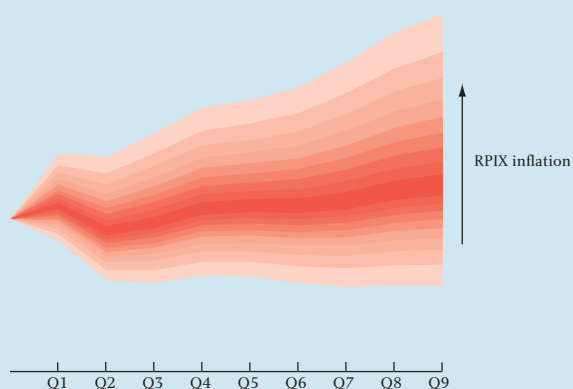
Chart B



The MPC's fan charts of inflation and GDP growth shown in this *Report* represent the best collective judgment of the Committee, conditional on a particular path for interest rates.⁽²⁾ It is sometimes said that the fan chart reflects the differences of view among Committee members. That is not the case. The fan chart encapsulates a single view, which represents the centre of gravity of opinion among Committee members about the outlook for the UK economy. Some

(1) For a more detailed and technical explanation, see 'The *Inflation Report* projections: understanding the fan chart', February 1998 *Bank of England Quarterly Bulletin*, pages 30–37.
 (2) For a description of how the MPC puts its forecast together see 'The formulation of monetary policy at the Bank of England', Winter 2001 *Bank of England Quarterly Bulletin*, pages 434–41.

Chart C



individuals may feel that the Committee's collective view is sufficiently far from their own to note those differences in the *Inflation Report*. Table 6.B in this and previous *Reports* provides illustrative calibrations of the most significant alternative judgments.

Given the lag between the change in the official interest rate and its full impact on inflation, the forecast represented by the MPC's fan chart is a key input to policy decisions. But it must be emphasised that there is no mechanical link between either the central projection or the distribution of inflation at the forecast horizon and the setting of monetary policy.⁽³⁾

(3) See the November 2000 *Inflation Report* (page 67) for a fuller discussion of the link between the forecast and monetary policy.