

## The Monetary Policy Committee's response to the Independent Evaluation Office evaluation of the MPC's forecasting performance

The MPC welcomes the Independent Evaluation Office (IEO) evaluation of the MPC's forecasting performance. In late 2014, the IEO was asked by the Court of Directors to provide it with a better basis for evaluating the Bank's forecast performance. The IEO subsequently undertook a wide-ranging statistical evaluation of the Bank's forecasts, the details of which have been published alongside this *Inflation Report*.<sup>(1)</sup> The IEO's assessment reinforces existing initiatives and provides new insights. This box highlights the key empirical findings and recommendations from this work and sets out a series of initiatives that the MPC will be putting in place.

The MPC's macroeconomic projections are central to the formation and communication of its policy decisions. Projections of GDP growth, the unemployment rate and CPI inflation are presented as fan charts, to portray the uncertainty involved; central projections are presented for a number of other variables (Section 5). To improve its understanding of the economy and its forecasting capabilities, the MPC regularly assesses how and why economic developments differed from its earlier central expectations and how the distribution of outturns compares with the fan charts. It has also benefited from a number of independent reports identifying areas for improvement since the MPC's inception in 1997.<sup>(2)</sup>

### Summary of the IEO's work programme

The IEO's work focused on a statistical evaluation of the Bank's forecasts made since 1997 at various horizons. The evaluation covered data outturns up until 2014, so, for example, the most recent two year ahead quarterly forecasts included were made in 2012. The IEO updated previous analysis examining the performance of the MPC's projections for GDP growth and CPI inflation. The IEO's analysis largely reinforced the conclusions of that previous work.<sup>(3)</sup> It expanded on that work by considering the forecasting performance of other key variables of interest to both the MPC and the Financial Policy Committee. It additionally considered how the Bank's projections compared with the forecasts generated by simple statistical processes, and the projections of other central banks and private sector forecasters.

The MPC's projections for GDP growth since 1997 were assessed to have performed relatively well, and did not exhibit statistically significant signs of bias. In other words, projections did not systematically under or overpredict outturns. These projections also compared favourably with

those of private sector institutions. The MPC's inflation projections also showed no statistically significant signs of bias. The forecast accuracy of the MPC's one year ahead inflation projection tended to compare favourably with that of other forecasters. The forecast accuracy of the two year ahead inflation projection compared less favourably, particularly for projections made following the start of the crisis.

The IEO noted a more general deterioration in two year ahead forecast accuracy since the start of the financial crisis, for both GDP growth and inflation. This was not unique to the Bank: projections made by UK private sector forecasters also became less accurate, and it seems likely that the economy became more difficult to forecast following the onset of the crisis. The accuracy of some of the Bank's longer-term forecasts appears to have declined relative to that of other forecasters: an example of this would be the two year ahead inflation projection, where the Bank appears to have underestimated the persistence of factors influencing inflation. The sample in the post-crisis period was relatively small, however, and the IEO stated that these results should be interpreted with caution.

The IEO's work programme also encompassed other variables — such as labour market variables — that have not been evaluated in previously published statistical studies. For much of the period considered, only GDP growth and inflation projections were published, and while projections for other variables provided background information for the forecasts of GDP growth and inflation, the MPC did not formally agree them. Since 2013, the MPC has published a projection for the unemployment rate. Since 2014, it has also included in the *Inflation Report* projections for additional variables produced by Bank staff.<sup>(4)</sup> This follows recommendations made by the Stockton Review.

Over the sample period as a whole, forecasts for the unemployment rate exhibited signs of bias and were less accurate than those produced by a simple statistical rule that assumed outturns for subsequent periods were the same as

(1) The full evaluation can be found at [www.bankofengland.co.uk/about/Documents/ieo/evaluation1115.pdf](http://www.bankofengland.co.uk/about/Documents/ieo/evaluation1115.pdf). More background on the IEO can be found at [www.bankofengland.co.uk/about/Pages/ieo/default.aspx](http://www.bankofengland.co.uk/about/Pages/ieo/default.aspx).

(2) See Pagan, A (2003), 'Report on modelling and forecasting at the Bank of England', *Bank of England Quarterly Bulletin*, Spring, pages 60–88; [www.bankofengland.co.uk/archive/Documents/historicpubs/qb/2003/qb030106.pdf](http://www.bankofengland.co.uk/archive/Documents/historicpubs/qb/2003/qb030106.pdf), and Stockton, D (2012), 'Review of the Monetary Policy Committee's forecasting capability'; [www.bankofengland.co.uk/publications/Documents/news/2012/cr3stockton.pdf](http://www.bankofengland.co.uk/publications/Documents/news/2012/cr3stockton.pdf).

(3) For a recent discussion of the efficiency and bias of the MPC's GDP growth and CPI inflation forecasts see, for example, Hackworth, C, Radia, A and Roberts, N (2013), 'Understanding the MPC's forecast performance since mid-2010', *Bank of England Quarterly Bulletin*, Vol. 53, No. 4, pages 336–50; [www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2013/qb130405.pdf](http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2013/qb130405.pdf).

(4) See for example, **Table 5.B** on page 32 for projections of the variables consistent with the MPC's key judgements, and **5.D** on page 37 for indicative projections of other variables produced by Bank staff to be consistent with the MPC's fan charts.

the latest observation. This in part reflected relatively large forecast errors in the pre-2001 period, perhaps due to a persistent decline, more evident after the event, in the natural rate of unemployment. If the pre-2001 data points were excluded, the findings of bias, and of outperformance by a simple statistical rule, were not statistically significant. That said, the accuracy of the Bank's unemployment forecasts compared relatively poorly with those of other forecasters; the IEO noted signs of improvement more recently, although it is too early to be confident that this represents a systematic change.

The IEO work also considered Bank projections for house price inflation, consumption growth, investment growth, wage growth, lending, US GDP growth and euro-area GDP growth. House price inflation projections had been persistently too low, but since the crisis they had been no less accurate than those of most private sector forecasters. Projections for consumption and investment growth were generally unbiased, although comparisons of forecast accuracy with other institutions' projections showed mixed results. Projections for US and euro-area GDP growth have been broadly as accurate as those produced by the US Federal Reserve and the European Central Bank.

### The MPC's initiatives to strengthen its forecasting capabilities

The IEO made a number of recommendations. The MPC has discussed these and, in the context of initiatives already under way following the 2012 Stockton Review, is taking a number of steps in response.

#### Recommendation 1: Learn more from other models and forecasters

The IEO work suggests that the MPC could benefit from drawing on the insights of other forecasters and other economic models.

**The MPC will expand its suite of statistical models.** The MPC already uses a number of economic models, including some that describe the financial sector and other key economic mechanisms not present in its main forecasting model. This work will expand the suite by increasing the range of models that place a greater emphasis on fitting the data than describing economic channels — so-called 'non-structural' models — as these historically have produced more accurate statistical projections at some forecast horizons.<sup>(1)</sup> Types of model that may be particularly useful to the MPC would be those that require few judgements to be made about certain aspects of the economy, such as its supply potential.

Although such models often have a better forecasting performance they lack a coherent economic structure and are

not suitable for simulating the effects of particular shocks or the impact of changes in policy. So they cannot substitute for the MPC's main structural model, founded in economic theory and estimated on UK data, which is much better suited for answering such questions. Further work is needed on how to use non-structural models as a part of the policymaking process. When agreeing a projection, the MPC would need to weigh up the relative benefits of the two approaches.

**In expanding its use of statistical models, the Bank will engage more with other experts in the field.** This will enable the MPC to benefit from others' modelling expertise when expanding the range of statistical models. One option under consideration is to draw on the work of the external researchers who participate in the Bank's broader research agenda.

This initiative continues a broader aim of increasing external engagement. The Bank has for some years conducted a Monetary Policy Roundtable, twice a year, where outside economists are asked to present views. There is a specialised briefing of the quarterly *Inflation Report* for economists. Following the Stockton Review there has been a greater focus on systematically gathering the views of external commentators on a more regular basis. Moreover, the MPC has three times this year invited groups of academic economists to present their views on topics of interest.

#### Recommendation 2: Learn more systematically from the past

The IEO work programme reiterated the importance of continuing forecast evaluation. Since its inception, the MPC has regularly assessed how and why economic developments differed from its earlier central expectations for GDP growth and inflation and how outturns compare to its fan charts. The MPC's latest evaluation, set out in the box on pages 42–43, evaluates the MPC's August 2014 projections against the key judgements that underpinned them. This allows the MPC to understand the factors explaining such deviations and whether they are likely to persist, providing a firmer basis for making adjustments to its subsequent forecasts. Over time, these evaluations will cover the performance of the wider set of variables published alongside the *Report* since February 2014.

Another recent initiative is the introduction of 'stocktakes' of slower-moving macroeconomic forces, such as the economy's supply potential. These stocktakes consider a wide range of evidence, including from structural and non-structural models, on developments over a number of years. The MPC's

(1) For a recent evaluation of projections from a structural model see Fawcett, N, Körber, L, Masolo, R M and Waldron, M (2015), 'Evaluating UK point and density forecasts from an estimated DSGE model: the role of off-model information over the financial crisis', *Bank of England Staff Working Paper No. 538*; [www.bankofengland.co.uk/research/Documents/workingpapers/2015/swp538.pdf](http://www.bankofengland.co.uk/research/Documents/workingpapers/2015/swp538.pdf).

reassessment of the supply potential of the economy is a recent example of this, and was presented in the May 2015 *Report*.

**Alongside such evaluations, the Bank will undertake a more systematic statistical monitoring of the performance of the MPC's central projections.** These tests, which will be reported to the Bank's Court on a regular basis, will consider any evidence of statistical bias or inefficiency (whether projections could have been improved by incorporating other information). These tests will need to be designed in such a way that the MPC can quickly identify whether outturns differ from expectations by an unusually large degree. Convincingly assessing the statistical performance of a forecast is not possible, however, if there are only a small number of observations, as highlighted in the IEO work.<sup>(1)</sup>

**The Bank will also more systematically assess outturns relative to the MPC's fan charts,** which illustrate the uncertainty around the central projection. If the fan chart accurately describes the uncertainty faced by the MPC, and the sample were sufficiently large, then outturns would be expected to lie evenly across the fan chart distribution.

### **Recommendation 3: Challenge convention more**

The IEO evaluation emphasises the importance of regular opportunities to challenge the MPC's key judgements.

The initiatives addressing Recommendations 1 and 2 will also address this recommendation. And they will complement the changes made following the Stockton Review, which included increased engagement with economic commentators and greater transparency around the variables underlying the MPC's forecasts. These and other initiatives are designed to enhance and encourage challenges to the MPC's view of the outlook.

### **Recommendation 4: Provide more support for non-MPC internal users of the Bank's forecasts**

Projections produced as part of the MPC's forecast process are increasingly used across the Bank in its other policy functions. In order to help these internal users understand the weight they should put on those projections, **clearer guidance will be provided on the level of oversight of different forecast variables.** This will be based on the projections' relative status, and in particular the distinction between the key forecast variables published as fan charts collectively agreed by the MPC, others published in the *Report*, and the less prominent unpublished series.

## **Conclusions**

To help improve its understanding of the economy and so its forecasting capabilities, the MPC regularly assesses its past forecasting performance. In recent years, it has implemented a number of changes designed to improve its forecasting capabilities and make its forecasts more transparent. In light of the IEO work, the MPC has agreed further new initiatives:

- develop a wider range of statistical models;
- further increase engagement with other experts, especially in developing new models;
- develop formal statistical tests to assess the performance of the MPC's projections and to try to identify changes in the economy's behaviour; and
- provide clear guidance to internal users on the relative degree of oversight of the various forecast variables.

Together, the initiatives aim to allow the MPC to identify more quickly whether outturns appear to be systematically moving away from earlier expectations, and to improve the analytical framework underlying its projections. The Bank's forecast processes have also changed in various ways since the 2012 Stockton Review, and it is too soon to assess the impact of those changes. There would therefore be merit in repeating an evaluation exercise of a similar nature in a few years' time.

(1) For a discussion of the issues around testing forecasting performance with a small sample see Broadbent, B (2013), 'Forecast errors'; [www.bankofengland.co.uk/publications/Documents/speeches/2013/speech653.pdf](http://www.bankofengland.co.uk/publications/Documents/speeches/2013/speech653.pdf).