Probability forecasting and central bank accountability

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Abstract

The paper studies probability forecasts of inflation and GDP by monetary authorities. Such forecasts can contribute to central bank transparency and reputation building. Problems with principal and agent make the usual argument for using scoring rules to motivate probability forecasts confused; however, their use to evaluate forecasts remains valid. Public comparison of forecasting results with a "shadow" committee is helpful to promote reputation building and thus serves the motivational role. The Brier score and its Yates-partition of the Bank of England's forecasts are compared with those of a group of non-bank experts.
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> If you twist my arm, you can make me give a single number as a guess about next year's GNP. But you will have to twist hard. My scientific conscience would feel more comfortable giving you my subjective probability distribution for all the values of GNP.

Paul A. Samuelson (1965), p. 278.

1. Introduction

For years, the conduction of monetary policy by central bankers has been a mystery to the general public. Central bankers built reputations making decisions in environments of confidentiality.

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Arguments supporting a higher degree of transparency have recently persuaded monetary authorities to be more open with respect to policymaking decisions, up to the point that some make their forecasts of key variables public. Intensifying the public's response to monetary policy changes is among the potential gains of increased transparency (Svensson, 1997; Woodford, 2003).

The *Bank of England* (BoE) is one of the few Central Banks that actually publish inflation forecasts.[1] The *Monetary Policy Committee* (MPC) of the BoE has been issuing density forecasts of inflation, also called "Fan Charts," on a quarterly basis in its *Inflation Report* since August 1997. It has been issuing output growth forecasts since November 1997. In addition, the BoE has published probabilistic forecasts of these two "key" variables from a quarterly survey of undisclosed external forecasters, averaging their responses for each range of the probability distribution.

In this paper, we evaluate the probability forecasts of the MPC and those of the group of undisclosed external forecasters using the Brier score and its partition, the latter originally suggested by Yates (1982). Our purpose is to demonstrate that the ex post evaluations of probability forecasts of both the MPC and an alternative "shadow" committee offer valuable information that is not available from reports on the MPC (alone).[2] A humorous (slightly edited) epigraph, summarizing a conversation between person "A" and person "B" of Granger and Newbold (1986) p. 265 illustrates well our suggestion—"A: How is your spouse? B: Compared to what?" Comparing the Central Bank's probability forecasts with a competent but "shadow" expert will help induce forecasting "soundness" by reputation building and learning. Analyzing both of the forecasters' predictability performances appeals to the forecast competition argument suggested above in the Granger and Newbold quote.

Recognizing the incentive-compatible feature of the Brier score, we considered (and later ruled out) utilizing the Brier score in the context of a contract between the government and the central bank in the spirit of Persson and Tabellini (1993, 1999, 2000) and Walsh (1995, 1998). Because of ambiguities discussed in McCallum (1999) and Blinder (1998) that present themselves in central banking, this possibility was abandoned.[3] Determining whether it is the principal (Parliament or Congress) or the agent (central bank) who has more incentive to try and boost real output in the short-run by creating "surprise inflation" is among these ambiguities.

Clements (2004) also calculates the Brier score of the MPC forecasts. This paper differs from his as we apply the Yates decomposition to extract meaningful information about the forecaster's beliefs. We find that the MPC is upwardly biased by placing larger probabilities to the high state, preventing the less conservative members of the Committee to gain any approval for interest rate cuts. These results are consistent with Pagan (2003), Wallis (2003, 2004) and Clements (2004). The Yates-partition shows that the MPC forecasts of inflation do not sort or discriminate between events that occur versus events that do not occur as well as the "shadow" forecasters. On the other hand, the MPC's forecasts of GDP do sort (or distinguish between events that ultimately obtain versus events that do not obtain) about the same as the "shadow" committee.

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[1] Hatch (2001) provides an insightful introduction to the Bank of England's modeling and forecasting. For detailed information on the construction of fan charts, see Britton, Fisher, and Whitley (1998).

[2] Here we use the undisclosed experts as a "shadow committee" because these forecasts are available. Certainly we do not necessarily argue for or against the selection of this particular set of individuals. If our suggestion is to be used as policy, selection of the "shadow committee" will need to be given more consideration (than we have in this particular case).

[3] In order to connect Walsh's (1995, 1998) and Persson and Tabellini's (1993, 1999, 2000) contracting approach to our proposal, it had to be followed literally. Consequently it was not given any practical consideration. However, this should not be interpreted as discarding the importance of their contributions to improve the assessment of modern monetary policy issues.