International Journal of Forecasting 32 (2016) 804–817

Contents lists available at ScienceDirect

International Journal of Forecasting

journal homepage: www.elsevier.com/locate/ijforecast

Central banks' forecasts and their bias: Evidence, effects and explanation

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ARTICLE INFO

Keywords:
Forecasts' bias
Inflation targeting
Forecasters' behaviour
Monetary policy

ABSTRACT

Through empirical analysis this paper shows that inflation forecasts produced for monetary policy councils in inflation targeting countries may be subject to bias towards the target. There is no clear evidence of such bias for other inflation forecasts. To explain this observation a model is constructed to analyse the effectiveness of monetary policy committee voting when the inflation forecast signals, upon which decisions are based, may be subject to manipulation. Using a discrete time intertemporal model, we examine the distortions resulting from such manipulation under a three-way voting system. We find that voting itself creates persistence and volatility in inflation. In the case when the expected value of the inflation distribution is not far from the target, alterations to the forecast signal, even if well intentioned, results in a diminished probability of achieving the inflation target and an increase in persistence. However, if committee members 'learn' in a Bayesian manner, this problem is mitigated.

1. Introduction

This research is stimulated by the empirical observation that the long-term inflation forecasts published by central banks which target inflation tend to be biased towards the target. We explain this observation by examining how the voting behaviour of members of a monetary policy committee (*MPC*) may influence its ability to target inflation. While the subject of the influence of decisions taken by the *MPC* on macroeconomic stability has been researched extensively, relatively little is known about the effects of the intra-committee dynamics of *MPC*s on future inflation. We hypothesize that the ways in which *MPC*s make decisions, including individual preferences and interactions among *MPC* members, will affect both the decisions themselves and the subsequent outcomes. More precisely, our hypotheses are (1) direct or indirect pressure from the leading members of the *MPC* on the forecasters might lead to biases, making the long-term goals of the monetary policy seem feasible; and (2) the *MPC* members' votes regarding policy decisions based on such biased forecasts might result in unnecessarily active decisions being undertaken, which in turn leads to an increased volatility and persistence of inflation. In addition, we also aim to further the finding of Fildes (2015) and Fritsche, Pierdzioch, Rülke, and Stadtmann (2015), that both organisational and psychological factors affect the rationality of forecasters' behaviour, by explaining the possible outcomes of such behaviours.

The effects of *MPC*s' decisions on macroeconomic stability have been analysed widely in the literature. Earlier research has looked at the committees' preferences with regard to inflation and output gaps (e.g., Mihov & Sibert, 2002; Rogoff, 1985; and Waller, 1989), along with the optimal rules to follow to ensure stability and growth (e.g., Clarida, Galí, & Gertler, 2000 and Rudebusch, 2001), and the ways in which different actions are interpreted

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http://dx.doi.org/10.1016/j.ijforecast.2015.12.007
0169-2070/

by the private sector (e.g., Demertzis & Hughes Hallett, 2008). However, this literature has not usually considered the process through which the monetary decision is made. A smaller body of work has shown that the dynamics of group interactions within *MPC*s have a significant effect on their ability (e.g., Blinder & Morgan, 2005). These papers, which examine heterogeneous voting behaviour under specific voting schemes, have been concerned principally with the real policy effects (Gerlach-Kristen, 2006), informational efficiency (Blinder, 2007), or game-theoretical equilibrium (Berk & Bierut, 2005a,b, 2010). However, the structure and heterogeneity of the signals considered by the *MPC* members as part of their voting decision have rarely been discussed. The only papers that have investigated this aspect of the problem are those of Gerlach-Kristen (2006) and Weber (2010), who analyse the effects of different gap signals on voting (see also Blinder, 2007); Brooks, Harris, and Spencer (2007), who consider the dynamic behaviour of the *MPC* voters; and Gerlach-Kristen (2004, 2005), Horváth, Šmitková, and Zapál (2010) and Sirchenko (2011), who use records of *MPC* voting to predict interest rate changes. We focus here on the effect of the *MPC* on inflation; however, historically, central banks have also targeted exchange rates, with varying degrees of success (Brander, Grech, & Stix, 2006). If these interventions are decided by a committee, they may be subject to the same types of biases that we analyse here.

Like Weber (2010), we assume heterogeneity of the *MPC* members with respect to the signals that they received. However, we concentrate on the heterogeneity of the inflationary signals rather than the output gap signals. We follow Blinder's (2007) suggestion and consider the static and dynamic effects of such heterogeneity, first on *MPC* monetary decisions, and subsequently on inflation. More precisely, this paper concentrates on the aspects of *MPC* voting behaviour which relate to the perception and manipulation of the signals from the inflation forecasts. We investigate the effects of biases that result from an alteration of the forecast signals before they reach the majority of the voters (for a different view on the place of leaders' bias in the voting scheme, see Chappell, McGregor, & Vermilyea, 2007). In many cases, *MPC* members have some institutional influence on the experts who produce the forecasts for the *MPC*, e.g., the experts might be employed by the Central Bank and be subordinates of the chair of the *MPC* (who is often a Governor of the Bank). As such, it is possible for some members of the *MPC* to put pressure on experts in such a way that they will produce forecasts that suit the preferences of some members of the *MPC* more than others. This would create a certain bias, which affects voting outcomes, and consequently, future monetary policy and inflation.

We examine the nature and outcomes of this potential bias using an inter-temporal model of voting. An evident difficulty in such research is the lack of data. Empirical information on individual votes is sometimes available, and can be used for establishing relationships between voting and outcomes (see e.g. Brooks et al., 2007 and Chappell, McGregor, & Vermilyea, 2005). Quite understandably, though, there is no direct evidence of inflation signal manipulation. Nevertheless, some indirect empirical evidence has been found, and is discussed in Section 2. Another difficulty is that analytical solutions are intractable in a fully stochastic and inter-temporal context (see Section 4). In the light of these facts, we resort to setting up an inter-temporal simulation model.

In this model, decisions made by the *MPC* affect the next-period inflation directly. The crucial aspect of this model is the fact that one member of the committee can alter the inflation forecast signals that are delivered to the others (see Section 3). We assume that the most influential member of the committee has the power to alter the signals received by other members of the committee. An alternative description of this behaviour could be that the most dominant member influences more junior members' *perceptions* of an accurate signal. Whether this is due to force of argument, seniority, or institutional rules, the dominant member may be able to persuade others to vote in a particular manner even when their individual interpretations of the signal would entail different actions. In this setting, Sibert (2003) shows that placing more weight on the decisions of senior policy makers has an ambiguous effect on the change in expected social welfare. The results presented in this paper may also be interpreted in the light of this setting, demonstrating that a bias towards one particular policy maker has a specific effect on the ability to meet inflation targets.

The general model setting differs markedly from those that are usually applied in the contemporary theory of voting and aggregation rules. The initial assumptions are simple: the *MPC* members are sincere (naïve) voters, who refrain from strategic voting. Only under the extreme assumption of an independence of voting decisions and identical (for all voters) probabilities of taking the correct decision, together with particular voting scheme designs, can the voting process be regarded as optimal in the Condorcet sense (that is, that a sincere democratic majority voting on a limited number of alternatives is socially superior to other alternatives; see e.g. Austen-Smith & Banks, 1996; Chwe, 2010 and Ladha, 1992). Our work is also related to that of Dietrich and List (2004), who present a model in which jurors make decisions based on a common body of evidence, rather than the state of the world. They showed that, in the limit, the probability of a correct decision converges to the probability of the evidence not being misleading. The model presented in this paper sits between these two views. Whilst our committee members receive information on a body of evidence rather than the state of the world, that body of evidence is not common. In fact, the information reaching particular *MPC* members is partially stochastic, and hence different and, in the general case, correlated. Nitzan and Paroush (1984) consider interdependent voting and find that it is inferior to independent voting. In contrast, Estlund (1994) finds that, in some circumstances, voters may increase the overall competence by following opinion leaders.

The problem of setting the optimal voting rules is not considered here (as it is not considered in the realities of central banks); instead, we focus on the efficiency of voting under the aggregation rules frequently used by central bankers. In this perspective, the paper extends the framework currently used for voting analysis by adding