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From Doves to Hawks:

A Spatial Analysis of Voting in the Monetary Policy Committee of the Bank of England, 1997-2007

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Abstract

This paper examines the making of UK monetary policy between 1997 and 2007 using an analysis of voting behaviour in the Bank of England's Monetary Policy Committee (MPC). We use a Bayesian method to estimate the interest rate policy preferences of the MPC members on a 'dove-hawk' scale. Then, by comparing the 'ideal points' of outgoing members with their successors, we find evidence that MPC composition complements the fiscal policies pursued by the government. The revealed preferences of the MPC members suggest three distinct groups; 'the doves', who favour lower interest rates than the median committee member; 'the centrists', whose revealed preferences are in line with the median committee member; and 'the hawks', who favour higher interest rates than the median committee member. Our analysis suggests that the 'opposition' to the centrist group changes from the doves to the hawks as the spending policies of the government ceased to be constrained by the 1997 electoral promise to maintain conservative spending plans.

1. Introduction[4]

On 11 January 2007 the Monetary Policy Committee (MPC) of the Bank of England increased the interest rate by a quarter of a percent to 5.25 percent. The increase came as a surprise to most observers given the economic conditions and past behaviour of the MPC. When the minutes were published three weeks later, it was revealed that the committee had split 5 to 4 in favour of the increase. In fact, the MPC has been divided about two-thirds of the time since the Bank of England was made independent in 1997, although rarely split down the middle as in January 2007. Presented with the same information about the state of the British economy each month, why do the members of the MPC disagree on the appropriate interest rate? Clearly, British central bankers, like all policymakers, do not all think the same way. This suggests that had the composition of the MPC been slightly different in January 2007, the decision might have been to hold rates rather than increase them.

What we do in this paper is undertake a 'spatial analysis' of voting in the MPC between the first meeting of the committee after the Bank of England was made independent in June 1997 and the end of the tenure of Gordon Brown as Chancellor of the Exchequer ten years later, in June 2007. Unlike existing research on voting in the MPC, we use a Bayesian estimation technique to derive 'ideal point estimates' of the location of the 25 people who were members of the MPC at one time or another in this ten year period. This method provides estimates of where the MPC members are located on what might be called a 'dove-hawk' (or 'ease-tightness') dimension of interest rate policy. These estimates are more robust to changes to the effects of making decisions under particular economic conditions than more commonly used 'batting average' methods of estimating the preferences of the MPC

[4] An earlier version of this paper was presented at seminars at Dartmouth College and the University of Oslo. We would like to thank Andrew Bailey, Danny Blanchflower, John Carey, Howard Davies, and Michael Herron for comments on this earlier version.

members. This method also produces uncertainty estimates around the locations of the MPC members.

In the next section we discuss how to understand voting behaviour in the MPC in particular, and voting in central banks and other decision-making settings (such as courts and parliaments) more generally. We also present the Bayesian technique we use to estimate the ideal points of the MPC members. These estimates are presented in section three. In section four we then use the estimated ideal points to investigate whether there is a conflict pattern revealed in the voting decisions by the members of the MPC.

2. Understanding and Measuring Voting Behaviour in the MPC

One of the first acts of the newly elected Labour government in May 1997 was to grant operational independence for setting interest rates to the Bank of England. After almost two decades in opposition the new Labour Chancellor of the Exchequer, Gordon Brown, was eager to demonstrate his commitment to economic stability. Central bank independence is seen as an effective institutional arrangement for delivering a stable monetary policy as it prevents the government from using interest rates to boost the economy prior to elections (Drazen 2000). Granting independence to the Bank of England hence sent a strong signal to the electorate and the markets that Labour could be trusted to manage the economy.

The act of parliament which established central bank independence in the UK provided for the Chancellor to set an annual inflation target and for a Monetary Policy Committee to meet every month to decide the interest rate in order to meet the Chancellor's target. This inflation target is currently set at 2 percent, plus or minus 1 percent.

The MPC consists of nine members: five 'internal' members from the staff of the Bank of England and four 'external' members appointed by the Chancellor. The Governor and the two Deputy Governors of the MPC are appointed for renewable 5-years terms by the Crown, which effectively means the Chancellor. The two other internal members, the Executive Directors of the Bank, are appointed for renewable 3-year terms by the Governor of the Bank of England, after consultation with the Chancellor. The four external members are appointed for renewable 3-year terms. Members are required to go before the House of Commons Treasury Select Committee. The Committee can take a vote on the nominee, but does not have the power to veto a Chancellor's appointee.[5] Thus the government, and particularly the Chancellor, would appear to possess a great deal of control over the appointment of most MPC members. Table 1 lists the people who where members of the MPC at one time or another between June 1997 and June 2007. As the table shows, most of the externally appointed members of the MPC have had a background in academia, with the others coming mainly from financial institutions in the City of London, the civil service, or industry.

[Table 1 About Here]

Given the set up of the MPC, with one individual wielding considerable power of appointment, given the collective aim of meeting an inflation target set externally, and given the fact that each month the members of the MPC are presented with the same information about the state of the economy, one might assume that it would be relatively easy for the members of the committee to reach agreement. However, several factors ensure that this is not in fact the case. Members of the MPC may disagree either because they have different

[5] In fact, in May 2000 the Treasury Select Committee voted to reject Christopher Allsopp as the replacement of Charles Goodhart, but the Chancellor ignored the position of the committee.

underlying economic preferences or because they hold different *beliefs about the true state of the economy*.

Where underlying economic preferences are concerned, members could prefer different absolute levels of inflation because they trade-off short-term inflation and unemployment in different ways (Hibbs 1977; Alesina and Sachs 1988). For example, the same rate of inflation will affect different sectors of the economy in different ways. So, if one central banker cares more about manufacturing while another cares more about financial services, these two members might have different preferences over inflation given the same economic conditions. One could argue that with a collective inflation target set externally, the MPC members are unlikely to be able to explicitly reveal their different preferred inflation rates. They collectively have an incentive to preserve the reputation of the Bank, which is diminished if the Bank repeatedly misses the inflation target. However, the sanctions for missing the target are relatively weak – the Governor of the Bank of England has to write a letter to the Chancellor explaining why the target has been missed. Furthermore, the inflation target takes the form of a symmetric range of inflation rates. As a result, there is some room for variance in preferences over inflation. For example, some members may prefer to overshoot the target than undershoot the target while others might prefer the opposite.

Even if the members of the central bank have the same underlying economic preferences, they may vote differently on an interest rate decision because they hold differing beliefs about the true state of the economy (Blinder 2007). For example, some macro-economic models of inflation place more emphasis on wages while others place more emphasis on output or house prices (Gerlach-Kristen 2006). Thus different members of the MPC probably have different forecasts about the likely direction of the economy as a result of their different forecasting techniques. To the extent that such differing techniques lead to systematic differences in forecasts across members (i.e. some members persistently believe

that inflationary pressures are stronger than do other members) then we are likely to observe systematic differences in the preferred interest rate of individuals. That is, we can expect policy preferences to vary across members.

Whether it is differing underlying economic preferences or differing beliefs that lead to variance in policy preferences across members, the existence of this variance means that the policy preferences of the average member of the committee that makes interest rate decisions is potentially significant. The central bank will be more likely to raise interest rates if the average member is more 'hawkish' than if the average member is more 'dovish'.

To understand the decisions of the MPC, then, one needs to know the policy preferences of the members of the committee. A number of techniques have developed in recent years to estimate the 'ideal points' of actors on the basis of their recorded voting behaviour. The starting point of most of these techniques is the standard spatial model of politics (Downs 1957; Hinich and Munger 1997). The power of the basic spatial model comes from its simplicity and generalisability. The model assumes a policy space within which all policy alternatives can be placed according to some underlying dimension (or several dimensions). Actors have preferences over the location of the policies on this dimension and they maximise their utility by voting for the alternative closest to their most preferred location on the dimension (their ideal point).

A one dimensional version of this scenario is illustrated in Figure 1. Legislators *l*, *c* and *r* have ideal-points *l*, *c* and *r*, respectively. They consider how to vote on proposal *f*, *g* and *h*. Let $\beta(f)$, $\beta(g)$ and $\beta(h)$ denote the cutpoints (or mid-points) between the status quo policy and proposals *f*, *g* and *h*, respectively. For example, $\beta(f)$ separates those legislators for whom proposal *f* yields a higher utility than the status quo from those legislators for whom the status quo yields a higher utility than proposal *f*. We see that $\beta(f)$ is very close to the ideal point of legislator *c*. She is nearly indifferent between the status quo and the proposal.

Legislator *r* votes against legislator *l* on this proposal. Proposal *g* pits legislator *r* against *l* and *c*. All legislators vote the same way on proposal *h*. As it stands, the model is only identified up to scale. To fully identify the model it is necessary to specify the direction of the scale and the metric. This can be done by constraining the location of one more legislator or proposal than there are dimensions, or by normalizing the distribution to have a mean of zero and a standard deviation of one and fixing the directionality of the policy space.

[Figure 1 About Here]

Based on these basic ideas, the statistical estimation of the spatial model has developed substantively in recent years. For example, Poole and Rosenthal (1997) build on item response models from educational testing to develop a model of the location of the members of the US Congress. Starting from a model which was based on maximum classification without a stochastic error element, they developed a series of more sophisticated models which allow for both trend effects and comparison across institutions. Known as 'NOMINATE', this approach has become the industry standard for estimation of the ideal points in political science (Poole 2005).

The Bayesian approach to the statistical analysis of voting behaviour has recently emerged as an alternative approach (Clinton, Jackman and Rivers 2004). Rather than maximizing the marginal likelihood, this method simulates the posterior distribution of all the parameters in the model simultaneously (Jackman 2000). It is straightforward to calculate the position and precision of any quantity of interest using descriptive statistics of the posterior distribution. The Bayesian approach also has the advantage of providing reliable estimates in smaller samples, as asymptotic properties are not required to hold with regard to sample size, only the number of iterations (in other words, the length of the Monte Carlo Markov Chain).

NOMINATE would be problematic in our case as the results are not necessarily stable in small legislatures (Poole 2005). In contrast, small legislatures are not a problem with the Bayesian technique (Martin and Quinn 2002).

Applications of these spatial techniques to voting in central banks are few and far between. Meade and Sheets (2005) use voting records from the US Federal Reserve to demonstrate significant regional influences on the voting behaviour of the members of Federal Open Market Committee (FOMC), but do not develop a spatial model of the preferences of the FOMC members. Chang (2005) and Chappell et al. (2005) both estimate similar probit models of voting in the FOMC, which they use to investigate political influences on monetary policy via the appointment of the FOMC members. So far, though, we know of no published research which looks at voting in central banks other than the US Federal Reserve or which estimates the ideal points of central bankers using a Bayesian estimation technique.

The Bayesian estimation technique that we use here builds on a standard item response model which assumes that actors have preferences over the policy outcome, in our case the optimal interest rate level given the economic conditions. However, some members of the MPC, for example Buiter, often differed from the majority not over the direction of change in the interest rate, but also on the *size* of such a change. We hence followed the suggestion in Bafumi et al (2005) and estimated the error-rates δ from the data. We follow the parameterization of Martin and Quinn (2006:26). Let member i of the committee have an ideal point on the 'hawk-dove' dimension defined as θ_i, let the location of the proposed interest rate j be α_j and the 'discrimination parameter' be β_j. The probability π that member i supports the proposal j is then assumed to be:

$$\pi_{ij} = \delta_0 + (1 - \delta_0 - \delta_1) / (1 + \exp(\alpha_i - \beta_i\theta_i))$$

For the members' ideal points, we assume independent normal priors for most members, but draw on substantive prior information to restrict $\theta_{Wadhwani}$ to be negative and θ_{Besley}, $\theta_{Sentance}$ and θ_{Large} to be positive.[6] These restrictions help to identify the directionality of the model. Wadhwani has a track-record of consistently voting for lower interest rates than the majority of the committee. It is hence unproblematic to restrict his prior to be negative. Large is known as the most hawkish of the internal members so restricting his prior to be positive is likewise unproblematic. Besley and Sentance have, since joining the bank in the autumn of 2006, consistently favoured higher interest rates than most of the other members of the committee. As the model does not rely on pre-coding the directionality of the votes, fixing these two members to have a positive prior helps to identify the directionality of the votes where Besley and Sentance are in the minority. We do not force any of these members to be the most extreme at either end of the scale, nor do we force the latter three to have identical ideal points.

As unanimous voting decisions of the MPC do not provide any information about differences between the committee members, 42 of the 125 decisions are dropped. This means that the analysis is based upon individual voting decisions by 25 members in a total of 83 meetings where at least one member dissented from the adopted decision. The data are taken from the minutes of the meetings released by the Bank of England.[7] If a decision is split two ways, where some members dissent in favour of higher interest rates than the majority position while other members dissent in favour of lower interest rates than the majority, the decision is coded as two separate votes. One vote is then the majority proposal against the lower alternative and the other vote is the majority position against the higher alternative. We assume that somebody who supports lower interest rates than the majority in

[6] See Martin and Quinn (2006:26) for the finer details about the set-up of the model.
[7] http://www.bankofengland.co.uk/publications/minutes/mpc/index.htm.

the former vote opposes higher interest rates than the majority in the latter vote in the *same* meeting.

The sceptical reader may at this point think that we are stacking the deck by using informative priors. The reason for using these priors and the additional δ term is that 42 of the remaining 83 votes only have one member opposing the majority view. As the directionality of these votes are parameters to be jointly estimated with the location of the members and the discrimination parameter of each vote, the standard approach ends up placing Besley and Sentance next to Wadhwani and Julius. However, if the 42 votes with only one member in the minority are excluded, and no other constraints are put on any of the parameters, the results are very similar to the results we end up with using the outlier-resistant approach and all votes (the results of the estimates from these models are presented in Figure A1 in the appendix.). Thus the outlier-resistant approach strikes us as more sensible than throwing away half of all the data-points. This is a clear example of the outlier problems in ideal point estimation in small committees (see Bafumi et al. 2005) .

We let the sampler run for 2 million iterations. The first 1 million iterations were discarded and the chain was heavily thinned to prevent autocorrelation between the observations. The presented results are summaries from 1,000 samples from the posterior distribution. The model is estimated using the MCMCirtKdRob function in the MCMCpack library in R (Martin & Quinn 2006). The Geweke plots, traceplots and autocorrelation plots are included in the appendix (see Gelman et al. 2003 for a description of these diagnostic tools). The Geweke statistics indicates that the samples are drawn from a stationary distribution. The traceplots do not display any trend in the samples. There is virtually no autocorrelation.

3. Ideal Point Estimates of MPC Members

The ideal point estimates for each MPC member and the associated uncertainties around these points are presented in Figure 2. The point indicates the median estimate. The thick line contains the central tendency (or the 50 percent credibility interval) of the estimate, while the thin line provides the 95 percent credibility interval. The numerical estimates are presented in Table A1 in the appendix.

A visual examination of Figure 2 would suggest that it is reasonable to talk of three 'groups' of MPC members: the doves, centrists and hawks. Wadhwani, Julius and Allsopp are the clear 'doves', while Large, Besley and Sentance could be labelled 'hawks', and the remainder centrists. Although Blanchflower is ranked as the third-most dovish member to have sat on the committee, his 95 percent credibility interval covers that of the most hawkish members. Similarly, although Buiter is ranked as the second most hawkish member of the committee, the central tendency of his position covers the central tendency of all but the most dovish members. As observers of decision-making in the MPC already know, Buiter has on several occasions expressed preferences for bigger changes in the interest rates than most other members. This has been the case for both increases and decreases in the interest rate.

[Figure 2 About Here]

According to our estimates, although the exact location of each committee member's ideal point is associated with a substantive amount of uncertainty, the ranking of members' ideal points is relatively clear. For example, there are only four bankers with a probability greater than 0.1 of being the overall median. These are Bean (0.128), Barker (0.115), George (0.109) and Clementi (0.103). Similarly, Buiter (0.312), Large (0.291), Besley (0.138) and

Sentance (0.136) are the only four members with a higher probability than 0.10 of being the most hawkish member. Only Wadhwani (0.484) and Julius (0.433) have probabilities above 0.1 of being the most dovish member.

Furthermore, as one might expect, the internal members tend to be clustered in the centrist group. Interestingly, though, the externally appointed members are found in both the group of hawks, the doves and amongst the centrist group. As a result, it is not correct to assume that externally appointed members vote in a particular way. However, the results do suggest that externally appointed members are more likely to vote against the majority on the committee than internal members (cf. Spencer, 2007). This suggests that the Chancellor might be able to influence the balance on the committee by appointing external members with particular preferences relative to the centrist group. More on this later.

In the meantime, as a validity check, we compare our results with two alternative ways of measuring the preferences of the MPC members that a commonly used by the media and MPC watchers. The first is a simple 'batting average' score, where members are ranked according to the proportion of times they voted for an increase in interest rates. The second is a measure which is commonly used by *The Financial Times* and other publications (e.g. Edmunds 1999). This measure is calculated by assigning scores for each vote of each member, where a member scores 1 if he or she voted with the majority, 2 if he or she voted for a higher interest rate than the majority and 0 if he or she voted for a lower interest rate than the majority. An average of these scores is then calculated for each member across all of his or her votes.

The estimates from our Bayesian ideal point model compared to these 'batting average' and 'Financial Times' scores are illustrated in Figure 3. The first thing to note is the relatively high correlation between our estimates and both these types of measures – as shown

by the clustering of most of the MPC members along the two regression lines. In other words, our method clearly passes the face validity test.

The figures nevertheless highlight some important differences between our estimates and the two more commonly used methods. The main problem with the batting average method is that it does not take account of the behaviour of the other committee members at the time a decision is taken. This is most clearly illustrated by the case of Davies, who only participated in two meetings, yet voted to raise rates in both meetings and hence has a maximum value on the batting average scale. However, every other member of the committee voted exactly the same way as Davies in these two meetings. Hence, it is impossible to tell his preferences apart from any of the other members of the committee at that time – which is exactly why there are very large confidence intervals around our estimates of his position.

[Figure 3 About Here]

The FT method, in this regard, is an improvement on the batting average method, as it takes into account the behaviour of the majority in the committee at the time of a decision. Nevertheless, both the batting average measure and the FT measure tend to give extreme scores for members who participated in very few meetings. We see for example that Sentence and Besley, who have only participated in few meetings, are measured as the most hawkish members of the MPC by both these methods. We also place these members towards the hawkish end of the scale, but there simply is not enough information in their votes to warrant locating them at such an extreme position. This demonstrates that the two most common existing ways of locating MPC members may invite the observer to conclude that any two

individuals differ in their preferences when the difference between their estimated ideal points may in fact be well within the margin of error given the available data.

Another disadvantage with the batting average measure is that it fails to take account of the economic conditions at the time of each vote. If a member's time on the committee happens to coincide with a period when there is pressure on the Bank to raise interest rates, he or she will tend to be located towards the hawkish end of the scale – as is the case with Besley and Sentence. Conversely, if the majority of a member's time on the committee happens to coincide with a period when there is pressure on the Bank to cut interest rates, he or she will tend to be located towards the dovish end of the scale – as is the case with Allsopp, who we locate in a much less extreme (albeit still relatively dovish) position than does the batting average measure.

Again, the FT method improves on this because it measures whether each vote is part of the majority or the minority. To the extent that the majority view on the MPC tends to reflect economic conditions, it provides a crude control for economic conditions: that is, a dissent vote implies that an individual prefers lower or higher rates relative to the majority of members, given economic circumstances.

But our method improves on the FT measure in this regard also. For example, our method locates Allsopp in a less extreme position than the FT measure; which locates Allsopp as almost as dovish as Wadhwani. The close proximity of Wadhwani and Allsopp in the FT's scores is due to the fact that, over the course of their respective terms on the MPC, they had a similar proportion of dissenting votes in favour of lower rates (13 out of 37 for Wadhwani and 12 out of 37 for Allsopp), while neither dissented in favour of higher rates. However, these simple summaries, which drive the FT scores, do not reflect the fact that, during the period when Wadhwani and Allsopp were simultaneously on the committee (between June 2000 and May 2002), Allsopp voted for higher rates than Wadhwani on eight occasions while

Wadhwani never voted for lower rates than Allsopp. Because our method measures members' votes relative to those of each other individual member (rather than relative to the majority), it picks up these differences and hence estimates Allsopp as much more moderate than Wadhwani. In other words, our measure picks up the fact that, given the same economic circumstances in the same meetings, Allsopp voted for higher rates than Wadhwani eight times, whereas the FT measure does not.

4. Appointments as a Monetary Policy Tool

With these estimates of the relative location of the MPC members, we can investigate whether there is a pattern in the in the relative strength of dovish, centrist and hawkish groups on the committee over time.

There are several reasons why we might expect such a pattern to exist. First, a newly independent central bank may wish to establish a credible reputation for being a strongly inflation-averse institution (Drazen 2000). Internal members may hence wish to pursue a policy at the more conservative end of the growth-inflation spectrum, preferring to keep inflation low, even at the risk of hampering growth. The government may in turn wish to limit this tendency by appointing more liberal external members who do not share the long-term institutional interest of the bank.

Second, the logic of the classic political business cycle would predict that the Chancellor would have wanted to use his appointment powers to engineer favourable economic conditions prior to elections (Nordhaus 1975). Translating the logic of Nordhaus's theory into the context of central bank appointments, we might expect the Chancellor to attempt to bias the MPC in a dovish direction in the 18 months before a general election, so

that a comparatively easier monetary policy stimulates (or at least does not restrict) the economy prior to the election.

Monetary policy is, of course, not the only policy tool for managing the economy. The Chancellor also has direct control over fiscal policy. Thus, the political business cycle theory can be adapted to allow for an interaction between the Labour government's fiscal policy and the revealed position of the new members of the committee. To elaborate, in the 1997 election Labour pledged that during its first two years in office it would not increase public spending beyond the levels planned by the previous Conservative government. The purpose of this pledge was to demonstrate that Labour could be responsible with public finances. However, this pledge also committed the government to a relatively austere fiscal policy for at least two years. In fact, in the year 1999-2000 public expenditure as a percentage of GDP reached its lowest point since 1980 (HM Treasury, 2007). During the financial year 2000-2001 public expenditure began to rise, but only slowly. Because of these political restraints upon fiscal policy, there may have been a greater incentive for the Chancellor to use his appointment powers to create a dovish bias in the MPC prior to the June 2001 general election.

In contrast, from the fiscal year 2001-2002 until the present, government expenditure as a percentage of GDP has increased rapidly (HM Treasury, 2007). In addition, having gained a reasonable reputation for economic competence, Labour did not make similar restrictive fiscal policy pledges prior to the election in 2001, which they won comfortably. As government spending increased throughout Labour's second term and stimulated the economy, the Chancellor had less incentive to ensure a particularly loose monetary policy in the run-up to the 2005 general election. In fact, he may have had more incentive to shift from a dovish to a hawkish bias, thereby encouraging a tighter monetary policy that would

counterbalance an increasingly loose fiscal policy and prevent inflationary pressures building up.

It should be noted that the Chancellor could not possibly have perfect information about the likely behaviour of each member he appointed to the MPC. This may have limited his ability to appoint the 'types' of central banker he wanted given the political and economic circumstances. Nevertheless, it is reasonable to assume that the Chancellor had probabilistic beliefs regarding the preferences of potential appointees. These beliefs, based upon past academic work by the individual, their career background and also information gathered via mutual acquaintances, can be thought of as probability distributions along the dove-hawk scale for each appointee, some relatively wide (indicating high uncertainty regarding preferences), some narrower (indicating less uncertainty regarding preferences). In the case of an extreme lack of information regarding a candidate, one could think of a normal probability distribution with mean zero and large variance.

Even allowing for uncertainty regarding the preferences of new appointees, the Chancellor would have been able to observe the voting behaviour of existing MPC members and utilise this information when deciding whether to re-appoint someone. It may have been the case that, if an existing member had revealed themselves to be relatively hawkish, then a Chancellor seeking a dovish bias on the MPC may have had an incentive to 'gamble' on a new appointee about whom he had relatively little information.

We investigate to what extent there is evidence in the data to support these predictions. To do this, we calculate the probability that each new member of the committee behaves in a more hawkish manner than his or her predecessor. A probability of over 0.5 indicates that the new member is more hawkish. A probability of under 0.5 indicates that the new member behaves in a more dovish manner than his or her predecessor. These probabilities are presented in Table 2. The table does not include those individuals who were original

members of the MPC in June 1997 (George, King, Buiter, Goodhart, Plenderleith and Davies), or who were appointed in the months thereafter to fill hitherto empty positions on the committee (Julius, Budd and Vickers).

[Table 2 About Here]

The first general pattern observable from this table is that, as predicted by the political business cycle logic above, in the run-up to the June 2001 general election, new appointees tended to be more dovish than the members they replaced. This trend is particularly pronounced in the cases of Wadhwani's and Allsopp's appointments. Wadhwani replaced the relatively hawkish Budd, who had only served on the committee for a shortened two-year term, in June 1999, two years before the general election. According to our ideal point estimates the posterior probability that Wadhwani is more hawkish than Budd is lower than 0.1 percent. At the same, the Chancellor opted to re-appoint the executive director, Plenderleith, who appears to be relatively dovish compared to Budd.

Allsopp replaced Goodhart in June 2000, eleven months before the general election. Interestingly, Goodhart, relatively centrist on our dove-hawk scale, stated publicly at the time that he had expressed an interest in serving a second term (Beattie, 2000). Despite this, the Chancellor chose instead to replace him with Allsopp who, according to our ideal point estimates, has a posterior probability of less than 1 percent of being more hawkish than Goodhart. Furthermore, newspaper reports at the time of Allsopp's appointment suggested that he was expected to be a dove by analysts (Thornton, 2000). The Chancellor is unlikely to have been unaware of these expectations.

Furthermore, in addition to these stand-out cases, almost every replacement made by the Chancellor during Labour's first term involved the appointment of an individual who,

according to our estimates, was more likely than not to act in a more dovish manner than his or her predecessor. Indeed, excluding Clementi, who was appointed in the first few months of Labour's first term, every appointee during this period has at most a 15 percent chance of being more hawkish than his or her predecessor. The result of this appointment policy was that, from October 2000 until the general election in May 2001, the MPC contained the three individuals identified above as the clear doves out of all MPC members since 1997: Allsopp, Wadhwani and Julius.

The only exception is the replacement of Julius with Barker, which took effect on 1 June 2001, six days prior to the general election. Barker has a posterior probability greater than 99 percent of being more hawkish than Julius. But any influence that this replacement had upon monetary policy would not have translated through to the real economy until well after the 2001 elections.

Second, and again as predicted, the electoral pattern is not observed in the case of appointment policy in the run-up to the May 2005 election, when consistent and substantial rises in government spending were already working to stimulate the British economy. In fact, we observe that throughout Labour's second term newly appointed individuals had very high probabilities of being more hawkish than their predecessors. Between July 2002 and June 2003, the two remaining clear doves on the MPC were replaced by individuals who were more centrist according to our ideal point estimates. However, the overall trend in appointment policy is also less clear in this period. For example, although the posterior probability of Bell being more hawkish than her predecessor, Wadhwani, is greater than 99 percent, Bell is far from a hawk according to our ideal point estimates. Similarly, Lambert, appointed in June 2003, is significantly more hawkish than his predecessor Allsopp, but is still only a centrist according to Figure 2.

Interestingly, it appears that after 2001 the most hawkish appointments were internal appointments. For example, the posterior probability that Large is more hawkish than Clementi is greater than 97 percent. The same applies in the case of Tucker's replacement of Plenderleith. Overall, it appears that between 2001 and June 2003, in the early part of Labour's second term, most appointments involved the replacement of dovish MPC members with centrist individuals or the replacement of centrist MPC members with more hawkish individuals.

However, our results suggest that from June 2003 onwards appointments have made only a marginal difference to the overall balance between doves and hawks on the committee. For example, although Gieve appears to be more of a dove than his predecessor Large (the posterior probability that Gieve is more hawkish than Large is lower than 10 percent), Large was known to be the most hawkish of the internal members of the committee and Gieve is by no means a dove. In fact, Gieve is also placed in the centre-right region of the dove-hawk scale in Figure 2. More generally, George, Lambert and Walton, who are all estimated to have ideal points in the centre or centre-right right region of the dove-hawk scale, were replaced as MPC members by Lomax, Besley and Sentance, respectively, who are all also estimated to be at the centre-right of the scale. Similarly, Nickell and Bell, who are estimated to be at the centre-left of the spectrum, were replaced by Walton and Blanchflower respectively, who both also have ideal points in this region.

[Figure 4 About Here]

The effect of the replacements on the location of the median and mean voter inside the committee is illustrated in Figure 4. The figure clearly shows that the appointment policy led to significant variation over time in the location of the average member of the committee,

whether measured by the location of the mean or the median member. The difference is largest for the mean estimates, as this measure is most affected by outliers. Nevertheless, the trend for both estimators is the same: the Committee became more dovish during the first term of the new Labour government, and then became more hawkish after the re-election of the government in 2001.

Although the median voter theorem has dominated thinking about committee decision-making for decades (Black 1958, Downs 1957), recent research suggests the location of the mean voter may be better prediction of the outcome of decision-making in small committees. The mean voter theorem corresponds to the Nash bargaining solution and as such may provide a better approximation of bargaining in small committees (Achen 2006). To the extent that the mean voter theorem approximates decision-making in the MPC better than the median voter theorem, it is likely that the appointment policy had an influence on the level of interest rate set by the Bank of England both before and after the 2001 elections.

This then relates to the other function in Figure 4: the level of British public expenditure as a percentage of GDP. This captures the public spending plans of the Chancellor relative to the make-up of the MPC. We see that the level of expenditure is at its lowest when doves are appointed to the committee. As the public expenditure starts to increase, hawks start to replace doves in the committee. This pattern may simply be coincidence! However, this pattern is also consistent with the mixed macro-economic policy incentives of the Chancellor: to pursue a less constrained monetary policy during a period when public spending is constrained (during the first Labour term), and then to pursue a tighter monetary policy after the initial spending constraints are been lifted (after Labour's re-election in 2001).

5. Conclusion

In this paper we have empirically examined the making of monetary policy in the UK in the first ten years of the independence of the Bank of England. We first employed a Bayesian estimation technique to undertake a spatial analysis of voting on the Bank of England Monetary Policy Committee between June 1997 and June 2007. To our knowledge, this is the first time such a statistical estimation technique has been applied to voting in a central bank committee and is also the first spatial analysis of voting in the Bank of England MPC. Using these methods we have produced an original set of rigorous estimates of the ideal points of MPC members on a 'dove-hawk' scale representing relative preferences over interest rates given economic conditions.

Our estimates improve on popular classifications of MPC members along a dove-hawk scale in two ways. First, unlike the existing measures, our estimate of each individual member's ideal point utilises information about the voting behaviour of other members at each meeting in which the individual voted as well as the voting behaviour of all other members of the MPC in the full ten-year period. As a result, our estimates are more robust to changes in the underlying economic conditions than the more ad hoc scores often cited in the press. Second, our results contain estimates of the uncertainty surrounding ideal point estimates. This helps us avoid making spurious inferences regarding differences between individuals. For both these reasons, our ideal point estimates represent a unique and valuable contribution to research on monetary policy-making on the MPC.

These ideal point estimates were in turn used to evaluate Chancellor Gordon Brown's appointment policy between 1997 and 2007. Even allowing for the uncertainty surrounding our estimates, we found evidence to suggest that there may have been an electoral influence upon the role taken up by new members of the committee. Specifically, it appears that when

public spending was restrained in the run-up to elections, new MPC appointees promoted a more stimulative monetary policy (ensuring a more favourable economic climate) than the centrist majority of the MPC. In contrast, when public spending was increasing rapidly in the run-up to elections, appointments were largely neutral in terms of their effect upon the mean or median ideal points on the committee.

This finding has implications for research on independent central banks more generally, in that it suggests that politicians may still attempt to influence the monetary policy of a formally independent central bank via appointments. Some may argue that a degree of democratic control upon such a major macroeconomic policy tool is desirable, while others may argue the opposite. Either way, our results would appear to highlight the possible importance of appointments as a channel for political influence, suggesting that future research could usefully examine how political factors and institutional design permit or constrain influence via this channel.

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Figure 1

1-dimensional Item-Response Model

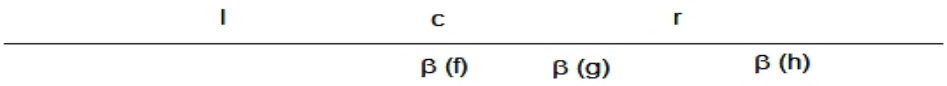


Table 1

MPC Members, June 1997-June 2007

Name	First Meeting	Last Meeting	Status	Background prior to appointment
Howard Davies	June 1997	July 1997	Internal	Bank of England
Willem Buiter	June 1997	May 2000	External	Academia
Charles Goodhart	June 1997	May 2000	External	Academia
Ian Plenderleith	June 1997	May 2002	Internal	Bank of England
Sir Edward George	June 1997	June 2003	Internal	Bank of England
Mervyn King	June 1997	--	Internal	Bank of England/Academia
DeAnne Julius	September 1997	May 2001	External	Industry
David Clementi	September 1997	August 2002	Internal	Finance
Sir Alan Budd	December 1997	May 1999	External	Government
John Vickers	June 1998	September 2000	Internal	Academia
Sushil Wadhwani	June 1999	May 2002	External	Finance
Christopher Allsopp	June 2000	May 2003	External	Academia
Stephen Nickell	June 2000	May 2006	External	Academia
Charles Bean	October 2000	--	Internal	Academia
Kate Barker	June 2001	--	External	Industry
Paul Tucker	June 2002	--	Internal	Bank of England
Marian Bell	July 2002	June 2005	External	Finance/Government
Sir Andrew Large	October 2002	January 2006	Internal	Finance
Richard Lambert	June 2003	March 2006	External	Financial journalist
Rachel Lomax	July 2003	--	Internal	Government
David Walton	July 2005	June 2006	External	Finance
Sir John Gieve	February 2006	--	Internal	Government
David Blanchflower	June 2006	--	External	Academia
Tim Besley	September 2006	--	External	Academia
Andrew Sentance	October 2006	--	External	Industry

Figure 2

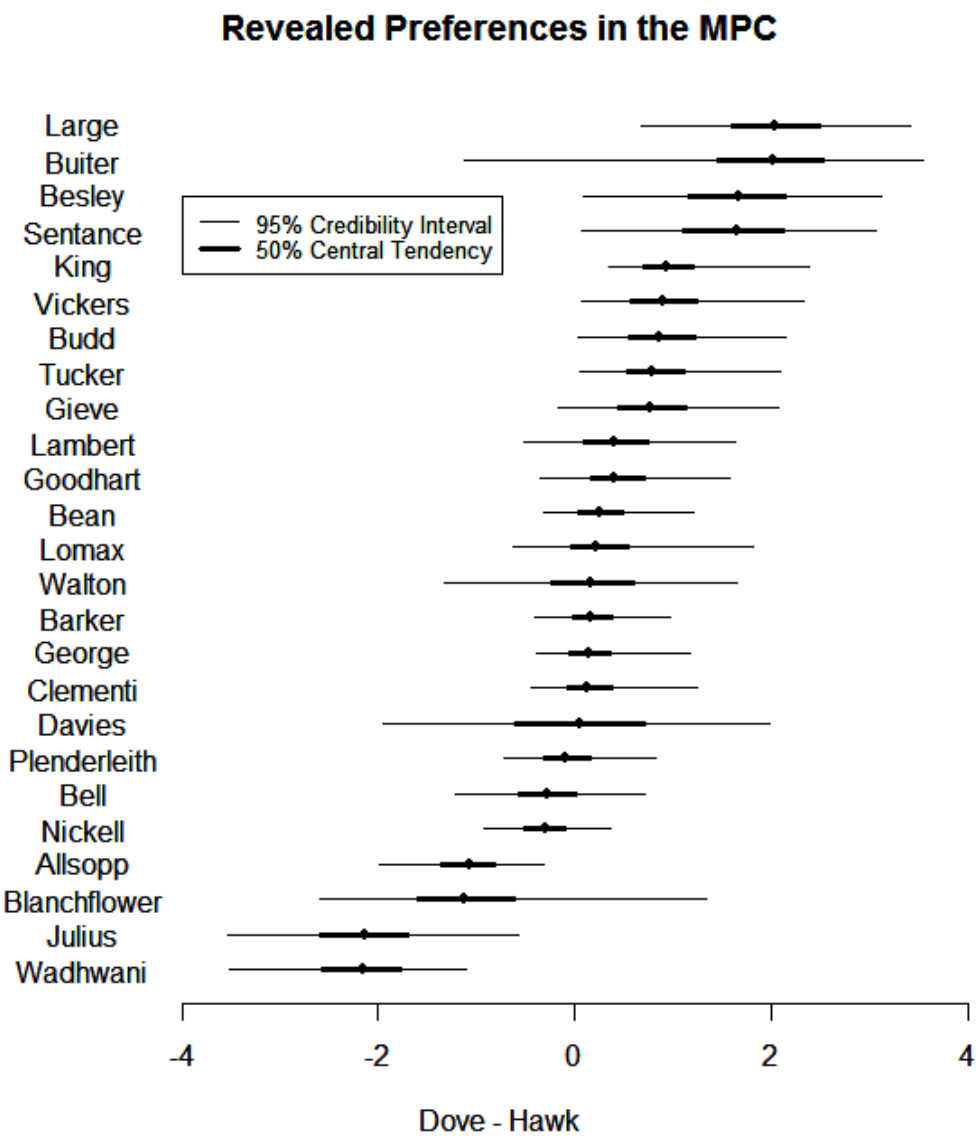
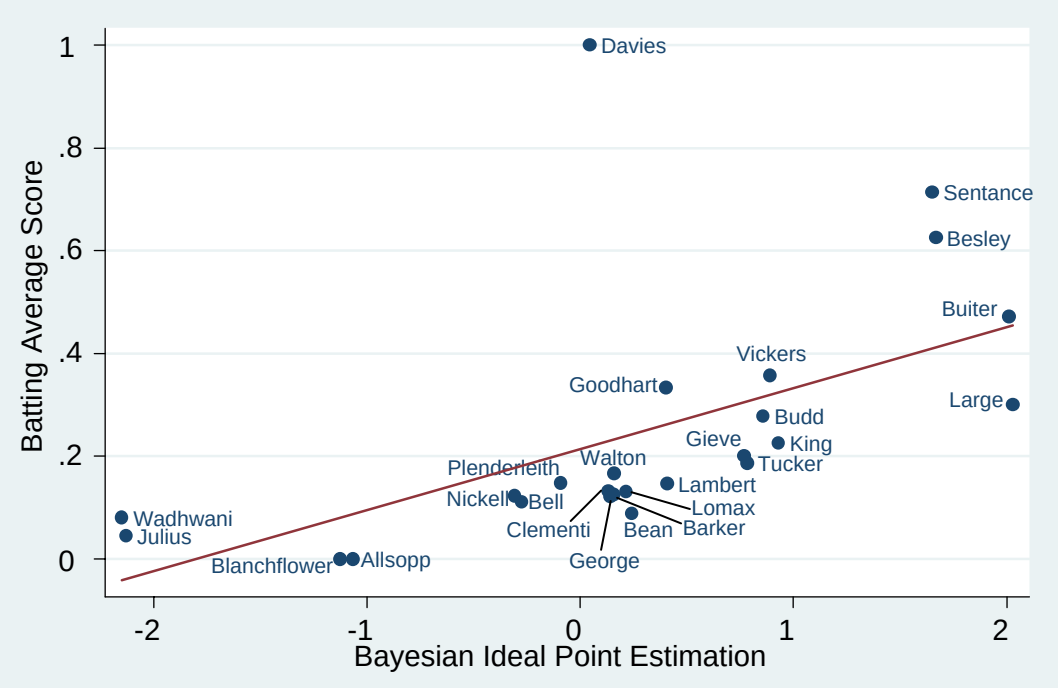
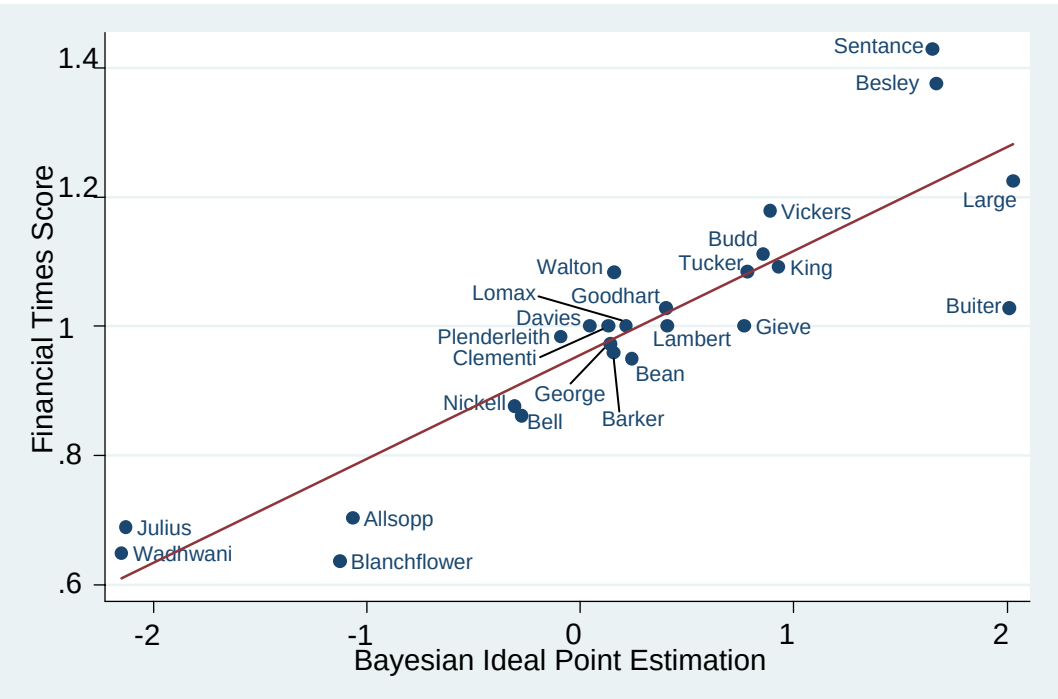

Revealed Preferences in the MPC
95% Credibility Interval
50% Central Tendency
Large
Buiter
Besley
Sentance
King
Vickers
Budd
Tucker
Gieve
Lambert
Goodhart
Bean
Lomax
Walton
Barker
George
Clementi
Davies
Plenderleith
Bell
Nickell
Allsopp
Blanchflower
Julius
Wadhwani
-4
-2
0
2
4
Dove - Hawk

Figure 3

Comparison of Bayesian Estimation with Two Alternative Measures





Note: The functions in the figures are bivariate regressions of our Bayesian ideal point estimates on the FT score/batting average score for each member.

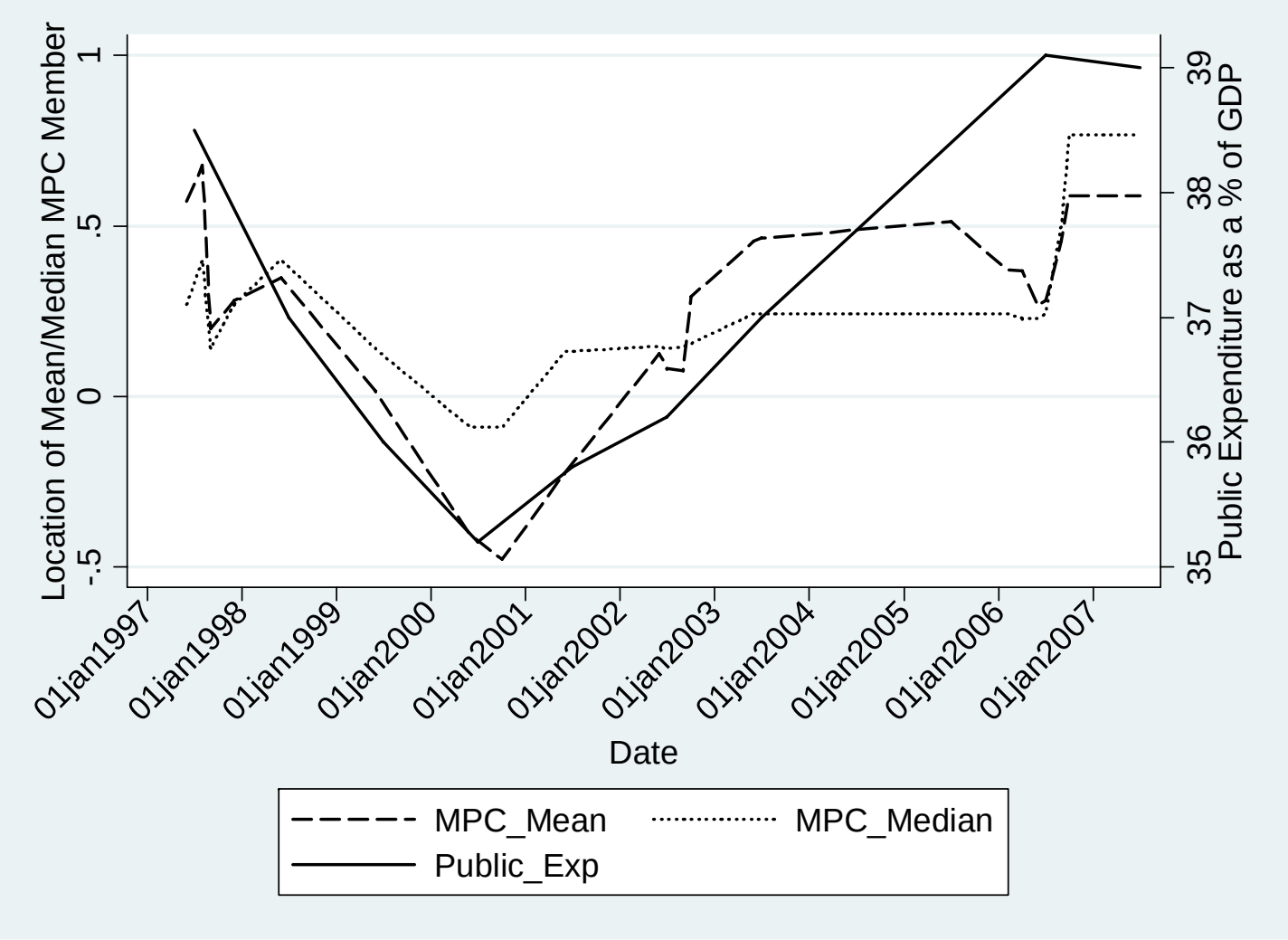
Table 2

MPC Replacements

New appointee	Predecessor	Date of replacement	Appointment type	Probability that new appointee is more hawkish than his or her predecessor
Clementi	Davies	September 1997	Internal	0.455
Wadhwani	Budd	June 1999	External	0.000
Nickell	Buiter	June 2000	External	0.099
Allsopp	Goodhart	June 2000	External	0.015
Bean	Vickers	October 2000	Internal	0.098
Barker	Julius	May 2001	External	0.999
	---------- GENERAL ELECTION, May 2001 ----------			
Bell	Wadhwani	July 2002	External	0.996
Tucker	Plenderlieth	June 2002	Internal	0.970
Large	Clementi	October 2002	Internal	0.971
Lambert	Allsopp	June 2003	External	0.995
Lomax	George	July 2003	Internal	0.577
	---------- GENERAL ELECTION, May 2005 ----------			
Walton	Bell	July 2005	External	0.718
Gieve	Large	February 2006	Internal	0.087
Blanchflower	Nickell	June 2006	External	0.157
Besley	Lambert	September 2006	External	0.871
Sentance	Walton	October 2006	External	0.896

Figure 4

Average Member of the MPC and Public Expenditure

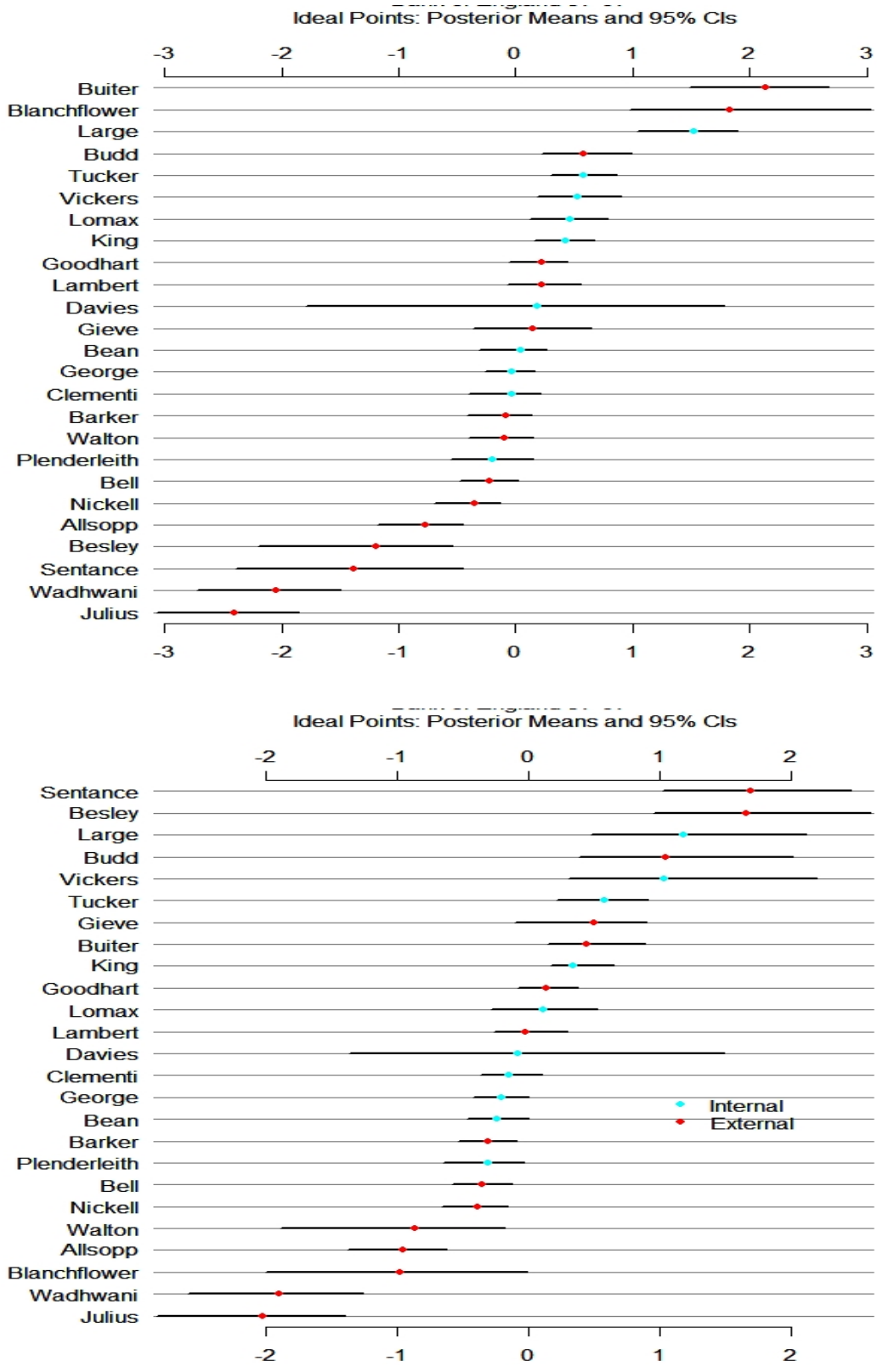


Appendix

Table A1. MPC Members' Ideal Point Estimates

	Credibility Interval				
	2.5 %	25 %	50 %	75 %	97.5 %
δ0	0.001	0.011	0.025	0.047	0.090
δ1	0.001	0.006	0.012	0.021	0.044
Large	0.681	1.592	2.027	2.490	3.417
Buiter	-1.125	1.446	2.010	2.525	3.534
Besley	0.092	1.155	1.667	2.136	3.122
Sentance	0.072	1.090	1.651	2.129	3.063
King	0.349	0.691	0.930	1.205	2.380
Vickers	0.060	0.564	0.890	1.252	2.323
Budd	0.031	0.552	0.858	1.218	2.152
Tucker	0.048	0.520	0.782	1.107	2.092
Gieve	-0.164	0.443	0.768	1.135	2.075
Lambert	-0.526	0.088	0.407	0.738	1.638
Goodhart	-0.350	0.158	0.401	0.716	1.574
Bean	-0.327	0.035	0.243	0.481	1.210
Lomax	-0.636	-0.040	0.216	0.539	1.814
Walton	-1.334	-0.253	0.159	0.604	1.648
Barker	-0.403	-0.033	0.155	0.387	0.976
George	-0.387	-0.067	0.139	0.370	1.168
Clementi	-0.450	-0.074	0.131	0.388	1.236
Davies	-1.950	-0.619	0.045	0.715	1.969
Plenderleith	-0.715	-0.315	-0.091	0.156	0.816
Bell	-1.223	-0.577	-0.275	0.007	0.704
Nickell	-0.921	-0.524	-0.308	-0.101	0.354
Allsopp	-1.986	-1.368	-1.068	-0.810	-0.318
Blanchflower	-2.603	-1.602	-1.127	-0.617	1.329
Julius	-3.539	-2.593	-2.130	-1.687	-0.567
Wadhwani	-3.518	-2.587	-2.150	-1.762	-1.103

Figure A1



Note: The top part of the figure shows the estimates from all votes. In the lower part, decisions with only 1 opposing member are taken out.

Figure A2. Traceplots of the Gibb Sampler for the Item Response Model

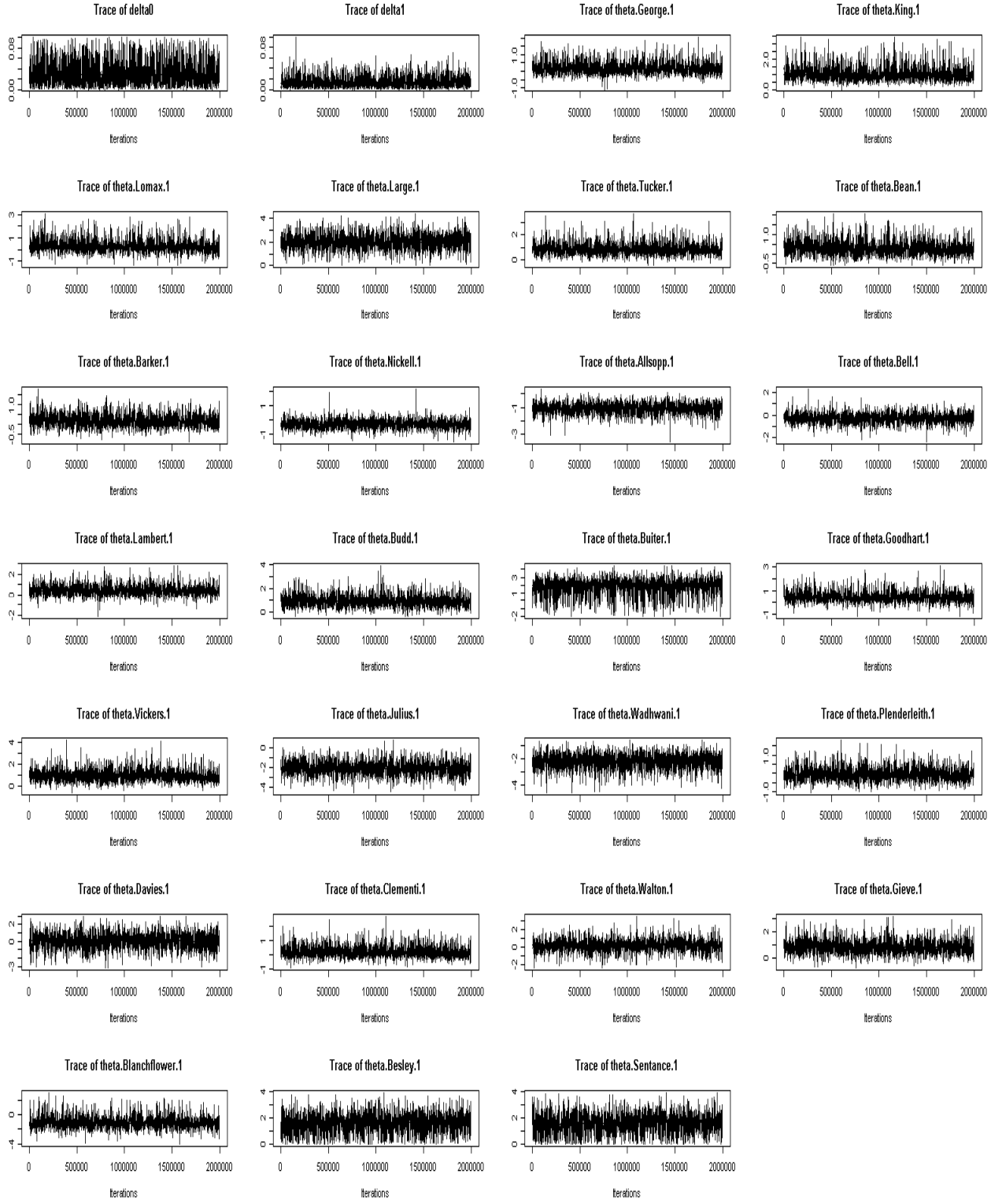


Figure A3. Geweke Plots of Stationarity of the Item Response Model

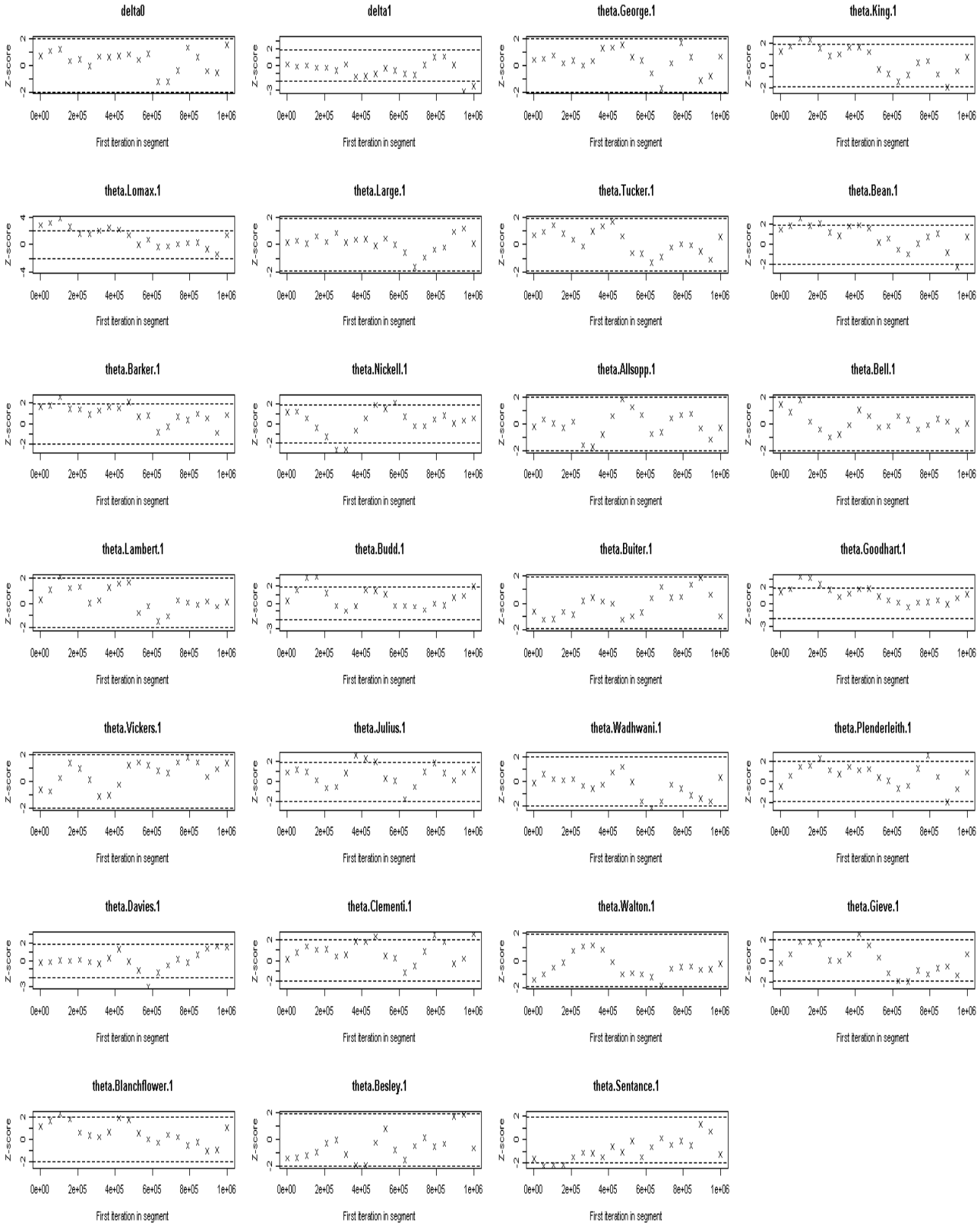


Figure A4. Autocorrelation Plots for the Item Response Model