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Preference Heterogeneity in Monetary Policy Committees

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Abstract

This short paper employs individual voting records of the Monetary Policy Committee (MPC) of the Bank of England to study heterogeneity in policy preferences among committee members. The analysis is carried out using a simple generalization of the standard Neo Keynesian framework that allows members to differ in the weight they give to output compared with inflation stabilization and in their views regarding optimal inflation and natural output. Results indicate that, qualitatively, MPC members are fairly homogeneous in their policy preferences, but that there are systematic quantitative differences in their policy reaction functions that are related to the nature of their membership and career background.

JEL Classification: E4, E5, D7
Key Words: Committees, reaction functions, Bank of England.

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1 Introduction

This short paper uses the individual voting records of the Monetary Policy Committee (MPC) of the Bank of England to study the extent and nature of preference heterogeneity among committee members. Understanding committees is important because many central banks use a committee structure to formulate policy. This is the case, for example, in 79 out of the 88 central banks studied by Fry *et al.* (2000). At the theoretical level, we use a simple generalization of the standard Neo Keynesian framework that allows members to differ in the relative weight they attach to output *versus* inflation stabilization and in their views regarding optimal inflation and natural output. Under the assumption of sincere voting, the individual reaction functions are derived and estimated for each member and for the committee as a whole. The model implies that, given the economy parameters and private-sector expectations, committee members agree on their reaction to the expected output gap and demand shocks and disagree on their reaction to expected inflation and supply shocks. In addition, members will differ systematically in their preferred interest rate even if they share the same inflation target and estimate of the natural output rate.

A first snapshot of the MPC voting records reveals that disagreement is frequent at the policy meetings of the Bank of England. In about two thirds of meetings between June 1996 and June 2006 decisions were not unanimous. Summary statistics like those computed, for example, by Gerlach-Kristen (2003) and Spencer (2006) are suggestive of heterogeneous preferences over policy. Both studies conclude that external members appear to have different voting patterns than internal ones, tend to dissent more frequently and, when they dissent, are more likely to vote for a lower interest rate. These results mirror the ones obtained by the literature on the Federal Open Market Committee (FOMC), which usually finds that Board members appear to prefer more expansionary policy than the Reserve Bank presidents (see Belden, 1989, Gildea 1990, Havrilesky and Schweitzer, 1990, and Havrilesky and Gildea, 1991). The aforementioned literature uses dissenting votes only and analyses differences in the voting behavior of the two groups by comparing dissenting frequencies. Tootell (1991, 1999), whose approach is followed here, uses instead all votes and investigates heterogeneity within the FOMC by comparing coefficients of individual policy reaction functions. Contrary to the previous literature, he finds no evidence of a systematic difference of voting patters between Board members and Bank presidents. Individual reaction functions are also estimated by Chappell *et al.* (2005). The literature has also considered other factors that may have an effect on FOMC voting behavior, such as career backgrounds (see, Havrilesky and Schweitzer, 1990, and Gildea, 1990) and regional affiliations. For example, Meade and Sheets (2005) find that regional unemployment rates have a statistically significant effect on

the voting patterns of Bank presidents and Board members alike.

The main empirical results are the following. First, committee members behave in agreement with economic theory in the sense that *i)* they generally favor higher (lower) interest rates when inflation (unemployment) is expected to increase and *ii)* the overidentification restrictions of the model are not rejected by the data. Thus, in qualitative terms, MPC members are fairly homogeneous in their policy preferences. Second, the joint hypothesis that individual reaction function coefficients are to equal those of the committee is rejected by the data. Hence, in quantitative terms, there is some heterogeneity in the policy reaction functions. Third, this heterogeneity appears to be systematic in that individuals who favor a strong response to expected inflation or unemployment do so regardless of the forecasts horizon. Fourth, systematic heterogeneity appears to be related with the nature of the membership (whether external or internal) and individual background (whether academia, private sector or Bank of England). In particular, the median external member tends to react more strongly to expected unemployment than the median internal member, but as strongly to expected inflation.

The paper is organized as follows: Section 2 describes the model that motivates the empirical specification, Section 3 reports empirical results, and Section 4 concludes.

2 The Model

Consider a monetary policy committee composed of N members. Assume that members have heterogeneous policy preferences in the sense that they may attach different relative weights to output *versus* inflation stabilization and may have different views regarding the optimal inflation rate and the true natural output level. The payoff of member $n \in \{1, 2, \ldots, N\}$ in each period is

$$U_n(\pi_t, x_t) = -(1/2)((\pi_t - \pi^*_{n,t})^2 + \alpha_n(x_t - x^*_{n,t})^2), \tag{1}$$

where π_t is the inflation rate, x_t is an output measure, $\pi^*_{n,t}$ and $x^*_{n,t}$ are, respectively, the optimal inflation rate and the natural level of x_t according to member n, and $\alpha_n > 0$ is the relative weight that member n attaches to output stabilization. Normalizing the inflation weight to one entails no loss of generality. The special case where members agree on a (possibly time-varying) inflation target corresponds to $\pi^*_{n,t} = \pi^*_t$ for all n. The difference between member n's estimate of the natural rate and its true value is assumed to be well approximated by

$$x^*_t - x^*_{n,t} = \nu_{n,t}, \tag{2}$$

where $\nu_{n,t}$ is an autocorrelated disturbance with zero mean and constant conditional variance.

This formulation allows the special cases where all members share the same estimate of the natural rate when $\nu_{n,t} = \nu_t$ for all n.[1]

The behavior of the private sector is summarized by

$$x_t = x_t^* - \phi(i_t - E_t\pi_{t+h}) + E_t(x_{t+k} - x_{t+k}^*) + \varepsilon_t, \tag{3}$$

$$\pi_t = \lambda(x_t - x_t^*) + \beta E_t\pi_{t+h} + \eta_t, \tag{4}$$

where i_t is the nominal interest rate, $\phi, \lambda, \beta > 0$ are constant parameters, $h, k \geq 1$ are integer numbers, E_t denotes the public's expectations conditional on information available at time t, and ε_t and η_t are exogenous autocorrelated disturbances with zero mean and constant conditional variance. Equation (3) is an IS curve and equation (4) is the Neo Keynesian Phillips curve. The IS curve may be derived from a linearized Euler equation for consumption and the resource constraint (see, McCallum and Nelson, 1999). The Neo Keynesian Phillips curve may be derived from the linearized pricing decision of a profit-maximizing monopolistic competitor in a sticky-price environment.

Committee members are assumed to sincerely cast their vote for the interest rate that maximizes their payoff in the current period subject to (3) and (4). Under discretion, the optimal interest rate must satisfy the first-order condition

$$\lambda(\pi_t - \pi_{n,t}^*) + \alpha_n(x_t - x_{n,t}^*) = 0. \tag{5}$$

Using (5) and the aggregate relations (3) and (4), one can write

$$\begin{aligned} i_{n,t}^* = & -\left(\frac{\lambda}{\phi(\alpha_n + \lambda^2)}\right)\pi_{n,t}^* + \left(1 + \frac{\lambda\beta}{\phi(\alpha_n + \lambda^2)}\right)E_t\pi_{t+h} + \left(\frac{1}{\phi}\right)E_t(x_{t+k} - x_{t+k}^*) \\ & + \left(\frac{\lambda}{\phi(\alpha_n + \lambda^2)}\right)(\eta_t + \nu_{n,t}) + \left(\frac{1}{\phi}\right)\varepsilon_t, \end{aligned} \tag{6}$$

where $i_{n,t}^*$ is member n's preferred interest rate.

Given the economy parameters and private-sector expectations, three empirical implications follow from Equation (6). First, committee members agree on their policy reaction to the expected output gap and demand shocks. To see this, note that the coefficients of $E_t(x_{t+k} - x_{t+k}^*)$ and ε_t are both equal to $1/\phi$, which is the inverse of the slope of the IS curve. Second, committee members disagree in their reaction to expected inflation and supply shocks. This follows from the observation that the coefficients of $E_t\pi_{t+h}$ and η_t

[1] It is easy to generalize the model to the case where member n's estimate of the natural rate differs systematically from its true value by introducing a non-zero, member-specific intercept in Equation (2). This generalization does not change the reduced-form of the reaction function estimated below but it changes the structural interpretation of its intercept.

depend on the idiosyncratic preference parameter α_n. Finally, even if members share the same inflation target and estimate of the natural rate (meaning that $\pi^*_{n,t} = \pi^*_t$ and $\nu_{n,t} = \nu_t$ for all n), they would disagree in their preferred interest rate because the coefficients of $\pi^*_{n,t}$ and $\nu_{n,t}$ also depend on α_n.

The reason why members agree in their response to demand shocks but disagree in their response to supply shocks is the following. In the Neo Keynesian model, the effect of demand shocks on the output gap may be offset directly by changes in the nominal interest rate (see Eq. (3)). However, offsetting the effect of supply shocks on inflation requires a monetary-policy-induced change in the output gap and, consequently, committee members face a trade-off between inflation and output stabilization.

3 Empirical Analysis

3.1 Data

The voting data consists of the preferred interest rates stated by each member of the Monetary Policy Committee (MPC) of the Bank of England in all the meetings held between June 1996 and June 2006. The sample starts with the first meeting of the MPC and ends at the time the data was collected. Under the assumption that members vote sincerely, we are able to assign to each member his/her preferred policy in each meeting. This is possible because the Minutes record the names of members in favor of the Governor's proposal and the names and preferred policy options of dissenting members.[2] The MPC consists of nine members of which five are internal, that is, chosen from within the ranks of bank staff, and four are external appointees. Internal members are nominated by the Governor, while external members are appointed by the Chancellor. Meetings are chaired by the Governor of the Bank of England and take place monthly, usually on the Wednesday and Thursday after the first Monday of each month. Decisions are made by simple majority and votes are on a one-person, one-vote basis. As of June 2006, twenty-four individuals have been members of the MPC but six of them have voting records that are too short to allow meaningful empir-

[2]Like Tootell (1999), we use all votes. Belden (1989) and Havrilesky and Schweitzer (1990) use only dissenting votes. Chappell *et al.* (2005, p. 26) argue that a dissent favoring a move to, say, tighten is "behaviorally different from an assent that concurs with a committee move to tighten." Since in their view dissenting involves a fixed cost in utility terms, members dissent only when the preferred interest rate is sufficiently different from the one adopted by the committee. It follows that only dissenters reveal their true preferred interest rate. Alternative game-theoretical models of dissent (see, Seidmann, 2006, and Groseclose and Milyo, 2006), argue that one cannot infer the true preferences from dissents. In this paper, the assumption of sincere voting simplifies the analysis and justifies the use of assenting and dissenting votes alike.

ical analysis.[3] After excluding these individuals, the sample reduces to 901 votes stated by eighteen MPC members during 109 meetings.[4]

For the estimation of reaction functions, we also use of the time series of inflation, unemployment, and money growth. Monthly observations of the Retail Price Index (RPI), Consumer Price Index (CPI) and unemployment rate were taken from the Web site of the U.K. National Statistics (*www.statistics.gov.uk*). The stock of money is measured by the end-of-month value of outstanding M4 and was taken from the Web site of the Bank of England (*www.bankofengland.co.uk*).

3.2 Econometric Strategy

The reaction function of member n may be written in reduced-form as

$$i_{n,t} = a_n + b_n E_t \pi_{t+h} + c_n E_t(x_{t+k} - x^*_{t+k}) + u_{n,t}, \tag{7}$$

where

$$\begin{aligned} a_n &= -\left(\frac{\lambda}{\phi(\alpha_n + \lambda^2)}\right)\pi^*_t, \\ b_n &= 1 + \frac{\lambda\beta}{\phi(\alpha_n + \lambda^2)}, \\ c_n &= \frac{1}{\phi}, \\ u_{n,t} &= \left(\frac{\lambda}{\phi(\alpha_n + \lambda^2)}\right)(\eta_t + \nu_{n,t}) + \left(\frac{1}{\phi}\right)\varepsilon_t. \end{aligned}$$

Since the Bank of England follows an inflation targeting policy, the definition of the intercept, a, explicitly assumes that committee members share the same inflation target. However, notice that because a also depends on the preference parameter, α_n, the intercept in the reaction function is member specific. For the same reason, the inflation coefficient, b, and the variance of the disturbance term are member specific as well. In principle, the output

[3] Of these six, four are very recent members of the MPC and, as of June 2006, they had participated in only twelve (D. Walton), eight (J. Gieve), four (D. Blanchflower), and one (T. Besley) meetings. H. Davies was a member in the original MPC committee but participated only in two meetings on 6 June and 10 July 1997. A. Budd was member from December 1997 to May 1999 but his voting record consists of only 14 observations.

[4] Prior to November 1998, minutes reported whether dissenting members favored tighter or looser policy, but not the interest rates they voted for. This means that a total of 23 dissenting votes from the period June 1997 to October 1998 could not be used for the estimation of the individual reaction functions of five members. They are M. King (3 votes), A. Budd (4 votes), W. Buiter (8 votes), C. Goodhart (3 votes), and D. Julius (5 votes). Except for W. Buiter, the number of missing observations is relatively small compared with the total number of individual observations.

coefficient, c, should be the same for all members, but the approach that we will follow here is to estimate an unrestricted version of the reaction function that allows c to vary across members and then statistically test whether c is constant or not. Following the literature (for example, Clarida *et al.,* 2000), lagged realizations of the interest rate are added to the right-hand side of (7) in order to capture interest-rate smoothing and the serial correlation of the error term.

The reaction function is estimated for each member and for the committee as a whole using efficient Generalized Method of Moments (GMM). The weighting matrix is computed using the Newey-West estimator with a Barlett kernel. Inflation is measured by the annual percentage change in the Retail Price Index (RPI).[5] Output is measured by the deviation of the unemployment rate from a Hodrick-Prescott trend computed recursively using a window of 120 observations.[6] Although the model does not specify a forecast horizon (that is, a value for h and k), the empirical observation that monetary policy affects output and inflation with a long lag motivates our use of $h = k = 12$ months for the benchmark results. However, as we will see below, results using other horizons are qualitatively similar. Instruments are a time trend, the inflation target, and one lag of the interest rate, RPI inflation, CPI inflation, the unemployment rate, and the rate of money growth.

3.3 Results

Table 1 reports benchmark results based on a forecast horizon of twelve months. Tables 2 through 4 report results using other forecast horizons, namely $h = k = 9$ (Table 2), $h = 12$ and $k = 9$ (Table 3), and $h = 12$ and $k = 6$ (Table 4). These Tables serve to assess the robustness of the results to different values of h and k.

Panel A in Table 1 reports estimates of individual and committee reaction functions. These results indicate that the voting behavior of individual MPC members is generally consistent with the theory. First, point estimates of the inflation (unemployment) coefficients are usually positive (negative) and statistically significant meaning that members tend to vote to raise (lower) the Repo rate when inflation (unemployment) twelve-months ahead is expected to increase. In this and other Tables, there are occasional exceptions to this general

[5]Prior to 10 December 2003, the inflation target applied to the twelve-month change in the RPIX index (that is, the RPI excluding mortgage interest payments). Thereafter, it applies to the change in the CPI. Results using the RPIX for the sample until December 2003 and the CPI after that are similar to the ones reported below and support the same conclusions. These results are not reported to save space but are available from the corresponding author upon request.

[6]We also considered using other output measures but few are available at the monthly frequency. The National Institute for Economic and Social Research produces a monthly GDP index dating back to April 1984 but the series pre- and post- April 1995 are not comparable. The Bank of England compiles an index of capacity utilization based on survey data, but it is not available for the complete sample.

observation but exceptions are usually characterized by numerically small and statistically insignificant coefficients. Second, the overidentifying restrictions of the model cannot be rejected for any committee member nor for the committee as a whole. To see this, note that the p-values of J tests reported in the last column of Panel A in Table 1 are all above standard significance levels. Comparing these results with those in Panel A in Tables 2 through 4 indicates that these conclusions are robust to the forecast horizon. The reaction function coefficients are also graphically reported in Figure 1 where "pluses" are coefficients of internal members, "crosses" are coefficients of the external members, and vertical lines are the coefficients of the committee as a whole. Overall, results in Panel A and Figure 1 suggest that, in qualitative terms, MPC members have fairly homogeneous preferences over policy.

However, these results also show that the magnitudes of reaction coefficients vary greatly across committee members. In order to examine whether this heterogeneity is statistically significant, we perform Wald tests of the joint null hypothesis that the individual coefficients are equal to those of the committee and report results in Panel B of Table 1. For the complete sample, the hypothesis can be rejected at the 5 per cent significance level for the intercept and inflation coefficient but not for the unemployment coefficients. This result is in line with the implication of the model that members are more likely to disagree on their policy reaction to expected inflation than on their reaction to the expected output gap. Recall that in the model this was due to the fact that changes in expected inflation require a monetary-policy induced change in the output gap which leads to a trade-off between inflation and output stabilization, while changes in the expected output gap may be offset directly by adjusting the nominal interest rate. From Panel B in Tables 2 through 4, it is clear that the rejection of the null hypothesis for the inflation coefficients is robust to the forecast horizon, but results concerning the unemployment coefficient are mixed. Overall, these statistical results suggest that individual policy responses within the MPC are heterogeneous.

Figure 2 that plots the relation between the reaction function coefficients in the benchmark results (vertical axis) and those obtained using other forecast horizons (horizontal axis). In all cases there is a positive relation across forecast horizons and, with only one exception, it is statistically significant different from zero. This means that, in general, individuals who favor a strong response to expected inflation or unemployment do so regardless of the forecasts horizon. Thus, the heterogeneity in individual policy responses within the MPC appears to be systematic.

There are at least two dimension along which MPC members systematically differ. First, the nature of their appointment (whether internal or external to the Bank of England) and

second, their career background (whether academic, private sector or Bank of England).[7] Thus, we also perform the Wald test described above for subsamples of committee members. These results are reported in Panel B of Table 1 and show that the hypothesis that individual coefficients are equal to those of the committee can be rejected for external but not for internal members,[8] and for academic, but not for private sector or Bank members. Note that these results are not independent because most academic members in the MPC as also external appointees. This result is generally robust to the forecast horizon (see Panel B in Tables 2 through 4) but in the case of the unemployment coefficients results are sometimes marginal. Table 4 shows that for short horizons of the unemployment forecast (six months) the hypothesis is rejected for private sector members, but not for academics. Still, as a whole, these results statistically confirm the idea that one important source of heterogeneity within the MPC is the nature of the individual membership.[9].

Panel C in Table 1 reports the results of t tests that the committee reaction function coefficients are equal to the median of the individual coefficients. Since the p-values are above standard significance levels, the hypothesis cannot be rejected for the intercept, inflation, or unemployment. From Panel C in Tables 2 through 4, it appears that this result is robust to the forecast horizon, though in Table 4 the hypothesis would be rejected for the inflation coefficient at the 5 but not at the 10 per cent significance level. Since the committee and median coefficients are (statistically) the same but the coefficients of committee and external members are (statistically) different, it follows that the median voter in the MPC is likely be an internal member.

Panel D in Table 1 reports the median for all members and subsamples. These results indicate that the median external member reacts as strongly to inflation as the median internal member, but that he/she tends to react more strongly to unemployment specially at long forecast horizons. Results are similar for the subsamples of academics and private sector members compared with Bank members. As noted above, these results are interrelated because a substantial number of the former members are external appointees.

4 Conclusions

This paper exploits the voting records of the Monetary Policy Committee (MPC) of the Bank of England to study preference heterogeneity among committee members. The analysis is motivated by the empirical observations that disagreement is frequent within the MPC and

[7]For the classification of MPC members in terms of career background, we mostly rely on the information contained in Spencer (2006).

[8]This result is robust to excluding chairmen from the subsample.

[9]On this point, see also Gerlach-Kristen (2003) and Spencer (2006).

by summary statistics reported in earlier literature which suggest differences in voting patterns. This research shows that, in qualitative terms, MPC members are fairly homogeneous in their policy preferences. That is, individual members tend to vote for an interest rate raise (decrease) when inflation (unemployment) is expected to increase, as one would expect. However, there are systematic quantitative differences in their policy reaction functions that appear related to the nature of the membership and previous career background. These systematic differences may be important in the decision-making process of the MPC and affect the interest rate level selected by the committee.

Table 1. Benchmark Results

A. Reaction Function Coefficients

	Intercept		Inflation		Unemployment		
Member	Estimate	s.e.	Estimate	s.e.	Estimate	s.e.	J test
George	-0.223^{*}	0.094	0.079	0.057	$-0.513^{\dagger}$	0.268	0.301
King	$-0.175^{\dagger}$	0.106	0.052	0.047	-0.490^{*}	0.224	0.422
Lomax	-0.239^{*}	0.067	0.120^{*}	0.037	-0.358^{*}	0.183	0.448
Large	-0.246^{*}	0.092	0.200^{*}	0.043	-0.251	0.294	0.635
Tucker	-0.145	0.106	0.100^{*}	0.040	-0.028	0.414	0.318
Bean	-0.216	0.162	0.080^{*}	0.028	-0.370	0.531	0.396
Barker	-0.247^{*}	0.121	$0.071^{\dagger}$	0.043	-0.329	0.387	0.168
Nickell	-0.455^{*}	0.162	0.086^{*}	0.041	-0.920^{*}	0.467	0.606
Allsopp	-0.812^{*}	0.198	0.318^{*}	0.105	0.059	0.364	0.217
Bell	-0.437^{*}	0.147	0.085	0.059	$-1.063^{\dagger}$	0.556	0.668
Lambert	-0.329^{*}	0.071	0.150^{*}	0.052	-0.388^{*}	0.192	0.544
Buiter	-1.805^{*}	0.550	0.348^{*}	0.089	-4.279^{*}	1.393	0.270
Goodhart	-0.587	0.456	0.136	0.093	-1.298	1.100	0.277
Vickers	1.497^{*}	0.608	-0.629^{*}	0.239	-2.084^{*}	0.935	0.158
Julius	-0.426^{*}	0.138	0.036	0.057	-0.888^{*}	0.297	0.275
Wadhwani	-0.179	0.399	-0.004	0.203	-1.497	1.031	0.208
Plenderleith	-0.221^{*}	0.073	0.097^{*}	0.050	-0.357	0.282	0.139
Clementi	-0.230^{*}	0.114	0.101	0.075	-0.405	0.311	0.136
Committee	-0.241^{*}	0.080	0.102^{*}	0.035	-0.411^{*}	0.198	0.300

B. Individual and Committee Coefficients are Equal

	Intercept	Inflation	Unemployment
All members	0.020	0.001	0.386
External	0.055	0.006	0.096
Internal	0.452	0.521	0.959
Academic	< 0.001	< 0.001	0.090
Private	0.852	0.383	0.547
Bank	0.942	0.907	0.886

C. Committee Coefficients are Equal to the Median

Intercept	Inflation	Unemployment
0.989	0.757	0.853

D. Median Coefficients

	Intercept	Inflation	Unemployment
All members	-0.242	0.092	-0.447
External	-0.437	0.086	-0.920
Internal	-0.221	0.098	-0.370
Academic	-0.335	0.083	-0.705
Private	-0.247	0.085	-0.405
Bank	-0.223	0.100	-0.358

Table 2. Robustness (h = 9, k = 9)

A. Reaction Function Coefficients

	Intercept		Inflation		Unemployment		
Member	Estimate	s.e.	Estimate	s.e.	Estimate	s.e.	J test
George	-0.163^{*}	0.042	0.088^{*}	0.043	-0.342	0.321	0.384
King	-0.131^{*}	0.051	0.047	0.031	-0.463^{*}	0.167	0.648
Lomax	-0.067	0.045	0.093^{*}	0.031	-0.069	0.114	0.484
Large	-0.154^{*}	0.058	0.180^{*}	0.065	-0.085	0.259	0.761
Tucker	-0.112^{*}	0.057	0.040	0.056	-0.106	0.231	0.580
Bean	-0.118^{*}	0.049	0.057^{*}	0.023	$-0.392^{\dagger}$	0.207	0.641
Barker	-0.136^{*}	0.054	0.075	0.050	-0.286	0.274	0.256
Nickell	-0.233^{*}	0.060	0.059^{*}	0.025	-0.566^{*}	0.177	0.421
Allsopp	-0.621^{*}	0.098	0.297^{*}	0.051	-0.900^{*}	0.269	0.400
Bell	-0.219^{*}	0.077	0.183^{*}	0.054	0.013	0.458	0.277
Lambert	-0.132^{*}	0.059	0.089^{*}	0.041	-0.230	0.144	0.769
Buiter	-0.498^{*}	0.115	0.185^{*}	0.064	-1.386^{*}	0.567	0.221
Goodhart	$-0.194^{\dagger}$	0.108	0.127^{*}	0.046	-0.394	0.437	0.187
Vickers	-0.303	0.224	0.096	0.125	-1.075^{*}	0.543	0.238
Julius	-0.280^{*}	0.088	$0.083^{\dagger}$	0.046	-0.686^{*}	0.306	0.300
Wadhwani	-0.296^{*}	0.109	0.168^{*}	0.072	-0.436	0.433	0.418
Plenderleith	-0.096^{*}	0.035	0.102^{*}	0.035	-0.231	0.278	0.205
Clementi	-0.160^{*}	0.057	0.131^{*}	0.059	-0.192	0.419	0.268
Committee	-0.156^{*}	0.031	0.081^{*}	0.019	-0.393^{*}	0.141	0.566

B. Individual and Committee Coefficients are Equal

	Intercept	Inflation	Unemployment
All members	< 0.001	< 0.001	0.009
External	< 0.001	< 0.001	0.003
Internal	0.795	0.462	0.342
Academic	< 0.001	< 0.001	< 0.001
Private	0.735	0.424	0.771
Bank	0.811	0.259	0.519

C. Committee Coefficients are Equal to the Median

Intercept	Inflation	Unemployment
0.880	0.480	0.578

D. Median Coefficients

	Intercept	Inflation	Unemployment
All members	-0.161	0.095	-0.314
External	-0.233	0.127	-0.394
Internal	-0.131	0.093	-0.231
Academic	-0.268	0.078	-0.515
Private	-0.160	0.131	-0.230
Bank	-0.112	0.093	-0.231

Table 3. Robustness (h = 12, k = 9)

A. Reaction Function Coefficients

	Intercept		Inflation		Unemployment		
Member	Estimate	s.e.	Estimate	s.e.	Estimate	s.e.	J test
George	−0.171	0.062	0.054	0.046	−0.588†	0.307	0.479
King	−0.142	0.078	0.032	0.036	−0.622*	0.217	0.692
Lomax	−0.213	0.067	0.134*	0.041	−0.275†	0.151	0.727
Large	−0.178	0.063	0.209*	0.049	−0.006	0.445	0.516
Tucker	−0.109	0.070	0.137*	0.051	0.302	0.483	0.287
Bean	−0.161	0.057	0.065*	0.024	−0.435†	0.245	0.382
Barker	−0.161	0.066	0.058	0.040	−0.146	0.245	0.089
Nickell	−0.274	0.072	0.065*	0.028	−0.574*	0.223	0.312
Allsopp	−0.840	0.221	0.330*	0.112	0.089	0.213	0.245
Bell	−0.301	0.098	0.109*	0.053	−0.604	0.452	0.352
Lambert	−0.271	0.085	0.153*	0.054	−0.284†	0.165	0.585
Buiter	−0.593	0.195	0.077	0.083	−2.062*	0.691	0.389
Goodhart	−0.211	0.189	0.049	0.050	−0.819	0.642	0.324
Vickers	−0.302	0.495	−0.129	0.153	−1.056*	0.450	0.437
Julius	−0.395	0.188	0.072	0.061	−1.011*	0.459	0.555
Wadhwani	−0.290	0.243	0.097	0.096	−1.014*	0.430	0.326
Plenderleith	−0.155	0.053	0.073†	0.044	−0.483†	0.282	0.245
Clementi	−0.142	0.089	0.042	0.065	−0.620†	0.352	0.302
Committee	−0.205	0.046	0.083*	0.023	−0.490*	0.210	0.460

B. Individual and Committee Coefficients are Equal

	Intercept	Inflation	Unemployment
All members	0.232	0.002	0.211
External	0.119	0.004	0.062
Internal	0.964	0.736	0.709
Academic	0.018	< 0.001	0.118
Private	0.800	0.345	0.315
Bank	0.875	0.694	0.586

C. Committee Coefficients are Equal to the Median

Intercept	Inflation	Unemployment
0.821	0.626	0.664

D. Median Coefficients

	Intercept	Inflation	Unemployment
All members	−0.195	0.072	−0.581
External	−0.290	0.077	−0.604
Internal	−0.155	0.065	−0.483
Academic	−0.218	0.065	−0.598
Private	−0.271	0.097	−0.604
Bank	−0.171	0.073	−0.483

Table 4. Robustness (h = 12, k = 6)

A. Reaction Function Coefficients

	Intercept		Inflation		Unemployment		
Member	Estimate	s.e.	Estimate	s.e.	Estimate	s.e.	J test
George	−0.241	0.074	0.132*	0.042	−0.555†	0.309	0.413
King	−0.069	0.074	0.023	0.035	−0.477†	0.247	0.125
Lomax	−0.250	0.084	0.167*	0.039	−0.285	0.203	0.454
Large	−0.173	0.044	0.223*	0.040	0.142	0.358	0.467
Tucker	−0.118	0.046	0.104*	0.048	0.193	0.370	0.424
Bean	−0.093	0.055	0.067*	0.026	−0.175	0.158	0.284
Barker	−0.113	0.048	0.053	0.040	0.063	0.168	0.101
Nickell	−0.182	0.068	0.042	0.032	−0.317	0.202	0.219
Allsopp	−0.852	0.216	0.333*	0.110	0.097	0.151	0.244
Bell	−0.225	0.071	0.155*	0.048	0.015	0.382	0.250
Lambert	−0.310	0.090	0.193*	0.048	−0.228	0.256	0.385
Buiter	0.077	0.201	0.034	0.091	−1.323*	0.659	0.229
Goodhart	−0.029	0.131	0.030	0.048	−0.328	0.269	0.241
Vickers	0.101	0.571	−0.037	0.170	−0.824	0.674	0.229
Julius	−0.591	0.314	0.222*	0.110	−2.543*	0.505	0.945
Wadhwani	−0.131	0.153	0.139*	0.043	−1.201*	0.189	0.326
Plenderleith	−0.135	0.061	0.111*	0.035	−0.628*	0.306	0.221
Clementi	−0.150	0.100	0.118*	0.050	−1.123*	0.465	0.345
Committee	−0.158	0.045	0.077*	0.021	−0.399†	0.222	0.153

B. Individual and Committee Coefficients are Equal

	Intercept	Inflation	Unemployment
All members	0.103	< 0.001	< 0.001
External	0.025	0.001	< 0.001
Internal	0.718	0.409	0.370
Academic	0.025	< 0.001	0.541
Private	0.495	0.135	< 0.001
Bank	0.504	0.430	0.624

C. Committee Coefficients are Equal to the Median

Intercept	Inflation	Unemployment
0.725	0.072	0.730

D. Median Coefficients

	Intercept	Inflation	Unemployment
All members	−0.142	0.114	−0.322
External	−0.182	0.139	−0.317
Internal	−0.135	0.111	−0.477
Academic	−0.081	0.038	−0.340
Private	−0.173	0.155	−0.228
Bank	−0.135	0.111	−0.328

Notes to all Tables: Internal members are George, King, Lomax, Large, Tucker, Bean, Vickers, Plenderleith and Clementi. The remaining members are external. King, Bean, Nickell, Allsopp, Buiter and Vickers have academic background. Large, Barker, Bell, Lambert, Julius and Clementi come from the private sector. The remaining members have been Bank of England staff or government officials. See Spencer (2006) for additional details. The superscripts $*$ and † denote the rejection of the null hypothesis that the true coefficient is zero at the 5 and 10 per cent significance levels.

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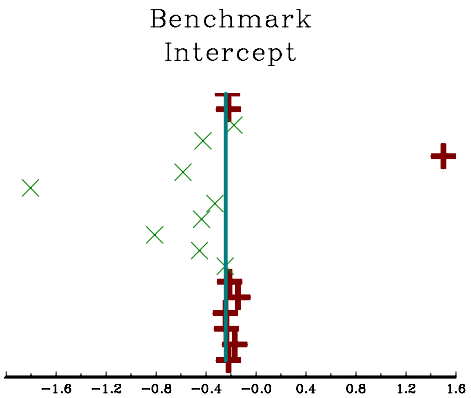
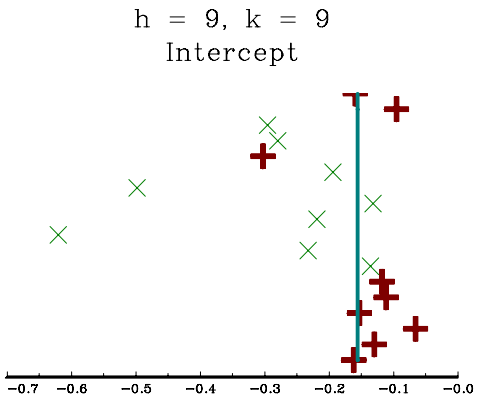
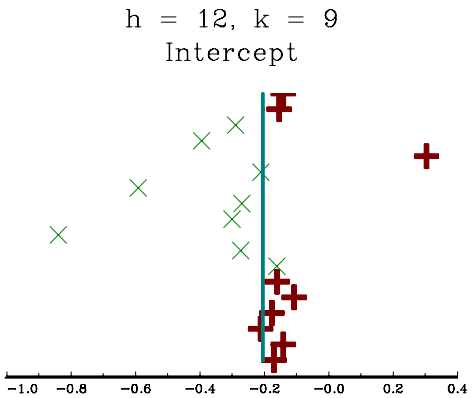
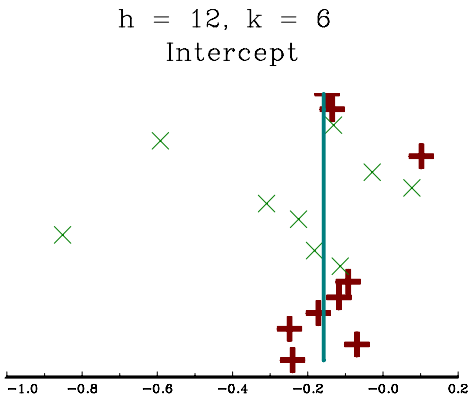
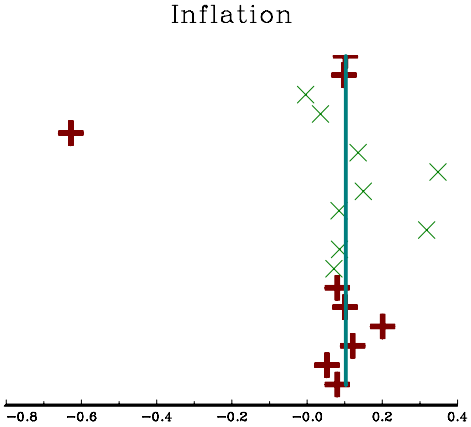
Figure 1: Reaction Function Coefficients

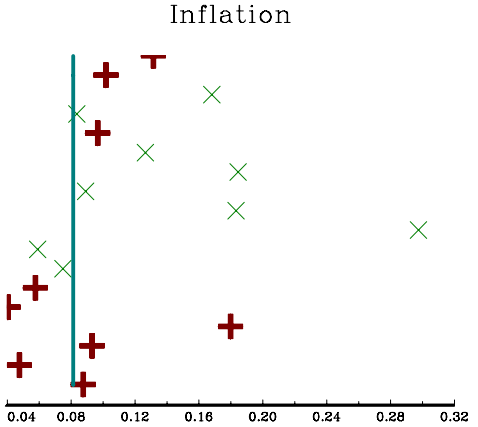


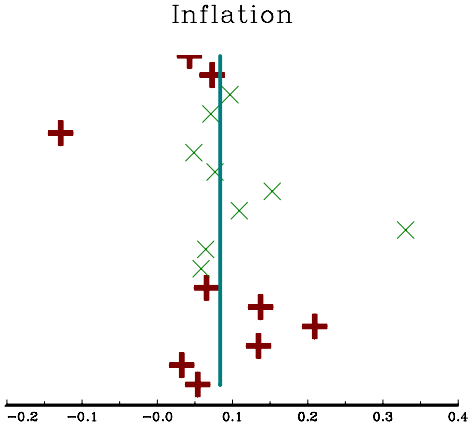


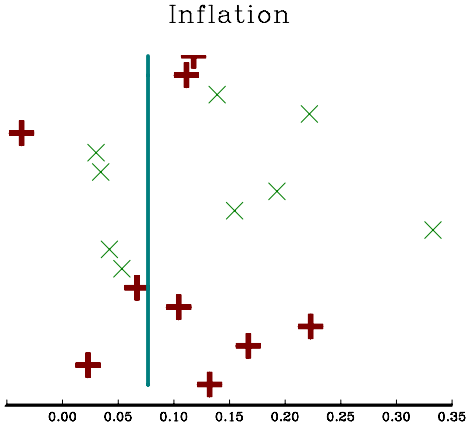


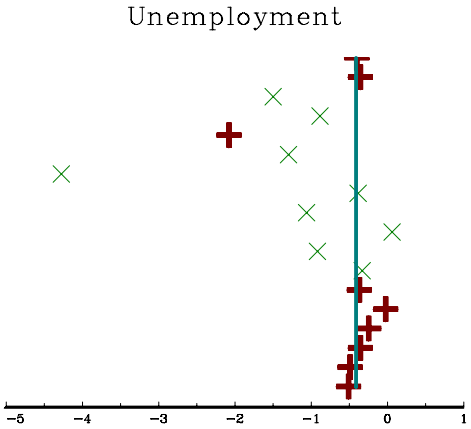


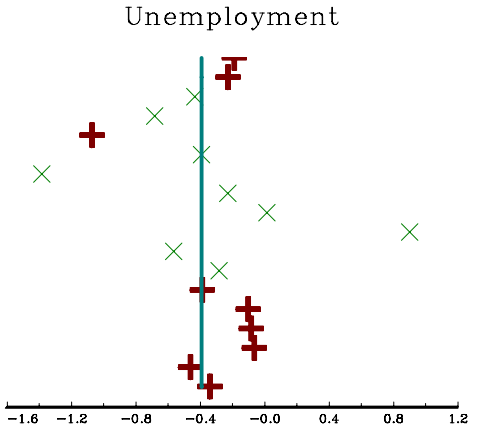


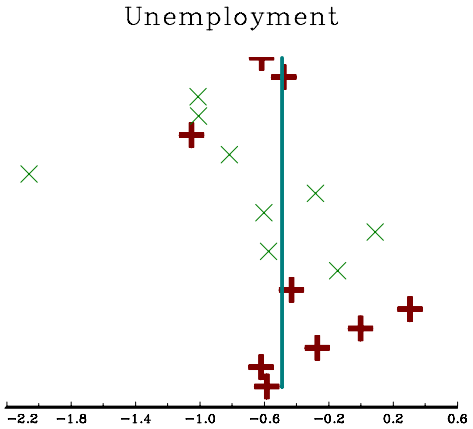












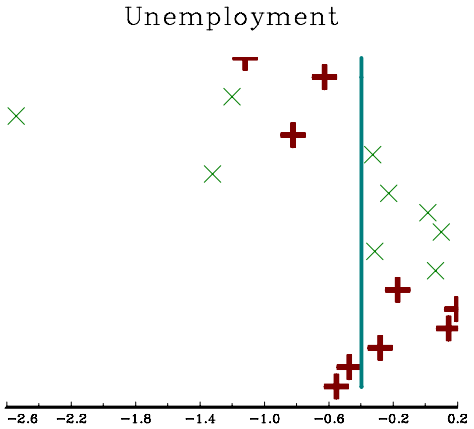


Figure 2: Relation with Benchmark Coefficients