

Variety of Economic Judgement and Monetary Policy-making by Committee

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Abstract

With the increasing attention to how monetary policy is communicated has come a focus on the scope for diverse messages to arise from the committee making the decision. While the existing literature sees the source of such diversity in relation to a 'correct' decision based on one 'true' model, we explore the implications of diversity as being instead the norm within a pluralist approach to knowledge. By considering judgement as the core of decision-making and uncertainty as conditioning judgement, we develop a theory of decision-making by committee under uncertainty. Our case study is the Monetary Policy Committee of the Bank of England. We conclude with a hypothesis about the tendency to policy inaction in different circumstances, notably where there are confident but conflicting judgements within the committee, on the one hand, and where there is agreement that a high level of uncertainty clouds judgement, on the other. This contrasts with the conventional association of diversity of MPC opinion with uncertainty (both as cause and effect).

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Introduction

The purpose of this paper is to consider the implications for policy decision-making of diversity of analysis, where this diversity is an integral aspect of pluralist economics in an uncertain environment, rather than something which is reducible. It is commonplace now to characterise economics as pluralist, having departed from the unifying methodology set by general equilibrium theory. This is most evident in the rise of game theory and experimental economics, and related debate as to the relative importance of theory and evidence. In macroeconomics, a ‘new consensus’ has been identified in the area of the mainstream theory of monetary policy (Arestis and Sawyer 2004). But even here some fragmentation is becoming apparent again. There has for example been a renewal of interest in monetary aggregates, and a renewed element of debate about rational expectations (De Grauwe 2008).

The question of which model to use for monetary policy (a question which presumes that there is one best model) has made this fragmentation explicit. This is the subject of the model uncertainty literature (Dow 2004a). The Bank of England has gone further than most, notably in its 1999 account of its approach to models in advocating recourse to a range of models, albeit with a focus on one main model (now the BEQM¹); while the European Central Bank has adopted the controversial two-pillar approach, which leaves ample room for judgement. The matter of selecting the appropriate policy action is complicated further for those central banks (such as the US Federal Reserve) required to pursue more than one goal simultaneously and where the policy decisions are taken by a committee whose members may pursue regional interests. Meade and Sheets (2005) show that policy makers are influenced by regional economic development and tend to have a ‘home bias’. The complexity of monetary policy has been increasingly emphasised in the mainstream literature ever since the failure of the confident days of the early 1980s when it was presumed that a single large model would unambiguously yield the appropriate policy action.

Variety of judgement about monetary policy is therefore evident in both academic and policy circles. What we want to focus on here is the implications of such variety when the institutional arrangement for monetary policy-making is a committee, whose members may differ in their analysis. We will focus particularly on the arrangements in the UK, whereby the Monetary Policy Committee (MPC) reaches decisions by vote rather than consensus. There is a growing literature on variety of opinion in monetary policy-making, and its implications for decision-making by committee. But, unlike this literature, not only do we put much more emphasis on why there should be variety in the first place, we argue that what is at stake is the broader question of *judgement*.

The paper begins with a brief account of the institutional arrangements surrounding monetary policy-making, and the ideas current in the literature about decision-making by committee. Our focus here is on the explanation for variety of opinion within committees.

¹ See <http://www.bankofengland.co.uk/publications/other/beqm/index.htm>

What is important is whether or not variety of opinion is ultimately open to resolution (resulting for example only from different skill sets, or information, for example), ie whether there is one best model which can feasibly be identified. This is the longstanding stance implicit in the established approaches to monetary policy in the context of model uncertainty. Yet policy-makers are not so sanguine (King 2007 emphasises the role of judgement under uncertainty²), and indeed variety of opinion is a normal feature of how dissenting approaches - such as Post Keynesian economics - regard knowledge of the economy. We therefore proceed to consider the source of variety of opinion more generally in order to explore what is required to justify the conventional stance on the one hand, and the dissenting stance that variety of opinion is inevitable on the other. The critical factor will prove to be uncertainty, and leading on from this the reasons for its presence, and its implications in terms of the necessity for economic judgement and the inextricable diversity of such judgement (cf. Dow 2004; Dow, Klaes and Montagnoli 2007). This is followed by a discussion of the implications for monetary policy of variety of judgement in policy-making being made public, as it is in the UK. The paper concludes with some reflections on how variety of judgement might more usefully be incorporated in the theory of monetary policy.

Monetary Policy by Committee

While older literature on monetary policy referred to institutional arrangements, and particularly relations between the central bank and financial institutions (eg Dow and Saville 1988), it became conventional from the 1980s to characterise monetary policy in terms of monetary targets, or interest-rate setting. This was the case even where monetary policy was established by committee, as in the US. But New Keynesian economics has put an emphasis on transparency, such that the statements and documents surrounding monetary policy decisions have become a major focus of attention (Blinder et al 2009). These wider communications are regarded as important for signalling central bank thinking and thus assisting markets in forming expectations about the effects of monetary policy, and the future path of monetary policy.

But where monetary policy is made by committee rather than a single individual, there is scope for these communications to reveal variety of opinion within the committee. Blinder (2004, 2008) in particular has discussed extensively the different institutional arrangements operating in different countries: genuinely-collegial committees, autocratically-collegial committees, and individualistic committees. He discusses the issues surrounding communication of variety of opinion within each type of committee. But the source of variety of opinion is left rather vague. Blinder refers to difference of 'approach' among different committee members, particularly as between those with academic backgrounds and those with business backgrounds. This difference may reflect different knowledge and information, or different methods of analysis ('decision-making

² King's analysis of uncertainty differs from ours, however, in that he sees it as the result of 'shocks' rather than, as we see it, the general case.

heuristics'³) (see further Blinder 2004, chapter 2). Tucker (2008) similarly refers to the 'fresh air' which new members may bring to a committee. But the epistemological basis for such differences is not explored.

Gerlach-Kristen (2006) offers similar explanations for difference in views within the committee. Like Blinder she explores the possibility that there may be a difference in preferences, but, as in the case of the MPC with its externally-set inflation target, she concludes that there is no scope for this to apply. Second there may be different skills represented in the committee, reflected in the variance of forecast errors. Third there may be different perceptions of potential output; this may result not only from data uncertainty but also from different interpretations of the same data. In discussing the benefits of committee deliberation where there is variety of opinion, Gerlach-Kristen (2003) likewise focuses on (stochastic) differences of opinion on errors and on parameter values (with respect to a particular model). Indeed Tucker (2008) emphasises the significance of all MPC members basing their judgements on a shared core model and shared forecasts. Gerlach-Kristen concludes that disagreements arise primarily (where there is rational, non-strategic behaviour) from information not being pooled effectively. This interpretation is reinforced by her analysis (Gerlach-Kristen 2004) of MPC voting patterns, which suggests that, where there are differences, these are over the timing of members coming to a particular policy conclusion (so that dissenting votes tend to be good predictors of future changes in policy stance).

Chappell *et al.* (1997) estimate reaction functions for each FOMC member. The results suggest that there is considerable diversity across members and they tend to vote systematically for tighter or looser monetary policy. 'This evidence suggests that policymakers may hold different views of the optimal level of inflation and/or potential output that make them disagree about the desirable level of interest rates' (Gerlach-Kristen 2008: 120). A similar exercise has been conducted by Riboni and Ruge-Murcia (2008) for the Bank of England MPC. They conclude that 'MPC members are fairly homogeneous in their policy preferences, but there are systematic quantitative differences in their policy reaction functions that are related to the nature of their membership and career background' (Riboni and Ruge-Murcia 2008: 213).

Gerlach-Kristen's explanations for difference of opinion support the conventional view that there is one best model and set of forecasts, but that different committee members arrive there at different speeds, and with different skills and information. Blinder and Tucker raise the possibility that there could in addition be different understandings of the economic process, but leave this possibility unexplored. There is general agreement that a committee structure, which draws on different opinions (drawing on different information and skills), provides a more robust approach to monetary policy than reliance on a single opinion. Yet it is fundamental whether or not such differences challenge the notion of one

³ Rather than exploring this further, Blinder (2004: 42) supports this statement with reference to an unpublished source which notes that the notion of differing heuristics has wide acceptance in the organisational behaviour literature.

best analysis. We explore the source of difference of opinion below, putting particular focus on the nature and significance of uncertainty (drawing on Dow, Klaes and Montagnoli 2007).

Variety of Opinion and Uncertainty

While the interest in central bank communication stems from a New Keynesian concern with transparency, some have suggested that transparency is not appropriate when it reveals central bank uncertainty (see Eusepi 2005, Morris and Shin 2002). In the case of difference of opinion within the committee, Blinder et al (2009) express concern that the effect will be noisy signals. In particular, difference of opinion for them represents uncertainty within the committee, which provokes uncertainty in markets. The explicit discussion of variety of opinion in the mainstream literature with respect to monetary policy builds on the somewhat older model uncertainty literature. Thus Gerlach-Kristen (2003) discusses variety of opinion in terms of additive and multiplicative uncertainty. But there has in addition been considerable discussion about model uncertainty, which refers to an inability to identify the one best model of the economy, and the *true* monetary policy transmission mechanism. While not put this way, implicitly there is clearly scope for variety of opinion as to which is the best model. And indeed this would be consistent with Blinder's reference to difference of approach. Yet this literature also puts forward procedures for selecting from this variety (either using robust control theory, or else selecting the best from a range of possible models). The aim is still to identify one best model. Otherwise, in the wider literature, variety of opinion is apparent in the argument that one is superior to another (the model being put forward is the best model). To complicate matters further we know that the models used by playmakers and practitioners are influenced by each others' signals. Economic agents formulate their decisions taking into account both information from monetary policy behaviour and signals coming from the financial market, thus forming a widespread belief about the future course of the events. It is these beliefs that, in turn, influence market dynamics and the monetary authorities' reaction. This intuition is based on the idea that the probability assigned by agents to the realisation of future events is the result of a complex process based on the observation of those variables that are considered relevant. As discussed below, this intuition finds support in Keynes's probability theory.

While on the one hand Blinder (2008) therefore advises against transparency about difference of opinion within the committee, he nevertheless identifies 'variety of approach' among members of monetary policy committees as a strength of the committee system. In fact in recent general commentaries on the state of economics as a whole, variety of opinion is identified as a welcome feature of the current state of thinking (Colander, 2000 and Goodwin, 2000). Indeed such variety has been likened to that offered by free markets (Pencavel 1991). But, however persuasive the metaphor, the notion of a market in ideas is highly problematic, and begs numerous methodological questions. The fundamental problem with this general position on variety is that it lacks methodological justification, or indeed explanation, and risks veering into an 'anything goes' methodological territory (Dow 2007). Meanwhile practitioners proceed broadly

speaking along traditional logical positivist lines, aiming to identify the one model which is best in terms of internal deductivist logic and in terms of conformity with data.

Given the difficulty of simultaneously satisfying the two requirements of consistent internal logic and conformity with the data, we find two routes in the literature towards identifying the one best model. The theoretical route requires models which apply deductive logic to axioms of rational individual behaviour, while the empirical route seeks confirmation that particular models are consistent with the data. There is clearly variety of opinion as to the nature of the axioms (given the new behavioural economics), and to the primacy to be given to logical consistency on the one hand and empirical confirmation on the other. Yet all concerned profess to seek models which are both consistent with satisfactory axioms and are also empirically confirmed. The implication is that a consensus will emerge in due course.

There is further a contrast between the academic practitioner literature on monetary policy on the one hand and accounts of the actual practice of monetary policy on the other. The former aims to identify the one best model from which a definitive policy stance could be derived, while, even though there may be agreement on the one best core model, the latter reserves a key role for judgement. It is in the exercise of judgement in implementing the results of the model that scope for variety of opinion is seen to arise. While Gerlach-Kristen for example refers to differences in skill set and access to information as explaining variety of opinion, the implication remains that, the better the skills and the fuller the information, the closer the decision will be to the correct one, ie the correct judgement applied to the best model. The nature of judgement remains unexplored and unexplained. In fact, the implicit assumption is that given the right skills and full information, no further judgement is required since the rational conclusion will be foregone.

When practitioners discuss the difficulties in applying judgement, they refer to the uncertainties in the real world, compared to the certainties of the models they use (King 2007). For policy makers in particular, the relation between models and the world in which policy is to be applied is crucial. Here the methodological literature can make a particular contribution to the practical problems faced by policy-makers.⁴ For example, the critical realist literature in economic methodology has drawn attention to ontological assumptions, and the need to bring them to the surface (Lawson 1997). In this terminology, seeking one best model which can then be tested against independent data is a 'closed-system' approach, which is only appropriate to a subject matter which is similarly closed, i.e. predictions on the basis of models based on the past can only be relied upon if there is no force for change in internal relations, eg between individuals, or in institutional structure (intrinsic closure), and no force for change impinges from outside the system, where 'the system' includes shocks known to be random (extrinsic

⁴ It is worth pointing out that, alongside model uncertainty, policymakers and practitioners face a good deal of uncertainty about the current and future position of the economy; policy decisions are taken considering current and forecast data which are subject to a high degree of uncertainty.

closure). Thus, in a way, prediction remains possible in a (stochastically) determinist system.

If rather the subject matter is subject to fundamental uncertainty (essentially 'open'), then formal models which, by definition, cannot take account of unanticipated change to the subject matter, are an insufficient guide for prediction and thus for action. Theory should instead be geared to identifying as far as possible the underlying tendencies which generate what we observe and experience, where these tendencies may not always be operative, and may operate in conflicting directions. The best we can hope for then is judgements as to the nature and effect of tendencies judged to operate in particular circumstances. If formal modelling is insufficient, then other methods must also be employed. Rather than a last step after modelling, judgement as to other sources of knowledge and how to combine them are integral to the methodology. Further, while Gerlach-Kristen (2006) talks about ideology as being encapsulated in policy goals and thus separable from analysis, ideology arguably is in fact embedded in understandings of the real world as well (Dow 2004c), or at least in 'ontological commitments' (Lawson 2003). Blinder's 'difference of approach', even when applied to a common goal (an inflation target) would thus extend from understanding of real processes to views about how to build knowledge about them. This pluralist approach to methodology (an acceptance of a range of internally valid methodologies), will ensure that variety of opinion will be the normal state of affairs. Indeed this is inevitable once we move away from any notion of 'one best model'.

The scope for variety of opinion is something explicitly identified by Keynes, and thus explicitly analysed by those drawing on Keynes in the modern literature (Carabelli 2008, Dow 2007, Dow and Ghosh, forthcoming). In his *Treatise on Probability*, Keynes set out to establish the grounds for belief in propositions in the general case where the conditions for applying classical logic in decision making were not satisfied. This general case is one of fundamental uncertainty (which cannot be reduced to calculable risk) where any knowledge held can at most be held with uncertainty. The alternative being ignorance, we still generally hold some knowledge, differentiated by the level of confidence we place in it. In the absence of the conditions allowing unequivocal decision-making on the basis of classical rationality, inevitably variety of opinion will arise, and any decisions arrived at will result from substantive judgement on the part of decision makers. As Keynes (1921: 3-4) writes:

All propositions are true or false, but the knowledge of them depends on our circumstances; and while it is often convenient to speak of propositions as certain or probable, this expresses strictly a relationship in which they stand to a corpus of knowledge, actual or hypothetical and not a characteristic of the propositions in themselves. [...] The theory of probability is logical, therefore, because it is concerned with the degree of belief which it is rational to entertain in given conditions, and not merely with actual beliefs of particular individuals which may or may not be rational.

In addition to the general epistemological argument for difference of opinion under conditions of fundamental uncertainty, Carabelli (2008) argues specifically that variety of opinion can arise for the same reasons put forward in the conventional monetary policy literature: different levels of skill and knowledge. She contrasts the reliance primarily on convention, in the face of ignorance on the part of individual investors, on the one hand, with the greater skill and knowledge of speculators (not that their predictions are necessarily correct). Arguably, the authorities too have access to partly-unique skills and knowledge in analysing the economy from their macro perspective. Weight of any argument within the MPC may therefore be expected to be higher than elsewhere. There may further be significant relations between these groups, and their different knowledges. Earl, Peng and Potts (2007) apply Simon's heuristics approach to analysing the investment behaviour of different groups in terms of cascading strategies. Experienced and creative speculators will develop a sophisticated strategy, eg for switching into real estate of particular types at particular times. Other market dealers with skills and information will adopt simpler versions of this heuristic as a sophisticated convention, and so on down to generally unskilled and uninformed investors who will adopt a crude conventional strategy such as 'buy real estate'.

Where there is not complete ignorance ('we simply do not know'), there are some reasons for judgements. There is more confidence in judgment (less uncertainty) where weight of argument is high, ie where there is relatively more relevant evidence which can be brought to bear – *even if it supports different opinions*. This view of uncertainty differs critically from the standard view, as expressed for example by Gerlach-Kristen (2003) and King (2007), who identify uncertainty with difference of opinion. The relative (ie ordinal) probability attached to belief in a particular outcome may be low, in the Keynesian system, but the more relevant evidence has been brought to bear, the less is the uncertainty attached to that probability.

But, as Carabelli argues, individual reasons may be incommensurate, so that probabilities cannot be compared at all. (Indeed, where there are multiple goals, incommensurability of goals exacerbates the difficulty in settling on a policy.) This explains the essence of Keynes's method – it is aimed at addressing incommensurability. It is a pluralist method, drawing on formal models, verbal argumentation and different types of evidence about different forces which are deemed to be at work, designed to produce practical (rather than fully demonstrable) reasons for action. This pluralism is given coherence by the kind of argument brought to bear, since this will limit the range of types of evidence and its interpretation (what Dow, 2004b, terms 'structured pluralism'). But if different members of the policy committee approach the decision not just from different levels of skill and assessment of uncertain data, but more generally from different underlying economic world views, the reasons they will produce will be incommensurate at a very fundamental level. Clarity is only possible when these different foundations are brought to the surface and addressed explicitly (as in accounts of Godley's different approach to the other 'wise men' in the 1980s; see Evans 1997).

Inevitably there will be variety of opinion, as different parties draw on different reasons which cannot be directly compared, even within a common ontology and epistemology. But if there are good reasons (with evidential weight) put forward by some for raising interest rates, together with good reasons (with evidential weight) put forward by others to lower them, then the committee can be confident in the judgement that there should be no change. On the other hand, if evidential weight is low, then the uncertainty attached to the various reasons put forward is high, and this too will encourage holding rates – but this time as a form of inaction rather than a positive decision to hold. What emerges is thus an institutionalised process of collective judgement in which explicit argument among committee members obtains central place in arriving at collective judgement the outcomes of which can be held in confidence of the soundness of this institutionalised process.

We turn now to consider explicitly the case of the MPC in order to formulate some more concrete hypotheses as to decision-making under uncertainty, which might then be considered in relation to evidence.

Variety of Judgement in the MPC

The MPC of the Bank of England is given an inflation target by the government (currently 2% growth in CPI over a two-year time-horizon), with an obligation to provide a written explanation if inflation departs from this target by more than two percentage points. The Committee consists of nine members, four of whom are appointed directly by the Chancellor of the Exchequer. With the support of Bank of England research staff, the MPC produces a quarterly *Inflation Report* (in February, May, August and November), which presents an agreed analysis of economic conditions and an agreed forecast of inflation and output which now extends beyond the two-year target period in order to show trends. The assertion that the analysis and forecasts are consensual (see Tucker 2008) is consistent with the Blinder and Gerlach-Kristen perspective, that difference of opinion does not have ideological roots, but is rather the product of difference of skill and information base. The Governor has a press conference on the publication of the Report, with exchanges with the press following on an opening statement.

The MPC meets monthly to decide on the level of the repo rate. The rate is announced with a press statement explaining the decision. The Minutes of the MPC discussion are not however made public until two weeks after the meeting. The votes are recorded, so that any dissent from the majority is made evident, and reasons given. The MPC therefore falls into Blinder's category of an individualistic committee. Variety of opinion is relatively transparent, and is further communicated through the speeches of the individual members.

The *Inflation Report* forecasts are displayed in 'fan charts', rather than as points, reflecting a probability distribution of risks based both on past errors, and on the MPC's judgement as to the amplitude and skewness of risks. Being quantified, what is being

represented is risk, not the fundamental uncertainty we have been discussing above (which, by definition, cannot be quantified). The term uncertainty is often applied to the fan charts (see eg Elder et al 2005). But our analysis of the MPC's use of the term 'uncertainty', compared to the term 'risk', in the Minutes of the monthly MPC meetings suggests that the MPC does use the two terms to reflect different concepts (Dow, Klaes and Montagnoli, forthcoming). Our work also supports the understanding that the MPC takes positive action more frequently in *Inflation Report* months when, arguably, understanding of risk is better (being more informed) and uncertainty lower, other things being equal.

What we are concerned with here is the relation between variety of opinion and uncertainty. The conventional literature, as we have seen, implies that the two may go together, reflecting an imperfect process by which different members arrive at what will ultimately prove to be the 'correct' judgement. From this perspective, diversity of voting record is an indicator of uncertainty.

Our analysis however suggests something rather different. We have argued that difference of opinion may stem from different understandings of the workings of the economy and different views as to how to build knowledge. But even where these are shared, no one model is sufficient as a reasoned basis for policy decision – rather judgement needs to be applied, and applied to a range of sources of knowledge (a pluralist position at times espoused by the MPC; see Bank of England 1999). Since there is no unitary theory of judgement (and we would not expect to find one within a pluralist approach), or mechanism for rendering incommensurate evidence and arguments commensurate, variety of opinion brought to judgement is thus the norm.

Where variety of judgement is the norm, each opinion may in fact be held with low uncertainty, being based on a significant body of evidence (as in *Inflation Report* months). If there are good reasons both for a rise and for a fall in the repo rate for example, then a collective judgement, held with a high degree of confidence, may suggest no change. Uncertainty is relatively low, even though measured risk may be high; only significant weight of evidence can justify attempts to quantify risk. Indeed, since most difference of opinion in practice has been skewed (dissent tending to be only in one direction or another from the majority view) difference of opinion is as likely to be associated with positive action as with inaction.

On the other hand, when there is low weight of argument in general, the reasons for any policy decision are weak, whether or not there is disagreement among committee members. Where confidence in reasons for decisions is low, the ability to assess risk in such circumstances will also be low. Even if the reasons put forward are different, and pointing to conflicting tendencies (and thus supporting different policy moves), there may be general agreement on the high level of uncertainty and therefore no positive action is taken. In other words uncertainty is more likely to be a characteristic of agreement on

uncertainty than of difference of opinion. It is also more likely to be associated with inaction.

We can therefore infer a hypothesis as to the decision-making process. In particular, we can consider the factors which may explain a change of rate rather than no change. While there is inevitable ambiguity as to whether a no-change decision is an active decision (ie made with confidence) or a passive decision (ie made with a low level of confidence), we can draw on evidence as to the level of uncertainty perceived by the MPC in order to distinguish the two. The level of confidence, according to our analysis, will be a positive function of statements about risk, and a negative function of statements about uncertainty. Changes in the amplitude and skewness of the fans will also be a reflection of confidence about the assessment of risks. Where uncertainty by this measure is high, a unanimous vote will reflect agreement on uncertainty. Where it is low, it will be the outcome of reasons with high weight tending to point to tendencies in similar directions, or balanced in conflicting directions, in both cases supporting the same positive policy response (action and inaction respectively).

In moving now to formalising the foregoing argument into a hypothesis about monetary policy decision-making, there is an important question about operationalising the variables we identify. We have been dealing in concepts whose full meanings, by their nature, defy quantitative capture. Judgement, for example, goes beyond application of mathematical models. The incommensurability of arguments by definition prevents reducing them to comparable forms of expression. Uncertainty similarly is the outcome of low weight of argument, where arguments are incommensurate. The evidence on judgement and uncertainty on the part of the MPC, further, itself comes in incommensurate forms: texts in the form of the Minutes, the *Inflation Report*, speeches by MPC members, and the wording of the press conference – even the body language of the Governor when expressing carefully pre-prepared wording. It is because of this incommensurability of communication that the nature and content of central bank communication has become such an important topic for study. Monetary policy no longer is seen as encapsulated simply in the announcement of an official rate.

In Dow, Klaes and Montagnoli (forthcoming) we took a first step at identifying risk and uncertainty variables from the MPC Minutes, using simple word counts. But the next step in that analysis will extend the identification of risk and uncertainty, using more complex indicators of risk and uncertainty as in the conventional literature, using discourse analysis. For the purposes of this paper, we keep the analysis here at a more conceptual level for the time being. (The next step for this analysis will be to settle on a way of identifying uncertainty from the MPC Minutes which will go beyond simple word counts.) Our aim is to provide more focus for the analysis above by indicating how we might identify the decision-making process of the MPC.

What we have argued is that the MPC is more inclined to take action the more confident it is in its arguments, and the more the various (generally incommensurate) arguments

brought to the table by the different members of the MPC point in the direction of the same action (where action may be either a change or no-change in the repo rate). The arguments will be held with more confidence, the greater the weight of evidence attached to them. High weight is also associated with detailed, and confident, assessment of the risks attached to forecasts, since this reflects greater knowledge. Other things being equal, then, action is more likely in *Inflation Report* months (ie quarterly), when there is more detailed and public MPC discussion of the forecasts and the risks attached to them. While action could include a positive decision, made with confidence, not to change the repo rate, there is no doubt that ‘change’ is synonymous with action, while ‘no change’ includes inaction as well as action. And indeed empirical studies do support the hypothesis that change is more likely in *Inflation Report* months (see Dow, Klaes and Montagnoli, forthcoming).

But each MPC member may attach significant evidential weight to his or her own reasoning (as in *Inflation Report* months), and yet there may be diversity of opinion as to which arguments should dominate. Such diversity is easily identified by diversity of voting among the MPC members (although unanimous voting may conceal underlying differences). Since lines of reasoning beyond the core model will be to some degree at least incommensurate, a diversity of strongly-held opinions will discourage action, while unanimity will encourage action. Again, while action could consist of no change in rate, a change in rate is unambiguously a form of action.

We are arguing that a change in repo rate, therefore, will be associated with two factors: high weight of argument (high confidence, including confidence in risk assessment, and thus low uncertainty) and unanimity of opinion within the MPC.

No change in the repo rate however can have a wider range of explanations. There may be high confidence in judgement (including judgement as to risk assessment) on the part of each member of the MPC, but diversity of argument such that conflicting views are confidently held, so that no resolution can be reached. Then the group decision will be no change. Alternatively the arguments brought forward may be clouded by uncertainty, the evidential weight and the capacity to assess risk being low. Yet if there is agreement that there is no sound basis for action, then the MPC will be unanimous in its vote for no change.

Concluding Reflections

Ever since the failure of the confident days of the early 1980s when it was presumed that a single large model would unambiguously yield the appropriate policy action, the complexity of monetary policy has found increasing emphasis in the various strands of literature on monetary policy. To a significant part, this complexity arises not just from the fact the economic phenomena under study are complex, but also from the epistemological difficulties of arriving at an accurate and reliable representation of these phenomena for the purposes of policy analysis.

We have argued that while, in much of the monetary policy literature, discussions of these difficulties restrict themselves to model uncertainty conventionally understood, it is vital to acknowledge a more radical form of model uncertainty that arises if several alternative models or model interpretations are conceivable concurrently but incommensurably so. In such a context, what is at stake is not simply the reliability of economic data feeding these models, but the fundamental structure of these models themselves.

Differential availability of economic data is typically addressed as an information problem in conventional analysis, giving rise to variety of opinion among economic agents, policy makers, and economic analysts. Our emphasis has sought to shift the focus to the implications of model uncertainty arising from incommensurability of models of the economy, and therefore from variety of opinion to variety of economic judgement. Economic judgement becomes important in the absence of technical grounds to choose between competing models. Its role is particularly significant when there is high uncertainty regarding the state of the economy.

We have studied the variety of economic judgement on the basis of the institutional structure of monetary policy-making in the UK, where such decision making is not only delegated to a committee, but also this committee operates on the basis of majority voting and adheres to principles of transparency that ensure that the meeting Minutes are made available to the public.

We have drawn out some implications of our general theory of economic judgement in monetary policy by tentatively formulating some hypotheses regarding the interaction of uncertainty, variety of judgement, and policy action. In particular, the conventional literature identifies MPC uncertainty with difference of judgement within the committee, and associates diversity of MPC opinion as ‘noise’ which creates market uncertainty. In principle this difference in judgement is seen as being reducible through pooling information. In contrast, we have identified two alternative possibilities: conflicting judgements, where each position is held with low uncertainty on the one hand, and agreement within the committee on uncertainty on the other. Uncertainty may be reduced by more relevant evidence, but cannot be eliminated, given open-system nature of the subject matter. Further, since judgement generally requires drawing on a range of incommensurate arguments, communication may be more clear the better these different arguments are articulated.

More specifically, we have suggested that the level of confidence, according to our analysis, will be a positive function of statements about risk, and a negative function of statements about uncertainty. If there are good reasons both for a rise and for a fall in the repo rate, a collective judgement, held with a high degree of confidence, may suggest no change. On the other hand, when there is low weight of argument in general, the reasons for any policy decision are weak. Where confidence in reasons for decisions is low, the

ability to assess risk in such circumstances will also be low. Even if the reasons put forward are different, and pointing to conflicting tendencies (and thus supporting different policy moves), there may be general agreement on the high level of uncertainty and therefore no positive action is taken. In other words uncertainty is more likely to be a characteristic of agreement than of difference of opinion. It is also more likely to be associated with inaction.

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