



BANK OF ENGLAND

Speech

Economic policy, with and without forecasts

Speech given by

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In this speech,⁽¹⁾ Sir Alan Budd, a member of the Bank's Monetary Policy Committee, discusses the debate between those who believe that monetary policy should be based on a small number of current indicators and those who use model-based forecasts to assist their decisions. He argues that all policy-makers use forecasts, implicitly or explicitly, and all respond to current indicators. He describes the role of the inflation forecast in the MPC's decisions.

My topic this evening is the use of forecasts in economic policy-making in general and their use by the Bank of England's Monetary Policy Committee (MPC) in particular.

Although this lecture is dedicated to Alec Cairncross, the first part of it is devoted to, or perhaps directed at, another economist whom I greatly admire and respect, namely Samuel Brittan. I am particularly sorry that he is not here this evening. It would clearly be grossly ill-mannered to conduct a dispute with him in his absence, so I hope that it will be recognised that I want to question some views about forecasting that are widely shared, and of which Samuel Brittan is certainly the most eloquent, and possibly the most influential, exponent.

I shall start with some quotations taken from recent columns and articles by Mr Brittan.

First, a few extracts from an *Economic Viewpoint* in May of this year:⁽²⁾

'But the signal for middle-of-the-road opinion to swing towards the hawks is unlikely to be the minutiae of the forecast path for ... output to which the [Bank of England's] *Inflation Report* devotes such loving care'.

He goes on to say that support for an interest rate increase would most probably come from an increase in interest rates by the US Federal Reserve. He says:

'This may not be entirely rational, but it is hardly less so than the supposedly scientific forecasting in which the more academic members of the MPC prefer to indulge'.

He concludes:

'Someone who is suspicious of forecasts is not committed to ignoring clear forward-looking information, of the kind we had when oil prices rose fourfold in 1973. But a rational sceptic prefers current data to prognostications about the implications of slight variations in demand and output two years ahead.'

In August,⁽³⁾ he discussed the MPC's concern with the output gap, and records his preference for monitoring nominal demand. He said:

'As an immediate step I would give more weight to actual inflation as distinct from rarefied speculation about its trend in two years' time'.

Finally, two quotations from his article 'An Inflation Target is Not Enough'.⁽⁴⁾ Again, this article is mainly about his view that monetary policy should be directed at nominal GDP (ie total spending in the economy), rather than at inflation alone. That is an important issue, but I do not intend to discuss it now. But his remarks are highly relevant to the more general issue that concerns me.

'There is no perfect solution; but it would help to go more by actual evidence of inflation and less by forecasts and models...'

He goes on:

'National cash objectives can indeed be pursued by means of formal forecasts and with a heavy fine-tuning emphasis. But they can also be pursued in a way which puts less reliance on forecasting abilities and reduces the need for an econometric straitjacket. Indeed a nominal demand objective has one advantage not sufficiently stressed by its adherents. That is, it can enable us to rely less on forecasting ability. For it would not be disastrous if the best we could do would be to react to the current situation'.

The view being expressed here is that it is better to conduct policy on the basis of observing a few actual variables than on forecasts derived from econometric models.

There are important substantive issues here, but first I want to clear up a matter of semantics. I would assert that all actions undertaken with the intention of affecting future outcomes involve forecasting. The only questions are:

(1) Given at the Sir Alec Cairncross Lecture for the Institute of Contemporary British History and the St Peter's College Foundation, 27 October.

(2) Brittan, S, *Economic Viewpoint*, *Financial Times*, 14 May 1998.

(3) Brittan, S, *Economic Viewpoint*, *Financial Times*, 6 August 1998.

(4) Brittan, S, 'An Inflation Target is Not Enough', *Essays, Moral, Political and Economic, Hume Papers on Public Policy*, Volume 6, No 4, 1998.

- are the forecasts implicit or explicit?
- which variables are taken into account in producing the forecasts?
- how are the forecasts derived from the variables?

I would add that all forecasts depend on observations of actual variables (either current or past). We all react to the *current* situation, the only question is how we do so.

The context in which I shall be discussing economic forecasts is the control of inflation (although similar arguments would apply if I were discussing the control of unemployment or the balance of payments). I hope it is common ground that inflation responds to economic developments with a lag. (Though there are some changes, eg changes in indirect taxes, that can affect the price level immediately.) Thus, policy actions taken today will affect inflation over a period of up to two years or more. It follows that anyone taking policy actions to control inflation must, at least implicitly, be thinking about the effects on inflation in the future, ie they are forecasting.

I should mention at this point that when I circulated an earlier version of this paper to my colleagues at the Bank of England, Mervyn King kindly drew my attention to comments by Federal Reserve Chairman Alan Greenspan made at the Bank of England's Tercentenary Symposium on The Future of Central Banking.⁽¹⁾ As a mere Treasury official I was not, of course, invited to that Symposium, nor had I read Alan Greenspan's comments; but I found that he had summarised, in a few sentences, most of the ideas that I shall be presenting this evening. I have often owned up to the charge of subconscious plagiarism, but I think this is the first time that I have committed an act of psychic plagiarism.

Alan Greenspan was commenting on a paper by another of my colleagues, Charles Goodhart. Greenspan's words were:

'Implicit in any monetary policy action or inaction is an expectation of how the future will unfold, that is, a forecast'.

He was particularly referring to those who favoured simple rules of policy-making. He went on:

'The belief that some formal set of rules for policy implementation can effectively eliminate that problem is, in my judgment, an illusion. There is no way to avoid making a forecast, explicitly or implicitly'.

In relation to monetary rules, he commented:

'I am not saying that monetary aggregates are without value, or that intermediate targets should not be sought. I am

saying that their use requires a forecast just as much as the broader, so-called discretionary policy procedures'.

It could be said that I have defined forecasting very widely—to include any form of thinking about the future—whereas we all know an economic forecast when we see one, and plenty of policy-makers do perfectly well without them. My reply is that we do indeed use the expression 'economic forecast' to describe a table of numbers (or a set of charts) showing the future values of economic variables. But it can be misleading to think that those who base their policy actions on such tables and charts are behaving in a fundamentally different way from those who do not. All policy actions in relation to inflation, for example, must depend on a response to observations of events and on some idea (however vague and uncertain) of how today's policy will affect the future path of inflation.

Some of you may by now be thinking that all this talk about forecasting is beside the point. Surely what I am really talking about is policy reaction functions. The question at issue is, how does the policy-maker respond to new information? So we could transfer our discussion into one about the nature of the reaction function. How many variables are involved? What use is made of formal transformations of these variables etc? And one is tempted to say, 'If it's the forecast that upsets you, we can leave it out'. A reaction function is a mapping from a set of observations to a policy decision. If the decision-making process of the MPC was entirely automatic, we could ask the computer to print out just one number, the interest rate required to achieve the Government's inflation target. The forecast would strictly be an incidental by-product of the policy-making process. Instead of saying that the decision is based on a forecast of inflation two years ahead (or whatever), we could say (correctly) that the decision is based on our current reaction to observations. That would also have the benefit of demonstrating that the distinction between those (sturdy realists) who base their policy actions on current observations and those (airy-fairy academics) who base them on forecasts is not very helpful. We all use current (and past) observations, since that is all we have.

Having said all that, I am going to have to explain why the MPC does use explicit economic forecasts, and I shall do so in due course. But having, I hope, resolved a question of semantics, let me move on to the substantive issue, which concerns the nature of the reaction functions. I have found it difficult to find suitable labels to describe the two approaches (and at any rate it is really a continuum), but I suggest 'hedgehogs' and 'foxes', from Tolstoy's remark that the fox knows many things but the hedgehog knows one big thing. So my hedgehogs rely on a few variables and my foxes rely on rather more variables and will possibly use formal methods to transform some or all of them into a forecast or an actual decision. (I think, incidentally, that this

(1) Greenspan, A. Discussion of Goodhart, C. Capie, F and Schnadt, N, 'The development of central banking', in Capie, F, Goodhart, C, Fischer, S and Schnadt, N (ed) *The Future of Central Banking*, Cambridge University Press, 1994.

is not yet another contribution to the ‘rules versus discretion’ debate, since either side may or may not believe in rules.)

On the face of it, it seems strange that anyone should suggest that it is better to base decisions on a small number rather than a large number of observations of current and past economic variables. How can more mean worse? Analogies are always unfair, but I am going to use one all the same. Suppose that one was being driven from A to B, where B is a well-defined but unfamiliar destination. How would one react if the driver announced at the outset that he favoured a simple approach to route-finding—he only read road signs that were on the right-hand side of the road, or that were wholly in upper-case letters, or that began with consonants? You might believe that you would reach your destination eventually, but you would fear that it was not the best way to proceed. Suppose, on the other hand, that the driver produced a map. A map is, of course, a gross over-simplification of the real world, and no two maps of any given area seem to be the same—there are different scales, different colours, different details and so on. But despite all this, you might be reassured by this abstract device. And you might be even more encouraged if the driver told you he intended to combine the use of the map with attention to road signs etc. Now let us take the analogy further. Suppose you set off and the driver leapt out every few hundred yards and measured the temperature of the road surface; or suppose he told you that at each road sign he converted the letters to their numerical equivalent and used a complicated formula to derive the desired direction, you might reasonably believe that these procedures would reduce the chance of your reaching the destination.

Is it this fear that leads people to condemn the use of formal models and a wide range of information in policy-making? If this is so, it would be a sad commentary on the large amount of time and money that has been spent on developing econometric models and on improving economic statistics over the past 30 years or so. In preparing this lecture, I re-read the 1966 Report from the Estimates Committee on The Government Statistical Services.⁽¹⁾ (As is so often the case, I found I had mis-remembered it after the gap of 25 years since I last looked at it.) The Committee recommended that ‘urgent steps be taken to increase research on forecasting methods and on the data used in forecasting both by Government and by outside bodies with Government Support and co-operation’.

In its written evidence to the Committee, the Treasury discussed the use of statistics in the analysis and forecasting of the domestic economy. It said:

‘The quality of the analysis has been very much improved by a large-scale and very rapid improvement, amounting to a transformation, in the range and reliability of statistics, and the speed with which they are produced’.

It went on:

‘The counterpart of the improved flow of statistics, and the now quite long historical runs, has been an improvement in interpretation. To some extent, the improvement consists of a more sophisticated assessment of what such and such a figure means. In addition, a number of research studies have been carried out into the nature of the key relationships; some of these have been published in the *National Institute Economic Review*. More generally, as time goes on and as statistics improve, the whole process of analysis and forecasting gets continually more refined, explicit and skilful’.

Alec Cairncross gave evidence to the Sub-Committee on Economic Affairs (which was conducting the study) on 25 January 1966, and was willing to share some of this optimism. He was asked by the chairman (Dr Jeremy Bray) whether he agreed that the measure of quality in forecasting was the quality of ultimate control that it makes possible, rather than the accuracy of plus or minus 2% in the outturn. He replied:

‘I think this is so. I think it is the degree to which you can operate on the economy in the light of the forecasts, and here I think we have made a very definite improvement’.

He referred in particular to the development of techniques for measuring the impact on the economy of changes in government policy. However, as one might expect, this optimism was accompanied by a considerable degree of caution. Alec was asked about research on forecasting outside the Treasury. He replied:

‘We have tried to interest universities in this, not always very successfully because I think it does require a very thorough knowledge of the statistical material. A good many would like to do it the short way by taking the figures and working on the figures, but most of the time you have to devote to studying whether the figures mean what they seem to mean before you can do any useful research at all, and this is why on occasion we have found attempts to interest the universities rather unsuccessful or unfruitful’.

Let us file away those wise words for future reference, and return to the hedgehogs and foxes. Let us imagine an extreme hedgehog position. The task is to control inflation; the only variable that contains any information about the future rate of inflation is the current rate of inflation. Therefore, policy-makers should tighten policy when inflation moves above its target rate and relax it when it falls below. (An alternative extreme hedgehog position is to state that only the growth of the money supply contains any information about the future rate of inflation.) The foxes believe that there is a wide range of variables (which they call ‘information variables’) that provide information about the future rate of inflation. Who is right? I personally am convinced by all the studies that show that if we are

(1) Estimates Committee, Fourth Report, Government Statistical Services, HC 246, 1966.

concerned with forecasting, foxes do better than hedgehogs. So why do the hedgehogs disagree? I think that there are a number of reasons why the debate continues. They are related to policy-making rather than to forecasting itself. I shall list them briefly with some comments, and I shall return to some of the points when I discuss the operation of the MPC.

One reason is that the hedgehogs accuse the foxes of cheating. They will always find another figure (for a hitherto ignored economic variable) that allows policy-makers to postpone making an unpopular decision. That is really an aspect of the rules versus discretion debate. We can all agree that bad discretion is worse than good rules.

Another charge is that the foxes rely excessively on models, without fully understanding the data on which they are based. (That was the fear expressed by Alec Cairncross.) There is the related charge that the foxes have an exalted view of their ability to control inflation, and therefore indulge in excessive fine-tuning. There are really two different versions of this charge. The first, which was propounded by Milton Friedman, states that policy-makers do not have superior information about future cyclical movements in the economy. Their attempts at stabilisation (either for its own sake or as a means of controlling inflation) will therefore make matters worse. There is a more recent version, which will be discussed by my colleague Charles Goodhart in the Keynes Lecture in two days' time. He examines the argument that if our knowledge of the economy is subject to a particular kind of uncertainty—known as Brainard uncertainty—large changes in policy in response to changes in the expected rate of inflation could cause an undesirable increase in the volatility of inflation. Charles discusses the issue in relation to the observed frequency of policy changes, particularly policy reversals. I shall not anticipate his conclusions.

Since these types of argument are based on policy-making rather than on forecasting on its own, there is no satisfactory way of resolving them. We would have to run through history twice, once with the hedgehogs in charge and once with the foxes in charge, and compare the outcomes. As a possible substitute, we can conduct synthetic experiments; but that requires us to use models, and we may not be able to agree about them.

Let me move on to the use of economic forecasts by the MPC. I should emphasise that the following account represents my own views, which may or may not be shared by my colleagues. We are all individually responsible for our own decisions, and are free to use the forecasts to inform our decisions in the way we think best.

I mentioned earlier that the production of an explicit forecast is not a necessary part of policy-making if we rely on a formal reaction function. We can go straight from the

observations of the relevant variables to the policy actions. Why then does the MPC produce and publish a forecast of inflation (which has now been joined by a forecast of output)? I think there is an internal reason and an external one. The internal one is concerned with the quality of the decision we take; the external one is concerned with explaining that decision to the public.

The immediate point is that we do not rely wholly on formal methods to reach decisions. The production of the forecast allows us to bring formal and informal methods together. As my colleague John Vickers pointed out in a recent lecture in Frankfurt,⁽¹⁾ the econometric model that is used in the Bank to help produce the forecasts uses about 150 economic variables; but each month, the MPC is presented with information on a thousand or so variables. If we believe that the variables that are not included in the model are relevant to our decisions, we obviously want to take them into account. There are considerable advantages to using the forecast as a framework for doing this. For one thing, it gives us a language with which we are familiar. We are used to watching an economy unfold and thinking about how it will develop in the future. We also have some ideas about the normal ranges within which an economy will behave (although of course we can all be greatly surprised from time to time). Thus if we think there is important new information in a non-model variable, we can examine the plausibility of the effect that it might have on the future path of inflation, and hence its possible implications for our decision. Finally, the model allows us to take account of the complex interactions within the economy, so that we can assess how changes in one part of the economy will change the overall picture. But we remain able to modify those effects if we believe we should do so.

I have referred to *the* econometric model. In fact, the Bank uses a suite of models, and we use our intuition and theoretical understanding to decide which particular model is appropriate to thinking about current circumstances. We can also develop *ad hoc* models to explore the implications of particular developments. For example, understanding the implications of a possible credit crunch might require a special model. The suite of models enables us to put together components from different models to construct an appropriate forecasting model each quarter. (One could use the analogy of hedgehogs and foxes to distinguish between those who rely on one big model and those who rely on many small models. The Bank is very much a fox on this definition.)

The process of policy-making that I am describing represents a particular way of using a reaction function. Instead of going straight from the observations to the decision, we stop the process in the middle. We go from one set of observations to a formally produced forecast, and we then adjust that forecast in the light of all other information that we believe is relevant. (In practice, even the more formal part of the process involves a considerable

(1) 'Inflation targeting in practice: the UK experience', given at the Conference on Implementation of Price Stability, 11–12 September 1998. See pages 368–75.

amount of judgment.) This is very fox-like behaviour. It is obviously not the only way of reaching policy decisions. Many authorities do not produce any type of explicit forecast. Others may publish or use a 'staff forecast'. Such a forecast will have been produced, using a combination of formal and informal methods, by the staff of the central bank (or finance ministry). It may inform the decision, but the policy-makers are not responsible for, or committed to, the forecast itself.

That is not, in my view, the current position. The forecast represents the collective view of the MPC members. It is not necessarily anyone's individual forecast, nor is it the average of the individual forecasts. If the MPC was told to go away until it had produced a single forecast, this is the forecast it would produce after discussion and a willingness to accept some compromise.

Does the forecast imply a decision? The practical answer is clearly not. At the time of the February inflation forecast, the Committee was divided four-four on whether interest rates should be raised. At the time of the August inflation forecast, seven members voted for no change, one voted for a cut and one voted for an increase. So it is clearly possible to produce a collective forecast and yet disagree about the interest rate decision. Why does this happen? It is for individual members to explain their actions, but I would make one general point. I have said that we stop the process of decision-making—the process of applying our reaction function—in the middle, in order to incorporate a wider range of information about the economy. But a reaction function consists of two things, a model of the economy and a welfare (or loss) function.

The Government has given the MPC a loss function that, reasonably enough, is not precisely specified. The objective is clearly defined: the target 'at all times' is a twelve-month inflation rate of retail prices excluding mortgage interest payments of 2½%. But the Chancellor's letter setting out the remit also says:

'The framework takes into account that any economy at some point can suffer from external events or temporary difficulties, often beyond its control. The framework is based on the recognition that the actual inflation rate will on occasions depart from its target as a result of shocks and disturbances. Attempts to keep inflation at the inflation target in these circumstances may cause undesirable volatility in output'.

There is room for disagreement about what constitutes 'undesirable volatility'. Also, as John Vickers pointed out in his Frankfurt lecture, there is room for disagreement about whether policy should be directed at the mean, the mode or the median of the probability distribution of future inflation rates. (That depends on the nature of the loss function for deviations of inflation from its target.) Finally, there is the issue, to which I have already referred, that is the subject of Charles Goodhart's forthcoming Keynes Lecture. The possible costs of policy reversals were specifically discussed in the minutes of the February meeting as one of the reasons

why interest rates were not raised, even though the associated commentary said that it was more likely than not that interest rates would have to be raised to meet the inflation target.

So even if there is agreement about the forecast, there is no simple mapping from the forecast to the policy decision.

This all smacks of fox-like behaviour. How do we meet the criticisms made by the hedgehogs? I said that the publication of the forecast serves the external purpose of explaining our decisions to the public. The *Inflation Report* is designed to fulfil the requirement imposed on the MPC by the Bank of England Act to publish a quarterly report containing:

- (i) a review of the monetary policy decisions taken by the MPC in the previous three months;
- (ii) an assessment of the developments in inflation in the United Kingdom over the same period; and
- (iii) an indication of the expected approach to meeting its inflation objective.

The Act does not require the MPC to publish a forecast of inflation, but we believe that it is right to continue the practice started by the Bank when the *Inflation Report* provided its independent assessment of the government's actions. (The system set up by Norman Lamont after the United Kingdom left the ERM in 1992.)

The forecasts for inflation and GDP provide not only a central projection but also the MPC's assessment of the probability distribution around the central projection. The public is free to comment on and criticise the projections. It can assess the views that informed the MPC's decisions. I believe that the process of publication reduces the chance that we shall succumb to the failings of which the hedgehogs accuse us.

Shall we cheat? Time will tell. But the fact that we provide a detailed account of the material we consider, and a full account of the MPC's deliberations, should reduce the risk. More importantly, the MPC's remit of controlling inflation should remove the risk that we are tempted to exploit the short-run trade-off between growth and inflation.

Are we so obsessed with our model-building skills that we fail to analyse what the numbers mean? In reply to that, I would repeat that the forecasts are only partly model-based. We are entirely free to adjust them in the light of additional information, and we do so. We also devote considerable time to trying to understand what the data mean. And I think that hedgehogs may be equally open to the charge that they do not fully understand the data they use.

Do we have an inflated view of our ability to control inflation? The *Inflation Report*, uniquely, shows the probability distribution of the inflation forecast (a system

pioneered by my colleague Mervyn King). The August *Report* suggests that the 50% confidence band for inflation in the third quarter of 2000 is about 1.9% to 3.3%. That is, there is a 50–50 chance that inflation will lie outside that range. I do not know whether that is excessively modest or excessively boastful, but we are certainly not claiming that we know precisely what inflation will be in two years' time.

Are we tempted into excessive fine-tuning? You must listen to Charles Goodhart, but I recall that the usual comment on the past conduct of monetary policy is that it has veered between 'too little, too late' and 'too much, too late'.

I have tried this evening to make the following points:

- no one can make policy decisions relating to the control of inflation without making a forecast, implicitly or explicitly;
- the distinction between relying on forecasts and on current observations to make policy decisions is invalid; a forecast is simply a particular transformation of current (and past) observations;

- there is a substantive issue concerning the number of economic variables that should be used to inform policy decisions. Policy-making supported by formal model-based forecasts typically use more 'information variables' than policy-making based on simple rules; and
- there are a number of risks associated with the use of large formal models in policy-making.

The Monetary Policy Committee uses a suite of models, and relies on a very wide range of supplementary information to guide its decisions. The production of an inflation forecast is not, technically, a necessary part of the decision-taking process, but it provides a valuable framework for discussion and the publication of the forecast also enhances transparency—its approach should minimise the risk that it places more weight on formal models than they can bear.

These are early days, and I am sure that the MPC will learn from experience and adapt its techniques accordingly; but I hope I have demonstrated that we are seeking to combine the best qualities of hedgehogs and foxes.