
The Production and Use of ECONOMIC FORECASTS

Giles Keating

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Introduction

Economic forecasters attempt to predict the future by using economic theory to provide a systematic explanation of the past, which they assume will apply in future. Their work is central to government decision making in almost all major industrialized countries and to corporate planning in many large firms. This book describes the techniques used by forecasters and the problems they encounter, illustrating every major point with practical examples.

The forecasters' explanation of past behaviour is contained in a *macro-econometric model*, which is a series of equations that together purport to describe all important aspects of the economy. These equations are derived by assuming, on the basis of economic theory, that certain relationships hold, then using statistical analysis of historical data to test whether those relations existed and to quantify them. This process is one of the main parts of applied *econometrics*.

Forecasters use judgement as well as econometrics, particularly when analysing recent economic developments, which determine the whole course of the forecast and for which few government macro-economic data are available because of publication delays. Surveys, newspaper reports and other information must be used, and drawn together into an overall picture of the economy consistent with economic theory and econometric results. This process is known as *conjunctural analysis*.

A key feature of the book: a macro-econometric model estimated from actual historical data

An essential feature of the book is a specially developed macro-econometric model. The relatively small size of this, and its direct derivation from a theoretical model, make it particularly suitable for teaching purposes. Unlike other apparently similar models, the one in this book is estimated from actual macro-economic data for the post-war UK economy, using up-to-date econometric techniques. It is used to illustrate the process of model building (Chapter 4) with a step-by-step illustrated example of applied econometrics. It is also used to prepare a forecast for the UK economy up to 1988 (Chapter 5), and readers will be able to compare this projection with the events that actually occur. They will also be able to use the model to prepare their own forecasts using the latest data.

A further distinguishing feature of the macro-econometric model used here is that it is based on a relatively recent theoretical model, proposed by Buiter and Miller in 1981. Although this draws largely on relationships that will be familiar to many readers (an IS curve, an LM curve and a Phillips curve), it links these to an exchange rate equation, making it particularly appropriate for describing a small open economy such as the UK. This model explains events like those of 1979–81 as the result of anticipations about a future tightening of monetary policy, which cause the exchange rate to rise sharply, thus depressing competitiveness and so raising unemployment. Like any model, this focuses on some important aspects of the economy and abstracts from others, but it captures many of the relationships that have been most significant over the last fifteen years.

This model is intended for use with the assumption of *rational expectations*. This means that people are assumed not to make systematic mistakes when forming expectations. Since the model itself is in principle a description of how the economy has behaved in the past and will continue to behave, rational expectations are usually interpreted to mean that expectations are consistent with the projections of the model itself. A non-mathematical outline of analysis using the assumption of rational expectations is given in Chapter 8 and the discussion is illustrated with results from the macro-econometric model. This should be of considerable use to readers, given that other simulation results assuming rational expectations, and based on econometric models estimated from historical data, are derived from the models of the large forecasting groups, which are generally much more difficult to understand than the small model presented here.

Other major features of the book

In addition to deriving and making widespread use of its own small macro-econometric model, the book discusses the large models of the main UK forecasting groups. The history and objectives of the groups are described in Chapter 1, and after a review of their track record in Chapter 6, there is a discussion of the properties of the models in Chapter 7. Rather than attempt a full description of the models as they were in one particular year, which would inevitably be out-dated as the models are continuously changed, and which might obscure overall properties by concentrating on detail, this chapter examines the development of the models, explaining how small changes can affect the properties of the whole system. The small macro-econometric model used throughout the book is shown to have many features in common with recent versions of the much larger London Business School model. Chapter 7 also discusses likely areas for future research by the forecasting teams.

The emphasis on practical problems and the use of illustrations from real life extend throughout the book. The principles of conjunctural

analysis, discussed in Chapter 2, are illustrated in Chapter 3 with a week-by-week account of developments in the UK during the final months of 1983, a period when the strength of economic recovery was highly uncertain. This discussion draws on the economic data, survey evidence, newspaper reports and other information as it was available at that time, and shows how this evidence is balanced against the results from the macro-econometric model used elsewhere in the book. The discussion of econometrics in Chapter 4 is based around a worked example, using a consumers' expenditure equation for the UK estimated from data from the mid-1950s up to the early 1980s. This shows the importance of starting from a general equation incorporating many items, and then gradually testing to see if some of them can be excluded, or combined, so that the end result is the more restricted equation suggested by theory. Each stage of this process is described in considerable detail to aid those unfamiliar with applied econometrics, but the procedure is followed right through to some less elementary tests not always found in econometrics textbooks.

The discussion of policy issues towards the end of the book involves some of the most exciting aspects of macro-economics and some of the most recent developments. Chapter 8 describes, with illustrations, how the effect of government action is greatly altered by the credibility of its policy announcements. After a description of applying *optimal control* to macro-econometric models, which involves a systematic search for the most effective policy (but is difficult to implement in practice), this chapter then explains that the government will in general be unable to implement the best policy unless the public believes that it will keep its promises. This is because the best policy is usually *time inconsistent*, i.e. there will be a temptation for the government to renege on it some time after having announced it.

The book has been written so that it can be understood by those with limited mathematical ability, but not at the cost of omitting any important relevant ideas that are usually expressed in mathematical notation. Such ideas are discussed mainly in words, with a mathematical explanation in the form of a 'box' for those who want to read it. Such notes are auxiliary to the main discussion and may be passed over if the reader so wishes.

There is no glossary; instead, where a technical term is first defined, it appears in italics. These definitions can be located rapidly using the index, in which such terms appear in italics with the page number of their definition also in italics.

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The users and the forecasters

This chapter examines two of the main influences on the development of economic forecasting: the needs of those using forecasts and the structure of the groups producing forecasts. Events that indicate weaknesses in the forecasters' methods, and the evolution of economic theory, also have a very important influence and are discussed in Chapter 7.

1.1 The users

Policy making

Economic forecasting is central to government decision making in almost all major industrialized nations. It has retained this important position against a background, over the last fifteen years, of fierce controversy among economists about the ability of governments to influence the economy. When this controversy emerged in the early 1970s, the belief that fiscal and monetary policies can have large and sustained effects on unemployment was widespread among policy makers. Since then, an increasing number of governments around the world have changed to the view that such policies affect inflation but have little or no sustained effect on unemployment.

The continuing importance of forecasting for policy making against this background may appear surprising. Until the early 1970s, governments had a clear need for economic projections to help select and quantify the fiscal and monetary policies which they believed would have sustained effects on unemployment. For many present-day governments holding the contrary view, it might appear that economic forecasting has very limited use, because targets for monetary growth can be chosen with little or no reference to the economic relationships described by macro-econometric models.

However, the experience of the UK over the last ten years or so (under not only the Thatcher governments, but also the Callaghan-Healey administration which introduced monetary targeting to the UK) has shown that such governments also need economic forecasting. They need it to indicate the size of government borrowing that is consistent with their monetary growth targets, to suggest expenditure plans and tax rates which give that amount of borrowing, and to give some idea of the impact on interest rates and the exchange rate.

Whatever the viewpoint of the government, there are always groups anxious to influence its policies, and their use of economic forecasting and conjunctural analysis has become more widespread and more sophisticated over the last ten or fifteen years. Since 1975 the Confederation of British Industry (CBI) has published budget recommendations which include a full analysis of the prospects for the economy and for government finances, both on existing policies and under the organization's own proposals. The Trades Union Congress (TUC) policy recommendations have been based on a similar degree of analysis in recent years.

Pressure groups with fewer resources than the TUC or CBI also occasionally produce policy recommendations supported by projections on macro-econometric models. An example was the call for increased construction expenditure made by the Federation of Civil Engineering Contractors (FCEC) in 1981. See FCEC (1981). However, many pressure groups, even when campaigning for fairly large fiscal measures (for example, to help the old) give no indication of the macro-economic impact of their proposals.

In addition MPs on the important House of Commons Treasury and Civil Service Committee have used economic forecasts and macro-econometric models to examine critically the government's policies. This has been done partly through the House of Commons Library's membership of a commercial group that makes the Treasury model available to MPs, and partly by commissioning work directly from independent forecasting groups.

Companies and individuals

Almost all organizations and individuals in the economy make plans which involve assessment of the current and likely future state of the economy. The plans include large-scale investment by big companies, which may depend on prospects for the exchange rate, consumer spending and other macro-economic variables; the pay claims submitted by trade unions, which will be influenced by beliefs about the outlook for price inflation; and personal decisions to buy homes, which will be affected by the expected course of interest rates. In all these cases the decision will also be influenced by important factors which affect the organization or the individual, but not the whole of the economy. Depending on the relative importance for the decision being made, and on the total resources available for obtaining information, so the effort and expense used to find out about current and likely developments in the economy will vary.

At one extreme, most individuals and many companies, particularly small and medium-sized firms, make no use of economic forecasts apart from extracting projections of inflation, and also perhaps output, from the widely published press reports. Companies use these mainly for pay bargaining and possibly for planning costs and prices. The regular coverage given to the output of the main forecasting groups is particularly full in the *Financial Times*, which also publishes from time to time tables

comparing all the main groups' forecasts for principal items. A problem with the publicity given by the media is that typically the limitations of forecasts are either ignored or over-emphasized. By contrast, the forecasting groups themselves generally try to indicate that although considerable uncertainty exists it can, in principle at least, be quantified. (See Chapter 6.)

For those who need more information than is available in the media, there are detailed publications produced by the groups that prepare the forecasts. In total, between five and ten thousand subscriptions to these publications are probably sold in the UK, at a cost from about £30 a year (for the quarterly *National Institute Economic Review*) up to around £600. These publications include analysis of recent developments, short-term projections reaching about two years into the future, and sometimes medium-term forecasts (about five years ahead). Assumptions are given for government policy and for main aspects of the world economy and the forecasts cover important items in the domestic economy, such as gross domestic product (GDP), inflation, unemployment, the current account and public borrowing (the PSBR). Other items such as output and investment by sector are sometimes included, to varying degrees of detail.

No service is offered by the forecasters to those who subscribe to their publications, although they will answer occasional enquiries. Large companies that want more information and assistance join one or more of the *forecasting clubs* run by several of the forecasting groups. In return for an annual subscription, typically several thousand pounds, such companies usually obtain briefings on the forecasts, access to the finalized forecasts perhaps several weeks ahead of publication, in greater detail than is generally available, and the facility to run the club's model on the companies' own assumptions often at an extra fee. The total number of firms belonging to such clubs in the UK is believed to be between seventy-five and a hundred.

A main attraction of this sort of access to a macro-econometric model is that it enables a company to tackle the problem of uncertainty about the future, by quantifying the effect on their business if the forecasts turn out differently from the view given by the forecasting groups. A large company selling consumer durables, for example, might use a macro-econometric model to investigate the impact of changes in interest rates on market size.

In addition to the forecasting clubs, an increasing number of consultancy services are now based partly on the use of macro-economic forecasts. In return for a substantial fee, companies are offered specialized projections for their industry, perhaps in conjunction with advice about their management methods. For example, Cambridge Econometrics (see Section 1.2) uses a disaggregated model to give forecasts of any sector of interest to a client.

Although very large companies often make use of the macro-econometric models of the forecasting groups in the ways described

above, none of them has a comparable model of their own, although some have small or specialized models. The reason is that setting up a macro-econometric model, modifying it when new data or new theories indicate inadequacies, and obtaining the latest historical data require very considerable, specialized resources.

Despite the growth in the use of macro-economic forecasts by companies over the last fifteen years, many features in the models remain more appropriate to their original purpose of advising government than to the newer role of aiding business planning. A major reason for the large size of the Treasury model, for example, is the inclusion of many different types of tax instruments and detailed modelling of the public sector. Without this detail the model would be significantly cheaper and quicker to use, but just as useful to companies.

Another problem for companies is that modelling expediency can take priority over their needs. An example of this is given by the aggregation of all private non-residential fixed investment into a single item in the 1984 version of the LBS model, an expedient adopted to avoid problems that were resulting from re-classification of investment among different parts of the private sector as leasing grew. This was a severe drawback for commercial users, anxious to distinguish, for example, between manufacturing investment in plant and machinery (machine tools, robots, etc.) and distributive trades investment in construction (new supermarkets, warehouses, etc.).

The use of macro-econometric models for research

Economists from outside the forecasting groups rarely make use of macro-econometric models when evaluating theories. Typically, they write down an equation, the theory indicating which items to include; the equation is estimated from historical data, and the results are tested to see if they are consistent with the theory.

It would be possible to make an additional test by inserting this new equation into a macro-econometric model, probably replacing an existing part of the model. If this altered the properties of the whole system from sensible to implausible, it might be possible to conclude that the new equation was unsatisfactory; but this is often not possible, for there may have been offsetting errors before the change. This is one of the main reasons why economists from outside the forecasting groups rarely use macro-econometric models in this way. Another reason is that access to the macro-econometric models for such economists is difficult, although the new macro-econometric modelling bureau makes these models more accessible. This bureau is described in the next section.

The forecasting groups themselves carry out a considerable amount of research work, most of which is incorporated into their macro-econometric models. These groups share many objectives with other researchers, but when new data or developments in economic theory indicate inadequacies in an existing macro-econometric model, they can