Global and National Macroeconometric Modelling

A Long-Run Structural Approach

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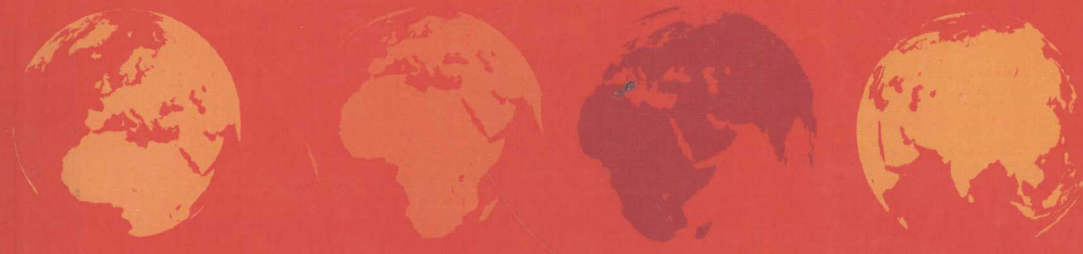

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Global and National Macroeconometric Modelling: A Long-Run Structural Approach

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Preface to Paperback Edition

The recent financial crisis and the subsequent widespread economic depression in the industrialised economies and some of the emerging economies have highlighted the increasingly interdependent nature of the world economy and the financial markets in particular. Shocks to one economy or market transmit, often rapidly, to other economies or markets and tend to accentuate the risks of downturns. The repercussions of the recent crisis are still being felt as public sector debt levels have risen rapidly and the sovereign debt crises currently being experienced in many countries are causing financial disruption and are likely to lead to further rounds of macroeconomic adjustments.

Against this background, the validity and usefulness of DSGE modelling, as currently practised and probably representing the predominant approach to macroeconomic modelling today, has come under question. Many of the DSGE models used by central bankers did not include the foreign, financial, and housing variables that proved crucial to the transmission of the crisis. These models also included a very limited treatment of fiscal policy or debt management. DSGE models have provided many theoretical insights but their insistence on a particular type of micro-founded theory and on particular approaches to identification and estimation has been at the expense of adequately representing the data and of being relevant to the central policy issues of concern.

The long-run structural approach to macroeconometric modelling developed in this volume provides a more flexible framework which can be, and has been, successfully used in modelling exercises to take account of interactions between real and financial variables as well as the economic connections across markets and economies. Under this approach, economic theory is used pragmatically to provide lists of variables that interact strongly, flag up crucial constraints of the sort that determine long-run relations, suggest restrictions on the signs of the interaction between variables, and provide guidance on functional forms. The approach emphasises the long-run relationships that exist between variables and recognises the role

they play in influencing macroeconomic dynamics, letting the data pin down the transitory dynamics rather than imposing strong prior views on them. The approach reflects the view that short-run interactions are often governed by political and institutional factors rather than specific calculations by a representative agent operating in a stylised environment. In contrast, long-run theoretical relations, driven by arbitrage opportunities, tend to be determined by long-run economic calculations and less by short-term institutional or political constraints. The flexibility of the approach and its pragmatic blend of theory and evidence mean that the long-run structural modelling approach takes the data seriously and provides a means of obtaining an economically meaningful interpretation of the events that show in the data without the theory becoming a straitjacket.

Since the publication of the first edition of this volume in 2006, the long-run structural modelling approach has been applied in a wide range of academic analyses and has informed and been adopted in work by many international agencies including the European Central Bank, the IMF, the Inter-American Development Bank, Banque de France, and Swiss National Bank, among others. The approach has also been associated with a surge of interest in the literature in two important related areas, in particular:

First, the approach has promoted the detailed study of global and regional interactions through the GVAR methodology. Here, economies are tied together through the careful construction of separate measures of 'foreign' variables in each of the separate national models. The GVAR methodology allows one to decouple a model of the world economy into subsystems so that country-specific models can be estimated separately but consistently and then analysed simultaneously taking into account that all the variables in the global model are endogenous and interlinked. The technique, therefore, sidesteps the curse of dimensionality that usually affects the analysis of large interconnected systems and this explains why the techniques have been widely taken up. Recent research in this area has resulted in a range of papers and procedures that have been widely employed in policy analysis and forecasting, brought together in the *GVAR Toolbox* available at http://www-cfap.jbs.cam.ac.uk/research/gvartoolbox/index.html.

Secondly, the approach of the book has prompted new developments in the area of decision-making using macroeconometric models and in particular in the production of forecasts (of point estimates, densities, and event probabilities) for use in decision-making based on the information available in real-time. The VAR methods at the heart of the

long-run structural approach provide easy-to-estimate models and can be readily investigated through simulation. For these reasons, the approach can take full advantage of model averaging methods used in forecasting to take into account model and regime uncertainties that surround policy advice and it can be used to present forecasts in a way that is useful for decision-makers. The models can also be easily re-estimated as new information becomes available and so can fully exploit the real-time datasets that are now widely available, containing the entire history of data vintages as they were published (not just the most recent single vintage) and including direct measures of expectations obtained from surveys to reflect agents' beliefs as expressed in real time. Therefore, the approach is extremely useful in understanding and informing real world decision-making. Research in this area has grown rapidly over recent years and is discussed in the research programme described at http://www.nottingham.ac.uk/cfcm/research/decision-making-using-macroeconomic-models-research-programme.aspx.

The research described in the book has proved useful to a range of policy- and decision-makers and has formed the launch pad for subsequent work in many areas of macroeconometric modelling and forecasting. Recent economic developments have once again highlighted the importance of allowing for the complexities of macroeconomic and financial systems and their interactions. The gains from doing so remain as important as ever and we are pleased that the long-run structural approach has proven useful in helping decision-makers to build statistically adequate models that are at the same time useful in policy analysis and forecasting even in testing times.

November 2011

Preface

National and global macroeconometric modelling has had a long and venerable history in the UK, with important implications for macroeconomic policy in general and monetary policy in particular. It is an activity that involves sustained research input of several investigators with a variety of skills. The present work is not an exception and its completion has required the enthusiasm and commitment of a large number of individuals and institutions. It was given initial impetus by funding from the UK's Economic and Social Research Council (Grant no. L116251016) and from the Newton Trust of Trinity College, Cambridge (under Anil Seal), to whom we are very grateful. They funded a project on 'Structural Modelling of the UK Economy within a VAR Framework using Quarterly and Monthly Data', conceived and originally housed in the Department of Applied Economics (DAE) at the University of Cambridge in the mid-1990s. The authors all worked at Cambridge at the time, along with Brian Henry and Martin Weale who were also co-applicants on the project. Although the team dispersed over the years (Garratt to Leicester and then Birkbeck; Henry to LBS and then Oxford; Lee to Leicester; Shin to Edinburgh and Leeds; and Weale to the National Institute), we remain very grateful for the resources and congenial atmosphere provided by co-researchers and colleagues during our time working at and visiting the DAE.

The research associated with the project extended well beyond the original intentions of the funded project, however, and has benefited from the help and expertise of many friends and colleagues. We are particularly grateful to Richard Smith and Ron Smith, who have collaborated with us and made essential contributions to various aspects of the work in the book, and we have received invaluable comments from Manuel Arrelano, Michael Binder, Carlo Favero, Paul Fisher, Clive Granger, David Hendry, Cheng Hsiao, George Kapetanios, Adrian Pagan, Bahram Pesaran, Til Schuermann, James Stock, Ken Wallis and Mike Wickens. The book draws on material from a variety of our published journal articles also, and we are particularly grateful to the constructive and enlightening comments

received from the editors and referees of *Econometric Reviews* (especially regarding parts of the material of Chapter 6), *Economic Journal* (Chapters 4 and 9), *Economics Letters* (Chapter 6), *Journal of the American Statistical Association* (Chapters 7 and 11) and *Journal of Econometrics* (Chapter 6). And the project has also been assisted greatly by the contributions of Yoga Affandi, Mutita Akusuwan, Mahid Barakchian, James Mitchell, Dimitrios Papaikonomou and Eduardo Salazar.

While we have been keen to disseminate various aspects of our work in the form of publications in academic journals, it was always our intention to write up the project in the form of a book describing the entire process of model building, including the methodology tying the economics and the econometric techniques together, descriptions of the data collection and analysis, and the use of the model in various decision-making contexts. We hope that our description will increase transparency on the process of model building. In the light of new economic and econometric ideas, and with the advent of fast and readily available computing power, macroeconometric model-building is an activity that can be widely pursued for a better understanding of national and global economies and their interlinkages. We hope this book serves to reduce the investment required in the first stages of the sustained effort required in building and using macroeconometric models.

November 2005

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