prices which are second best efficient subject to a break-even constraint. The predictions of the two papers are thus radically different, depending on the presence or absence of sunk costs, and the number of potential rivals.

The importance of beliefs emerges strongly in the papers on entry deterrence, notably in the fine paper by Gilbert. Entry deterrence is difficult if the post-entry game is Nash-Cournot, very easy if Nash-Betrand, and extremely difficult if potential entrants anticipate collusive behaviour. Both this paper and the previous one on dominant firms by Encaoua, Geroski and Jacquemin take care to distinguish between the *desirability* and the *credibility* of entry deterrence, given the nature of the post-entry game. There is a paradox involved, for in the section on collusion and oligopoly, the papers discuss the evident desirability of collusive behaviour, and the problems of sustaining such cartel behaviour. d'Aspremont and Gabszewicz investigate cartel stability by asking whether individual firms will wish to leave the cartel, though they stop short of a repeated game formulation in which firms adopt punishment strategies against deviations from collusion. Salop discusses a range of practices which facilitate oligopolistic co-ordination, such as *most-favoured-nation* clauses, and *meeting competition* clauses. Some of these also facilitate entry deterrence, but to the extent that stable collusive outcomes are likely to emerge in the industry, it will be subject to the intensively competitive force of entry.

I found almost all the papers interesting, as was to be expected from the topics covered and the authors chosen. The subject has moved on in the four years since the conference was held, and has numerous other dimensions not covered in the volume (one thinks of recent developments in trade policy in the presence of imperfectly competitive firms) but it is a measure of the quality of the papers presented here that they remain valuable sources and a stimulus to further research. Graduate students looking for interesting thesis topics would be well advised to read the book, but all students and teachers attempting to keep up in an exciting and rapidly developing field will enjoy this collection.

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New Developments in Applied General Equilibrium Analysis. Edited by JOHN PIGGOT and JOHN WHALLEY. (Cambridge: Cambridge University Press, 1985. Pp. 465. £25.00 hardback.)

Applied general equilibrium (AGE) analysis traces its roots to the work of Harberger and Johansen in the early 1970s. It is now a rapidly growing field. This book is the proceedings of a conference that was held at the Australian National University in 1983 and that brought together a number of then recent contributors to this field. The book itself is evidence of the large amount of activity in this area. In fact, it is one of (at least) three such conference volumes that have been published in the last three years, the others being *Applied General Equilibrium Analysis*, edited by H. E. Scarf and J. B. Shoven (1984), and *Economic Equilibrium: Model Formulation and Solution*, edited by A. S. Manne (1985).

Until recently, contributions to AGE analysis often read like those early

economics articles that used regression techniques and had to explain the basics of least-squares before doing anything else. This stage is now past. The fifteen papers in this book all take the use of AGE analysis in policy evaluation as an accepted starting point. From there they go in many different directions.

The advantage of the AGE model over other quantitative models is that it is grounded in a well-understood theory of individual maximization. This greatly helps us to organize our thinking about economic phenomena (although some claim that it imposes an intellectual straight-jacket) and to communicate this thinking to others. It also allows us to compare, in quantitative terms, the relative importance of different, and often opposing, effects of economic policy, particularly on individual welfare. Most of the authors in this volume are concerned with the question of how seriously we should take AGE models as empirical exercises.

Whalley, in the first paper, stresses the tension between the need for more validation of simulation results and the need for a recognition of the subjectivity of these results, their dependence on the preconceptions and the prejudices of the modeller. This tension, he argues, is not endemic to AGE models but is pervasive in all empirically based economic models.

Pagan and Shannon in their paper, and Harrison and Kimbell in theirs, explore the use of systematic sensitivity analysis of the parameters of AGE models that have been constructed using the calibration approach. Since data limitations often dictate the use of this approach, well-defined conventions are needed for measuring and communicating the sensitivity, or lack of it, of simulation results to closure rules and to choices of elasticities. Many simulation results are robust, many are not. Unfortunately, as Harrison and Kimbell point out, 'criticism based on suspicion of the particular empirical calibration adopted currently leads to non-systematic and/or uniformed debate.' The introduction of systematic sensitivity analysis would go a long way toward making this debate more informed.

An alternative to the calibration approach is econometrically to estimate the parameters of an AGE model. Jorgenson and Slesnick explore the possibility of incorporating an econometric model of consumer behaviour into an AGE model of the US economy. This paper is representative of a major research program being conducted by Jorgenson and coworkers to combine AGE modelling with more traditional econometric practice. Thus far their approach seems very promising.

Three papers deal with issues that overlap heavily into macroeconomics: Slemrod presents an AGE model of financial markets. Ballard and Goulder experiment with alternative specifications of consumers' expectations formation in a tax policy model. Cooper, McLaren, and Powell use a short-run macro model to provide the closure for an AGE model. If AGE modellers are to take seriously the task of validating model results, they need to pay more attention to short-run macroeconomic phenomena. There is certainly more room for interaction between AGE modellers and macroeconomists, like Lucas and Kydland and Prescott, who are sympathetic to the general equilibrium approach.

Additional papers explore a variety of topics: alternatives for measuring welfare gains and losses in AGE models, the gains to individual countries of membership in the EEC, tariffs and protectionism in Australia and Canada, interest rate and price rigidities, and the use of AGE models in the study of economic history. One fascinating paper analyzes the impact of tax policy on the Australian wine industry.

This book has all the vices and virtues of a conference volume. On one hand, the papers are uneven in terms of length, level of presentation, and quality. On the other, the diversity of approaches give the reader a good overview of the field. Furthermore, there is a sense of excitement and challenge that runs throughout the book. It would be difficult to recommend this book as an introduction AGE analysis: it is not systematic enough. Nevertheless, researchers, teachers, and graduate students will find it a useful reference to the wide variety of open research topics in this field. It neither dominates nor is dominated by either of the two volumes cited previously.

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General Equilibrium Trade Policy Modeling. Edited by T. N. SRINIVASAN and JOHN WHALLEY. (Cambridge, Massachusetts & London: The MIT Press, 1986. Pp. vii + 360. £39.95 hardback.)

This volume results from a conference organised by the International Research Centre at Columbia University in April 1984. It addresses the issue of how computable general equilibrium models can be utilised to analyse international trade policy problems. The editors, John Whalley and T. N. Srinivasan, are among the pioneers of this relatively recent development in trade policy evaluation. The origins of numerical general equilibrium trade policy analysis lie in the work in the early 1970s on the computational approach to general equilibrium. The result of this work has been to produce models which incorporate specifications (functional forms and parameter values) of production and demand behaviour in the fashion of Arrow-Debreu. The models are then 'solved' for alternative policy regimes, thereby enabling assessment of the general equilibrium impact of trade policy changes. The scope for application of such models, in the context of trade policy options for individual countries (developed and developing), and for bilateral and multilateral initiatives, is clearly considerable. This book constitutes therefore a valuable contribution to an important and growing literature. It brings together a range of techniques and assumptions about specification, which will increase the accessibility of the literature to both academic and policy making communities.

The assimilation by a wider and less-specialised audience of this type of modeling is helped in two ways by this book. On the one hand the editors, along with Deborah Fretz, in a very useful introductory section, provide a summary of the characteristics and structural features of the alternative models used by the contributors, of the data and key elasticity parameters used in specifying the models, and of the results and implications for trade policy. On the other