

Preface

The MDEF Workshop has been held at the University of Urbino since 2000. The 2014 Workshop is particularly dedicated to Carl Chiarella for his 70th birthday. As the second home (along with the University of Bielefeld, another second home), Carl visited Urbino in 1998 for the first time and the visit has become an almost annual event since then. In order to commemorate the occasion, a number of Carl's colleagues from around the world gladly agreed to contribute chapters to a special book dedicated to this event. The book is the outcome of this process. It contains the latest developments in nonlinear economic dynamics, financial market modeling, and quantitative finance, the three most active research areas Carl has been involved in.

This book is a collection of essays written by colleagues of Carl Chiarella in honour of his 70th birthday. Most of the authors have been collaborating with Carl in the past. We would first of all like to thank Laura Gardini and Gian Italo Bischi for stimulating discussion on the initiation of this special book and suggestion to dedicate it to Carl's 70th birthday in the 2014 MDEF Workshop. We would also like to express our gratitude to all contributors and in particular those who have collaborated with Carl, as well as to the referees involved in the review process. Finally, we would like to acknowledge the assistance of Kai Li who has worked on the book under much pressure.

Born in March 1944 in Sydney, Carl realized in his final high school years that he wanted to do something in life that would involve the use of mathematics, although that "something" would involve economics and finance was totally absent from his mind then. After completing his B.Sc. (Hons.) from the University of Sydney in 1965, Carl completed an M.Sc. at the University of Sydney in 1967, a Ph.D. at the University of New South Wales in 1969 in applied mathematics, and wrote a thesis on nuclear reactor physics. After spending two years at the University of Nancy as a postdoc Carl returned to Australia in 1971, and joined the School of Mathematical Science at University of Technology, Sydney (UTS). He has built his entire subsequent career at UTS since then (apart from a three year spell at the University of New South Wales from 1986 to 1989).

From his teenage years, Carl had an interest in the origins of the economic cycle. Despite heavy teaching load, Carl managed to pursue his long held interest in economics and completed a Master of Commerce in 1977 and a second Ph.D. in Economics at the University of New South Wales in 1988. His Ph.D. thesis was on

the nonlinear viewpoint in economics. The thesis led to his first book, *The Elements of a Nonlinear Theory of Economic Dynamics*, published in the Springer-Verlag Lecture Note Series in 1990. In 1989, Carl was appointed as a Professor in the School of Finance and Economics at UTS, a position that he still occupies. Apart from his early work on nuclear reactor theory, Carl has made numerous scientific achievements and important contributions to the economics and finance area, in particular to nonlinear dynamic economic, financial market modeling, and option pricing.

As a mathematical economist, Carl has a strong research interest in modeling key economic adjustment processes as nonlinear dynamical systems. Carl's earlier work on chaotic economic dynamics in 1980s, in particular *The Cobweb Model: Its Instability and the Onset of Chaos* published in *Economic Modeling* in 1988 and *The Dynamics of Speculative Behaviour*, published in *Annals of Operations Research* in 1992, have been pioneering contributions in this area, which had profound influence on many researchers in this field. Carl has made a significant contribution to at least two areas of dynamic economic modeling. The first is on out-of-equilibrium models of macroeconomic dynamics. It develops a systematic approach to the disequilibrium tradition of macroeconomic dynamic analysis, leading to nine jointly authored books (with Peter Flaschel and others) on integrated Keynesian dynamic macroeconomic models, including three with Cambridge University Press and three with Springer-Verlag. The other is on financial market models with heterogeneous boundedly rational economic agents, showing that price movements of financial assets are the result of nonlinear dynamic feedback processes driven by the interaction of investors with heterogeneous beliefs and bounded rationality.

Through his many conferences and visits, the University of Urbino and the University of Bielefeld have become second home for Carl. Carl's visits to Urbino started in 1998 and have become regular since then. The attraction of Urbino for Carl is not only the glorious history, beautiful palaces, and churches, but also a group of brilliant researchers around Laura and Gian Italo in the theory of nonlinear dynamical systems. Through the Vienna Workshops on Economic Dynamics initiated by Gustav Feichtinger, Carl established his intensive research collaboration with the research groups around Peter Flaschel, Willi Semmler, and Volker Böhm in Bielefeld. Carl's collaborations with these groups belong to the highlights of his career.

As one of the main organizers of the annual Quantitative Methods in Finance conference at UTS since 1997, Carl has made a significant contribution to American option pricing, where he has mainly contributed to the development and numerical implementation of various solution methods. He has also been active in pricing interest rate derivative securities along two directions. The first is to implement on market data the various interest rate term structure and interest rate derivative pricing models that have been developed over the last two decades using nonlinear filtering and Bayesian updating methods. The second consists in finding improved computational procedures within the stochastic calculus framework of the term structure and option prices by allowing the volatility function of

the Heath–Jarrow–Morton model to depend on the forward rate, and allowing for jump-processes in the underlying forward rate dynamics of this framework.

Carl has published more than 15 books and 200 papers, supervised more than 10 Ph.D. students, been involved in more than 30 research projects including the Australian Research Council (ARC) Discovery Grants. He was the Co-Editor of the *Journal of Economic Dynamics and Control* from 2004 to 2012 and has been Associate Editor of many leading finance and economics journals, including *Journal of Economic Behavior and Organization*, *Macroeconomic Dynamics*, *Computational Economics*, *Studies in Nonlinear Dynamics and Econometrics*, *European Journal of Finance*, *Quantitative Finance*, and *Asia-Pacific Financial Markets*. Of course, this is not a full list of Carl's numerous scientific achievements. The papers in this book deal with some of the many research topics Carl has addressed in many of his papers and books. They reflect the breadth of topics Carl has worked on during his career. We are grateful for the inspiration his work has given to all of us over so many years. Indeed his work inspires a new generation to further develop this exciting and challenging research agenda.

Bologna, April 2014
Sydney
Amsterdam

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Nonlinear Economic Dynamics and Financial Modelling

Essays in Honour of Carl Chiarella

Dieci, R.; He, X.-Z.; Hommes, C. (Eds.)

2014, XV, 389 p. 71 illus., Hardcover

ISBN: 978-3-319-07469-6