

THE WORLD IN THE MODEL

During the last two centuries, the way economic science is done has changed radically: it has become a social science based on mathematical models in place of words. This book describes and analyses that change – both historically and philosophically – using a series of case studies to illuminate the nature and the implications of this change. In format, it offers a tourist guide to economics by focussing on specific models, explaining how economists created them and how they reason with them. This book will be of interest to economists and science studies scholars (historians, sociologists, and philosophers of science). But it is not a technical book; it is written for the intelligent person who wants to understand how economics works from the inside out and particularly the ways in which economic models have shaped our beliefs and the world we live in.

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How Economists Work and Think

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London School of Economics

and

University of Amsterdam



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Preface

Science is messy. Historians write seamless accounts to make it comprehensible, and in doing so, sometimes paper over the knots and holes in scientific life. Philosophers provide sparsely argued analyses of scientific method, and in doing so may avoid the many awkward rubs of detail. This book is not such a monograph: It offers neither a continuous historical narrative nor a fortified philosophy of modelling. Yet, its ambition is to offer both a history of the naturalization of modelling in economics and a naturalized philosophy of science for economics. And it does so in the spirit of those many others who eschew smoothness.

So – this book is not a conventional monograph. It is a series of historical case studies through which the philosophical commentary runs. I have long described it as a kind of travel guide: I present, as three-star tourist sites, some of the best known, and historically significant, models in economics, and use each as the basis upon which to fashion a philosophical commentary about the nature of modern economics. But readers might also find this book something like a detective's case-book: my series of investigations, as I follow the clues and fit them together, to make sense of what economic modelling is all about. Case studies are the best way that I know to figure out how science goes on. Cases not only form individual stories that capture the practices of economic science in considerable depth, but taken together they provide the materials for a broader account of how economics became, and works, as a modelling science. The messy details are important – not just because, as we know, bald narratives lack credibility, but rather because the devil is often in the detail, and thus larger, and important, matters cannot be understood and explained without them. After all, what would detective novels be if the clues were omitted as *mere* detail to the argument?

What else does this book not do – and what does it do? It does not try to give a definition of models – but it does discuss the qualities that make them useful in a science. It does not suggest that there are different kinds of models, but it does illuminate the heterogeneity of objects that count as models. It does not suggest that models are easy to characterize, but it does argue that in order to understand them, we should pay attention to what models are used for, and how they are used. It is not

even-handed, but does argue that models are both very useful knowledge-makers in economics as well as being of limited use in that same domain. It is not a critique of modelling, but it does make clear how and why they may be criticised as well as how and why they may be valued.

Fifteen years of researching, thinking, and writing about models have convinced me that there are no easy answers to questions about what models are, and how modelling works. Some questions are more helpful than others. Asking: What qualities do models need to make them useful in a science? and What functions do models play in a science? are more fruitful than asking What are models? Asking: How does reasoning with models go on? and What kind of knowledge does a science gain from its investigations with models? prompt an account of modelling (in economics) as an autonomous epistemic genre: that is, as a way of doing science that has its own rationale just as do other modes of science. Answering these questions is the agenda for this book.

But those fifteen years have also persuaded me that there are lots of different kinds of things that legitimately count as models in other sciences, and that they often look and function very differently in those other sciences. Comparisons between model-based sciences are extremely useful; they operate here, only gently, as a foil. Fifteen years have also taught me that looking for how a science becomes a model-based discipline requires attention not just to the scientific modes of reasoning, but also to questions of perception and cognition as well as to qualities of imagination and creativity. The arts cannot be entirely taken out of the sciences.

I am delighted to thank all those many scholars who have helped me, argued with me, discussed issues, commented upon chapters, and generally become involved in my attempt to understand modelling. I hope that I have captured most of these by name in acknowledgement notes attached to each chapter – of course none of them are responsible for my not always taking their advice. Special thanks go to Margaret Morrison and Nancy Cartwright who were significant research partners at the beginning of my research; to Marcel Boumans, Harro Maas, and Roy Weintraub who engaged with my work throughout; and to a cohort of graduate students at LSE and in The Netherlands who responded to my enthusiasm for models in a variety of fruitful ways. Such special thanks also go to the anonymous readers for the Press, and to others who read the manuscript as a whole, for their many generous and positive pieces of advice (which, unfortunately, sometimes conflicted with each other); to Aashish Velkar who sorted out the permissions and acknowledgements; to Simona Valeriani who looked after the many figures; to Tracy Keefe and Rajashri Ravindranathan who saw the manuscript through publication; and finally to Jon Adams for his brilliant red cover design and to Scott Parris at Cambridge University Press, whose patience has been unfailing. I am grateful to the Wissenschaftskolleg in Berlin for hosting my first research work on the topic (for several months in 1995–6), to the British Academy for a Research Readership (for a second block of time in 1999–2001), and to my Department of Economic

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History at the London School of Economics and my History and Philosophy of Economics group in the Faculty of Economics and Econometrics at the University of Amsterdam who have supported my work throughout. It has been a long fifteen years, but in my defence – several other things happened on the way!

Mary S. Morgan

December 2010