Book Reviews

NEUROECONOMICS – DECISION MAKING AND THE BRAIN, P.W. Glimcher, C.F. Camerer, E. Fehr and R.A. Poldrack, Elsevier Academic Press, London, 2009, 538 pages, ISBN 978-0-12-374176-9

Neuroeconomics, which is both the subject and title of this book by Paul Glimcher and his collaborators, has been a vague and weakly defined term used by economists, psychologists and neuroscientists in recent years. It is now beginning to grow into a more defined field, trying to integrate economic theories of decision making, psychological insights on people's behaviour and understanding of neural functioning in the human brain. Using synergies between those three approaches, neuroeconomics seeks to explain choice behaviour in the terms of brain processing. The main tool of this analysis has been the use of brain scan images recorded during human decision making in experiments. The brain pictures are consequently related to and interpreted in the context of revealed decisions that were taken at the time of the recording. Furthermore, the data generated on human subjects is supplemented with insights from experiments on animal behaviour, an approach with a long-lasting tradition in psychological and neuroscientific research.

Especially economists have shown great interest in research results provided by neuroeconomics, hoping to gain a better understanding of economic choices made by individuals. The book is part of as well as a response to this development and represents the first general and comprehensive attempt to summarise major findings. It sets out to answer central questions and to establish a common standard for future teaching and research within neuroeconomics. It does so by gathering together many of the leading researchers within the field and draws on the expertise of specialists for the more specific questions. As such, the book covers much of what may soon become mainstream neuroeconomics, skipping broad claims and romanticised future outlooks and going straight to the interesting and twisted questions within the field.

The book explains neuroeconomics throughout 32 chapters, which are grouped into 4 parts and framed by an introductory preface and some general, concluding remarks. It addresses a diverse array of topics that represent most of the building blocks of neuroeconomics. The parts are not hierarchical, but designed such that readers from different disciplines can decide which will serve as the best starting point. Each part includes an introductory chapter that sketches the angle from which neuroeconomics will be approached. The subsequent chapters then go into the particular research results and outline the respective literature. All of the chapters throughout the book are self-sufficient, such that the reader can select which topics will be of interest and which are less relevant without losing the overall context.

For example, chapter 16 studies the role of emotion in neuroeconomics. It is a contribution by E. Phelps, who is active at the Center for Neuroeconomics, a research center designed to support NYU (junior) researchers from different disciplines that are interested in neuroeconomic research. Chapter 16 begins with a commonsense definition and categorisation of emotion. It does so by outlining the role of emotion as a "relevance detector" in psychology, similar to the role preferences have in economics. Emotion goes beyond perceived feelings, but is rather characterised by observable bodily reactions to stimuli. Furthermore, emotional reactions are relatively discrete and characterised by high intensity – in contrast to persistent and low-intensity moods. The role of emotion in decision-making is that it influences choices, but does not directly determine outcomes. The chapter goes on to outline how emotion can be measured and reasonably be connected to economic choices. Psychological and neuroeconomic research usually use manipulations of emotion, mostly employing the approach-withdrawal relation, an emotional category that can also be observed in animal research. The chapter then outlines main methods used in experiments to evaluate emotion, including information from facial expressions, brain scans and skin conductance measures. It also explains the problem of "reverse inference", i.e. that emotion and decisions are recorded at one point in time and then combined in order to derive causal relationships which are, however, not deductively valid. This in turn establishes a link between the broad term of emotion and reasons for why economic researchers are interested in analysing pictures of brain activity. The chapter finishes with the problem of disentangling emotion and cognition, finally pointing out how difficult it is to identify singular effects in terms of body responses dependent on a specific emotion (and not on cognitive reactions).

My experience of reading Neuroeconomics has been mixed, not least due to its structure of free-standing chapters. From the very start, I had been eagerly anticipating to know more about neuroeconomics and was questioning in which way this field could add to my understanding of economics. I was curious to learn what insights economists could integrate from diverse fields such as psychology and neuroscience and I was interested how economics could contribute to those other fields. Some of these expectations were met, as some chapters offered valuable insights on questions like: What can economists learn from behavioural research on animals? Can decisions be recorded on brain scans? Why does people's evaluation of outcomes sometimes differ from their actions? How important is reference-dependence in decision tasks for evaluation and rewarding in the brain? Are social preferences altruistic or selfish? Are decision-making patterns learned or inherited and in how far might they be observable in other species? Is it worthwhile analysing neural processes to improve understanding of economic decisions? These examples and many more questions are addressed within the book, partly answered to a highly detailed degree, partly providing first evidence and opening avenues for future research.

While Neuroeconomics succeeds at addressing many interesting questions it fails on its goal, which is outlined in the preface, to be a comprehensive collection of the literature in the field. Rather, the chapters sometimes appear to be put together in a hasty and unsystematic manner as if neuroeconomics could not be defined. From reading the book, it seems that just about anything that has a connection to economic choices, experiments and has some neural underlying could be labelled as neuroeconomics. This makes it difficult to comprehend how the puzzle of the different articles will fit together and what picture is finally to arise from this. Rather, the chapters often appear like microscopically elaborate descriptions of details, while the reader is still asking: "Details of what?" This might in part be due to the nature of this emerging field, but the editors of the book remain too ambiguous if the book is designed to help the reader overcome the confusion or if the book is meant as an invitation for even more research ideas to be included.

This main criticism of Neuroeconomics springs from and merges into the major and unanswered question of whom the book addresses. Without a doubt, Neuroeconomics includes many insightful papers, but is there more to it than a related, but somewhat arbitrary literature collection? And who should finally read this collection? The complexity of the topics would attract only few undergraduate students and non-academic readers. Even advanced or graduate students would need to have some intermediate knowledge of economics, psychology and neuroscience to understand all chapters. Finally, (senior) researchers would probably abstain from reading through the book in its entirety and read selected papers from already familiar sources instead. For this researcher group it appears even more critical that neuroeconomics would have to compete with pre-existing research interests. However, the book often fails to get the reader excited about its content and to arouse the reader's curiosity for the next chapter having just finished the previous. Instead, the most opinion-creating parts of the book are those that fundamentally question the usefulness of neuroeconomics. Almost contrarily, arguments for neuroeconomics are often scattered in fractionated details, leaving the reader uncomfortable with and reluctant towards any enthusiasm for this field. Basically missing the opportunity to make a clear statement and to defend the newly emerging field of neuroeconomics, only pointing out to some descriptive articles, but to no pamphlet in the literature, is disappointing. Even an overly biased opinion piece would not deprive the book of its scientific depth documented in over 30 fact-loaded articles! On the contrary, at least one such an article could help to define neuroeconomics, which remains blurred throughout the book, but is definitely needed.

Finally, despite all criticism it has to be acknowledged that Neuroeconomics is basically the first extensive book on this new and complex topic and is consequently the flagship of the field and guiding example for any possible successor. Due to its in-depth analysis it will be interesting to see if any books will be considerable alternatives despite of the shortcomings of this first edition of Neuroeconomics. Until such an alternative is available, anyone with an interest in neuroeconomics will be able to learn more from reading this book. It is available e.g. via www.elsevierdirect.com.

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AN INTRODUCTION TO CLIMATE CHANGE ECONOMICS AND POLICY, F.R. Fitzroy and E. Papyrakis, Earthscan Ltd, London, 2009, 214 pages, ISBN 978-1-844-07809-7

Anyone trying to sort out the seemingly inexplicable machinations that went on in Copenhagen should read 'An introduction to climate Change Economics and Policy'. Which is to say this book is an excellent way of updating your knowledge of the fast changing science, economics and policy on climate change issues and a useful window into how academics are approaching the issue. This exhortation is directed to students and members of the public and less so to those who are in the field of climate change.

The real strength of this book is its clear and logical short history of key developments in climate change science. Its message is blunt and rightly pessimistic about the international community's capacity to effectively deal with climate change. We are informed that past lack of action on environmental, and in particular climate change issues, means we are heading for a global food crisis. And rightly the authors hammer home that its the third world countries which have most to loose and therefore should be the focus of our concerns and policy prescriptions.

These stark predictions are based on the toxic mix of global population increases, profligate consumption and an obsession with conventional economic growth which are inexorably driving up GHG emissions. The authors note that current projections flowing from the IPCC's work now make a 2 degree increase in global temperatures all but inevitable. That assertion leads to a needed focus on the threat of uncontrolled climate change through environmental tipping points. The particularly critical assessment of Lord Nicholas Stern's report shows how quickly climate change science is moving on.

Fitzroy and Papyrakis point out that such is the extent of climate change's effects on our economies that a substantial rethinking and re- definition of some of the fundamental concepts of economics is needed and is already under way. The authors perform particularly well here by reviewing the utilitarian underpinnings of market economics, its translation into a preoccupation with growth, and its 'capture' by market fundamentalists who have used it to justify greed and selfishness in driving market economics. Supply-siders opposition to tax and welfare wealth redistributions is pointed to as part of this fundamentalist policy armoury. This in turn leads to a discussion on widening income distribution, the Easterlin paradox and the benefits of reducing this gap in terms of moderating consumption.

The book is also a useful primer on the basic concepts of sustainable economics – with references to weak sustainability, natural capital and genuine and genuine negative savings.

The global negotiations leading up to Copenhagen are well covered. The authors point to China's new role as the largest single contributor to global warming. This provides useful insights into China's negotiating gymnastics at Copenhagen and why poorer developing countries – which have most to loose from climate change - have gained very little from Copenhagen.

This account is good as far as it goes. But more might have been included on the politics behind these negotiations and where future negotiations might take us. There is reference to the need for a 'contraction and convergence ' scheme (involving a compensating allowance for population) in order to effect a cap on global emissions. However there is not a lot about the political issues involved. There is the view expressed that a top down comprehensive global cap and trade system might not be politically feasible but not a lot about whether the alternative of a national carbon pricing system is any more politically feasible or workable. Of course a thorough analysis of these issues is for those with a background in political issues and a different book.

The authors also usefully cover the issues of international trade, and the roles of multinationals and governance as key influence on climate change. Here the authors might have provided more balance in their analysis. While the perfidies of free trade and multinationals are rightly referred to acknowledgement of not just the costs but also some of the benefits for third world economies would have been welcomed. The same can be said for the coverage of the roles of the IMF and the World Bank in third world economic development. These institutions have both good and bad track records in assisting third world countries. Their future role in the transfer of climate change related funding to the third world could also bear mention.

There are other issues which also may not come under the purview of this book. That includes governance in third world countries. The authors argue that an increase in development assistance to the third world should be a major element of a successful global mitigation strategy. There are those who would argue however that governance issues among recipient countries could well nullify much of the effects of such a policy.

More generally the arguments in support of the package of mitigating prescriptions which could bring about a rapid reduction in global GHG emission needs more justification. The authors' centrepiece is wholesale reform of agricultural practices and in particular no-till agriculture. But in placing such a strong emphasis on this aspect there is need for more supportive information and references. A more comprehensive global analysis of both the positive and negative effects of increased precipitation and warming in all major agricultural regions would seem a good starting point.

There is also need for recognition that there is as yet no solid consensus on the relative cost benefits of the various means of green power generation and that technology is changing the relativities constantly. For example, the rejection of nuclear power is too unqualified as is the support of decentralised against centralised power generation. Better to suggest that given the lack of precision in cost benefit analysis, the market needs to play a central role to sort it out by putting a proper price on carbon. Absent too is any serious discuss of coal sequestration and more generally of the role of incentivising new green technology as part of the mix of tools to arrest carbon emissions. This is work, hopefully, for another chapter in a future edition.

While recognising the length constraints imposed on what is purposely a short layman's introduction to climate change, there is one further important omission. That is the critical role oceans play in climate change. This warrants a chapter of its own although to be fair, this oversight is too often shared by other writers on climate change who invariably display a land based bias. The oceans are after all the mother of all tipping points given they absorb some one third of all human induced carbon emissions. A more detailed coverage of why this capacity is under threat is needed together as is an explanation of how rising salinity and warming of the oceans are affecting weather patterns and the marine food chain.

A future expanded edition might usefully also discuss political impediments to reducing GHG both at a national and international level. That is, each mitigation prescription could be accompanied by reference to its political practicality. That might lead to some reordering of priorities in the light of this re-ranking. In this context a section on the historical trends and role of public corporate institutions in driving the climate change debate would have been useful. (Robert Reich's book "Supercaptialism" is a useful starting point with its explanation of how the countervailing power of public opinion, trade unions, and public environmental and consumer groups has been progressively and substantially weakened over the past 50 years.

Where the authors do dwell on the role of public opinion and public awareness their observations are hardly encouraging. Referring to the need for large scale mobilisation of public opinion on climate change, they note that . "….in Europe at least such education has hardly begun." The reader is left wondering what can be said about Australia and the US!

In summary it needs to be acknowledged that climate change now embraces an extraordinarily wide range of major and complex issues. The authors have done a masterly job in boiling them down to an exceptionally clear and easily read condensation.

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MACROECONOMIC THEORY – A DYNAMIC GENERAL EQUILIBRIUM APPROACH, M.R. Wickens, Princeton University Press, Princeton, 2008, 496 pages (hardback), ISBN 0691116407

Dynamic general equilibrium modelling is considered as the standard approach in modern macroeconomics. Kydland and Prescott (1982) became famous for their pioneering role in the (neoclassical) real business cycle theory and as such in establishing dynamic general equilibrium modelling in macroeconomic theory. At its core, the approach applies Walrasian general equilibrium theory to aggregate economic phenomena. Being completely microfounded, models that are based on this approach are shielded from the Lucas critique. Soon, New Keynesian macroeconomists Rotemberg and Woodford (1997) took the opportunity and added Keynesian features to the model, thereby putting Keynesian theory on a more solid ground and protecting it against accusations of being 'ad hoc'. As a result, both the neoclassical and the New Keynesian school of thought are nowadays using the dynamic general equilibrium framework as their workhorses.

Professor Wickens' graduate textbook provides an excellent introduction to the dynamic general equilibrium approach and thereby fills a long-awaited gap. Despite, or better because of his predominant econometric background, the author presents the theoretical framework in a thorough and comprehensive manner.

Starting with a very stylized model of the closed economy, Wickens introduces economic concepts such as the optimal and golden rule consumption rates, while, at the same time, demonstrating the mathematical tools necessary for their derivation. Many existing textbooks fail on this part, i.e. to deliver a self-contained treatment of both the economic contents and the mathematical methods. The technique of conveying the essential concepts of theoretical macroeconomics together with the most important tools is rather efficient, however demands a clear writing style. Fortunately, the author's writing skills are exceptional to the extent that he is never forced to separate the two. The mathematical appendix simply adds an in-depth discussion of the results and tools used in the main text.

Building on the stylized model outlined at the start, each chapter adds the necessary features required to develop the key topics of contemporary macroeconomics. These include: economic growth, the government and fiscal policy, international trade, monetary economics, asset pricing, and exchange rates. All topics are discussed in sufficient depth, and the technical difficulty (i.e. the rigor of argument) is at the appropriate level for graduate students of macroeconomics. However, the book does not only address students. Economists who wish to explore any of the given topics (in greater detail) can employ Wickens' book as a road map to the frontier of research. Numerous references to seminal papers and most recent developments invite the reader to expand his/her knowledge.

One of the key strengths of the book lies in the author's ability to successfully integrate theories on asset pricing and macroeconomics. Wickens explains the essentials of contingent-claims analysis, general equilibrium asset pricing, the consumption based capital-asset-pricing model, and the traditional asset-pricing model. He continues with some preliminary reflections on risk aversion, arbitrage considerations, the completeness of financial markets, and intertemporal asset pricing. Having laid the foundations, the author transfers and tailors these theories to three very different financial markets: the market for bonds; stocks; and foreign exchange. Using empirical evidence, the author elaborates on the shortcomings of asset pricing theories (e.g. the equity premium puzzle). This enables him to clearly demonstrate the close connection between theory and empiricism – between models and data – in modern macroeconomics.

As mentioned earlier, the treatment of asset pricing theory is one of the strengths of Wickens' book. Every macroeconomist will connote investments and the capital stock with asset pricing. This connotation brings us inevitably to the other factor market: the labour market. Unfortunately, *Macroeconomic Theory* pays limited attention to the labour market (apart from some short remarks). The models of search and matching in the labour market are on par with asset pricing theories, when it comes to their explanatory power (e.g. with respect to labour market outcomes and dynamics). However, these models also contain some shortcomings (e.g. Nash bargaining as the wage setting mechanism). From my point of view, it would have been ideal to include a chapter along these lines. And, I hope a future edition of the book will bring exactly this.

Macroeconomic Theory is an excellent graduate textbook. It presents the dynamic general equilibrium approach in a comprehensive and concise manner. The author, Michael R. Wickens, consistently follows this rule in a broad variety of macroeconomic topics, including asset pricing, and guides the reader instructively through the mathematical treatment of the underlying models. Despite the disregard of search and matching theories of the labour market, the textbook is a must for all serious macroeconomists.

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