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# GAME THEORY, SECOND EDITION

A critical text

*Shaun P. Hargreaves Heap*  
*and*  
*Yanis Varoufakis*

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and third editions in 1947 and 1953). They defined a game as any interaction between agents that is governed by a set of rules specifying the possible moves for each participant and a set of outcomes for each possible combination of moves. One is hard put to find an example of social phenomenon that cannot be so described. Thus a theory of games promises to apply to almost any social interaction where individuals have some understanding of how the outcome for one is affected not only by his or her own actions but also by the actions of others. This is quite extraordinary. From crossing the road in traffic, to decisions to disarm, raise prices, give to charity, join a union, produce a commodity, have children, and so on, the claim was made that we shall now be able to draw on a single mode of analysis: the theory of games.

### 1.1.3 Why this book?

Our motivation for writing this book originally was an interesting contradiction. On the one hand, we doubted that the claim in Section 1.1.2 was warranted. This explains the book's subtitle. On the other hand, however, we enjoyed game theory and had spent many hours pondering its various twists and turns. Indeed it had helped us on many issues. However, we believed that this is predominantly how game theory makes a contribution: it is useful mainly because it helps clarify some fundamental issues and debates in social science, for instance those within and around the political theory of liberal individualism. In this sense, we believed the contribution of game theory to be largely paedagogical. Such contributions are not to be sneezed at.

We also felt that game theory's further substantial contribution was a negative one. The contribution comes through demonstrating the limits of a particular form of individualism in social science: one based *exclusively* on the model of persons as preference-satisfiers. This model is often regarded as the direct heir of David Hume's (the eighteenth-century philosopher) conceptualisation of human reasoning and motivation. It is principally associated with what is known today as *Rational Choice Theory*, or with the (neoclassical) *Economic Approach* to social life (see Downs, 1957, and Becker, 1976). Our first edition's main conclusion (which was developed through the book) was that game theory exposes the limits of these models of human agency. In other words, game theory does not actually deliver Jon Elster's 'solid microfoundations' for all social science; and this tells us something about the inadequacy of its chosen 'microfoundations'.

Game theory books had proliferated in number even before our first book in 1995. For example, Rasmussen (1989) was a good 'user's manual' with many economic illustrations. Binmore (1990) comprised lengthy technical but stimulating essays on aspects of the theory. Kreps (1990) was a delightful book and an excellent eclectic introduction to game theory's strengths and problems. Myerson (1991), Fudenberg and Tirole (1991) and Binmore (1992) added worthy entrants to a burgeoning market. Dixit and Nalebuff (1993) contributed a more informal guide while Brams (1993) was a revisionist offering. One of our favourite books, despite its age and the fact that it is not an extensive guide to game theory, was Thomas Schelling's *The Strategy of Conflict*, first published in 1960. It is highly readable and packed with insights few other books can offer.

Despite the large number of textbooks available at the time, *none* of them located game theory in the wider debates within social science. We thought it important to produce an introductory book which does *not* treat game theory as a series of solved problems to be learnt by the reader. Indeed, we felt that the most fruitful way of conveying game theory was by presenting its concepts and techniques *critically*. Engineers can afford to impart

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their techniques assertively and demand that the uninitiated go through the motions until they acquire the requisite knowledge. Game theorists doing the same devalue their wares. Our first book was, thus, motivated by the conviction that presentations of game theory which simply plunder the social sciences for illustrations (without however locating the theory properly within the greater debates of social science) are unfortunate for two reasons:

First, they were liable to encourage further the insouciance among economists with respect to what is happening elsewhere in the social sciences. This is a pity because mainstream economics is actually founded on philosophically controversial premises and game theory is potentially in rather a good position to reveal some of these foundational difficulties. In other words, what appear as 'puzzles' or 'tricky issues' to many game theorists are actually echoes of fundamental philosophical dispute and so it would be unfortunate to overlook this invitation to more philosophical reflection.

Second, there was a danger that other social sciences will greet game theory as the latest manifestation of economic imperialism, to be championed only by those who prize technique most highly. Again this would be unfortunate because game theory really does speak to some of the fundamental disputes in social science and as such it should be an aid to all social scientists. Indeed, for those who are suspicious of economic imperialism within the social sciences, game theory is, somewhat ironically, a potential ally. Thus it would be a shame for those who feel embattled by the onward march of neoclassical economics if the potential services of an apostate within the very camp of economics itself were to be denied.

The first book addressed these worries. It was written for all social scientists. It did not claim to be an authoritative textbook on game theory. There are some highways and byways in game theory which were not travelled. But it did focus on the central concepts of game theory, and discussed them critically and simply while remaining faithful to their subtleties. The technicalities were trimmed to a minimum (readers needed a bit of algebra now and then) and our aim was to lead with the ideas.

### 1.1.4 *Why a second book?*

Since our first book, the list of game theory textbooks has grown to such an extent that it would be futile to enumerate them.<sup>1</sup> Most of them are competent and some of them are excellent. Of the relatively (technically) advanced introductions, we have found Osborne and Rubinstein (1994) to be the most useful and thoughtful offering. Among the many texts on the market, there have been quite a few good guides on game theory's applications to political and other social sciences (our preferred one is Dixit and Skeath, 1999).

Nevertheless, we still feel that there is still no other text undertaking the task we set ourselves ten years ago: of combining an introduction to game theory with a critical attempt to locate the latter within the broader social science debates. So, why a new version of our 1995 effort? For two reasons: First, because there have been many developments in game theory which, once understood, reinforce our book's original argument but also open up windows onto some interesting new vistas. Indeed, the same developments, if misunderstood, may cause confusion and sidetrack the social theorist who cares not for the technicalities but for the *meaning* of these developments. This new book hopes to offer readers a guide through this theoretical maze of increasing complexity.

Second, many readers and colleagues suggested a new edition which would cover game theory's *techniques* more accurately and comprehensively. In short, it was suggested to us that, while retaining our emphasis on 'leading with the ideas', the book should offer more