

Economica, February 2002 (69), pp. 180-81.

Bargaining Theory with Applications. BY ABHINAY MUTHOO. Cambridge University Press. 1999. 374 pp. £45.00. Paperback £26.95

The alternating-offers model of bargaining, proposed by Ariel Rubinstein in 1982, has stood the test of time. It has proved to be both a very fruitful tool for applications and the starting point of a surprisingly resilient area of research. The basic model and at least some of its subsequent variations are an essential requirement in the training of graduate students in economics. Even advanced undergraduates can be made familiar with the essential logic of the model, especially through the techniques developed by Avner Shaked and John Sutton in their 1984 *Econometrica* paper.

Where, then, can advanced non-cooperative bargaining theory be learned? If the aim is merely to glean the basics, there are of course numerous references in the form of chapters or sections in microeconomics textbooks. But my feeling is that, before the publication of this book, the average graduate student wishing to expand that knowledge, yet with no ambition to become a game theory specialist, would find it difficult to find a totally suitable treatment. The major text on the topic is the one written by Rubinstein himself and Martin Osborne. It is all but impossible to improve on that classic and outstanding work in terms of clarity, depth and intellectual rigour. Its focus and tone are, however, highly abstract and theoretical. This, in my experience, tends to discourage many students and even scholars from deepening their knowledge of bargaining theory.

Muthoo's treatment is, in this light, a welcome addition to the literature. It offers an alternative "path to enlightenment" in the area, which deftly avoids some of the trickiest theoretical passageways, while on the other hand diluting the rigour of the exposition only in a minimal way. A single example should suffice to illustrate the difference in focus I am referring to. In the Osborne-Rubinstein book the basic model is introduced by listing axioms on time preferences; then the main results are derived explicitly from the axioms. Similarly, in the model with risk of breakdown, axioms on risk preferences are imposed, which are used to show that they render the model homeomorphic to the basic one with time preferences. There is no disputing that, from the pure theorist's point of view, this is the way it should be done. We forget too often that the primitives of the model are preferences, not their representations as utility functions, and that what drives the results are the properties of (axioms on) those preferences. In this light, exponential discounting, taken for granted in virtually all applications, is just one example of the many kinds of preferences allowed in the model. Yet there is also no doubt that such an axiomatic treatment can be heavy-handed for a large number of economists and students. Muthoo, on the other hand, starts straightaway with the familiar discounting example in the case of time preferences and with utility functions in the risk preference case. In other words, he uses directly the language used in applied theory papers.

Having made this and other simplifying choices, Muthoo develops the analysis with considerable rigour and care for the detail. Again, one example will suffice to make the point. The 1984 paper by Shaked and Sutton (mentioned at the beginning of this review), which developed a most useful technique and extended Rubinstein's ideas, none the less contains a minor logical flaw: it implicitly *assumes* that in equilibrium there is an immediate agreement between the players. Muthoo, on the contrary, is extremely careful to *prove* that an immediate agreement will follow from the other assumptions.

Chapter after chapter, the basic model is extended and enriched, to deal with outside and inside options, limiting behaviour, changes in the bargaining procedure, asymmetric information and repeated bargaining situations. Given the vastness of the literature, a choice of content had to be made. Muthoo has clearly followed two main criteria for selection: his own expertise (several of the extensions and applications considered are original with him) and the relevance for economic applications. Indeed, the book is very successful, by picking applications appropriately, in conveying a picture of bargaining theory as a subject of immediate relevance to applied theorists, rather than as the exclusive province of a more abstract and mathematically oriented brand of theorist. Inevitably, the omissions are several, some noted by Muthoo himself. (The most noticeable, compared with the Osborne-Rubinstein book, concerns the topic of bargaining and markets; the treatment of incomplete information is also a bit sketchy.) In my view, Muthoo did well by cutting down on material in this way to preserve sharpness of focus and exposition.

In summary, *Bargaining Theory with Applications*, written by a leading expert in the field, may become a standard resource for graduate students, teachers and applied economists for a long time to come.

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