

A review of

Préférence et Utilité Floues
- Applications à la Théorie de l'Équilibre Partiel du Consommateur -

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This thin book (86 pages) presents an attempt to diminish the gap between highly normative and idealistic models in economy such as the ones proposed by Arrow or Debreu, and the complex and nuanced reality of the world, by using a fuzzy set-based approach. He takes the consumer equilibrium problem as an illustrative example.

The book is organized in three chapters. The first one gives the necessary background, by introducing possibility and necessity measures and providing a comparison of their axiomatics with probability theory (perhaps the fact of using both possibility measures and Nahmias' valuations is prejudicial to a clear distinction between fuzzy sets and possibility measures). The connection between Shackle [1]'s non-probabilistic modelling of uncertainty and possibility theory, is recalled and stressed. The chapter ends by pointing out that the ideas of imprecision and uncertainty are latent in works by Marchal and Arrow. The second chapter is devoted to a presentation of fuzzy preference relations and a method, proposed by Ponsard [2], for deriving a utility function from a fuzzy preference relation, is analyzed in detail. The third chapter discusses the consumer's equilibrium problem in a fuzzy context, allowing both a fuzzy utility and a fuzzy constraint ; it leads to a fuzzy mathematical programming problem. In each chapter, the author makes efforts for giving the economic meaning of his mathematical model.

This book should contribute to show the interest of using new mathematical tools such as fuzzy sets and possibility theory in order to develop less normative models (with a less stringent view of the supposed rationality of the individual) in economy. It may also help to a better diffusion of the pionnering work made by Professor Claude Ponsard [2] and his colleagues during the last fifteen years on the modelling of various aspects of economics by means of fuzzy sets. However, this small book provides neither a complete account of what has been made in this

research group, nor an overview of non-purely probabilistic approaches to utility or preference ; see Dubois and Prade [3] for a survey of other recent proposals, and Roubens and Vincke [4] on preference modelling.

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References

- [1] Shackle G.L.S. *Decision, Order and Time in Human Affairs*. Cambridge University Press, Cambridge, U.K., 2nd edition, 1961.
- [2] Ponsard C. Fuzzy mathematical models in economics. *Fuzzy Sets and Systems*. Special issue on *Mathematical Modelling*, 1988, to appear.
- [3] Dubois D., Prade H. Recent models of uncertainty and imprecision as a basis for decision theory : towards less normative frameworks. In : *Intelligent Decision Support in Process Environments* (E. Hollnagel, G. Mancini, D.D. Woods, eds.), Vol. 21 in *Computer and Systems Sciences Series*, Springer Verlag, Berlin, New York, 1986, 3-24.
- [4] Roubens M., Vincke P. *Preference Modelling*. *Lecture Notes in Economics and Mathematical Systems* n° 250, Springer Verlag, Berlin, New York, 1985.