

REVIEW

Spieltheoretische Modelle und ihre Anwendungsmöglichkeiten im Versicherungswesen By Bernd Kaluza. 137 pp. Duncker & Humblot, 1972, DM 39.60

This booklet is based on a diploma-dissertation in the University of Köln and gives a survey of the applications of the theory of games to problems in insurance. The author mentions a great number of relevant German and English publications and has chosen some items for more detailed description and criticism.

About 50 pages are devoted to a review of the theory of games, which deals with situations of conflict of interest, either complete or partial. In the latter case some cooperation between the 'players' is indicated.

The author starts with games of two persons against one another, or of one person against Nature, and he explains the fairly complete and elegant theory which exists for this case, fundamentally due to John von Neumann. One of the more dubious aspects (which is also a subject for criticism in the final section of the book) is the application to a once for all choice of the so-called mixed strategy, i.e. a probabilistic sequence of not necessarily identical decisions. He proceeds to deal with cooperative games, where cooperation between some participants might be advantageous. Various 'solutions' of such games, due respectively to von Neumann, Shapley, Gillies, and Nash are mentioned.

Non-cooperative games, i.e. such where agreements between players are physically impossible or legally prohibited, and about which extensive literature exists, are merely mentioned in an aside, as not being applied in the field of insurance.

The second part of the book deals with applications. 'Games against Nature' are mentioned, where the insurer has to consider various possibilities of the development of mortality in time, or the differential mortality of sections of the population. Reference is made to work by Nolfi and by Bühlmann. This section of the book is used to illustrate the concept of a solution for a game of two persons with completely opposed interest, and he mentions that this assumes some malicious purpose in Nature, an assumption which is only justified by the simplification which it provides.

Applications of the theory of cooperative games are quoted from work by Borch (combination of groups of insured persons to reduce the average mortality, or to reduce costs of administration and also problems of reinsurance) and by Bragg (cooperation and opposing interests of the company, the agents and the public). Here the various concepts of solution mentioned above are illustrated.

The book finishes with remarks which seem to suggest that the author is himself somewhat doubtful about the usefulness of applying ideas of game theory in the insurance industry.

It is in the nature of such a book that the author has used many sources to which only shorter reference is made. Work by K. H. Wolff belongs into this category. A bibliography of nearly 200 titles is attached.

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