

A. MUNTEAN

## Fixed Point Principles and Applications to Mathematical Economics

Cluj University Press. Cluj–Napoca 2002.

198 pages.

ISBN 973–610–082–0.

The fixed point theorem and related concepts and results belong to the mathematical tools which are frequently and effectively used in many fields of mathematical economics, game theory, and some other applications of mathematics in optimization modeling. The referred booklet offers an overview of the development and some recent results regarding this topic. A significant part of those results which are presented in this book was derived by the author and his colleagues.

The work is, besides a brief “*Introduction*” simplifying the orientation in the text, divided into four chapters. The first one, headed “*Elements of the Multivalued Operators Analysis*”, is of rather auxiliary character. It aims to introduce some terms and results necessary for the presentation of the main concepts dealt in the next chapters. It presents the notions of some functionals on space of subsets of metric space, multivalued operators including Lipschitz operators, and techniques of the fixed point structures.

The second chapter, “*Coincidence and Fixed Point Principles for Multivalued Operators*”, is oriented to the topic formulated in its heading. It shows some results regarding the topological fixed point theorems with a stress on the coincidence theorems with economical relevance, existence of fixed points for expansive multivalued operators, common fixed point theorems for sequences of single valued operators, and generalization of the multivalued case of intermediate values theorem.

The third chapter, “*Strict Fixed Point*”, which is the largest one of the book, deals with the properties of the mentioned concept. Some existence results, but also commutativity condition for the composition, conditions for the exclusive existence of the strict fixed point, validity of the properties of the usual fixed points for the strict ones, and a few new applications in mathematical economics and game theory are presented in this chapter.

The last chapter headed “*Maximal Elements Structures and Applications to Mathematical Economics*” is focused on the applicability of the maximal elements technique to the problems of mathematical modeling of economic phenomena. Some already known results of the maximal elements theory are summarized here, and the maximal elements methodology is applied to the solution of some problems of the economic equilibrium theory.

The explanation is supported by an impressive list of references including 269 items.

The referred book is written with respect to mathematical correctness and logical formalism. The presentation of particular topics is well organized and lucid.

The book can be recommend to any reader who is interested in recent trends in economical modeling and operations research methods in which the fixed point theory and related topics play a significant role.

*Milan Mareš*