

Studies in Systems, Decision and Control 316

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# Frontier Information Technology and Systems Research in Cooperative Economics

 Springer

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Editors

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# Preface

The presented work is the very first book-length study devoted to the advances in technological development and systems research in the field of cooperative economics. Employing both qualitative and quantitative research methods, the book provides, first of all, a coherent framework for understanding and applying the concepts and approaches of complexity and systems science for the advanced study of cooperative networks and particular cooperative enterprises and communities. Second, the book serves as a unique source of reliable information on the frontier information technologies available for the production, consumer, credit, and agricultural cooperative enterprises, as well as it discusses predominant strategies, potential drivers of change, and responses to complex problems. Such topics as intelligent systems research, computational economics and finance, and the Internet of things are also extensively covered by the leading researchers through the prism of cooperative economics.

The whole collection of chapters is divided into five sections, and the remaining text briefly describes each of them. The first section of the book addresses the challenges and opportunities in the development of cooperatives and cooperative communities in the new economic environment, which is heavily influenced by information and communication technologies. The scholars review the key trends, factors, and patterns of the emerging “digital” environment and emphasize the urgent need for cooperative enterprises to constantly innovate. The section also provides a comprehensive review of the information technologies available for cooperative enterprises and cooperative communities, additionally focusing on creative and innovative environments within organizations, national and regional innovation systems, knowledge and expert systems, as well as collaborative innovation networks.

The scholars note that the advanced information technologies, particularly their ever-increasing computing capacity, have never been so powerful in the ability to represent complex systems. In turn, our deeper insights and better understanding of the structure and dynamics of complex systems will be eventually reflected in the scientific and technological developments of the future in various fields. The second book section focuses on (1) new methods and technologies in systems research;

(2) the applicability of systems theory in economics, capturing the most important components and their interactions; (3) advances in cooperative networks research; (4) unconventional solutions to complex problems and new perspectives on systems research in cooperative economics; as well as (5) particular applications of systems research in technological innovation and cooperative business.

The third part of the book is fully devoted to the arising opportunities of computational economics and finance to better understand complex problems in cooperative economics and find effective ways of dealing with them. A bright collection of chapters addresses the theoretical issues of computational economics and finance, as well as it reviews the real-world applications in the field of cooperative economics. Particularly, the book includes theoretical chapters on multi-order nonlinear modeling, incremental learning, fuzzy networks, generic algorithm, risk valuation, predictive analytics, agent-based modeling, stock pricing, market sentiment harvesting, etc. In terms of practical implications, there are numerous chapters addressing the following aspects: intelligent data analysis and processing; data mining; new financial products; risk control systems; market-making; organization theory problems; job scheduling; decision support systems, and many others.

The last two book sections focus on (1) decision-making strategies, human resources, and knowledge management, as well as (2) the firm-level performance of production, credit, consumer, and agricultural cooperative enterprises. They are both based on rich cases, real-world and industrial applications, as well as rely on the original empirical data.

Representing a diverse range of backgrounds and advanced research results spanning academia and the public and private sectors, the book is an indispensable source of cutting-edge information on frontier information technology and advances in economic, social, and technological systems for researchers, decision-makers, and stakeholders in cooperative economics.

Sincerely,

Aleksei V. Bogoviz  
Alexander E. Suglobov  
Alexandr N. Maloletko  
Olga V. Kaurova  
Svetlana V. Lobova

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