1. Record Nr. UNINA9911019695903321

Titolo	Econophysics and sociophysics : trends and perspectives / / edited by Bikas K. Chakrabarti, Anirban Chakraborti, and Arnab Chatterjee
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, c2006
ISBN	9786610854424 9781280854422 1280854421 9783527609581 352760958X 9783527610006 3527610006
Descrizione fisica	1 online resource (650 p.)
Altri autori (Persone)	ChakrabartiB. K <1952-> (Bikas K.) ChakrabortiAnirban ChatterjeeArnab
Disciplina	530.1595
Soggetti	Statistical physics Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Econophysics and Sociophysics; Contents; Preface; List of Contributors; 1 A Thermodynamic Formulation of Economics; 1.1 Introduction; 1.2 Differential Forms; 1.2.1 Exact Differential Forms; 1.2.2 Not Exact Differential Forms; 1.2.3 The Integrating Factor; 1.2.4 The First and Second Law of Differential Forms; 1.2.5 Not Exact Differential Forms in Thermodynamics and Economics; 1.3 The First Law of Economics; 1.3.1 The First Law: Capital Balance of Production; 1.3.2 Work (W); 1.3.3 Surplus (Q); 1.3.4 Capital (E); 1.4 The Second Law of Economics 1.4.1 The Second Law: Existence of a System Function (S)1.4.2 The Integrating Factor (T); 1.4.3 Entropy and Production Function (S); 1.4.4 Pressure and Personal Freedom; 1.4.5 The Exact Differential (dS(T,V)); 1.4.6 The Maxwell Relation; 1.4.7 Lagrange Function; 1.5 Statistics; 1.5.1 Combinations; 1.5.2 Normal Distribution; 1.5.3 Polynomial Distribution; 1.5.4 Lagrange Function in Stochastic Systems; 1.5.5

Boltzmann Distribution; 1.6 Entropy in Economics; 1.6.1 Entropy as a Production Function; 1.6.2 Entropy of Commodity Distribution; 1.6.3 Entropy of Capital Distribution
1.6.4 Entropy of Production1.6.5 Summary of Entropy; 1.7 Mechanism of Production and Trade; 1.7.1 The Carnot Process; 1.7.2 The Origin of Growth and Wealth; 1.7.3 World Trade Mechanism; 1.7.4 Returns; 1.8 Dynamics of Production: Economic Growth; 1.8.1 Two Interdependent Systems: Industry and Households; 1.8.2 Linear and Exponential Growth (0 1); 1.9 Conclusion; References; 2 Zero-intelligence Models of Limit-order Markets; 2.1 Introduction
2.2 Possible Zero-intelligence Models2.3 Data Analysis and Empirical Facts Regarding Statics; 2.4 Dynamics: Processes, Rates, and Relationships; 2.5 Resulting Model; 2.6 Results from the Model; 2.7 Analytic Studies: Introduction and Mean-field Approach; 2.8 Random-walk Analyses; 2.9 Independent Interval Approximation; 2.10 Concluding Discussion; References; 3 Understanding and Managing the Future Evolution of a Competitive Multi-agent Population; 3.1 Introduction; 3.2 A Game of Two Dice; 3.3 Formal Description of the System's Evolution; 3.4 Binary Agent Resource System
3.5 Natural Evolution: No System Management3.6 Evolution Management via Perturbations to Population's Composition; 3.7 Reducing the Future-Cast Formalism; 3.8 Concluding Remarks and Discussion; References; 4 Growth of Firms and Networks; 4.1 Introduction; 4.2 Growth of Firms; 4.2.1 Dataset of European Firms; 4.2.2 Pareto-Zipf's Law for Distribution; 4.2.3 Gibrat's Law for Growth; 4.2.4 Detailed Balance; 4.3 Pareto-Zipf and Gibrat under Detailed Balance; 4.3.1 Kinematics; 4.3.2 Growth of Firms and Universality of Zipf's Law; 4.4 Small and Mid-sized Firms
4.4.1 Data for Small and Mid-sized Firms

Sommario/riassunto

Using tricks to handle coupled nonlinear dynamical many-body systems, several advancements have already been made in understanding the behavior of markets/economic/social systems and their dynamics. The book intends to provide the reader with updated reviews on such major developments in both econophysics and sociophysics, by leading experts in the respective fields. This is the first book providing a panoramic view of these developments in the last decade.