1. Record Nr. UNINA9910451683903321

Titolo	Modeling complexity in economic and social systems [[electronic resource] /] / [editor] Frank Schweitzer
Pubbl/distr/stampa	New Jersey, : World Scientific, c2002
ISBN	981-277-726-1
Descrizione fisica	1 online resource (x, 391 p.) : ill
Altri autori (Persone)	SchweitzerFrank
Disciplina	330/.01/51
Soggetti	Economics - Mathematical models Economics, Mathematical Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	A. Market dynamics. ch. 1. Trading behavior and excess volatility in toy markets / M. Marsili and D. Challet -- ch. 2. Percolation models of financial market dynamics / D. Stauffer -- ch. 3. Electrodynamical model of quasi-efficient financial markets / K.N. Ilinski and A.S. Stepanenko -- ch. 4. Multi-agent market modeling of foreign exchange rates / G. Zimmermann, R. Neuneier and R. Grothmann -- ch. 5. Forecasting price increments using an artificial neural network / F. Castiglione -- ch. 6. Spectral regularization, data complexity and agent behavior / A. Ilyinsky -- B. Technological evolution. ch. 7. Dynamics of economic and technological search processes in complex adaptive landscapes / W. Ebeling, Karmeshu and A. Scharnhorst -- ch. 8. New results in a self-organized model of technological evolution / A. Arenas ... [et al.] -- ch. 9. Firms' decision making process in an evolutionary model of industrial dynamics / W. Kwasnicki -- C. Spatial dynamics and economic growth. ch. 10. Modelling migration and economic agglomeration with active Brownian particles / F. Schweitzer -- ch. 11. The evolution of industrial clusters - simulating spatial dynamics / T. Brenner and N. Weigelt -- ch. 12. The growth dynamics of German business firms / J. Voit -- ch. 13. A dynamic theory of a firm: an application of 'economic forces' / M. Estola -- D. Decision processes. ch. 14. Adaptive platform dynamics in multi-party spatial voting / B.M. R. Stadler -- ch. 15. Subtle nonlinearity in popular album charts / R.A.

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Sommario/riassunto

Economics and the social sciences are, in fact, the "hard" sciences, as Herbert Simon argued, because the complexity of the problems dealt with cannot simply be reduced to analytically solvable models or decomposed into separate subprocesses. Nevertheless, in recent years, the emerging interdisciplinary "sciences of complexity" have provided new methods and tools for tackling these problems, ranging from complex data analysis to sophisticated computer simulations. In particular, advanced methods developed in the natural sciences have recently also been applied to social and economic problems. The twenty-one chapters of this book reflect this modern development from various modeling perspectives (such as agent-based models, evolutionary game theory, reinforcement learning and neural network techniques, time series analysis, non-equilibrium macroscopic dynamics) and for a broad range of socio-economic applications (market dynamics, technological evolution, spatial dynamics and economic growth, decision processes, and agent societies). They jointly demonstrate a shift of perspective in economics and the social sciences that is allowing a new outlook in this field to emerge.