

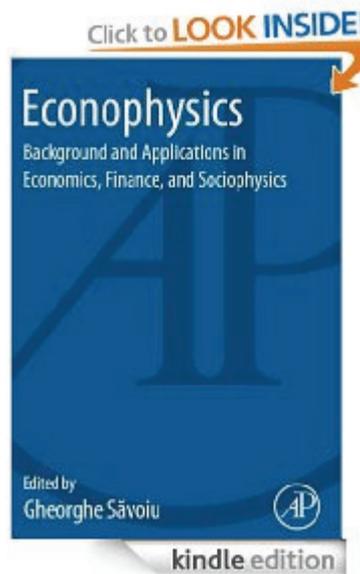
BOOK REVIEW

ECONOPHYSICS: BACKGROUND AND APPLICATIONS IN ECONOMICS FINANCE, AND SOCIOPHYSICS

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Ever since the official birth of the new trans-disciplinary field of econophysics, whose admitted date is the very beginning of the last decade of the twentieth century, a number of Romanian researchers have authored some highly appreciated and frequently cited papers published in international literature, especially articles. Such authors whom we could mention, in a purely random selection, and in alphabetical order only, are Mircea Bulinski, Radu Chișleag, Adrian Drăgulescu, Mircea Gligor, Margareta Ignat, Sorin Solomon, Ion Spânulescu, etc. In 2003, the first book in this line was published in Romania, titled *Econophysics* and authored by Mircea Gligor and Margareta Ignat, followed four years later by *Investment Econophysics*, authored by Ion Spânulescu and Anca Gheorghiu. A relatively small number of summer schools dealing with issues of econophysics and complexity science, organized jointly by E.S.A. and the University of Bucharest, then the international workshops *EDEN I-IV* of the University of Pitești, with moderators Gheorghe Săvoiu și Ion Iorga Simăn, whose notable result was the publication of the first Romanian online journal *Econophysics, Sociophysics and other multidisciplinary sciences* (or *ESMS Journal*), which continues to be published on the site <http://www.esmsj.upit.ro/>, or the international conferences of *Econophysics, new economy and complexity (ENEC)* of the Hyperion University in Bucharest, coordinated by Ion Spânulescu, are only some landmarks of a dynamic process of evolutive repertoire-drawing of the Romanian econophysicists' activity.



A theoretical and practical analysis of the multiple interferences between physics and economics in the trans- and multi-disciplinary interstice of the last two decades, particularizing the new science of econophysics, represents the essence of a recent online book, i.e. the Kindle edition of the work titled *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (*Econofizica: Context și aplicații în economie, finanțe și sociofizică*), whose editor is Gheorghe Săvoiu, and which was authored by him

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together with Radu Chişleag, Constantin Andronache, Mircea Gligor, Aretina–Magdalena David–Pearson and Ion Iorga Simăn, published in the last month of 2012, by Academic Press, Elsevier Publishers. The book manages to introduce the reader to the specific issues of econophysics and provides useful applications to both students and graduates, postgraduates and researchers (<http://www.amazon.com/Econophysics-Background-Applications-Sociophysics-ebook/dp/B009T33Q5A/ref=sr>).

The book has a balanced three-part structure; **to begin with**, it provides an image of the contextual background of the emergence and evolution of modern econophysics, by the joint contribution of economic thinking and the profoundly simplifying modelling specific to physics, focusing initially on statistical physics: the first chapter describes both the history and the important role of econophysics in contemporary scientific research, while the second chapter delimits the multidisciplinary modelling knowledge, based on scenarios and models of econophysics, from the of isolating knowledge of classical economics' unidisciplinarity. This first part of the book is written by two professors at the University of Piteşti, respectively Gheorghe Săvoiu și Ion Iorga Simăn, and manages to identify and describe the main benefits of a multidisciplinary coexistence in the new economy, by applying the highly precise and general models of physics to identifying and quantifying the essence of the economic phenomenon, redefining the relationship between physics and economics, and also between physicists and economists, and defining the so promising concept of modern econophysics, and, hence, the new profession of the econophysicist.

The second part of the book enjoys a generous title (*Economics and Finance*) and amalgamates, in its five applicative chapters, a few econophysical solutions, mainly applied to several economic fields. Regarding the efficiency of capital markets, as hypothesis or approximation, a third chapter describes an analysis of informational symmetry of the U.S. economy and finance, capitalizing on the Dow Jones daily data between 1920 and 2008 (the paper is signed by Gheorghe Săvoiu and Constantin Andronache). The non-linear mechanisms generated by power laws in social-economic systems appear to be far more appropriate for understanding and anticipating trends; an exciting econophysics exposition of these mechanisms is presented by Mircea Gligor, in the fourth chapter. A thorny question, concerning the possibility of credit risk prediction, finds its response in the simulations, characteristic of econophysics, based on the Monte Carlo method, dealt with in chapter V of the book, elaborated by Aretina-Magdalena David-Pearson, who turns into a methodical and experienced guide to the interrogative approach generated by the latest major global recession begun in the financial domain. The sixth chapter describes a model of quantum mechanics able to offer a credible explanation of the violation of a number of financial rules, anticipating the context of crises and recessions. The auspices to this scientific journey were provided by an unparalleled guide, characterized by succinct expression of physical modelling and accurate assessment of the economic impact, namely Professor Radu Chişleag. The seventh chapter draws, in a statistical and comprehensive manner, the repertory of the achievements in econophysics, as well as its amazing potential, and expounds the new expectations in this trans- and multidisciplinary science, which investigates economic processes by means of physics. The authors of this vast repertorying are Gheorghe Săvoiu and Constantin Andronache, and their effort fully repays the reader who is eager to know the main valences of econophysics and the hopes of this new science based on its ability to investigate the economic process.

The third part of the book includes three additional chapters and is exclusively devoted to sociophysics, anticipated as a sociological insight through physical modelling, with comprehensive explanations that extend beyond the scope of socio-economics, moving from the integrative and systemic knowledge of the educational impact of the Bologna reform in academic education, by means of an original physical model, presented, within the same unmatched physical instrumental compass, by Professor Radu Chişleag in chapter VIII, to the modelling based on the statistical physics of group decisions, in a wonderful chapter IX, written by Mircea Gligor, and concluding with several questions about modern sociophysics, an apparent rival of econophysics, which has virtually become a new science of deeply understanding the sociological phenomenon, no less than an applied field of physics in modern academia. This tenth and last chapter concludes the theoretical and applicative, shaping and gnoseological, and also strongly epistemological universe of econophysics and sociophysics. The authors, Gheorghe Săvoiu and Ion-Iorga Simăn, end, on a balanced and optimistic note, a transition from the micro- to the macro- scale, therefore highlighting the amazing speed of development and adequacy of the new sciences based on physical models and methods, which fertilize, in an unexpected manner, the social and economic contemporary universe, increasing the degree of accuracy and validity of forecasts and simulations in the new global economy.

This on-line book, made by a group of enthusiastic researchers whose way of working together was tested by the EDEN I-IV workshops, is an attractive book, dedicated to the emergence and rising importance of trans- and multidisciplinary in economics, which emphasizes, in the closing section, the idea that the most important issue for this new science, called econophysics, remains its ability to measure, report and understand change in economic and social realities, much more quickly than classical economics still does. Econophysics will become a stronger science, not so much through its methodological component, or its distinctive modelling excess, but through its increasing adaptability to the changes in the economic and social reality, based on the best methods, techniques, tools, instruments, concepts and solutions taken over from physical thinking, which is more able to generalize, and conduct simulations, experiments and relativizations.

Concluding, we have to recognize the pleasure of reading and harmonizing the scientific language in a trans- and multi-disciplinary book, added to the novelty of seeing it published online, which is actually the future of academic publishing in the coming decades of the new century, the 21st. The major scientific publishers, as is the case of Elsevier Publishers for this book, are decanting a vast huge written material, first in the on-line collections of Amazon and Kindle, while still retaining the alternative of classic books, paperback editions, to the traditionalist reader's delight, but they clearly and permanently tip the scales in favour of online books.

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