

to such network statistics. While building the agents the authors have given proper emphasis on building rule sets that reasonably represents the constraints and parameters governing the actual decision making of the business firms. One important assumption is the delay in information which the authors claim to be one of the causes of bankruptcy. The intuitive justification of such delay in information in a networked economy is a little difficult to establish. Their model shows the dependency of evolution of corporations on use of available information. However, it does not clearly establish how informational inefficiency may creep up in the product market. The traditional theories on bankruptcy (Brander & Lewis, 1986, 1988) are not pitted against the proposed models, which certainly would have made the findings more acceptable. However, this section does bring out the power of agent based modelling in explaining some basic economic phenomena rather well.

The last section, which deals with perspectives for practical applications, may arouse maximum curiosity amongst the business practitioners and consultants. Since this book is meant for an open audience (meaning researchers from physics background without a formal training on management science as well as management researchers/practitioners without a background of physics) the job of aligning all the interested groups has been rather difficult for the authors. For this reason some space has been dedicated to explaining the basics on both principles of management/economics as well as physics. In the last section a lot of space has been devoted to standard corporate finance theories, some of which appear a little disjoint when compared to the rest of the book. The later part of the chapter also does not integrate this traditional theories with the new approach either. But to the credit of the authors they have brought forward certain possibilities of applying these new approaches to find business solutions.

In the end, one must observe that while the book provides an excellent insight into the various methods and approaches of statistical physics that can be applied to corporate finance and economics, it does so in a normative frame work. The power of agent based models or other econophysics tools in replacing existing positive economics are yet to be seen. However, to be fair to the authors as well as the discipline of econophysics, it is only about a decade and a half old and already there are promises galore. Also, in our almost puritan obsession with 'perfect' theories of positive economics we should not ignore the power of alternate methodologies that capture the reality rather well, albeit without being grounded on perfect theory.

Kousik Guhathakurta  
*Indian Institute of Management  
 Kozhikode*

## References

- Brander, J., & Lewis, T. (1986). Oligopoly and financial structure: The limited liability effect. *American Economic Review*, 76, 956–970.
- Brander, J., & Lewis, T. (1988). Bankruptcy cost and the theory of oligopoly. *The Canadian Journal of Economics/Revue Canadienne d'Economique*, 212, 221–243.

Gheorghe Săvoiu (Ed.), *Econophysics: Background and Applications in Economics, Finance, and Sociophysics*, 2013, Oxford, UK and Waltham, USA: Academic Press, 178 pp., \$39.95.

DOI: 10.1177/2277975213507840

## Appetizer without Main Course

*Econophysics: Background and Applications in Economics, Finance, and Sociophysics* is a collection of 10 chapters by six different contributors. The first part of the book consisting of two chapters lays down the philosophy of econophysics. Both economics and physics employ reductionist thinking. However, there are fundamental differences in their approach which is highlighted in the first chapter. Economists are largely concerned about positing a model of human behaviour focusing primarily on its rational aspect; physicists occupy themselves with describing the natural phenomena in empirical terms. In this background, history of econophysics is extension of physicists' attempt towards gaining understanding of human economic phenomena.

An apparent criticism to the approach pursued by econophysics and to complexity studies in general concern the multidisciplinary approach of the discipline. Multidisciplinary studies are viewed as conceptually confusing and characteristically shallow by their critics (Benson, 1985). Votaries of a multidisciplinary approach submit their defence to such criticisms in the second chapter. Philosophy of science is based upon representing reality through a model. The scope and construction of model differs between various disciplines, depending upon the form of abstraction that particular discipline emphasizes upon. This limits the power of unidisciplinary modelling in developing understanding of complex systems about which

a multidisciplinary model is, they cogently argue, more adept than its unidisciplinary counterpart.

The next five chapters which constitute the second part of this book discuss applications of econophysics in domains of economics and finance. Contributions of econophysics often posit a power law distribution at the upper tail which is manifested in various socioeconomic systems such as variation in city sizes, wealth distribution, stock market returns, all of which has been discussed in the fourth chapter. This well-written chapter closes with a model of a system in which natural dynamics occurs to engender power law distribution which was again confirmed by a simulation exercise. This natural dynamics may also endow us with a predictive power.

The seventh chapter presents a comprehensive survey of economic processes studied by researchers working in the domain of econophysics. The editor might have done a greater justice to this book had he moved up this chapter in the beginning of the second part, which would have enabled a reader to possess the big picture of the contributions of this new discipline, and then motivated him to study individual cases outlined in various subsequent chapters. This chapter starts with a historical narrative which elaborates the strong association between physicists and economists with the former influencing the latter in terms of concepts. This narrative, though useful, suffers from being oblivious to the fact that famous economists like Paul Samuelson considered (Sarkar *et al.*, 2010) the route of emulating concepts of classical mechanics in economic analysis and eventually abandoned that avenue. Not only a detailed survey of contributions but this chapter also contains opinions of two of the doyens of econophysics, Eugene H. Stanley and Victor Yakovenko, on major contributions of this new discipline. These opinions may unearth new perspectives even to the informed.

The other chapters in this part highlight some endeavours of econophysics on financial markets: Testing normality of Dow-Jones Industrial Average returns, forecasting credit crunch and an apparent quantum mechanics way of describing financial markets. None of these studied is particularly remarkable, some of them are half-baked.

The third part of the book is on sociophysics, a discipline that actually predates econophysics. Tools and methodologies of physics when used to model a social situation have collectively been granted the nomenclature of this domain. The final chapter presents a historical background of sociophysics along with a host of areas where this discipline contributes. This chapter also makes a case for inclusion of sociophysics so as to develop understanding about organization and functioning of a university.

Two research contributions of sociophysics are developed in the third part. Econophysics and sociophysics distinguish themselves for considering the interaction effects which conventional economics fails to consider to a large extent. These interaction effects are particularly of interest in case of group decision making which is the subject of one of the research contributions developed under the theme of sociophysics. This chapter develops a theory and demonstrates the power of the theory using the GDP data for 25 European Union countries.

A volume on a new discipline like econophysics should provide a proper perspective to a subject which is clearly accomplished. The other expectation from such a volume rests with cultivation of deeper understanding regarding a few research themes, which is an expectation mostly not met by this volume. Excepting a couple of contributions, this book does not present really significant research, something that could have been improved upon.

Kausik Gangopadhyay  
*Indian Institute of Management  
 Kozhikode*

## References

- Benson, Thomas C. (1985). Five arguments against interdisciplinary studies. *Issues in Integrative Studies*, 1(1), 38–48.
- Sarkar, Abhirup, Sinha, Sitabhra, Chakrabarti, Bikas K., Tishin, A. M., & Zverev, V. I. (2010). Discussions and comments in Econophysics Kolkata IV. In B. Basu (Ed.), *Econophysics & economics of games, social choices and quantitative techniques* (pp. 154–171). Dordrecht, Heidelberg, London and New York: Springer.