

Prof. Mishael Milaković  
Department of Economics  
University of Bamberg  
Winter Term 2011-12

## Statistical Equilibrium in Economics

Seminar at Bielefeld University

February 20–23, 2012

The foremost purpose of this seminar is to introduce graduate students to recent developments in statistical equilibrium theory, which is particularly suitable for studying problems that arise from the aggregation of many agents. While this approach does not readily provide answers to traditional policy questions, it provides a sounder (or at least more time-tested) methodology than orthodox representative agent models for studying complex systems that consist of a large number of heterogeneous agents.

This seminar deals with a variety of empirical regularities in macroeconomic activity, focusing on distributional regularities in central economic variables like wealth, profitability, income, firm size, or growth rates in GDP and firm size. It turns out that the functional forms of these distributions are non-Gaussian and remarkably stable, both across space and time, begging the question why the central limit theorem (CLT) breaks down in most economic contexts. Statistical equilibrium economics is based on the idea that *interactions* among heterogeneous agents are responsible for deviations from the CLT, and the question becomes how to identify the interactions that do not cancel out in the process of aggregation.

Statistical equilibrium approaches to macroeconomics are a relatively recent phenomenon, and so far there are no “textbooks” on the subject, but motivated students might want to consider the following readings,

- W. Weidlich, “Sociodynamics: A Systematic Approach to Mathematical Modeling in the Social Sciences,” Dover, NY, 2000.
- M. Aoki “New Approaches to Macroeconomic Modeling,” Cambridge University Press, NY, 1998.
- M. Aoki and H. Yoshikawa, “Reconstructing Macroeconomics: A Perspective from Statistical Physics and Combinatorial Stochastic Processes,” Cambridge University Press, NY, 2007.

- D. K. Foley, “A Statistical Equilibrium Theory of Markets,” *Journal of Economic Theory*, 62(2), 1994.
- S. Alfarano et al., “A Statistical Equilibrium Model of Competitive Firms,” *Journal of Economic Dynamics and Control* , 36(1), 2012.

Additional readings and lecture notes will be disseminated as we go along. Ideally, students should conduct their own data exploration exercises using, for instance, Mathematica and its curated data sources (or any other statistical/mathematical software and databases) to look for distributional regularities in macroeconomic variables within or across countries, and write a term paper on their discoveries that will be graded for credit.