

Equilibrium and non-equilibrium in Physics and Economics

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Various agent-based models give rise to power-law distributions of relevant economic variables such as wealth of an individual or growth of a firm. Usually, these models are characterized by complex dynamics with coupled non-linear equations and a certain degree of stochasticity.

However, the complex dynamics could be possibly mapped onto an aperiodic Markov chain. If this is the case, the system time evolution under suitable conservation laws will lead to the equilibrium Maxwell-Boltzmann-Gibbs distribution.

It is the purpose of this paper to critically review the concept of statistical equilibrium and discuss its relevance in the agent-based framework. Boltzmann's H function (the negative entropy) is suggested as a good measure of (dis)equilibrium states for an agent-based model.