

ECONOMIC INEQUALITY FROM STATISTICAL PHYSICS POINT OF VIEW

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Similarly to the probability distribution of energy in physics, the probability distribution of money among the agents in a closed economic system is also expected to follow the exponential Boltzmann-Gibbs law, as a consequence of entropy maximization [1]. Analysis of empirical data shows that income distributions in the USA, European Union, and other countries exhibit a well-defined two-class structure [2, 3]. The majority of the population (about 97%) belongs to the lower class characterized by the exponential (“thermal”) distribution. The upper class (about 3% of the population) is characterized by the Pareto power-law (“superthermal”) distribution, and its share of the total income expands and contracts dramatically during booms and busts in financial markets [4, 5]. Globally, data analysis of energy consumption per capita around the world shows decreasing inequality in the last 30 years and convergence toward the exponential probability distribution, in agreement with the maximal entropy principle [6, 7]. Similar results are found for the global probability distribution of CO₂ emissions per capita. All papers are available on the Web site [8]. See Ref. [9] for a recent popular coverage in the special issue on *The Science of Inequality* in the Science magazine.

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