Physics Colloquium

Statistical Mechanics of Money, Income, Debt, and Energy Consumption

Presented by
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4:00 PM
Location: SCAN 157

Snacks will be provided

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Money, it's a gas.

-- Pink Floyd, Dark Side of the Moon

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. Analysis of empirical data shows that income distributions in the USA, European Union, and other countries exhibit a well-defined two-class structure. 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. 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.