"Thermal" and "superthermal" two-class structure of the personal income distribution VICTOR YAKOVENKO, ANTONIO SILVA, University of Maryland — In Ref. [1] we proposed an analogy between the thermal Boltzmann-Gibbs probability distribution of energy in physics and the probability distribution of money in economics in statistical equilibrium. In Ref. [2] we find that the probability distribution of personal income in the USA has a well-defined two-class structure. The majority of population (97-99%) belongs to the lower class characterized by the exponential Boltzmann-Gibbs ("thermal") distribution, whereas the upper class (1-3% of population) has a Pareto power-law ("superthermal") distribution. By analyzing the income data for 1983–2001 from IRS, we show that the "thermal" part is stationary in time, save for a gradual increase of the effective temperature, whereas the nonequilibrium "superthermal" tail swells and shrinks following the stock market. We discuss the concept of equilibrium inequality in a society, based on the principle of maximal entropy, and quantitatively show that it applies to the majority of the US population.

[1] A. Dragulescu and V. M. Yakovenko, "Statistical mechanics of money", Eur. Phys. J. B **17**, 723–729 (2000). [cond-mat/0001432]
[2] A. C. Silva and V. M. Yakovenko, "Temporal evolution of the 'thermal' and 'superthermal' income classes in the USA during 1983–2001", accepted to Europhysics Letters. [cond- mat/0406385]

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