Conservation laws, debt, and the current financial crisis: Lessons from statistical physics

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At the first ECONOPHYS KOLKATA conference in 2005, Thomas Lux claimed that "Money is illusion". The current global financial crisis of 2008 is very real, yet it was caused by faults in the monetary system. Since around 2000, many econophysicists have been studying statistical models of money transfer within a big ensemble of economic agents. Most of these models impose a boundary condition that money balance of each agent must be non-negative. In this talk, I will discuss how the results are modified when debt is permitted, so that the net-worth balances of the agents can go negative. I will emphasize the necessity of a constraint on the maximal debt in the system in order to prevent it from becoming unstable. The concepts of material production, money, wealth, and debt will be clearly distinguished, and connection with the major paradigms in the economic thought of the 20th and 21st centuries will be discussed.