ARE LARGE COMPLEX ECONOMIC SYSTEMS UNSTABLE ?

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Although classical economic theory is based on the concept of stable equilibrium, real economic systems appear to be always out of equilibrium. Indeed, they share many of the dynamical features of other complex systems, e.g., ecological foodwebs. We focus on the relation between increasing complexity of the economic network and its stability with respect to small perturbations in the dynamical variables associated with the constituent nodes. Inherent delays and multiple timescales suggest that economic systems will be more likely to exhibit instabilities as their complexity is increased even though the speed at which transactions are conducted has increased many-fold through technological developments. Analogous to the birth of nonlinear dynamics from Poincare's work on the question of whether the solar system is stable, we suggest that similar theoretical developments may arise from efforts by econophysicists to understand the mechanisms by which instabilities arise in the economy.

PACS numbers: 89.65.Gh,05.65.+b,89.75.Da,05.40.Fb