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Structural Mechanisms in Economics and Physics

There are striking similarities between complex systems in physics and economics that rest on common dynamical features. Prominent examples are phase transitions in ferromagnets and financial market crashes. I want to claim that both can be studied in a common framework because structurally similar mechanisms are in play. To this end, I propose to distinguish two different classes of structures, namely (i) structural start and boundary conditions, and (ii) emerging dynamical structures. If one has identified a structural mechanism, then one knows that a certain set of structural start and boundary conditions (i) is essential for producing certain dynamical structures (ii). In addition, what one needs in order to be sure that one has found a mechanism and not just an artefact is the fulfilment of a robustness condition. For complex systems connectivity is the most important structural aspect in class (i). The parts of a complex system often all have identical interactive behaviors and interact simultaneously, so that it is impossible or at least not helpful to distinguish parts with different stable roles in the mechanism. Thus in contrast to conventional mechanisms, structural mechanisms in complex systems standardly have an egalitarian set-up. Nevertheless, the emerging dynamics displays non-trivial features, which are again structurally similar across different sciences.