How big data may explicitly show the usefulness of complex systems methods in economics

To address the most pressing issues of our time, economics would benefit from a plurality of approaches that complement the current mainstream paradigm. One of these approaches is complexity economics, which I narrowly and practically define as building economic models without equilibrium. In the most general definition of equilibrium, this means building models, such as Agent-Based Models (ABMs), in which beliefs and plans need not match outcomes. In this talk I will frame my current and future research around the issue of when building non-equilibrium models is useful. First, it is useful if equilibrium is hard or impossible to reach. Looking at games as simplified representations of economic scenarios, we theoretically show that in many cases agents who learn by repeatedly playing a game converge to chaotic trajectories that are far from equilibrium. Second, building non-equilibrium models can be useful qualitatively, to illustrate intuition with a simpler narrative or to study certain phenomena. I will illustrate these points with examples from my work on ABMs of the housing market and of endogenous business cycles. Third, non-equilibrium models may more easily include realistic assumptions and be directly calibrated from increasingly available large and granular datasets, so potentially outperforming equilibrium models in quantitative out-of-sample forecasting. I will discuss this conjecture, which will be the main project of my postdoc, both in terms of the theoretical difficulties to forecast with ABMs and of the identification of useful case studies. Explicitly proving this conjecture would make ABMs much more widely accepted.