

An agent-based modeling approach for real-world economic systems: calibration with a Social Accounting Matrix of Spain

Topic: Agent-Based Modeling and Input-Output Analysis - II

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The global economy is one of today's major challenges, with increasing relevance in recent decades. A frequent observation by policy makers is the lack of tools that help at least to understand, if not predict, economic crises. Currently, macroeconomic modeling is dominated by Dynamic Stochastic General Equilibrium (DSGE) models. The limitations of DSGE in coping with the complexity of today's global economy are often recognized and are the subject of intense research to find possible solutions. As an alternative or complement to DSGE, the last two decades have seen the rise of agent-based models (ABM). An attractive feature of ABM is that it can model very complex systems because it is a bottom-up approach that can describe the specific behavior of heterogeneous agents. The main obstacle, however, is the large number of parameters that need to be known or calibrated. To enable the use of ABM with data from the real-world economy, this paper describes an agent-based macroeconomic modeling approach that can read a Social Accounting Matrix (SAM) and deploy from scratch an economic system (labor, activity sectors operating as firms, a central bank, the government, external sectors...) whose structure and activity produce a SAM with values very close to those of the actual SAM snapshot. This approach paves the way for unleashing the expected high performance of ABM models to deal with the complexities of current global macroeconomics, including other layers of interest like ecology, epidemiology, or social networks among others.