

An Agent-Based General Equilibrium

Model of Employment, Production and Consumption

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Abstract:

In this paper, an agent-based general equilibrium model of employment, production and consumption will be introduced, the model is an extended work based on Ian Wright's design in his paper "The Social Architecture of Capitalism" (Physica A 346 (2005) 589-620). The game rules have been simplified, modified and restructured, which result in qualitatively changes in simulation outcomes, and it also largely enhanced the model's capacity in explaining the empirical distributions.

The model's code is written with MatLab and C++, an outstanding performance of the model is that once the simulation starts, it quickly converges to equilibrium with statistical properties that are in agreement with many empirical distributions of developed capitalistic countries, including the lognormal firm size distribution (instead of power law)[†], the Gaussian GDP growth distribution (instead of Laplace), the Gaussian firm demise distribution (instead of lognormal), the exponential duration of recession distribution, the Gaussian wage-profit share distribution, the lognormal-pareto income distribution and etc. Normally these distributions are studied in an isolated manner, while the aim of this paper is to introduce an enhanced agent-based model, which not only unifies all these empirical distributions into a causal framework, but also exhibits more robust simulation results in accordance with empirical findings.

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[†] The distributions described in brackets are the simulation results proved by the original setting based on Wright(2005)