

Endogenous cooperation networks: an agent-based approach

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The appearance and sustainability of trust-based behaviour has received intense interest from practitioners over many years. Whilst much of this research has necessarily considered non-existent, or at best, simple interaction spaces, it is widely acknowledged that realistic social and economic activity occurs in complex interaction spaces with agents not only engaging with each other, but also with the interaction space itself.

This paper employs insights from Complex Systems literature to develop a computational model of endogenous strategic network formation. Artificial Adaptive Agents (AAAs), implemented as finite state Moore machines, play a modified two-player Iterated Prisoner's Dilemma game with an option to further develop the interaction space as part of their strategy. I find that network formation is a necessary condition for cooperation to be sustainable but that two types of networks predominate with one of the extremes of cooperation or defection being displayed in each. The former exploits the type-selection mechanism of networks, whilst the latter arises due to the interaction-externality that the network creates. Cooperation network characteristics are also considered.