

From market to non-market: an autonomous agent approach to central planning

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In the longstanding debate in political economy about the feasibility of socialism, the Austrian school of economists have argued that markets are an indispensable means of evaluating goods, hence a prerequisite for productive efficiency. From an Austrian perspective, the prices generated by markets neatly encapsulate, in terms of a single numerical unit, highly complex information about the relative levels of demand and supply for different goods. Furthermore, it is emphasised that prices enable both consumers and producers to discover new economic knowledge about more efficient ways of attaining their particular ends. The Austrians contend that, such is the complexity of economic choices facing producers, no adequate level of economic efficiency could be achieved in the absence of markets, even on the assumption that a set of production objectives has been agreed. This problem of productive calculation is referred to as the 'economic calculation problem' for socialism.

Socialist advocates of a non-market economy have yet to provide a satisfactory response to this Austrian argument for the indispensability of markets. Some have sought to develop computational solutions to the economic calculation problem using techniques such as linear programming. Yet the computational models proposed are strongly influenced by the equilibrium model of neoclassical economics. From an Austrian perspective, these models overlook the essence of the calculation problem by assuming the availability of knowledge which can only be acquired through the market process itself.

The debate in political economy about the feasibility of a computational solution to the problem of non-market calculation has not yet considered the recent emergence of agent-based systems and their applications to resource allocation problems. Agent-based simulations of market exchange offer a promising approach to fulfilling the dynamic functions of knowledge encapsulation and discovery in a decentralised way, as the Austrians show to be performed by markets. Further research is needed in order to develop an agent-based approach to the economic calculation problem. Given that the macro-level objectives of agent-based systems can be easily engineered, it is suggested that such an approach holds the potential to become a desirable alternative to the real markets that the Austrians favour.