

# **Tracking the Invisible Hand: Convergence of Double Auctions to Competitive Equilibrium**

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## **ABSTRACT**

Economics is the science of want and scarcity. We show that want and scarcity, operating within a simple exchange institution (double auction), can be sufficient for an economy consisting of multiple inter-related markets to attain competitive equilibrium (CE). We generalize Gode and Sunder's (1993a, 1993b) single-market finding to multi-market economies, and explore the role of the scarcity constraint in convergence of economies to CE. When the scarcity constraint is relaxed by allowing arbitrageurs in middle markets to enter speculative trades, prices still converge to CE, but allocative efficiency of the economy declines.

Optimization by individual agents, often used to derive competitive equilibria, is unnecessary for an actual economy to approximately attain such equilibria. From the failure of humans to optimize in complex tasks, one need not conclude that the equilibria derived from the competitive model are descriptively irrelevant. We show that even in complex economic systems which are highly inefficient, such equilibria can be attained under a range of surprisingly weak assumptions about agent behavior.

Journal of Economic Literature Classification: C92, D40, and D44.

Keywords: competitive equilibrium, convergence, zero-intelligence traders, minimal rationality economics

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