

Viability analysis of a strategic market microstructure game

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In this paper we extend the series of our studies on the properties of the Bornholdt interacting particle system as a model for market microstructure. In our earlier work we defined a Markov process on the majority opinion of the agents, obtained the transition probabilities and analyzed the martingale properties of the ensuing wealth process. Here we relax the assumption on the choices of individual agents by allowing mixed strategies, offering opportunities for the agents to gain intermediate submartingale exposure for their individual wealth processes. We develop a set-valued dynamical system to model the critical regions of the wealth process as a reflection of the agents' behaviors. We use viability theory to study the existence and uniqueness of the resulting attractors and investigate their convergence properties.