Extending Zero and Minimal Intelligence Trader Agents to Exhibit Size-Impact Effects

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In this paper I present results from extending zero-intelligence (ZI) and minimal-intelligence (MI) traders so that, in appropriate situations when engaging in a continuous double auction (CDA) running with a limit order book (LOB), they autonomously exhibit *market impact* effects: if a large-quantity limit order is added to the LOB, the prices quoted by the traders change *before any transaction takes place*, in anticipation of the expected change in transaction prices that will result from the sudden shift in supply or demand caused by the arrival of that large order. Such size-dependent market impact effects are something that large institutional traders in real financial markets have had to deal with for many years, and avoiding impact effects has driven the development of trading-technology innovations such as "VWAP Engines" that salami-slice large "block" orders for a particular asset into a sequence of much smaller orders while aiming at a volume-weighted average price target, and the development of coupled lit-and-dark exchanges for reducing impact effects on block orders such as that offered by the London Stock Exchange (LSE). If one seeks to apply ZI/MI techniques to the study of contemporary issues in present-day financial markets, then the agents in the experimental markets need to be capable of exhibiting realistic impact effects. In the full version of this paper I show how to extend Gode & Sunder's (1993) ZI-C agent strategy, Cliff's (1997) ZIP trader strategy, and a simple deterministic strategy called "Shaver" which is a minimal model of a pesky high-frequency trader.

These results demonstrate that, in the single lit-pool version of BSE populated by ISHV/IZIC/IZIP traders, market impact is as genuine a concern as in real markets: that is, the dynamics of our model market do capture size impact effects, and so can function as a valuable first approximation for studying impact effects in real-world markets.**References**

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