The competition for restricted goods: experiment and simulation of decision dynamics

D. Helbing and M. Schönhof

Institute for Economics and Traffic, Dresden University of Technology, 01062 Dresden, Germany

The coordinated and efficient distribution of limited resources by individual decisions is a fundamental, unsolved problem. When individuals compete for restricted goods, they normally make decisions based on aggregate rather than complete information, such as TV news or stock market indices. In related experiments, we have observed an intermittent dynamical reaction to aggregate information similar to volatility clustering in stock market data, causing considerable losses in the average payoffs. Depending on the way of information presentation, the average and individual payoffs, and even the successful adaptability of a group to changing conditions, can be increased. It turns out that decision behaviour is not just driven by the potential gain in payoffs. We will present a dynamical decision model in order to understand the experimental findings. One has to consider individual learning, which can be simulated by an appropriate reinforcement learning model.