Strategic Market Games with Production

Bill Sudderth, University of Minnesota

We consider several models of a simple economy in which a single nondurable good is produced and consumed in each of a countable number of time periods. The agents seek to maximize the expectation of their total discounted utility derived from consumption of the good.

In the simplest model a single agent in isolation produces for his or her own personal consumption. The agent must decide in each time period how much of the good to consume and how much to put into production for the future.

Another model has a continuum of producer-consumer agents who sell the goods they produce in a market and purchase goods in the same market for consumption and as input for further production. The agents hold money and are required to pay cash to purchase goods in the market. They may also be allowed to borrow money from (or deposit money in) a central bank.

A third model has a continuum of agents who consume and a continuum of firms that produce. The firms sell the goods they produce in a market and seek to maximize profit. The firms are owned mutually by the agents and pay their profits to the agents each period as dividends.

All the models considered can be regarded as stochastic games and we look for a stationary equlibrium in each case. We can then compare the welfare of the agents in the strategic market games to that of the single agent in isolation.

Analytic solutions are available when there is no uncertainty in the production process. If production is subject to random shocks, such solutions are typically not possible.

This talk is based on joint work with John Geanakoplos, Ioannis Karatzas, and Martin Shubik.