

“Agent-based” commodity market models

Language: German or English

Contact: Thomas Heckeley, thomas.heckelei@ilr.uni-bonn.de

Background: Traditional numerical equilibrium market models have problems explaining more complex dynamic processes of price generation, especially regarding price volatility at high temporal resolution. A realistic representation of stockholder behavior, the formation of price expectations, and the relationship between spot and future markets quickly render equilibrium models too complex to be feasible. Moreover, analytically tractable model specifications (parameter choice) are often not robust to structural changes, i.e. cannot capture changes in fundamental market regimes. Agent-based models might provide an alternative for the modeling of shorter term market fluctuations. They simulate predominantly sequential actions of market relevant actors (agents) with no requirement of simultaneously finding short and long run equilibriums. Agent-based models are currently not used to model commodity markets, but started to emerge as useful models to analyze financial markets in times of crises. Given the ongoing discussion on the (negative) influence of financially motivated investors and speculators on agricultural commodity markets, it seems that these models could become interesting to agricultural economists.

Objective: Describe the agent-based models currently used to model financial markets and identify their potential and limitations for modeling dynamic market developments. Possibly extended by assessing the necessary adaptation to model agricultural commodity markets.

Approach:

- Literature review of approaches and systematic description. Systemization by concept, scope, technical implementation and/or whatever proves useful when current models are better known.
- Potentially a first try at developing necessary adjustments of approaches based on what the literature identified as (additionally) relevant for agricultural commodity markets.

References to start:

Farmer, J. D. and D. Foley (2009): The economy needs agent-based modelling. *Nature* 460, 685-686 (6 August 2009). doi:10.1038/460685a