

Agent-Based Model Study on Statistical Properties of Firms' Dynamics

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We construct a workable agent-based model for firms' dynamics. The model consists of firm agents with identical characteristic parameters and a bank agent. Dynamics of those agents is described by their balance sheets. Each firm tries to maximize its expected profit with possible risks in market. Possibility of bankruptcy of firms is also taken into account. The firms, mutually interacting through the bank, become heterogeneous in the course of temporal evolution. Statistical properties of firms' dynamics are discussed in light of observations in the real world. We pay our special attention to distribution of sizes of firms, life-time distribution for firms, correlation of successive growth rates for a given firm, and correlation of the growth rates between firms. Such an agent-based model, once established, enables us to investigate interplay between behavior of individual firms and macroscopic trend of economy. For instance, the size distribution of firms and the temporal evolution of the bank show critical dependence on whether firms use perfect information on their financial conditions to draw up next production plans or not.