Systemic Risk and Interbank Lending

孫立憲 中央大學統計研究所

Abstract

We propose a simple model of inter-bank lending and borrowing incorporating a game feature where the evolution of monetary reserve is described by a system of coupled Feller diffusions. The optimization subject to the quadratic cost reflects the desire of each bank to borrow from or lend to a central bank through manipulating its lending preference and the intention of each bank to deposit in the central bank in order to control the volatility for cost minimization. We observe that the adding liquidity creates a flocking effect leading to stability or systemic risk depending on the level of the growth rate. The deposit rate diminishes the growth of the total monetary reserve causing a large number of bank defaults. The central bank acts as a central deposit corporation. In addition, the corresponding Mean Field Game in the case of the number of banks N large and the infinite time horizon stochastic game with the discount factor are also discussed.

Keywords: Feller diffusion, systemic risk, inter-bank borrowing and lending system, Nash equilibrium, Mean Field Game.