A game theoretic approach to funding liquidity modeling

Andreea Minca
Cornell,USA

Abstract:
We study the liquidity position of a fi nancial institution that funds its operations through short term debt in a multi-period setting. The short term debt is provided by a continuum of agents with different beliefs about the prospects of the company. In each period creditors observe the company's P&L and decide on the amount they invest. The agents make their decisions in order to maximize their expected payoff. We formalize this problem as a mathematical game with a continuum of agents and we introduce the notion of Mean Field Equilibrium for this game. Our results show that there exists a liquidity barrier, such that, in all Mean Field Equilibria, if the liquidity position falls below this barrier, there will be a run by short term creditors, that will lead to illiquidity.

Keywords: funding liquidity, Mean Field Equlibrium, credit risk, liquidity risk.