Control of interbank contagion under partial information

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July 23, 2014

Abstract

We consider a stylized core-periphery financial network in which links lead to the creation of projects in the outside economy but make banks prone to contagion risk. The controller seeks to maximize, under budget constraints, the value of the financial system defined as the total amount of external projects. Under partial information on interbank links, revealed in conjunction with the spread of contagion, the optimal control problem is shown to become a Markov decision problem. We find the optimal intervention policy using dynamic programming.

Our numerical results show that the value of the system depends on the connectivity in a non-monotonous way: it first increases with connectivity and then decreases with connectivity. The maximum value attained depends critically on the budget of the controller and the availability of an adapted intervention strategy. Moreover, we show that for highly connected systems, it is optimal to increase the rate of intervention in the peripheral banks rather than in core banks.

Keywords: Systemic risk, Optimal control, Financial networks.

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