Optimal Bank and Regulatory – Capital Reserve Strategies under Loan-Loss Uncertainty

Mingliang Cheng, University of Manchester

Abstract

We formulate a general model of a commercial bank and its regulator, where the bank's loans are exposed to default risk. The bank's objective is to maximise equity value by appropriately controlling the rate at which new loans are issued, early closure, and dividend payments. The regulator's objective is to reduce the probability of the bank's early closure, which they achieve by appropriately controlling the bank's minimum capital requirements. We show that the regulator can in fact minimise this probability of closure, which is achieved via suitably balancing the risk of insolvency (associated with lower capital requirements) and the risk of endogenous closure (associated with higher capital requirements). We model this situation in continuous time, where the default risk is modelled as a stochastic jump process. Both analytic and numerical results are presented, thus allowing for the full non-linearity of the model to be understood. A discussion upon the model's practical implementation and extension is also provided.