Systemic Risk and Network Formation in the Interbank Market

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Abstract

We propose a novel mechanism to facilitate understanding of systemic risk in financial markets. The literature on systemic risk has focused on two mechanisms, common shocks and domino-like sequential default. We provide a new model that draws on the games-on-networks literature. Transmission in our model is not based on default. Instead, we provide a simple microfoundation of banks' profitability based on competition incentives and the outcome of a strategic game. As competitors' loans change, both for closely connected ones and the whole market, banks adjust their own decisions as a result, generating a 'transmission' of shocks through the system. Our approach permits us to measure both the degree that shocks are amplified by the network structure and

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the manner in which losses and gains are shared. We provide a unique equilibrium characterization of a static model, and embed this model into a full dynamic model of network formation. Because we have an explicit characterization of equilibrium behavior, we have a tractable way to bring the model to the data. Indeed, our measures of systemic risk capture the propagation of shocks in a wide variety of contexts; that is, it can explain the pattern of behavior both in good times as well as in crisis.

Keywords: Financial networks, interbank lending, interconnections, network centrality, spatial autoregressive models.

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