

Rollover risk, network structure and systemic financial crises

Kartik Anand^{*,a}, Prasanna Gai^b, Matteo Marsili^c

^a*Technische Universität Berlin, Sek. H 52, Straße des 17. Juni 135, 10623 Berlin, Germany*

^b*Department of Economics, University of Auckland, 12 Grafton Road, Auckland 1142, New Zealand*

^c*The Abdus Salam International Centre for Theoretical Physics,
Strada Costiera 11, 34014 Trieste, Italy*

Abstract

The breakdown of short-term funding markets was a key feature of the global financial crisis of 2007/8. Combining insights from the literature on global games and network growth, we develop a simple model that sheds light on how network topology interacts with the funding structure of financial institutions to determine system-wide crises. We show how the arrival of bad news about a financial institution leads others to lose confidence in it and how this, in turn, spreads across the entire interbank network. The rate of system-wide bank failure is rendered endogenous, depending crucially on both the rate at which bad news arrives and on the maturity of debt contracts. The conditions under which the financial system makes a sharp transition from a dense network of credit relations to a sparse network where credit freezes readily occur are characterized. Our results also emphasize the role of hysteresis – once broken, credit relations take a long time to re-establish as a result of common knowledge of the equilibrium. Our findings shed light on the nature of public policy responses both during and after the crisis.

JEL classification: C72, G01, G21.

Key words: interbank networks, credit crisis, liquidity freeze
