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"Resilience of the Interbank Network to Shocks and Optimal Bail-Out Strategy: Advantages of "Tiered" Banking Systems"

Abstract

Systemic risk and the scale of systemic breakdown in the banking system are the key concern for central banks charged with safeguarding overall financial stability. This paper focuses on the risk and potential impact of system-wide defaults in the frequently observed "tiered" banking system, where first-tier institutions, that are relatively few in number, are connected with second-tier "peripheral" banks and are also connected with each other, while the peripheral banks are almost exclusively connected with the first-tier banks. The banking network is constructed from a number of banks which are linked by interbank exposures with a certain predefined probability. In this framework, the tiered structure is represented either by a network with negative correlation in connectivity of neighboring banks, or alternatively, by a network with a scale-free distribution of connectivity across banks. The main finding of the paper highlights the advantages of tiering within the banking system, in terms of both the resilience of the banking network to systemic shocks and the extent of necessary government intervention should a crisis evolve. Specifically, the tiered network structure, showing negative correlations in bank connectivity, is found to be less prone to systemic breakdown than other structures. Moreover, in the scale-free tiered system, the resilience of the system to shocks increases as the *level of tiering* grows. Also, the *targeted* government bail-out policy aimed at rescuing the most highly connected failing banks in the first place, is expected to be more effective and induce lower costs in a tiered system with high level of tiering.