

The question of how to stabilize financial systems has attracted considerable attention since the global financial crisis of 2007–2009. Recent studies point out that higher portfolio diversity among banks would reduce systemic risk by decreasing the risk of simultaneous defaults at the expense of a higher likelihood of individual defaults. In practice, however, a bank default has an externality in that it undermines the other banks' balance sheets. This paper explores how each of these different sources of risk, simultaneity risk and externality, contribute independently to systemic risk. It shows that the allocation of external assets that minimizes systemic risk varies with the topology of the financial network as long as asset returns have negative correlations. In the model, an appropriately defined “infectiveness” of a bank is accurately captured by a well-known centrality measure, PageRank. An important result is that the most infective bank needs not always be the safest bank. Under certain circumstances, the most infective node should act as a firewall to prevent large-size collective defaults.