

Network structure and systemic risk in banking systems

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Abstract

We present a quantitative methodology for analyzing the potential for contagion and systemic risk in a network of interlinked financial institutions, using a metric for the systemic importance of institutions: the Contagion Index.

We apply this methodology to a data set of mutual exposures and capital levels of financial institutions in Brazil in 2007 and 2008, and analyze the role of balance sheet size and network structure in each institution's contribution to systemic risk. Our results emphasize the contribution of heterogeneity in network structure and concentration of counterparty exposures to a given institution in explaining its systemic importance. These observations plead for capital requirements which depend on exposures, rather than aggregate balance sheet size, and which target systemically important institutions.

Keywords: default risk, domino effects, balance sheet contagion, scale-free network, default contagion, systemic risk, macro-prudential regulation, random graph.

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