



## A Network approach to Financial Stability

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In this talk I will present an overview of my research addressing the role of the interbank markets in both promoting and undermining systemic stability of the banking system. Our approach is based on a combination of empirical analysis of interbank networks data and the development of Agent Based models. In an earlier paper we showed that when banks are homogenous in size and risk characteristics, the interbank market acts as an effective shock absorber for individual fluctuations in liquidity needs. But when banks are heterogeneous, contagion effects may arise, particularly following the default of highly interconnected banks– the so called too connected to fail syndrome. Direct knock-on contagion driven by creditor defaults, while increasing with connectivity, only explains a small percentage of the overall failures. Rather simultaneous defaults arise spontaneously as the system reaches a critical state by its own intrinsic dynamics. Instability builds up as liquidity is depleted from the system, leading to funding contagion, in a fashion that resembles self-organized criticality in physical systems. In a more recent paper we have analyzed the implication of the new regulatory proposals of the Basel III agreement. One of the impacts of these proposals is to push banks to either increase their capital or reduce their intermediation activity. We find that the effects of tightening leverage constraints on the banking sectors performance can vary in a complex way with the state of the economy, the degree of connectivity of the interbank market and the amount of information available to market participants on bank risks. In particular, our findings suggest that counter-cyclical leverage ratios, as proposed under the new regulatory framework, will increase systemic stability but at the expenses of the average level of lending to firms that will fall over the business cycle. In a different paper we show that banks who establish long lasting relationships with other banks have better access to liquidity, both in normal times and during the crisis. The default, or exit from the market, of banks that are important relationship lenders or borrowers may lead to a deterioration of the interbank credit market. Thus, when identifying the systemically important financial institutions (SIFIs) regulators should not only look at how connected a bank is, but also at how preferentially connected it is to other institutions. Given the implications of relationship lending for financial stability, it is important, when performing stress test exercises, to generate scenarios that allow for the formation of stable relationships. We do propose a simple ABM model that can achieve so in a recent paper.

**Keywords:** Financial stability; overnight interbank market; subprime crisis; network analysis.