

Entangling credit and funding shocks in interbank markets

G. Cimini¹, M. Serri²

¹IMT Lucca, ISC(-CNR), Italy

²Sapienza Universit di Roma, Italy

Recently, both researchers and regulators realized that the financial system is actually more fragile than previously thought, because of the complexity of interconnections between financial institutions. Indeed, while interconnectedness means diversification and thus reduces individual risk, it can however increase systemic risk: financial distress can spread between institutions through such exposures and propagate over the market, leading to amplification effects like default cascades. In the context of interbank lending markets, the main channels of financial contagion are represented by credit and liquidity risk. On one hand, banks face potential losses whenever their counterparties are under distress and thus unable to fulfill their obligations. On the other hand, solvency constraints may force banks to recover lost fundings by selling their illiquid assets, resulting in effective losses in the presence of fire sales (that is, when funding shortcomings are widespread over the market). Building on Debt Rank, we define a systemic risk metric that estimates the potential amplification of losses in interbank markets accounting both for credit and liquidity shocks. The underlying assumption is that equity losses experienced by a bank do imply both a decreasing value of its obligations and a decreasing ability to lend money to the market.

We implement our method on a dataset of 183 European banks that were publicly traded between 2004 and 2013, quantifying individual impact and vulnerability of these financial institutions over time. Our analysis confirms that liquidity spillovers substantially increase systemic risk (the overall equity loss increases by a factor up to 1.5 and almost doubles the individual systemic impact of banks, especially in years after 2008), and thus cannot be neglected in stress-test scenarios. We also provide additional evidence that the interbank market was extremely fragile up to the 2008 financial crisis, as in those years even the smallest initial shock would have caused all banks to default. By contrast, after the crisis the market became able to absorb an increasing amount of financial distress. Our analysis supports the thesis that liquidity requirements on financial institutions may be as effective as capital requirements in hindering financial crises.

[1] Cimini, Serri, PLoS ONE **11**, e0161642 (2016).

[2] Battiston et al., Scientific Reports **2**, 541 (2012).

[3] Bardoscia et al., PLoS ONE **10**, e0134888 (2015).