Liability Concentration and Systemic Losses in Financial Networks

Abstract:
We develop a majorization-based tool to compare financial networks with a focus on the implications of liability concentration. Specifically, we quantify liability concentration by applying the majorization order to the liability matrix that captures the interconnectedness of banks in a financial network. We develop notions of balancing and unbalancing networks to bring out the qualitatively different implications of liability concentration on the system's loss profile. We illustrate how to identify networks that are balancing or unbalancing, and make connections to interbank structures identified by empirical research, such as tiering schemes. An empirical analysis of the network formed by the banking sectors of eight representative European countries suggests that the system is either unbalancing or close to it, persistently over time. This empirical finding, along with the concentration results, supports regulatory policies aiming at limiting the size of gross exposures toward individual counterparties. (joint work with David D.Yao and Peng Chu Chen).

Bio:
Agostino Capponi joined Columbia University's IEOR Department in August 2014, where he is also a member of the Institute for Data Science and Engineering. His main research interests are in the area of financial engineering with main focus on counterparty risk, systemic risk, and dynamic optimization. For his research, has been awarded a grant from the Institute for New Economic Thinking. The outcome of his research contributes to a better understanding of risk management practices, along with their systemic implications, and to assess the impact of regulatory policies aiming at stabilizing financial markets. His research has been published in top-tier academic journals of financial engineering and control, including Mathematical Finance, Finance and Stochastics, SIAM Journal of Financial Mathematics, IEEE Transactions on Automatic Control, and Automatica. His work has also been published in leading practitioner journals and invited book chapters.