Systemic Risk, Policies, and Data Needs

SUMMARY REPORT

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SYSTEMIC RISK

The stability of the financial system plays a fundamental role in modern economies.

When systemically important financial institutions fail or enter into financial distress, losses spread throughout the financial system, often spilling over to other sectors of the real economy. Financial institutions are interlinked through two main channels, counterparty risk exposures and balance sheet interactions. Counterparty risk originates from the fact that institutions share risk through derivatives trading and interbank loans, incurring losses if their trading counterparties fail or enter into a distressed state. These counterparty related losses may lead to the insolvency of banks who were relying on these payments to fulfill their obligations, and can possibly generate default cascades bringing down a significant part of the financial system. During the great recession, monoline insurers and investment banks were severely affected by counterparty risk losses. On the other hand, inter-institutional balance sheet interactions can introduce a form of price-induced contagion. Institutions who need to meet redemption requests or satisfy regulatory requirements may be forced to sell assets at reduced prices if their selling pressure cannot be absorbed by unconstrained buyers. These price drops may then impact institutions which hold similar assets on their balance sheets, and in turn generate liquidity spirals and fire-sales externalities.

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APPROACHES

To gain a better understanding of the complex relationships that exist within the financial system and how these can originate the occurrence of systemic events, system risk modelling is employed. Systemic risk models can be partitioned into two main categories; bottom-up and top-down approaches. Bottom-up approaches are typically based on a network representation of the financial system where nodes represent financial institutions and directed edges, which connect the nodes, represent the bilateral exposures arising from contractual obligations between counterparties. The network approach allows for the characterization of payments made by financial institutions, and thus allows one to quantify the amount of losses caused by the partial repayments of defaulted institutions. Moreover, the network structure can be used to study the stability of the financial system, along with the impact of structural policies aimed at improving financial resilience.

Top down approaches aim at assessing the level of distress in the economy. Rather than modeling the microscopic interactions between the components of the financial system, they construct systemic risk measures to quantify the overall distress. These methods are usually designed to capture tail comovements of firms' balance sheets as well as the resulting negative spill-overs to the real economy. The risk is then allocated to each financial institution based on its contribution to the aggregate risk.

POLICIES

Concerns about the onset and propagation of systemic risk have prompted regulatory authorities to design both macroprudential and resolution-driven policies.

An important policy proposed in response to the great depression was the conservation and countercyclical capital buffer policy. This ensures that banks build up capital buffers during periods of booms and use them in periods of distress when losses are likely to be generated. This countercyclical policy guarantees that, in downturns, the risk that the supply of credit is constrained by regulatory capital requirements is reduced. The most significant policy regulating financial trading in over-the counter markets is the mandate of a centralized trading structure. This policy requires that standardized contracts are traded via a central entity, the clearinghouse, which is responsible for setting collateral requirements of trading parties so as to reduce losses arising from counterparty failures. Such a policy has been mandated by the European Market Infrastructure Regulation (EMIR) and the Dodd-Frank Wall Street Reform and Consumer Protection Act in the United States.

OBSTACLES

An impediment to systemic risk analysis is the lack of a comprehensive dataset for the analysis of macro-financial linkages. Several efforts promoting data sharing, retrieval, and distribution have been initiated to help relieve this obstacle. These efforts include the G20 Data Gaps Initiative, which recommends the collection of consistent bank level data for enhancing existing sets of aggregate statistics, and the Office of Financial Research, established as a department within the U.S. Treasury and tasked with the collection and analysis of financial data.

Systemic Risk Analysis research is a topic of great interest to practitioners and policy makers alike. Not only is it helping to shape the future of the financial services industry, but it is also informing the design of future regulations. In his recent tutorial, A. Capponi provides an in depth review of the main modeling approaches and techniques for systemic risk analysis. In addition, he discusses relevant policies that are targeted at preventing and mitigating systemic risk and introduces some of the obstacles that are currently hampering this research field.

The complete report "Systemic Risk, Policies, and Data Needs" can be downloaded from the link below or access at Global Risk Institute Website

About the Author

Agostino Capponi is an assistant professor in the IEOR Department at Columbia University, where he is also a member of the Institute for Data Science and Engineering. His research is in the area of networks, with a special focus on systemic risk, contagion, and control. The outcome of his work on financial networks contributes to a better understanding of risk management practices, and to assess the impact of regulatory policies aimed at controlling financial markets.