

Comments on “A Network Model of Super-Systemic Crises”

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Basic description of the model

- Network Model of financial system: financial institutions are randomly linked together by their claims on each other
 - Nodes: Banks
 - Connections: (directed) claims of each bank
 - Incoming: interbank assets; Outgoing: liabilities
 - Connections:
 - Are exogenous and static in nature, there is no reaction to crisis
 - Are originated in an entirely arbitrary way; (distribution and average number of connections are arbitrarily chosen)

Basic description of the model

- **t=0:** Banks are initially solvents
- **t=1:** Network is perturbed by the default of one bank
 - Neighboring banks lose a fraction of their interbank assets
 - If still solvents, no contagion
 - If becomes vulnerable, then there is contagion of the initial default
 - The contagion process is repeated until that the network becomes stable (i.e., no more contagion)

Basic description of the model

- **Benchmark Case:**
 - Higher number of average connections increases the extent of contagion
- **Variant Capital Buffer:**
 - Higher capital buffer decreases the extent and frequency of contagion
- **Resale price of illiquid assets falling with contagion:**
 - Higher liquidity risk increases the extent and frequency of contagion
- **Impact of Credit Derivatives (increase the number of interconnections)**
 - Higher development of credit derivatives reduces the frequency of the contagion but increases the extent of contagion

Contribution of this paper

- Typically, many of the earlier work on financial networks is quite mechanical and does not have much real life features in them.
- The authors have an earlier paper that uses elegant mathematical techniques to derive general and robust results on financial networks.
- This paper is a nice complement to the earlier paper of the authors, and adds some important features of the recent crisis into the analysis of financial networks.

Contribution of this paper

- Improve the understanding of the channels throughout the default of a single financial institution spreads among the entire financial system
- Results suggest that a greater interconnectivity reduces the likelihood of contagion, but the impact in the event of problems may be on a significantly larger scale than before
- Greater interconnectivity allows both, to absorb and to amplify financial shocks

Contribution of this paper

- Typically, Recent financial innovations (securitization, CDOs, CDS etc.) increased the linkages significantly throughout the globe.
- For example, through securitization, US mortgage backed securities could be acquired by investors in Europe, Asia, New Zealand, Iceland etc.
- Suddenly, investors in New Zealand can get exposed to mortgage failures in the suburbs of Ohio.
- While this can be good to spread the risk, during severe crisis periods these linkages can act as shock transmitters rather than shock absorbers.

Contribution of this paper

- An important feature of the recent crisis is the complex nature of these interlinkages and agents' inability to figure out their and others' exact exposures.
- In the previous literature on financial networks, linkages were typically interpreted as interbank lending and borrowing (Allen and Gale and others).
- The role of recent financial innovations is key to increase and spread the linkages throughout the globe.

Contribution of this paper

- Liquidity turns out to be a key feature of the recent crisis. The authors have a nice extension on that (Cifuentes, Ferucci and Shin (2005) and Allerton, Nier, Yang and Yorulmazer (2008))
 - Hence, the authors are doing a nice job in including real life features into the network models.

Discussion

- Number versus size of the connections:
 - Paper makes intensive efforts in assessing the effect of changing the average number of interconnection
 - Even more important evaluate the impact of contagion is the size and distribution of assets and liabilities maintained by financial institutions
 - In the model, banks are homogenous and thus it does not matter the characteristics of the first defaulting bank...
 - In reality, the fact that the first falling bank is a big one (for instance, Lehman Brothers) can make a big difference...

Discussion

- Quality of debtors:
 - Authors assume that interbank assets are evenly distributed among connections...
 - Banks could actually reduce their default probability by picking debtors according to risk criterions
 - Problems if information is asymmetrical and risk agencies are not able to measure the implied risk of each financial institution

Discussion

- Could this stylized model be able to account the main facts of the recent subprime crisis?
 - Yes. Initial default of a single bank produces systemic contagion (although this is a very low probability event, in fact in only 5 out 1,000 draws the initial default produces systemic contagion)

Discussion

- Open questions
 - Authors assume static joint degree distribution, How could be introduced bailout plans into the model?
 - Could bailout plans as the ones applied in Eurozone and U.S. deter contagion?
 - How does affect to the model the assumption of exogenous and constant resale price and recovery rate? How may they interact?

Discussion

- Add more real life features into these models.
- Agents' actions are exogenous in most of these models but agents react to financial developments (recent freezes in financial markets as investors response to increased risk and uncertainty).
- Add behavior into these models: That is a though, challenging, yet very fruitful task!

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