On the Origin of Systemic Risk

Mattia Montagna, Gabriele Torri and Giovanni Covi

Discussant: Celso Brunetti
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Interconnectedness and Systemic Risk

The notion of "interconnectedness" became very popular with the GFC.

Interconnectedness is important for regulation:

- Financial Stability Board $\rightarrow$ G-SIBs
- FSOC $\rightarrow$ designation of nonbank SIFIs

"Systemic Risk" also became popular with the GFC

The paper uses several tools, including interconnectedness, to propose a new measure of systemic risk

Several Contributions

- Definition of Systemic Risk

- Model

  - ▶ Trigger in the real economy

  - ▶ Banking sector

  - ▶ Interconnectedness and correlations

- Data

I like the paper → path forward

Comment 1: Defining Systemic Risk

Equation (4) $SR = Pr\left(\frac{D_t}{N} > \bar{D}|I_{t-\Delta t}\right)$

$SR \rightarrow$ how many banks are in distress (or fail)?

Assume two banks, j and i, are connected. If bank j is experiencing large losses above a threshold s, we have:

$Pr\{i > s|j > s\} > 0$

The conditional expected number of bank crashes given the collapse of at least one bank, can be written as

$E\{\kappa|\kappa \geq 1\} = \frac{Pr\{j>s\}+Pr\{i>s\}}{1-Pr\{j\leq s, i\leq s\}}$

Comment 1 (cont'ed)

In other words, the conditional probability of both banks crashing given that at least one bank lost more than s, can be written as:

$$E\left\{\kappa|\kappa \geq 1\right\} = Pr\left\{i > s|j > s\right\}(+1)$$

Hartman et al. (2004) call the above equation the "extreme linkage indicator"

- Is the concept of systemic event, E_t, similar to the extreme linkage indicator?
- How does the SR definition in (4) relate to the extreme linkage indicator?

Comment 2: Sequencing of Events

Model has two components:

- shocks from the real economy
- multi-layer contagion in the banking sector that transmits and amplifies initial shocks

1. Losses are transmitted via long-term interbank linkages
2. Then, via short-term interbank linkages
3. Security sell-off (firesale)

Long-term exposures can be held until maturity
A bank in financial distress usually seeks oxygen in short-term funding markets

Comment 3: Network Dynamics

Four adjacency matrices:

1. M^{lt}: long-term interbank exposures network
2. M^{st}: short-term interbank exposures network
3. M^{re}: exposures of banks to real sector
4. M^{sec}: exposures to securities sold to get liquidity

In a systemic event, networks change.
There is limited dynamics in the setup of the model.
For example, M^{st}, exposures of distressed banks become zeros
– no possibility for a bank to access the interbank market
and/or the lending facility

Comment 4: The Central Bank

Central bank interventions play an important role in crises

- Mitigating effects on all markets
- Reduce the number of banks in financial distress
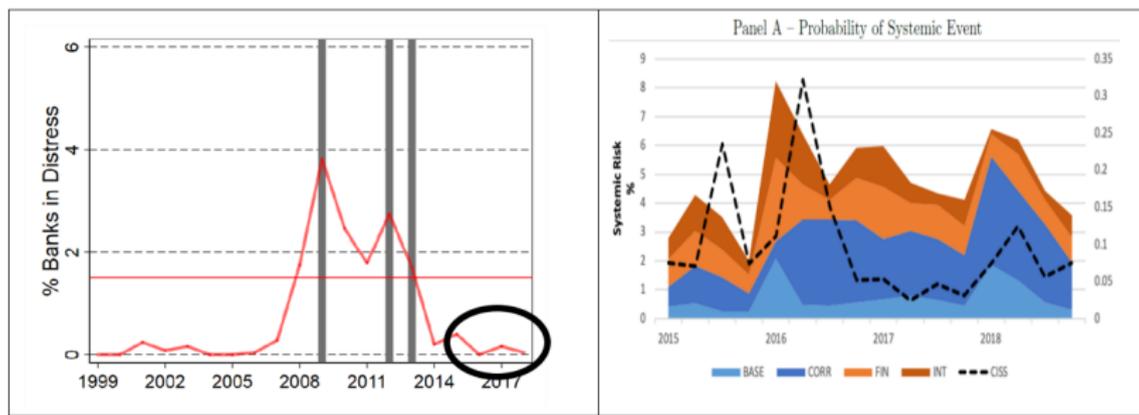
There is no central bank in the model

Comment 5: Benchmark

Results are compared to

- the ECB Composite Index of Systemic Stress (CISS)
- average CDS spreads of EU banks

The motivation of the paper and of the Systemic Risk measure is to capture the percentage of distressed banks (Figure 1)!

Comment 5 (cont'ed)

Comment 6: Explaining the Results

Correlations seem to be an important source of systemic risk.
The interesting question is WHY?

● Is it because of a lack of investment opportunities?

● Or is it because of regulation?

Comment 7: Policy Implications

It is unclear how the paper's approach helps identifying new sources of systemic risk.

- Can it be used for warning about future (out of sample) crises?

- Would this approach have identified pre-crisis development of banks off-balance sheet ABCPs as contributing to systemic risk?

- Would this approach have identified pre-crisis development in the shadow banking sector as new source of systemic risk?

Can the proposed approach help policymakers keeping track of vulnerabilities?

Comment 8: Popcorns or Dominos

Are the failure in *SR* an example of popcorns or dominos?

My intuition is that the proposed *SR* is capturing both.

What is driving the popcorns?
What is driving the dominos?