Tackling the Volatility Paradox: Spillover Persistence and Systemic Risk

Christian Kubitza, University of Bonn christian.kubitza@uni-bonn.de

1. Systemic Risk

- Fragility: builds up in good times, realizes in bad times
- Amplification: Realized in bad times only

Volatility Paradox (BS 2014):
Low volatility $\rightarrow$ High volatility

but: Fragility $\neq$ Low volatility
How to capture fragility?

This paper: Loss dynamics
Low Spillover Persistence: Losses easily absorbed
High Spillover Persistence: Losses boost future losses

2. Defining Spillover Persistence

- Firm $i$’s contribution to the system’s future risk:
  \[ \Delta \text{CoSP}(\tau) = \mathbb{P} \left( -r_{i}(t+\tau) \geq V_aR_{i}(q) \mid -r_{f}(t) \geq V_aR_{f}(q) \right) - q. \]

- Spillover Persistence
  $\bar{\tau} = \frac{1}{\int_{1}^{\tau_{\text{max}}} \Delta \text{CoSP}(\tau) \, d\tau}$

3. Low Spillover Persistence before Crises

- Compute for $> 700$ financial firms, $> 25$ countries, 1989-2017, based on daily equity returns
- Important determinant: Financial constraints
  Tighter constraints $\leftrightarrow$ Higher Spillover Persistence (e.g., higher TED & credit spreads)

4. Low Spillover Persistence during Stock Market Booms

- Explore fire sales by US non-life insurers exposed to hurricane Katrina (Girardi et al., 2021).

5. High Spillover Persistence during Fire Sales

- Spillover Persistence disentangles fragility & amplification:
  Low: Loose constraints, run-up of crises, stock market booms
  $\Rightarrow$ Fragility
  High: Tight constraints, during crises, fire sales
  $\Rightarrow$ Amplification
  $\Rightarrow$ Useful for policy & understanding systemic risk.

References