SPRING 2017 SIPA CAPSTONE:
Measuring systemic risk using open source software and directed graphs to determine collateralized exposure in the presence of initial margin.

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- Capstone students in the School of International and Public Affairs (SIPA) were tasked with running examples of collateralized exposure within the Open Source Risk Engine (ORE).
- Objective was to investigate the effect of new financial regulation (BCBS 261, US Swap Margin Rules) on the aggregate systemic risk in a simulated financial system.

OTHER RECENT FINTECH LAB RESEARCH

Daisy Chains and Non-Cleared OTC Derivatives: Optimizing initial margin through trade compression

by Donal Gallagher, Roland Lichters, Sharyn O’Halloran, and Roland Stamm

- During the 2008 Global Financial Crisis, exposure to counterparty credit risk peaked at over $4.5 trillion, revealing significant weaknesses in the banking sector.
- Dodd Frank Act and other global regulation introduced requirements for central clearing of standardized derivatives and additional margin requirements for bilateral trading (non-cleared over-the-counter, or OTC).
  - Bilateral OTC market is estimated at over $500 trillion in notional value.
- Hedging OTC derivatives gives rise to inefficient trading where the risk is moved around the system (“daisy-chains”) consuming segregated collateral with each trade.
  - Total amount of initial margin required is >$315 billion for US banks alone, money that is segregated and unavailable to the rest of the financial system.
- Using ORE to calculate exposure and margin within a simulated financial system, the authors demonstrate that initial margin can be reduced via trade compression while maintaining the same net risk between each counterparty.
  - Published in Banking & Financial Services Policy Report, Vol. 36, #2, Feb. 2017

Conclusion
Optimizing initial margin through trade compression would provide financial institutions with more financial resources to support client trading and serve as an intermediary of wealth creation for the wider economy, while at the same time reducing global systemic.

Read more at

fintech.datascience.columbia.edu/research