Keynote Address

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Cyber Risks to Financial Stability

Cyber Risk Workshop

Quantitative Supervision and Research
Federal Reserve Bank of Richmond, Charlotte Branch

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Cyber Risks to Financial Stability

General Framework

Cyber Risks

1. **Internal IT Enterprise**
2. **External Dependencies**
   a. Counterparties and Partners
   b. Outsourced and Contract
   c. Supply Chain
   d. Upstream Infrastructure
3. **External Shocks**

Can Trigger

Transmission from Cyber to Financial

Transmission Channels
How Can Cyber Events Threaten Financial Stability?

1. Lack of Financial Substitutability
2. Lack of IT Substitutability
3. Loss of Confidence
4. Data Integrity
5. Interconnectedness

Can Trigger

Financial Stability

1. **Fragility**
   a. Leverage
   b. Maturity Transformation
   c. Procyclicality of Risk
2. **Complexity**
3. **Adaptability**
   a. Innovation
   b. Regulatory Arbitrage

Feedback to Cyber and Larger System

Amplifiers and Dampeners
Can Exacerbate or Alleviate Risks Over Time

Within Environment of
Geopolitical Fragility – Financial Fragility – Technological Fragility – Societal Fragility

Analysis can begin with cyber risks (flowing left to right, like the incident itself); with financial stability and working backwards (right to left), or from the amplifiers and dampeners (bottom up)