Financial Networks & Contagion during the Panic of 1873

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What happened

• Coinage Act (1973) caused a reduction in the money supply
• Speculation in railroad bonds
  – High risk-low immediate return
  – Banks lent money to market speculators
• One bank initially failed
• Runs on New York banks led to the stock exchange being closed
• Liquidity became scarce
• Panic spread to other cities
Why interesting

• 1873 Crisis shares many of the hallmarks of the 2007-8 crisis
  – Liquidity
  – Investment in substandard assets
  – Leverage of banks
  – Network effects
Research Question

• How can an understanding of historical crisis help us to understand modern crisis?
  – Examine contagion in a simpler environment

• Can we use modern tools to better understand historical events?
Data

• Comptroller of the Currency reports: 1872-1874
  – Quarterly Bank balance sheets
  – 1976 National Banks

• Location of all banks
Reserve Tiering

New York City - 25%

Reserve Cities – 25%

National Banks – 15%

Depositors

Albany, Baltimore, Boston, Chicago, Cincinnati, Cleveland, Detroit, Louisville, Milwaukee, New Orleans, Philadelphia, Pittsburgh, San Francisco, St. Louis, Washington
Network Construction

• Balance sheets specify
  – The amount of money in reserve city banks
  – The amount in other banks
  – The amount held from other banks

• Construct the maximum entropy network fulfilling the above constraint

• But this has problems!
Network Construction

• Make pairwise swaps of deposit partners
  – Without violating reserve requirements
  – To increase utility
Network
Initial Results

• Tiering is less significant than believed
• Approximately 8 banks can cause contagion
  – All in New York
  – If leverage is permitted this increases significantly
• The periphery is has a relatively small effect
Conclusions

• Network tools can be applied to historical events
• Simpler balance sheets and financial environments make this possible
• Next steps:
  – More accurate representation of space
    • Roads, Rails, Canals
  – Examine the effect of regulation