

*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

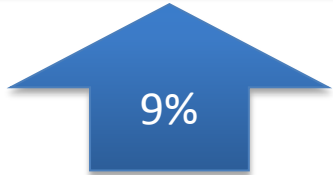
Reserve Tiering

New York City - 25%



Reserve Cities – 25%

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



National Banks – 15%



Depositors

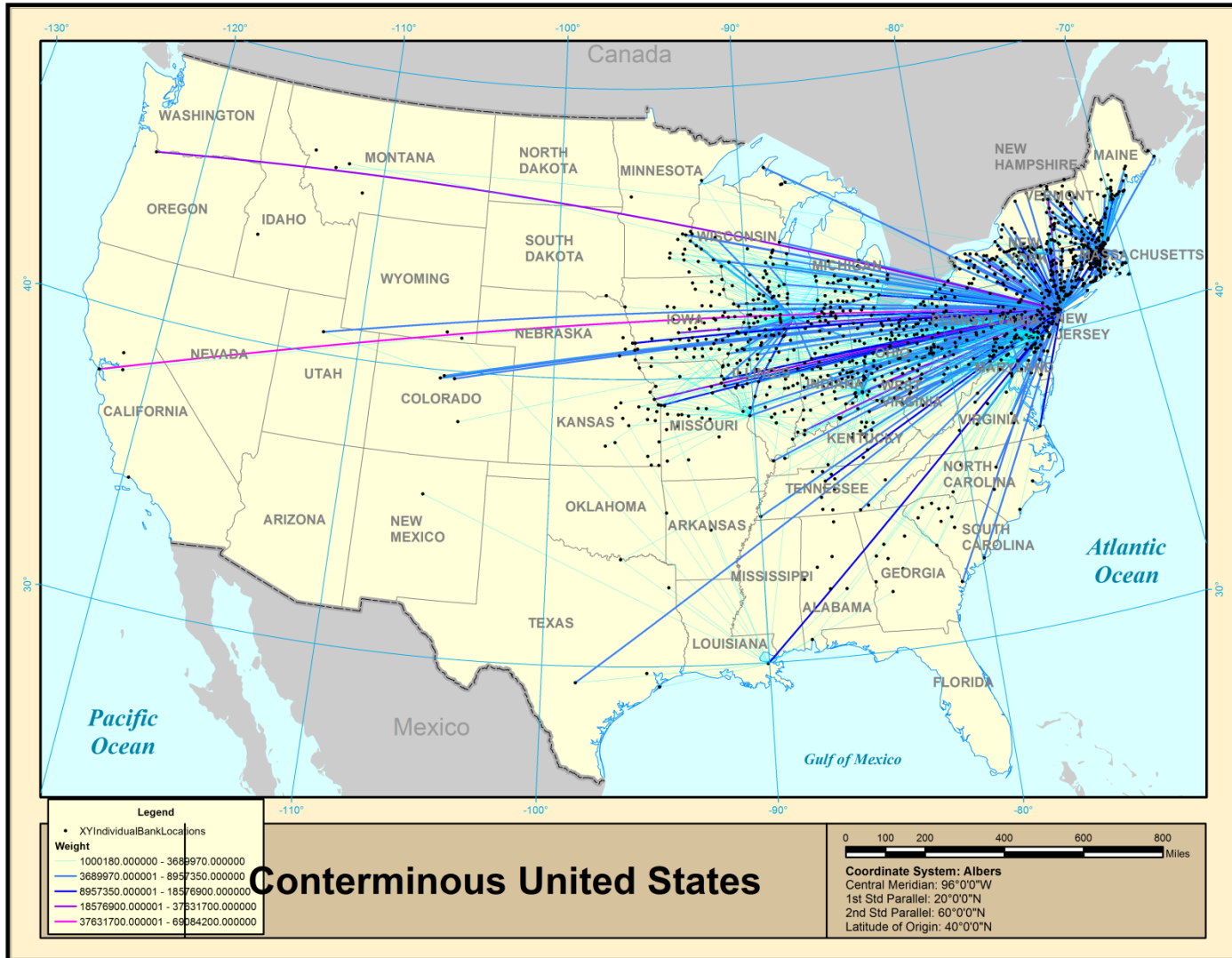
Network Construction

- 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