**Bank Avalanche Model of Systemic Risk**

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### Bank Avalanche

A bank avalanche occurs when more than one bank defaults at the same time.

### Agent Based Model

**Agents:**
- Banks
- Non-Financial Transactors (NFTs)
- AIG-like Insurance Company

**Definitions:**
- Deposits: NFT asset given to bank.
- Loans: bank asset given to NFT.
- Euroloans: interbank loans.
- Eurodeposits: interbank deposits.
- Reserves: money kept at bank.

### Motivation

Efficient banking system facilitates economic transactions.
- Complex links in financial markets are the hallmark of modern finance.
- Bank runs occur when rational agents expect bank failure.
- Insurance on mortgages and bank failures traded in financial system.
- Interconnectedness of institutions, high indebtedness, and contagion explain the global impact of the financial crisis in the United States.

### Research Questions

- How does systemic risk build up in the financial system?
- Can systemic risk be characterized using an agent based model?
- How does insurance impact financial system stability?
- What regulatory policies mitigate build up of systemic risk?

### Research Objectives

- Compare financial stability of various bank networks.
- Examine increases in likelihood of firesale and bank avalanche.
- Compare networks with and without insurance company.
- Test effectiveness of various regulatory measures.

### NetLogo Simulation

NetLogo is an agent based model (ABM) software developed at Northwestern University.

Bank Avalanche Model of Systemic Risk in NetLogo:

**Circle network:** banks trade interbank deposits and loans with neighbors.

**Complete network:** all banks trade interbank deposits and loans.

**Unconnected network:** banks cannot trade interbank deposits and loans.

**Star network:** centrally cleared transactions of interbank deposits and loans.

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