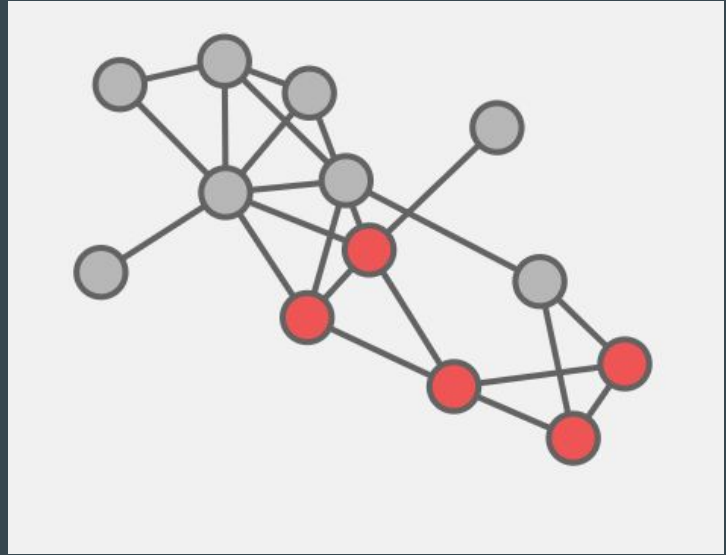
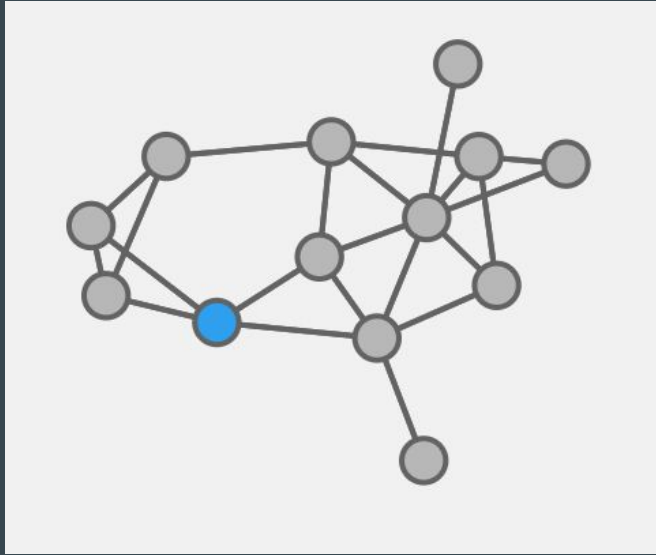


# The Contagion Effect



Hannah Chow & Fabio Della Coletta





# Why do we distinguish the two definitions?

1. Evaluating the effectiveness of international diversification
2. Justifying multilateral intervention
3. Differentiating between various transmission mechanisms



# Non-crisis-contingent

Transmission mechanisms after an initial shock are not significantly different than before the crisis (real linkages: based on economic fundamentals)

1. Trade links
2. Financial links
3. Pure contagion (bandwagon)
4. Random aggregate global shocks

Pre-shock: A  B

Post-shock: A  B

# Empirical evidence

Different approaches have been utilized to measure the transmission of shocks and test for contagion:

1. Cross-market correlation coefficient
2. Estimate of variance-covariance transmission mechanisms
3. Probit models

Results based on the above techniques arrive at the same general conclusion: some contagion occurred.

# Interpretation of Contagion

Although the above tests appear straightforward, they might be biased in the presence of heteroskedasticity and omitted variables. Heteroskedasticity in market returns can have a significant impact on estimates of cross-market correlations: when market volatility increases after a crisis the unadjusted correlation coefficient is biased upward.



# Interpretation of Contagion

When market volatility increases, which tends to happen during crises, tests for contagion that do not adjust for heteroskedasticity may suggest that contagion occurred, even when cross-market transmission mechanisms are stable and shift-contagion does not occur.

Each of the papers that attempted to correct for heteroscedasticity find that cross-market linkages do not change significantly during recent financial crisis, this evidence suggests that most shocks are transmitted through non-crisis-contingent channels.

# Contagion channels

```
graph TD; A[Contagion channels] --> B[Trade links]; A --> C[Financial links]; A --> D["Pure contagion (bandwagon)"]
```

Trade links

Financial links

Pure contagion  
(bandwagon)

# Domestic vs. International contagion

Domestic: starts at local banks → Wall Street

International: between countries

# Contagion channels

```
graph TD; A[Contagion channels] --> B[Trade links]; A --> C[Financial links]; A --> D["Pure contagion (bandwagon)"];
```

Trade links

Financial links

Pure contagion  
(bandwagon)

# Trade Links

Most direct channel of contagion

Competition in international trade

Devaluing of currency A  $\rightarrow$  devaluing of currency B

# Currency Devaluation

Why would a currency become devalued?

Central bank does not have enough reserves

Reasons:

1. Large current account deficit
2. Drop in FDI
3. Lender's reduced willingness to rollover country's debt

# Example: Asian Currency Crisis 1997



# Thailand's story

- Early 1900s - massive volumes of K inflow
    - Banks credit limiting, low inflation rate, high savings rate
  - Japanese investors, other FDI
- 
- But, 1) K inflow → non-productive sectors (CA)
    - Little investment in K goods, factories, inventories, land
  - 2) non-bank lending
  - 3) competitors
  - → Current account deteriorated





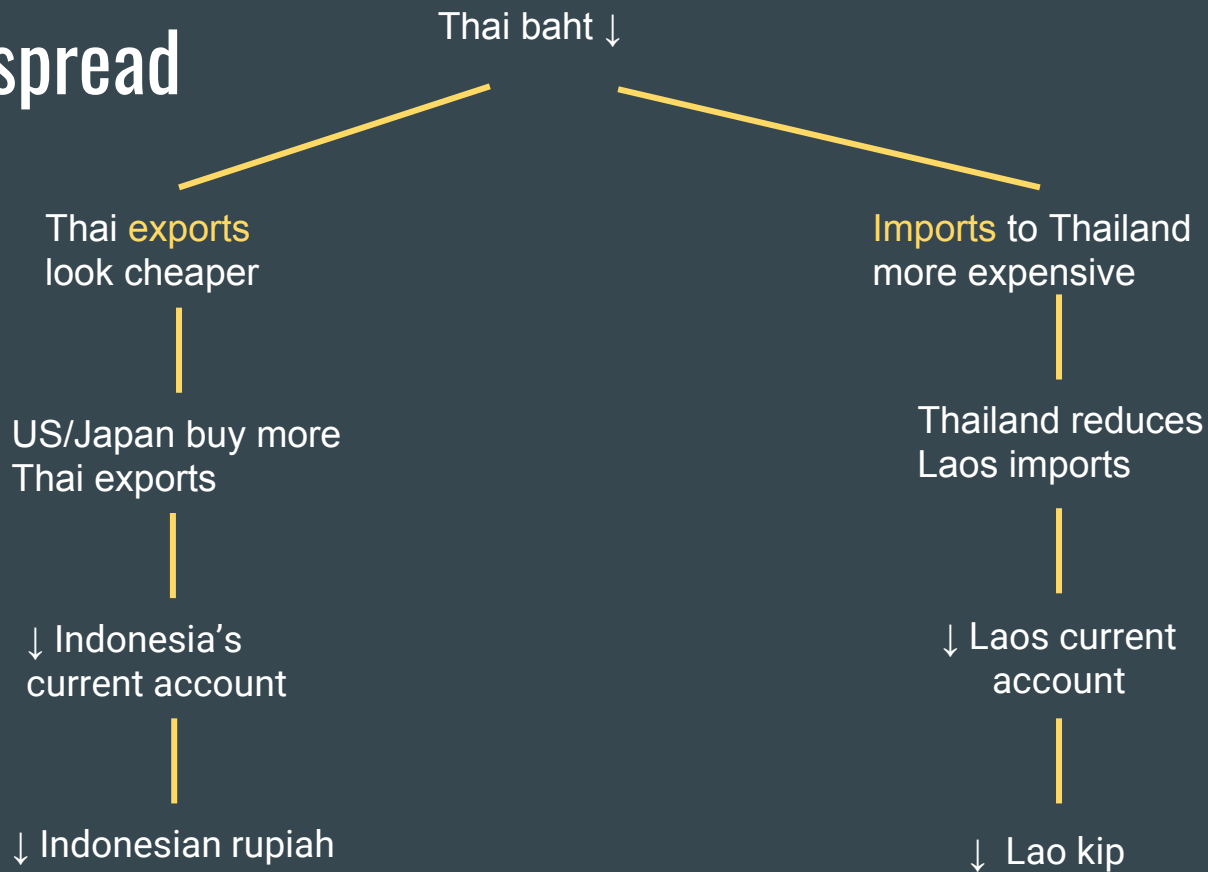
- Getting worse...
- FDI pulls out (financial links)
- Balance sheets: no K inflow or FDI
- Forced to float (July 2, 1997)
- Immediately devalued 15-20%



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# Contagion spread



# Contagion spread





# Contagion channels

```
graph TD; A[Contagion channels] --> B[Trade links]; A --> C[Financial links]; A --> D["Pure contagion (bandwagon)"]
```

Trade links

Financial links

Pure contagion  
(bandwagon)

# Foundation: Diamond-Dybvig model

Domestic

Type is important: patient vs. impatient

Bank's job: provide liquidity to withdrawers

Too many impatient → excess demand for liquidity

What do banks do?

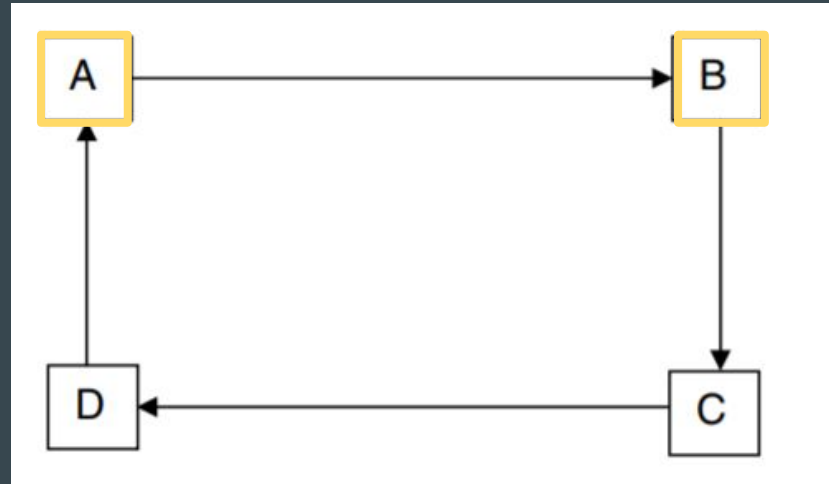
# Interconnectedness of banks (Allen & Gale, 2000)

Connected through  
claims/deposits

Bank A: early withdrawers, excess  
demand for liquidity (impatient)

Find those with excess supply

Short asset form = liquidity



	A	B	C	D
Date 1:				
Liquidity demand:	0.75	0.25	0.75	0.25
Liquidity supply:	0.5	0.5	0.5	0.5
Transfer		← 0.25 —		← 0.25 —
Date 2:				
Liquidity demand:	$0.25 \times 1.5 = 0.375$	$0.75 \times 1.5 = 1.125$	0.375	1.125
Liquidity supply:	$0.5 \times 1.5 = 0.75$	0.75	0.75	0.75
Transfer		— 0.375 →		— 0.375 →

Figure 10.2. Achieving the first-best allocation in state  $S_1$ .



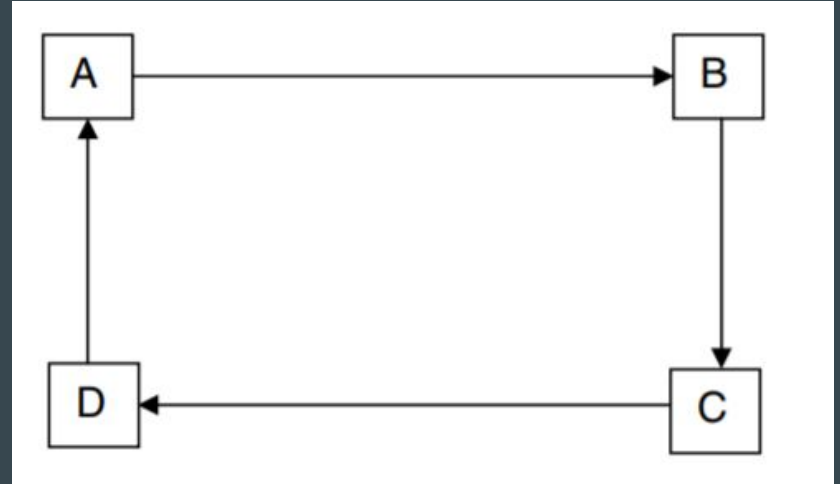
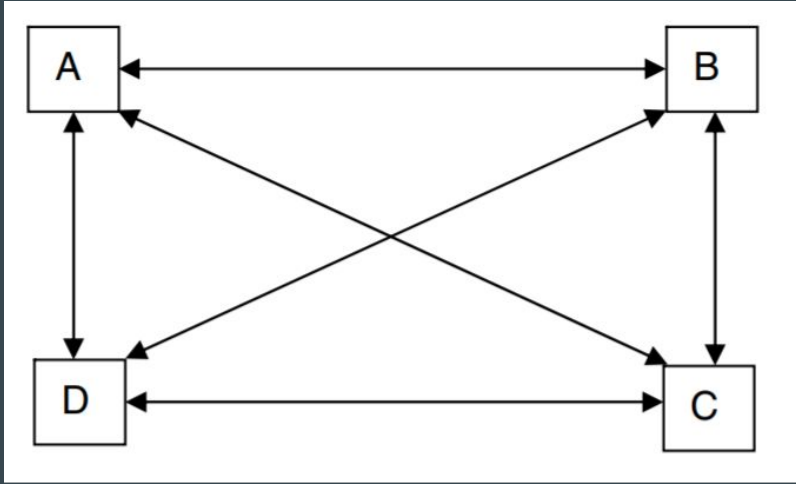
# Liquidity shortage

Too much excess demand  $>$  short asset stock

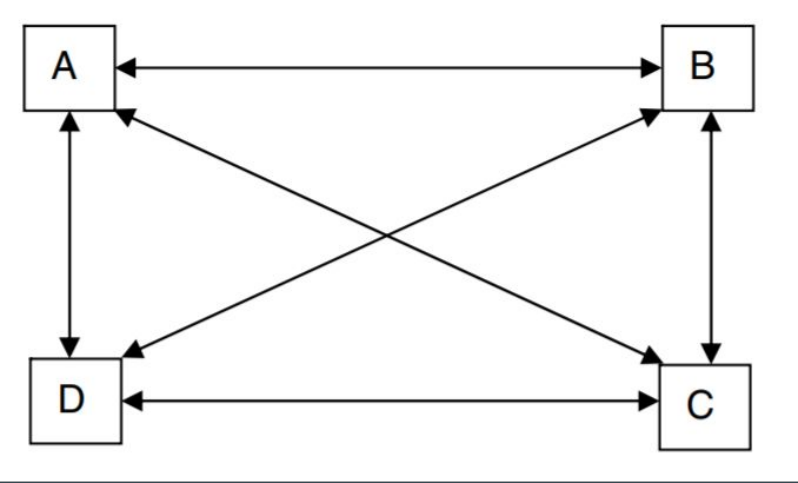
Forced to liquidate **long asset stock** (illiquid)

Dangerous: costly. Overliquidation  $\rightarrow$  bankrupt

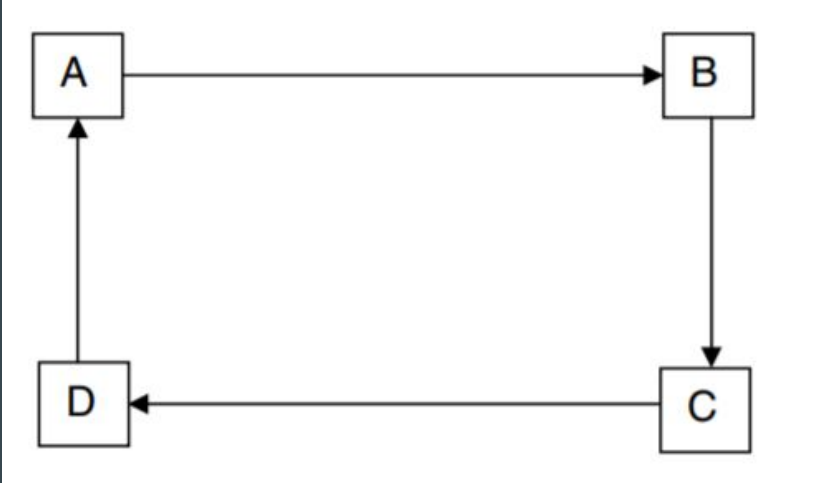
# Which bank system do we want?



# Complete Market

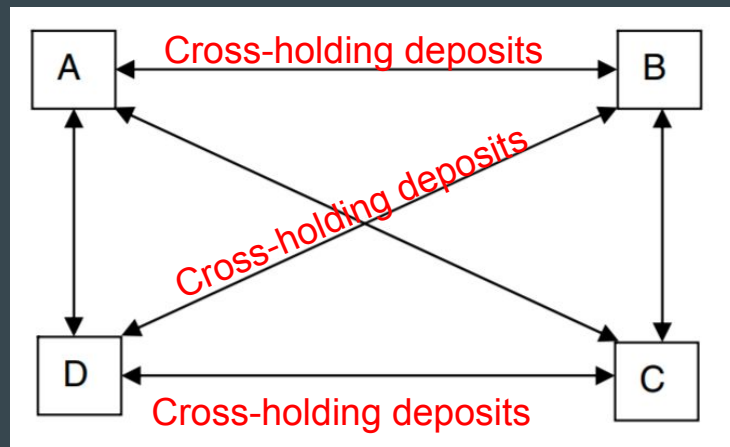


# Incomplete Market



# Example: 2008 recession

- Cross-depositing/holding claims in banks
- Small local banks could not meet liquidity demand
- Eventually moves up levels
- Beliefs!
  - Lose confidence in banks repaying short term loans
  - Belief about asset quality



# Contagion channels

```
graph TD; A[Contagion channels] --> B[Trade links]; A --> C[Financial links]; A --> D["Pure contagion (bandwagon)"];
```

Trade links

Financial links

Pure contagion  
(bandwagon)

# Pure contagion

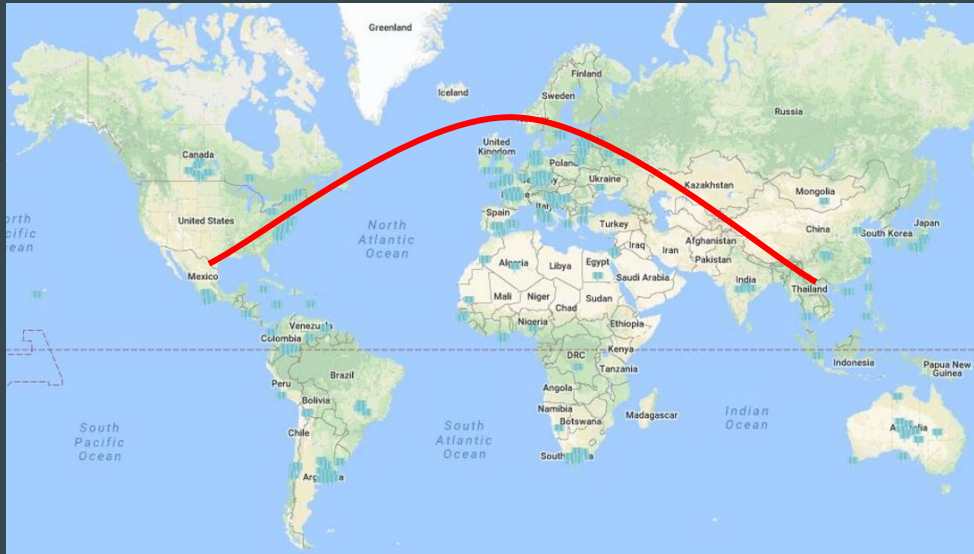
Disinclined to lend to a country with similar characteristics (association effect)

Self-fulfilling expectations

Sunspots (random external shock, randomizing device = confidence index, may or may not be legitimate concerns)

Strengthens co-movement of these countries = contagion

# Example: Asian crisis spreads to Mexico



- Other than trade links
- Mexico “looks like” Thailand
  - Lumping emerging economies
- Even though monitoring banks’ balance sheets, keeping peso competitive
- Peso devalued

Pull out FDI/capital flight

**Solutions to prevent contagion spread?**



# Potential Solutions

Risk sharing!

1. Market completeness
  - a. Countries have balanced dependence on each
  - b. Diversification
2. Each bank liquidate a little bit of long asset

