

# Week 8: International Banking System and Exchanges

FINA3020

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October 21 and 22, 2025

# Overview of Banking

Firms mainly obtain financing through debt (loans from banks, bond issuance) and equity. For multinational corporations (MNCs), there are many international considerations, motivating the material this week and next week.

## Banks and markets channel savings across borders

- Distinguish between **debt** (fixed repayments) and **equity** (profit-sharing; discretionary variable payments)
- Firms' motivations are cheaper financing, indirect FX hedging, and other risk management
- Investors' motivations are higher returns and portfolio diversification
- Allocate savings to highest returns
  - How and why return differentials persist?
- Financial integration encourages efficiency but also vulnerability

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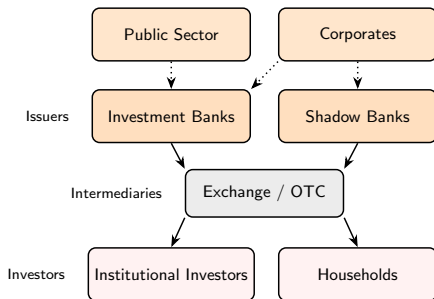
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# What are Capital Markets

## Primary Markets

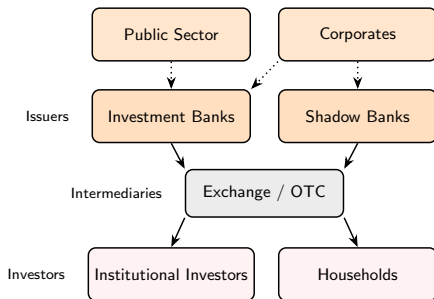
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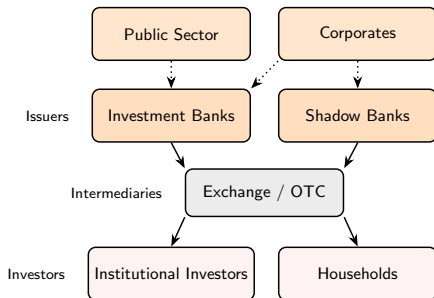
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- Trading of existing equity, bonds, FX, or commodities
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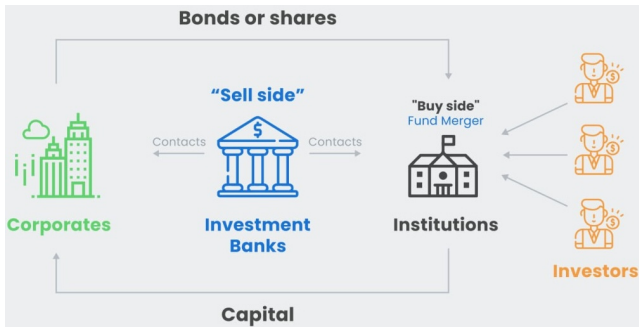
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Additional:

Regulators (e.g. ECB, SEC)

Rating agencies (e.g. S&P, Moody's)

# Investment Banks Intermediate Capital Markets: Primary Market



Sell-side: advisory, underwriting and issuing securities, facilitating clients' trades, analyst research

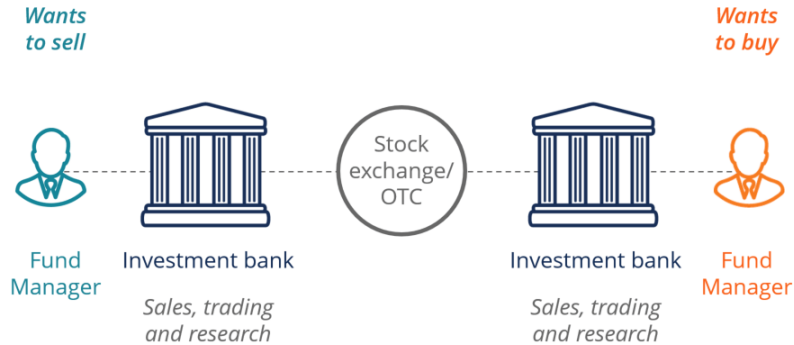
Buy-side: buy assets and manage portfolios; most buy-side activity is outside investment banks, e.g. at private equity funds that directly take large stakes

*Unlike* commercial banks, investment banks do not take deposits to earn the lending-deposit spread, but instead earn fees for services listed above

Source: Srivastava

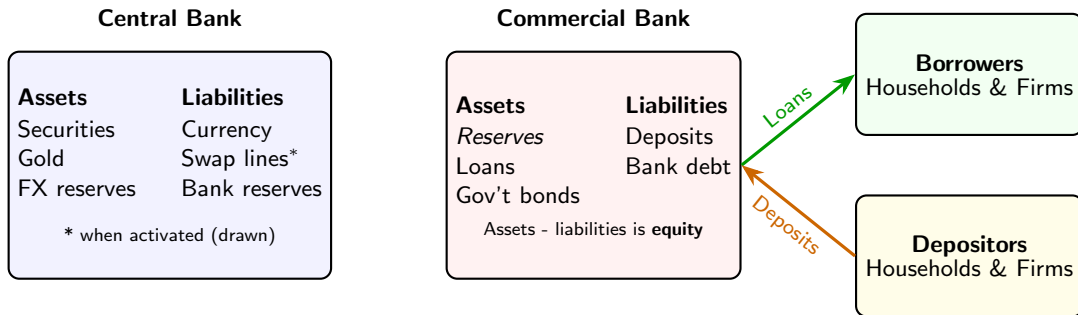


# Investment Banks Intermediate Capital Markets: Secondary Market



Source: CFI

# Commercial Banking



Commercial banks create money by creating new loans through crediting deposit's account, expanding its balance sheet (with multiplier depending on the reserve ratio)

## Early finance and money handling

- Ancient Mesopotamia (2000 BCE): Clay tablets recorded quantities of goods and silver, including deposits with intermediaries and loan contracts. Formalized in the Code of Hammurabi
- Classical Greece (500 BCE): Money changers (*trapezitai*) that accepted deposits. Ancient Rome inherited this system with specialization of financial activities
- As seen in Weeks 1 and 2, Chinese merchants long ago issued letters of credit that circulated like currencies, but banking institutions that lent outside the family or business associates did not exist until the Qing Dynasty in the 1800s
- Medieval Europe: Italian city-states kept deposits and bills of exchange to finance trade fairs

## Instruments of early banking

- *Correspondent balances*: Merchant-bankers kept accounts with each other to clear obligations.
- *Bills of exchange*: Enabled long-distance payment without metal transport.

## Impact on trade

- Facilitated *multilateral clearing* of international trade.
- Trust in long-distance settlement long before central banks or exchanges

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# Early Banks

Private: Operated for profit for shareholders

- Joint-stock: deposits and payments to many customers
  - Examples: Barclays, Lloyds
- High net worth (generally called “private”)
  - Example: Coutts. Now mostly served by wealth management divisions of UBS and other major bancorps
- Merchant: bills of exchange and trade finance
  - Examples: Rothschild, Baring

Public: Owned and operated by a government entity. Some central banks began as public deposit-taking banks.

- Banco di San Giorgio (1407, Genoa): Managed state debt and deposits of merchants.
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- Banks operated mainly within national borders due to capital controls.
- Japanese and German banks faced restrictions on cross-border operations until the 1970s
- IMF oversaw the fixed FX system, World Bank oversaw reconstruction and development
- As public investment receded in the 1950s and private capital (FDI) increased, MNCs demanded financing that local banks did not balance sheet capacity to accommodate
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# How Banks Operate Off-Shore: Correspondent Banking

Definition: one bank (correspondent) provides services on behalf of another bank (respondent), often when respondent does not have physical presence, e.g. due to regulation

- Important for cross-border payments: for centuries, correspondent relationships have been used for clearing trade bills and sending remittances
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- Example: HK firm with account at HSBC wishes to pay supplier in US; HSBC uses SWIFT to coordinate transfer with JP Morgan Chase (correspondent) to ensure supplier receives funds
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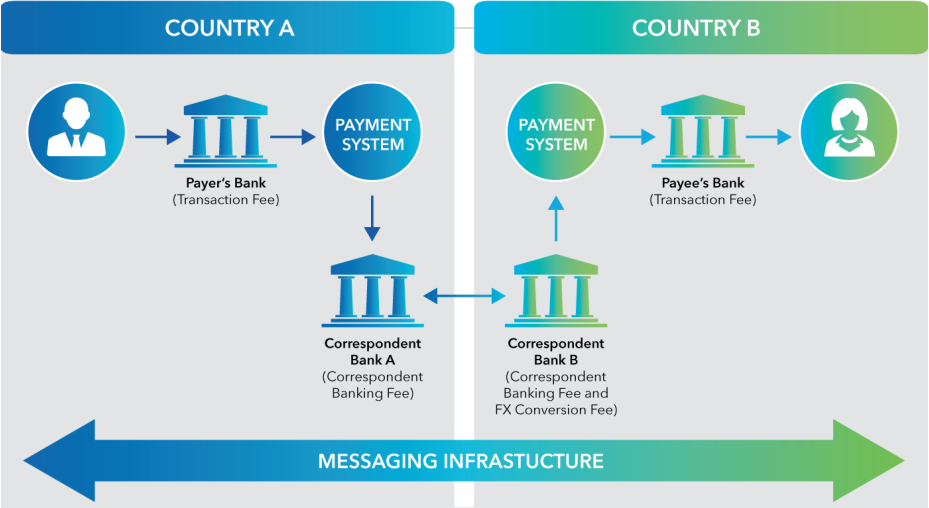
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# Correspondent Banking Diagram

Source: Aite Group



# Types of Correspondent Banking

## COMMON CORRESPONDENT BANKING STRUCTURES

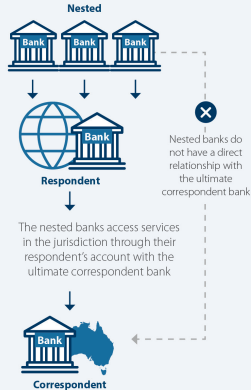
### Traditional

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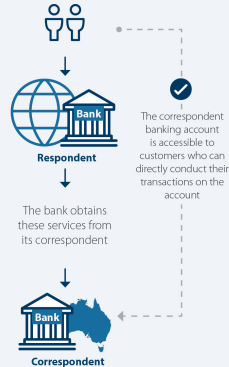
### Nested

A number of banks use another bank's correspondent relationship to conduct transactions and access other financial services



### Payable-through or pass-through

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# Offshore Banking: Beyond Correspondent Networks

Definition of offshore: Bank account located outside home country

- Correspondent banking: Account-based relationships for payments and settlements
- Foreign branches: Direct presence abroad under the parent
- Subsidiaries & affiliates: Separate legal entities, locally incorporated
- Offshore centers: Nonresident banking (e.g. Cayman Islands, Singapore)
- Booking centers: Paper offices for regulatory or tax reasons (e.g. Panama)

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# Why MNCs Sought Offshore Funding after WWII

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  - Due to US funded reconstruction in Europe, and an increase in European exports to the US (the only major consumer market in 1945 that immediately rebounded from the war), there was a surge in USD held outside the US
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  - Example: US Regulation Q capped interest rates on deposits.
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- Examples: USD in a French bank are Eurodollars.  
EUR in a US bank are Euroeuros (confusing!)
- Banks took these deposits and re-lent them at market interest rate without regulatory limits
  - No reserve requirements, minimal reporting
- Eurodollar loans were often cheaper than US domestic borrowing
  - Again, both types of borrowing are in USD, not the same as examples in Weeks 5-7!
- Development: In the 1950s, Soviet bloc governments deposited USD reserves in European banks to avoid US asset seizure as Cold War tensions rose
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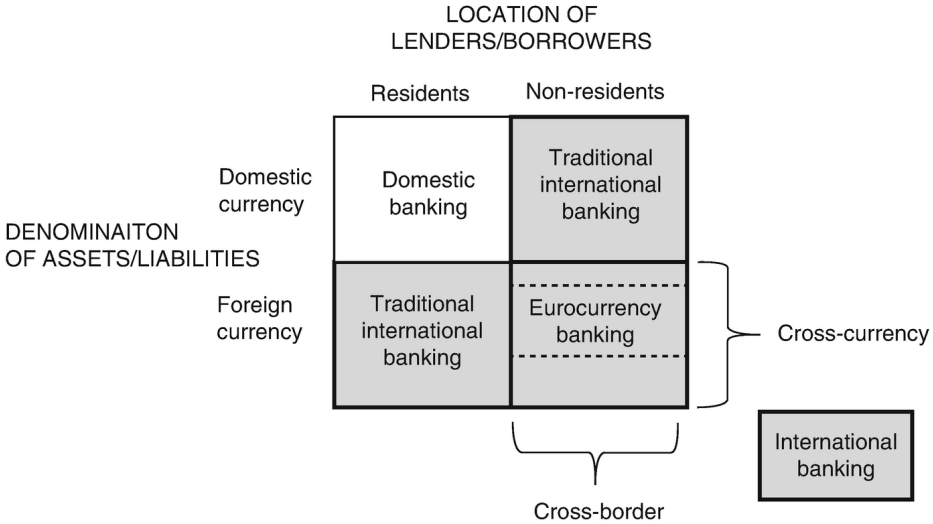
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# Eurocurrency Market Categorization



Source: Battilossi (2019)

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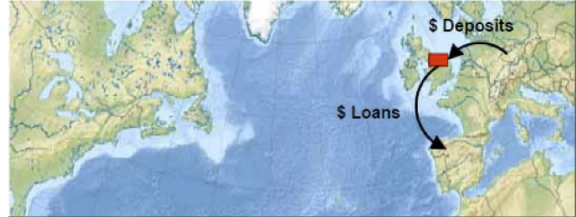
International lending – outflow



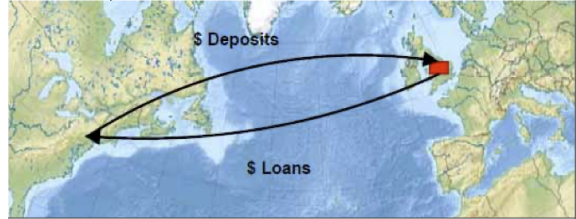
International lending – inflow



Pure offshore transactions

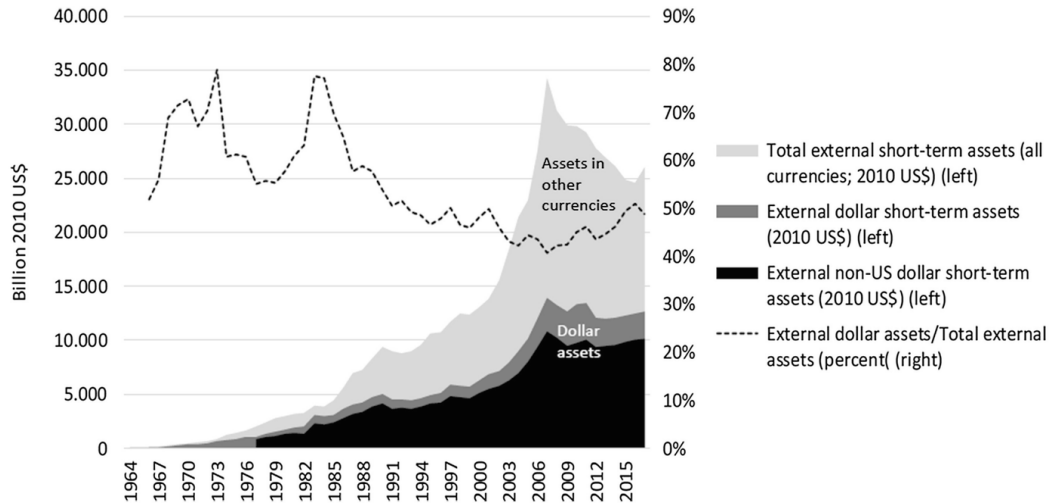


Pure round-trip transactions



Source: He and McCauley (2012)

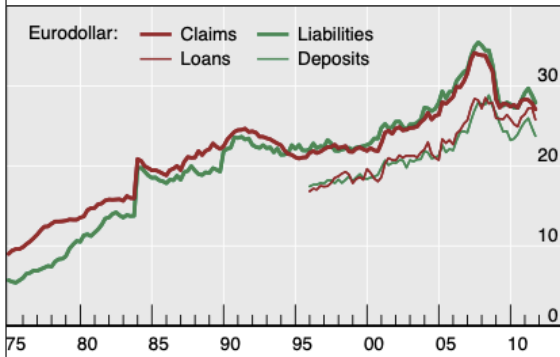
# Eurocurrency Market Growth



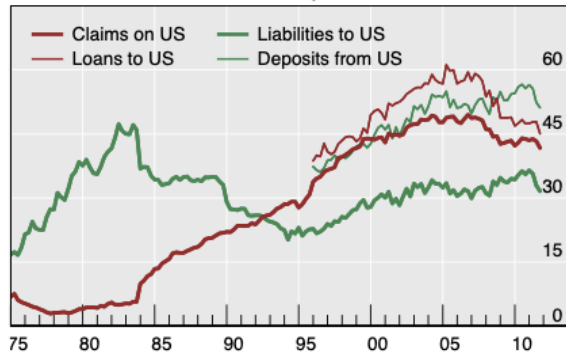
Source: Battilossi (2019)

# Eurodollar Banking Growth

Eurodollar share of global dollar banking<sup>1</sup>



Positions against US non-bank residents as a share of total eurodollar positions



Most banking activity, whether measured by assets (red) or liabilities (green), is domestic, with US firms borrowing onshore from US banks. But the offshore share has increased from below 10% at the end of the Bretton Woods system to around 30% at the time of the Global Financial Crisis

Source: He and McCauley (2012)

# Globalization of Banking in the 1960s

- By the 1960s, major US and Japanese banks opened London branches to compete with European banks in offshore deposits and lending
  - First National City Bank (now Citibank) had hundreds of branches worldwide
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- Summary: Offshore banking blurred the distinction between domestic and international finance, gradually weakened the effectiveness of capital controls, and turned into the global capital markets of the post Bretton Woods era
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# Rise of Hong Kong as a Banking Center from the 1960s

## Strategic context

- British colony with free capital movement and no exchange controls
- Proximity to Japan, China, and Southeast Asia; already a major entrepot
- Close regulatory link with London encouraged foreign bank entry

## By the late 1970s

- Dozens of foreign banks had Asian headquarters in Hong Kong for regional USD lending and trade finance
  - Example: Japanese banks had USD accounts with HK banks, who in turn had accounts in London and NYC
- HK became gateway for Chinese trade and finance as China liberalized its economy

## 'Three-tier' system starting in 1980s; regulation to enhance stability

- Licensed (Tier 1) can accept any size deposit and operate current accounts
- Restricted (Tier 2) mainly serve firms and capital markets, with deposits of HK\$500K+
- Deposit-taking (Tier 3) can accept term deposits of HK\$100K+ for 3+ months

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# Deregulation in the 1980s

## Key developments

- US Depository Institutions Deregulation and Monetary Control Act (1980) removed caps on interest rates.
- UK “Big Bang” (1986) liberalized securities and banking.

## Implications for banks

- Financial conglomerates “one-stop shop”
- Relationship lending → securitized finance
  - Securitization: Package loans/mortgages, each with unique contracts and risks, into standardized assets
- Continued rise of offshore centers like Hong Kong, Singapore, and Cayman Islands

## Consequences

- Capital adequacy concerns led to Basel I
- Maturity and currency mismatches in Asian banks with weak supervision
- Culminated in 1997 Asian Financial Crisis (Week 3)

Rise of **shadow banks**: provide credit and payment, but do not take deposits

- e.g. AIG's and Lehman Brothers' repo financing = sell security today and agree to repurchase tomorrow, functionally equivalent to collateralized loan, but legally distinct

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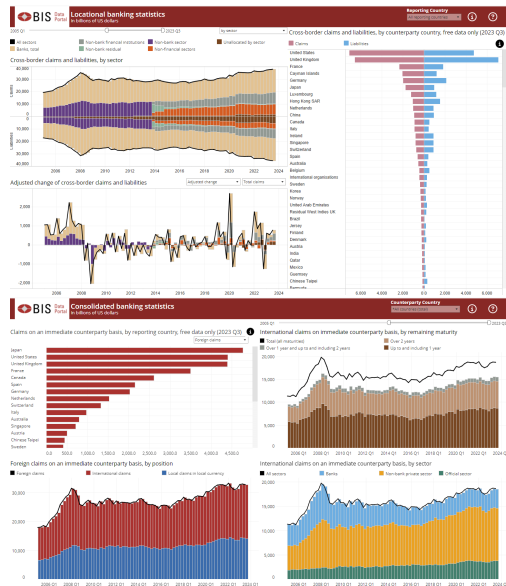
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# Patterns of Cross-Border Banking Activity

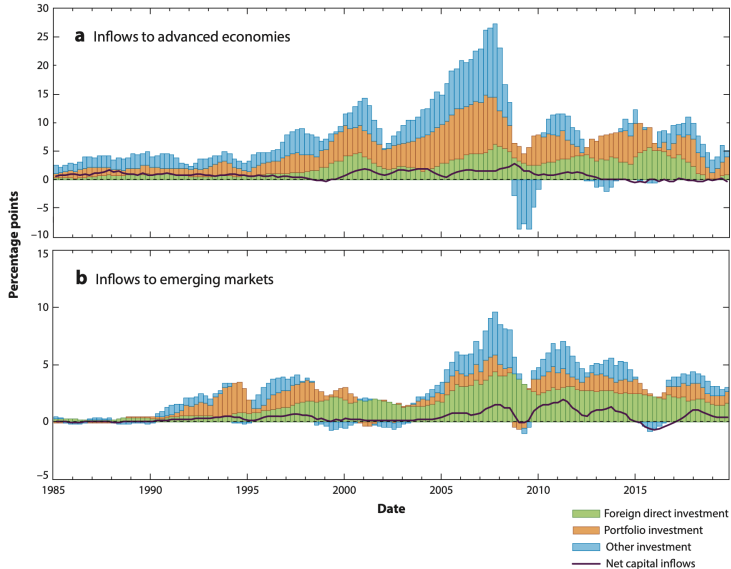
International banking linkages can be measured through:

- *Locational statistics*: record positions by where activities occur
- *Consolidated statistics*: record exposures by nationality of parent bank





# Patterns of Cross-Border Banking Activity



# Bank Fragility and Bank Runs

Biggest risk for deposit-financed banks is bank run, when depositors try to withdraw all at once

- Maturity mismatch: Banks borrow short-term (deposits) and lend long-term (loans).
- Liquidity transformation: They promise depositors liquidity on demand, but their assets cannot be liquidated quickly without loss.
- Confidence dependence: Even a solvent bank can fail if too many depositors withdraw early  $\implies$  runs can be self-fulfilling
- Thin equity: 5% capital ratio = 5% fall in asset values wipes out equity.

Note: bank run fragility applies to money market funds, stablecoins, and other settings

Key question: under what conditions will depositors coordinate on a run?

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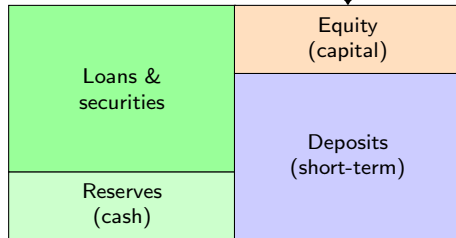
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# Stylized Bank Balance Sheet and Run Mechanism

## Stylized Bank Balance Sheet (in \$ millions)

Assets		Liabilities + Equity	
Loans (illiquid)	3,800	Deposits (short-term)	3,600
Liquid reserves	200	Equity (capital)	200
<b>Total assets = 4,000</b>		<b>Total liab. + eq. = 4,000</b>	

$$\text{Capital ratio} = \$200 / \$4,000 = 5\%$$



Small withdrawals or price shocks can destroy equity  $\Rightarrow$  run risk.

# Diamond & Dybvig (1983): Simple Numerical Example

## Setup

- Total deposits = 1. Early consumers:  $p = 0.3$ .
- Asset pays  $R = 1.5$  if held to maturity (period 2); if sold early (period 1), only  $L = 0.9$  is recovered.
- Liability: Bank promises  $c_1 = 1$  if withdraw early,  $c_2 = 1.4$  if withdraw late

## Good outcome

- Early withdrawals =  $0.3 \times 1 = 0.3$ .
- Bank sells  $x$  of the asset so that  $xL = 0.3 \Rightarrow x = 0.33$ .
- Remaining asset =  $1 - 0.33 = 0.67$ , which grows to  $0.67 \times 1.5 = 1.0$ .
- Enough to pay  $0.7 \times 1.4 = 0.98$  to late depositors. Stable equilibrium.

## Run outcome

- Suppose everyone withdraws early.
- Bank must liquidate all assets:  $1 \times 0.9 = 0.9$
- Only the first 90% of depositors get paid in full
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# Diamond & Dybvig in the Real World: Northern Rock (UK, 2007)

## Background

- Northern Rock funded long-term mortgages with short-term wholesale debt.
- News of liquidity problems triggered panic withdrawals by retail savers.
- Bank was solvent on paper but illiquid.

## Diamond–Dybvig logic

- People ran not because of insolvency, but fear others would.
- Liquidity mismatch turned panic into collapse.
- Deposit insurance and central bank support later restored confidence.

## Key takeaway

- Classic case of a coordination failure.
- No fundamental change in asset quality at the start of the run.
- Policy lesson: credible guarantees prevent the “bad” equilibrium.

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- Bank's strength depends on a fundamental  $\theta$  between 0 and 1.
- The bank survives if total withdrawals  $\leq \bar{\alpha}(\theta) = \theta$ .
- Each depositor sees a private noisy signal  $x_i = \theta + \varepsilon_i$ .
- Withdraw early and get  $c_1 = 1$ ; wait and get  $c_2 = 1.4$  if the bank survives.

## Intuition (no equations needed)

- Depositors face uncertainty about bank health.
- If they believe others will wait when the bank is “strong enough,” only one consistent outcome exists.
- This removes the multiple-equilibria problem in Diamond–Dybvig.

## Decision rule

- Withdraw if the signal is too low.
- Be indifferent when expected survival probability  $= 1/1.4 \approx 0.71$ .
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- When confidence in solvency ( $\theta$ ) fell below a perceived threshold, lenders refused to roll over debt.

## Goldstein & Pauzner logic

- A small drop in expected fundamentals pushed beliefs below the cutoff.
- Crisis was not pure panic: it was triggered by crossing that threshold.
- IMF support and new information shifted beliefs upward and restored funding.

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- Deposit runs  $\Rightarrow$  rollover stops are the same coordination game.
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# Diamond & Dybvig vs. Goldstein & Pauzner

## Diamond & Dybvig

- Coordination failure can create multiple equilibria with identical fundamentals.
- Liquidity mismatch is central: early liquidation destroys value.
- Policy: credible insurance and LOLR remove bad equilibrium.
- Example: Northern Rock retail run despite no immediate insolvency shock.

## Goldstein & Pauzner

- Small uncertainty about fundamentals yields a unique cutoff  $\theta^*$ .
- Runs are fundamental-threshold events, not pure sunspots.
- Policy: raise survival odds or capacity to shift the cutoff.
- Example: Korea 1997 rollover stop; backstops moved beliefs above threshold.

- Crisis began in US subprime mortgages; securitized globally.
- When housing prices fell, losses spread through structured products.
- Lehman failure froze interbank funding and shadow markets.
- Banks hoarded liquidity, collapsing cross-border lending.
- Feedback loop: falling asset prices → margin calls → fire sales.
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## Microprudential focus

- Supervises individual institutions.
- Basel I and II were largely micro: capital linked to each bank's own risk.
- Neglects correlations and feedbacks across banks.

## Macroprudential focus

- Addresses system-wide risk and leverage cycles.
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# Microprudential vs Macroprudential Regulation

## Microprudential focus

- Supervises individual institutions.
- Basel I and II were largely micro: capital linked to each bank's own risk.
- Neglects correlations and feedbacks across banks.

## Macroprudential focus

- Addresses system-wide risk and leverage cycles.
- Uses countercyclical buffers and liquidity tools.

---

## Managers' incentives

- Target regulatory ratios rather than system stability.
- Herd toward assets with lowest assigned weights.

Systemic lesson: Individually sound actions can generate collective fragility.



## Basel I (1988)

- Introduced an 8% minimum capital ratio using simple risk weights.
- Banks shifted toward higher-yield assets with the same risk weight → regulatory arbitrage.
- Incentive: raise return on equity without appearing riskier.

## Basel II (2004)

- Allowed internal risk models to set capital requirements.
- Encouraged underestimation of risk and procyclical leverage.
- Thin buffers in booms, forced deleveraging in busts.

## Basel III (2010)

- Strengthened capital quality ( $\text{CET1} \geq 4.5\% + \text{buffers}$ ).
- Introduced leverage ratio ( $\geq 3\%$ ) and liquidity ratios (LCR, NSFR).
- Added countercyclical and systemic buffers for large banks.
- Shifted incentives toward stable funding and lower maturity mismatch.

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Global rules vs. national discretion create **regulatory arbitrage** and leakage of financial activity to weaker jurisdictions or shadow banks.

- International: Basel Committee sets minimum standards; Financial Stability Board (FSB) monitors systemically important institutions.
- U.S.: Dodd–Frank Act introduced stress tests, Volcker Rule, and “living wills.”
- European Union: CRD IV and the Single Supervisory Mechanism (SSM) under the ECB.

## National tools and tradeoffs:

- Deposit insurance and resolution funds.
- Capital and reserve requirements.
- Prudential supervision and stress testing.
- Central bank lender-of-last-resort operations.
- Crisis guarantees and bailouts.
- Moral hazard if protection is unconditional.
- Time inconsistency: authorities promise no rescue, but intervene in crises.

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# Moral Hazard and Too Big to Fail

- Expected bailouts reduce perceived risk and funding costs.
- Managers expand balance sheets and cross-border exposures.
- Cheap wholesale funding encourages leverage.
- Examples: Continental Illinois (1984), Sweden (1992), global banks (2008).
- Basel III adds capital surcharges for global systemically important banks (G-SIBs).
- Bail-in debt and resolution planning aim to avoid taxpayer losses.
- Stress tests and early-intervention rules heighten accountability.
- Yet credible backstops remain necessary – some moral hazard persists.

# The Financial Trilemma (Schoenmaker, 2011)

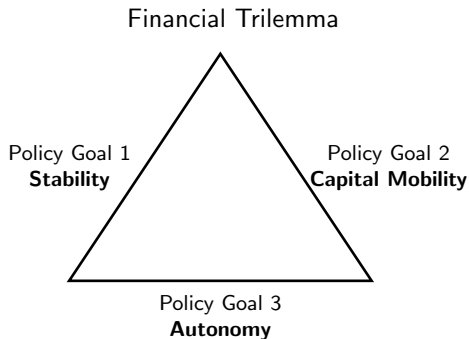
Three policy goals:

- Financial stability
- National regulatory autonomy
- Free capital mobility

Only two can coexist at once.

Similar to Mundell-Fleming.

- Basel III strengthens global standards to preserve stability under open capital markets.
- National autonomy is partially sacrificed: cross-border supervision and swap lines limit discretion.
- For banks, global coordination reduces regulatory arbitrage but constrains business models.





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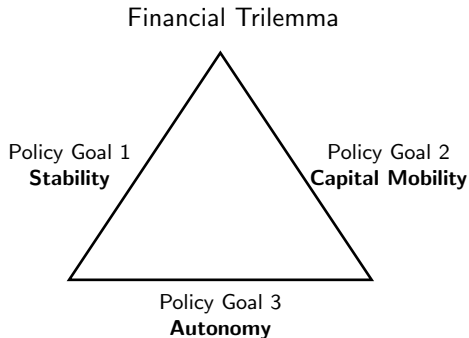
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# The Financial Trilemma (Schoenmaker, 2011)

## Logic:

- With *free capital mobility*, banks and investors can shift funds across borders instantly.
- With *national regulatory autonomy*, each country designs its own prudential rules.
- These regimes interact: when capital flows freely but oversight remains national, risks migrate to the weakest jurisdiction.
- Result: no single authority can contain cross-border contagion  $\Rightarrow$  global financial instability.

## Trilemma tradeoffs:

Financial stability + National autonomy	$\Rightarrow$	No free capital mobility
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**Examples:** Bretton Woods (capital controls) | Basel III + swap lines (shared sovereignty) | 2008 crisis (fragmented regulation)

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# Money Market Funds (MMFs): Structure and Purpose

- Money market funds (MMFs) invest in high-quality, short-term instruments:
  - Treasury bills, commercial paper, certificates of deposit.
  - Repurchase agreements (repos) and Eurodollar deposits.
- Provide investors with:
  - Liquidity comparable to bank deposits.
  - Slightly higher yields from short-term credit exposure.
- Major investors:
  - Corporate treasuries, institutional investors, banks.
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# Implications for Corporate Treasury and Banks

- Corporate treasury use:
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  - Post-GFC practice: diversify across funds, maturities, and counterparties.
- Example: Cisco, Pfizer, and Apple reduced MMF exposure after GFC, increasing T-bill holdings.
- Bank perspective:
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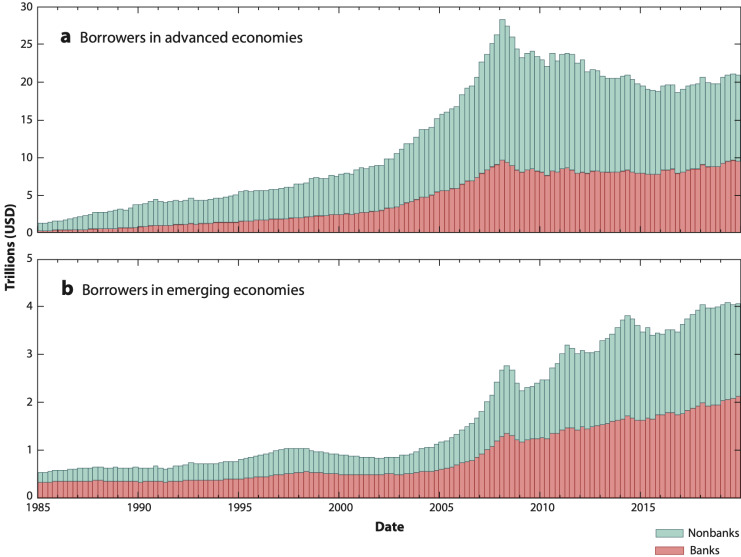
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# Patterns of Cross-Border Banking Activity



# From International Banking to Global Markets

International banking forms the bridge between domestic financial systems and global capital markets.

- Banks channel savings across borders and across currencies.
- Exchange rates and interest rates jointly determine returns on international lending and borrowing.
- Offshore financial centers (London, Hong Kong, Singapore, the Bahamas) grew as venues outside domestic regulation.
- Through these centers, funds circulate globally
  - Linking monetary policy, liquidity, and credit conditions across economies

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Foreign exchange (FX) markets coordinate international banking activity.

- Interbank FX trading determines both spot and forward exchange rates.
- Exchange rates serve as prices for transferring purchasing power across countries.
- Covered interest parity (CIP) links interest differentials and forward rates: if violated, banks can arbitrage through swaps.
- After 2008, persistent CIP deviations showed how bank balance-sheet constraints affect global currency pricing.

Example: Japanese and European banks borrowing U.S. dollars in swap markets pay a “CIP basis” reflecting global dollar demand.



International banks gradually expanded from intermediating loans to organizing **securities issuance**.

- The same offshore liquidity used for interbank loans financed the early Eurobond market.
- Eurobonds are debt securities issued in a currency outside its home market (e.g., USD bonds sold in London).
- Offshore issuance let firms and governments bypass domestic capital controls and reach new investor bases.
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## Setting Up Next Week: Portfolio Investment Channels

Today's discussion on international banking naturally leads to cross-border investment.

- Banks are at the heart of international finance, providing liquidity + FX services + maturity transformation + intermediation.
- The infrastructure they built enables the trading and settlement of international bonds and equities.
- Once capital controls loosened, investors moved more funds internationally.
- Portfolio flows now dominate global capital movements, seeking yield, diversification, and currency exposure.

Next lecture: How these channels evolved into global markets for **international bonds, equities, and portfolio investment**.