Week 8: International Banking System and Exchanges

FINA3020

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CUHK Business School

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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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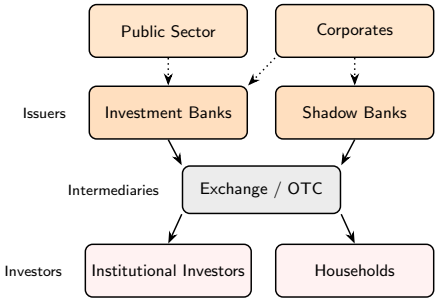
What are Capital Markets

Primary Markets

- Issuance of equity and debt by governments, corporates, banks
- Investment banks arrange and place securities with investors
- **Goal:** Transfer of risk and reward from issuers to investors



Secondary Markets

- Trading of existing equity, bonds, FX, or commodities
- Investment banks and investors trade among themselves
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Additional: Regulators (e.g. ECB, SEC) Rating agencies (e.g. S&P, Moody's)

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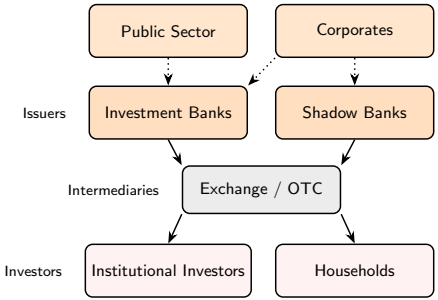

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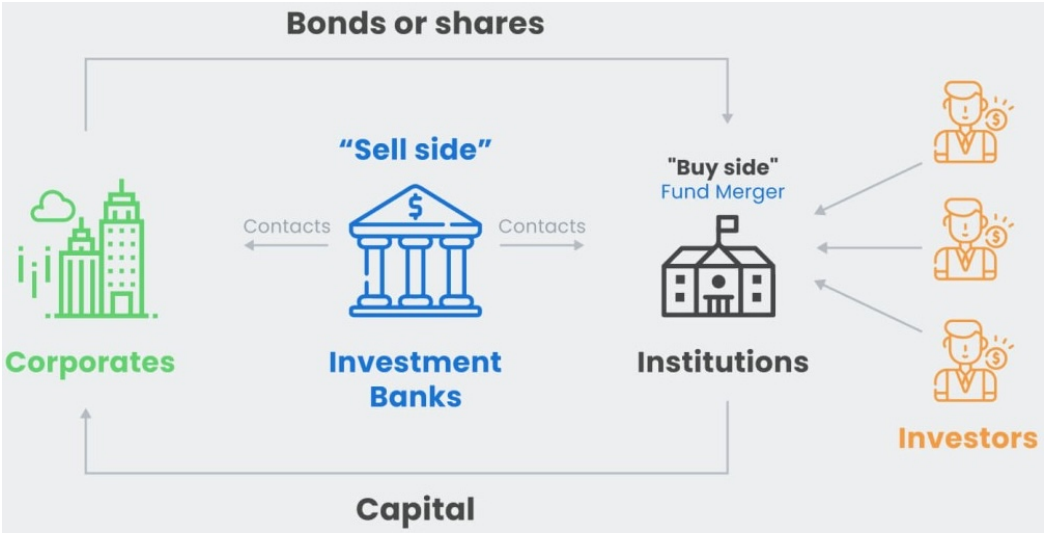
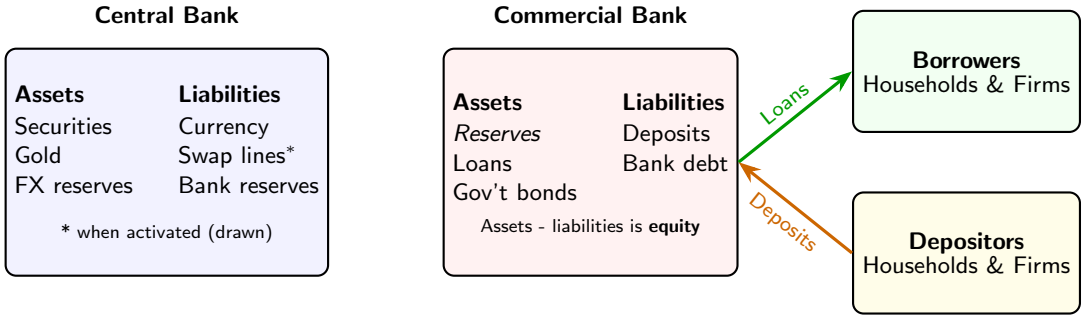
Investment Banks Intermediate Capital Markets



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

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)

Precursors to Modern Banks

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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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.

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- Strict capital controls; initially international lending mostly limited to trade finance.
- 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

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In this example, JP Morgan Chase debits HSBC's *nostro* (= JP Morgan Chase's *vostro*) to credit supplier's account in US

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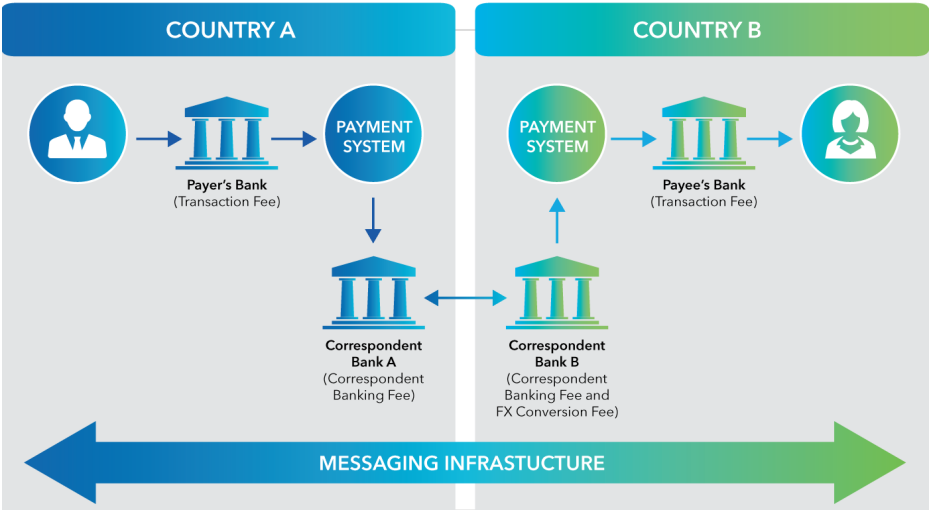
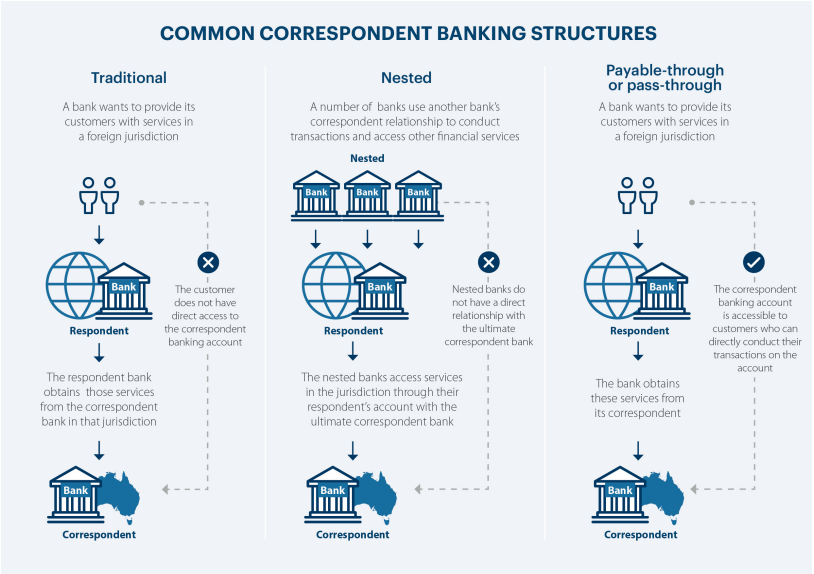
Correspondent Banking Diagram

Source: Aite Group



Types of Correspondent Banking



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

- Remember that the Bretton Woods system featured fixed exchange rates and tight capital controls (foreign lending, currency convertibility) along with limited monetary policy independence
  - 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
- Domestic banking systems were heavily regulated under Bretton Woods:
  - Example: US Regulation Q capped interest rates on deposits.
- Weeks 6-7: MNCs wished to finance investments and acquisitions abroad
  - Directly hedge FX risk of payment flows (e.g. trade, repatriated profits)
  - Indirectly match currencies of inflows to outflows through currency choice in invoicing and borrowing
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What Happened Offshore: Eurocurrency Market

Definition of eurocurrency: deposit in account outside currency's home country

- 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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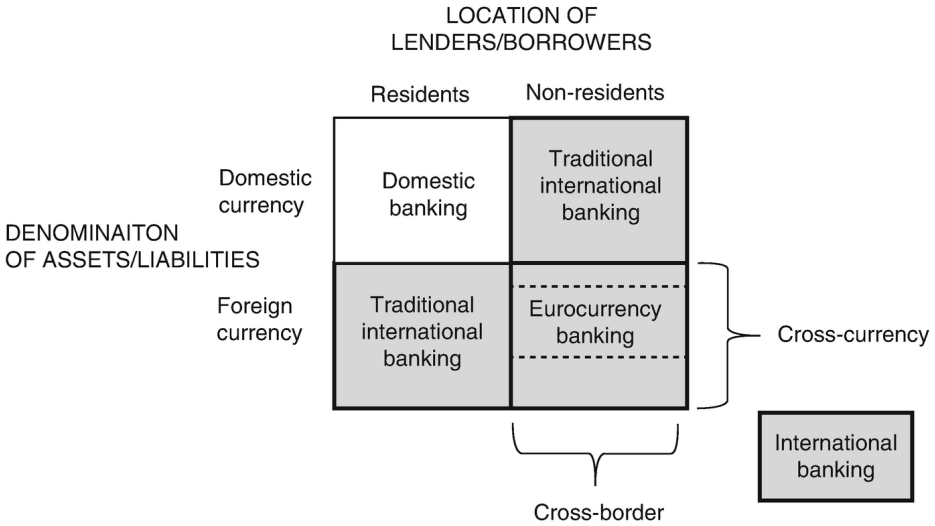
Eurocurrency Market Categorization



Source: Battilossi (2019)

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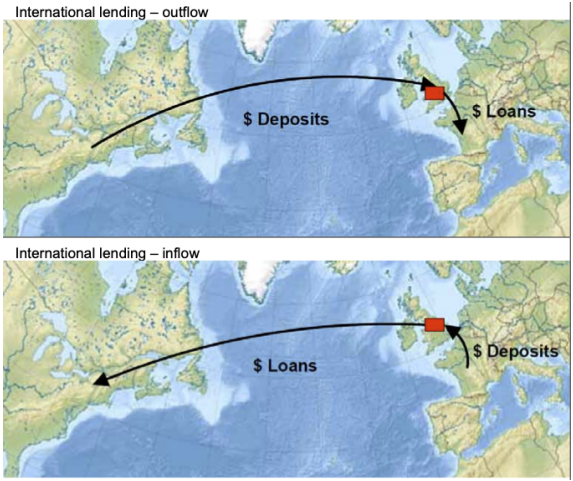
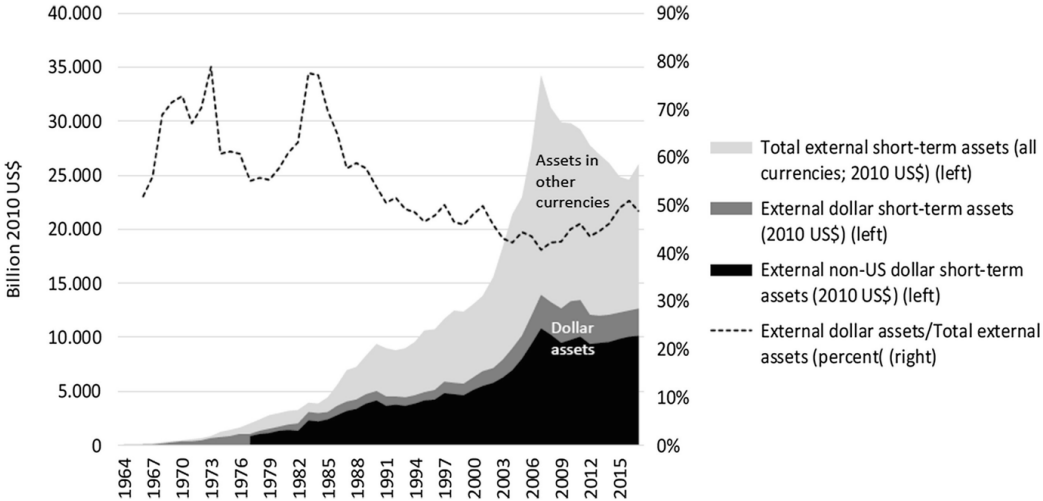


Source: He and McCauley (2012)

Eurocurrency Market Growth



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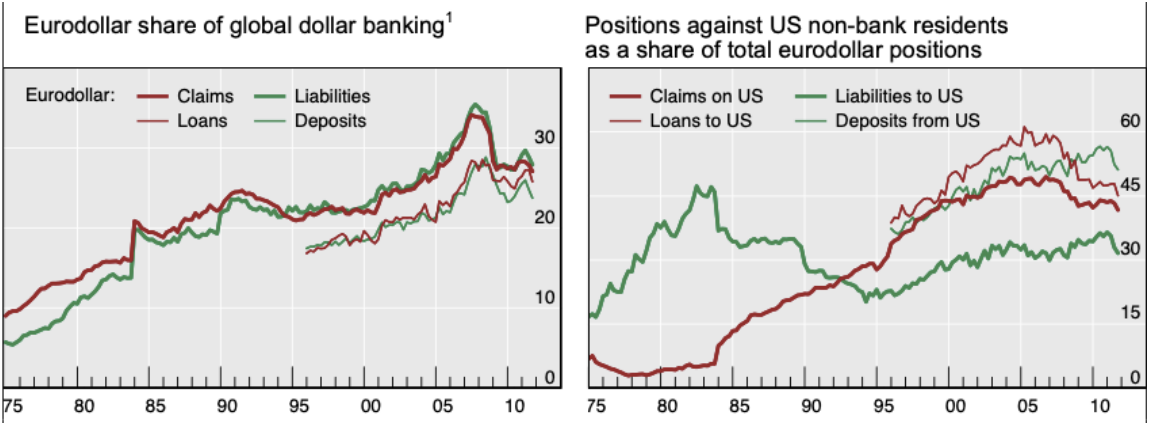
Eurodollar Banking Growth



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
  - Major US banks opened branches in HK in the 1960s to finance MNC activities in industrializing Asian economies and evade Bretton Woods regulation
- 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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  - Major US banks opened branches in HK in the 1960s to finance MNC activities in industrializing Asian economies and evade Bretton Woods regulation
- 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
  - MNCs borrowed more cheaply
  - Banks earned higher returns with greater flexibility
- But one key weakness: no lender of last resort

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
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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 $\rightarrow$ 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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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 $\Longrightarrow$ 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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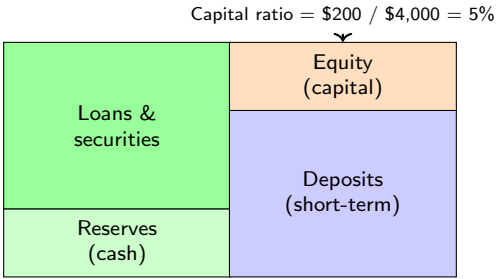
Stylized Bank Balance Sheet and Run Mechanism

Stylized Bank Balance Sheet (in $ millions)

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



Small withdrawals or price shocks can destroy equity ⇒ 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
- Bank fails even though assets were sound
- This is a **self-fulfilling run**

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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.

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.

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.

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Goldstein & Pauzner (2005): Simple Threshold Example

Setup

- Bank's strength depends on a fundamental θ 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.

Decision rule

- Withdraw if the signal is too low.
- Be indifferent when expected survival probability $= 1/1.4 \approx 0.71$.
- This gives a unique cutoff θ^*: below it, runs occur; above it, no runs.

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.
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Goldstein & Pauzner Intuition: Korea 1997 Rollover Crisis

Background

- Korean banks and firms borrowed heavily in short-term U.S. dollars.
- Investors had limited, noisy information about reserves and FX exposure.
- When confidence in solvency (θ) fell below a perceived threshold, lenders refused to roll over debt.

Interpretation

- Deposit runs $\Rightarrow$ rollover stops are the same coordination game.
- GP explains how uncertainty over fundamentals can lead to one critical point, not two equilibria.
- Liquidity support moves the system above the safe threshold.

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.
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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 θ^*.
- 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.

Banking in the Global Financial Crisis

- 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 $\rightarrow$ margin calls $\rightarrow$ fire sales.
- Contagion through interbank and derivative exposures.
- Revealed limits of regulation focused only on single-bank safety.

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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.

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- Incentive: raise return on equity without appearing riskier.

Basel II (2004)

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- Encouraged underestimation of risk and procyclical leverage.
- Thin buffers in booms, forced deleveraging in busts.

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- Shifted incentives toward stable funding and lower maturity mismatch.

Global Coordination and National Responses

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 (G-SIBs, G-SIIs).
- 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.
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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)

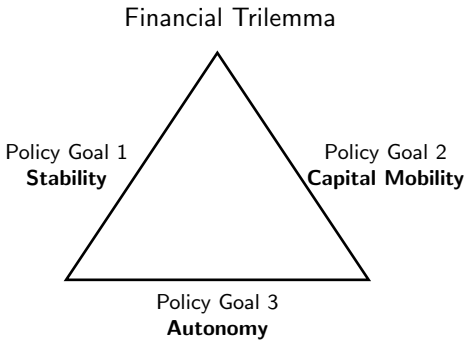
Three policy goals:

- 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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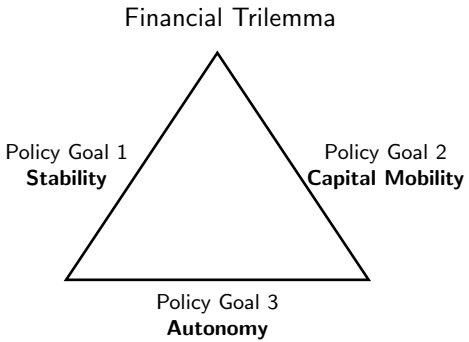

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Logic:

- 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:

$$\begin{aligned} \text{Financial stability} + \text{National autonomy} &\Rightarrow \text{No free capital mobility} \\ \text{Financial stability} + \text{Free capital mobility} &\Rightarrow \text{No national autonomy} \\ \text{Free capital mobility} + \text{National autonomy} &\Rightarrow \text{No financial stability} \end{aligned}$$

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.
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- Major investors:
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- In 2008, the collapse of Lehman Brothers triggered a run on MMFs.
- The Reserve Primary Fund "broke the buck":
  - Net asset value fell below $1 after losses on Lehman paper.
  - Institutional investors rushed to redeem shares.
- MMFs were forced to sell assets into illiquid markets, amplifying stress.
- Consequences:
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Systemic Vulnerabilities in MMFs

- MMFs offer stable-value claims but hold risky, illiquid assets.
- First-mover advantage:
  - Early redeemers receive full value; later investors bear losses.
- Structural mismatch:
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Implications for Corporate Treasury and Banks

- Corporate treasury use:
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  - Should be viewed as investment products, not true cash equivalents.
  - Post-GFC practice: diversify across funds, maturities, and counterparties.
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- Bank perspective:
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  - Post-crisis, banks shortened maturities and shifted to secured funding.
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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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Exchanges as Hubs

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.

From Banking Flows to Securities Markets

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**.