

Financial Crises and Regulation

ECO 301: Money and Banking

Goals and Learning Outcomes

- Goals:
 - Describe attributes and types of assets and liabilities held by the banking sector
 - Describe different types of risks banks face and how they manage these risks.
 - Explain the difference between liquidity crises and solvency crises.
 - Identify how a crisis can spread to other banks.
 - Describe government interventions to mitigate and prevent banking crises.
 - Describe the macroeconomic implications for banking crises.
- Learning Outcomes:
 - LO1: Understand and appreciate the importance of financial markets for the overall functioning of the economy.

Reading and Exercises

- Bank liabilities: Chapter 10, pp. 311-317
- Bank assets: Chapter 10, pp. 317-321
- Managing bank risks: Chapter 10, pp. 325-333
- Origins of financial crisis: Chapter 12, pp. 406-411
- Financial crisis and regulation: Chapter 12, pp. 411-425
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Bank's Balance Sheets

- **Balance sheet:** A statement that shows an individual's or firm's position of assets and liabilities at a particular time.
- **Asset:** something of value that an individual or firm owns, such as a financial claim.
- **Liability:** a financial claim *on* an individual or firm.
- **Bank capital** or **shareholder's equity** is the value of the bank's assets over and above the value of its liabilities.

Bank Liabilities: Checkable Deposits

- **Checkable deposits:** Accounts which depositors can use for payments, make immediate withdrawals. Also called *transaction deposits*.
- Liability because it is money the bank owes to the depositors should they demand their funds back.
- From the perspective of an individual person or firm holding the checking account, checkable deposits are an asset.
- **Saving accounts:** interest bearing accounts, available for immediate withdrawal
- **Demand deposits:** Checking accounts that do not pay interest.
- **NOW (Negotiable Order of Withdrawal) accounts:** checkable deposits that pay interest.

Bank Liabilities: Nontransaction Deposits

- **Nontransaction deposits:** interest bearing deposit accounts with restricted access to funds for the depositors.
- **Money market deposit accounts:** interest bearing accounts, depositors can write a limited number of checks from this account per month.
- **Time deposits** or **Certificates of deposit (CDs):** deposit accounts with specified maturity dates ranging from several months to several years.
 - Banks charge penalties for withdrawing funds prior to maturity date.
 - Large denomination CDs (over \$100,000) are *negotiable*, which means they can be liquidated in a secondary market prior to maturity.

Bank Liabilities: Borrowing

- **Federal funds borrowing:** banks make literally overnight loans to each other.
- **Discount loans:** banks can borrow funds from the Federal Reserve, at the *discount window*.
- **Repurchase agreements:** banks sell something (usually treasuries) to another party, with an agreement to purchase it back for a slightly higher price, usually the next day.
 - Kinda like a pawn shop loan.
 - Banks usually borrow from large corporations through this channel.

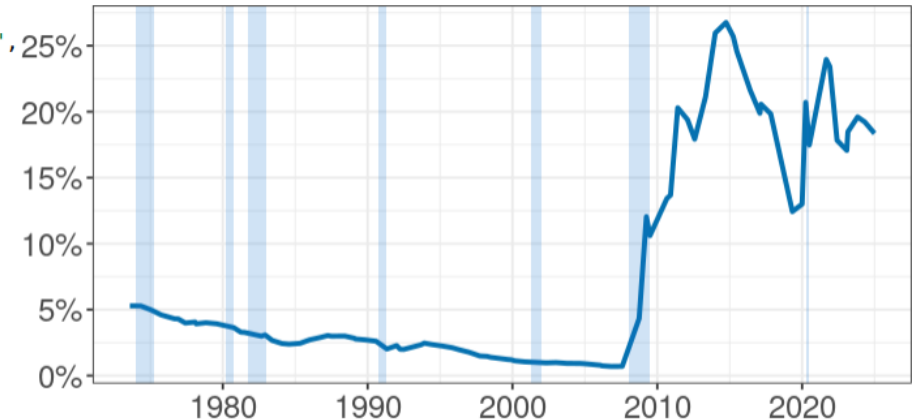
Bank Assets: Reserves

- **Reserves:** vault cash plus reserve deposits with the Federal Reserve.
- **Interest rate on reserve balances:** interest rate paid by the Fed to banks for reserves held at the Federal Reserve. Currently 3.9% (November 17, 2025).
- **Vault cash:** cash on hand, including cash held in banks' vaults, cash held in ATMs, and deposits held with other banks.

Reserves

```
1 library(tidyverse)
2 library(ecodata)
3
4 urls <- c("https://fred.stlouisfed.org/series/DPSACBW027SB0G",
5           "https://fred.stlouisfed.org/series/TOTRESNS")
6
7 varnames <- c("Deposits", "Reserves")
8
9 df <- get_ecodata(urls, varnames)
10
11 df <- df |>
12   mutate(`Reserves Ratio` = Reserves / Deposits * 100,
13          units = "Percent")
14
15 ggplot_ecodata_ts(df,
16                   variables = "Reserves Ratio",
17                   title = "Reserves (% of Total Deposits)",
18                   plot.recessions = TRUE)
19
20 ecodata_description_table(df)
```

Reserves (% of Total Deposits)



Source: FRED (R) Federal Reserve Bank of St. Louis

Total reserves are approximately \$3.2 trillion, which is approximately 18.3% of deposits.

Bank Assets: Marketable Securities

- **Marketable securities:** liquid assets that banks can trade in financial markets.
- U.S. Treasury Bonds (often referred to as “secondary reserves”)
- Other government and corporate bonds that received investment-grade ratings when first issued.
- Limited amounts of municipal bonds.
- Mortgage-backed securities. In 2010, made up 56% of bank securities held.
- Collateralized loan obligations (CLOs), Commercial mortgage-backed securities (CMBS)

Bank Assets: Loans

- Loans:
 - Largest category of banks' assets.
 - Illiquid.
 - Banks earn higher interest than with marketable securities.
- Types of loans:
 - Loans to businesses (or Commercial and Industrial (C&I) loans).
 - Consumer loans - loans to consumers to buy cars, furniture, other crap.
 - Real estate loans - residential mortgages.
 - Real estate loans - commercial mortgages.

Other Assets

- Repossessed collateral, including real estate from borrowers who defaulted on their loans.
- Bank's physical assets, such as its own buildings, office furniture, and computer equipment.

Working with Defaults

- **Write-downs** or **write-offs**: when a bank expects a loan will not be repaid, or only partially repaid, the bank reduces the value of the loan (asset) on its balance sheets or removes the value entirely.
- **Loan loss reserve**: banks set aside part of their financial capital to offset anticipated future write-offs.
 - When a bank sets aside money in its loan loss reserves, it decreases current profits.
 - When a borrower defaults, and the bank uses its loan loss reserves, it adds these funds back to its assets, and profits do not change.
 - It is a way of smoothing out the pain of defaults.

Liquidity Risk

- **Liquidity risk:** the possibility the bank may not have reserves on hand to meet its depositors needs.
- Ways to manage liquidity risk involves:
 - Keep excess reserves
 - Make federal funds loans with excess funds.
 - Make repurchase agreements with other banks or corporations (agreements to buy with the promise to resell).
 - Hold treasury bills. Short-term or long-term?
 - What is the opportunity cost?

Credit Risk

- **Credit risk:** risk that borrowers may default on their loans.
- Exacerbated by problems of *adverse selection* and *moral hazard*.
- **Diversification:** diversify across borrowers, regions, and industries.
- **Credit-risk analysis:** use of information about borrowers' employment, income, net worth, and credit scores to mindlessly determine loan eligibility and interest rate.
- **Relationship banking:** established long-term relationship between a bank and a borrower. Reduces asymmetric information.
- Collateral, credit rationing, restrictive covenants.

Interest Rate Risk

- Interest rate risk: the effect a change in market interest rates has on bank's profits or bank capital.
- A change in interest rates can affect the present value of banks' assets and liabilities.
- **Fixed-rate assets or liabilities:** Increase in interest rate leads to decrease in present value. Interest rates and value of fixed-rate assets/liabilities move in opposite directions.
- **Variable-rate assets or liabilities:** Increase in interest rate leads to both an increase in cash flows and the denominator of the present value formula. The net effect on present value is small, ambiguous (depends on the details of the contract).
- Most bank assets are fixed rate (loans to consumers and businesses), most bank liabilities are variable rate (deposits).
- How does an increase in interest rates affect banks' net worth?

Managing Interest Rate Risk

- **Gap analysis:** gap = value of a bank's variable-rate assets - value of its variable-rate liabilities. Typically negative.
- **Duration gap** average duration of a bank's assets - average duration of bank's liabilities. Typically positive.
- An increase in interest rates will have a larger (negative) effect on the present value bank's assets than on present value of bank's liabilities.
- **Adjustable-rate loans:** loans whose interest rates, and therefore payments, change before maturity. Eg: home equity lines of credit, aka adjustable-rate second mortgages.
- **Interest-rate swaps:** exchanges with other financial firms or corporations - payments of a fixed-rate loans received by the bank exchanged for payments of flexible-rate loans received by the other firm.

Liquidity Crisis

- **Liquidity risk:** banks assets are illiquid, banks liabilities are liquid.
- **Liquidity crisis:**
 - A liquidity crisis implies banks start with a *positive net worth*.
 - Banks may be called on to pay their liabilities, without enough liquid assets on hand, and credit constrained markets prevent borrowing at affordable interest rates.
 - To pay liabilities, borrow at high interest rates or sell illiquid assets at low prices.
 - These transactions cause *net worth to fall below zero*.
- **Insolvency crisis:** when banks have a *negative net worth*.
- Without government intervention, liquidity crises can lead to insolvency crises.

Bank Crises

- **Bank run:** widespread loss in confidence in bank(s), depositors suddenly and simultaneously withdraw large amounts of funds.
- **Contagion:** when panic spreads from one financial institution to another
 - A problem may begin with an insolvent bank or institution, depositors rightly withdraw funds and lenders to these institutions rightly restrict lending.
 - If depositors or lenders cannot distinguish between healthy financial institutions and insolvent ones, panic may spread to other banks, causing a liquidity crisis.
- **Bank panic:** when many banks simultaneously experience bank runs.

Government Intervention

- **Lender-of-last-resort:** The Federal Reserve Bank (as most central banks) acts as a last-resort lender to banks and financial institutions.
 - Lender-of-last-resort loans provide liquidity to otherwise liquidity constrained banks.
 - The simple presence of a lender-of-last-resort (even if not used) reduces chances of bank runs and contagion.
 - Lending to solvent, but illiquid banks is not a “bail out.” It does not lead to moral hazard.
- **Federal Deposit of Insurance Corporation (FDIC):** Federal government agency established by Congress in 1934 to insure deposits in commercial banks.
 - FDIC insures \$250,000 per depositor, per bank.

Troubled Asset Relief Program (TARP)

- Congressional order signed by George W. Bush on October 3, 2008
- Intended to provide *liquidity* to financial institutions
- Gave U.S. Treasury authority to purchase \$700 billion in “troubled assets”
- Eventually changed to \$475 billion, \$431 billion in actual purchases
- Treasury made money! Sold last of these assets on December 19, 2014, total profit = \$24 billion

Federal Reserve Large Scale Asset Purchase (LSAP)

- Late 2008 - 2014, Fed made large purchases of long-term securities
- Included government bonds and securities guaranteed by Freddie Mac and Fannie Mae
- Brought down return on safe long-term bonds
- Increased demand for other long-term securities, adding liquidity
- Included \$1.25 trillion purchases of MBS (Jan 5, 2009 - March 31)
- The Fed is still earning (lots!) of interest on these securities

Too Big To Fail: Systemic Risk

- **Systemic risk:** risk that an economic or financial market event will trigger a loss of economic value or a loss in confidence to a substantial part of the entire financial system.
- A given financial institution is deemed **too-big-to-fail** if its liabilities are connected to a large number of financial institutions. A failure of the one firm will result in a loss of the value of assets held by many financial institutions.
- There may be cause to bail out insolvent, too-big-to-fail institutions. Tax payers will still be at a loss, but systemic problems are mitigated.
- Presence of too-big-to-fail firms along with a bail-out precedence causes moral hazard.

Banking Crises and the Macroeconomy

- When the financial system fails to function, it fails to get funds from individual savers to businesses to use for investment in capital.
- A decrease in investment decreases total output / total spending in the short-run.
 - $GDP = C + I + G + X - M$
 - When sales of final goods and services are lower than expected, production decreases and workers are laid off.
 - Lower income for workers leads to lower consumption (standard expenditure multiplier effect).
- A sustained decrease in investment leads to lower long-run economic growth:
 - A decrease in investment leads to a lower level of aggregate capital stock in the future.
 - Lower levels of capital stock means production possibilities are lower.

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