Banking
Ch.9 in Mishkin ed.11.
Ch.10 in Mishkin e.10.

1. Bank balance sheets

2. Reserve Management
   - Holding reserves
   - Borrowing from other banks => Fed-funds market
   - Borrowing from the Fed => Discount loans (regular and term auction)

3. Asset & Liability Management
   Issues: Risk, Return & Liquidity  (Like Mishkin ch.5)
   - Credit risk: The economic role of banks is to evaluate borrowers
   - Interest Rate Risk: Short-term deposits and longer-term loans
   - Liquidity Risk => Reserve management
# The Essence of Banking: Deposits & Loans

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loans (L)</td>
<td>Deposits (D)</td>
</tr>
<tr>
<td>Reserves (R)</td>
<td>Bank Capital</td>
</tr>
</tbody>
</table>

- **Deposits** \(D\). Pay interest rate \(i_D\) => **Cost of deposit-taking**: \([i_D+(\text{expenses})] \cdot D\)

- **Loans** \(L\). Pay interest rate \(i_L\) => **Earnings**: \([i_L-(\text{monitoring cost})-(\text{default rate})] \cdot L\)
  - After adjusting for: **Credit risk** => Monitoring cost
  - **Deposit taking & lending is profitable** if \((i_L - i_D)\) exceeds the cost

- **Reserves** \(R\) = Vault cash or balance in a Federal Reserve account
  - Reserves do not pay interest. They reduce deposits that can be loaned out
    => **Task of reserve management**: Keep \(R\) low.
  - U.S. currently: **Required reserve ratio** \(rr = 10\% = R/D\)  (with loopholes)

- **Bank Capital**: protection against loan losses, but expensive: leverage raises ROE. Regulated to prevent deposit insurance losses.
The Economics of a Simple Bank

• **Credit Risk**: common to all lenders
  - Adverse selection. Moral Hazard. Should banks avoid credit risk? (No!)
  - Risk reduction: screening; monitoring; loan covenants; collateral; long-term relations (+information across business lines, e.g. checking transactions)
  - Risk management: diversification; sufficient equity capital; securitization.

• **Interest Rate Risk**: threat to many lenders
  - Long-term loans & short-term deposits. Should banks avoid this risk? (Yes!)

• **Liquidity Risk**: specific to banks as deposit-taking institutions
  - Deposits can be withdrawn any time => Threat of a **Bank Run**
    - Conflict between maintaining liquidity and minimizing cost of reserves.
    - Gives the Fed power over the banking system as provider of liquidity
  - Need to maintain liquidity explains most other items on banks’ balance sheets
## Bank Balance Sheets

**TABLE 1** Balance Sheet of All Commercial Banks (items as a percentage of the total, June 2014)

<table>
<thead>
<tr>
<th>Assets (Uses of Funds)*</th>
<th>Liabilities (Sources of Funds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserves and cash items</td>
<td>Checkable deposits 11%</td>
</tr>
<tr>
<td>Securities</td>
<td>Nontransaction deposits</td>
</tr>
<tr>
<td>U.S. government and agency</td>
<td>Small-denomination time deposits 47%</td>
</tr>
<tr>
<td>State and local government and other securities</td>
<td>(&lt;$100,000) + savings deposits 11%</td>
</tr>
<tr>
<td>Loans</td>
<td>Borrowings 20%</td>
</tr>
<tr>
<td>Commercial and industrial</td>
<td>Bank capital 11%</td>
</tr>
<tr>
<td>Real estate</td>
<td></td>
</tr>
<tr>
<td>Consumer</td>
<td></td>
</tr>
<tr>
<td>Interbank</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Other assets (for example, physical capital)</td>
<td>Total 100%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

*In order of decreasing liquidity.

Liquidity Management Perspective

- Balance sheet items motivated by liquidity management:

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loans to customers L</td>
<td>Deposits D</td>
</tr>
<tr>
<td>Reserves R</td>
<td>Loans from the Fed BR</td>
</tr>
<tr>
<td>Loans to other banks</td>
<td>Loans fr. other banks</td>
</tr>
<tr>
<td>Liquid securities</td>
<td>Negotiable CDs</td>
</tr>
<tr>
<td></td>
<td>Bank Capital</td>
</tr>
</tbody>
</table>

- Overnight loans between banks = The Fed-funds market

- The Fed balance sheet:

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loans to Banks $</td>
<td>Reserve Account - Bank#1 $</td>
</tr>
<tr>
<td></td>
<td>Reserve Account - Bank#2 $</td>
</tr>
<tr>
<td></td>
<td>Reserve Account - Bank#3 $</td>
</tr>
</tbody>
</table>

[Notes on Banking - P.5]
Bank Runs and Bank Regulation

• Economics of demand deposits:
  Depositors value the option of immediate withdrawal, but most deposits are
  not withdrawn quickly => Banks can use a large fraction of their deposit
  volume as funding source for longer-term, illiquid assets (bank loans).

• Bank Run: game situation with multiple equilibrium outcomes.
  - Normal play: Expect the bank to be solved. Withdraw balances only when
    needed. Bank is solvent.
  - Run equilibrium: Expect the bank to fail. Everyone wants to withdraw. Bank
    is forced to sell illiquid assets at “fire sale” prices. Bank is insolvent.
  - Common solutions for banks: Discount Loans. Deposit Insurance.

• Problem:
  - Guarantees create incentives to make risky investments. If returns are high,
    stockholders/managers profit. If low, government/taxpayers pay.
  - Common solutions: Regulations imposing minimum capital requirements.
Bank Capital Requirements

- Expressed as minimum ratio equity/assets, or maximum leverage (assets/equity)
- Basic U.S rules: ratio $\geq 5\%$ is well capitalized; regulatory restrictions if ratio $< 3\%$
  - Problems: ratio based on book values; incentive to hold risky assets.

- International rules (“Basel” standards): ratios based on risk-weighted assets
  - Basel I (1988): risks measured by credit rating & asset type (for most banks).

- Problems: Low weight on AAA. Zero on governments debt (=the regulators!).
  => Incentives to “engineer” AAA securities; lending to governments.
- Basel III (by 2019): higher capital requirements – more sophisticated?
  - Promising: higher capital buffer for large institutions.
The Financial Crisis: Runs on Non-Banks & The TBTF problem

- **Can bank runs occur at non-bank institutions?** (Investment banks etc.)
  - Traditional answer: No. Investment banks hold liquid assets (securities), so they can and do provide collateral to their “depositors”.
  - **Repo** = Overnight loans structured as sale and repurchase of securities. Typically “rolled over” daily. Normally provides stable funding source.
  - Crisis: Liquid securities turn illiquid (e.g., MBS). Repo lenders expect failure of future rollovers => Everyone stops lending. Result: run equilibrium.

- **Too Big To Fail** (TBTF): Concern about “systemic risk” = chain reaction of failures. Motivates government interventions. Key distinction:
  - Central Bank as **Lender of Last Resort**: emergency loans at penalty rates. [Note: Fed interventions in 2007-09 have been profitable.]
  - **Bailout**: Government payment without expectation of full repayment.

- Sensible mitigation measures: capital requirements; relation to size/TBTF risk

[Notes on Banking - P.8]