Chapter 9

Banking and the Management of Financial Institutions

The Bank Balance Sheet

Table 1 Balance Sheet of All Commercial Banks (items as a percentage of the total, January 2003)

Assets (Uses of Funds)*		Liabilities (Sources of Funds)	
Reserves and cash items	5	Checkable deposits	9
Securities		Nontransaction deposits	
U.S. government and agency	15	Small-denomination time deposits	
State and local government and other securities	10	(< $100,000) + savings deposits	42
Loans		Large-denomination time deposits	14
Commercial and industrial	14	Borrowings	28
Real estate	29	Bank capital	7
Consumer	9		
Interbank	4		
Other	8		
Other assets (for example, physical capital)	6		
Total	100	Total	100

*In order of decreasing liquidity.
Source: www.federalreserve.gov/releases/h8/current/.

The Bank Balance Sheet: Select Items

- Borrowings
  - from the Fed (discount loans) or from other banks (overnight loans)
  - taken to fulfill reserve requirements with the Fed
- Reserves:
  - consist of vault cash and deposits with the Fed (reserves):
    - required reserves with the Fed (a certain percent of checkable deposits, given by the *required reserve rate*)
    - excess reserves, because they are the most liquid bank assets

The Bank Balance Sheet: Select Items (cont.)

- Cash items:
  - cash items in process of collecting
  - deposits at other banks (correspondent banking)
- Short-term U.S. government securities are also called *secondary reserves*

Bank Operation

T-account Analysis:

Deposit of $100 cash into First National Bank

Assets	Liabilities
Vault Cash + $100 (=Reserves)	Checkable Deposits + $100

Deposit of $100 check into First National Bank

Assets	Liabilities
Cash items in process of collection + $100	Checkable Deposits + $100

First National Bank		Second National Bank	
Assets	**Liabilities**	**Assets**	**Liabilities**
Reserves + $100	Checkable Deposits + $100	Reserves – $100	Checkable Deposits – $100

Conclusion: When bank receives deposits, reserves ↑ by equal amount; when bank loses deposits, reserves ↓ by equal amount

Principles of Bank Management

1. Liquidity Management
   - have enough liquid assets to meet bank's obligation to depositors
2. Asset Management
   - keep an acceptable level of risk
   - two aspects:
     - managing credit risk (the risk that borrowers may default)
     - managing interest-rate risk (changes in earnings and returns on bank assets because of changes in interest rates)

Principles of Bank Management (cont.)

3. Liability management
   - acquire funds at low cost
4. Capital adequacy management
   - decide the amount of capital the bank should maintain
   - acquire the necessary capital

Liquidity Management Example

Reserve requirement = 10%, Excess reserves = $10 million

Assets		Liabilities	
Reserves	$20 million	Deposits	$100 million
Loans	$80 million	Bank Capital	$ 10 million
Securities	$10 million		

Deposit outflow of $10 million

Assets		Liabilities	
Reserves	$10 million	Deposits	$ 90 million
Loans	$80 million	Bank Capital	$ 10 million
Securities	$10 million		

With 10% reserve requirement, the bank still has excess reserves of $1 million: no changes needed in balance sheet

Liquidity Management Example (cont.)

No excess reserves

Assets		Liabilities	
Reserves	$10 million	Deposits	$100 million
Loans	$90 million	Bank Capital	$ 10 million
Securities	$10 million		

Deposit outflow of $10 million

Assets		Liabilities	
Reserves	$ 0 million	Deposits	$ 90 million
Loans	$90 million	Bank Capital	$ 10 million
Securities	$10 million		

Liquidity Management Example – Solutions to Liquidity Problem

1. Borrow from other banks or corporations

Assets		Liabilities	
Reserves	$ 9 million	Deposits	$ 90 million
Loans	$90 million	Borrowings	$ 9 million
Securities	$10 million	Bank Capital	$ 10 million

2. Sell Securities

Assets		Liabilities	
Reserves	$ 9 million	Deposits	$ 90 million
Loans	$90 million	Bank Capital	$ 10 million
Securities	$ 1 million		

Liquidity Management Example – Solutions to Liquidity Problem (cont.)

3. Borrow from Fed

Assets		Liabilities	
Securities	$10 million	Bank Capital	$ 10 million
Reserves	$ 9 million	Deposits	$ 90 million
Loans	$90 million	Discount Loans	$ 9 million

4. Call in or sell off loans

Assets		Liabilities	
Reserves	$ 9 million	Deposits	$ 90 million
Loans	$81 million	Bank Capital	$ 10 million
Securities	$10 million		

Liquidity Management – Conclusions

- Cover deposit outflows (liquidity needs):
  - excess reserves
  - loans from other banks or corporations
  - sale of securities
  - loans from the Fed
  - call-in or sale of loans
- Conclusion:
  - excess reserves are insurance against above 4 costs from deposit outflows (higher costs imply more excess reserves desired)

Asset Management

- Goals
  - seek highest returns possible on loans and securities
  - reduce risk
  - hold liquid assets

Asset Management Techniques

- get borrowers with low default risk, paying high interest rates (typically, banks are conservative – default rate is less than 1%)
- buy securities with high return, low risk
- diversify (many types of securities and many types of loans)
- manage liquidity (satisfy reserve requirements without large costs)

Liability Management

- not important before the 1960s because:
  - checking accounts were not paying interest, hence no competition for attracting deposits
  - inter-bank overnight loans were not well developed
- became important when large banks (*money center banks*) developed new financial instruments (e.g., negotiable CDs) and inter-bank overnight loans
- banks no longer primarily depend on deposits - when they see loan opportunities, they borrow or issue CDs to acquire the funds
- most banks manage both sides of the balance sheet together – *asset-liability management*

Capital Adequacy Management: Measures of Bank Profitability

- *Return on assets* (ROA) = net profits/assets
  - shows how efficiently the bank is run
- *Return on equity* (ROE) = net profits/equity capital
  - shows how well bank owners do
- *Equity multiplier* (EM) = assets/equity capital
  - is related to the other two measures:
    ROE = ROA × EM

Capital Adequacy Management

- Bank capital
  - is a cushion that helps prevent bank failure
  - if capital ↑, EM ↓, ROE ↓, hence there is a tradeoff between safety (high capital) and high ROE (satisfy shareholders)
  - the higher is bank capital, the lower is return on equity
  - banks also hold capital to meet capital requirements (set to avoid bankruptcies)

Capital Adequacy Management (cont.)

- Strategies for managing capital:
  - sell or retire stock
  - change dividends to change retained earnings (pay higher or lower dividends)
  - change asset growth (issue CDs, or conversely, call-in loans or sell securities)

Managing Credit Risk

Solving asymmetric-information problems:

- screening
- monitoring and enforcement of restrictive covenants
- specialize in lending
- establish long-term customer relationships
- loan commitment arrangements
- collateral and *compensating balances* (minimum amount of funds required in the checking account)
- credit rationing (no loans or smaller amounts)

Managing Interest-Rate Risk

First National Bank

Assets		**Liabilities**	
Rate-sensitive assets	$20 m	Rate-sensitive liabilities	$50 m
Variable-rate loans		Variable-rate CDs	
Short-term securities		MMDAs	
Fixed-rate assets	$80 m	Fixed-rate liabilities	$50 m
Reserves		Checkable deposits	
Long-term bonds		Savings deposits	
Long-term securities		Long-term CDs	
		Equity capital	

More rate-sensitive liabilities than assets: interest rates ↑, profit ↓

Gap Analysis

- *gap* (GAP) = the difference between rate-sensitive assets and rate-sensitive liabilities

  GAP = \$20 – \$50 = – \$30 million
- when interest rates rise by 5%:

  income on assets = 5% × \$20m = + \$1 million

  costs of liabilities = 5% × \$50m = +\$2.5 million

  ΔProfits = \$1m – \$2.5m = – \$1.5 million

  = 5% × (\$20m – \$50m) = 5% × (GAP)
- hence,

  ΔProfits = Δ*i* × GAP

Duration Analysis

- *duration* (DUR) = a measure of the average lifetime of a stream of payments
- the value of balance sheet items changes when interest rates change:

  %Δ value ≈ –(Δ*i*) × (DUR)
- example: interest rates rise by 5%, duration of bank assets = 3 years, duration of liabilities = 2 years

  %Δ assets = –5% × 3 = –15%

  %Δ liabilities = –5% × 2 = –10%
- if assets = \$100m and liabilities = \$90m, then assets fall by\$15m, liabilities fall by \$9m, and bank's net worth falls by \$6m

Strategies to Manage Interest-Rate Risk

- rearrange the balance-sheet:
  - shorten duration of assets
  - lengthen duration of liabilities
- use financial instruments (interest-rate swaps, futures)
  - less costly than altering the balance sheet
  - possibly the only feasible alternative

Off-Balance-Sheet Activities

- Loan sales
- Fee income from
  - foreign exchange trades for customers
  - servicing mortgage-backed securities
  - guarantees of debt
  - backup lines of credit
- Trading activities
  - financial futures
  - financial options
  - foreign exchange
  - swaps

Risk Management

- Principal-agent problem
  - traders have incentives to take big risks
- Risk management controls
  - separation of front and back rooms
  - modeling *value-at-risk* (the maximum loss the bank portfolio is likely to sustain over a given period of time)
  - stress testing (doomsday scenario)
  - regulators encourage banks to pay more attention to risk management