

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		(< \$100,000) + savings deposits	42
other securities	10	Large-denomination time deposits	14
Loans		Borrowings	28
Commercial and industrial	14	Bank capital	7
Real estate	29		
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

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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*

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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

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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)

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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

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Liquidity Management Example

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

Assets

Reserves	\$20 million
Loans	\$80 million
Securities	\$10 million

Liabilities

Deposits	\$100 million
Bank Capital	\$ 10 million

Deposit outflow of \$10 million

Assets

Reserves	\$10 million
Loans	\$80 million
Securities	\$10 million

Liabilities

Deposits	\$ 90 million
Bank Capital	\$ 10 million

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

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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		

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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		

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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		

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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)

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Asset Management

■ Goals

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

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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)

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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*

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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:
$$\text{ROE} = \text{ROA} \times \text{EM}$$

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Capital Adequacy Management

- Bank capital
 - is a cushion that helps prevent bank failure
 - if capital \uparrow , EM \downarrow , ROE \downarrow , 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)

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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)

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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)

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Managing Interest-Rate Risk

First National Bank

Assets

Rate-sensitive assets \$20 m
 Variable-rate loans
 Short-term securities

Fixed-rate assets \$80 m
 Reserves
 Long-term bonds
 Long-term securities

Liabilities

Rate-sensitive liabilities \$50 m
 Variable-rate CDs
 MMDAs

Fixed-rate liabilities \$50 m
 Checkable deposits
 Savings deposits
 Long-term CDs
 Equity capital

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

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Gap Analysis

- *gap* (GAP) = the difference between rate-sensitive assets and rate-sensitive liabilities
$$\text{GAP} = \$20 - \$50 = -\$30 \text{ million}$$
- when interest rates rise by 5%:
income on assets = $5\% \times \$20\text{m} = +\1 million
costs of liabilities = $5\% \times \$50\text{m} = +\2.5 million
$$\Delta\text{Profits} = \$1\text{m} - \$2.5\text{m} = -\$1.5 \text{ million}$$
$$= 5\% \times (\$20\text{m} - \$50\text{m}) = 5\% \times (\text{GAP})$$
- hence,
$$\Delta\text{Profits} = \Delta i \times \text{GAP}$$

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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:
$$\% \Delta \text{ value} \approx -(\Delta i) \times (\text{DUR})$$
- example: interest rates rise by 5%, duration of bank assets = 3 years, duration of liabilities = 2 years
$$\% \Delta \text{ assets} = -5\% \times 3 = -15\%$$
$$\% \Delta \text{ liabilities} = -5\% \times 2 = -10\%$$
- if assets = \$100m and liabilities = \$90m, then assets fall by \$15m, liabilities fall by \$9m, and bank's net worth falls by \$6m

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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

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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

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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