Money and Banking

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Banking and the Management of Financial Institutions

- The Bank Balance Sheet
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  - assets
- Basic Banking
- General Principle of Bank Management
  - Liquidity management and the role of reserve
  - Asset management
  - Liability management
  - Capital adequacy management
- Managing Credit Risk
  - Screening and Monitoring
  - Long-term customer relationship
  - Loan commitment
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  - Credit Rationing
- Managing Interest Rate Risk
  - Gap and Duration analysis

The Bank Balance Sheet

- Liabilities
  - Checkable deposits
  - Non-transaction deposits
  - Borrowings
  - Bank capital
- Assets
  - Reserves
  - Cash items in process of collection
  - Deposits at other banks
  - Securities
  - Loans
  - Other assets

The Bank Balance Sheet

Balance Sheet of All Commercial Banks (items as a percentage of the total, June 2011

Assets (Uses of Funds)*		Liabilities (Sources of Funds)	
Reserves and cash items	15%	Checkable deposits	10%
Securities		Nontransaction deposits	
U.S. government and agency	13	Small-denomination time deposits (< $100,000) + savings deposits	41
State and local government and other securities	6	Large-denomination time deposits	14
Loans		Borrowings	23
Commercial and industrial	10	Bank capital	12
Real estate	28		
Consumer	9		
Interbank	1		
Other	8		
Other assets (for example, physical capital)	9		
Total	100	Total	100

*In order of decreasing liquidity.

Source: www.federalreserve.gov/releases/h8/current/.

Basic Banking: Cash Deposit

What will happen to the bank's balance sheet if a new deposit account is opened using cash?

T-ACCOUNT

First National Bank		**First National Bank**	
Assets	Liabilities	Assets	Liabilities
Vault Cash +$100	Checkable deposits +$100	Reserves +$100	Checkable deposits +$100

Opening of a checking account leads to an increase in the bank's reserves equal to the increase in checkable deposits

Basic Banking: Check Deposit

What will happen to the bank's balance sheet if a check written from Second National Bank is deposit in First National Bank?

First National Bank	
Assets	Liabilities
Cash items in process of collection +$100	Checkable deposits +$100

When a bank receives additional deposits, it gains an equal amount of reserves; when it loses deposits, it loses an equal amount of reserves

First National Bank		**Second National Bank**	
Assets	Liabilities	Assets	Liabilities
Reserves +$100	Checkable deposits +$100	Reserves -$100	Checkable deposits -$100

Basic Banking: Making a Profit

First National Bank			
Assets		Liabilities	
Required reserves	+$10	Checkable deposits	+$100
Excess reserves	+$90		

First National Bank			
Assets		Liabilities	
Required reserves	+$10	Checkable deposits	+$100
Loans	+$90		

- Asset transformation: selling liabilities with one set of characteristics and using the proceeds to buy assets with a different set of characteristics
- The bank borrows short and lends long

General Principle of Bank Management

- Liquidity management and the role of reserve
- Asset management
- Liability management
- Capital adequacy management

Liquidity Management: Ample Excess Reserves

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

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

- Suppose bank's required reserves are 10%
- If a bank has ample excess reserves, a deposit outflow does not necessitate changes in other parts of its balance sheet

Liquidity Management: Shortfall in Reserves

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

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

- Reserves are a legal requirement and the shortfall must be eliminated
- Excess reserves are insurance against the costs associated with deposit outflows

Liquidity Management: Borrowing

Assets		Liabilities	
Reserves	$9M	Deposits	$90M
Loans	$90M	Borrowing	$9M
Securities	$10M	Bank Capital	$10M

- Cost incurred is the interest rate paid on the borrowed funds

Liquidity Management: Security Sales

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

- Cost incurred is the brokerage and other transaction costs.

Liquidity Management: Federal Reserve

Assets		Liabilities	
Reserves	$9M	Deposits	$90M
Loans	$90M	Borrow from Fed	$9M
Securities	$10M	Bank Capital	$10M

- Borrowing from the Fed also incurs interest payments based on the discount rate.

Liquidity Management: Reduce Loans

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

- Reduction of loans is the most costly way of acquiring reserves
- Calling in loans antagonizes customers
- Other banks may only agree to purchase loans at a substantial discount

Asset Management

- Three Goals:
  1. Seek the highest possible **returns** on loans and securities
  2. Reduce **risk**
  3. Have adequate **liquidity**

- Four Tools:
  1. **Find** borrowers who will pay high interest rates and have low possibility of defaulting
  2. **Purchase** securities with high returns and low risk
  3. Lower risk by **diversifying**
  4. **Balance** need for liquidity against increased returns from less liquid assets

Liability Management

- Before 1960s, most banks take liability as given (hence no management..)
  - more than **60%** of the bank funds are checkable deposits
  - **overnight loans market** is not well developed

- Starting at 1960s, **money center banks** began to explore new ways to obtain funds
  - overnight loan market is expanded
  - new financial instruments are developed (e.g. negotiable Certificate of Deposits)

- Checkable deposits have decreased in importance as source of bank funds
  - **61%** in 1960 to **10%** in 2011

Capital Adequacy Management: Preventing Bank Failure

High Bank Capital				Low Bank Capital			
Assets		Liabilities		Assets		Liabilities	
Reserves	$10M	Deposits	$90M	Reserves	$10M	Deposits	$96M
Loans	$90M	Bank Capital	$10M	Loans	$90M	Bank Capital	$4M

High Bank Capital				Low Bank Capital			
Assets		Liabilities		Assets		Liabilities	
Reserves	$10M	Deposits	$90M	Reserves	$10M	Deposits	$96M
Loans	$85M	Bank Capital	$5M	Loans	$85M	Bank Capital	-$1M

When a bank becomes insolvent, government regulators close the bank (**bank failure**).

Capital Adequacy Management: Return to Equity Holders

Return on Assets: net profit after taxes per dollar of assets

$$\text{ROA} = \frac{\text{net profit after taxes}}{\text{assets}}$$

Return on Equity: net profit after taxes per dollar of equity capital

$$\text{ROE} = \frac{\text{net profit after taxes}}{\text{equity capital}}$$

Relationship between ROA and ROE is expressed by the

Equity Multiplier: the amount of assets per dollar of equity capital

$$\text{EM} = \frac{\text{Assets}}{\text{Equity Capital}}$$

$$\frac{\text{net profit after taxes}}{\text{equity capital}} = \frac{\text{net profit after taxes}}{\text{assets}} \times \frac{\text{assets}}{\text{equity capital}}$$

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

Given the return on assets, the lower the bank capital, the higher the return for the owner of the bank.

Managing Credit Risk

- Screening and Monitoring
  - **Screening** (select borrowers)
  - **Specialization** in lending (e.g. by location, by industry)
  - **Monitoring** and enforcement of restrictive **covenants**
- Long-term customer relationships
- Loan commitments

  - The **majority** of commercial and industrial loans are made under loan commitments (credit line)
- Collateral

  - **compensating balances**: a firm receiving a loan must keep a required minimum amount of funds in a checking account at the bank
- **Credit rationing**
  - refusing to make loans even the borrower is willing to overpay
  - can be either no loan or partially loan

Managing Interest Rate Risk

First National Bank			
Assets		Liabilities	
Rate-sensitive assets	$20M	Rate-sensitive liabilities	$50M
Variable-rate and short-term loans		Variable-rate CDs	
Short-term securities		Money market deposit accounts	
Fixed-rate assets	$80M	Fixed-rate liabilities	$50M
Reserves		Checkable deposits	
Long-term loans		Savings deposits	
Long-term securities		Long-term CDs	
		Equity capital	

If a bank has more rate-sensitive liabilities than assets, a rise in interest rates will reduce bank profits and a decline in interest rates will raise bank profits.

Gap and Duration Analysis

- **Gap Analysis**
  - Basic gap analysis:

    (rate sensitive assets - rate sensitive liabilities) * change in interest rates = change in bank profit
  - *Maturity bucked* approach
    - Measures the gap for several maturity subintervals.
  - *Standardized* gap analysis

    -Accounts for different degrees of rate sensitivity.

- Duration Analysis

% change in market value of security = percentage change in interest rate * duration in years.

Off Balance Sheet Activities

- Loan sales (secondary loan participation)
- Generation of fee income. Examples:
  - Servicing mortgage-backed securities
  - Creating SIVs (structured investment vehicles) which can potentially expose banks to risk, as it happened in the global financial crisis
- Trading activities and risk management techniques
  - Financial futures, options for debt instruments, interest rate swaps, transactions in the foreign exchange market and speculation.
  - Principal-agent problem arises
- Internal controls to reduce the principal-agent problem
  - Separation of trading activities and bookkeeping
  - Limits on exposure
  - Value-at-risk
  - Stress testing