

CHAPTER 6: BANKING AND THE MANAGEMENT OF FINANCIAL INSTITUTIONS

MONEY & BANKING
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OUTLINE

- The Bank Balance Sheet
- Basic Banking
- General Principles of Bank Management
- Gap and Duration Analysis
- Off-Balance-Sheet Activities

INTRODUCTION

- Crucial role of banks in channeling funds within the economy
- In US banks supply in order of \$10 trillion in credit annually
- Provide loans to businesses, students, purchasing homes or cars ...

THE BANK BALANCE SHEET

bank balance sheet, a list of the bank's assets and liabilities

– it has the characteristic that :

$$\underline{\text{Total assets} = \text{total liabilities} + \text{capital}}$$

– A bank's balance sheet : a list of its *sources* of bank funds (liabilities) and *uses* to which the funds are put (assets).

THE BANK BALANCE SHEET

- **Liabilities:**

- Checkable deposits
- Nontransaction deposits
- Borrowings
- Bank capital

CHECKABLE DEPOSITS

- All accounts on which checks can be drawn
- Accounts for around 11% of bank liabilities in US
- They were once one of the most important source of bank funds (60% of liabilities in 1960)
- Payable on demand
- Lowest-cost source of bank funds (depositors look for liquidity and not the interest rate)
- Costs for bank:
 - Interest payments ~ 5% of total cost
 - Servicing cost (sending out monthly statements, buildings and branches...) ~ 85% of total cost
 - Advertising and marketing

NONTRANSACTION DEPOSITS

- Primary source of bank funds
- 2 basic types:
 - Savings accounts
 - Time deposits ((have a fixed maturity length)
 - Small-denomination time deposits (<\$100,000)
 - Large-denomination time deposits

BORROWINGS

- Banks borrow from the federal reserve (central banks) : discount loans
- Borrow overnight from the federal fund market from other US banks → to have required amount of reserves
- Loans made to banks by parent company
- borrowings are becoming an important source of finance: 2% of liabilities in 1960 vs. 17% in 2017

BANK CAPITAL

- Bank capital = the bank's net worth, which equals the difference between total assets and liabilities
- Raised by selling new equity (stock) or from retained earnings
- A cushion against a drop in the value of its assets, which could force the bank into insolvency

THE BANK BALANCE SHEET

- **Assets:**
 - Reserves
 - Cash items in process of collection
 - Deposits at other banks
 - Securities
 - Loans
 - Other assets

Bank assets are thus naturally referred to as uses of funds, and the interest payments earned on them are what enable banks to make profits.

RESERVES

- All banks hold some of the funds they acquire as deposits in an account at the central bank
- Reserves consist of deposits plus currency physically held by banks (vault cash)
- 2 reasons:
 - Required reserves → reserve requirements as a regulation in some countries (absent in Canada in EU drop from 2% of certain liabilities in 2012 to 1%)
 - to manage their own short-term liquidity requirements
 - meet unpredictable and potentially large withdrawals by their liability holders

The risk that net cash withdrawals might be negative is known as **banker's risk**

CASH ITEMS IN PROCESS OF COLLECTION

- Suppose that a check written on an account at another bank is deposited in your bank and the funds for this check have not yet been received (collected) from the other bank. The check is classified as a cash item in process of collection
- An asset for your bank because it is a claim on another bank for funds

DEPOSITS AT OTHER BANKS

- Many small banks hold deposits in larger banks in exchange for a variety of services, including cheque/check collection, foreign exchange transactions, and help with securities purchases. These deposits are known as **interbank deposits**.
- System of correspondent banking

SECURITIES

- An important income-earning asset
- can be classified into three categories :
 - Government securities (liquid because of low transaction costs)
 - State and local government securities (because local government does business with banks but subject to higher risk)
 - Other securities

LOANS

- Banks make their profits primarily by issuing loans
- A loan is a liability for the individual or corporation receiving it but an asset for a bank because it provides income
- Less liquid than other assets
- Higher probability of default → higher return for the bank

OTHER ASSETS

- the physical capital (bank buildings, computers, and other equipment) owned by the banks are included in this category.

TABLE 1 BALANCE SHEET OF ALL COMMERCIAL BANKS IN US (ITEMS AS A PERCENTAGE OF THE TOTAL, JUNE 2014)

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

Assets (Uses of Funds)*		Liabilities (Sources of Funds)	
Reserves and cash items	19%	Checkable deposits	11%
Securities		Nontransaction deposits	
U.S. government and agency	13	Small-denomination time deposits	47
State and local government and	6	(<\$100,000) + savings deposits	
other securities		Large-denomination time deposits	11
Loans		Borrowings	20
Commercial and industrial	12	Bank capital	11
Real estate	25		
Consumer	8		
Interbank	1		
Other	7		
Other assets (for example,	9		
physical capital)			
Total	100	Total	100

*In order of decreasing liquidity.

Source: <http://www.federalreserve.gov/releases/h8/current/>.

BASIC BANKING

- **Asset transformation**: *selling liabilities* with one set of characteristics (liquidity, risk, size, and return) and using the proceeds to *buy assets* with a different set of characteristics
Ex: deposit by one can be a mortgage for another
- like any firm: If the bank produces desirable services at low cost and earns substantial income on its assets, it earns profits

BASIC BANKING

- Cash Deposit:

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

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

Check Deposit:
 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

Opening an account with a check written on an account at another bank

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 and make profits from the process of asset transformation

GENERAL PRINCIPLES OF BANK MANAGEMENT

- The bank manager has four primary concerns :
 - to make sure that the bank has enough ready cash to pay its depositors when there are deposit outflows, that is, when deposits are lost because depositors make withdrawals and demand payment To keep enough cash on hand, the bank must engage in liquidity management
 - pursue an acceptably low level of risk by acquiring assets that have a low rate of default and by diversifying asset holdings (asset management)
 - acquire funds at low cost (liability management)
 - the manager must decide the amount of capital the bank should maintain and then acquire the needed capital (capital adequacy management).

GENERAL PRINCIPLES OF BANK MANAGEMENT

- Liquidity Management
- Asset Management
- Liability Management
- Capital Adequacy Management
- Credit Risk :the risk arising because borrowers may default
- Interest-rate Risk :the riskiness of earnings and returns on bank assets that results from interest-rate changes.

LIQUIDITY MANAGEMENT AND THE ROLE OF RESERVES

- Excess reserves:

1st bank			
Assets		Liabilities	
Reserves	\$20M	Deposits	\$100M
Loans	\$80M	Bank	\$10M
Securities	\$10M	Capital	

2 nd bank			
Assets		Liabilities	
Reserves	\$10M	Deposits	\$90M
Loans	\$80M	Bank	\$10M
Securities	\$10M	Capital	

- Suppose a 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 AND THE ROLE OF RESERVES

- Shortfall:

1 st bank			
Assets		Liabilities	
Reserves	\$10M	Deposits	\$100M
Loans	\$90M	Bank Capital	\$10M
Securities	\$10M		

2 nd bank			
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 AND THE ROLE OF RESERVES

- 1) Borrowing:

2 nd bank			
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 AND THE ROLE OF RESERVES

- 2) Securities sale:

2nd bank			
Assets		Liabilities	
Reserves	\$9M	Deposits	\$90M
Loans	\$90M	Bank Capital	\$10M
Securities	\$1M		

- The cost of selling securities is the brokerage and other transaction costs.

LIQUIDITY MANAGEMENT AND THE ROLE OF RESERVES

- 3) Federal Reserve:

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

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

LIQUIDITY MANAGEMENT AND THE ROLE OF RESERVES

- 4) 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.
 1. *Calling in loans* antagonizes customers.
 2. Other banks may only agree to purchase loans at a substantial discount.

SUMMARY

- When a deposit outflow occurs, holding reserves allows the bank to escape the costs of:
 - (1) borrowing from other banks or corporations,
 - (2) selling securities
 - (3) borrowing from the Bank of Canada
 - (4) calling in or selling off loans
- Reserves are insurance against the costs associated with deposit outflows. The higher the costs associated with deposit outflows, the more reserves banks will want to hold.

ASSET MANAGEMENT

Three goals:

1. Seek the highest possible returns on loans and securities.
2. Reduce risk.
3. Have adequate liquidity.

ASSET MANAGEMENT

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 (short- and long-term, government, and municipal bonds)
4. Balance need for liquidity against increased returns from less liquid assets. (arbitrage between low-return liquid assets or otherwise)

LIABILITY MANAGEMENT

- Recent phenomenon due to rise of money center banks
- Expansion of loan markets and new financial instruments (such as negotiable CDs)
- Checkable deposits overnight have decreased in importance as source of bank funds.
- Because of the increased importance of liability management, most banks now manage both sides of the balance sheet together in an asset liability management (ALM) committee

CAPITAL ADEQUACY MANAGEMENT

- Bank capital serves as a cushion to the bad shocks and helps prevent bank failure.
- The amount of capital affects return for the owners (equity holders) of the bank.
- Regulatory requirement

CAPITAL ADEQUACY MANAGEMENT

How Bank Capital Helps Prevent Bank Failure:

High Capital Bank				Low Capital Bank			
Assets		Liabilities		Assets		Liabilities	
Reserves	\$10 million	Deposits	\$90 million	Reserves	\$10 million	Deposits	\$96 million
Loans	\$90 million	Bank capital	\$10 million	Loans	\$90 million	Bank capital	\$ 4 million

Crisis and bad loans:

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

HOW THE AMOUNT OF BANK CAPITAL AFFECTS RETURNS TO EQUITY HOLDERS

In order to know whether a bank is managed well, proper measures of bank profitability are needed.

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

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

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

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

Relationship between ROA and ROE is expressed by the

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

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

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

$$ROE = ROA \times EM$$

- Equity multiplier for High capital bank: 10 (\$100 million/\$10 million)
- Equity multiplier for low capital bank: 25 (\$100 million/\$4 million)
- Suppose the **return on asset** for both banks are 1%
- *Which bank's equity holders are happier ?*

The low capital bank, because:

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

ROA is the same for both banks = 0.01

But EM is higher for the low capital bank (25 vs. 10)

Therefore, ROE is higher for the low capital bank

CAPITAL ADEQUACY MANAGEMENT

- Trade-off between safety and returns to equity holders:
 - Benefits the owners of a bank by making their investment safe
 - Costly to owners of a bank because the higher the bank capital, the lower the return on equity
 - Choice depends on the state of the economy and levels of confidence

APPLICATION: HOW A CAPITAL CRUNCH CAUSED A CREDIT CRUNCH DURING THE GLOBAL FINANCIAL CRISIS

- Shortfalls of bank capital led to slower credit growth:
 - Huge losses for banks from their holdings of securities backed by residential mortgages.
 - Losses reduced bank capital
- Banks could not raise much capital on a weak economy, and had to tighten their lending standards and reduce lending.

MANAGING CREDIT RISK

– Asymmetric information:

- Adverse selection
- Moral hazard

– Walter Wriston (former head of Citicorp): "business of banking is the production of information"

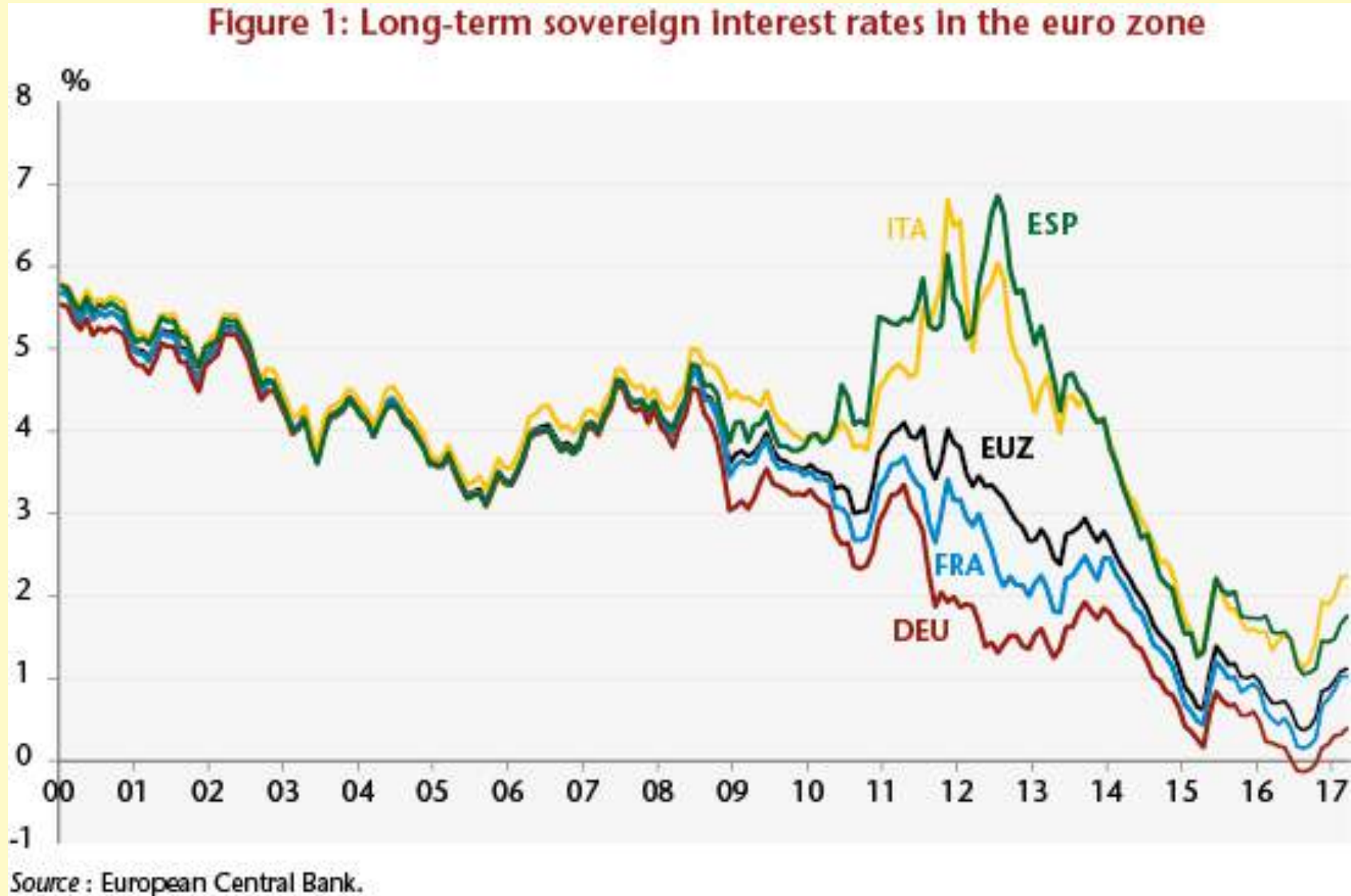
MANAGING CREDIT RISK

- Screening and Monitoring:
 - Screening
 - Specialization in lending (Ex. to local firms or to firms in a particular industry)
 - Monitoring and enforcement of restrictive covenants
- Long-term customer relationships
- Loan commitments (bank's commitment (for a specified future period of time) to provide a firm with loans up to a given amount at an interest rate that is tied to some market interest rate)
- Collateral (collateral: property promised to the lender as compensation if the borrower defaults) and compensating balances (A firm receiving a loan must keep a required minimum amount of funds in a checking account at the bank)
- Credit rationing

- **credit rationing:** refusing to make loans even though borrowers are willing to pay the stated interest rate or even a higher rate.
- Two forms :
 - when a lender refuses to make a loan of any amount to a borrower, even if the borrower is willing to pay a higher interest rate
 - The second occurs when a lender is willing to make a loan but restricts the size of the loan to less than the borrower would like

The larger the loan, the greater the benefits from moral hazard

MANAGING INTEREST-RATE RISK



MANAGING INTEREST-RATE RISK

- 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.

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

GAP AND DURATION ANALYSIS

- Basic gap analysis:
 $(\text{rate sensitive assets} - \text{rate sensitive liabilities}) \times \Delta \text{ interest rates} = \Delta \text{ in bank profit}$
- Maturity bucked approach:
 - Measures the gap for several maturity subintervals
- Standardized gap analysis:
 - Accounts for different degrees of rate sensitivity

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

REFERENCES

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