Chapter 1-3

Landscape of Financial system: Financial Instruments, Financial Markets, and Financial Institutions

Learning Objectives

1. Landscape of financial system
2. Explain what **financial instruments** are, how they are used, and how they are valued.
3. Discuss the role and structure of **financial markets** and identity the characteristics of a well-run financial market.
4. Describe the role of **financial institutions** and structure of the financial industry.

What does a financial system do?

- Providing key financial services
  - Funding services: ex. deficit v.s. surplus
    - Direct v.s. Indirect finance
  - Risk-management service: ex. Insured v.s. insurer
  - Payment service: ex. Platform of payments

What does a financial system do?

- Efficient financial system enhances welfare of the overall society.
  - Financial development is linked to economic growth.
  - The role of the financial system is to facilitate production, employment, and consumption.
  - Resources are funneled through the system so resources flow to their most efficient uses.

Six Parts of the Financial System

1. **Money**

   To pay for purchases and store wealth.

2. **Financial Instruments**

   To transfer resources from savers to investors and to transfer risk to those best equipped to bear it.

3. **Financial Markets**

   To buy and sell financial instruments.

4. **Financial Institutions**

   To provide access to financial markets, collect information & provide services.

5. **Regulatory Agencies**

   To provide oversight for financial system.

6. **Central Banks**

   To monitor financial Institutions and stabilize the economy.

Six Parts of the Financial System

1. **Money**
   - Money has changed from gold/silver coins to paper currency to electronic funds.
   - Cash can be obtained from an ATM any where in the world.
   - Bills are paid and transactions are checked online.
   - Digital currency is the new trend; cashless society!

Six Parts of the Financial System

2. Financial instruments (products)

- Transfers resources from savers to investors
- Buying and selling individual stocks used to be only for the wealthy.
- Today we have mutual funds and other stocks available through banks or online.
- Putting together a portfolio is open to everyone.

Six Parts of the Financial System

3. Financial Markets

- Allow the buying and selling of financial instruments easily
- Went from being in coffee houses and tavern to well organized markets like the New York Stock Exchange.
- Now transactions are mostly handled by electronic markets.
  - This has reduced the cost of processing financial transactions making the way for a much broader array of financial instruments available.

Six Parts of the Financial System

4. Financial Institutions

- Provide all the services of the financial system like providing access to financial markets and gathering information
- Banks began as vaults, developed into institutions that accepted deposits and gave loans, and evolved to today's financial supermarket (universal banking).

Six Parts of the Financial System

5. **Government regulatory agencies**
   - Make sure the elements of the financial system operate safely and reliably.
   - Government regulatory agencies were introduced by federal government after the Great Depression.
   - They provide wide-ranging financial regulation, rules, and supervision; and examine the systems a bank uses to manage its risk.
   - The 2007-2009 financial crises has led governments to greater regulation, such as the Dodd-Frank Wall Street Reform and Consumer Protection Act

Six Parts of the Financial System

6. **Central banks**
   - They monitor and stabilize the financial system
   - Central banks began as large private banks to finance wars.
   - Central banks control the availability of money and credit to promote low inflation, high growth and stability of financial system.
   - Today's policymakers strive for transparency in their operations.
   - The financial crisis of 2007-2009 have lead the U.S. central bank to try many new policy tools.

Getting into details!

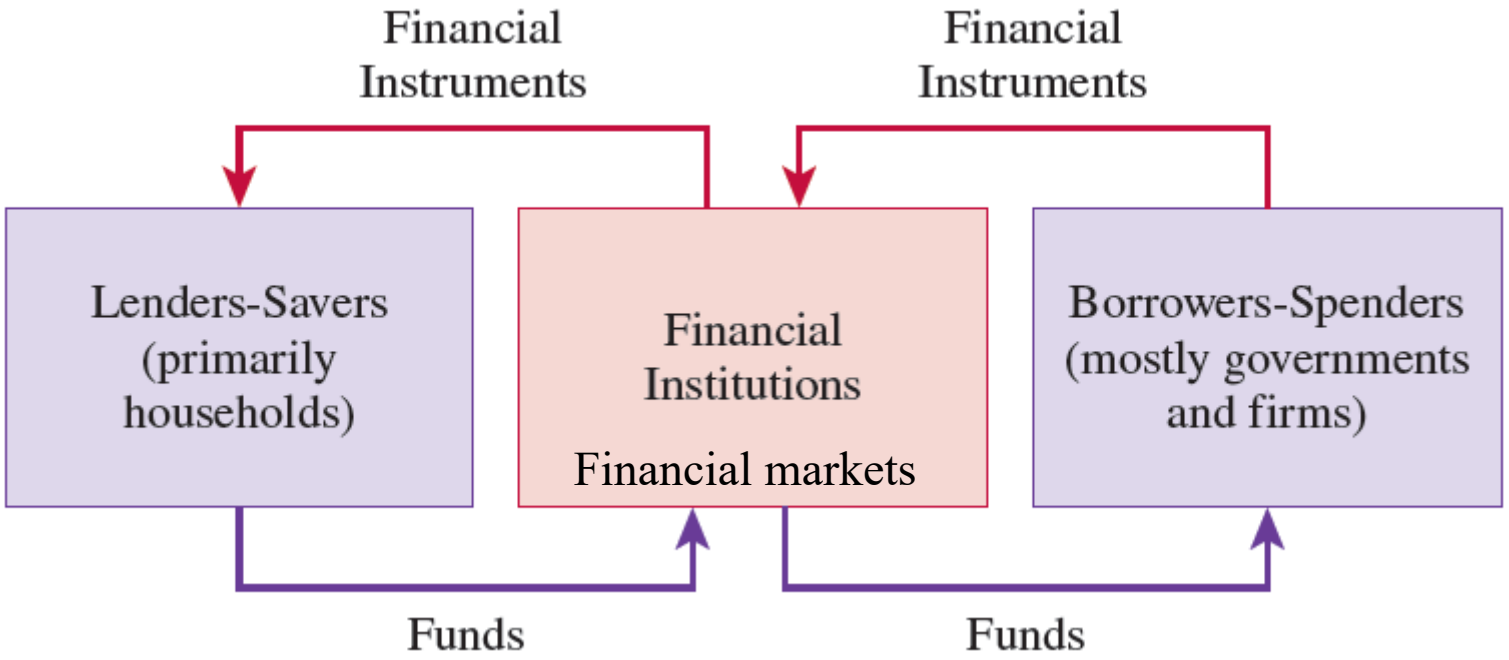
- Indirect Finance: An institution stands between lender and borrower.
  - We get a loan from a bank or finance company to buy a car.
- Direct Finance: Borrowers sell securities directly to lenders in the financial markets.
  - Direct finance provides financing for governments and corporations.
- Asset: Something of value that you own.
- Liability: Something you owe.

Getting into details!

We will survey the financial system in three steps:

1. Financial instruments or securities
   - Stocks, bonds, loans and insurance.
   - What is their role in our economy?
2. Financial Markets
   - New York Stock Exchange, Nasdaq.
   - Where investors trade financial instruments.
3. Financial institutions
   - What they are and what they do.

Figure 3.1: Funds Flowing through the Financial System



Financial Instruments

Financial Instruments: *The written legal obligation of one party to transfer something of value, usually money, to another party at some future date, under specified conditions*.

- The enforceability of the obligation is important.
- Financial instruments *obligate one party* (person, company, or government) to transfer something to another party.
- Financial instruments specify payment will be made at *some future date*.
- Financial instruments *specify conditions* under which a payment will be made.

Uses of Financial Instruments

- Three functions:
  - Financial instruments act as a means of payment (like money).
    - Employees take stock options as payment for working.
  - Financial instruments act as stores of value (like money).
    - Financial instruments can be used to transfer purchasing power into the future.
  - Financial instruments allow for the transfer of risk (unlike money).
    - Futures and insurance contracts allows one person to transfer risk to another.

LESSONS FROM THE CRISIS
LEVERAGE

- The use of borrowing to finance part of an investment is called *leverage.*
  - Leverage played a key role in the financial crisis of 2007-2009.
- The more leverage, the greater the risk that an adverse surprise will lead to bankruptcy.
  - During the crisis, some financial firms leveraged more than 30 times their net worth.
  - For those important firms, small declines in assets made these firms vulnerable.

LESSONS FROM THE CRISIS
LEVERAGE

- When losses are experienced, firms try to *deleverage* to raise net worth.
  - As many institutions deleveraged, prices fell, losses increased, and net worth fell.
  - This is called the "paradox of leverage".
    - Reinforces the leverage spiral
    - Both spirals fed the cycle of falling prices and widespread deleveraging - the hallmark of the financial crisis of 2007-2009.

Characteristics of Financial Instruments

- These contracts are very complex.
- This complexity is costly, and people do not want to bear these costs.
- *Standardization* of financial instruments overcomes potential costs of complexity.
- Financial instruments also communicate *information*, summarizing certain details about the issuer.

Characteristics of Financial Instruments

- Mechanisms exist to reduce the cost of monitoring the behavior of *counterparties*.
  - A counterparty is the person or institution on the other side of the contract.
- The solution to the high cost of obtaining information is to standardize both the instrument and the information about the issuer.
- Financial instruments are designed to handle the problem of *asymmetric information*.
  - Borrowers have some information they don't disclose to lenders.

Underlying Versus Derivative Instruments

- Underlying instruments are used by savers/lenders to transfer resources directly to investors/borrowers.
  - This improves the efficient allocation of resources.
    - Examples: stocks and bonds
- Derivative instruments are those where their value and payoffs are "derived" from the behavior of the underlying instruments.
  - Examples are futures, options, and swaps.
  - The primary use is to shift risk among investors.

A Primer for Valuing Financial Instruments

Four fundamental characteristics influence the value of a financial instrument:

1. Size of the payment:
   - Larger payment - more valuable.
2. Timing of payment:
   - Payment is sooner - more valuable.
3. Likelihood payment is made:
   - More likely to be made - more valuable.
4. Conditions under with payment is made:
   - Made when we need them - more valuable.

A Primer for Valuing Financial Instruments

We organize financial instruments by how they are used:

- Primarily used as **stores of value**

1. Bank loans
   - Borrower obtains resources from a lender to be repaid in the future.
2. Bonds
   - A form of a loan issued by a corporation or government.
   - Can be bought and sold in financial markets.

A Primer for Valuing Financial Instruments

3. Home mortgages
   - Home buyers usually need to borrow using the home as collateral for the loan.
     - A specific asset the borrower pledges to protect the lender's interests.
4. Stocks
   - The holder owns a small piece of the firm and entitled to part of its profits.
   - Firms sell stocks to raise money.
   - Primarily used as a stores of wealth.

A Primer for Valuing Financial Instruments

5. Asset-backed securities
   - Shares in the returns or payments arising from specific assets, such as home mortgages and student loans.
   - Mortgage backed securities bundle a large number of mortgages together into a pool in which shares are sold.
     - Securities backed by *sub-prime mortgages* played an important role in the financial crisis of 2007-2009.

YOUR FINANCIAL WORLD

Disability Income Insurance

- The biggest risk we all face is becoming disabled and losing our earning capacity.
  - Insuring against this should be one of our highest priorities.
- It is important to assess to make sure you have enough insurance.
- Disability insurance is one way to transfer that risk to someone else.

Financial Instruments Used Primarily to Transfer Risk

1. Insurance contracts.
   - Primary purpose is to assure that payments will be made under particular, and often rare, circumstances.
2. Futures contracts.
   - An agreement between two parties to exchange a fixed quantity of a commodity or an asset at a fixed price on a set future date.
   - A *price* is always specified.
   - This is a type of derivative instrument.

Financial Instruments Used Primarily to Transfer Risk

3. Options
   - Derivative instruments whose prices are based on the value of an underlying asset.
   - Give the holder the right, not obligation, to buy or sell a fixed quantity of the asset at a pre-determined price on either a specific date or at any time during a specified period.

Financial Instruments Used Primarily to Transfer Risk

4. Swaps
   - Agreements to exchange two specific cash flows at certain times in the future.
   - Come in many varieties reflecting differences in maturity, payment frequency, and underlying cash flows

Financial Markets

- Financial markets are places where financial instruments are bought and sold.
- These markets are the economy's central nervous system.
- These markets enable both firms and individuals to find financing for their activities.
- These markets promote economic efficiency

The Role of Financial Markets

1. Market liquidity:
   - Ensure owners can buy and sell financial instruments cheaply.
   - Keeps transactions costs low.
2. Information:
   - Pool and communication information about issuers of financial instruments.
3. Risk sharing:
   - Provide individuals a place to buy and sell risk.

The Structure of Financial Markets

1. Distinguish between primary or secondary markets
2. Categorize by the way they trade
3. Group based on the type of instrument they trade

Primary versus Secondary Markets

- A primary market is one in which a borrower obtains funds from a lender by selling **newly issued securities.**

- Secondary financial markets are those where people can buy and sell existing securities.

TOOLS OF THE TRADE

Trading in Financial Markets

- Trading is what makes financial markets work.
- You can place a market order.
- You can place a limit order
- Executing a trade requires someone on the other side.
  - Can seek help of a broker who can facilitate access to an electronic trading system known as an Electronic Communication network (ECN).

TOOLS OF THE TRADE

Trading in Financial Markets

- For a well known stock, the NYSE is another place from which to order.
  - Liquidity may be supplemented by designated market makers (DMMs).
- The system combines the buy (sell) orders of different customers at each price.
  - We can see the aggregate supply (demand) of the stock at that price.

Centralized Exchanges, OTCs, and ECNs

- Historically there were:
  - Centralized exchanges - buyers and sellers meet in a central, physical location.
  - Over-the-counter markets (OTS's) - decentralized markets where dealers stand ready to buy and sell securities electronically.
- More recently, there are electronic communication networks (ECN's):
  - Electronic system bringing buyers and sellers together without the use of a broker or dealer.

Centralized Exchanges, OTCs, and ECNs

- Pace of structural change has accelerated dramatically
  1. Ongoing technological advances in computing and communications
     - Physical location of exchange less important
  2. Increased globalization
     - Encouraged more cross border mergers of exchanges.

Centralized Exchanges, OTCs, and ECNs

Decentralized electronic exchanges has benefits

- Customers can see their orders
- Orders happen quickly
- Can trade 24 hours a day
- Low cost
- Reduces operational risk, like when the NYSE was inaccessible for days after 9-11.

Centralized Exchanges, OTCs, and ECNs

- But it also has risks
  - The system has proven prone to errors
    - Trading algorithm a rule based program for automatically executing hundreds or thousands of trades.
    - High frequency traders (HFTs) can purchase or sell thousands of stocks in seconds.
- We also see that efforts to speed up electronic trading drain resources from other uses.
- Could diminish the willingness of market makers to provide liquidity.

Table 3.4: The Structure of Financial Markets

Primary versus Secondary Markets	
Primary markets:	Markets where newly issued securities are sold.
Secondary markets:	Markets where existing securities are traded.
Centralized Exchanges versus Over-the-Counter Markets	
Centralized exchanges:	Secondary markets where dealers meet in a central, physical location.
Over-the-counter markets:	Decentralized secondary markets where dealers stand ready to buy and sell securities electronically.
Electronic communication networks (ECNs):	An electronic system that brings buyers and sellers together for electronic execution of trades without the use of a broker or dealer.
Debt and Equity versus Derivatives Markets	
Debt and equity markets:	Markets where financial claims are bought and sold for immediate cash payment.
Derivatives markets:	Markets where claims based on an underlying asset are traded for payment at a later date.

APPLYING THE CONCEPT

BASICS OF HIGH-FREQUENCY TRADING

- High-frequency trading (HFT) poses at least five problems

1. It amplifies the risks of electronic operations
2. The complex real-time interaction of HFT algorithms can overwhelm trading platforms and disrupt the markets
3. The prevalence of HFT weakens the position of market makers, who provide liquidity to traditional investors
4. Creates a temptation for front-running customer orders, which damages investor confidence
5. It can trigger a socially unproductive arms race

Debt and Equity versus Derivative Markets

- Used to distinguish between markets where *debt and equity* are traded and those where *derivative instruments* are traded.
- Debt markets are markets for loans, mortgages, and bonds.
- Equity markets are the markets for stocks.
- Derivative markets are the markets where investors trade instruments like futures, options, and swaps.

Debt and Equity versus Derivative Markets

- In debt and equity markets, actual claims are bought and sold for immediate cash payments.
- In derivative markets, investors make agreements that are settled later.
- Debt instruments categorized by the loan's maturity
  - Repaid in less than a year - traded in money markets.
  - Maturity of more than a year - traded in bond markets.

Characteristics of a Well-Run Financial Market

- Essential characteristics of a well-run financial market:
  - Must be designed to keep transaction costs low.
  - Information the market pools and communicates must be accurate and widely available.
  - Borrowers promises to pay lenders much be credible.
  - Lenders must be able to enforce their right of repayment quickly and at low cost.

Financial Institutions

- Firms that provide access to the financial markets, both
  - to savers who wish to purchase financial instruments directly and
  - to borrowers who want to issue them.
- Also known as financial intermediaries.
  - Examples: banks, insurance companies, securities firms, and pension funds.

The Role of Financial Institutions

- To reduce transaction costs by specializing in the issuance of standardized securities.
- To reduce the information costs of screening and monitoring borrowers.
  - They curb asymmetries, helping resources flow to most productive uses.
- To give savers ready access to their funds.

LESSONS FROM THE CRISIS
SHADOW BANKS

- Financial intermediation and leverage in the U.S. have shifted away from traditional banks and toward other financial institutions less subject to government regulations.
  - Brokerages, insurers, hedge funds, etc.
- These have become known as shadow banks.
  - Provide services that compete with banks but do not accept deposits.
  - Take on more risk than traditional banks and are less transparent.

LESSONS FROM THE CRISIS
SHADOW BANKS

- The rise of highly leveraged shadow banks, combined with government relaxation of rules for traditional banks, permitted a rise of leverage in the financial system as a whole.
- Rapid growth in some financial instruments made it easier to conceal leverage and risk-taking.
- The financial crisis of 2007-2009 transformed shadow banking.
  - Scrutinize any financial institution that could, by risk taking, pose a threat to the financial system.

The Structure of the Financial Industry (Intermediary)

- We can divide intermediaries into two broad categories:
  - Depository institutions,
    - Take deposits and make loans
    - What most people think of as banks
  - Non-depository institutions.
    - Include insurance companies, securities firms, mutual fund companies, hedge funds, private equity or venture capital firms, finance compnaies, and pension funds.

The Structure of the Financial Industry (Intermediary)

1. Depository institutions take deposits and make loans.
2. Insurance companies accept premiums, which they invest, in return for promising compensation to policy holders under certain events.
3. Pension funds invest individual and company contributions in stocks, bonds, and real estate in order to provide payments to retired workers.

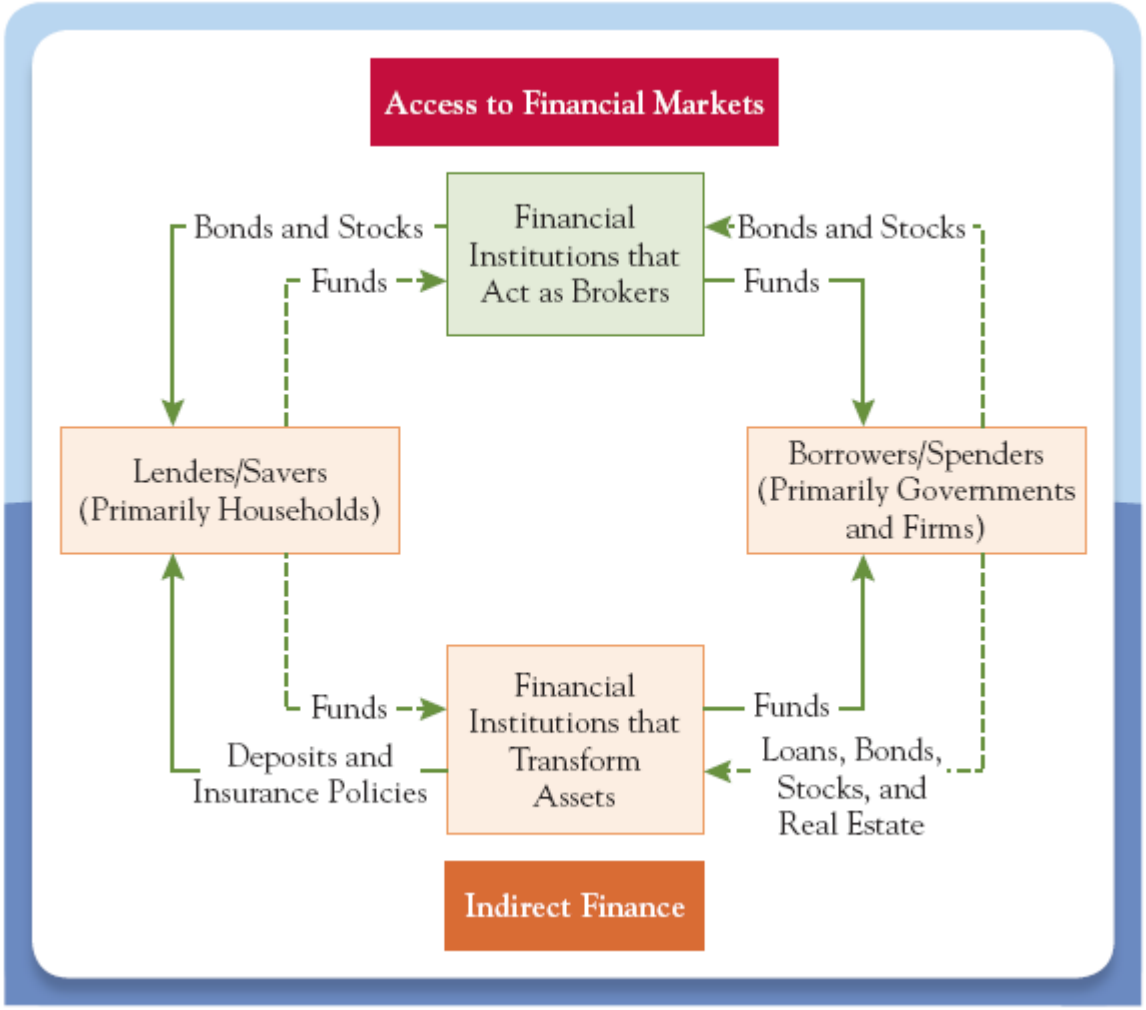
The Structure of the Financial Industry (Intermediary)

4. Securities firms include brokers, investment banks, underwriters, mutual fund companies private equity firms, and venture capital firms.
   - Brokers and investment banks issue stocks and bonds to corporate customers, trade them, and advise customers.
   - Mutual-fund companies pool the resources of individuals and companies and invest them in portfolios - passive investing.
   - Hedge funds do the same for small groups of wealthy investors.
   - Private equity and venture capital firms also serve wealthy investors by acquiring controlling stakes in a few firms and manage them actively.

The Structure of the Financial Industry (Intermediary)

5. Finance companies raise funds directly in the financial markets in order to make loans to individuals and firms.
6. Government-sponsored enterprises (GSEs) are federal credit agencies that provide loans directly for farmers and home mortgagors.

Figure 3.2: Flow of Funds through Financial Institutions



- Financial access promotes both economic equality and economic growth
- Finance allows countries to mobilize domestic savings effectively, lowering transaction costs
  - Efficient means of payment broadens the markets for goods and services and facilitates a greater division of labor