Chapter 3: Financial markets

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Content

1. Definition of financial market
2. Function of financial markets
3. Structure of financial markets
4. Financial market instruments
5. Internationalisation of financial markets
6. Regulation of financial system

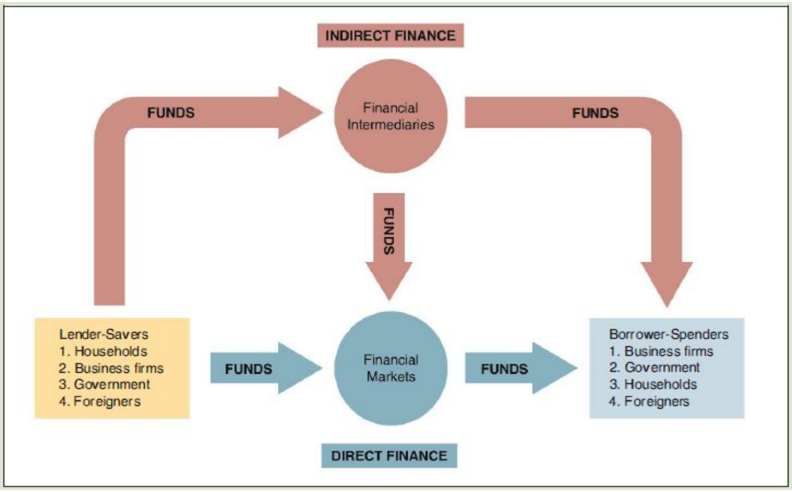
1. Definition of financial market

- **Financial market** is a market in which financial asset (securities) such as stocks and bonds can be purchased or sold.
- Funds are transferred in financial markets when one party purchases financial assets previously held by another party.

2.Function of financial markets

- The basic function of financial markets is to channel funds between **surplus units** (who spend less than their income) to **deficit units** (who wish to spend more than their income).

Function of financial markets

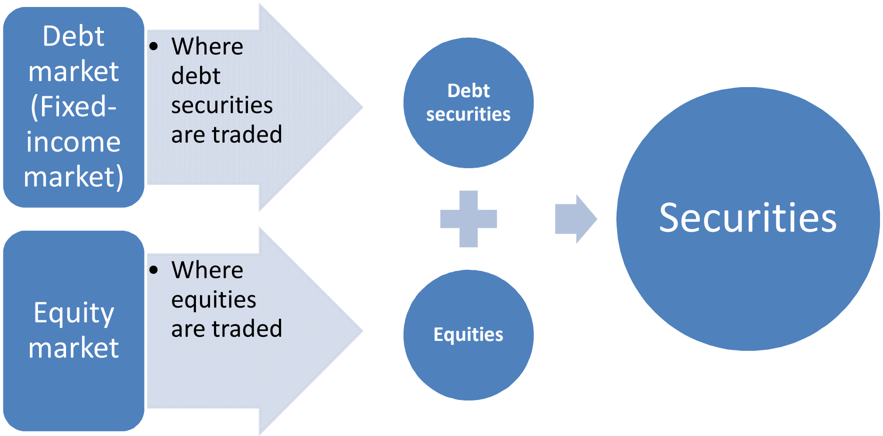


Flow of funds through the financial system

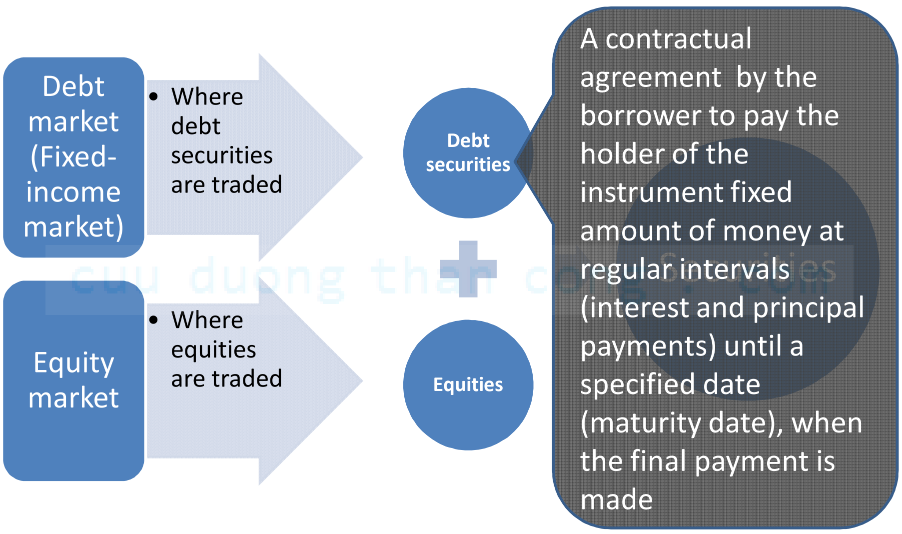
3. Structure of financial markets

- Debt and equity markets
- Primary and secondary markets
- Exchanges and Over-The-Counter markets
- Money and Capital markets

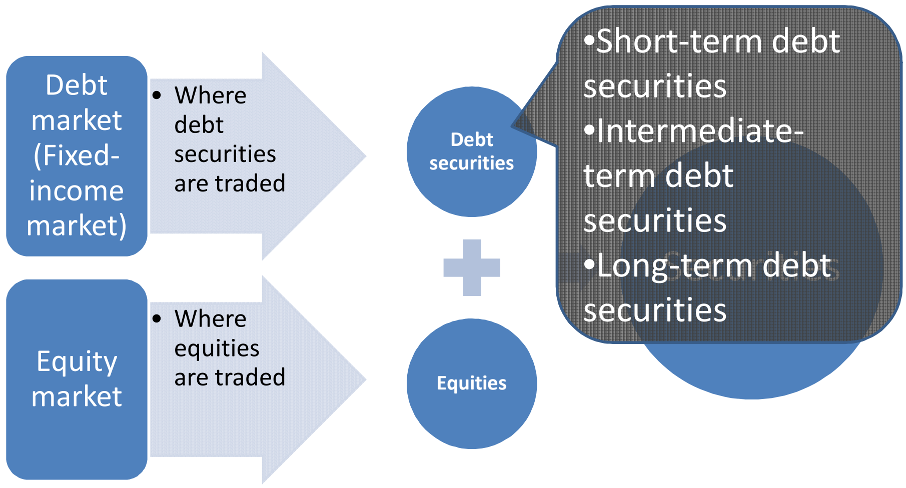
Debt and equity markets



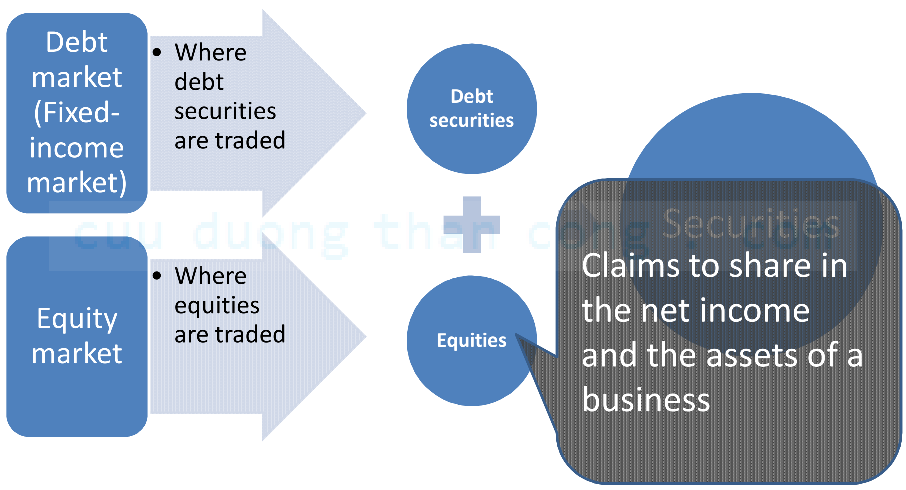
Debt and equity markets



Debt and equity markets



Debt and equity markets



Primary and secondary markets

- A **primary market** is a financial market in which new issues of a security, such as a bond or a stock, are sold to initial buyers by the corporation or government agency borrowing the funds (IPO: Initial Public Offering).
- Primary market is the only place that provide funds to the initial issuers of securities

Primary and secondary markets

- Primary markets are not well known for the public because the selling of securities to initial buyers often takes place behind closed doors.
- The sale of securities in primary markets usually made by **underwriting** securities from **investment banks**.

Primary and secondary markets

- A **secondary market** is a financial market in which securities that have been previously issued can be resold.
- **E.g:** New York Stock Exchange and NASDAQ; foreign exchange market, futures markets...
- Secondary market transactions provide funds for the one who sell securities but the initial issuers of those securities acquire no new fund.

Primary and secondary markets

- The prices of securities on secondary markets are determined by market's supply and demand
- **Brokers** and **dealers** are important parties in a well-functioning secondary market.

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Agents of investors who match buyers with sellers of securities

Primary and secondary markets

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Who links buyers and sellers by buying and selling securities at stated prices

Primary and secondary markets

- **Relationship between primary and secondary markets:**
  - Primary markets provide goods to secondary market
  - Secondary markets make the securities which initially issued on primary market become more liquid, they make it easier and quicker to sell these financial instruments to raise cash.
  - Secondary markets contribute in determination of the price of securities that the issuer sell in the primary market.

Exchanges and Over-The-Counter markets

- The secondary market can be organised in two ways:
  - **Exchanges**: where buyers and sellers of securities (or their agents or brokers) meet in one central location to conduct trades.
  - **Over-the-counter (OTC) market:** dealers at different locations who have an inventory of securities stand ready to buy and sell securities "over the counter" to anyone who comes to them and is willing to accept their prices.

Money and Capital markets

- **Money market:** is a financial market in which only short-term debt instruments (generally those with original maturity of less than one year) are traded.
- **Capital market:** is the market in which long- and intermediate-term debt (generally those with original maturity of one year or greater) and equity instruments are traded.

4. Financial market instruments

- Money market instruments
- Capital market instruments
- Derivatives instruments

Money market instruments

- Money market instruments (securities) are debt securities that have a maturity of one year or less.
- Money market securities include:
  - Treasury bills
  - Negotiable bank certificates of deposit
  - Commercial paper
  - Repurchase Agreements

Treasury bills

- **Treasury bill (T-bill)** is a short-term debt instrument issued by the treasury to finance the government.
- Treasury bills are the most liquid and safest of all the money market instruments

Negotiable certificate of deposit

- A **certificate of deposit (CD)** is a debt instrument sold by a bank to depositors that pay annual interest of a given amount and at maturity pays bank the original purchase price.
- **Negotiable certificate of deposit (NCD)**: is CD that is sold in secondary market. It usually has high denomination and can not be cashed-in before maturity.

Commercial paper

- **Commercial paper** is a short-term debt instrument issued by large bank and well-known corporations.

Repurchase Agreements (REPOs)

- **Repurchase agreements (REPOs):** is an agreement in which the borrower agree to sell an amount of government securities (usually T-bills) to the lender and commit to repurchase them in a near future with a specified price.

Repurchase Agreements (REPOs)

- **Repurchase agreements (REPOs):** are effectively short-term loans (usually with a maturity of less than two weeks) for which Treasury bills serve as *collateral.*

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is an asset that the lender receives if the borrower does not pay back the loan

Capital market instruments

- Capital market instruments (securities) are securities with a maturity of more than one year.
- Capital market securities include:
  - Bonds
  - Stocks
  - Mortgages
  - Government securities
  - Government agency securities
  - Consumer and bank commercial loans

Bonds

- **Bonds** are long-term debt securities issued by corporations and government agencies to support their operations.
- They provide return to investors in the form of interest income (coupon payments) every period (usually six-month).
- The amount and timing of interest and principal payments to investors who purchase bonds are specified on the bonds.
- Bonds could be sold on secondary market and its price could change over time.

Bonds

- There are different kinds of bonds from different issuers with different level of credit:
  - Corporate bonds
    - Variations of corporate bonds: zero-coupon bonds, floating-rate bonds, convertible bonds, consol bonds
  - State and local government bonds (municipal bonds)

Bonds

- Some issue to clarify related to bonds:
  - Valuing bonds
  - Interest rate and coupon rate
  - Face value (par value) and market value
  - Yield to maturity

Bonds

- **Valuing bonds**
  - Bondholders could receive cash flows from two sources: **coupon** payments each period and **face value** paid at maturity.

Bonds

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The interest payments paid to the bondholder

Bonds

- **Valuing bonds**
  - Bondholders could receive cash flows from two sources: **coupon** payments each period and **face value** paid at maturity.

Payment at the maturity of the bond. Also called *principal* or *par value*

Bonds

- **Valuing bonds**
  - Bond price can be calculated as the present value of all **coupon** and **face value** payments that the bondholders receive.

$$PV = PV(coupons) + PV(face\ value)$$

$$\Rightarrow PV = \frac{C}{(1+i)} + \frac{C}{(1+i)^2} + \cdots + \frac{C}{(1+i)^n} + \frac{FV}{(1+i)^n}$$

Bonds

- **Valuing bonds (cont.)**
  - Recall annuity formula in chapter 2 we have the formula for value of bonds:

$$PV = C\left[\frac{1 - \frac{1}{(1+i)^n}}{i}\right] + \frac{FV}{(1+i)^n}$$

  - In which:
    - PV: is the value of the bond
    - C: value of coupon payment
    - i: interest rate
    - n: number of coupon payment period
    - FV: face value of the bond

Bonds

- **Interest rate and coupon rate:**
  - **Coupon rate:** is the annual interest payment as a percentage of face value
  - When the market interest rate exceeds the coupon rate, bonds sell for less than face value, and vice versa.
  - When the interest rate rises, the present value of the payments to be received by the bondholder fall and bond prices fall, and vice versa

Bonds

- **Yield to maturity:** is the interest rate for which the present value of the bond's payments equals the price.
- **Bond rates of return**

$$\text{Bond rates of return} = \frac{\text{coupon income} + \text{price change}}{\text{investment}}$$

- **Current yield:**

$$\text{Current yield} = \frac{\text{Annual coupon payment}}{\text{Bond price}}$$

- **Yield curve:** plot of relationship between bond yields to maturity and time to maturity.
  - Normal yield curve
  - Steep yield curve
  - Flat or humped yield curve
  - Inverted yield curve

Mortgages

- **Mortgages:** are long-term debt obligations created to finance the purchase of real estate
- Households or firms could borrow in form of mortgages to purchase housing, land, or other real structures, where the structure or land itself serves as collateral for the loans.

Mortgages

- There are two types of mortgages based on the creditworthy of borrowers:
  - **Prime mortgage**
  - **Sub-prime mortgage**
- **Mortgage-backed securities** are debt obligations representing claims on a package of mortgages.

Stocks

- **Stocks** (also referred as equity securities) are equity claims on the net income and assets of a corporation.
- Stocks represent partial ownership in the corporations that issued them.
- There are two kinds of stocks:
  - **Common stock :** ownership shares in a publicly held corporation
  - **Preference stock:** Company stock with dividends that are paid to shareholders before common stock dividends are paid out

Common stock vs. Preference stock

	Common stock	Preference stock
Dividend	Decided by the BODs	Fixed
Voting right	Yes	No
Earning payment order	Last	After bond and before common stock

Stocks

- Some corporations provide income to their **stockholders** by distributing a portion of their earnings in the form of **dividends**.
- As equity securities represent partial ownership, when a corporation grow and increase in value, the value of the stock increase. Thus investors could earn another source of return from stock through capital gain when they sell stock.

Stocks

- **Valuing stocks using dividend discount model:**
  - **Dividend discount model:** discounted cash flow model which states that today's stock price equals the present value of all expected future dividends

$$P_0 = \frac{DIV_1}{(1+r)} + \frac{DIV_1}{(1+r)^2} + \cdots + \frac{DIV_1}{(1+r)^t} + \cdots$$

  - In which:
    - P_0 is the stock value
    - DIV_i is the dividend in year i
    - r is the rate of return

Stocks

- **Valuing stocks using dividend discount model:**
  - **Dividend discount model with no growth**

$$P_0 = \frac{DIV}{r}$$

  - In which:
    - P_0 is the stock value
    - DIV is the dividend each year
    - r is the rate of return

Stocks

- **Valuing stocks using dividend discount model:**
  - **Constant-growth dividend discount model**

$$P_0 = \frac{DIV}{r - g}$$

  - In which:
    - P_0 is the stock value
    - DIV_1 is the dividend in year 1
    - r is the rate of return
    - g is the growth rate

Stocks

- **Growth stocks** vs. **Income stocks**
- If a company earns a constant return on its equity and plows back a constant proportion of earnings, then:
  - **Sustainable growth rate**: the steady rate at which firm can grow is:

$$g = sustainable\ growth\ rate = return\ on\ equity \times plow\ back\ ratio$$

Stocks

- **Growth stocks** vs. **Income stocks**
- If a company earns a constant return on its equity and plows back a constant proportion of earnings, then:
  - ... steady rate at which

$$g = \ldots on\ equity \times plow\ back\ ratio$$

The fraction of earnings retained by the firm
Plow back ratio = 1- payout ratio

Derivative instruments

- **Derivative instruments** (derivative securities) are financial contracts whose values are derived from the values of underlying assets (such as debt securities or equity securities).
- Derivative securities enable investors to engage in speculation and risk management
  - Speculation
  - Risk management

Derivative instruments

- Some famous types of derivative instruments
  - Futures/Forward Contracts
  - Options: Call options and Put options
  - Swaps

Futures/Forward Contracts

- **Futures contract** is an exchange-traded promise to buy or sell an asset in the future at a pre-specified price.
- **Forward contract:** is an agreement to buy or sell an asset in the future at an agreed price.

Options

- **Call option:** is the right to buy an asset at a specified exercise price on or before expiration date
- **Put option:** is the right to sell an asset at a specified exercise price on or before expiration date

Swaps

- **Swap** is an arrangement by two counterparties to exchange one stream of cash flows for another.

5. Internationalisation of financial markets

- International bond market, Eurobonds, and Eurocurrencies
- World stock markets

International bond market, Eurobonds, and Eurocurrencies

- **Foreign bonds:** are sold in foreign country and are denominated in that country's currency. E.g: Yankee bond, Samurai Bond, Kangaroo Bond...
- **Eurobond:** is a bond denominated in a currency other than that of the country in which it is sold
- **Eurocurrencies:** are foreign currencies deposited in banks outside the home countries. E.g.: **Eurodollar:** U.S dollar deposited in foreign banks outside the US or in foreign branches of US banks.

World stock markets

- Dow Jones Industrial Average (New York)
- Nikkei 300 Average (Tokyo)
- Financial Times Stock Exchange (FTSE) 100-Share Index (London)

6. Regulation of financial system

- Increasing information available to investors
- Ensuring the soundness of financial intermediaries
  - Restriction on entry
  - Disclosure requirements
  - Restrictions on assets and activities
  - Deposit insurance
  - Limits on competition
  - Restriction on interest rates

The story of sub-prime mortgage crisis 2008

- http://www.youtube.com/watch?v=bx_LWm6_6tA