

## LM01 Market Organization and Structure

### Main functions of financial system

Three main functions of the financial system are to:

1. Allow entities to utilize its six main purposes.
  - **Saving:** Entities can earn returns that match the risk of investment.
  - **Borrowing:** Needful entities can borrow money from lenders that require adequate collateral and return for the risk taken.
  - **Issuing equity:** Provides a medium for entities to issue new shares to raise capital.
  - **Managing risks:** Allows trading of hedging instruments that cover risks like interest rates, currency values, default of debts, commodity prices, etc.
  - **Exchanging assets:** For example, trading one currency for another currency.
  - **Trading on information:** Investors can earn surplus returns by identifying undervalued and overvalued securities.
2. Determine equilibrium rates of return that equate the total lenders and the total borrowers.
3. Allow for efficient allocation of resources.

### Classifications of assets and markets

| Classification of assets                             |  |   |
|--|--|---|
| Based on the underlying                              | <b>Financial assets</b> represent a claim on real assets and future income generated by these assets. E.g., stocks and bonds.          | <b>Real assets</b> include physical assets like real estate, equipment, commodities, and other assets.                |
| Based on the nature of claim by financial securities | <b>Debt securities:</b> Periodic interest payments made on borrowed funds which might be collateralized.                               | <b>Equity securities:</b> Represent ownership positions and claim on the future cash flows of the business.           |
| Based on where the securities are traded             | <b>Publicly traded:</b> These securities trade in public markets through exchanges or dealers and are subject to regulatory oversight. | <b>Privately traded:</b> These securities are not traded in public markets. They are often not subject to regulation. |
| Classification of markets                            |  |   |
| Based on delivery                                    | <b>Spot market:</b> Markets for immediate delivery of assets.  | <b>Forward market:</b> Contracts that call for future delivery of assets and include forwards, futures and options.   |

|   |  |  |
|---|--|--|
| Based on issuance of security           | <b>Primary market:</b> Issuers sell securities directly to investors.                  | <b>Secondary market:</b> Investors buy and sell securities among themselves.   |
| Based on maturity                       | <b>Money market:</b> Securities with maturities of one year or less.                   | <b>Capital market:</b> Securities that have a maturity of more than one year or equities that don't have any maturity. |
| Based on the type of investment markets | <b>Traditional investment markets:</b> Include all publicly traded debts and equities. | <b>Alternative investment markets:</b> Include hedge funds, private equity, commodities, real estate etc.              |

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### Securities, currencies, contracts, commodities, and real assets

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**Securities** can be broadly classified into:

**Fixed income:** refers to debt securities where the borrower is obligated to pay interest and principal at a pre-determined schedule. They may be collateralized, which means that investors have claim on certain physical assets. The different types are:

- Bonds: Long-term debts
- Notes: Intermediate-term debts
- Bank borrowings: Long to short term involving revolving credit lines and other debt instruments
- Convertible: Debt can be exchanged for a specified number of equity shares.

**Equity:** refers to ownership claims by investors in companies. The different types are:

- Common shareholders: have a residual claim over any assets and income, after all the senior securities have been paid.
- Preferred shareholders: paid scheduled dividends before the common shareholders.
- Warrants: give the holder a right to buy the firm's security at a price called the exercise price, within a specified time period (similar to options).

**Pooled investments:** refer to structures that combine investment from many investors. The different types are:

- Mutual funds: can either be open-end (shares purchased from fund) or close-end (shares purchased from other investors) funds.
- Asset backed securities: represent claim on cash flow earned by the assets in the portfolio like mortgages, car or credit card debt.
- Exchange traded funds (ETFs): combine the advantages of open-end and closed-end funds.
- Hedge funds: utilize different strategies and often rely on leverage.

**Contract** is an agreement between traders to perform some action in the future which can either be settled physically or in cash. The types of contracts (also termed as derivatives) are:

- **Forward contract:** an agreement to trade the underlying asset at a future date at a pre-specified price. It is not standardized and not traded on public exchanges.
- **Futures contract:** a standardized contract where the amount, asset characteristics and delivery date are the same for all contracts. It is exchange traded and has higher liquidity because of standardization.
- **Swap contract:** an agreement to swap payments of one asset for the other. The different types are:
  - Interest rate swap: Floating rate payments are swapped for fixed-rate payments for a specified period.
  - Currency swap: Currency amount swapped for another currency for a specified period.
  - Equity swap: Returns earned on one investment are swapped for the other.
- **Options:** contracts that give the holder a right, but not the obligation, to buy/sell an underlying security at a specified price, at or before a specific date. The different types are:
  - Call option: Buyer gets the right but not the obligation to buy the underlying security at a predetermined price; seller of the call option gets the premium but has to sell the security if the buyer exercises his option to buy.
  - Put option: Buyer gets the right but not the obligation to sell the underlying security at a predetermined price; seller of the put option gets the premium but has to buy the security if the buyer exercises his option to sell.
- **Credit default swaps:** offer insurance and make payment to the insurance holder if a borrower defaults on its bonds.

**Currencies** are legal tenders issued by national monetary authorities, that trade in the spot, forward, or futures markets (also called as the Forex market).

**Commodities** include energy products, precious metals, industrial metals, agricultural products, and carbon credits. They trade in spot, forward, and futures markets.

**Real assets** are physical assets which are normally used by operating companies as factors of production. (E.g. real estate, plant and equipment, etc.)

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### Types of financial intermediaries

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**Financial intermediaries** facilitate transaction between buyers and sellers allowing them to exchange asset, capital and risk. The different types are:

**1. Brokers, Exchanges, and Alternative Trading Systems:**

- **Brokers:** find counterparties for transactions (other entities willing to take the opposing side in a transaction) and do not indulge in trade with their clients directly.
- **Block brokers:** provide similar services as brokers, except that their clients have large trade orders that might potentially impact the security prices if the trade is executed without proper care.
- **Investment banks:** provide advice for corporate actions like mergers & acquisitions and help firms raise capital by issuing securities such as common stock, bonds, preferred shares, etc.
- **Exchanges:** provide places where traders can meet. They regulate traders' actions to ensure smooth execution of the trades.
- **Alternative trading systems (ATS):** serve the same trading function as exchanges but have no regulatory oversight. ATS where client orders are not revealed are also called dark pools.
- **Dealers:** trade directly with their clients by taking the opposite side of their trades. They provide liquidity by buying or selling from their own inventory and earn profits on the bid-ask spreads.

**2. Securitizers:**

- They pool together large amounts of securities or assets. A special purpose entity (SPE) or special purpose vehicle (SPV) buys these assets and interests in this entity are sold off to investors.
- Assets that are often securitized include mortgages, car loans, student loans, credit card receivables, and bank loans.
- Investors then earn returns from the cash flows of the underlying assets.
- Pooling of resources offers economies of scale, creates liquidity for these securities, and reduces the total risk for these assets.

**3. Depository institutions:** include commercial banks, savings and loan banks, credit unions, and similar institutions that raise funds from depositors and other investors and lend it to borrowers.**4. Insurance companies:**

- They help entities offset risks by issuing insurance contracts that payout if a specified event occurs.
- The insured entity in turn pays an insurance premium for availing this benefit.
- The event risk is spread over large entities such that the total insurance premium earned is more than the insurance payout.
- Three key risks inherent in insurance system:

- Moral hazard: Insured entities are likely to take more risks.
  - Adverse selection: Entities that are the most at risk are likely to buy the assets.
  - Fraud: Entities may claim factitious losses or purposely indulge in damaging behavior.
5. **Clearinghouses:** act as intermediaries between buyers and sellers, thereby lowering the counterparty risk and increasing the reliability of the trades.
  6. **Depositories or custodians:** hold securities for their clients. This helps prevent loss of securities through fraud, oversight or natural disasters.
  7. **Arbitrageurs:** indulge in buying and selling of mispriced securities and earn a riskless profit in the process. They provide added liquidity to the market by removing any price inefficiencies.

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### Positions an investor can take in an asset

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An investor's position in a security may either be a long position or a short position.

#### Long positions

- These are created when a trader owns an asset or has a right or obligation under a contract to purchase an asset.
- Investors who are long benefit from increases in the price of the security.

#### Short positions

- These are created when traders borrow an asset and sell it, with the obligation to replace the asset in the future.
- Investors who are short benefit from decreases in price of the security.
- The seller must keep the proceeds of the short sell as collateral with the broker.
- The deposit kept with the broker earns an interest rate, termed as the short rebate rate.
- The seller must also pay all payments like interest or dividends the security might have earned to the lender. These payments are called payments-in-lieu of dividends or interest.

#### Hedgers

- Hedgers use contradictory positions to their natural risk exposure to eliminate the risk.
- For example, a maize farmer will sell (take a short position in) maize future contracts to offset the risk of the price drop of maize when he harvests the produce.

#### Options

- The buyer of an option is long the contract while the seller or writer of an option is short the option.
- For example, an investor who buys a put option is long the put option.

### Leveraged positions

- The use of loans to make asset purchases is termed as having a leveraged position.
- The borrowed funds are termed as the margin loan and the interest rate paid is called the call money rate.
- The initial equity required to make the purchases is termed as the initial margin requirement.
- Financial leverage magnifies both gains and losses.

### Leverage ratio and margin call price

**Leverage ratio:** is used to calculate the amount of borrowed funds in a transaction. The borrowed money is called the margin loan and the interest paid is called the call money rate.

$$\text{Leverage ratio} = \frac{\text{value of position}}{\text{value of equity investment in that position}}$$

Calculate the leverage ratio and return earned by an investor over a period of one year. The details of the transaction are as follows:

|                                    |      |
|------------------------------------|------|
| Shares purchased                   | 500  |
| Price at the start of the year     | €200 |
| Dividend on the share for the year | €5   |
| Commission per share               | €0.1 |
| Price at the end of the year       | €220 |
| Initial margin requirement         | 50%  |
| Call money rate                    | 3%   |

#### **Solution:**

1. Leverage ratio =  $\frac{1}{0.5} = 2$

2. Purchase amount =  $500 * 200 = €100,000$

Initial margin requirement = purchase amount \* initial margin % =  $100,000 * 0.5 = €50,000$

Borrowed amount = €50,000

Purchase commission =  $0.1 * 500 = €50$

Dividend earned =  $5 * 500 = €2,500$

Selling amount =  $500 * 220 = €110,000$

Call money rate paid = call money % \* borrowed amount =  $3% * 50,000 = €1,500$

Selling commission =  $0.1 * 500 = €50$

Total gain =  $110,000 - 100,000 + 2,500 - 1,500 - 50 - 50 = €10,900$

Initial equity investment = Initial investment + purchase commission =  $50,000 + 50 = €50,050$

The gain on the transaction =  $10,900/50,050 = 21.78%$

**Margin call price:**

- An investor must maintain a minimum equity percentage, called the **maintenance margin requirement**, to ensure that the loan for a transaction is covered by the value of the asset.
- If the value of the asset drops, then the investor (considering he is long that security) will have to increase his equity in the account to provide more collateral for the loan.

$$\text{Margin call price} = \text{initial purchase price} \times \frac{(1 - \text{initial margin})}{(1 - \text{maintenance margin})}$$

If the share price is €200 with an initial margin requirement of 50% and maintenance margin requirement of 30%, compute the margin call price.

**Solution:**

$$\text{Margin call price} = \frac{200(1-0.50)}{1-0.30} = €142.86$$

Margin call for this trade will be at a price below €142.86.

**Execution, validity and clearing instructions**

Orders entered must specify what security to trade, the size of the trade, and whether to buy or sell. The order can also include additional instructions:

- **Execution instruction:** specifies how the order will be filled.
- **Validity instruction:** specifies when the order may be filled.
- **Clearing instruction:** specifies how the final settlement will be done.

**Execution instructions** types are:

- **Market orders:** are immediately executed at the best price available; however, there can be substantial slippages in execution price if a stock is thinly traded.
- **Limit orders:** set a minimum execution price on sell orders and maximum execution price on buy orders. This ensures that an investor never exceeds his price limit on a transaction. However, there is a possibility that the order may not be executed at all if the markets are fast-moving or there is insufficient liquidity.
- **All or nothing orders:** will be executed only if the entire quantity can be traded. They are beneficial when the trading costs depend on the number of executed trades and not on the size of the order.
- **Hidden orders:** are large orders that are known only to the brokers or exchanges executing them until the trades are executed.
- **Iceberg orders:** A small visible portion of a large hidden order is executed first, to gauge the market liquidity, before the entire order is executed.

**Validity instructions** types are:

- **Day orders:** expire if they are unfilled on the trading day on which they were submitted.

- Good-till-cancelled orders: last until the order is executed or the trader cancels the order.
- Immediate or cancel (fill or kill) orders: are to be immediately filled, i.e. when they are received by the broker or exchange. If it fails to execute, the order is canceled from the system.
- Good-on-close (market-on-close): can only be filled at the close of trading. Mutual funds often rely on this order type.
- Stop orders (also called stop-loss orders): come with a trigger price. Stop-sell order executes only if the price is at or below the stop price or trigger price. Stop-buy order executes only if the price is at or above the stop price or trigger price.

**Clearing instructions** convey who is responsible for clearing and settling the trade.

### Market orders v/s limit orders

|                               | <b>Market order</b>   | <b>Limit order</b>   |
|-------------------------------|---|--|
| <b>Execution</b>              | Executed at the best available market price.  | Sets a minimum execution price on sell orders and maximum execution price on buy orders.   |
| <b>Advantages</b>             | Quick execution when a trader believes that the prices are volatile.                  | Avoids slippages as the orders are executed at the pre-determined or better prices.  |
| <b>Disadvantages</b>          | Quick execution can lead to unfavorable trade prices and has trade price uncertainty. | In a volatile market, the order might be partially filled or not filled at all, making the possibility of missing out on trade.  |
| <b>Additional information</b> | Trader sacrifices price certainty for immediate liquidity.                            | Types of limit orders: <ul style="list-style-type: none"> <li>• <b>Marketable or aggressively priced:</b> Limit buy order above the best ask or a limit sell order below the best bid. It will be immediately executed.</li> <li>• <b>Making a new market or inside the market:</b> Limit price is between best bid and the best ask.</li> <li>• <b>Behind the market:</b> Limit buy order with limit price below the best bid and limit sell order with limit price above the best ask. If the limit prices are way behind the market, they are termed as <b>far from the market limit orders</b>.</li> </ul> |

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## Primary and secondary markets

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**Primary markets** refer to the sale of an issuer's newly issued securities to investors.

The sale can be one of two types:

- **IPO (Initial Public Offering):** issuers sell new securities that aren't publicly traded to the investors for the first time.
- **Seasoned or secondary offering:** issuers sell additional new units of their securities which already trade on the public exchanges.

Based on the investors targeted, primary market offerings can be either:

### Public offerings:

- The firm seeks capital from retail or individual investors and for this it uses the services of an investment bank.
- The investment bank disseminates information like the financial performance of the firm and the purpose for which the capital is raised.
- The investment bank can use either of the two methods:
  - **Underwritten offering:** The investment bank agrees to buy the unsold portion of the issue at a pre-negotiated price if enough interest is not generated in the issuance. This creates a conflict of interest between the bank and the firm, as the bank would like the price to be low.
  - **Best efforts:** The investment bank is not obligated to purchase the unsold portion.

Private placements: Large blocks of securities are sold directly to qualified investors. The costs and disclosures are low as compared to public offerings.

**Secondary markets** are where investors buy or sell securities from other investors.

- Companies are not directly involved in the secondary markets, i.e. do not gain capital from it.
- However, liquid secondary markets lower the cost of raising capital for the company in primary markets.

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## Quote-driven, order-driven, and brokered markets

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The two categories of securities markets **based on when they are traded** are as follows:

### 1. Call markets:

- The trade only takes place at specific times of the day; all the traders are present and the entire bid-ask quotes are used to arrive at one negotiated price.
- Markets are highly liquid when the market is in session and illiquid when the market is not in session.
- Usually used for smaller markets or to determine the opening and closing prices at stock exchanges.

## 2. Continuous markets:

- Trades can occur at any time the market is open, and the prices are either quote-driven or auction-driven.

The three categories of the securities market **based on how they are traded** are as follows:

### 1. Quote-Driven Markets:

- Trade takes place at the price quoted by dealers who maintain an inventory of the security.
- Dealers provide liquidity in these markets and gain from the difference in bid-ask spread.
- They are also called over-the-counter, price-driven or dealer markets.

### 2. Order-Driven Markets:

- Trading rules match buyers to sellers, thus making them supply liquidity to each other.
- Trading follows two sets of rules:
  - Order matching rules: establishes the order precedence based on price, their arrival time and other factors.
  - Trade pricing rules: determines the price of the transaction.

### 3. Brokered Markets:

- Brokers arrange trades between counterparties.
- Used for instruments that are unique or illiquid like real estate or art pieces.

The two categories of the securities market **based on when the information is disclosed** are as follows:

1. **Pre-trade transparent:** trade information on quotes and orders is publicly available prior to the trades.
2. **Post-trade transparent:** trade information on quotes and orders is publicly available after the trade.

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## Characteristics of a well-functioning financial system

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Four characteristics of a well-functioning financial system include:

1. Entities can trade securities that help to solve their financial problems or take advantage of the opportunities available, i.e. firms can share or hedge risks, borrow at a reasonable rate, and investors can earn adequate rate of returns on their investments.
2. **Operationally efficient markets** where trading costs like commissions, bid-ask spreads, and price impacts are low, increasing market pricing efficiencies.
3. **Informational efficient markets** allow for absorption of timely financial disclosures, making the prices a close reflection of the fundamental values.

4. **Allocationally efficient markets** allow for better utilization of capital by allocating it to the most productive use.

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### Objectives of market regulation

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The key objectives of market regulation are to:

- control fraud
- control agency problems
- promote fairness
- set mutually beneficial standards
- prevent undercapitalized financial firms from exploiting their investors by making excessively risky investments
- ensure that long-term liabilities are funded