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INDUSTRIAL ECONOMICS

UNIT IV
MARKET STRUCTURE

Lecture by

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SYLLABUS – Unit IV

- Market Structure
- Perfect Competition
- Monopoly
- Monopolistic
- Oligopoly
- Components of Pricing
- Methods of Pricing
- Capital Budgeting
- IRR, ARR – NPV - Return on Investment - Payback Period.

MARKET

- Market is a place where **buyer and seller meet**, goods and services are offered for the **sale and transfer of ownership** occurs.
- Economists describe a market as a **collection of buyers and sellers** who transact over a particular product.
- A market is a **group of buyers and sellers**, where **buyers determine the demand** and **sellers determine the supply**, together with the means whereby they **exchange their goods or services** is called the market.

MARKET STRUCTURE

- Market structure refers to the **nos. and distribution size of buyers and sellers** in the market of particular goods and services.
- A market consists of all firms and individuals who are **willing and able to buy or sell a particular product.** This includes firms and individuals currently engaged in buying and selling a particular product, as well as potential entrants.
- These are the main areas in the market, they are,
  - ✓ Seller contribution
  - ✓ Buyer contribution
  - ✓ Product differentiation
  - ✓ Conditions of entry into the market.(competition)

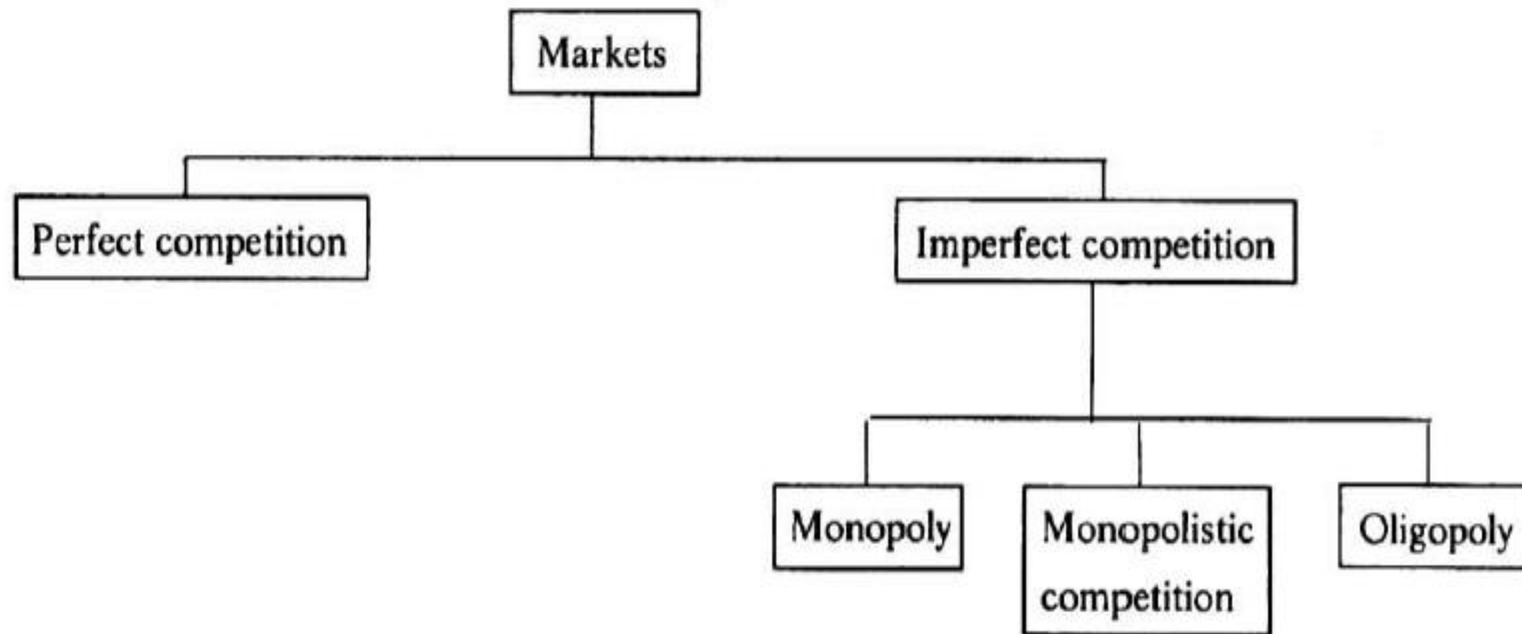
DETERMINANTS OF MARKET STRUCTURE

- For a particular product the number so determinants of market structure are,

1. Number and nature of sellers
2. Number and nature of buyers
3. Nature of product
4. Entry and exit conditions
5. Economies of scale - Producing the goods and services at a low cost.

TYPES OF MARKET STRUCTURE

- The types of market depend on the degree of competition prevailing in the market. These are,



1. PERFECT COMPETITION

- Perfect competition is a type of market where there is an **extensive number of buyers and sellers** and all of them initiate the buying and selling mechanism and there are **no restrictions** and there is an absence of direct competition in the market and it is assumed that all the sellers are selling **identical or homogenous products**.

1. PERFECT COMPETITION

Characteristics/Features of Perfect Competition

1. **Large Market:** A large population of buyers and sellers are present in the market. Sellers are unorganized, small or medium enterprises owned by individuals. However, a **large number of both seller and buyer** maintain the constancy of demand and supply chain in the market. I.e. buyer can easily substitute firms to buy its product and seller also have a large availability of buyers.
2. **Homogeneous Market:** Firms sell **identical products** with similar features and pricing, hence buyer is not able to differentiate between available products based on features and generally has no preference to select a particular product or seller over others.
3. **Freedom to Enter or Exit the Market:** In perfect competition, the startup cost and cost of production are very less and the demand for products is high, thus entry into the market is easy. In case some enterprise incurs losses and survival in the market becomes difficult due to the heavy competition then it is free to **exit** and other players' take heir place to fulfill the supply requirements.

Characteristics/Features of Perfect Competition

5. **Lower Restrictions and Obligations from Governments:** For sellers, governmental barriers are less. Sellers are allowed to freely sell their products in the market. Similarly, buyers are also **free to buy goods and services** offered by sellers. Prices are not regulated but fluctuate according to demand and supply chain.
6. **Perfect Information Availability:** Sellers have full **market knowledge** like required **costs, technological** requirements, marketing **tactics**, and levels of supply as per demands in the market. The buyer is fully informed about the availability of products, its features, quality, and prices. Hence manipulating the market by either party is not possible.
7. **Cheap and Efficient Transportation:** Transportation is a very important part of every business and in a perfectly competitive market the cost of transportation for the seller is low and thus the product prices decrease. Also, efficient transportation is easily available cause a reduction in delays to transport goods.

PERFECT COMPETITION - ADVANTAGES

1. Perfect competition markets are **theoretically ideal market** structures.
2. Perfectly Competition market structures are consumer-oriented. It is said that "**consumer is the king**" in such market situations. Consumers have readily available substitutes for both products and sellers and can easily switch to others if required.
3. **Sellers have no pricing power** as in the case with a monopoly market and the whole control of pricing remains under **demand and supply** chain. Thus probability to exploit consumers becomes negligible.
4. The product **features, quality, and rate remain similar everywhere** for perfectly competitive products. E.g. quality and rates of toothpaste in New York City or South Dakota remain almost same and consumer everywhere gets standardized products.
5. In perfect competition **start-up costs, cost of production, advertising, and marketing costs all are very low**. Thus entry, production, and sales get easy for the seller.

PERFECT COMPETITION - DISADVANTAGES

1. The biggest disadvantage of perfect competition is that being the most ideal market structure, it is just a **hypothetical or theoretical** concept of economics with negligible existence in the real world.
2. Sellers **can not add value to their product** because adding value or features to the products does not **increase prices** which are fully determined and controlled by demand and supply system. Hence cost to seller increases but revenue remains the same and ultimately profit margin decreases. If sellers increase their prices for better products, consumers may get shifted to other sellers or consider other products.
3. **Heavy competition** is another disadvantage for sellers due to low barriers and **high freedom to entry and exit**. i.e. anytime a new player can enter the market and starts offering similar products or services to the consumer at similar rates.
4. Existing sellers always have an advantage over new players because they are well established in the market, created goodwill among suppliers and consumers, are located at prime locations. But **new sellers have to struggle** and sometimes incur losses and ultimately thrown out of the market.

2. IMPERFECT COMPETITION

A competition is said to be imperfect when it is not perfect. Based on the **number of buyers and sellers, the structure** of market varies as outlined below: "**poly**" refers to seller and "**psony**" refers to buyer. Imperfect competition has three types, they are,

1. Monopoly
2. Monopolistic competition
3. Oligopoly

IMPERFECT COMPETITION - MONOPOLY MARKET

DEFINITION:

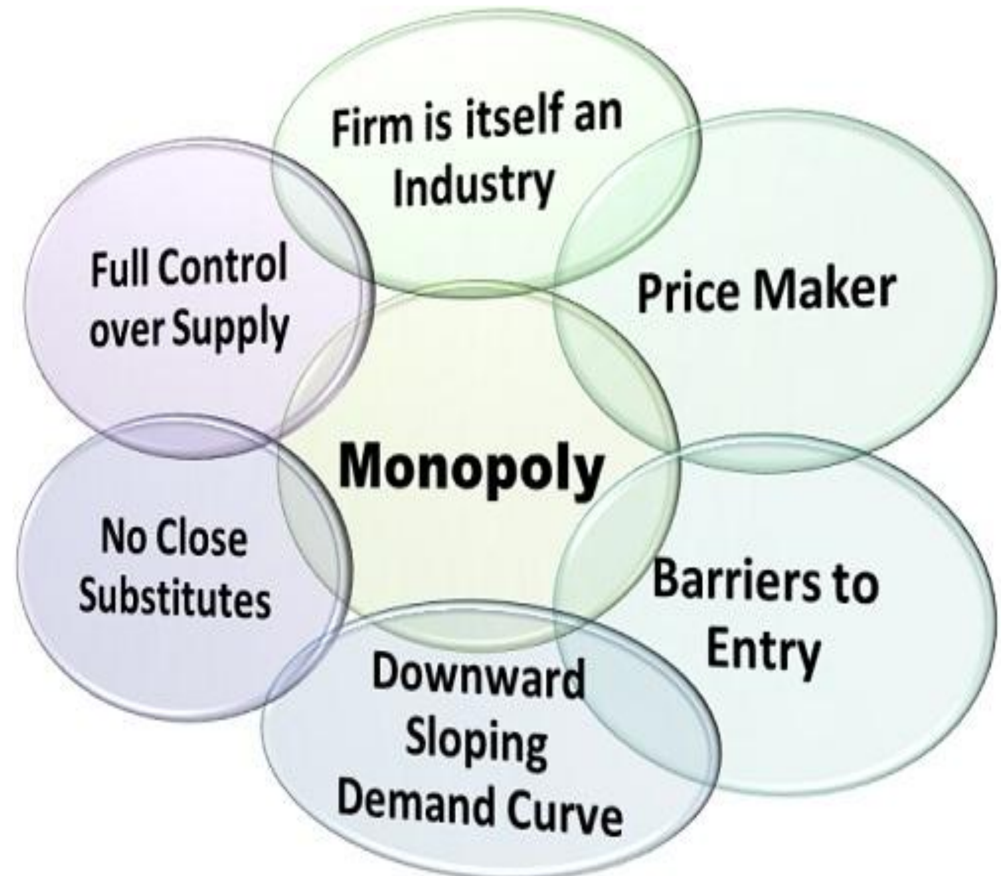
According to FERGUSON AND KREPS,” a pure monopoly exists when **one and only one firm** produces or sells the commodity in questions. In other words a monopoly is a one firm industry”.

MEANING:

- A market situation where there is only **one seller** and barriers for others to entry product having no close substitute cross **elasticity of demand** being low with every other product and no other firm produces an identical product is called monopoly.
- Hence the price is fully under control of the monopolist but no control over the demand that is determined by the purchased.

IMPERFECT COMPETITION - MONOPOLY MARKET

The word monopoly is made up of two syllables, **Mono** and **poly**. **Mono** means **single** while **poly** implies **selling**. Thus monopoly is a form of market organization in which there is **only one seller** of the commodity. There are no close substitutes for the commodity sold by the seller. Pure monopoly is a market situation in which a single firm sells a product for **which there is no good substitute.**



FEATURES OF MONOPOLY

1. SINGLE SELLER:

- A single producer of a particular commodity or service in a monopoly market gathering large number of buyers, who can be an individual, a group of partners a joint stock company or a state, it is the alone source of supply for goods and services having no close substitute. The market is referred is the industry.

2. RESTRICTED ENTRY:

- **There is a restriction** on the free entry of new organization as **new sellers are prohibited** to enter the monopoly market.
- Following are the primary barriers restricting the entry of new sellers.

  a. Government license or franchise

  b. Resource ownership

  c. Patents and copyrights

  d. High start up cost and

  e. Decreasing average total cost.

FEATURES OF MONOPOLY

3. HOMOGENEOUS PRODUCT:

- The product which is produced by the monopoly firm has **no close substitute** and is a homogeneous product.
- The **buyer is forced to purchase** the product which is available at the labeled price.

4. FULL CONTROL OVER PRICE:

- The features of a monopoly market where **entry is restricted** of the new sellers or buyers making the competition restricted, market conditions are **fully influenced by the monopolist** thus a company under monopoly is **free from price pressure** and is independent to charge according to his advantages and with the intention of maximizing of profit via predetermined choice of quantity.

5. PRICE DISCRIMINATION:

- The practices of charging different prices from different buyers for the same goods or service are price discriminating.
- The monopolist has advantages of being in the market by discriminating the prices as per his convenience.

MONOPOLY -ADVANTAGES & DISADVANTAGES

ADVANTAGES

1. Research and development - Successful research can be used for improved products and lower costs in the long term
2. **Economies of scale** - Increased output will lead to a decrease in average costs of production
3. **Competition for corporate control**
4. **Stability of prices**
5. **Source of revenue for the government**
6. **Massive profits**

DISADVANTAGES

1. **Exploitation of consumers**
2. **Dissatisfied consumers**
3. **Higher prices**
4. **Price discrimination**
5. **Inferior goods and services**

MONOPOLY - EXAMPLES

IMPERFECT COMPETITION - MONOPOLISTIC MARKET

Definition: Under, the Monopolistic Competition, there are a **large number of firms** that produce **differentiated products** which are close substitutes for each other. In other words, large sellers selling the products that are **similar, but not identical** and compete with each other on other factors besides price.

Characteristics of Monopolistic Competition

1. **Product Differentiation** – Product is not identical but is slightly different
2. **Large number of firms** - stiff competition between the firms
3. **Free Entry and Exit** - can move in and out of the industry at any time
4. **Some control over price** - if a firm lowers the price of substitutes product, then the customers of other products will switch over to it
5. **Heavy expenditure on advertisement and other Selling Costs** - huge cost on advertisements
6. **Product Variation** – changes in the form of new design, better quality, new packages or container, better materials,

FEATURES OF MONOPOLISTIC COMPETITION

1.LARGE NUMBER OF SELLERS:

- There are **huge sellers** in a monopolistically competitive market who have a small market share individually.
- These firms produce and sell **close substitute products**. This makes the touch and real competition among firms.

2. PRODUCT DIFFERENTIATION:

- The different seller's products are differentiated in a monopolistic completive market on the **basis of brands**.
- A monopoly element is aroused because of product differentiating to the product over the product that is it competition.

3. FREEDOM OF ENTRY OR EXIT:

- Market **allows** free entry of new firms and also exits of existing firms.

FEATURES OF MONOPOLISTIC COMPETITION

4. INDEPENDENT BEHAVIOR:

- Every firm posses an **independent policy** in monopolistic competition. Since there are large number of seller's major portion of total output is not controlled by anyone.

5. PRODUCT GROUPS:

- Under monopolistic competition there is not any industry but groups of firms that exist which produce the similar product.
- Each firm is an industry in itself and produces a different product.
- **For example, cigarettes, cars, etc.**

6. SELLING COSTS:

- Sales area essentially pushed up by the selling costs because product differentiation exists in monopolistic competition.
- It includes **salesman expenses, advertisement costs, sellers allowances** for displaying windows free sampling premium gifts and coupons free service etc.

FEATURES OF MONOPOLISTIC COMPETITION

7. NON-PRICE COMPETITION:

- A firm increase profits and sales of its product in monopolistic competition **without any price cut**.
- Products can be changed by a monopolistic competitor either by quality etc.

8. CONTROL OVER PRICE:

- Prices are **controlled by the firms** to some extent. For example professionals such as solicitors restaurants etc., are price maker.
- A price which is set by the firm's conscious decision is termed as administered price. Also firms must decide the price changing frequency.

MONOPOLISTIC-
ADVANTAGES & DISADVANTAGES

ADVANTAGES

1. Promotion of **competition** (link of barriers to entry)
2. **Differentiation** brings greater consumer choice and variety
3. Product and service quality development
4. Consumers become more knowledgeable of products

DISADVANTAGES

1. Liable of excess capacity
2. Allocatively inefficient
3. Higher prices
4. Advertising

MONOPOLISTIC- EXAMPLES

Taxi's

Clothing

Toilet Paper

Hotel's

Restaurants

Hairdressing

IMPERFECT COMPETITION – OLIGOPOLY MARKET

Definition: The Oligopoly Market characterized by **few sellers**, selling the **homogeneous or differentiated products**. In other words, the Oligopoly market structure lies between the pure monopoly and monopolistic competition, where few sellers dominate the market and have control over the price of the product.

Under the Oligopoly market, a firm either produces:

Homogeneous product: The firms producing the homogeneous products are called as Pure or Perfect Oligopoly. It is found in the producers of industrial products such as **aluminum, copper, steel**, zinc, iron, etc.

Heterogeneous Product: The firms producing the heterogeneous products are called as Imperfect or Differentiated Oligopoly. Such type of Oligopoly is found in the producers of consumer goods such as **automobiles, soaps, detergents, television, refrigerators**, etc.

Features of Oligopoly Market

1. **Few Sellers**
2. **Interdependence** - cautious with the competing firms
3. **Advertising**
4. **Competition**
5. **Entry and Exit Barriers** - government license, Patent, high capital requirement, complex technology
6. **Lack of Uniformity**

FEATURES OF OLIGOPOLY

1. FEW SELLERS:

- There are few large firms. The exact number of firms is not defined. For example, the market for automobiles in India is an oligopolist structure as there are only few producers of automobiles.

2. INTERDEPENDENCE:

- Interdependence among firms is a major character in an oligopoly. This means that the action of a particular firm affects the other firms in the market.

3. IMPORTANCE OF ADVERTISING AND SELLING COSTS:

- Oligopolist's interdependence shows **direct impact** on the various firms to employ marketing weapons that are of north natures aggressive and defensive so as to gain greater market share or to maintain their existing share.

FEATURES OF OLIGOPOLY

4. NON-PRICE COMPETITION

- Firms try to **avoid price competition** due to the fear of price wars in Oligopoly and hence **depend on non-price** methods like advertising, after sales services, warranties, etc. This ensures that firms can influence demand and build brand recognition.

5. GROUP BEHAVIOUR:

- Group behaviour is crucial in an oligopoly. To maintain a true oligopoly, every firm must abolish **profit-maximising** behaviour. In an oligopoly, all the firms work as a team to achieve success.

6. INDETERMINATE DEMAND CURVE:

- Due to firms interdependence is oligopoly and also because of a particular firm's inability to predict other firms' behavior determinateness and definiteness is lot by the demand curve facing an oligopolistic firm.

OLIGOPOLY
ADVANTAGES & DISADVANTAGES

ADVANTAGES

1. **Huge profits** are made by the large firms that have strong hold over the market because there are few market players.
2. Mostly products of two varying competitive companies are derived out of one main large firm in oligopoly.
3. The companies generate high profits and this profit can be used for **development and innovation of new process** and products.
4. Customers can **stabilize and plan their expenditure** efficiently due to stable market prices.

DISADVANTAGES

1. Though price setting can prove to be advantages for the firms' but if it's not done in realistic manner it may tend to be **disadvantages to customers**.
2. Dominant companies do not think to **improvise their products** because of little competition.
3. Due to presence of various entry barriers **new firms cannot easily enter** the market.

OLIGOPOLY - EXAMPLES

- Beverage/Soft Drinks industry
- Airline industry
- Oil industry
- Wholesale Beer industry
- Automobile industry
- Music industry, etc

Few number of Sellers

Large number of buyers

PRICING

THEORY OF PRICE

- The theory of price—also referred to as "price theory"—is a microeconomic principle that uses the **concept of supply and demand** to determine the **appropriate price** point for a given good or service.

- The goal is to achieve the **equilibrium** where the quantity of the goods or services provided matches the **demand** of the corresponding market and its ability to **acquire** the good or service.

- The concept of price theory allows for **price adjustments** as market conditions change.

PRICING

MEANING AND DEFINITION OF PRICING

According to PROF. K.C. KITE, pricing is a managerial task that involves,

- Establishing pricing objectives
- Identifying the factors governing the price
- Determining the product value in monetary terms
- Formulation of price policies
- Strategies implementing them
- Controlling them for the best results.

PRICE POLICY

- It's a **guideline** set by the top management to bring about optimum market integration
- Used to encourage/discourage competition
- Satisfy/dis-satisfy the consumers

IMPORTANCE OF PRICING

1. Price is the **Pivot** for an Economy
2. Price **Regulates** Demand
3. Price is the **Competitive Weapon**
4. Price is the Determinants of **Profitability**
5. Price is a **Decision Input**
6. Marketing **Communication**

FACTORS AFFECTING PRICING

1. **Cost of the Product** - Fixed Cost, Variable Cost, Semi-Variable Costs
2. **The Demand for the Product** - Price is the elasticity of demand
3. **Price of Competitors** - Additional features reflected in the price
4. **Government Regulation** - To protect the citizens from unfair practices and pricing

OBJECTIVES OF PRICING

- Maximize long-run **profit**
- Maximize short-run **profit**
- Increase sales **volume** (quantity)
- Increase **market share**
- Obtain a target rate of **Return On Investment** (ROI)
- **Stabilize** market or stabilize market price
- Company **growth**
- Maintain price **leadership**
- Match **competitors prices**

OBJECTIVES OF PRICING

- **Survival**
- Avoid government investigation **or intervention**
- Obtain or maintain the **loyalty** and enthusiasm of distributors and other sales personnel
- Enhance the image of the firm, **brand**, or product
- Create **interest** and **excitement** about a product
- **Discourage** competitors from **cutting prices**
- Use price to make the product "**visible**"
- Help prepare for the **sale** of the business
- **Social, ethical, or ideological objectives**

COMPONENTS OF PRICING

1. **Base price** — typically the base price of a product prior to calculation
2. **Discount** — a simple price component type useful for **price reductions**
3. **Fee** — a simple price component type useful for **price increases**
4. **Tax rates** — each tax rate gets its own component type so the **total tax collected** for an order can be found in its order **total price** field

STEPS IN SETTING THE PRICE

- Selecting the pricing **objective**
- **Determining** demand
- Estimating **costs**
- Analyzing **competitors** costs, prices and offers
- Selecting a pricing **method**
- Selecting the **final price**

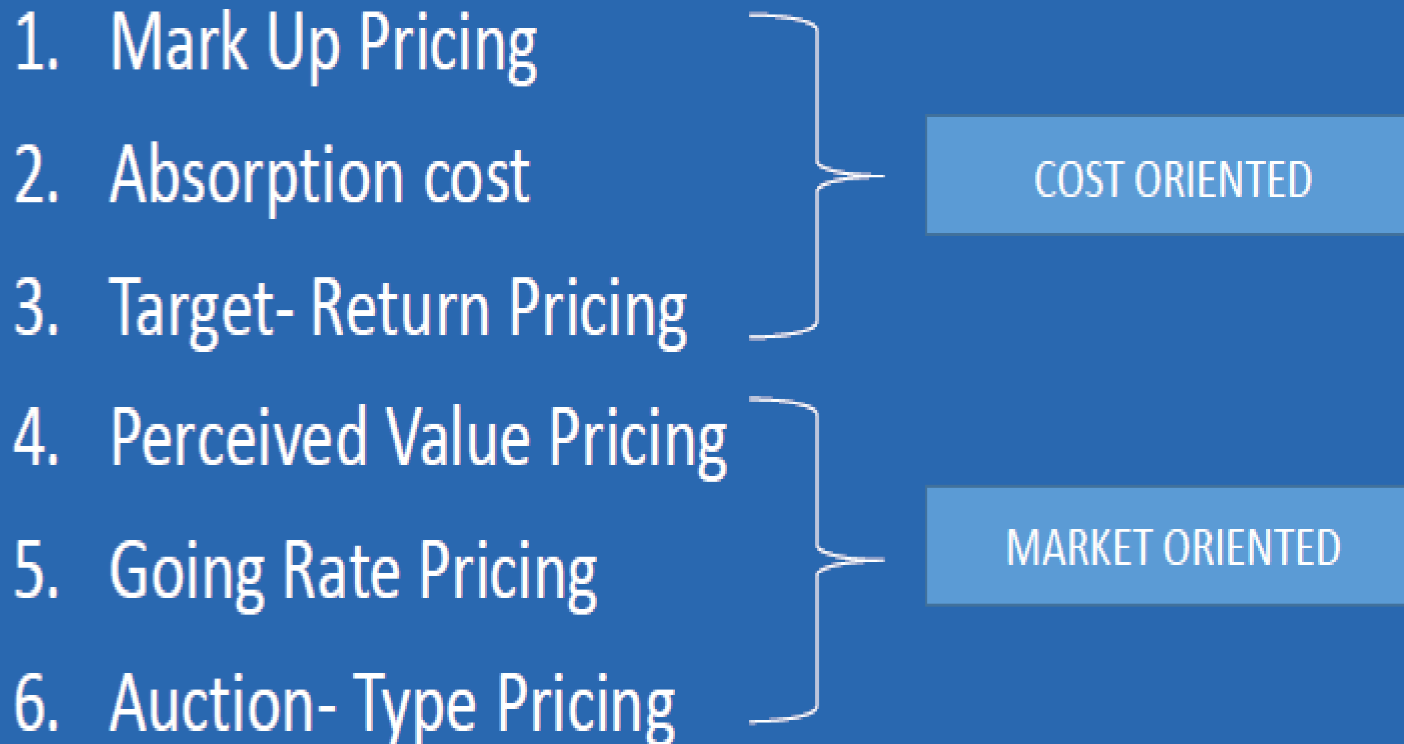
PRICING METHODS

Definition: The Pricing Methods are the **ways in which** the price of goods and services **can be calculated** by considering all the factors such as the **product/service, competition, target audience, product's life cycle, firm's vision of expansion**, etc. influencing the pricing strategy as a whole.

The pricing methods can be broadly classified into two parts:

1. **Cost Oriented Pricing Method** - Many firms consider the **Cost of Production** as a base for calculating the price of the finished goods.
2. **Market Oriented Pricing Method** - Under this method price is calculated on the basis of **market conditions**.

PRICING METHODS



1. MARK UP PRICING

- The Mark-up pricing is the method of **adding a certain percentage of a markup** to the cost of the product to determine the **selling price**.
- The mark-up pricing method, **calculates all the costs** of purchasing or producing the product and then adds a **desired mark-up** to it.
- **Selling Price = Total Cost + Mark-up Price**

$$\text{Mark-up price} = \frac{\text{Unit Cost (Total Cost)}}{\text{1-desired return on sales}}$$

Where,

Unit Cost = VC + (FC/Unit Sales)

VC = Variable Cost

FC = Fixed Cost

MARK UP PRICING - Example

- Suppose, there is a laptop manufacturer who has the following cost and sales expectations and the manufacturer decided to add a **20% markup** on sale. Calculate the Markup price.

  Fixed Cost : Rs 30

  Variable cost per unit : Rs. 5,00,000

  Expected Unit Sales: 50,000

- The manufacturer's unit cost is given by:

  Unit Cost = Fixed cost + Variable cost

  Thus, Unit cost = 30 + 500000/50000 = Rs 40

- Once the cost is determined, the manufacturer decided to add a **20% markup** on sales. The mark-up price is given by:
- **Mark-up price = Unit Cost/1-desired return on sales**
- Thus, mark-up price = 40/ 1-0.2 = 50
- Hence, the manufacturer must charge Rs 50 to earn a profit of Rs 10.

MARK UP PRICING

Example

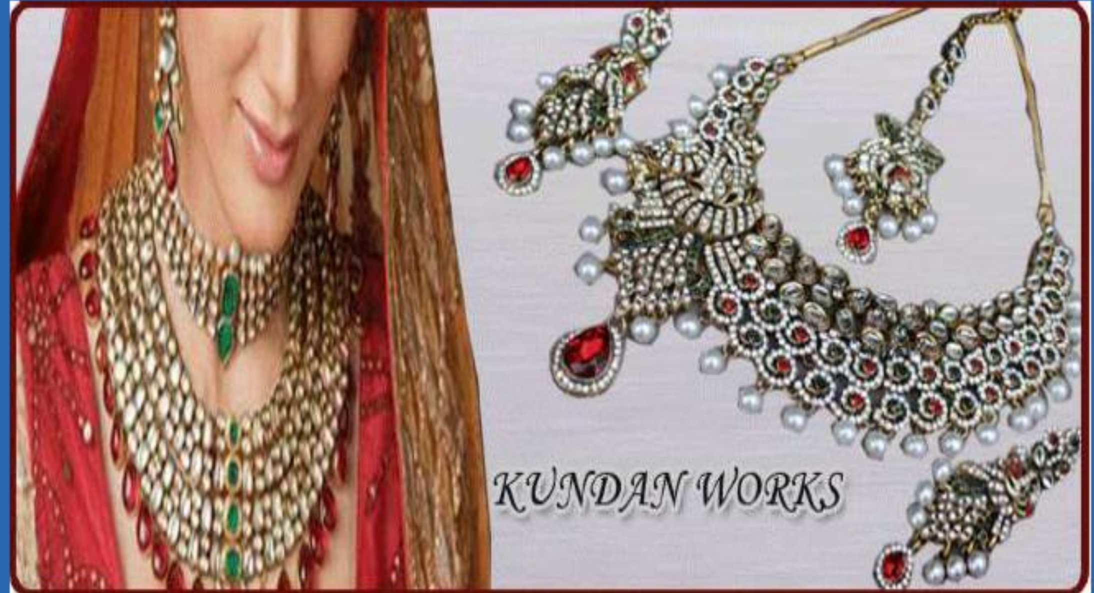
Demand inelastic item

Seasonal Items

MARK UP PRICING

Example

Cost= US$ 0.08
Price= US$1.08
Mark Up= 1,250%



Jewellery

2. ABSORPTION COST PRICING

- Mainly used by manufacturing firms.
- It uses standard costing techniques.
- It includes :

✓ Fixed cost

✓ Variable cost

✓ Selling and administering cost

✓ Advertisement cost

- It is also known as full cost pricing.

ABSORPTION COST PRICING

Example

Delhi	-	5.04lakhs
Chennai	-	5.44lakhs
Hydrabad	-	5.40lakhs
Mumbai	-	5.37lakhs
Bangalore	-	5.59lakhs
Pune	-	5.24lakhs

3. TARGET RETURN PRICING

- The Target-Return Pricing is a method wherein the firm determines the price on the **basis of a target rate of return on the investment** i.e. what the firm expects **from the investments** made in the venture.
- **Formula based** pricing method.
- The price is set for a product to return a **desired profit on investment**.
- Manufacturer assumes that a **particular quantity** of the product will be sold.
- Used by Market leaders or **Monopolist**.

$$\text{Unit Cost} + \frac{(\text{Desired Return} \times \text{Invested Capital})}{\text{Unit Sales}}$$

TARGET RETURN PRICING - Example

Suppose the tractor manufacturer has invested 2 million in his venture and he expects to earn 20% as an ROI. Therefore, he will set the price accordingly. The cost and sales expectation are:

Unit cost: 20

Expected sales: 50,000 units

The Target-Return Pricing is given by:

Target-Return Pricing = unit cost + (desired return x invested capital) /unit sales

Thus, Target-Return Pricing = 20+(0.20 x 20,00,000) / 50,000

= Rs 28

To earn the ROI of 20%, the company must sell the product at Rs 28, provided 50,000 units are sold.

TARGET RETURN PRICING

Example

Market Leaders ensuring target sales

TARGET RETURN PRICING

Example

ITC Cigarettes

4. PERCEIVED VALUE PRICING

Perceived value pricing is that value which customers are willing to pay for a particular product or service **based on their perception** about the product.

The perceived value is made up of several elements such as **buyer's experience with the product, service support, warranty quality, channel deliverables, customer support, supplier's reputation, trustworthiness**, etc.

4. PERCEIVED VALUE PRICING

- Perceived value is made up of host of inputs

[1 Buyer's image of the product performance

2 The warranty quality.

3 Customer support, etc.]

- and softer attributes.

[1 Supplier's reputation

2 Trustworthiness

3 Esteem, etc]

- Firms use marketing program to communicate and enhance perceived value in buyer's mind

PERCEIVED VALUE PRICING

Examples

PERCEIVED VALUE PRICING

Examples

Perceived value

Durability

Reliability

Service

Longer warranty

PERCEIVED VALUE PRICING

Examples

5. GOING RATE PRICING

- The product is priced as per the rates **prevailing** in the market.
- The company sets a price of its products and services in line with the **competitor's prices**
- This type of pricing is mostly followed in **Oligopolistic** industries where they deal in **homogenous goods**, and in which **less variation** is seen from one producer to another.
- The prices set by the market leaders are followed by all the organizations in the industry.
- With a going-rate pricing method, companies feel secure as they are sure to get the customers because of the **same rates prevailing in the industry**.
- Ex: Steel, aluminium, paper, fertilizer, etc., the firms dealing with these usually charge the **same price from the customers**

GOING RATE PRICING

Examples

Telecom Industry

Airlines Industry

GOING RATE PRICING

Examples

Banking Industry

Electronic goods

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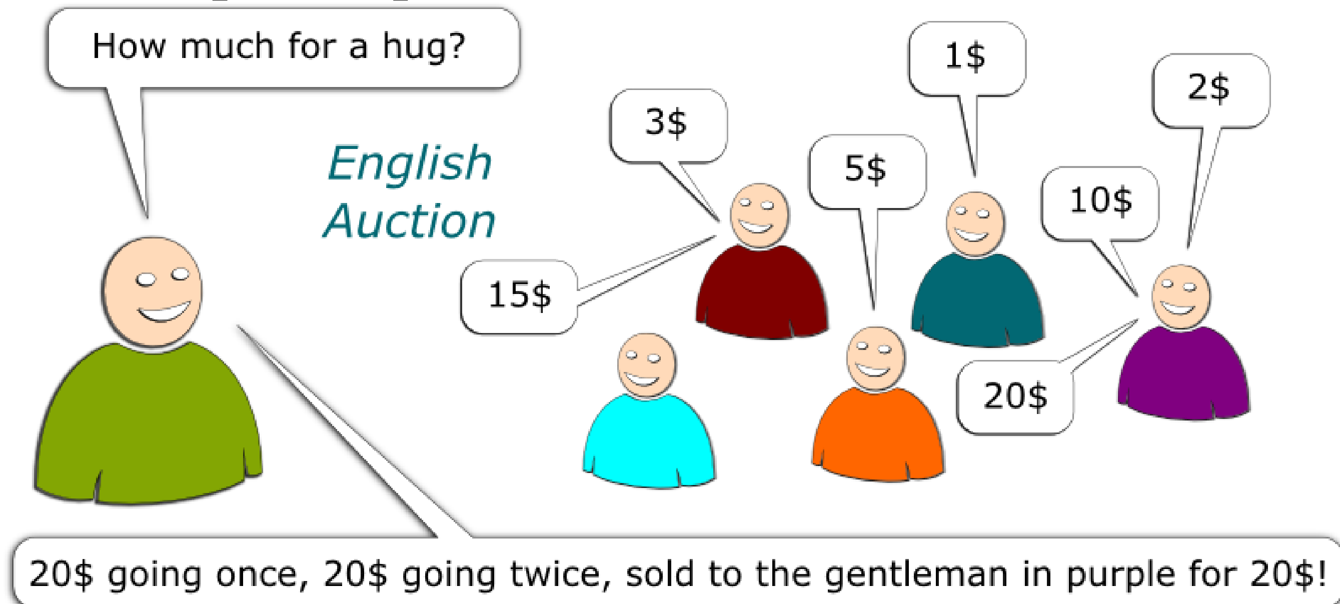
6. AUCTION TYPE PRICING

- An auction is a process of buying and selling goods or services by offering them up for **bid, taking bids**, and then selling the item to the **highest bidder**.
- A bid is an offer to pay a particular amount of money for something that is being sold.
- There are three major type of auctions and their separate pricing procedures.
- **English Auctions**
- **Dutch Auctions**
- **Sealed-Bid Auctions**

English Auctions

- The auctioneer opens the auction by **announcing** a Suggested Opening Bid, a starting price.
- Then, the auctioneer accepts **increasingly higher bids** from the floor.
- The highest bidder at any given moment is considered to have the standing bid.
- If no competing bidder challenges the standing bid within a given time frame, the standing bid becomes the winner, and the item is sold to the highest bidder at a price equal to his or her bid.



Dutch Auctions

- It is also known as **Descending bids**.

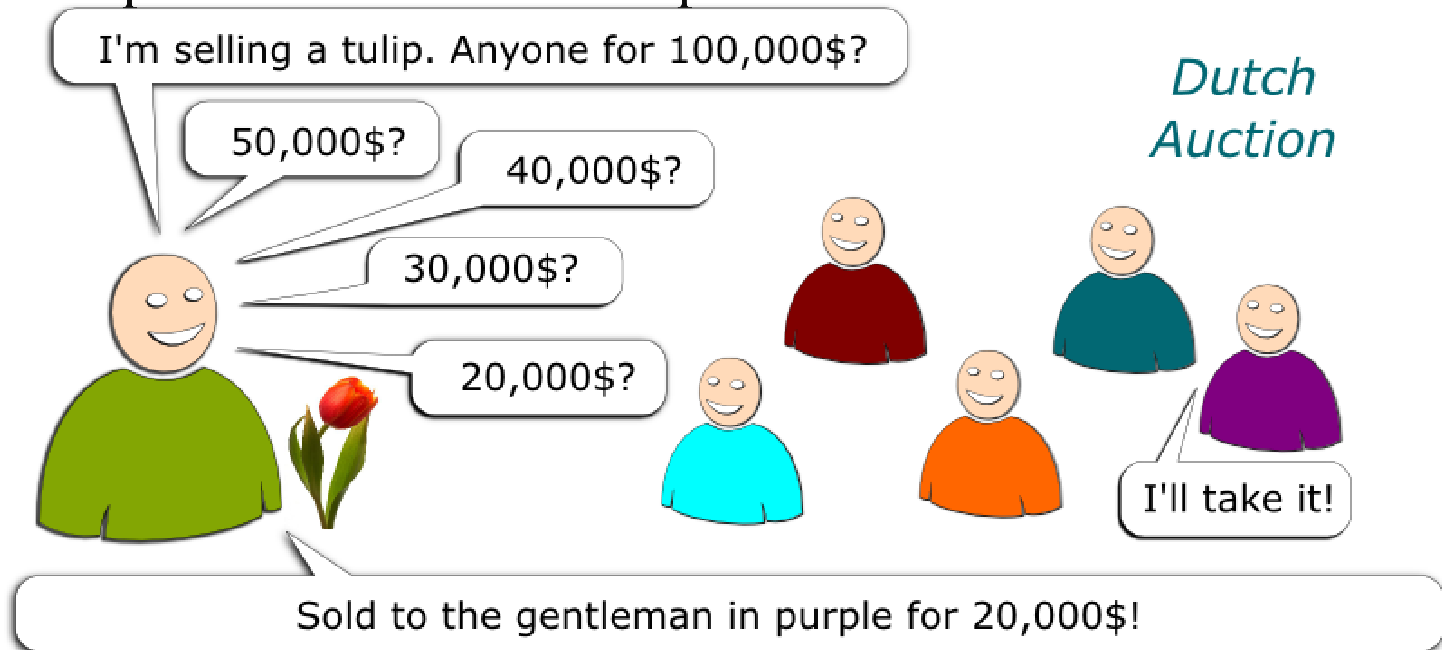
There are two types

1) **One seller and many buyers:**

An auctioneer announces a high price for a product and then slowly decreases the price until a bidder accepts.

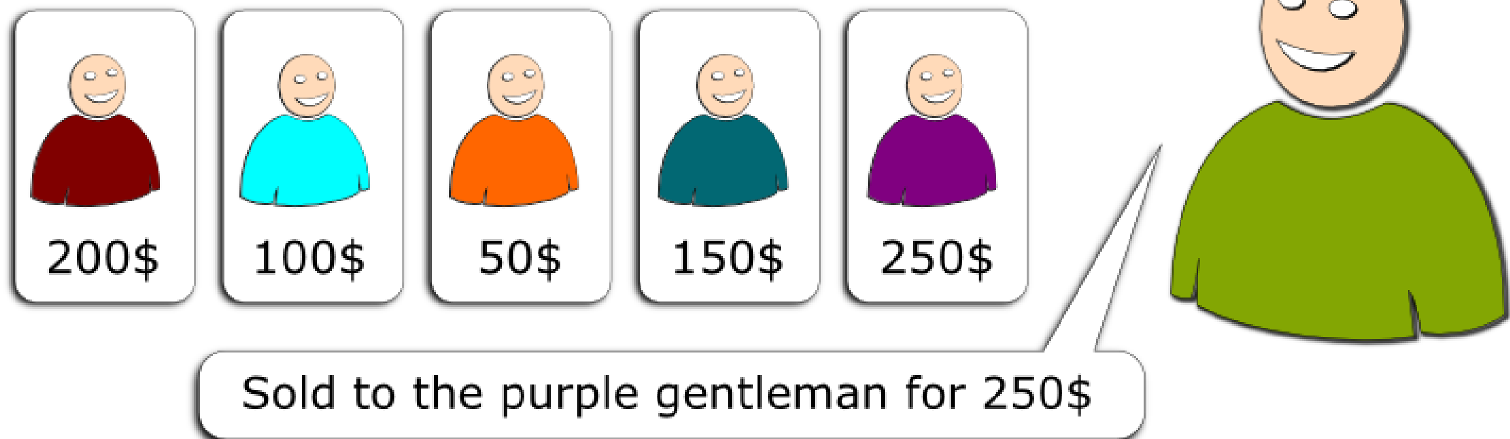
2) **One buyer and many sellers:**

The buyer announces something he or she wants to buy, and potential sellers compete to offer the lowest price.



Sealed-Bid Auctions

- Also known as blind auction.
- Bidders **simultaneously** submit sealed bids.
- No bidder knows the bid of any other participant.
- The **highest bidder** pays the price they submitted.
- Each bidder is characterized by his/her monetary valuation of the item for sale.
- Each bidder is given just **one chance** to bid.
- In sealed-bid auction, it is advantageous for a bidder to gather information about the competing bids before deciding on his own bid. Therefore, the "**privacy**" issue is essential in this auction format.



AUCTION TYPE PRICING

Examples of English Auctions

AUCTION TYPE PRICING

Examples of Dutch Auctions

Google IPO Bidding
1 seller many buyers

1 buyer many sellers

CAPITAL BUDGETING

CAPITAL BUDGETING

- Capital budgeting is the method of **determining and estimating** the potential of **long-term** investment options involving enormous capital expenditure. It is all about the company’s strategic decision making, which acts as a milestone in the business.

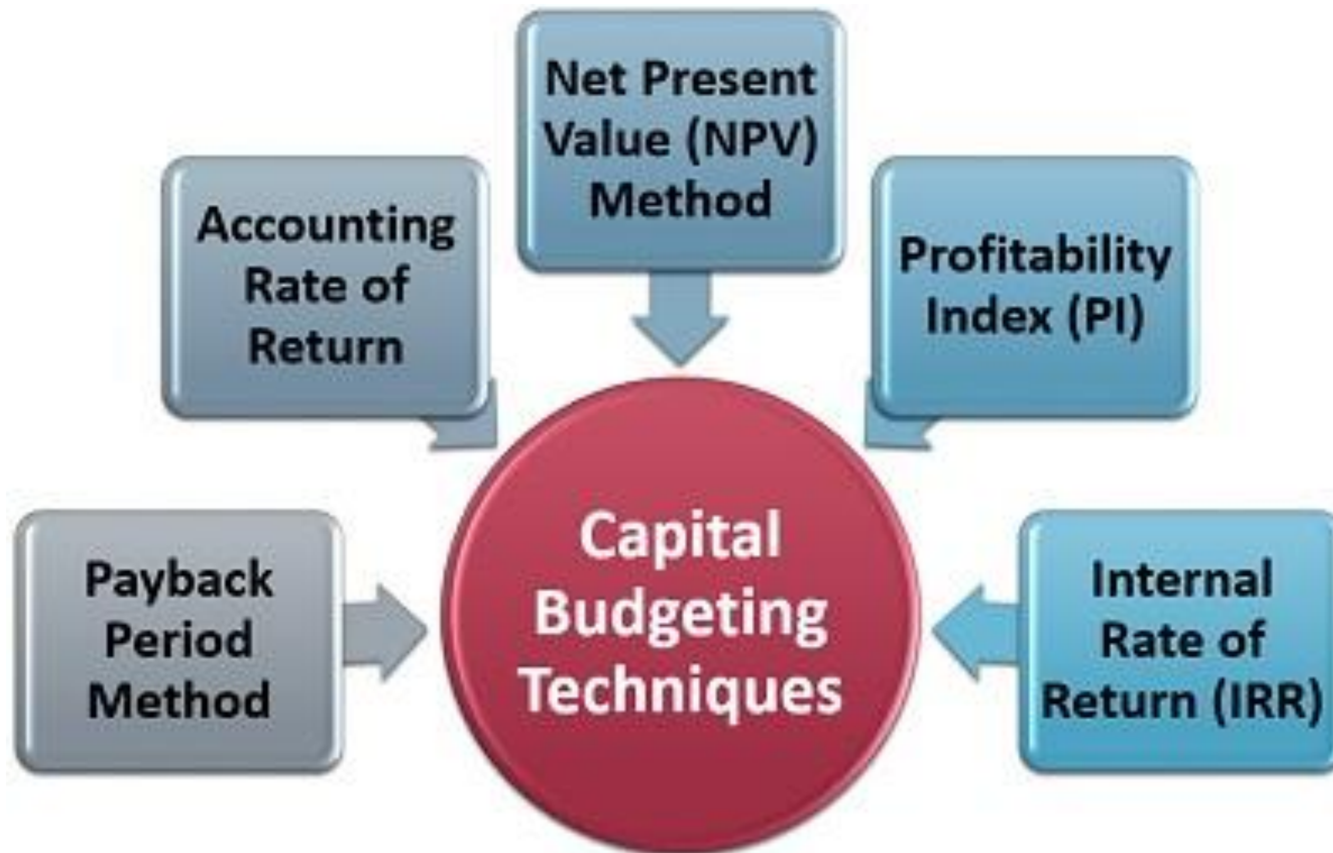
- Following are the categories of projects that can be examined using capital budgeting process:
  - The decision to buy new machinery
  - Expansion of business in other geographical areas
  - Replacement of an obsolete equipment
  - New product or market development etc

FEATURES OF CAPITAL BUDGETING

- Huge Funds
- High Degree of Risk
- Affects Future Competitive Strengths
- Difficult Decision
- Estimation of Large Profits
- Long Term Effect
- Affects Cost Structure
- Irreversible Decision

TECHNIQUES OF CAPITAL BUDGETING

- Capital budgeting techniques are the methods to **evaluate an investment** proposal in order to help the company decide upon the desirability of such a proposal.



CAPITAL BUDGETING TECHNIQUES

1. Payback Period Method

- The payback period method is the simplest of all. It defines the **period** in which the company can recover its investment value.

- The formula for calculating the payback period of a project is:

$$Payback\ Period = \frac{Cash\ Outlay\ (Investment)}{Annual\ Cash\ Inflow}$$

- The shorter is the payback period of the project, the more suitable it is for the company.

CAPITAL BUDGETING TECHNIQUES

2. Accounting Rate of Return

- The accounting rate of return depicts the future profitability of a project with the help of accounting information mentioned in financial statements.

- The formula for calculating rate of return of a project is:

$$Accounting\ Rate\ of\ Return\ (ARR) = \frac{Average\ Income}{Average\ Investment} \times 100$$

- The higher is the ARR of the investment proposal, the more preferable it is for the company.

CAPITAL BUDGETING TECHNIQUES
3. Net Present Value (NPV) Method

- Net present value is the discounted cash flow method. It functions on the principle that the cash inflow from the project will be acquired in a future period when the value of money will change. Hence, the future cash flow needs to be discounted at present value to compare the estimate performance with the actual one.
- The Net Present Value (NPV) formula is:

$$\textit{Net Present Value (NPV)} = \left[\frac{A_1}{(1+k)^1} + \frac{A_2}{(1+k)^2} + \frac{A_3}{(1+k)^3} + \cdots + \frac{A_n}{(1+k)^n}\right] - C$$

$$\textit{Net Present Value (NPV)} = \sum_{t=1}^{n} \frac{A_1}{(1+k)^t} - C$$

- Where, A1, A2, A3 are the cash inflows in consecutive years;
- k is the cost of capital of the project;
- We assume that all the cash outflows are done in the first year (t) and therefore, t=1.

CAPITAL BUDGETING TECHNIQUES

4. Profitability Index (PI)

- Profitability index is the ratio which relates the present value of earnings with the investment value.

- The Net Present Value (NPV) formula is:

$$= \frac{\text{Present Value}}{\text{Initial investment}}$$

CAPITAL BUDGETING TECHNIQUES
5. Internal Rate of Return (IRR)

- The internal rate of return determines **the rate at which the investment amount is recovered by the cash inflows**. The net present value of the project is zero in this method. Also, the discounted cash inflow and outflow are the same.

- Initially, the Present Value of Cash Outflow (Co) is calculated as follows:

$$C_o = \frac{C_1}{(1+r)^1} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \cdots + \frac{C_n}{(1+r)^n}$$

- Where Co is the present value of cash outflow;
- C1, C2, C3 are the cash inflows in the consecutive years;
- n is the number of years;
- r is the expected rate of return.
- This is the cutoff rate of the project.

CAPITAL BUDGETING TECHNIQUES

5. Internal Rate of Return (IRR)

- The Internal Rate of Return (IRR) formula is:

$$IRR = Lower\ Rate + \left[\frac{NPV_{LR}}{NPV_{LR} + NPV_{HR}}\right] \times (Higher\ Rate - Lower\ Rate)$$

- Where NPV (LR) is the net present value at a lower rate;
- NPV (HR) is the net present value at a higher rate.
- Analysis: If the IRR≥Co, the project is accepted; but if IRR<Co, the project is rejected.