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MANAGERIAL ECONOMICS

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PREFACE

In today's competitive and fast-paced business environment, making informed and strategic decisions is more important than ever. **Managerial Economics** serves as a vital bridge between economic theory and business practice, providing managers and decision-makers with analytical tools to solve real-world problems and make sound business decisions. This book aims to present a clear and concise understanding of the core concepts of managerial economics, combining theoretical frameworks with practical applications. It explores how economic principles can be effectively used to analyze business situations, optimize resource allocation, assess market dynamics, and formulate strategic decisions that drive organizational success. Designed for students, professionals, and aspiring managers, this book covers essential topics such as demand and supply analysis, production and cost functions, pricing strategies, market structures, and decision-making under risk and uncertainty. Each chapter integrates real-world examples, case studies, and problem-solving exercises to reinforce learning and enhance critical thinking skills. The objective is to equip readers not only with economic reasoning but also with the ability to apply these concepts in day-to-day managerial functions. By fostering an understanding of economic logic and its relevance in business decision-making, this book seeks to develop strategic thinkers who can navigate complex market conditions with confidence. We express our gratitude to the scholars, educators, and industry professionals whose insights and research have enriched the content of this book. We also thank the readers and learners for choosing this work as part of their academic and professional journey. It is our sincere hope that this book serves as a valuable resource and a stepping stone toward informed and effective managerial decision-making.

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CHAPTER I

INTRODUCTION TO MANAGERIAL ECONOMICS

1.1.INTRODUCTION

Managerial Economics is a specialized branch of economics that applies economic theories, principles, and analytical tools to solve practical business problems and aid in decision-making. It serves as a bridge between economic theory and managerial practice, providing a framework for analyzing how businesses can allocate scarce resources efficiently to achieve their objectives. By integrating concepts from microeconomics, macroeconomics, and decision sciences, Managerial Economics equips managers with the tools needed to make informed, rational, and effective decisions in a dynamic and competitive business environment.

At its core, Managerial Economics focuses on optimizing decision-making processes by evaluating costs, benefits, risks, and trade-offs. It helps managers address key business challenges such as pricing strategies, production planning, resource allocation, market analysis, and investment decisions. For example, it provides insights into how to set prices that maximize revenue, determine the optimal level of production, or evaluate the feasibility of new projects. By combining economic theory with quantitative methods, Managerial Economics enables businesses to navigate complex environments and achieve their goals efficiently.

The scope of Managerial Economics is vast, encompassing areas such as demand analysis, cost analysis, market structures, pricing strategies, profit management, capital budgeting, and risk analysis. It also considers macroeconomic factors like inflation, interest rates, and government policies, which influence business decisions. Additionally, Managerial Economics emphasizes the importance of ethical considerations and corporate social responsibility (CSR) in decision-making, ensuring that businesses contribute positively to society while pursuing their objectives.

In essence, Managerial Economics is a practical and application-oriented field that translates abstract economic concepts into actionable strategies for business success. It plays a critical role in helping firms achieve efficiency, profitability, and long-term sustainability by providing a

structured approach to decision-making. Whether it is a small business or a multinational corporation, Managerial Economics offers valuable insights and tools that enable managers to make better decisions, optimize resource utilization, and drive organizational growth.

DEFINITION

- ✓ According to Mc Nair and Merriam“ Managerial economics is the use of economic modes of thoughts to analyses business.
- ✓ According to Menfield“ managerial economics is concerned with the applications of economic concept and economics to the Problems of Formulating rational decision making.
- ✓ According to Spencer and Seigelman “managerial economics is the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by the management.
  According to Hague” Managerial economics is the fundamental academic subject which seeks to understand and analyse the business problems and make suitable solutions”

NATURE OF MANAGERIAL ECONOMICS

Managerial Economics is a specialized field that blends economic theory with business practices to facilitate decision-making and problem-solving in managerial contexts. Its nature can be understood through the following key characteristics:

Microeconomic Focus:

Managerial Economics is primarily rooted in microeconomics, which deals with individual consumers, firms, and markets. It focuses on analyzing demand and supply, production and cost structures, pricing strategies, and market competition at the firm level. By applying microeconomic principles, managers can make informed decisions about resource allocation, production levels, and pricing to maximize efficiency and profitability.

Pragmatic and Application Oriented:

Unlike pure economic theory, which is often abstract and theoretical, Managerial Economics is practical and application-oriented. It provides

tools and techniques to solve real-world business problems, such as determining the optimal price for a product, forecasting demand, or evaluating investment opportunities. Its focus is on actionable insights that can be directly applied to improve business outcomes.

Decision-Making Framework:

At its core, Managerial Economics serves as a decision-making framework. It helps managers evaluate alternatives by analyzing costs, benefits, risks, and trade-offs. For example, it assists in deciding whether to enter a new market, invest in new technology, or adjust production levels based on market conditions. By providing a structured approach to decision-making, it reduces uncertainty and enhances the quality of managerial choices.

Interdisciplinary Approach:

Managerial Economics draws on insights from various disciplines, including economics, accounting, finance, marketing, operations research, and statistics. This interdisciplinary nature allows it to address complex business problems holistically. For instance, it combines economic theories with financial analysis to evaluate investment projects or uses statistical tools to forecast demand and market trends.

Use of Quantitative methods:

A significant aspect of Managerial Economics is its reliance on quantitative methods and analytical tools. Techniques such as regression analysis, linear programming, cost-benefit analysis, and optimization models are commonly used to analyze data, predict outcomes, and support decision-making. These methods enable managers to make data-driven decisions with greater precision.

Focus on optimization:

Managerial Economics emphasizes optimization, which involves making the best possible use of limited resources to achieve organizational goals. Whether it is minimizing costs, maximizing profits, or achieving efficient production levels, the focus is on finding optimal solutions that align with the firm's objectives.

Dynamic and Adaptive:

The nature of Managerial Economics is dynamic, as it adapts to changing business environments, market conditions, and technological advancements. Managers must consider factors such as consumer preferences, competitor behavior, government policies, and global economic trends when making decisions. Managerial Economics provides the tools to analyze these factors and adapt strategies accordingly.

Goal-Oriented:
Managerial Economics is goal-oriented, with a primary focus on achieving the firm's objectives. While profit maximization is often a key goal, it also considers other objectives such as market share expansion, customer satisfaction, and long-term sustainability. It helps managers balance short-term and long-term goals while considering the interests of various stakeholders.

Normative and prescriptive:

Managerial Economics is normative in nature, meaning it prescribes what managers should do to achieve desired outcomes. It provides recommendations based on economic analysis, such as setting prices at a level that maximizes revenue or choosing a production method that minimizes costs. This prescriptive approach distinguishes it from positive economics, which focuses on describing economic phenomena.

Integration of Theory and Practice:

Managerial Economics acts as a bridge between economic theory and business practice. It translates abstract economic concepts into practical tools and strategies that managers can use to address real-world challenges. For example, the theory of demand and supply is applied to determine pricing strategies, while cost theories are used to optimize production processes.

SCOPE OF MANAGERIAL ECONOMICS

The scope of Managerial Economics is vast and encompasses a wide range of topics and applications that are essential for effective decision-making in business. It integrates economic theory with business practices to

address various managerial challenges. The scope can be broadly categorized into the following areas:

1. Demand Analysis and Forecasting

- **Demand Analysis**: Managerial Economics helps managers understand consumer behavior and the factors influencing demand for a product or service. This includes analyzing price elasticity, income elasticity, and cross elasticity of demand.
- **Demand Forecasting**: Accurate demand forecasting is critical for production planning, inventory management, and resource allocation. Managerial Economics employs statistical and econometric tools to predict future demand based on historical data and market trends.

2. Production and Cost Analysis

- **Production Function**: Managerial Economics examines the relationship between inputs (labor, capital, raw materials) and outputs (goods and services). It helps managers determine the optimal combination of inputs to maximize output and efficiency.
- **Cost Analysis**: Understanding cost behavior is crucial for pricing and profitability. Managerial Economics analyzes fixed costs, variable costs, marginal costs, and economies of scale to guide production and operational decisions.

3. Pricing Decisions and Strategies

- **Pricing Policies**: Managerial Economics provides insights into setting prices that maximize revenue and profit. It considers factors such as cost structures, market competition, and consumer demand.
- **Price Discrimination**: It explores strategies like differential pricing, peak-load pricing, and bundling to capture consumer surplus and enhance profitability.
- **Competitive Pricing**: In markets with intense competition, Managerial Economics helps firms adopt pricing strategies that maintain competitiveness while ensuring profitability.

4. Market Structure and Competitive Analysis

- **Market Types**: Managerial Economics analyzes different market structures, such as perfect competition, monopoly, monopolistic competition, and oligopoly, to understand their implications for pricing, output, and profitability.
- **Competitive Strategies**: It helps firms develop strategies to gain a competitive edge, such as product differentiation, branding, and innovation.

5. Profit Analysis and Management

- **Profit Maximization**: Managerial Economics focuses on strategies to maximize profits by optimizing revenue and minimizing costs.
- **Profit Planning**: It assists in setting realistic profit targets and developing plans to achieve them through effective resource allocation and cost control.
- **Risk and Uncertainty**: Managerial Economics incorporates risk analysis to evaluate the impact of uncertainty on profits and decision-making.

6. Capital Budgeting and Investment Decisions

- **Capital Budgeting**: Managerial Economics provides tools for evaluating long-term investment projects, such as Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period.
- **Cost of Capital**: It helps managers determine the cost of raising funds and assess the feasibility of investment projects.
- **Risk Assessment**: Managerial Economics incorporates risk analysis to evaluate the potential returns and risks associated with investment decisions.

7. Resource Allocation and Optimization

- **Optimal Resource Use**: Managerial Economics helps firms allocate scarce resources (labor, capital, materials) efficiently to maximize output and minimize waste.

- **Linear Programming**: It uses optimization techniques to solve resource allocation problems, such as determining the optimal mix of products to produce or the best distribution network.

8. Macroeconomic Factors and Business Environment

- **Economic Indicators**: Managerial Economics considers macroeconomic factors like GDP growth, inflation, unemployment, and interest rates, which influence business decisions.
- **Government Policies**: It analyzes the impact of fiscal policies (taxation, government spending) and monetary policies (interest rates, money supply) on business operations.
- **Global Economic Environment**: Managerial Economics examines the effects of international trade, exchange rates, and global economic trends on business strategies.

9. Strategic Decision-Making

- **Game Theory**: Managerial Economics uses game theory to analyze competitive behavior and strategic interactions among firms.
- **Business Strategy**: It helps firms develop long-term strategies for growth, market expansion, and sustainability.
- **Scenario Analysis**: Managerial Economics evaluates different scenarios and their potential outcomes to guide strategic planning.

10. Risk Analysis and Uncertainty

- **Risk Management**: Managerial Economics provides tools for identifying, assessing, and mitigating risks in business decisions.
- **Decision-Making Under Uncertainty**: It helps managers make informed decisions in situations where outcomes are uncertain, using techniques like decision trees and sensitivity analysis.

11. Environmental and Ethical Considerations

- **Sustainability**: Managerial Economics incorporates environmental considerations into decision-making, such as minimizing waste and adopting sustainable practices.

- **Corporate Social Responsibility (CSR)**: It evaluates the ethical implications of business decisions and their impact on stakeholders, including employees, customers, and the community.

12. Applications in Functional Areas

- **Marketing**: Managerial Economics supports marketing decisions by analyzing consumer behavior, demand patterns, and pricing strategies.
- **Finance**: It aids in financial planning, investment analysis, and capital budgeting.
- **Operations**: Managerial Economics optimizes production processes, inventory management, and supply chain operations.
- **Human Resources**: It helps in workforce planning, labor cost analysis, and productivity improvement.

1.2.BASIC ECONOMIC PRINCIPLES IN MANAGERIAL ECONOMICS

Managerial Economics is grounded in fundamental economic principles that guide decision-making in business. These principles help managers allocate scarce resources efficiently, evaluate alternatives, and optimize outcomes. The key principles include scarcity, choice, and opportunity cost, marginal analysis, and the incremental concept. Each of these principles plays a critical role in shaping managerial decisions.

SCARCITY, CHOICE, AND OPPORTUNITY COST

Scarcity is the central economic problem that arises because resources are limited, while human wants are unlimited. In a business context, resources such as capital, labor, raw materials, and time are finite, but the demands for products, services, and profits are boundless. Scarcity forces businesses to make choices about how to allocate these resources effectively.

Choice refers to the decisions that managers must make to prioritize competing uses of scarce resources. For example, a firm may need to decide whether to invest in new technology, expand production, or enter a

new market. Every choice involves trade-offs, as selecting one option often means forgoing another.

Opportunity Cost is the value of the next best alternative that is sacrificed when a choice is made. It is a critical concept in managerial decision-making because it highlights the true cost of a decision. For instance, if a company decides to allocate funds to marketing instead of research and development (R&D), the opportunity cost is the potential innovation and growth that could have been achieved through R&D. Understanding opportunity cost helps managers evaluate the benefits and drawbacks of different options and make decisions that maximize value.

In summary, scarcity necessitates choice, and every choice involves an opportunity cost. These principles remind managers that resources are limited and that decisions must be made carefully to achieve the best possible outcomes.

MARGINAL ANALYSIS

Marginal Analysis is a fundamental tool in Managerial Economics that involves evaluating the additional benefits and costs of a decision. The term "marginal" refers to the change in a variable resulting from a small increase in another variable. For example, marginal cost is the additional cost incurred by producing one more unit of a product, while marginal revenue is the additional revenue earned from selling one more unit.

Managers use marginal analysis to make optimal decisions by comparing marginal benefits (MB) and marginal costs (MC). The goal is to continue an activity as long as the marginal benefit exceeds the marginal cost (MB > MC) and to stop when the marginal benefit equals the marginal cost (MB = MC). This principle is applied in various business decisions, such as:

Production Decisions: Determining the optimal level of output where marginal revenue equals marginal cost (MR = MC) to maximize profit.

Pricing Decisions: Setting prices based on the marginal cost of production and the marginal utility to consumers.

Resource Allocation: Allocating resources to activities that provide the highest marginal return.

Marginal analysis is particularly useful because it focuses on incremental changes, allowing managers to make precise adjustments to their strategies. It ensures that decisions are made at the margin, where the benefits and costs are most relevant.

INCREMENTAL CONCEPT

The **Incremental Concept** is closely related to marginal analysis but focuses on the broader impact of decisions. It involves analyzing the total change in costs and revenues resulting from a decision, rather than just the marginal change. Incremental analysis considers the overall effect of a decision on the firm's profitability and operations. For example, if a company is considering launching a new product line, incremental analysis would evaluate the total additional costs (e.g., production, marketing, distribution) and the total additional revenues generated by the new product. The decision to proceed would depend on whether the incremental revenues exceed the incremental costs. The incremental concept is applied in various managerial decisions, such as:

Expansion Projects: Evaluating the incremental costs and benefits of expanding into new markets or increasing production capacity.

Pricing Strategies: Assessing the impact of price changes on total revenue and costs.

Investment Decisions: Analyzing the incremental cash flows generated by an investment project to determine its viability.

Unlike marginal analysis, which focuses on small changes, the incremental concept considers the overall impact of a decision. It provides a comprehensive framework for evaluating the net effect of managerial choices on the firm's performance.

1.3.OBJECTIVES OF THE FIRM

The objectives of a firm define its goals and guide its decision-making processes. While traditional economic theory often emphasizes profit

maximization, modern businesses pursue a variety of objectives, including wealth maximization, sales maximization, and market share expansion. Each objective has its own implications for managerial strategies and outcomes.

Profit Maximization

Profit Maximization is the core objective of many businesses that represent the pursuit of strategies to achieve the highest possible net income. This involves identifying optimal production levels, pricing strategies, and cost management practices to ensure that revenues exceed costs, leading to increased profitability. In essence, it is about striking the right balance between income generation and cost management to ensure sustained financial success.

Wealth Maximization

Wealth maximization is a financial management and economic concept that focuses on enhancing the long-term value of a business for its shareholders. Unlike profit maximization, which emphasizes short-term gains, wealth maximization takes a broader perspective by considering the overall value creation for the company's owners

DIFFERENCE BETWEEN PROFIT MAXIMIZATION AND WEALTH MAXIMIZATION

Basis	**Profit Maximization**	**Wealth Maximization**
Objective	Focuses on short-term gains by maximizing net income.	Aims for long-term value creation for shareholders.
Time Horizon	Short-term orientation.	Long-term orientation.
Emphasis	Primarily on maximizing	Considers a broader set

Basis	Profit Maximization	Wealth Maximization
	profits.	of factors beyond profits.
Inclusion of Factors	Mainly concerned with revenue generation, cost control, and profitability.	Considers factors such as risk management, sustainability, and corporate social responsibility (CSR).
Holistic Approach	Tends to be more narrow and focused on financial metrics.	Offers a holistic approach by considering financial and non-financial aspects for sustained success.
Shareholder Value	May benefit shareholders through increased dividends and stock prices.	Aims to enhance shareholder wealth through long-term value creation and sustainable business practices.
Flexibility	Less flexible, as it may prioritize short-term gains at the expense of long-term considerations.	More flexible, allowing adaptation to changing market conditions and ensuring long-term

Basis	Profit Maximization	Wealth Maximization
		viability.
Risk Tolerance	It may involve higher risk tolerance for the sake of immediate profits.	Generally, it involves a balanced approach to risk management to ensure long-term stability.
Financial Ratios	Return on Investment (ROI), Net Profit Margin, Inventory Turnover Ratio, and Accounts receivable Turnover Ratio are all relevant metrics in this case.	Price-to-earnings (P/E) ratio, price-to-book (P/B) ratio, and earnings per share (EPS) are important ratios for wealth maximization.
Corporate Social Responsibility (CSR)	Typically, CSR may be a secondary consideration.	Emphasizes CSR as an integral part of business strategy, considering the impact on society and the environment.

OTHER OBJECTIVES OF THE FIRM

In addition to the traditional goal of profit maximization, firms often pursue a variety of alternative objectives that reflect their broader responsibilities to stakeholders, including employees, customers, society, and the environment. These objectives are essential for achieving long-

term sustainability, maintaining a competitive edge, and fostering a positive organizational culture. Below is a detailed explanation of these alternative objectives in a paragraph format:

1. Sales Maximization

Sales maximization is an objective where firms focus on increasing their revenue by selling as many units as possible, often prioritizing market penetration over short-term profits. This approach is particularly useful for businesses aiming to establish a strong market presence or compete in highly competitive industries. Strategies such as aggressive pricing, extensive marketing campaigns, and product diversification are commonly employed to achieve this goal. While sales maximization can lead to increased market share and brand recognition, it may also result in lower profit margins and strain on resources, requiring careful balancing to ensure long-term profitability.

2. Market Share Expansion

Expanding market share involves increasing the firm's proportion of total sales within an industry. This objective is critical for firms seeking to dominate their market and gain a competitive advantage. Companies often achieve this through competitive pricing, innovation, and strategic partnerships. A larger market share can lead to greater bargaining power with suppliers, enhanced brand loyalty, and economies of scale. However, pursuing market share expansion may require significant investment in marketing and could lead to price wars with competitors, which can impact profitability.

3. Customer Satisfaction

Customer satisfaction is a key objective that focuses on meeting or exceeding customer expectations to build long-term relationships and foster loyalty. Satisfied customers are more likely to make repeat purchases and recommend the firm to others, which can drive sustained revenue growth. Firms achieve high customer satisfaction by improving product quality, offering excellent customer service, and creating personalized experiences. While this objective can lead to increased customer retention and positive word-of-mouth, it may also involve higher costs associated with quality improvements and customer support.

4. Employee Well-being and Job Satisfaction

Prioritizing employee well-being and job satisfaction is essential for maintaining a motivated and productive workforce. Happy employees are more likely to be engaged, loyal, and committed to the firm's success. Firms can achieve this by offering competitive compensation, providing career development opportunities, and fostering a positive work environment. While investing in employee well-being can lead to reduced turnover and higher productivity, it may also involve increased costs related to benefits and development programs.

5. Social Responsibility and Ethical Practices

Social responsibility and ethical practices are increasingly important objectives for modern firms. This involves considering the impact of business operations on society and the environment, and taking steps to contribute positively. Strategies include adopting sustainable practices, engaging in community development, and ensuring ethical sourcing of materials. Firms that prioritize social responsibility often enjoy enhanced brand reputation, customer loyalty, and regulatory compliance. However, these practices may involve higher costs and could impact short-term profitability.

6. Innovation and Technological Advancement

Innovation is a critical objective for firms aiming to stay competitive and meet evolving customer needs. By investing in research and development (R&D), collaborating with academic institutions, and fostering a culture of creativity, firms can develop new products, improve processes, and enter new markets. Innovation provides a competitive advantage, increases market share, and drives long-term growth. However, it also involves high R&D costs and the uncertainty of success, which can pose challenges for firms.

7. Financial Stability and Liquidity

Ensuring financial stability and liquidity is essential for a firm's ability to meet its obligations and invest in growth opportunities. This objective involves maintaining a healthy balance between assets and liabilities, managing cash flow effectively, and maintaining reserve funds. Financial stability allows firms to withstand economic fluctuations, seize investment

opportunities, and ensure long-term sustainability. However, conservative financial practices may limit aggressive growth strategies, requiring a careful balance between stability and expansion.

8. Building a Good Business Reputation

A strong business reputation is a valuable asset that enhances a firm's credibility and competitiveness. This objective involves gaining prestige and recognition from society by demonstrating ethical practices, social responsibility, and high-quality products or services. Firms build their reputation through ethical conduct, corporate social responsibility (CSR) initiatives, quality assurance, and effective brand building. A good reputation enhances customer trust, attracts investors, and differentiates the firm from competitors, contributing to long-term success.

9. Leisure and Peace of Mind for Employees

Ensuring employees' leisure and peace of mind is an objective that recognizes the importance of mental and physical well-being in achieving overall job satisfaction and productivity. Firms can achieve this by offering health and wellness programs, providing recreational facilities, implementing stress management policies, and encouraging employees to take time off. Prioritizing leisure and peace of mind enhances employee well-being, reduces burnout, and creates a more engaged and productive workforce.

1.4.DECISION-MAKING PROCESS

The decision-making process is a systematic approach that managers use to identify problems, evaluate alternatives, and implement solutions to achieve organizational goals. In the context of Managerial Economics, this process is guided by economic principles and analytical tools to ensure rational and effective decision-making. Below is a detailed explanation of the steps in decision-making and the role of Managerial Economics in business decisions.

Steps in Decision-Making

1. **Identifying the problem or Objective:**

The first step in the decision-making process is to clearly define the problem or objective. This involves recognizing the issue that needs to be

addressed or the goal that the firm aims to achieve. For example, a firm may identify a decline in market share as a problem or set an objective to launch a new product. Managerial Economics helps in framing the problem by analyzing market conditions, consumer behavior, and competitive dynamics.

2. **Gathering Relevant Information**

   Once the problem or objective is identified, the next step is to collect relevant data and information. This includes internal data (e.g., production costs, sales figures) and external data (e.g., market trends, competitor strategies). Managerial Economics emphasizes the importance of accurate and timely information for making informed decisions. Tools such as market research, surveys, and statistical analysis are often used to gather and analyze data.

3. **Identifying Alternatives**

   After gathering information, managers identify possible courses of action to address the problem or achieve the objective. For instance, if the goal is to increase profitability, alternatives may include reducing costs, increasing prices, or expanding into new markets. Managerial Economics provides frameworks for evaluating the feasibility and potential outcomes of each alternative.

4. **Evaluating Alternatives**

   This step involves analyzing the costs, benefits, risks, and trade-offs associated with each alternative. Managerial Economics uses tools such as cost-benefit analysis, marginal analysis, and break-even analysis to assess the economic viability of each option. For example, a firm may compare the incremental costs and revenues of different production levels to determine the optimal output.

5. **Making the Decisions**

   Based on the evaluation, managers select the best alternative that aligns with the firm's objectives and constraints. Managerial Economics ensures that decisions are made rationally by considering economic principles such as opportunity cost, marginal utility, and profit maximization. The

chosen alternative should provide the highest net benefit while minimizing risks.

6. **Implementing the Decisions**

   Once a decision is made, it is put into action. This involves allocating resources, assigning responsibilities, and setting timelines. Managerial Economics plays a role in ensuring that resources are used efficiently during implementation. For example, it helps in optimizing production schedules or pricing strategies to achieve the desired outcomes.

7. **Monitoring and Evaluating Results**

   The final step is to monitor the outcomes of the decision and evaluate its effectiveness. This involves comparing actual results with expected results and identifying any deviations. Managerial Economics provides tools for performance evaluation, such as variance analysis and profitability analysis. If the decision does not yield the desired results, managers may revisit the earlier steps and make necessary adjustments.

ROLE OF MANAGERIAL ECONOMICS IN BUSINESS DECISIONS

Managerial Economics plays a critical role in enhancing the quality of business decisions by providing a structured and analytical approach. Below are the key ways in which it contributes to decision-making:

1. **Framework for Rational Decision Making**

   Managerial Economics provides a systematic framework for analyzing problems and evaluating alternatives. It ensures that decisions are based on logical reasoning and economic principles rather than intuition or guesswork. For example, it helps managers determine the optimal price for a product by considering demand elasticity, production costs, and competitive pricing.

2. **Optimization of Resources**

   One of the primary roles of Managerial Economics is to help firms allocate scarce resources efficiently. By using tools such as linear programming and cost analysis, managers can optimize the use of labor, capital, and materials to achieve maximum output with minimum input.

3. **Risk Analysis and Management**

   Managerial Economics incorporates risk analysis into the decision-making process. It helps managers assess the potential risks and uncertainties associated with different alternatives and develop strategies to mitigate them. For instance, it uses techniques like decision trees and sensitivity analysis to evaluate the impact of uncertain variables on business outcomes.

4. **Demand and Supply Analysis**

   Understanding market dynamics is crucial for making informed decisions. Managerial Economics provides tools for analyzing demand and supply conditions, such as demand forecasting, elasticity analysis, and market equilibrium. This helps managers make decisions related to pricing, production, and market entry.

5. **Cost and Revenue Analysis**

   Managerial Economics emphasizes the importance of cost and revenue analysis in decision-making. It helps managers understand cost structures, break-even points, and profit margins, enabling them to make decisions that maximize profitability. For example, it assists in determining the optimal level of production where marginal cost equals marginal revenue.

6. **Strategic Planning and Long-Term Growth**

   Managerial Economics supports strategic planning by providing insights into long-term trends, market opportunities, and competitive strategies. It helps firms evaluate investment opportunities, assess the impact of macroeconomic factors, and develop sustainable growth strategies.

7. **Ethical and Social Considerations**

   In addition to economic efficiency, Managerial Economics encourages managers to consider ethical and social implications in their decisions. It promotes corporate social responsibility (CSR) and sustainable practices, ensuring that business decisions contribute positively to society and the environment.

CHAPTER II

DEMAND ANALYSIS AND FORECASTING

2.1.DEMAND CONCEPTS

Demand is a fundamental concept in Managerial Economics that refers to the quantity of a good or service that consumers are willing and able to purchase at various prices during a given period. Understanding demand is crucial for businesses as it influences pricing, production, and marketing strategies.

TYPES OF DEMAND

Demand is a central concept in Managerial Economics, and it can be categorized into various types based on the factors influencing it. Understanding these types of demand helps businesses analyze consumer behavior, predict market trends, and make informed decisions about pricing, production, and marketing strategies. Below is a detailed explanation of the types of demand, including price demand, income demand, cross demand, and others, with examples.

1. Price Demand: Price demand refers to the relationship between the price of a product and the quantity demanded by consumers. It is the most basic and widely studied type of demand, forming the foundation of the law of demand, which states that there is an inverse relationship between price and quantity demanded (all other factors remaining constant). As the price of a product decreases, consumers are likely to buy more of it, and as the price increases, the quantity demanded tends to decrease. Example: If the price of a chocolate bar decreases from 2to2*to*1, consumers may purchase more chocolate bars, leading to an increase in quantity demanded. Conversely, if the price rises to $3, fewer chocolate bars will be demanded.

Application: Businesses use price demand analysis to set optimal prices that maximize revenue and profitability. For instance, during a sale, lowering prices can increase demand and clear out excess inventory.

2. Income Demand: Income demand reflects the relationship between consumers' income levels and the quantity of a product demanded. The nature of this relationship depends on the type of good:

- Normal Goods: For normal goods, demand increases as consumer income rises. These are goods that people tend to buy more of as they become wealthier. Examples include luxury cars, organic food, and high-end electronics. Example: As consumers' incomes increase, they may switch from buying regular coffee to premium coffee brands.

- Inferior Goods: For inferior goods, demand decreases as consumer income rises. These are goods that people tend to buy less of as they become wealthier, often opting for higher-quality substitutes. Examples include low-cost fast food, second-hand clothing, and public transportation. Example: As incomes rise, consumers may reduce their consumption of instant noodles and instead purchase fresh meals or dine out.

- Application: Businesses use income demand analysis to target specific consumer segments. For example, luxury brands focus on high-income consumers, while discount retailers cater to budget-conscious shoppers.

3. Cross Demand: Cross demand refers to the demand for a product in relation to the price of another related product. It is particularly relevant for goods that are either substitutes or complements:

- Substitute Goods: These are goods that can be used in place of each other. An increase in the price of one product leads to higher demand for its substitute. Example: If the price of tea increases, consumers may switch to coffee, leading to an increase in the demand for coffee.
- Complementary Goods: These are goods that are used together. An increase in the price of one product leads to lower demand for its complement. Example: If the price of printers increases, demand for printer ink may decrease, as fewer people buy printers.

- Application: Businesses use cross demand analysis to understand how changes in the price of related products affect their own sales. For instance, a smartphone manufacturer may consider the impact of price changes in complementary products like earphones or cases.

4. Derived Demand: Derived demand occurs when the demand for one product is derived from the demand for another product. This type of demand is common in industrial and manufacturing sectors, where the demand for raw materials or components depends on the demand for the final product. Example: The demand for steel is derived from the demand

for automobiles, construction, and appliances. If the demand for cars increases, the demand for steel will also rise.

- Application: Businesses in supply chains use derived demand analysis to forecast demand for their products. For example, a tire manufacturer may analyze automobile sales data to predict demand for tires.

5. Composite Demand: Composite demand refers to demand for a product that can be used for multiple purposes. This type of demand is common for goods that serve various functions or industries. Example: Electricity is in composite demand because it is used for lighting, heating, powering appliances, and industrial processes. An increase in demand for one use (e.g., industrial production) can affect the availability and price of electricity for other uses.

- Application: Businesses use composite demand analysis to allocate resources efficiently. For example, an energy company may prioritize electricity supply to high-demand sectors during peak periods.

6. Joint Demand: Joint demand occurs when two or more goods are demanded together to satisfy a single need. These goods are often complementary and are used in combination. Example: Cars and petrol have joint demand, as cars require petrol to operate. Similarly, printers and ink cartridges are demanded together.

- Application: Businesses use joint demand analysis to bundle products or offer discounts on complementary goods. For example, a car dealership may offer free petrol vouchers to boost car sales.

7. Seasonal Demand : Seasonal demand refers to fluctuations in demand based on seasonal factors, such as weather, holidays, or cultural events. This type of demand is common for products that are only needed or preferred during specific times of the year. Example: Demand for winter clothing (e.g., coats, sweaters) increases during colder months, while demand for air conditioners rises during summer. Similarly, demand for holiday-related products (e.g., Christmas decorations, Easter eggs) peaks during festive seasons.

- Application: Businesses use seasonal demand analysis to plan production, inventory, and marketing campaigns. For example, a retailer may stock up on umbrellas and raincoats before the rainy season.

8. Autonomous Demand: Autonomous demand refers to demand for a product that is independent of the demand for other products. It is driven by the intrinsic need or desire for the product itself, rather than external factors. Example: Demand for basic necessities like food, water, and healthcare is often autonomous, as these products are essential for survival.

- Application: Businesses producing essential goods use autonomous demand analysis to ensure consistent production and supply, as demand for these products remains relatively stable.

2.2.LAW OF DEMAND

The **Law of Demand** is one of the most fundamental principles in economics and a cornerstone of Managerial Economics. It describes the inverse relationship between the price of a good or service and the quantity demanded by consumers, assuming all other factors remain constant (ceteris paribus). In simpler terms, when the price of a product decreases, consumers tend to buy more of it, and when the price increases, they tend to buy less. This relationship is visually represented by a downward-sloping demand curve.

Explanation of the Law of Demand

1. **Inverse Relationship Between Price and Quantity Demanded**: The Law of Demand states that there is an inverse relationship between price and quantity demanded. This means that as the price of a product falls, the quantity demanded rises, and as the price rises, the quantity demanded falls.

   Example: If the price of a pizza decreases from 10to10*to*8, consumers are likely to buy more pizzas. Conversely, if the price increases to $12, fewer pizzas will be demanded.

2. **Ceteris Paribus Assumption**: The Law of Demand assumes that all other factors influencing demand (such as consumer income, tastes, prices of related goods, etc.) remain constant. This allows economists to isolate the effect of price on quantity demanded.

3. **Demand Curve**: The Law of Demand is graphically represented by a downward-sloping demand curve. The vertical axis represents price, and

the horizontal axis represents quantity demanded. The curve slopes downward from left to right, reflecting the inverse relationship between price and quantity demanded.

Why Does the Law of Demand Hold?

The Law of Demand is based on several key economic principles and consumer behaviors:

1. **Substitution Effect**:

   When the price of a product falls, it becomes relatively cheaper compared to substitute goods. As a result, consumers are likely to switch from more expensive alternatives to the cheaper product, increasing its quantity demanded.

   Example:

   If the price of tea decreases, consumers may switch from coffee to tea, leading to higher demand for tea.

2. **Income Effect**: When the price of a product falls, consumers experience an increase in their real income (purchasing power). This allows them to buy more of the product with the same amount of money.

   Example: If the price of bread decreases, consumers can afford to buy more bread without spending additional money.

3. **Diminishing Marginal Utility**:

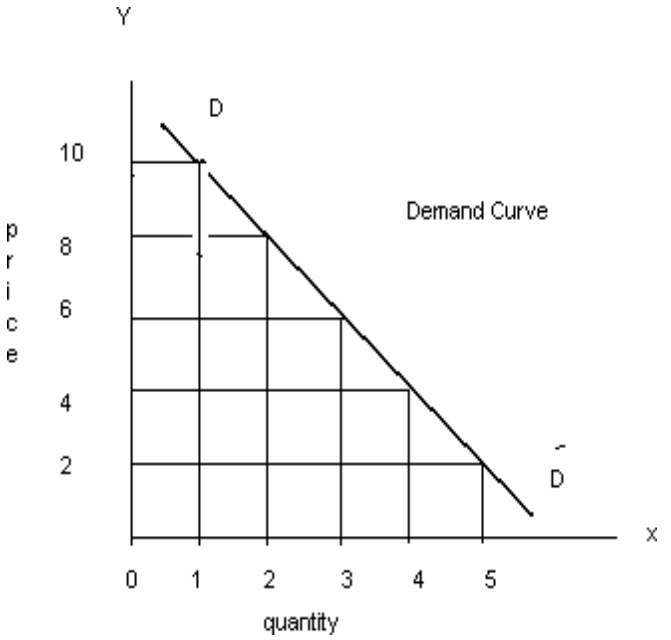
   The Law of Demand is also supported by the concept of diminishing marginal utility, which states that as a consumer consumes more units of a product, the additional satisfaction (utility) derived from each additional unit decreases. As a result, consumers are only willing to buy more units if the price decreases. The concept of law of demand may be explained with the help of a demand schedules.

Individual demand Schedule

An individual demand schedule is a list of quantities of a commodity purchased by an individual consumer at different prices. The following table shows the demand schedule of an individual consumer for apple.

Price of Apple (In Rs.)	Quantity demanded
10	1
8	2
6	3
4	4
2	5

When the price falls from Rs 10 to 8, the quantity demanded increases from one to two. In the same way as price falls, quantity demanded increases. On the basis of the above demand schedule we can draw the demand curve as follows;



The demand curve DD shows the inverse relation between price and demand of apple. Due to this inverse relationship, demand curve is slopes down ward from left to right. This kind of slope is also called“ negative slope”

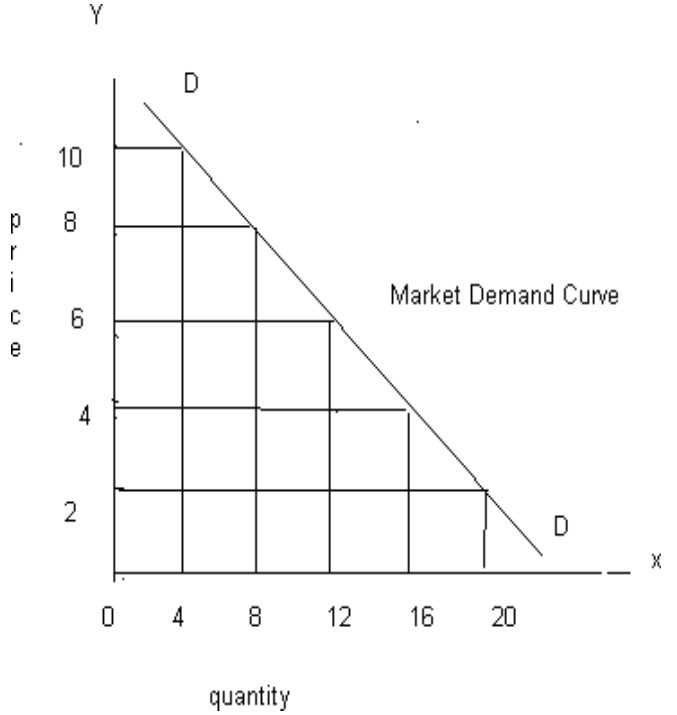
Market demand schedule

Market demand refers to the total demand for a commodity by all the consumers. It is the aggregate quantity demanded for a commodity by all the consumers in a market. It can be expressed in the following schedule.

Market Demand Schedule for egg.

Price per dozen(Rs)	Demand by consumers				Market Demand
	A	B	C	D	
10	1	2	0	0	3
8	2	3	1	0	6
6	3	4	2	1	10
4	4	5	3	2	14
2	5	6	4	3	18

Derivation of market demand curve is a simple process. For example, let us assume that there are four consumers in a market demanding eggs. When the price of one dozen eggs is Rs.10, A buys one dozen and B buys 2 dozens. When price falls to Rs.8, A buys 2 , B buys 3 and C buys one dozen. When price falls to Rs.6, A buys3 bbuys4, C buys 2 and D buys one dozen and soon. By adding up the quantity demanded by all the four consumers at various prices we get the market demand curve. So last column of the above demand schedule gives the total demand for eggs at



Different prices, ie," Market Demand" as given below;

Assumptions of Law of Demand

Law of demand is based on certain basic assumptions. They are as follows

1) There is no change in consumers' taste and preference
2) Income should remain constant.
3) Prices of other goods should not change.
4) There should be no substitute for the commodity.
5) The commodity should not confer any distinction.
6) The demand for the commodity should be continuous.
7) People should not expect any change in the price of the commodity.

Exceptions to the Law of Demand

While the Law of Demand generally holds true, there are certain exceptions where the relationship between price and quantity demanded may not follow the typical inverse pattern:

1. **Giffen Goods**: Giffen goods are inferior goods for which demand increases as the price rises, violating the Law of Demand. This occurs because the income effect outweighs the substitution effect for these goods.

   Example: In low-income communities, staple foods like bread or rice may become Giffen goods. If the price of bread rises, consumers may not be able to afford more expensive substitutes and may end up buying more bread despite the price increase.

2. **Veblen Goods**: Veblen goods are luxury goods for which demand increases as the price rises because they are seen as status symbols. Higher prices make these goods more desirable to consumers seeking prestige.

   Example: Luxury items like designer handbags, high-end watches, or luxury cars may experience higher demand as their prices increase.

3. **Speculative Demand**: In certain markets, consumers may buy more of a product when its price rises because they expect prices to rise further in the future. This behavior is common in real estate, stock markets, and collectibles.

   Example: If the price of gold is expected to rise, consumers may buy more gold even at higher prices.

4. **Necessities and Emergency Situations**: In cases of necessity or emergency, consumers may not respond to price changes as predicted by the Law of Demand. For example, during a natural disaster, the demand for essential items like water or fuel may remain high even if prices rise.

Importance of the Law of Demand in Managerial Economics

The **Law of Demand** is a foundational concept in economics that describes the inverse relationship between the price of a product and the quantity demanded by consumers. In Managerial Economics, this principle plays a critical role in guiding business decisions and strategies. By understanding how consumers respond to price changes, managers can optimize pricing, forecast demand, analyze markets, and formulate effective policies.

1. Pricing Decisions

One of the most significant applications of the Law of Demand is in pricing decisions. Businesses use this principle to set prices that maximize revenue and profitability while remaining competitive in the market. By understanding how consumers react to price changes, firms can determine the optimal price point for their products.

- **Example**: A company selling smartphones may lower the price of its latest model to attract more customers and increase sales volume. Conversely, a luxury brand may raise prices to target premium segments and enhance its brand image.
- **Elasticity of Demand**: The Law of Demand also helps businesses understand the price elasticity of demand, which measures how sensitive consumers are to price changes. For example, if demand is elastic (i.e., consumers are highly responsive to price changes), a small price reduction can lead to a significant increase in sales. On the other hand, if demand is inelastic (i.e., consumers are less responsive to price changes), raising prices may increase revenue without significantly reducing sales.
- **Dynamic Pricing**: Businesses can use the Law of Demand to implement dynamic pricing strategies, where prices are adjusted in real-time based on demand fluctuations. For instance, airlines and ride-sharing services often use dynamic pricing to maximize revenue during peak demand periods.

2. Demand Forecasting

The Law of Demand is essential for **demand forecasting**, which involves predicting future demand for a product based on various factors, including price changes. Accurate demand forecasting enables businesses to plan production, manage inventory, and allocate resources effectively.

- **Example**: A retailer anticipating a price drop for winter clothing may stock up on inventory to meet the expected increase in demand. Similarly, a manufacturer may increase production capacity in response to a planned price reduction for its products.
- **Seasonal Demand**: The Law of Demand helps businesses anticipate seasonal fluctuations in demand. For example, demand for air conditioners typically rises during summer, and businesses can use this knowledge to adjust production and marketing strategies accordingly.
- **New Product Launches**: When launching a new product, businesses can use the Law of Demand to estimate how pricing will affect demand and plan their marketing and distribution strategies accordingly.

3. Market Analysis

The Law of Demand provides valuable insights into consumer behavior and market dynamics, helping businesses identify opportunities and threats in the market. By analyzing how price changes affect demand, firms can better understand their competitive position and develop strategies to gain a competitive edge.

- **Example**: A firm may analyze how competitors' pricing strategies affect demand for its own products. If a competitor lowers prices, the firm can assess whether it needs to adjust its prices or focus on differentiating its product to maintain demand.
- **Market Segmentation**: The Law of Demand helps businesses segment markets based on price sensitivity. For example, a company may identify price-sensitive customers who are more likely to respond to discounts and target them with promotional offers.
- **Competitive Advantage**: By understanding the demand elasticity of their products, businesses can identify opportunities to gain a competitive

advantage. For instance, a firm with a highly elastic product may focus on cost leadership to offer lower prices, while a firm with inelastic demand may emphasize quality and brand loyalty.

4. Policy Formulation

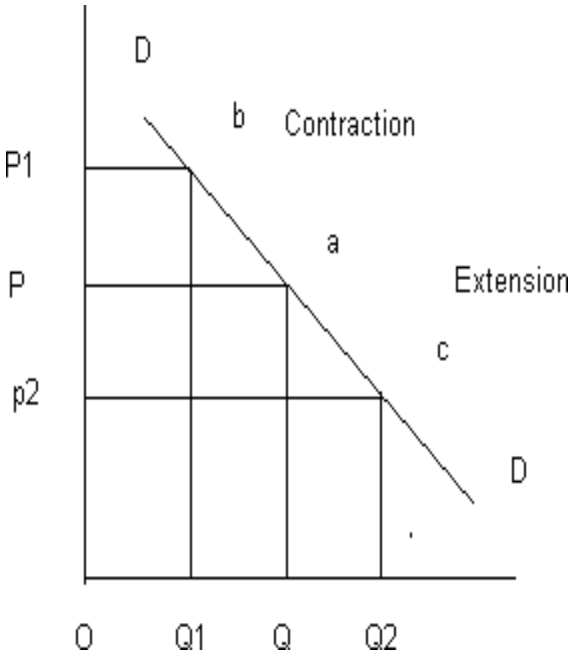
The Law of Demand is not only relevant for businesses but also for governments and policymakers. It is used to design and implement economic policies that influence consumer behavior and market outcomes. Policies such as taxation, subsidies, and price controls are often based on the principles of the Law of Demand.

- **Taxation**: Governments use the Law of Demand to predict how taxes on certain goods (e.g., tobacco, alcohol, or sugary drinks) will affect consumption. For example, imposing higher taxes on tobacco products is intended to reduce demand and discourage smoking.
- **Subsidies**: Subsidies are used to lower the effective price of essential goods (e.g., food, fuel, or education) and increase their demand. For instance, a government may subsidize renewable energy sources to encourage their adoption and reduce reliance on fossil fuels.
- **Price Controls**: In some cases, governments may impose price ceilings (maximum prices) or price floors (minimum prices) to regulate markets. For example, rent control policies aim to make housing more affordable by limiting the price landlords can charge.
- **Public Welfare**: The Law of Demand helps policymakers design programs that improve public welfare. For example, providing free or subsidized healthcare services can increase demand for healthcare and improve public health outcomes.

Extension and Contraction of Demand.

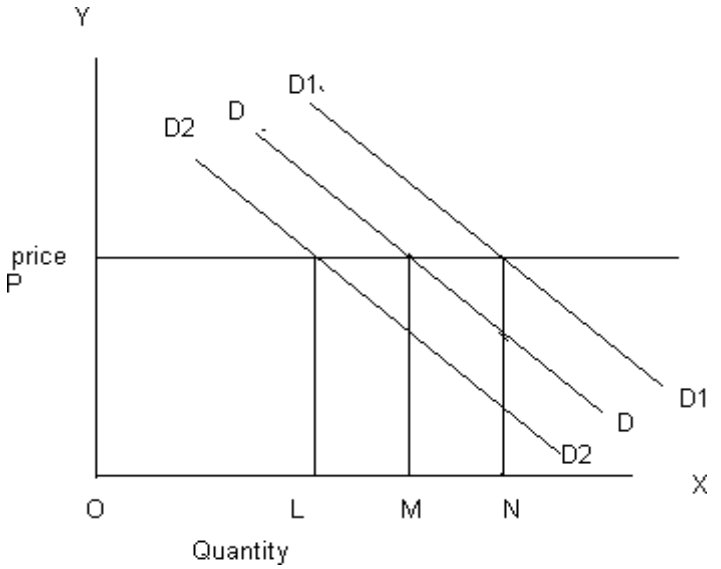
Demand may change due to various factors. The change in demand due to change in price only, where other factors remaining constant, it is called extension and contraction of demand. A change in demand solely due to change in price is called extension and contraction. When the quantity demanded of a commodity rises due to a fall in price, it is called extension of demand. On the other hand, when the quantity demanded falls due to a rise in price, it is called contraction of demand. It can be understand from

the following diagram.



When the price of commodity is OP, quantity demanded is OQ. If the price falls to P2, quantity demanded increases to OQ2. When price rises to P1, demand decreases from OQ to OQ1. In demand curve, the area **a** to **c** is extension of demand and the area **a** to **b** is contraction of demand. As result of change in price of a commodity, the consumer moves along the same demand curve.

- Shift in Demand (Increase or Decrease in demand)
- When the demand changes due to changes in other factors, like taste and preferences, income, price of related goods etc... ,it is called shift in demand. Due to changes in other factors, if the consumers buy more goods, it is called increase in demand or upward shift. On the other hand, if the consumers buy fewer goods due to change in other factors, it is called downward shift or decrease in demand.
- Shift in demand cannot be shown in same demand curve. The increase and decrease in demand (upward shift and downward shift) can be expressed by the following diagram.



DD is the original demand curve. Demand curve shift upward due to change in income, taste & preferences etc. of consumer, where price remaining the same. In the above diagram demand curve D1-D1 is showing upward shift or increase in demand and D2-D2 shows downward shift or decrease in demand.

Comparison between extension/ contraction and shift in demand

SL.No	Extension/ Contraction of Demand	Shift in Demand
1	Demand is varying due to changes in price	Demand is varying due to changes in other factors
2	Other factors like taste, preferences, income etc... remaining the same.	Price of commodity remain the same
3	Consumer moves along the same demand curve	Consumer may moves to higher or lower demand curve

DETERMINANTS OF DEMAND

The determinants of demand are the various factors that influence the quantity of a good or service that consumers are willing and able to purchase at a given price. While the Law of Demand focuses on the relationship between price and quantity demanded, the determinants of demand explain why the demand curve shifts, even when the price remains constant. Understanding these factors is crucial for businesses to predict consumer behavior, plan production, and develop effective marketing strategies.

1. Price of the Product: The price of the product is the most direct determinant of demand. According to the Law of Demand, there is an inverse relationship between price and quantity demanded: as the price of a product decreases, the quantity demanded increases, and vice versa.

Example: If the price of a cup of coffee decreases from 5to5*to*3, consumers are likely to buy more cups of coffee, leading to an increase in quantity demanded.

2. Consumer Income: The level of consumer income significantly affects demand. The relationship between income and demand depends on the type of good:

Normal Goods: For normal goods, demand increases as consumer income rises. These are goods that people tend to buy more of as they become wealthier.

Example: As incomes rise, consumers may switch from regular coffee to premium coffee brands or purchase more organic food.

Inferior Goods: For inferior goods, demand decreases as consumer income rises. These are goods that people tend to buy less of as they become wealthier, often opting for higher-quality substitutes.

Example: As incomes rise, consumers may reduce their consumption of instant noodles and instead purchase fresh meals or dine out.

3. Prices of Related Goods: The demand for a product is influenced by the **prices of related goods**, which can be either substitutes or complements:

Substitute Goods: These are goods that can be used in place of each other. An increase in the price of one product leads to higher demand for its substitute.

Example: If the price of tea increases, consumers may switch to coffee, leading to an increase in the demand for coffee.

Complementary Goods: These are goods that are used together. An increase in the price of one product leads to lower demand for its complement.

Example: If the price of printers increases, demand for printer ink may decrease, as fewer people buy printers.

4. Consumer Preferences and Tastes: Consumer preferences and tastes play a significant role in shaping demand. Changes in preferences, influenced by trends, advertising, cultural shifts, and social influences, can lead to shifts in demand for certain products.

Example: The growing preference for electric vehicles (EVs) over traditional gasoline-powered cars has increased demand for EVs while reducing demand for conventional vehicles.

5.Role of Advertising: Effective advertising campaigns can influence consumer preferences and increase demand for a product. For example, a successful ad campaign for a new smartphone can boost its demand significantly.

6. Population and Demographics: The size and composition of the population affect demand for various goods and services. Changes in demographics, such as age, gender, income distribution, and family size, can lead to shifts in demand.

Example: An aging population may increase demand for healthcare services and retirement products, while a younger population may boost demand for educational products and technology.

7. Expectations of Future Prices: Consumer expectations about future prices can influence current demand. If consumers expect prices to rise in the future, they may increase their current demand, and if they expect prices to fall, they may delay purchases.

Example: If consumers anticipate a rise in fuel prices, they may fill up their tanks in advance, leading to a temporary increase in demand for fuel.

8. Seasonal Factors: Seasonal factors can cause fluctuations in demand based on the time of year, weather conditions, or cultural events. Certain products are in higher demand during specific seasons or occasions.

Example: Demand for winter clothing (e.g., coats, sweaters) increases during colder months, while demand for air conditioners rises during summer. Similarly, demand for holiday-related products (e.g., Christmas decorations, Easter eggs) peaks during festive seasons.

8. Advertising and Marketing: Advertising and marketing efforts can significantly influence consumer behavior and increase demand for a product. Effective campaigns can create brand awareness, shape consumer preferences, and drive sales.

Example: A successful ad campaign for a new smartphone can boost its demand significantly, even if the price remains unchanged.

9. Government Policies and Regulations: Government policies and regulations can impact demand for certain goods and services. Policies such as taxes, subsidies, and regulations can either increase or decrease demand.

10. Economic Conditions: The overall economic conditions, such as economic growth, inflation, and unemployment rates, can influence consumer demand. During periods of economic prosperity, demand for luxury goods and services may increase, while during recessions, demand for essential goods may remain stable or increase.

Example: During an economic boom, demand for luxury cars and high-end electronics may rise, while during a recession, demand for discount retailers and essential goods may increase.

2.3.ELASTICITY OF DEMAND

Elasticity of demand is a fundamental concept in economics that measures the responsiveness of the quantity demanded of a good or service to changes in its price. It indicates how consumers react when the price of a product increases or decreases, helping businesses and policymakers make

informed decisions. A higher elasticity means consumers are more sensitive to price changes, while lower elasticity indicates that demand remains relatively stable regardless of price fluctuations.

The concept of demand elasticity is crucial for businesses in setting optimal pricing strategies. If a product has elastic demand, even a small price increase can lead to a significant drop in sales, making price reductions a more effective way to boost revenue. On the other hand, products with inelastic demand can sustain higher prices without a major decline in sales, allowing businesses to maximize profits.

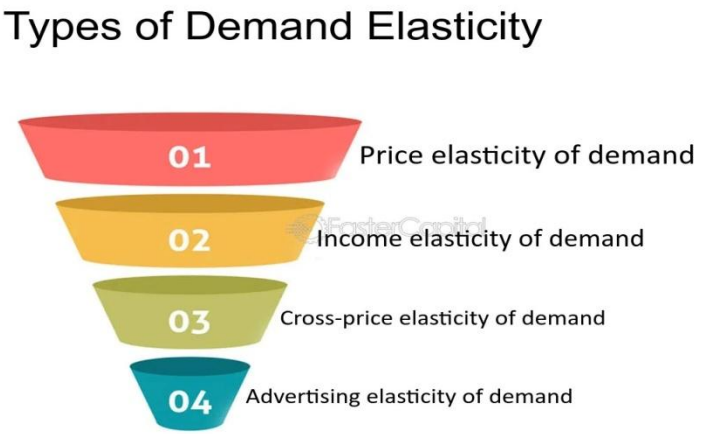
Apart from price elasticity of demand (PED), there are other types of elasticity that influence consumer behavior. Income elasticity of demand (YED) measures how demand changes with consumer income levels, distinguishing between normal and inferior goods. Cross elasticity of demand (XED) evaluates how the price change of one good affects the demand for another, such as substitutes (tea and coffee) or complements (cars and fuel).

Governments also consider demand elasticity when formulating policies and taxation strategies. For example, products with inelastic demand, such as tobacco and alcohol, are heavily taxed since consumers will continue purchasing them despite price increases. In contrast, goods with elastic demand may see reduced consumption if taxed, potentially harming businesses and employment in that sector.

Understanding the elasticity of demand allows businesses to adopt competitive pricing strategies, governments to design effective tax policies, and consumers to make informed purchasing decisions. It plays a key role in market dynamics, influencing revenue, competition, and economic stability.

There are mainly four types of elasticity of demand:

1.Price Elasticity of Demand.
2.Income Elasticity of Demand
3,Cross Elasticity of Demand.
4.Advertisement Elasticity of Demand



1.**Price Elasticity of Demand**

Price Elasticity of Demand (PED) is perhaps the most well-known type of demand elasticity. A product is said to have elastic demand if a small change in price leads to a large change in quantity demanded. Conversely, if a price change leads to a relatively small change in quantity demanded, the demand is considered inelastic. Some products exhibit elastic demand, such as luxury goods or non-essential items. For example, if the price of a luxury car increases, many consumers may choose not to purchase it, leading to a significant drop in demand. On the other hand, commodities like essential medicines often have inelastic demand, meaning that even if their prices rise, consumers will continue to buy them because they are necessary

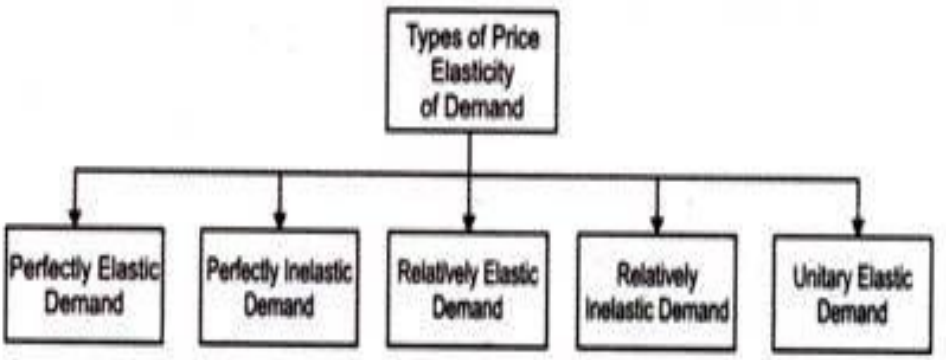


Figure-1: Different Types of Price Elasticity of Demand

Perfectly Elastic Demand:

When a small change in price of a product causes a major change in its demand, it is said to be perfectly elastic demand. In perfectly elastic demand, a small rise in price results in fall in demand to zero, while a small fall in price causes increase in demand to infinity. In such a case, the demand is perfectly elastic or $e_p = 00$. The degree of elasticity of demand helps in defining the shape and slope of a demand curve. Therefore, the elasticity of demand can be determined by the slope of the demand curve. Flatter the slope of the demand curve, higher the elasticity of demand.

In perfectly elastic demand, the demand curve is represented as a horizontal straight line, which is shown in Figure-2:

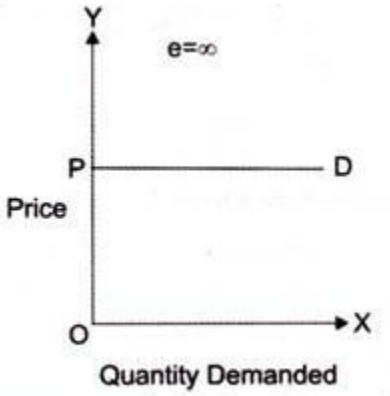


Figure-2: Perfectly Elastic Demand

From Figure-2 it can be interpreted that at price OP, demand is infinite; however, a slight rise in price would result in fall in demand to zero. It can also be interpreted from Figure-2 that at price P consumers are ready to buy as much quantity of the product as they want. However, a small rise in price would resist consumers to buy the product. Though, perfectly elastic demand is a theoretical concept and cannot be applied in the real situation. However, it can be applied in cases, such as perfectly competitive market and homogeneity products. In such cases, the demand for a product of an organization is assumed to be perfectly elastic.

From an organization's point of view, in a perfectly elastic demand situation, the organization can sell as much as much as it wants as consumers are ready to purchase a large quantity of product. However, a slight increase in price would stop the demand.

B. Perfectly Inelastic Demand:

A perfectly inelastic demand is one when there is no change produced in the demand of a product with change in its price. The numerical value for perfectly inelastic demand is zero (e_p=0).

In case of perfectly inelastic demand, demand curve is represented as a straight vertical line, which is shown in Figure-3:

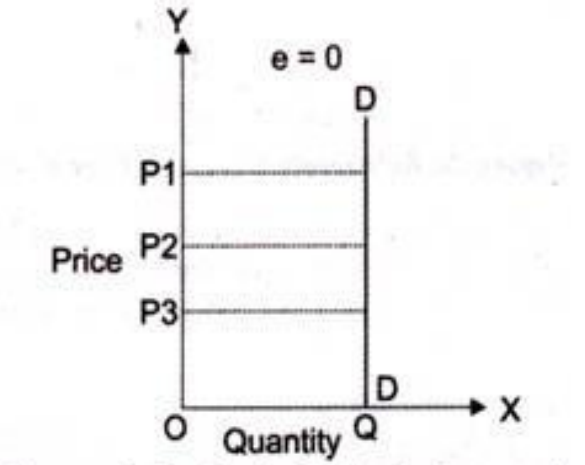


Figure-3: Perfectly Inelastic Demand

It can be interpreted from Figure-3 that the movement in price from OP1 to OP2 and OP2 to OP3 does not show any change in the demand of a product (OQ). The demand remains constant for any value of price. Perfectly inelastic demand is a theoretical concept and cannot be applied in a practical situation. However, in case of essential goods, such as salt, the demand does not change with change in price. Therefore, the demand for essential goods is perfectly inelastic.

C. Relatively Elastic Demand:

Relatively elastic demand refers to the demand when the proportionate change produced in demand is greater than the proportionate change in price of a product. The numerical value of relatively elastic demand ranges between one to infinity. Mathematically, relatively elastic demand is known as more than unit elastic demand (e_p>1). For example, if the price of a product increases by 20% and the demand of the product decreases by 25%, then the demand would be relatively elastic.

The demand curve of relatively elastic demand is gradually sloping, as shown in Figure-4:

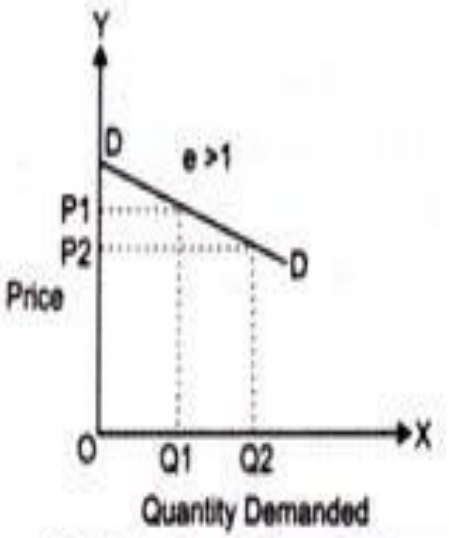


Figure-4: Relatively Elastic Demand

It can be interpreted from Figure-4 that the proportionate change in demand from OQ1 to OQ2 is relatively larger than the proportionate change in price from OP1 to OP2. Relatively elastic demand has a practical application as demand for many of products respond in the same manner with respect to change in their prices.

For example, the price of a particular brand of cold drink increases from Rs. 15 to Rs. 20. In such a case, consumers may switch to another brand of cold drink. However, some of the consumers still consume the same brand. Therefore, a small change in price produces a larger change in demand of the product.

D. Relatively Inelastic Demand:

Relatively inelastic demand is one when the percentage change produced in demand is less than the percentage change in the price of a product. For example, if the price of a product increases by 30% and the demand for the product decreases only by 10%, then the demand would be called relatively inelastic. The numerical value of relatively elastic demand

ranges between zero to one (e_p<1). Marshall has termed relatively inelastic demand as elasticity being less than unity.

The demand curve of relatively inelastic demand is rapidly sloping, as shown in Figure-5:

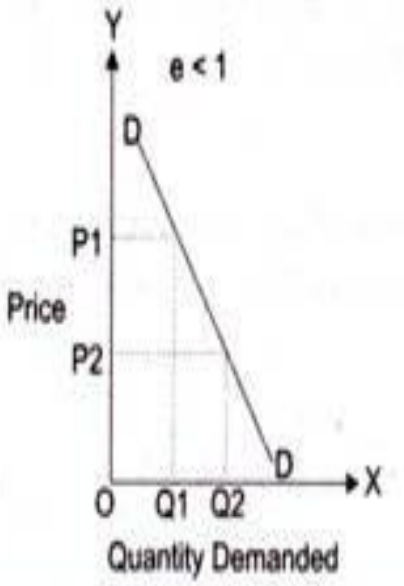


Figure-5: Relatively Inelastic Demand

It can be interpreted from Figure-5 that the proportionate change in demand from OQ1 to OQ2 is relatively smaller than the proportionate change in price from OP1 to OP2. Relatively inelastic demand has a practical application as demand for many of products respond in the same manner with respect to change in their prices. Let us understand the implication of relatively inelastic demand with the help of an example.

Example:

Table-3: Demand Schedule for Milk

Price of Milk(per litre)	Quantity Demanded(litres)
15	100
20	90

Calculate the price elasticity of demand and determine the type of price elasticity.

Solution:

P= 15

Q = 100

P1 = 20

Q1 = 90

Therefore, change in the price of milk is:

$\Delta P = P1 - P$
$\Delta P = 20 - 15$
$\Delta P = 5$

Similarly, change in quantity demanded of milk is:

$\Delta Q = Q1 - Q$
$\Delta Q = 90 - 100$
$\Delta Q = -10$

The change in demand shows a negative sign, which can be ignored. This is because of the reason that the relationship between price and demand is inverse that can yield a negative value of price or demand.

Price elasticity of demand for milk is:

$e_p = \Delta Q/\Delta P * P/Q$

$e_p = 10/5 * 15/100$

$e_p = 0.3$

The price elasticity of demand for milk is 0.3, which is less than one. Therefore, in such a case, the demand for milk is relatively inelastic.

E. Unitary Elastic Demand:

When the proportionate change in demand produces the same change in the price of the product, the demand is referred as unitary elastic demand. The numerical value for unitary elastic demand is equal to one (e_p=1).

The demand curve for unitary elastic demand is represented as a rectangular hyperbola, as shown in Figure-6:

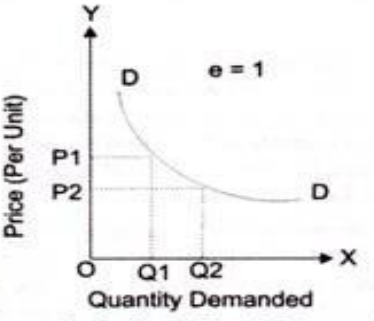


Figure-6: Unitary Elastic Demand

From Figure-6, it can be interpreted that change in price OP1 to OP2 produces the same change in demand from OQ1 to OQ2. Therefore, the demand is unitary elastic.

The above five types of elasticity can be summarized as follows

Sl.No	Type	Numerical expression	description	Shape of curve
1	Perfectly elastic	A	infinity	Horizontal
2	Perfectly inelastic	0	Zero	Vertical
3	Unitary elastic	1	One	Rectangular hyperbola
4	Relatively elastic	>1	More than one	Flat
5	Relatively inelastic	<1	Less than one	Steep

2. Income Elasticity of Demand

Income elasticity of demand refers to the sensitivity of the quantity demanded for a certain good to a change in the real income of consumers who buy this good.

The formula for calculating income elasticity of demand is the percent change in quantity demanded divided by the percent change in income.

With income elasticity of demand, you can tell if a particular good represents a necessity or a luxury.

Income Elasticity of Demand = % Change in Demand Quantity / % Change in Income of Consumer

Where:

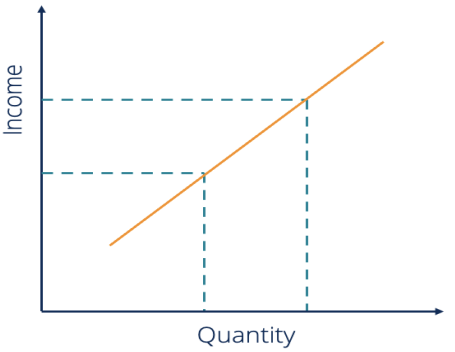
- **% Change in Demand Quantity** = Change in Demand Quantity / Original Demand Quantity
- **% Change in Income of Consumer** = Change in Income of Consumer / Original Income of Consumer

Income Elasticity of Demand Types

Based on numerical value, the income elasticity of demand is divided into three classes as follows:

1. Positive income elasticity of demand

It refers to a condition in which demand for a commodity rises with a rise in consumer income and declines with a decline in consumer income. Commodities with positive income elasticity of demand are normal goods.



Figue-7

The upward slope implies that the rise in income contributes to a rise in demand and vice versa. There are three forms of positive income elasticity of demand stated as follows:

- **Unitary** – The positive income elasticity of demand will be unitary if the proportionate change in the amount of a product demanded equals the change in consumer income in due proportion.
- **More than unitary** – The positive income elasticity of demand will be more than unitary if the proportionate change in the amount of a product demanded is higher than the change in consumer income in due proportion.
- **Less than unitary** – If the change in the amount of a product demanded in due proportion is less than the change in consumer income in due proportion, positive income elasticity of demand will be less than unitary.

2. Negative income elasticity of demand

It refers to a condition in which demand for a commodity decreases with a rise in consumer income and increases with a fall in consumer income. Inferior goods are such commodities. For example, the demand for millet will decrease if the income of consumers increases since they will prefer to purchase wheat instead of millet. Thus, millet is an inferior good to wheat for customers.

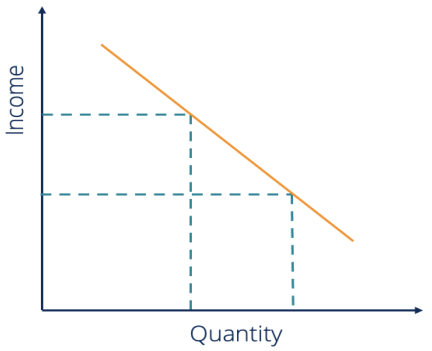


Figure-8

The downward slope implies that the increase in income contributes to a fall in demand, and a decrease in income causes a rise in demand.

3. Zero income elasticity of demand

It corresponds to the situation when there is no impact of rising household income on commodity production. Such goods are termed essential goods.

For example, a high-income consumer and a low-income consumer will need salt in the same quantity.

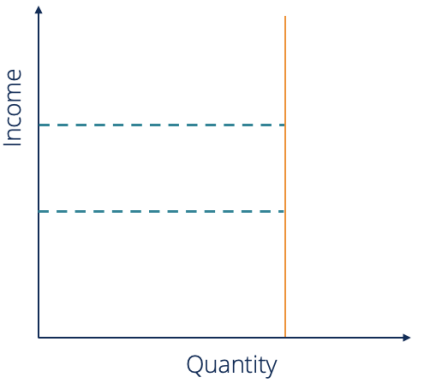


Figure-9

Uses of Income Elasticity of Demand

1. Forecasting demand

Forecasting demand applies to the idea that the income elasticity of demand tends to predict demand for commodities in the future. If there is a substantial change in wages, the change in demand for products will also be significant. This is because when buyers become aware of a shift in income, they will change their preferences and expectations for such products.

2. Investment decisions

The idea of national income is very important to businesses as it helps them to decide which sectors they should invest their money in. In general, investors tend to invest in markets where they can predict that the demand for commodities is related to a growth in national income or where the income elasticity of demand is greater than negligible.

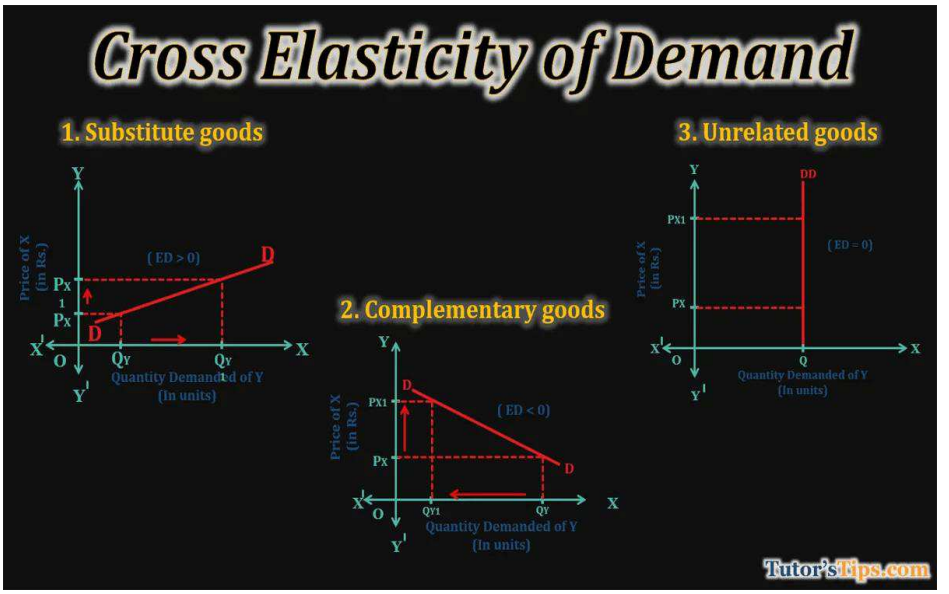
3. Cross Elasticity of Demand

Cross elasticity of demand is the proportionate change in the quantity demanded of a commodity in response to change in the price of another related commodity. Related commodity may either substitutes or complements. Examples of substitute commodities are tea and coffee.

Examples of compliment commodities are car and petrol. Cross elasticity of demand can be calculated by the following formula;

$$\text{Cross Elasticity} = \frac{\text{Proportionate Change in Quantity Demanded of a Commodity}}{\text{Proportionate Change in the Price of Related Commodity}}$$

If the cross elasticity is positive, the commodities are said to be substitutes and if cross elasticity is negative, the commodities are compliments. The substitute goods (tea and Coffee) have positive cross elasticity because the increase in the price of tea may increase the demand of the coffee and the consumer may shift from the consumption of tea to coffee. Complementary goods (car and petrol) have negative cross elasticity because increase in the price of car will reduce the quantity demanded of petrol. The concept of cross elasticity assists the manager in the process of decision making. For fixing the price of product which having close substitutes or compliments, cross elasticity is very useful.



4. Advertising Elasticity of Demand

AED measures a market's sensitivity to increases or decreases in advertising saturation. Advertising elasticity shows a campaign's effectiveness in generating sales.

AED is calculated by dividing the percentage change in the quantity demanded by the percentage change in advertising expenditures. A positive advertising elasticity indicates increased advertising raises demand for the goods or services

$$\text{Advertising Elasticity of Demand} = \frac{\%\ \text{Change in Quantity Demanded}}{\%\ \text{Change in Advertising Expenditure}}$$

FACTORS INFLUENCING ELASTICITY OF DEMAND

1. Nature of the Good

Goods can be classified as necessities or luxuries. Necessities (e.g., food, medicine) have inelastic demand, while luxuries (e.g., jewelry, designer clothes) tend to have elastic demand.

2. Availability of Substitutes

The greater the number of close substitutes, the more elastic the demand. If a product has readily available alternatives (e.g., soft drinks), consumers can switch easily, making demand elastic. In contrast, unique goods with no close substitutes (e.g., patented drugs) have inelastic demand.

3. Proportion of Income Spent

Goods that take up a small portion of a consumer's income (e.g., salt, matchsticks) tend to have inelastic demand, as price changes do not significantly impact consumption. However, goods that require a large income share (e.g., cars, electronics) have elastic demand.

4. Time Period

Demand tends to be more inelastic in the short run, as consumers take time to adjust their consumption habits. Over the long run, demand becomes more elastic as consumers find alternatives or change behaviors in response to price fluctuations.

5. Habitual Consumption

If a product becomes a habit or an addiction (e.g., cigarettes, coffee), its demand tends to be inelastic because consumers find it difficult to reduce consumption even if prices rise.

6. Durability of the Good

Durable goods (e.g., refrigerators, furniture) have elastic demand because consumers can delay purchases when prices rise. In contrast, perishable goods (e.g., vegetables, milk) have inelastic demand as they need to be purchased regularly.

7. Definition of the Market

A broadly defined market (e.g., food in general) tends to have inelastic demand, while a narrowly defined market (e.g., specific brands of bread) is more elastic due to the availability of substitutes.

8. Price Level

For very cheap goods, price changes have little effect on demand, making them inelastic. However, for very expensive goods, even small price changes can lead to significant changes in demand, making them more elastic.

SIGNIFICANCE OF ELASTICITY OF DEMAND

1. Pricing Decisions

Businesses use elasticity of demand to determine optimal pricing strategies. If demand for a product is inelastic, firms can increase prices without losing many customers, maximizing revenue. Conversely, for elastic demand, price hikes can lead to significant drops in sales, so firms may focus on competitive pricing.

2. Revenue and Profit Maximization

Understanding elasticity helps firms maximize profits. If a firm knows that demand for its product is elastic, it may reduce prices to attract more customers and boost total revenue. On the other hand, if demand is inelastic, increasing prices can lead to higher revenue without a significant loss in quantity demanded.

3. Taxation Policies

Governments consider elasticity when imposing taxes. Products with inelastic demand (such as fuel and cigarettes) are often taxed more heavily because consumers will continue buying them despite higher prices.

However, taxing elastic goods can lead to significant demand reductions and lower tax revenue.

4. Wage Determination

Labor market elasticity helps businesses and policymakers set wages. If the demand for labor is inelastic, wage increases have little effect on employment levels. However, if labor demand is elastic, higher wages could lead to job losses as businesses reduce hiring or automate processes.

5. International Trade and Exchange Rates

Elasticity plays a crucial role in global trade. If demand for a country's exports is elastic, currency depreciation can boost export revenues by making goods cheaper internationally. However, if exports are inelastic, price changes may not significantly impact demand, limiting the benefits of currency fluctuations.

6. Production Planning

Businesses use elasticity to decide production levels. If demand is highly elastic, firms must be cautious about overproduction, as small price changes could lead to large fluctuations in sales. For inelastic products, companies can maintain stable production levels without worrying about significant demand shifts.

7. Consumer Welfare and Policy Decisions

Governments analyze elasticity to regulate essential goods. If a product like food or medicine has inelastic demand, policies may be introduced to keep prices stable, ensuring affordability. Similarly, subsidies for elastic goods (such as electric vehicles) can encourage adoption and support economic growth.

2.3.DEMAND FORECASTING

Meaning

Demand forecasting refers to the process of predicting the future demand for a product or service based on historical data, market trends, and various external factors. It helps businesses and organizations make informed decisions about production, inventory management, pricing strategies, marketing efforts, and financial planning.

Key Aspects of Demand Forecasting

1. **Estimation of Future Demand**

   Demand forecasting involves estimating how much of a product or service consumers will require in a given future period. This helps businesses prepare adequately to meet customer needs without overproducing or under producing.

2. **Data-Driven Approach**

   Forecasting relies on both qualitative and quantitative data, including past sales records, consumer behaviour, economic conditions, competitor analysis, and industry trends.

3. **Time-Based Predictions**

   Businesses may forecast demand for short-term (a few months to a year) or long-term (several years ahead), depending on their objectives.

4. **Influence of Market Dynamics**

   Demand is influenced by multiple factors such as changes in consumer preferences, price fluctuations, availability of substitutes, income levels, advertising efforts, and overall economic conditions.

5. **Risk Reduction and Decision making**

   By predicting demand accurately, businesses can reduce uncertainties, optimize resource allocation, and enhance profitability. This ensures they can efficiently manage production schedules, workforce requirements, and supply chain operations

Objectives of Demand Forecasting

1. To Ensure Smooth Production Planning and Avoid Shortages or Excess Inventory

Demand forecasting plays a crucial role in helping businesses plan their production efficiently. By predicting future demand, companies can adjust their manufacturing schedules to ensure that supply matches demand. If production is too low, businesses may face stock shortages, leading to lost sales and dissatisfied customers. On the other hand, overproduction results in excess inventory, leading to increased storage costs, wastage, and

potential losses. Accurate demand forecasting helps maintain the right balance, ensuring smooth operations and efficient resource utilization.

2. To Set Optimal Pricing Strategies Based on Expected Demand Fluctuations

Pricing decisions are significantly influenced by demand trends. When demand is expected to be high, businesses can optimize their pricing strategies to maximize profits. Conversely, during periods of low demand, companies may need to reduce prices, offer discounts, or introduce promotional schemes to attract customers and maintain sales volume. Demand forecasting allows firms to anticipate seasonal or economic fluctuations and adjust their pricing strategies accordingly, ensuring competitiveness and revenue optimization.

3. To Assist in Budgeting and Financial Planning by Estimating Future Revenues

One of the key objectives of demand forecasting is to help businesses estimate future sales revenue, which is essential for effective financial planning. Companies use demand forecasts to create budgets for raw materials, labor, marketing, logistics, and other operational costs. Accurate forecasting helps businesses allocate financial resources efficiently, avoid unnecessary expenditures, and ensure stability in cash flow management. It also allows firms to make informed investment decisions and plan for business expansion with confidence.

4. To Help in Strategic Expansion Decisions Such as Entering New Markets or Launching New Products

Businesses looking to expand into new markets or introduce new products rely on demand forecasting to assess potential customer demand and market trends. Forecasting helps companies identify which regions or customer segments have growing demand and can support expansion efforts. Similarly, when launching a new product, demand forecasting provides insights into expected sales volume, helping businesses determine production levels, marketing strategies, and distribution plans. This reduces business risks and improves the chances of a successful expansion.

5. To Improve Customer Satisfaction by Ensuring Products Are Available When Needed

Customer satisfaction is a top priority for any business, and demand forecasting helps ensure that products are available when and where customers need them. Stock shortages can lead to frustration and lost customers, while excessive stock can lead to obsolete inventory. By predicting future demand accurately, businesses can maintain adequate inventory levels, reduce stockouts, and ensure timely delivery of products. This not only enhances customer satisfaction and loyalty but also strengthens the brand's reputation in the market

IMPORTANCE OF DEMAND FORECASTING

Demand forecasting plays a crucial role in the decision-making process of businesses, helping them anticipate future customer demand and align their operations accordingly. By using historical data, market trends, and statistical analysis, businesses can minimize risks, optimize resource allocation, and ensure sustained profitability. Below are some key reasons why demand forecasting is essential for businesses and the economy.

1. Efficient Production Planning

One of the most significant benefits of demand forecasting is its role in production planning. By accurately predicting future demand, businesses can adjust their production schedules to avoid underproduction, which may lead to stock shortages, or overproduction, which results in excess inventory and higher storage costs. Proper forecasting ensures that raw materials, labor, and machinery are used efficiently, leading to reduced waste and optimized production processes.

2. Better Inventory Management

Holding too much inventory increases storage costs, while too little inventory leads to missed sales opportunities and dissatisfied customers. Demand forecasting allows businesses to maintain an optimal inventory level, ensuring that products are available when needed without excessive stockpiling. This is particularly important for perishable goods, seasonal products, and industries with high demand fluctuations, such as fashion and electronics.

3. Informed Pricing Strategies

Pricing decisions are closely linked to demand. Businesses need to adjust their prices based on anticipated demand trends to maximize revenue. For example, during periods of high demand, firms may increase prices to boost profits, whereas during low-demand seasons, discounts and promotional offers may be necessary to attract customers. Accurate demand forecasting enables businesses to set competitive and dynamic pricing strategies that align with market conditions.

4. Enhanced Financial Planning and Budgeting

Financial stability is crucial for business success, and demand forecasting plays a key role in budgeting and financial planning. By estimating future sales revenue, companies can allocate financial resources more effectively, plan investments, and manage cash flow efficiently. It also helps in securing funding from investors or financial institutions, as accurate sales projections increase business credibility and reduce financial risks.

5. Strategic Market Expansion and New Product Launches

Businesses looking to expand into new markets or introduce new products must analyze demand trends before making investment decisions. Demand forecasting helps companies identify emerging market opportunities, assess potential customer demand, and determine the feasibility of expansion. By understanding market needs in advance, businesses can launch products successfully and reduce the risks associated with entering new territories.

6. Improved Supply Chain Management

Demand forecasting helps in better coordination between suppliers, manufacturers, and distributors. When businesses have accurate demand estimates, they can communicate effectively with suppliers to ensure timely procurement of raw materials. This prevents supply chain disruptions and ensures smooth operations. It also helps in logistics planning, reducing transportation costs and ensuring products reach customers on time.

7. Competitive Advantage in the Market

Companies that can predict demand accurately gain a competitive edge over their rivals. They can respond quickly to market changes, introduce promotions at the right time, and ensure customer satisfaction. Businesses

that fail to forecast demand correctly may struggle with stock shortages, excess inventory, or misaligned marketing efforts, leading to lower sales and reduced profitability.

8. Customer Satisfaction and Retention

Customers expect products to be available when they need them, and demand forecasting ensures that businesses meet these expectations. Stock shortages can lead to lost customers, while excess inventory may result in outdated products. By maintaining the right inventory levels and offering products at competitive prices, businesses enhance customer satisfaction, build brand loyalty, and improve retention rates.

LEVELS OF DEMAND FORECASTING

Demand forecasting operates at different levels depending on the scope, purpose, and time frame of the prediction. Businesses, industries, and governments use demand forecasting to make informed decisions in production, marketing, inventory management, and economic planning. The major levels of demand forecasting include macro-level, industry-level, firm-level, and product-level forecasting.

1. Macro-Level Demand Forecasting

Macro-level demand forecasting focuses on the overall demand for goods and services in an entire economy. This type of forecasting is conducted by government agencies, economic analysts, and financial institutions to understand national and global economic trends. It helps policymakers set fiscal and monetary policies, such as controlling inflation, adjusting interest rates, and planning infrastructure development. For example, macro-level forecasting can predict national demand for electricity, fuel, healthcare, or food products based on population growth, income levels, and economic conditions. It also helps businesses understand economic cycles (booms and recessions) and adjust their strategies accordingly.

2. Industry-Level Demand Forecasting

Industry-level forecasting estimates demand within a specific industry or sector, rather than the entire economy. It is useful for trade associations, manufacturers, and policymakers to assess market trends and plan production accordingly.

For instance, the automobile industry uses demand forecasting to determine how many vehicles will be required in the coming years based on factors such as fuel prices, technological advancements, and consumer preferences. Similarly, the real estate sector relies on demand forecasting to anticipate future housing needs based on urbanization and demographic changes.

This level of forecasting is crucial for companies within an industry to understand market potential, competition, and investment opportunities. It helps businesses make strategic decisions regarding capacity expansion, mergers, and acquisitions.

3. Firm-Level Demand Forecasting

Firm-level forecasting is conducted by individual companies to estimate the demand for their own products or services. It helps businesses optimize production, manage inventory, set pricing strategies, and allocate marketing budgets. For example, a clothing brand might forecast demand for winter jackets by analyzing past sales data, seasonal trends, and consumer preferences. A fast-food chain may use demand forecasting to determine how many burgers it needs to prepare daily in different locations to minimize waste and maximize sales. Firm-level forecasting is essential for businesses to stay competitive, ensure profitability, and meet customer expectations. It allows companies to adjust their supply chain, marketing campaigns, and workforce planning based on anticipated demand.

4. Product-Level Demand Forecasting

Product-level forecasting focuses on the demand for a specific product or product category within a firm. It helps businesses decide which products to promote, discontinue, or modify based on consumer preferences and market trends.

For example, an electronics company like Apple may forecast demand for different iPhone models to decide how many units to manufacture. Similarly, a supermarket chain may use product-level forecasting to determine how much stock of a particular brand of cereal is needed in each store location.

This level of forecasting is particularly useful for new product launches, seasonal products, and perishable goods. By analyzing demand at the product level, companies can prevent stock shortages, avoid overproduction, and maximize sales.

TYPES OF DEMAND FORECASTING

Demand forecasting is classified into different types based on time duration, nature of data, purpose, and forecasting techniques. Businesses use various forecasting methods to predict future demand and make informed decisions. The major types of demand forecasting are as follows:

1. Based on Time Horizon

(a) Short-Term Demand Forecasting

Short-term forecasting predicts demand for a few months to one year. It is mainly used for inventory management, production scheduling, workforce planning, and short-term pricing strategies.

Example: A retailer forecasts demand for winter jackets based on seasonal trends and last year's sales data.

Usage: Suitable for businesses with seasonal demand patterns, perishable goods, and industries with frequent demand fluctuations.

(b) Long-Term Demand Forecasting

Long-term forecasting predicts demand for several years (3-10 years or more). It helps businesses in capacity planning, capital investments, new market entry, and strategic expansion. **Example:** A car manufacturer forecasts demand for electric vehicles over the next 10 years to decide on production investments.

Usage: Useful for industries like automobiles, real estate, energy, and infrastructure development.

2. Based on Nature of Data

(a) Passive (Historical) Demand Forecasting

This type relies on past sales data and historical trends to predict future demand. It assumes that demand patterns will continue in a similar manner.

Example: A bakery uses last year's sales data to predict how many cakes will be sold in the same season this year.

Usage: Suitable for **stable markets** where demand does not fluctuate significantly.

(b) Active Demand Forecasting

Active forecasting considers market trends, economic conditions, competitor strategies, and external factors to predict demand. It is commonly used by businesses in dynamic industries with changing consumer preferences.

Example: A smartphone company analyzes consumer trends, competitor launches, and global chip shortages to predict demand for its next model.

Usage: Useful for industries like technology, fashion, and consumer electronics.

3. Based on Purpose

(a) External Demand Forecasting

This method analyzes demand at a market or industry level, considering factors like government policies, population growth, and economic trends.

Example: The government forecasts the demand for renewable energy sources in the next decade to plan investments in solar and wind energy.

Usage: Used by governments, policymakers, and industry associations for national and industry-level planning.

(b) Internal Demand Forecasting

Internal forecasting focuses on a specific company's products or services. It helps businesses plan their production, pricing, and marketing strategies.

Example: A pharmaceutical company predicts demand for a new drug based on medical trends and doctor prescriptions.

Usage: Used by individual businesses to optimize **operations, inventory, and sales strategies.**

4. Based on Forecasting Techniques

(a) Qualitative Demand Forecasting

Qualitative forecasting relies on expert opinions, market research, and surveys rather than numerical data. It is used when historical data is unavailable or insufficient, such as for new product launches.

Methods Used:

- **Expert Opinion:** Industry specialists provide insights on future demand.
- **Delphi Method:** Experts answer questions anonymously, and a consensus forecast is derived.
- **Market Research:** Customer surveys and focus groups help predict demand.

Example: A new startup launching an innovative smart gadget conducts a customer survey to estimate potential demand.

Usage: Best for new product launches, emerging markets, and industries with rapid innovation.

(b) Quantitative Demand Forecasting

Quantitative forecasting uses statistical and mathematical models to analyze historical data and predict future demand.

Methods Used:

- **Time Series Analysis:** Examines past sales patterns to predict future trends.
- **Regression Analysis:** Analyzes relationships between demand and factors like price, income, and advertising.
- **Econometric Models:** Uses multiple economic variables to forecast demand.

Example: A supermarket chain uses time series analysis to predict future demand for groceries based on past sales trends.

Usage: Suitable for businesses with **consistent and historical sales data.**

METHODS OF DEMAND FORECASTING

Several methods are employed for forecasting demand. All these methods can begrouped into survey method and statistical method.

Survey Method.

Under this method, information about the desire of the consumers and opinions of experts are collected by interviewing them. This can be divided into four types;

Opinion Survey method: This method is also known as Sales- Force – Composite method or collective opinion method. Under this method, the company asks its salesmen to submit estimate for future sales in their respective territories. This method is more useful and appropriate because the salesmen are more knowledgeable about their territory.

Expert Opinion: Apart from salesmen and consumers, distributors or outside experts may also be used for forecast. Firms in advanced countries like USA, UK etc...Make use of outside experts for estimating future demand. Various public and private agencies sell periodic forecast of short or long term business conditions.

Delphi Method: it is a sophisticated statistical method to arrive at a consensus. Under this method, a panel is selected to give suggestions to solve the problems in hand. Both internal and external experts can be the members of the panel. Panel members are kept apart from each other and express the reviews in an anonymous manner.

Consumer Interview method: under this method a list of potential buyers would be drawn and each buyer will be approached and asked about their buying plans. This method is ideal and it gives firsthand information, but it is costly and difficult to conduct. This may be under taken in three ways:

Complete Enumeration–in this method, all the consumers of the product are interviewed.

Sample survey –in this method, a sample of consumers is selected for interview. Sample may be random sampling or Stratified sampling.

End-use method–the demand for the product from different sectors such as industries, consumers, export and import are found out.

Statistical Methods

It is used for long term forecasting. In this method, statistical and mathematical techniques are used to forecast demand. This method is

relies on past data. This includes; Trend projection method: under this method, demand is estimated on the basis of analysis of past data. This method makes use of time series (data over a period of time). Here we try to ascertain the trend in the time series. Trend in the time series can be estimated by using least square method or free hand method or moving average method or semi-average method.

Regression and Correlation: these methods combine economic theory and statistical techniques of estimation. In this method, the relationship between dependent variables (sales) and independent variables (price of related goods, income, advertisement etc..) is ascertained. This method is also called the economic model building.

Extrapolation: in this method the future demand can be extrapolated by applying binomial expansion method. This is based on the assumption that the rate of change in demand in the past has been uniform.

Simultaneous equation method: this means the development of a complete economic model which will explain the behavior of all variables which the company can control.

Barometric techniques: under this, present events are used to predict directions of change in the future. This is done with the help of statistical and economic indicators like:

Construction contract, Personal income Agricultural income ,Employment, GNP, Industrial production, Bank deposit etc…

Forecasting Demand for a New Product.

Joel Dean has suggested six approaches for forecasting the demand for new products.

1.Evolutionary Approach: In this method, the demand for new product is estimated on the basis of existing product. E.g. Demand forecasting of colour TV on the basis of demand for black & white TV.

2.Substitute Approach: The demand for the new product is analyzed as substitute for the existing product.

3.Growth curve Approach: On the basis of the growth of an established

product, the demand for the new product is estimated.

4.Opinion Polling Approach: In this approach, the demand for the new product is estimated by inquiring directly from the consumers by using sample survey.

5.Sales Experience Approach: The demand is estimated by supplying the new product in a sample market and analyzing the immediate response on that product in the market...

6.Vicarious Approach: Consumers reactions on the new products are found out indirectly with the help of specialized dealers.

FACTORS AFFECTING DEMAND FORECASTING.

The following are the important factors governing demand forecasting:

1.Prevailing Business conditions (price level change, per capita income,

Consumption pattern, saving, investments, employment etc..,

2.Condition with in the Industry (Price – product –competition policy of firms with in the industry).

3.Condition with in the firm. (Plant capacity, quality ,important policies of the firm).

4.Factors affecting Export trade (EXIM control, EXIM policy, terms of export, export finance etc..,)

5.Market behavior

6.Sociological Conditions (Population details, age group, family lifecycle, education, family income, social awareness etc...)

7.Psychological Conditions (taste, habit, attitude, perception, culture, religion etc…)

8.Competitive Condition (competitive condition within the industry)

CRITERIA FOR GOOD FORECASTING METHOD.

A good forecasting method should satisfy the following criteria:

1. **Plausibility**- It should be reasonable or believable.
2. **Simplicity**- It should be simple and easy.
3. **Economy**– it should be less costly.
4. **Accuracy**– it should be as accurate as possible.
5. **Availability**–Relevant data should be easily available.
6. **Flexibility**– it should be flexible to adopt required changes

CHALLENGES IN DEMAND FORECASTING

Demand forecasting is essential for businesses to plan production, manage inventory, and optimize supply chains. However, predicting future demand accurately is challenging due to various internal and external factors. These challenges can arise from data limitations, market uncertainties, changing consumer preferences, and external disruptions. Addressing these challenges is crucial for improving forecast accuracy and ensuring smooth business operations.

Data availability and accuracy Forecasting models rely on historical sales data, customer trends, and market insights, but businesses often struggle with incomplete, outdated, or inconsistent data. Poor data quality can lead to errors in demand estimation, resulting in stock shortages or excess inventory. Without reliable data, businesses may face difficulties in making informed decisions about production and resource allocation.

Rapid change in consumer behavior. Customer preferences shift due to trends, social influences, economic factors, and lifestyle changes. Traditional forecasting models may not always capture these sudden changes, leading to inaccurate predictions. For example, a surge in demand for organic and plant-based food products may not be reflected in past sales data, making it difficult for businesses to adjust their strategies accordingly.

External factors such as economic downturns, inflation, political instability, and pandemics also create uncertainty in demand forecasting.

Unexpected events can cause drastic shifts in demand patterns, making historical data less reliable. For instance, the COVID-19 pandemic led to a sudden rise in demand for essential goods while reducing demand for travel and luxury products. Such unforeseen disruptions make it difficult for businesses to maintain stable supply chains and production plans.

Seasonality and market fluctuations pose another challenge in demand forecasting. Many industries experience seasonal variations in demand, such as increased sales of winter clothing during cold months or higher demand for ice cream in summer. If businesses fail to anticipate these changes accurately, they may either overproduce during off-peak seasons or under produce during high-demand periods, leading to financial losses.

Supply chain disruptions can prevent businesses from meeting customer demand effectively. Factors such as raw material shortages, transportation delays, and import-export restrictions can impact supply chain efficiency. For example, semiconductor shortages have affected the production of electronic devices and automobiles, despite strong demand forecasts. Managing such disruptions requires businesses to develop flexible supply chain strategies.

Lack of historical sales data. Businesses must rely on market research, consumer surveys, and competitor analysis, which may not always provide accurate predictions. A new smartphone model, for instance, may experience unexpected demand fluctuations depending on customer reception and competitor actions. Miscalculations can lead to excess inventory or stockouts, affecting profitability.

Technological and model limitations also create forecasting challenges. Many businesses still use traditional statistical models that fail to incorporate real-time data and external market variables. Advanced forecasting tools such as artificial intelligence (AI) and machine learning can improve accuracy, but they require significant investment. Companies that rely solely on outdated models may struggle to keep up with dynamic market conditions.

Competitor actions and market uncertainty further complicate demand forecasting. Businesses often do not account for competitor strategies, pricing changes, or new product launches, which can significantly impact

demand. For example, if a competitor introduces a similar product at a lower price, the demand for an existing product may decline unexpectedly. Businesses must monitor competitors closely to adjust their forecasts accordingly.

Lack of skilled personnel in demand forecasting. Accurate forecasting requires expertise in data analysis, AI-driven models, and market research. Many companies, especially small businesses, may lack the necessary talent to implement and interpret advanced forecasting techniques. Without skilled professionals, businesses may struggle to improve the accuracy of their demand predictions.

The high cost of advanced forecasting techniques can be a barrier for many companies. AI-powered forecasting models, predictive analytics, and big data solutions require substantial investment in technology, infrastructure, and training. Small and medium-sized enterprises (SMEs) may find it difficult to afford such systems, making them reliant on less accurate, traditional forecasting methods. Limited access to advanced technology can result in poor demand predictions and inefficient decision-making.

CHAPTER - III

PRODUCTION AND COST ANALYSIS

3.1.PRODUCTION FUNCTION

A production function is an economic concept that describes the relationship between input factors (such as labour, capital, and raw materials) and the output of goods or services. It represents how efficiently a firm can transform inputs into outputs using available technology.

General Form of a Production Function

Q=f(L,K,M,T)

where:

- Q = Output (quantity of goods/services produced)
- L = Labor (human effort)
- K = Capital (machines, equipment, infrastructure)
- M = Materials (raw inputs)
- T = Technology (level of knowledge and efficiency in production)

The laws of production

Production function shows the relationship between a given quantity of input and its maximum possible out put. Given the production function, the relationship between additional quantities of input and the additional output can be easily obtained. This kind of relationship yields the law of production The traditional theory of production studies the marginal input- output relationship under (I) Short run; and (II) long run. In the short run, input-output relations are studied with one variable input, while other inputs are held constant. The Law of production under these assumptions are called "the Laws of variable production". In the long run input output relations are studied assuming all the input to be variable. The long-run input output relations are studied under `Laws of Returns to Scale.

Law of Diminishing Returns (Law of Variable Proportions)

The Laws of returns states the relationship between the variable input and the output in the short term. By definition certain factors of production (e.g.-Land, plant, machinery etc) are available in short supply

during the short run. Such factors which are available in unlimited supply even during the short periods are known as variable factor. In short-run therefore, the firms can employ a limited or fixed quantity of fixed factors and an unlimited quantity of the variable factor . In other words, firms can employ in the short run varying quantities of variable inputs against given quantity of fixed factors. This kind of change in input combination leads to variation in factor proportions. The Law which brings out the relationship between varying factor properties and output are therefore known as the Law of variable proportions.

The variation in inputs lead to a disproportionate increase in output more and more units of variable factor when applied cause an increase in output but after a point the extra output will grow less and less. The law which brings out this tendency in production is known as' Law of Diminishing Returns`

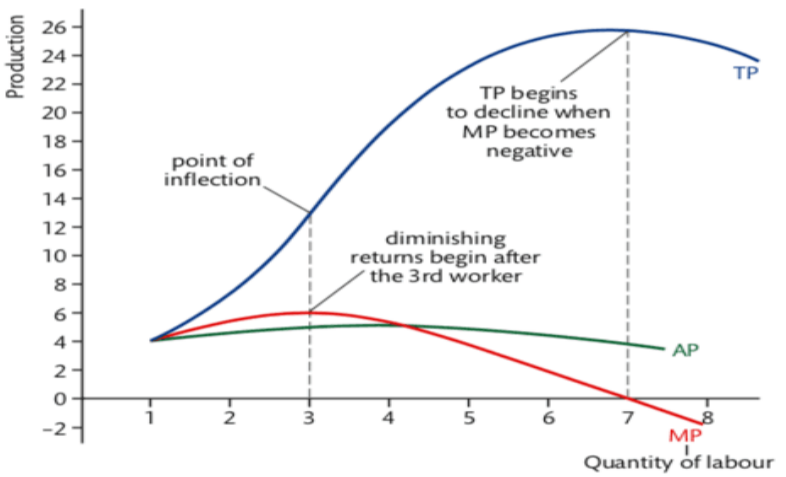
The Law of Diminishing returns levels that any attempt to increase output by increasing only one factor finally faces diminishing returns. The Law states that when some factor remain constant, more and more units of a variable factor are introduced the production may increase initially at an increasing rate; but after a point it increases only at diminishing rate. Land and capital remain fixed in the short-term whereas labor shows a variable nature.

The following table explains the operation of the Law of Diminishing Returns.

No. of Workers	Total product	Average product	Marginal product
1	10	10	10
2	22	11	12
3	36	12	14
4	52	13	16
5	66	13.2	14
6	76	12.7	10
7	82	11.7	6
8	85	10.6	3

9	85	9.4	0
10	83	8.3	(-2)

The above table illustrates several important features of a typical production function. With one variable input.- here both Average Product (AP) and Marginal Product (MP) first rise ,reach a maximum - then decline. Average product is the product for one unit of labor . It is arrived at by dividing the Total Product (TP) by number of workers Marginal product is the additional product resulting term additional labor. It is found out by dividing the change in total product by the change in the number of workers. The total output increases at an increasing rate till the employment of the 4th worker. The rate of increase in the marginal product reveals this .Any additional labor employed beyond the4th labor clearly faces the operation of the Law of Diminishing Returns. The maximum marginal product is 16 after which it continues to fall, ultimately becoming negative. Thus when more and more units of labor are combined with other fixed factors the total output increase first at an increasing rate then at a diminishing rate finally it becomes negative. The graphical representation the above table is shown below



Three Phases of the Curve

1. **Increasing Returns Phase:** Here, each additional unit of input results in a larger output, indicating underutilised resources.
2. **Diminishing Returns Phase:** Output continues to grow but at a

decreasing rate, demonstrating the essence of the law of diminishing returns.

3. **Negative Returns Phase:** Eventually, the output starts to decrease with the addition of more inputs, showing inefficiency and over utilisation.

Assumptions of Law Diminishing Returns

The Law of Diminishing Returns is based on the following assumptions;- Returns is based on the following assumptions;-

1. The production technology remains unchanged
2. The variable factor is homogeneous.
3. Any one factor is constant
4. The fixed factor remains constant.

RETURNS TO SCALE

Production is the result of various factors of production. The level of output can be increased into two ways:

1. By increasing only one factor and keeping other factors are constant.
2. By increasing all factors of production.

The law of variable proportion deals with the first cases. It explains how the output increases when one factor is changed on the other hand the "Law of returns "to scale is deals with the second way. It shows that how the output changes when all factors of production changed in the long period.

Labour	Capital	% Increase in Labour and Capital	tal out put	Increase in out put	Returns to scale
1	100	-	100	-	Increasing Returns to scale
2	200	100	220	120	
3	300	50	350	59	
4	400	33.33	500	42.9	
5	500	25	625	25	Constant Returns to Scale
6	600	20	750	20	

7	700	16.66	860	14.66	Decreasing Returns to scale
8	800	14.24	940	9.3	
9	900	12.29	1000	6.4	

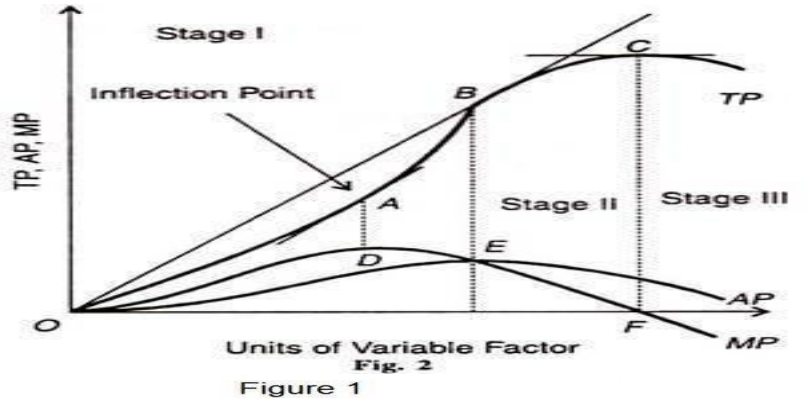
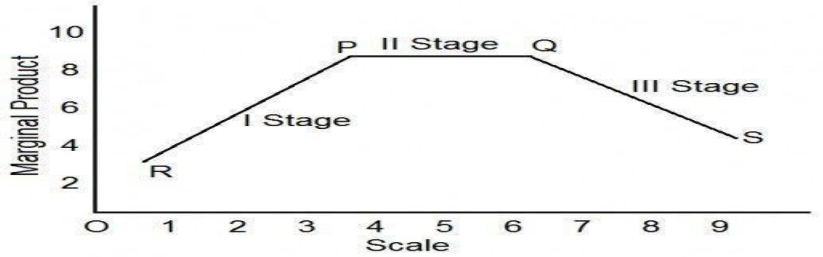


Fig. 2

Figure 1



When all factors are increased, we find three stages in the production they are:

1. Increasing Returns to Scale
2. Constant Return to Scale
3. Diminishing Returns to Scale

Increasing Return to Scale:

When an increase in the factors of production causes a more than proportionate increases in the output. It is called increasing return to scale. In other words, increasing returns to scale refers to that "the rate of change in the output is greater than the rate of change in input".

Numerically it was represented as $\frac{\Delta P}{P} > \frac{\Delta F}{F}$

$\frac{\Delta P}{P}$ =Change in production P

$\frac{\Delta F}{F}$ =Change in factors of production. F

Constant Return to Scale:

Increasing returns to scale will not be continuing in definitely. After a certain stage the advantages and disadvantages of a large-scale production are equal and we get the constant returns to scale.

In this stage "the rate of change in output is equal to the rate of change in the inputs". Symbolically represented as $\frac{\Delta P}{P} = \frac{\Delta F}{F}$

The numerically value of constant returns to scale is always equal to one. If the inputs are doubled, the output will also be doubled.

Diminishing Return to Scale:

In the stage the "rate of change in the output is less than the rate of change in input". It was represented as $\frac{\Delta P}{P} < \frac{\Delta F}{F}$

The numerical value of diminishing returns is less than one. When inputs are doubled, the output cannot be doubled. In this stage the advantages of large scale of Production are dominated by the disadvantages of production.

There are some other reasons for diminishing returns:

- Lack of proper control
- Inefficiency of Management
- Storage of raw materials
- Lack of Proper division of labour

Isoquant curve.

The terms " Iso-quant" has been derived from the Greek word *iso* means `equal` and Latin word *quantus* means `quantity`. The iso-quant curve is therefore also known as`` equal product curve ``or production indifference curve .

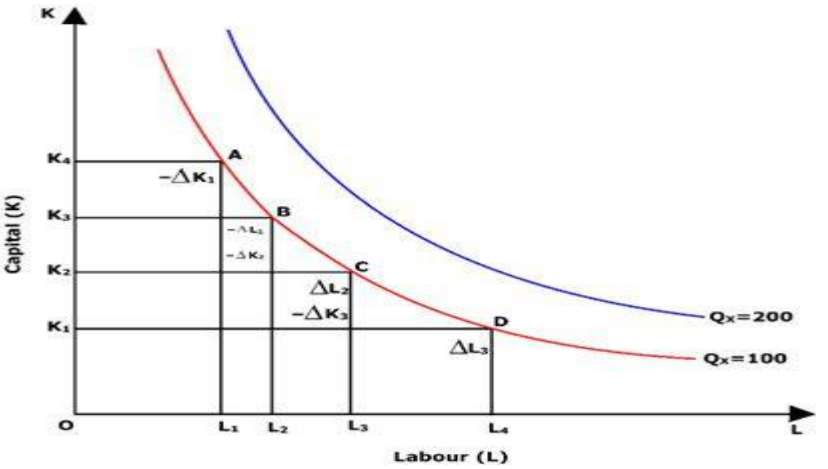
An iso- quant curve is locus of point representing the various combination of two inputs –capital and labor – yielding the same output. It shows all possible combination of two inputs, namely- capital and labor which can produce a particular quantity of output or different combination of the two inputs that can give in the same output . An isoquant curve all along its length represents a fixed quantity of output.

Table: Capital–Labour Combinations and Output

Points	Input Combinations K + L	Output
A	$OK_4 + OL_1$	= 100
B	$OK_3 + OL_2$	= 100
C	$OK_2 + OL_3$	= 100
D	$OK_1 + OL_4$	= 100

Capital–Labour Combinations and Output

As it is quite clear from the above table that different input combinations, i.e. point A, B, C, and D, yield the same level of output, 100. Thus an isoquant should pass through these points. Moreover, as can be seen from these combinations that both inputs are substitutes for one another. Now based on all these, we can draw the isoquant as shown in Figure



As represented above, IQ_1 yields the same level of output, i.e. 100 units of X using different combinations of l and k. But it is important to note here that the movement from point A to D indicates an increase in the employment of labour and a reduction of capital in the production process.

This clearly indicates that labour and capital are perfect substitutes for each other as the same quantity of X can be produced by either more of labour/less of capital or by more of capital/less of labour. A higher isoquant represents higher output produced using more of both labour and capital combinations, as represented by IQ_2 in the above diagram, which yields 200 units of X.

Properties of Isoquants

An **isoquant** is a curve that represents different combinations of two inputs (such as labour and capital) that produce the same level of output. It is similar to an indifference curve in consumer theory but applies to production. The shape and characteristics of isoquants help in understanding how firms can substitute one input for another while maintaining the same level of production.

1. Downward Sloping

Isoquants are negatively sloped, meaning that if a firm reduces one input, it must increase the other to maintain the same level of output. This follows the principle of input substitution—if less labour is used, more capital is needed to compensate.

2. Convex to the Origin

Isoquants are convex due to the diminishing marginal rate of technical substitution (MRTS). This means that as more of one input is used, its additional contribution to output decreases, requiring progressively more of the input to substitute for the other.

3. Non-Intersecting

Two isoquants never intersect because each represents a different level of output. If two isoquants were to cross, it would imply that the same input combination produces two different output levels, which is logically impossible.

4. Higher Isoquants Represent Higher Output

Isoquants further from the origin indicate higher levels of output. Since production increases with more inputs, moving to a higher isoquant means a firm is producing more output.

5. No Isoquant Touches Either Axis

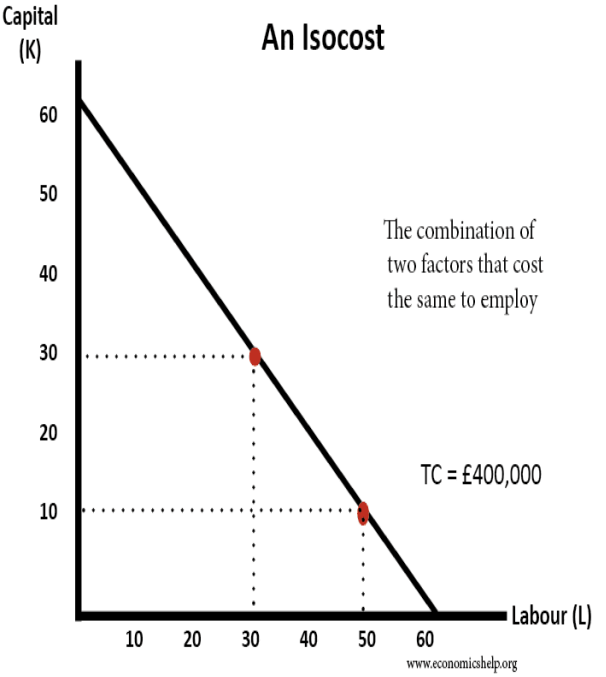
Isoquants never touch the labour or capital axis, as production generally requires at least some amount of both inputs. A purely labour-based or capital-based production process is rare in most real-world industries.

6. Shape Depends on Input Substitutability

The curvature of an isoquant depends on how easily one input can replace another. If inputs are perfect substitutes, the isoquant will be a straight line. If they are perfect complements (e.g., machinery and operators), the isoquant will have an L-shape with fixed input proportions.

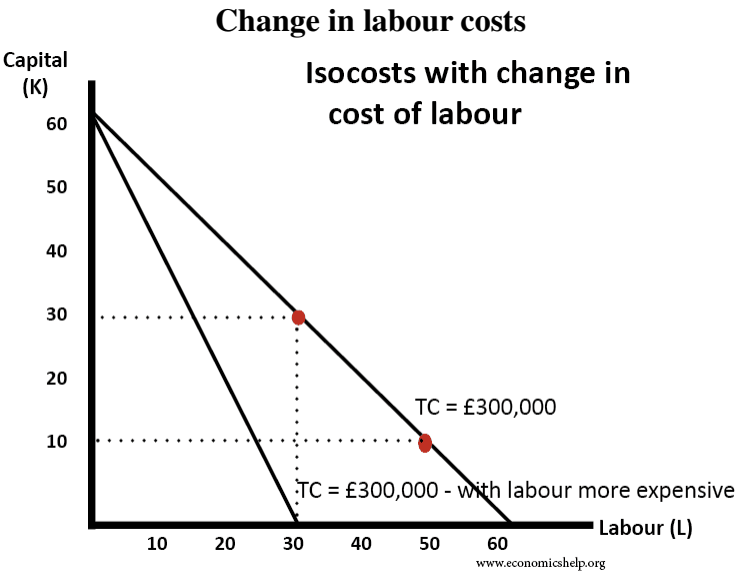
Isocost Curve

An isocost shows all the combinations of factors that c̄ost the same to employ.



In this example, a unit of labour and capital cost £6,666 each.

- If we employ 30K and 30L, the total cost will be £200,000 + £200,000
- If we employ 10 K and 50L, the total cost will be £66,666 +£333,333 = £400,000



- In this example, initially, the cost of labour and capital is both £5,000. (e.g. 60L = 60 x £5,000 = £300,000)
- However, if Labour cost rises to £10,000, then the isocost shifts to the left. Now, to keep cost at £300,000, a firm could only employ 30 workers (30 x £10,000)
- The slope of an isocost is, therefore, P_L / P_K

Profit maximisation

To maximise profits, a firm will wish to produce at the point of the highest possible isoquant and minimum possible isocost

MRTS Marginal Rate of Technical Substitution (MRTS)

The Marginal Rate of Technical Substitution (MRTS) measures how much of one input (e.g., capital) a firm can reduce while increasing another input (e.g., labour) to maintain the same level of output. It shows the rate at which one input can be substituted for another in production while keeping output constant.

3.2. ECONOMIES OF SCALE

Economies of scale refer to the cost advantages that businesses experience as they expand their production. When a firm increases its scale of operation, the average cost per unit of output decreases due to improved efficiency, bulk purchasing, and better resource utilization. These cost

savings enable businesses to produce goods or services at a lower cost, enhancing their competitiveness in the market. There are two main types of economies of scale: internal economies of scale and external economies of scale.

Internal Economies of Scale

Internal economies of scale refer to cost savings that arise within a firm as it expands its production. These advantages result from improvements in efficiency, better resource allocation, and the firm's ability to spread fixed costs over a larger output. As a company grows, it can reduce its per-unit cost of production, making it more competitive in the market.

There are several types of internal economies of scale:

Technical Economies:

Larger firms can invest in advanced machinery, automation, and production techniques, which improve efficiency and reduce per-unit costs. For example, an automobile manufacturer using robotic assembly lines can produce cars faster and at a lower cost than a smaller company relying on manual labour.

Managerial Economies:

As a firm grows, it can hire specialized managers for different departments such as finance, marketing, and operations. Specialization improves decision-making, increases productivity, and reduces inefficiencies, leading to lower costs. A multinational corporation, for instance, benefits from having dedicated teams for each business function, optimizing overall performance.

Financial Economies:

Larger firms have better access to financial resources. They can secure loans at lower interest rates due to their creditworthiness and financial stability. Additionally, they can raise capital by issuing shares in the stock market, reducing their dependence on expensive borrowing.

Marketing Economies:

Bigger companies can spread their advertising and marketing costs over a larger number of units, reducing the cost per unit of promotion. They can also negotiate better deals with media outlets and advertising agencies, making large-scale marketing campaigns more cost-effective.

Additionally, bulk purchasing of raw materials allows firms to obtain discounts from suppliers, further reducing production costs.

Risk-Bearing Economies:
Large firms can diversify their products and markets, reducing their reliance on a single source of revenue. This diversification helps in managing business risks more effectively. For example, a company like Apple produces multiple products, including iPhones, iPads, MacBooks, and accessories, ensuring that a decline in demand for one product does not significantly impact the entire business.

Internal economies of scale play a crucial role in helping firms lower their production costs, improve efficiency, and strengthen their market position. However, if a company expands beyond its optimal size, it may face diseconomies of scale, where inefficiencies such as poor communication and management difficulties lead to rising costs. Therefore, firms must balance growth with operational efficiency to maximize the benefits of internal economies of scale.

Internal Diseconomies of Scale
Internal diseconomies of scale occur when a firm grows beyond its optimal size, leading to inefficiencies and rising production costs. While expanding operations can initially bring cost savings, excessive growth may result in managerial, operational, and financial difficulties that increase the firm's average cost per unit of output. These inefficiencies arise due to challenges in coordination, resource management, and employee productivity.

There are several types of internal diseconomies of scale:

Managerial Diseconomies:
As a firm expands, the complexity of management increases. Decision-making becomes slower due to bureaucratic procedures, and communication between different departments may become inefficient. Large organizations often struggle with coordination, leading to delays in production and increased administrative costs. For example, a multinational corporation may face difficulties in ensuring smooth operations across various global branches.

Labor Diseconomies:

In large firms, employees may feel disconnected from management, leading to lower motivation and reduced productivity. Lack of personal supervision can also result in inefficiencies, such as workers taking advantage of relaxed oversight. Additionally, conflicts between workers and management may arise due to differences in interests, further affecting operational efficiency.

Technical Diseconomies:

While larger firms benefit from advanced machinery and automation, maintaining and managing complex technology can become challenging. Excessive expansion may lead to overuse of equipment, resulting in frequent breakdowns and higher maintenance costs. Furthermore, increased production may require additional storage and logistics management, leading to congestion and inefficiencies.

Financial Diseconomies:

Although large firms usually have better access to financial resources, excessive expansion can lead to higher risks and mismanagement of funds. Over-investment in new projects or excessive borrowing can increase debt and financial instability. If a company takes on too many projects at once, it may struggle to generate sufficient revenue to cover its costs, leading to financial losses.

Coordination and Communication Issues:

As businesses grow, maintaining effective communication between different departments and employees becomes challenging. Miscommunication and delays in information flow can lead to errors, inefficiencies, and poor decision-making. For instance, a large retail chain may struggle to coordinate its supply chain effectively, leading to stock shortages or excess inventory.

Internal diseconomies of scale can negatively impact a firm's profitability and long-term sustainability. To avoid these issues, businesses must implement efficient management structures, invest in employee motivation, and maintain effective communication systems. Proper planning and resource allocation can help firms balance growth while minimizing inefficiencies.

External Economies of Scale

External economies of scale refer to cost advantages that firms experience due to industry-wide growth, improved infrastructure, or the availability of skilled labour. These benefits are external to individual firms but help reduce costs and improve efficiency. Some key sources of external economies include:

Infrastructure Development:

Government investments in roads, power supply, communication networks, and transportation hubs lower operational costs for businesses. For example, improved highways and ports reduce logistics costs for manufacturing firms.

Specialized Suppliers and Support Services:

As an industry expands, suppliers of raw materials, machinery, and specialized services (such as logistics, legal, or financial consulting) emerge. This reduces production costs and improves efficiency. For instance, automobile manufacturers benefit from dedicated auto parts suppliers, reducing procurement expenses.

Skilled Labor Pool:

The growth of an industry attracts skilled workers, universities, and training institutions specializing in relevant fields. Businesses can hire well-trained employees without incurring high training costs. For example, Silicon Valley benefits from a continuous supply of tech professionals, reducing recruitment and training expenses for tech companies.

Research and Development (R&D) Spillovers:

Firms within the same industry share knowledge and technological advancements, reducing innovation costs. Companies operating in industrial clusters benefit from shared expertise, leading to improved products and processes. For example, pharmaceutical firms in a research hub benefit from joint discoveries and collaborations.

Government Policies and Incentives:

Tax benefits, subsidies, and reduced regulations in certain industries encourage growth and reduce costs. For example, governments may offer

tax breaks for renewable energy companies, making solar panel production cheaper.

External Diseconomies of Scale

External diseconomies of scale occur when the expansion of an industry leads to inefficiencies, increased costs, or negative impacts on businesses within that sector. These disadvantages are caused by external factors beyond an individual firm's control. Key sources of external diseconomies include:

Resource Scarcity and Rising Costs:

As an industry grows, the demand for raw materials, land, and skilled labour increases. This leads to higher prices and competition for essential resources, raising production costs. For example, the rapid expansion of the real estate sector can drive up land prices, making it more expensive for businesses to set up new facilities.

Overcrowding and Infrastructure Strain:

When too many businesses operate in the same area, infrastructure such as roads, water supply, and electricity may become overburdened. Traffic congestion, higher utility costs, and logistical challenges can negatively impact efficiency. A common example is major industrial cities where frequent power shortages disrupt manufacturing operations.

Environmental Degradation and Regulations:

Industrial growth can lead to pollution, waste disposal issues, and environmental damage. Governments may impose stricter regulations and pollution control measures, increasing compliance costs for businesses. For instance, firms in heavily polluted industrial zones may need to invest in expensive waste management systems or pay fines for exceeding emission limits.

Increased Competition for Labor:

A growing industry may experience labour shortages, leading to rising wages and increased hiring costs. When multiple firms compete for the same skilled workforce, salaries increase, raising overall production expenses. For example, in booming IT hubs, companies must offer higher salaries and benefits to attract top talent.

Market Saturation and Declining Profits:
If too many firms enter an industry, the market may become saturated, leading to price wars and reduced profitability. Excessive competition can force businesses to lower prices, sometimes below sustainable levels, leading to financial instability. For example, in the airline industry, too many carriers operating on the same routes lead to fare reductions, squeezing profit margins.

3.3.COST CONCEPTS

Short Run Cost refers to a certain period of time where at least one input is fixed while others are variable. In the short-run period, an organisation cannot change the fixed factors of production, such as capital, factory buildings, plant and equipment, etc. However, the variable costs, such as raw material, employee wages, etc., change with the level of output.

Example: If a firm intends to increase its output in the short run, it would need to hire more workers and purchase more raw materials. The firm cannot expand its plant size or increase the plant capacity in the short run. Similarly, when demand falls, the firm would reduce the work hours or output, but cannot downsize its plant. Therefore, in the short run only variable factors are changed, while the fixed factors remain unchanged. Let us discuss the cost-output relations in the short run

Type of Short Run Cost

What is Short Run Cost Types? There are basically three **types of short run costs**:

1. Short Run Total Cost
2. Short Run Average Cost
3. Short Run Marginal Cost

Type of Short Run Cost
Short Run Total Cost

The **total cost** refers to the actual cost that is incurred by an organisation to produce a given level of output. The Short-Run Total Cost (SRTC) of an organisation consists of two main elements:

Total Fixed Cost (TFC):

These costs do not change with the change in output. TFC remains constant even when the output is zero. TFC is represented by a straight line horizontal to the x-axis (output).

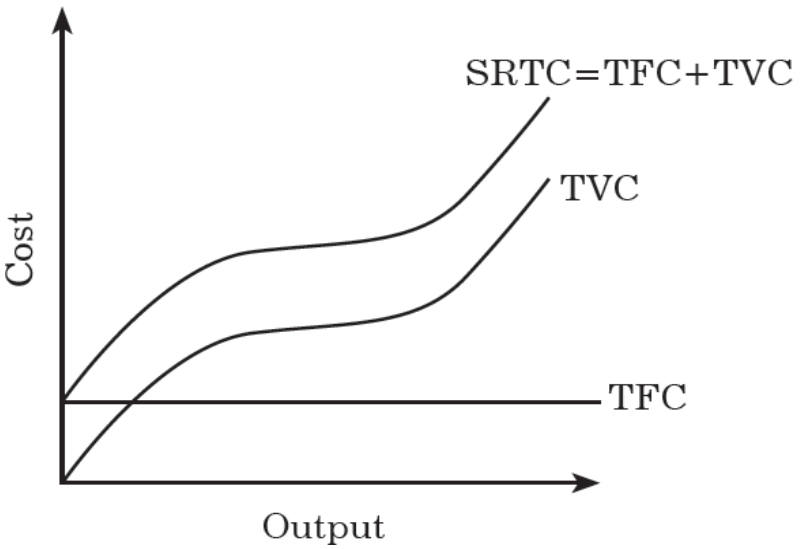
Total Variable Cost (TVC):

These costs are directly proportional to the output of a firm. This implies that when the output increases, TVC also increases and when the output decreases, TVC decreases as well.

SRTC is obtained by adding the total fixed cost and the total variable cost.

SRTC = TFC + TVC

As the TFC remains constant, the changes in SRTC are entirely due to variations in TVC. Figure depicts the **short run cost curve** of a firm:



Short Run Total Cost

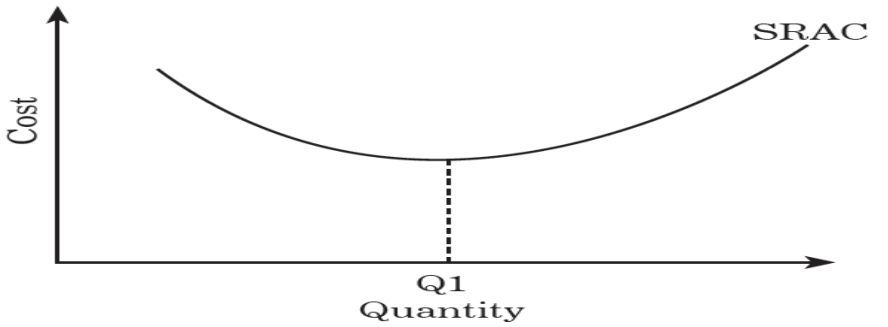
Short Run Average Cost

The **average cost** is calculated by dividing total cost by the number of units a firm has produced. The short-run average cost (SRAC) of a firm refers to per unit cost of output at different levels of production. To calculate SRAC, short-run total cost is divided by the output.

SRAC = SRTC/Q = TFC + TVC/Q

Where, TFC/Q =Average Fixed Cost (AFC) and TVC/Q =Average Variable Cost (AVC) Therefore, SRAC = AFC + AVC

SRAC of a firm is U-shaped. It declines in the beginning, reaches to a minimum and starts to rise. Figure depicts the short run average cost curve of a firm



U Shaped Short Run Average Cost

The SRAC curve represents the average cost in the short run for producing a given quantity of output. The downward-slope of the SRAC curve indicates that as the output increases, average costs decrease. However, the SRAC curve begins to slope upwards, indicating that at output levels above Q1, average costs start to increase.

Short Run Marginal Cost

Marginal cost (MC) can be defined as the change in the total cost of a firm divided by the change in the total output. Short-run marginal cost refers to the change in short-run total cost due to a change in the firm's output.

SRMC = ØSRTC / ØQ

In the marginal cost concept, Δ Q = 1. Therefore, SRMC = TVC

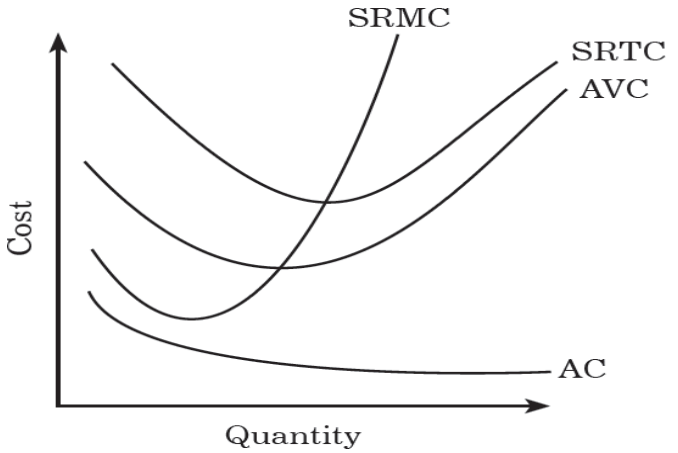
Short-run marginal cost on a graph is the slope of the short-run total cost and depicts the rate of change in total cost as output changes. The marginal cost of a firm is used to determine whether additional units need to be produced or not. If a firm could sell the additional unit at a price greater than the cost incurred to produce the additional unit (marginal cost), the firm may decide to produce the additional unit.

Table shows the estimation of SRTC, SRAC, and SRMC of a firm producing paper bags. Quantity expressed is in thousands ('000) and the cost in ` (in lakhs):

QUANTITY (Q)	FIXED COST (TFC)	TOTAL VARIABLE COST (TVC)	TOTAL COST (SRTC = TFC + TVC)	AVERAGE COST (SRAC=TC/Q)	MARGINAL COST (SRMC= ΔTC/ΔQ)
20	10	15	25	1.25	–
21	10	20	30	1.43	5
22	10	10	20	0.91	10
23	10	12	22	0.96	2

Calculation of SRTC, SRAC and SRMC

The figure depicts the Short Run Marginal Cost curve of a firm:



Short Run Marginal Cost

The short-run marginal cost (SRMC), short-run average cost (SRAC) and average variable cost (AVC) are U- shaped due to increasing returns in the

beginning followed by diminishing returns. SRMC curve intersects SRAC curve and the AVC curve at their lowest points.

What is Long Run Cost?

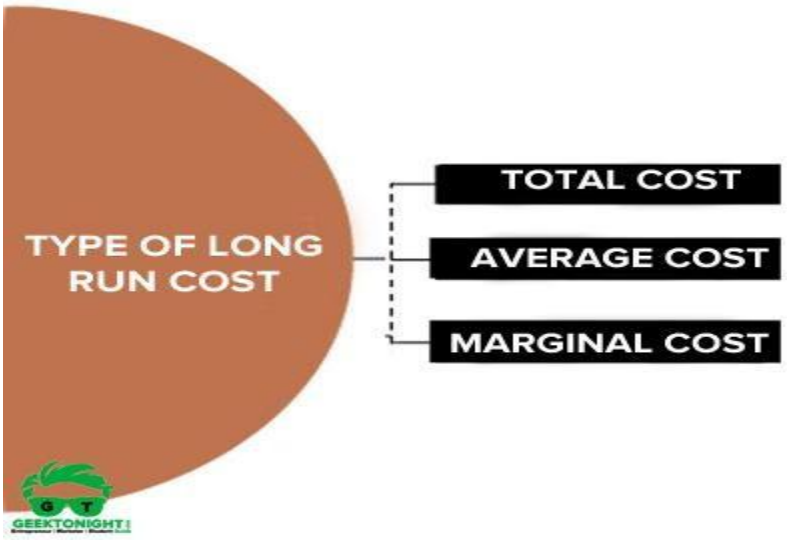
Long run cost refers to the time period in which all factors of production are variable. Long-run costs are incurred by a firm when production levels change over time. In the long run, the factors of production may be utilised in changing proportions to produce a higher level of output. In such a case, the firm may not only hire more workers, but also expand its plant size, or set up a new plant to produce the desired output.

Example: downsizing or expanding an organisation, entering or leaving a market, etc., involve long-run costs. To understand the long run cost-output relations, it can be assumed that a long-run cost curve is composed of a series of short-run cost curves.

Type of Long Run Cost

What is Long Run Cost Type? There are basically three **types of long run costs**:

1. **Long Run Total Cost**
2. **Long Run Average Cost**
3. **Long Run Marginal Cost**



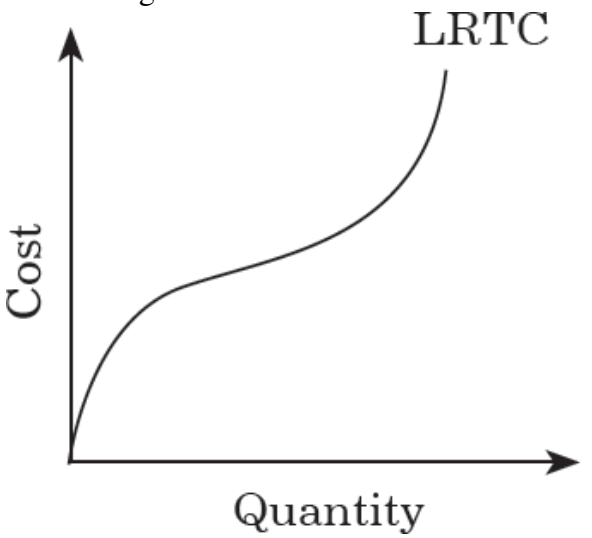
Type of Long Run Cost

Long Run Total Cost

Long-run total cost (LRTC) refers to the total cost incurred by an organisation for the production of a given level of output when all factors of production are variable.

Example: Long run total cost is the per unit cost incurred by a firm when it expands the scale of its operations not just by hiring more workers, but also by building a larger factory or setting up a new plant. The shape of the long-run total cost curve is S-shaped, much similar to a short-run total cost curve. For relatively small quantities of output, the slope begins to flatten. Then, for larger quantities the slope makes a turn-around and becomes steeper.

The figure depicts the long-run total cost curve of a firm:



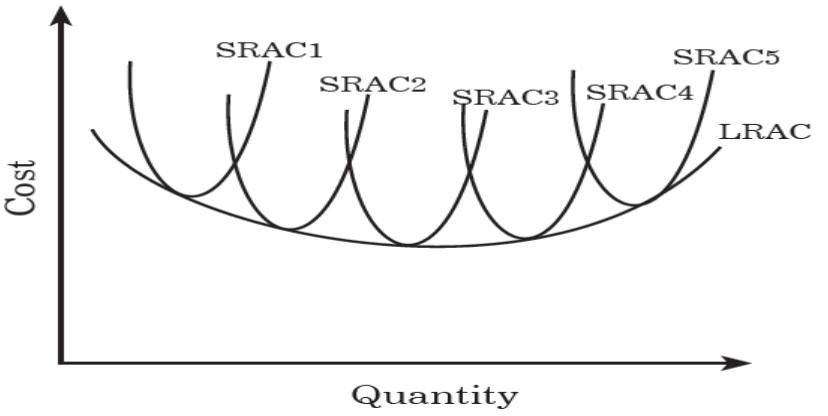
Long Run Average Cost

Long-run average cost (LRAC) refers to per unit cost incurred by a firm in the production of a desired level of output when all the inputs are variable.

Example: long-run average cost curve of a firm depicts the minimum average cost at which the firm can produce any given level of output in the long run. The LRAC of a firm can be obtained from its individual short-run average cost curves.

Each SRAC curve represents the firm's short-run cost of production when

different amounts of capital are used. The shape of the LRAC curve is similar to the SRAC curve although the U-shape of the LRAC is not due to increasing, and later diminishing marginal.



The **negative slope of the LRAC curve** depicts economies of scale and increasing returns to scale. On the other hand, the positive slope of the LRAC curve represents diseconomies of scale or decreasing returns to scale.

Figure depicts the long-run average cost curve of a firm:
Long Run Average Cost

In Figure, there are five alternative scales of a plant SRAC1, SRAC2, SRAC3, SRAC4 and SRAC5. However, in the long run, the firm will operate the scale LRAC, which is the most profitable to it.

Long Run Marginal Cost

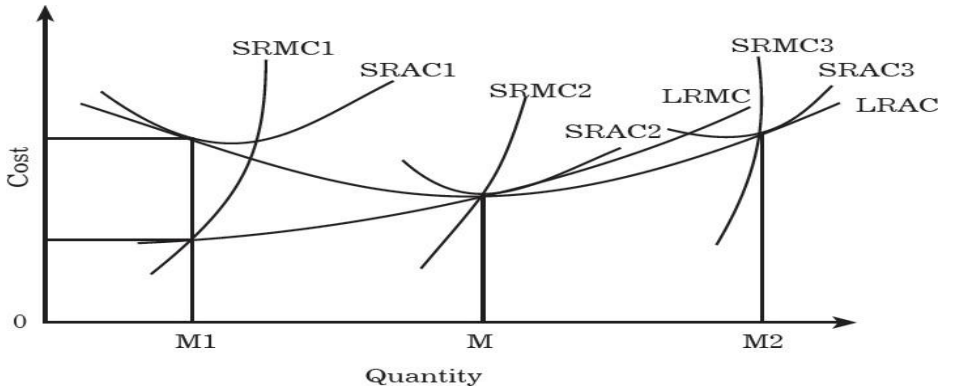
Long-run marginal cost (LRMC) refers to the incremental cost incurred by an organisation for producing a given output level when none of the input is constant.

Example: long-run marginal cost is the additional cost that the firm incurs when it expands the scale of its operations not just by hiring additional workers, but also by increasing the plant capacity.

The LRMC is the slope of the **Long run marginal cost curve**. The shape of the LRMC curve is similar to the SRMC curve although the U-shape of the LRMC is not due to increasing, and later diminishing marginal.

The **negative slope of the LRMC curve** depicts economies of scale and increasing returns to scale. On the other hand, the positive slope of the LRMC curve represents diseconomies of scale or decreasing returns to scale.

LRMC curve can be derived from the LRAC curve. In Figure, at output OM1, SRMC1 = LRMC. At SRMC2, LRMC = SRAC2 = LRAC. SRAC1 = LRAC (at tangency) and SRMC1 = LRMC (at intersection).



Long Run Marginal Cost

(a) Cost-Output Relation in the short-run:

The cost concepts made use of in the cost behavior are total cost, Average cost, and marginal cost. Total cost is the actual money spent to produce a particular quantity of output. Total cost is the summation of fixed and variable costs.

$$TC=TFC+TVC$$

Up to a certain level of production total fixed cost i.e., the cost of plant, building, equipment etc, remains fixed. But the total variable cost i.e., the cost of labor, raw materials etc., Vary with the variation in output. Average cost is the total cost per unit. It can be found out as follows.

$$AC=TC/Q$$

The total of average fixed cost (TFC/Q) keep coming down as the production is increased and average variable cost (TVC/Q) will remain constant at any level of output. Marginal cost is the addition to the total cost due to the production of an additional unit of product. It can be

arrived at by dividing the change in total cost by the change in total output. In the short-run there will not be any change in total fixed cost. Hence change in total cost implies change in total variable cost only.

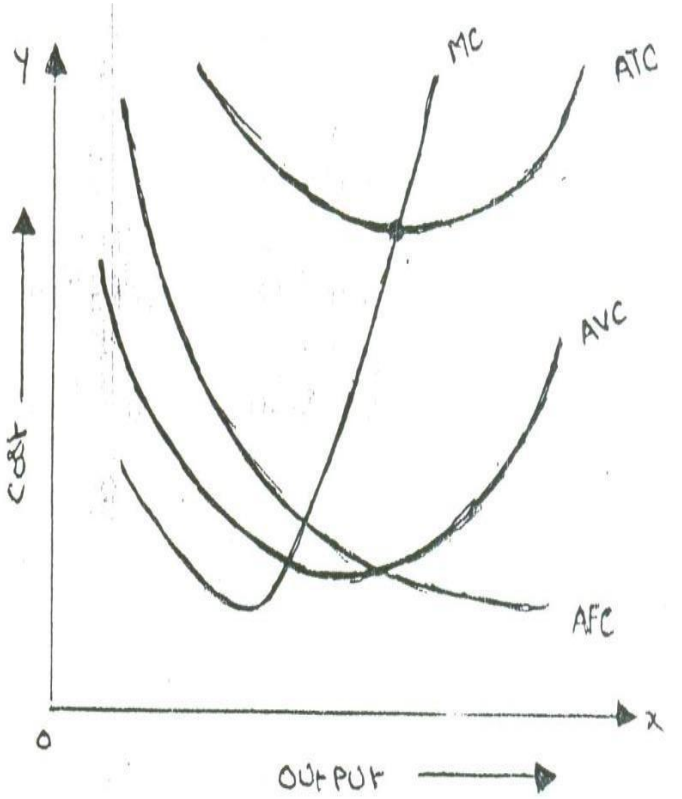
Cost – output relations

Units of Output Q	Total fixed cost TFC	Total variable cost TVC	Total cost (TFC + TVC) TC	Average variable cost (TVC / Q) AVC	Average fixed cost (TFC / Q) AFC	Average Total cost (TC/Q) AC	Marginal cost MC(
0	60	-	60	-	-	-	-
1	60	20	80	20	60	80	20
2	60	36	96	18	30	48	16
3	60	48	108	16	20	36	12
4	60	64	124	16	15	31	16
5	60	90	150	18	12	30	26
6	60	132	192	22	10	32	42

The above table represents the cost-output relation. The table is prepared on the basis of the law of diminishing marginal returns. The fixed cost Rs. 60 May include rent of factory building, interest on capital, salaries of permanently employed staff, insurance etc. The table shows that fixed cost is same at all levels of output but the average fixed cost, i.e., the fixed cost per unit, falls continuously as the output increases. The expenditure on the variable factors (TVC) is at different rate. If more and more units are produced with a given physical capacity the AVC will fall initially, as per the table declining up to 3rd unit, and being constant up to 4th unit and then rising. It implies that variable factors produce more efficiently near a firm's optimum capacity than at any other levels of output. And later rises. But the rise in AC is felt only after the start rising. In the table 'AVC' starts rising from the 5th unit onwards whereas the 'AC' starts rising from

the 6th unit only so long as 'AVC' declines 'AC' also will decline. 'AFC' continues to fall with an increase in Output. When the rise in 'AVC' is more than the decline in 'AFC', the total cost again begins to rise. Thus, there will be a stage where the 'AVC', the total cost again begins to rise thus there will be a stage where the 'AVC' may have started rising, yet the 'AC' is still declining because the rise in 'AVC' is less than the droop in 'AFC'. Thus, the table shows an increasing return or diminishing cost in the first stage and diminishing returns or diminishing cost in the second stage and followed by diminishing returns or increasing cost in the third stage.

The short-run cost-output relationship can be shown graphically as follows.



In the above graph the "AFC' curve continues to fall as output rises an account of its spread over more and more units Output. But AVC curve (i.e., variable cost per unit) first falls and then rises due to the operation of the law of variable proportions. The behavior of "ATC' curve depends

upon the behavior of 'AVC' curve and 'AFC' curve. In the initial stage of production both 'AVC' and 'AFC' decline and hence 'ATC' also decline. But after a certain point 'AVC' starts rising. If the rise in variable cost is less than the decline in fixed cost, ATC will still continue to decline otherwise AC begins to rise. Thus, the lower end of 'ATC' curve thus turns up and gives it a U-shape. That is why 'ATC' curve are U-shaped. The lowest point in 'ATC' curve indicates the least-cost combination of inputs. Where the total average cost is the minimum and where the "MC' curve intersects 'AC' curve, It is not be the maximum output level rather it is the point where per unit cost of production will be at its lowest.

The relationship between 'AVC', 'AFC' and 'ATC' can be summarized up as follows:

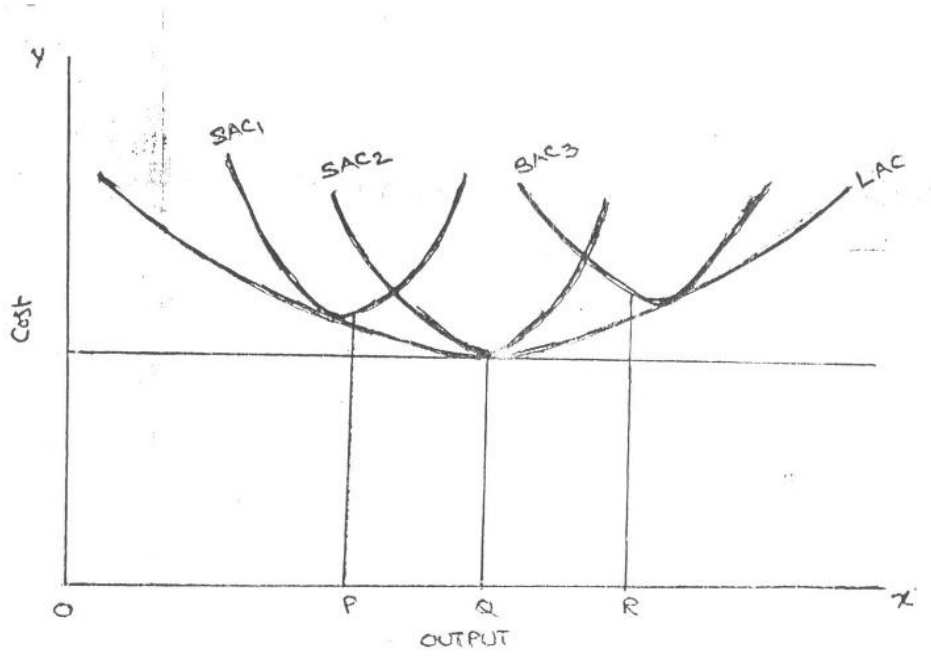
1. If both AFC and 'AVC' fall, 'ATC' will also fall.
2. When 'AFC' falls and 'AVC' rises

a. 'ATC' will fall where the drop in 'AFC' is more than the raise in 'AVC'.
b. 'ATC' remains constant is the drop in 'AFC' = rise in 'AVC'
c. 'ATC' will rise where the drop in 'AFC' is less than the rise in 'AVC'

b. Cost-output Relationship in the long-run:

Long run is a period, during which all inputs are variable including the one, which are fixes in the short-run. In the long run a firm can change its output according to its demand. Over a long period, the size of the plant can be changed, unwanted buildings can be sold staff can be increased or reduced. The long run enables the firms to expand and scale of their operation by bringing or purchasing larger quantities of all the inputs. Thus, in the long run all factors become variable. The long-run cost-output relations therefore imply the relationship between the total cost and the total output. In the long-run cost-output relationship is influenced by the law of returns to scale. In the long run a firm has a number of alternatives in regards to the scale of operations. For each scale of production or plant size, the firm has an appropriate short-run average cost curves. The short-run average cost (SAC) curve applies to only one plant whereas the long-run average cost (LAC) curve takes in to consideration many plants. The long-run cost-output relationship is shown graphically with the help of

"LCA' curve.



To draw on 'LAC' curve we have to start with a number of 'SAC' curves. In the above figure it is assumed that technologically there are only three sizes of plants – small, medium and large, 'SAC', for the small size, 'SAC2' for the medium size plant and 'SAC3' for the large size plant. If the firm wants to produce 'OP' units of output, it will choose the smallest plant. For an output beyond 'OQ' the firm wills optimum for medium size plant. It does not mean that the OQ production is not possible with small plant. Rather it implies that cost of production will be more with small plant compared to the medium plant. For an output 'OR' the firm will choose the largest plant as the cost of production will be more with medium plant. Thus, the firm has a series of 'SAC' curves. The 'LCA' curve drawn will be tangential to the entire family of 'SAC' curves i.e., the 'LAC' curve touches each 'SAC' curve at one point, and thus it is known as envelope curve. It is also known as planning curve as it serves as guide to the entrepreneur in his planning to expand the production in future. With the help of 'LAC' the firm determines the size of plant which yields the lowest average cost of producing a given volume of output it anticipates.

3.4.COST-VOLUME-PROFIT ANALYSIS

Cost-volume-profit analysis or CVP analysis, also known as break-even analysis, is a financial planning tool leaders use to create effective short-term business strategies. It conveys to business decision-makers the effects of changes in selling price, costs, and volume on profits (in the short term). Cost-Volume-Profit (CVP) analysis is a fundamental financial tool that helps businesses understand the relationship between costs, sales volume, and profitability. It allows firms to determine how changes in these factors impact their overall financial performance. CVP analysis is widely used in managerial decision-making, particularly in setting sales targets, pricing strategies, and cost management. By analysing the break-even point and contribution margin, businesses can plan for sustainable profitability and assess the financial viability of different operational strategies.

Key Components of CVP Analysis

Selling Price

The selling price is the amount at which a product or service is sold to customers. It plays a crucial role in determining revenue and profitability. A higher selling price can lead to increased revenue per unit but may also reduce demand if customers perceive the price as too high. Conversely, a lower price may attract more customers but can reduce profit margins. Therefore, businesses must carefully balance pricing decisions based on market conditions, customer preferences, and cost structures to maximize profitability.

Variable Costs

Variable costs are expenses that change directly with the level of production or sales volume. These include costs such as raw materials, direct labour, packaging, and transportation. Since variable costs fluctuate with production levels, they are crucial in determining the contribution margin and break-even point. Businesses aim to optimize variable costs by negotiating better supplier rates, improving production efficiency, and reducing waste to enhance profitability. Managing variable costs effectively ensures that each unit sold generates a sufficient margin to cover fixed costs and contribute to profit.

Fixed Costs

Fixed costs are expenses that remain constant regardless of the production or sales volume. These include rent, salaries of permanent employees, insurance, and depreciation of equipment. Since fixed costs do not change with output, they must be covered by the contribution margin to ensure profitability. Businesses with high fixed costs require a higher sales volume to break even, whereas firms with lower fixed costs can achieve profitability at lower sales levels. Efficiently managing fixed costs through budget control, cost-cutting measures, and strategic investments can help improve a company's financial health.

Contribution Margin

The contribution margin represents the amount remaining after deducting variable costs from sales revenue. It indicates how much revenue is available to cover fixed costs and generate profit. The contribution margin is calculated as:

$$\text{Contribution Margin} = \text{Sales Revenue} - \text{Variable Costs}$$

A high contribution margin suggests that a business retains more revenue from each sale to cover fixed costs and earn a profit. Companies can increase their contribution margin by either increasing the selling price or reducing variable costs. This metric is essential for decision-making, as it helps determine pricing strategies, cost control measures, and profitability forecasting.

Break-Even Point

The break-even point is the level of sales at which total revenue equals total costs, resulting in neither profit nor loss. It is a critical figure in CVP analysis, as it helps businesses determine the minimum sales volume required to cover costs. The break-even point is calculated using the formula:

$$\text{Break-Even Point (Units)} = \text{Fixed Costs} \quad \backslash$$

Contribution Margin per Unit

Understanding the break-even point allows businesses to set realistic sales targets, assess risk levels, and make informed pricing and cost-management decisions. If a company operates below the break-even

point, it incurs losses, while sales beyond this point contribute to profit generation.

Importance of CVP Analysis

Determining the Break-Even Point

CVP analysis is widely used to calculate the break-even point, which helps businesses understand how many units they need to sell to cover costs. Knowing the break-even point enables managers to set realistic sales goals and develop pricing strategies that ensure profitability. It also helps in evaluating the financial feasibility of new projects or business expansions. By determining this critical threshold, businesses can assess their operational efficiency and take corrective actions if needed.

Profit Planning

By analysing different sales levels, CVP analysis helps businesses forecast profits and set revenue targets. It enables firms to understand how changes in production, pricing, or costs impact overall profitability. Businesses can use CVP models to test various scenarios, such as increasing production, launching new products, or adjusting pricing, to identify the most profitable strategies. This proactive approach to profit planning ensures that businesses remain competitive and financially sustainable.

Pricing Decisions

Pricing is a crucial factor in a company's profitability, and CVP analysis helps determine the best pricing strategy. By examining the relationship between price, volume, and costs, businesses can set prices that maximize revenue while ensuring cost recovery. A higher price increases the contribution margin but may reduce demand, while a lower price can increase sales volume but may not cover costs effectively. CVP analysis helps businesses strike the right balance to achieve optimal profitability.

Cost Control

Identifying fixed and variable costs through CVP analysis allows businesses to manage expenses efficiently. Companies can focus on reducing unnecessary costs, improving operational efficiency, and increasing productivity to maintain healthy profit margins. By analysing cost structures, businesses can identify areas where expenses can be minimized without compromising product quality or customer satisfaction.

Effective cost control measures ensure long-term profitability and financial stability.

Decision-Making for Product Mix

Businesses that sell multiple products use CVP analysis to determine which products contribute the most to profitability. By analysing the contribution margin of each product, companies can decide which items to prioritize in production and marketing efforts. Products with higher contribution margins should receive more focus, while low-margin products may need pricing adjustments or cost reductions. This analysis helps firms optimize their product mix and allocate resources efficiently to maximize profits.

Assumptions of CVP Analysis

CVP analysis is based on several key assumptions that simplify calculations but may not always reflect real-world complexities. First, it assumes that selling prices, variable costs, and fixed costs remain constant, which may not always be the case due to inflation, market competition, or production inefficiencies. Second, it assumes that all units produced are sold, meaning there is no change in inventory levels. Third, it assumes that the company sells either a single product or maintains a constant sales mix if multiple products are involved. Finally, it assumes that productivity and efficiency remain unchanged regardless of production volume. While these assumptions simplify analysis, businesses should use CVP analysis alongside other financial tools for more accurate decision-making.

Example of CVP Analysis

Consider a company that sells a product for $50 per unit, with a variable cost of $30 per unit and fixed costs of $20,000. The contribution margin per unit is:

$$50 - 30 = 20$$

Using the break-even formula:

$$20{,}000 / 20 = 1{,}000 \text{ units}$$

This means the company must sell **1,000 units** to cover all costs and reach the break-even point. If it sells more than 1,000 units, it earns a profit; if it sells fewer, it incurs a loss. This simple CVP analysis helps the company set sales targets and pricing strategies.

Break-even Chart

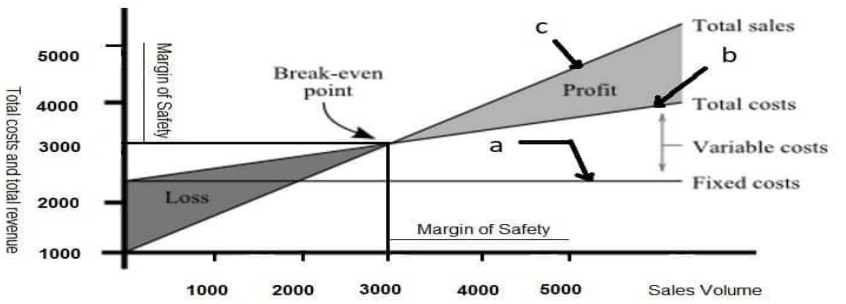
A Break-even chart is the graphical representation of the relation between cost and revenue at a given time. It is a graphic tool to determine the Break-even point and profit potential under the varying condition of output and costs. In 1930 Walter Rautenstruch an Industrial engineer and a professor of Columbia university, invented the Break-even chart. It was the first planning tools that become available to production management and management accountancy. Some modifications have been done on that chart and now it becomes a more useful tool for the production management field.

Functions of Break-even Chart

1. A break-even chart gives a clearer view of the position of a business.
2. It is one of the most useful graphic presentations of an economic rather than an accounting concept.
3. It portrays profit or loss at various output levels.
4. Break-even chart marks no profit no loss situation or Break-even point.
5. It portrays the margin of safety.
6. It can help to make specific plans to affect the profits through the control of expenses.
7. This chart can sum up the impact of alternative decisions on costs and profits.
8. It is a decision-making tool in the hand of management.

Construction of Break-even chart

The figure below portraying construction of Break-even chart.



Break-even Chart (www.financialaccountancy.org)

The Break-even chart consists of an **ordinate (y-axis)** which representing total cost and total revenue, And **abscissa (x-axis)** representing units of output or sales volume and number of unit produced.

There are 3 lines marked as **a,b** and **c** on the breakeven chart.

Line 'a' representing fixed cost function, fixed cost doesn't change with the increase of sales volume.

Line 'b' representing the **total cost** which is an increasing linear, monotonic function that increases with an increasing volume of production. Total cost results from the summation of fixed costs and variable costs.

line 'c' represents **sells revenue** line or **total sales**, this line shows the income at varying levels of output or production volume.

Analysis of break-even Chart

1. The breakeven point making no profit and no loss situation occurs for a given volume of production.
2. The grey area between the total cost line and total sales revenue line on the left side of the breakeven point marks loss to the concern. The grey area between the same lines on the right side of the break-even point represents the profit.
3. the profit comes only when more than a minimum volume of output is reached and profit increases at a faster rate than the increase of the total costs.
    - Profit margin % = 1- (variable cost / sale)
    - Where, sale = fixed cost + Variable cost as a % of the sale.
4. Effect of increase in fixed costs (because of purchasing new machines) increase the total cost, thus Break-even point shifts towards the right-hand side. that means the company's profit position will be impaired. So, management should study the market before purchasing new equipment.
5. The effect of an increase in variable costs (hire new of labour) increases the total cost, which would shift the break-even point towards the right-hand side. That decrease the profit for the same unit of output.
6. Effect of increase in sales price shifts the breakeven point towards the left-hand side. it increases the company's profit for the same volume of output.

Margin of safety

The margin of safety presented on the Breakeven chart by the distance between break-even point and the production output as shown in the chart. A large distance indicates that profit will be there even if there is a serious drop in production. If the distance is relatively small, it indicates profit will be reduced considerably with a sign of a small drop in productive capacity or sales.

Angle of incidence

Angle of incidence is the angle at which sales revenue line cuts the total cost line. A large angle indicates that profit making at a high rate. High **margin of safety** with a large incidence angle are indication of favorable business position.

Limitations of break-even chart

1. The Break-even point is difficult to determine in many cases due to market condition may not remain constant over the range of projected capacity.
2. The total cost line representing the summation of variable costs and fixed costs need to be a straight line, but actual costs do not usually vary in direct proportion.
3. A Breakeven chart represents a static figure, whereas business operations are not static.
4. The Break-even analysis chart presents difficulties when an enterprise produces a variety of products.

CHAPTER IV

MARKET STRUCTURES AND PRICING DECISIONS

4.1.MARKET STRUCTURES

Market structures describe the competitive environment in which businesses operate. They determine how firms set prices, compete with one another, and enter or exit markets. The four main types of market structures are perfect competition, monopoly, monopolistic competition, and oligopoly. Each structure differs based on factors such as the number of firms, product differentiation, market power, and barriers to entry

The structure of market is based on its following features:

The degree of seller Concentration:

This refers to the number of sellers and their market share for a given product or service in the market.

The degree of buyer concentration:
This refers to the number of buyers and their extent of purchases of a given product or service in the market.

The degree of product differentiation:
This refers to the extent by which the product of each trader is differentiated from that of the other. Product differentiation can take several forms as varieties, brands all of which are sufficiently similar to distinguish them as a group, from other products eg: cars

The conditions of entry into the market:
There could be certain restrictions to enter or exit from the markets. The degree with which one can enter the market or exit from the markets also determines the market structure.

Types of Competition

Based on the degree of competition, the market can be divided into

Perfect market Competition

Imperfect market Competition

PERFECT MARKET COMPETITION

Perfect competition is an ideal market structure where a large number of firms sell identical products, and no single firm has control over prices. It

represents a highly competitive environment where businesses operate efficiently, and consumer welfare is maximized. While perfect competition is rare in the real world, it serves as a benchmark for analysing other market structures.

Characteristics of Perfect Competition

A market must meet the following conditions to be classified as perfectly competitive:

Large Number of Buyers and Sellers: No single buyer or seller can influence the market price. Each firm is small relative to the total market supply.

Homogeneous Products: All firms sell identical or nearly identical products. Consumers do not prefer one firm's product over another, making branding and advertising unnecessary.

Free Entry and Exit: There are no significant barriers to entering or exiting the market. If firms make abnormal profits, new firms enter, increasing supply and driving profits down. If losses occur, firms leave the market.

Perfect Knowledge: Consumers and producers have full knowledge of prices, products, and market conditions. This prevents firms from charging higher prices or misleading buyers.

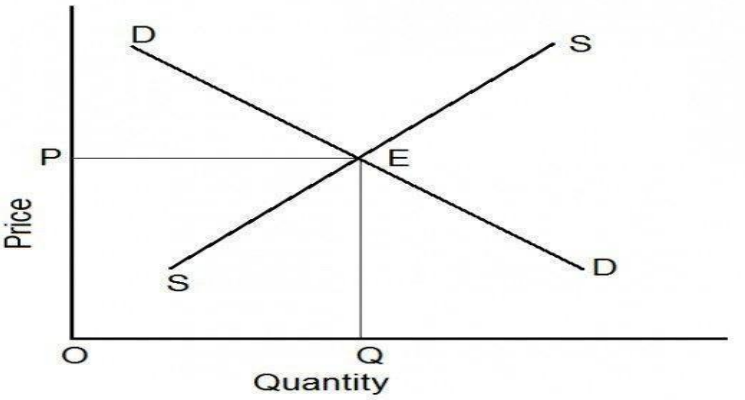
Price Takers: Since individual firms cannot influence market prices, they must accept the price determined by the overall market demand and supply.

Output Determination In Case Of Perfect Competition

The price and output of the firm are determined under perfect competition, based on Demand and Supply, at which price demand and supply's are interest the seller will follow that price.

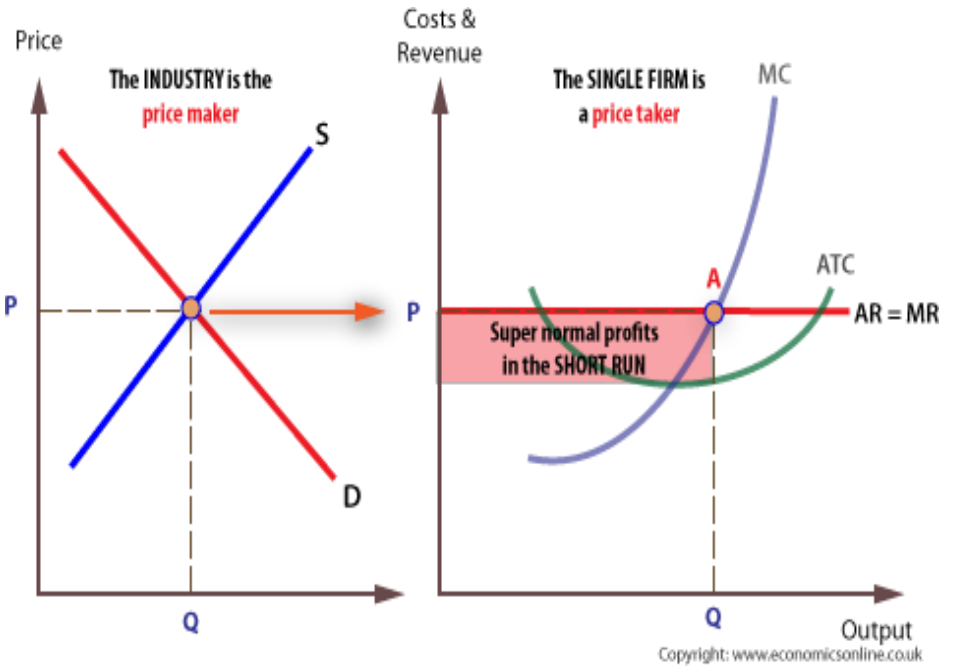
Price	Demand	Supply
60	20,000	30,000
50	25,000	25,000
40	30,000	20,000

Figure 1



Equilibrium in Perfect competitive market

- ✓ MR = MC
- ✓ MC Curve cuts MR Curve from below.
- ✓ AR > AC



IMPERFECT COMPETITION

A Competition is said to be imperfect when it is not perfect. In other words when any or most of the above conditions do not exist in a given market. It is referred to as imperfect market. Based on the number of buyers and sellers, the imperfect markets are classified as explained below. The structure of market varies as below.

The various imperfect competitions are:

- Monopoly
- Monopolistic Competition
- Oligopoly
- Duopoly

MONOPOLY

Monopoly refers to a situation where a single firm is in a position to control either supply or price of a particular product/services. In monopoly the seller has rights to fix the price as he like. Monopoly can be interpreted in to two ways. When there is a sole supplier, it is a case of a pure monopoly. In this case, the firm and the industry are one and the same. E.g.: RBI is the sole supplier of currency notes in India. Another way is the firm supplying a half of the total market may have a greater market power, if the rest of the market is shared by a number of small firms, when the remaining firms are equally big it may face competition from the other firms.

Features of Monopoly

1. Single Seller and Market Control

The most defining feature of a monopoly is that one firm is the sole producer and seller of a particular good or service. Unlike other market structures where multiple firms compete, a monopolist faces no direct rivals. As a result, the firm has complete control over supply, allowing it to set prices according to its profit-maximizing strategy. Consumers have no alternative sources for the product, making them entirely dependent on the monopolist.

2. Absence of Close Substitutes

A monopoly exists when the product being offered has no close substitutes in the market. This means that consumers cannot easily switch to an

alternative product if they find the price too high. For example, a railway transportation service in a region where no other form of transportation exists is a monopoly. The lack of substitutes gives the monopolist significant power to control demand and dictate prices without fearing customer loss to competitors.

3. Price Maker

Unlike firms in perfect competition that are price takers, a monopolist is a price maker. This means the firm has the ability to set and adjust prices according to market demand. However, the monopolist cannot charge excessively high prices without losing customers. If prices are too high, consumers may reduce their demand or look for alternative ways to meet their needs. The firm must balance profit maximization with consumer demand to ensure long-term sustainability.

4. High Barriers to Entry

Monopolies exist because there are strong barriers that prevent new firms from entering the market. These barriers can be:

Legal Barriers: Governments may grant exclusive rights, patents, or licenses to a single firm, preventing competition. For example, pharmaceutical companies hold patents for new drugs, preventing others from manufacturing the same product.

Economic Barriers: High startup costs, economies of scale, or significant capital investments make it difficult for new firms to compete. Industries such as electricity generation or telecommunications require large infrastructure investments, discouraging new entrants.

Control Over Key Resources: A monopoly can arise if a firm controls essential raw materials needed for production. For instance, De Beers historically dominated the diamond industry by controlling major diamond mines.

5. Price Discrimination

Since a monopolist controls the market, it can charge different prices to different customers based on their ability to pay. This practice is called price discrimination and occurs when the firm sets different prices for the same product based on customer segments, location, or purchasing

behaviour. Examples include airline ticket pricing, student discounts, and peak-hour pricing in transportation services. Price discrimination helps monopolists maximize profits by capturing consumer surplus.

6. Lack of Innovation and Consumer Choice

Since a monopolist faces no competition, it may have little incentive to innovate, improve quality, or reduce prices. Unlike firms in competitive markets that must constantly improve to attract customers, a monopolist does not feel pressure to enhance its offerings. Additionally, consumers are left with limited choices, as no alternative products are available. This can lead to poor service, outdated technology, and inefficiencies if the firm becomes complacent. However, some monopolists invest heavily in research and development, especially if they hold patented technologies or expect future competition.

7. Government Regulation and Monopoly Control

Due to the potential negative effects of monopolies, governments often regulate them to prevent unfair pricing and market exploitation. Authorities may impose price controls, break monopolies into smaller firms, or introduce competition laws to protect consumers. For example, antitrust laws in the U.S. have been used to break up monopolistic companies like Standard Oil and AT&T. In some cases, governments allow natural monopolies to operate (e.g., electricity and water supply) but regulate their prices to ensure fair access for consumers.

Examples of Monopolies

Public Utilities: Electricity, water supply, and natural gas companies are often government-regulated monopolies.

Technology Companies: Some tech giants hold monopolistic power in specific industries due to their dominance in software, search engines, or e-commerce.

Pharmaceutical Industry: Drug companies with patents on new medicines have temporary monopolies until their patents expire.

Price and output determination under monopoly

In monopoly price and output determination is based on elasticity of demand, where elasticity of demand is greater than one

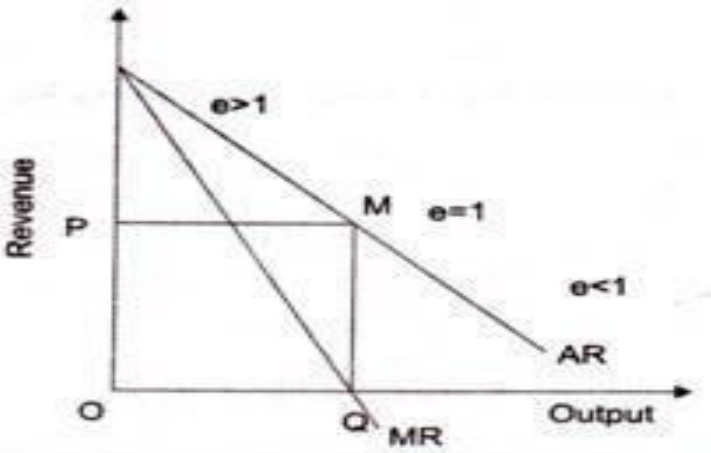


Figure-10: MR and AR Curves under Monopoly

Equilibrium in Monopoly market

In the case of monopoly, the marginal revenue (MR) is always less than the average revenue (AR) because of discounts or concessions.

- ✓ MR = MC
- ✓ MC Curve cuts MR Curve from below.
- ✓ AR > AC

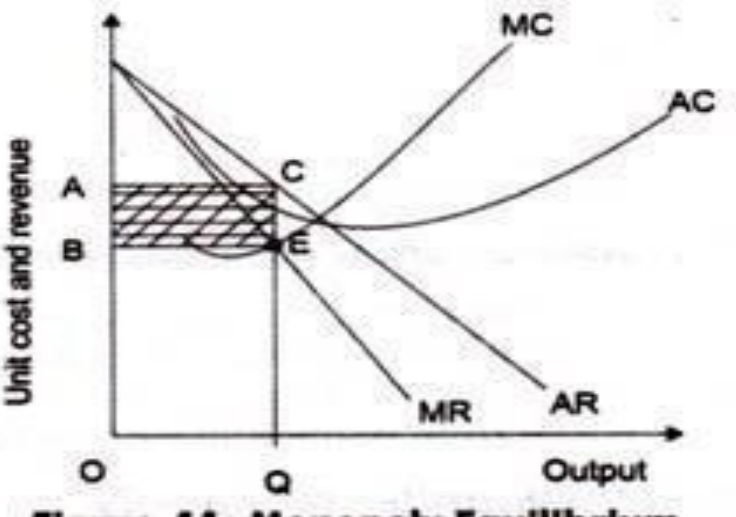


Figure-11: Monopoly Equilibrium

MONOPOLISTIC COMPETITION

Monopolistic competition is a market structure where many firms sell similar but not identical products. Unlike perfect competition, where products are homogeneous, firms in monopolistic competition differentiate their products through branding, quality, design, and customer service. This differentiation gives firms some degree of pricing power, allowing them to charge slightly different prices for their unique offerings. However, since there are many competitors, firms cannot raise prices too high without losing customers. This market structure is commonly found in industries such as restaurants, clothing brands, cosmetics, and consumer electronics, where products are not identical, and branding plays a key role in attracting customers.

Features of Monopolistic Competition

a) Large Number of Firms

Monopolistic competition consists of many firms operating in the market. Unlike a monopoly (where a single firm dominates) or an oligopoly (where a few large firms control the market), monopolistic competition allows many small and medium-sized businesses to coexist. Each firm has a relatively small market share, and no single firm can dominate the industry.

b) Product Differentiation

A key characteristic of monopolistic competition is product differentiation. Firms sell products that are similar but not identical, meaning each firm creates a unique appeal for its product. Differentiation can occur in various ways:

- **Physical differences:**

  Variations in design, features, or ingredients (e.g., different flavors of soft drinks).

- **Branding and advertising:**

  Creating a strong brand image to build customer loyalty (e.g., Nike vs. Adidas).

- **Customer service:**

- Offering better after-sales services, warranties, or exclusive benefits.

- Location convenience: Businesses in different locations may attract different consumer groups (e.g., local restaurants vs. chain restaurants).

c) Some Degree of Price Control

Since firms offer differentiated products, they have some control over pricing. Unlike perfect competition (where firms are price takers), monopolistically competitive firms act as price makers to a limited extent. A firm can charge a slightly higher price if customers perceive its product as superior. However, if the price difference is too large, consumers may switch to competitors.

d) Freedom of Entry and Exit

In the long run, new firms can enter the market freely, and existing firms can exit without major restrictions. This ensures that if a firm earns supernormal profits in the short run, new competitors will enter, increasing competition and driving profits down. Conversely, if firms incur losses, they can exit the market easily. This cycle ensures that in the long run, firms only earn normal profits (where total revenue equals total costs).

e) Heavy Reliance on Advertising and Branding

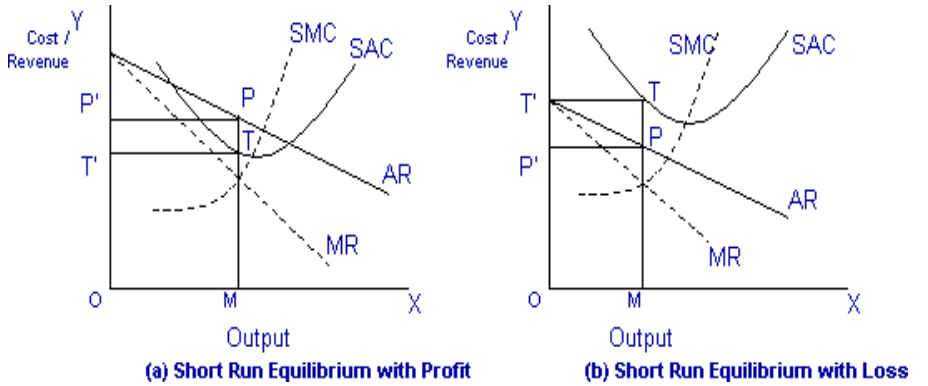
Since firms in monopolistic competition sell differentiated products, advertising plays a crucial role in attracting and retaining customers. Firms spend significant amounts on marketing, promotions, and endorsements to build a brand identity and create consumer loyalty. For example, fast-food chains like McDonald's and Burger King invest heavily in advertising to maintain their market presence.

Price Output determination under monopolistic competition:

Under monopolistic competition, the firm will be in equilibrium position when marginal revenue is equal to marginal cost. So long the marginal revenue is greater than marginal cost, the seller will find it profitable to expand his output, and if the MR is less than MC, it is obvious he will reduce his output where the MR is equal to MC. In short run, therefore, the firm will be in equilibrium when it is maximising profits, i.e., when MR = MC.

Short Run Equilibrium:

Short run equilibrium is illustrated in the following diagram:



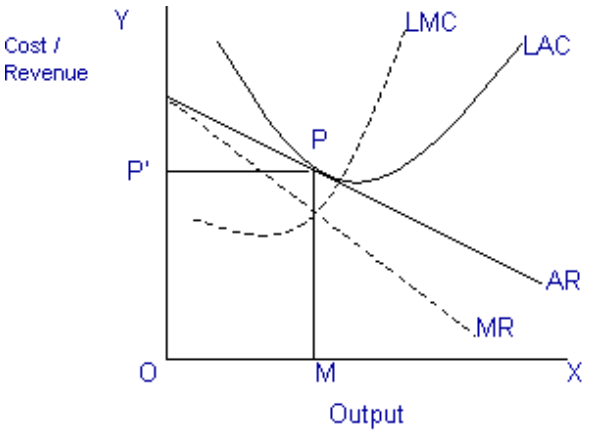
In the above diagram, the short run average cost is MT and short run average revenue is MP. Since the AR curve is above the AC curve, therefore, the profit is shown as PT. PT is the supernormal profit per unit of output. Total supernormal profit will be measured by multiplying the supernormal profit to the total output, i.e. PT × OM or PTT'P' as shown in figure

(a). The firm may also incur losses in the short run if it is facing AR curve below the AC curve. In figure

(b)MP is less than MT and TP is the loss per unit of output. Total loss will be measured by multiplying loss per unit of output to the total output, i.e., TP × OM or TPP'T'.

Long Run Equilibrium: Under monopolistic competition, the supernormal profit in the long run is disappeared as new firms are entered into the industry. As the new firms are entered into the industry, the demand curve or AR curve will shift to the left, and therefore, the supernormal profit will be competed away and the firms will be earning normal profits. If in the short run firms are suffering from losses, then in the long run some firms will leave the industry so that remaining firms are earning normal profits.

The AR curve in the long run will be more elastic, since a large number of substitutes will be available in the long run. Therefore, in the long run, equilibrium is established when firms are earning only normal profits. Now profits are normal only when AR = AC. It is further illustrated in the following diagram:



Long Run Equilibrium in Monopolistic Competition

OLIGOPOLY

Oligopoly is a market structure where a few large firms dominate the industry. These firms hold significant market power, influencing prices and output levels while also considering the actions of their competitors.

Features

1. Few Large Firms

One of the defining characteristics of an oligopoly is the presence of a small number of dominant firms. Since only a few firms control a substantial portion of the market, their decisions significantly impact competitors. This interdependence makes strategic decision-making crucial, as a change in price, production, or marketing by one firm can trigger similar responses from others.

2. Interdependence of Firms

Unlike perfect competition, where firms operate independently, oligopolistic firms are highly interdependent. Each firm's actions directly affect the market and influence the strategies of competitors. For example, if one firm reduces its prices, others may follow suit to maintain their market share. Similarly, if a firm launches a new product or increases advertising expenditure, rivals may respond with similar actions.

3. Barriers to Entry

Oligopolistic markets often have high barriers to entry, preventing new firms from easily entering the industry. These barriers may include high capital requirements, economies of scale, brand loyalty, government

regulations, and access to essential raw materials. Such obstacles protect existing firms from potential competition, allowing them to sustain their market dominance.

4. Price Rigidity and Price Wars

Oligopolies are characterized by price stability over long periods. Firms are reluctant to change prices frequently due to the risk of price wars. If a firm lowers its price, competitors may do the same, leading to reduced profits for all. Conversely, if a firm increases its price, customers may switch to rivals. To avoid such instability, firms often follow a practice of "price leadership," where one dominant firm sets the price, and others follow.

5. Product Differentiation

In many oligopolistic markets, firms try to differentiate their products through branding, quality improvements, packaging, and advertising. This differentiation helps firms create customer loyalty and reduce the direct impact of price competition. Some industries, like the automobile and smartphone sectors, exhibit strong product differentiation strategies.

6. Non-Price Competition

Since price wars can be detrimental to profits, firms engage in non-price competition to attract customers. This includes aggressive advertising, promotional offers, superior customer service, after-sales support, and innovation in product design. Non-price competition is particularly significant in industries like telecommunications, banking, and consumer electronics.

7. Collusion and Cartels

Firms in an oligopoly may engage in collusive behaviour, where they secretly or openly cooperate to control prices and market supply. This can take the form of cartels, where firms agree on pricing and output strategies to maximize collective profits. The Organization of the Petroleum Exporting Countries (OPEC) is a well-known example of a cartel that regulates oil prices globally. However, collusion is often illegal in many countries due to anti-trust laws.

8. Uncertainty in Decision-Making

Due to interdependence, firms in an oligopoly face uncertainty regarding

competitors' actions. Unlike a monopoly, where a single firm dominates, or perfect competition, where individual firms have little impact, oligopolists must constantly anticipate and react to rivals' strategies. This uncertainty makes game theory a crucial tool in understanding oligopoly behaviour.

9. High Profit Potential

Since firms in an oligopoly face limited competition due to high barriers to entry, they often enjoy significant pricing power and economies of scale. This results in higher profit margins compared to firms in more competitive market structures. However, the extent of profitability depends on factors like government regulations, market demand, and competitive behaviour.

10. Examples of Oligopoly Markets

Common examples of oligopoly markets include the automobile industry (Toyota, Ford, BMW), the airline industry (Boeing, Airbus), technology firms (Apple, Samsung, Google), and soft drink companies (Coca-Cola, Pepsi). In each of these industries, a few dominant players control a significant market share while competing through innovation, advertising, and strategic pricing.

4.2.PRICING

Pricing is one of the most critical elements of a business's success. It not only determines revenue but also influences customer perception, competitiveness, and overall market positioning. Setting the right price requires careful consideration of costs, market demand, customer expectations, and competition. Businesses adopt different pricing strategies and methods to achieve their goals and maintain profitability.

MEANING OF PRICING

Pricing refers to the process of determining the selling price of a product or service. It involves analyzing various factors such as production costs, consumer demand, competitor pricing, and market trends. The price of a product plays a vital role in attracting customers, maintaining profitability, and ensuring a competitive advantage. Businesses need to find a balance between affordability for customers and sustainability for the company. A price set too high may discourage potential buyers, while a price set too

low may lead to losses or devalue the product. For example, luxury brands often use high pricing to create exclusivity, while budget retailers set low prices to attract price-sensitive consumers.

Pricing is not just about covering costs but also about creating value, influencing buying decisions, and achieving business objectives. A well-thought-out pricing strategy helps companies differentiate themselves in the market and maximize their success.

OBJECTIVES OF PRICING

Every business sets pricing objectives based on its goals, market conditions, and competitive landscape. Pricing objectives guide companies in setting the right price and achieving their financial and strategic targets.

a) Profit Maximization

The primary goal of many businesses is to maximize profits. By setting the right price, companies aim to generate the highest possible revenue while covering production and operational costs. Businesses that focus on profit maximization often use premium pricing strategies, targeting customers willing to pay more for high-quality or exclusive products. For example, Apple sets higher prices for its iPhones to earn substantial profit margins while maintaining its brand image.

b) Sales Growth and Market Share

Some businesses prioritize increasing sales volume and market share over immediate profits. They may set lower prices to attract a larger customer base and outperform competitors. This approach is common in industries with intense competition, such as fast food and e-commerce. For example, new e-commerce platforms may offer heavy discounts to gain market traction and encourage customer loyalty.

c) Survival in the Market

During economic downturns, market fluctuations, or intense competition, businesses may reduce prices to survive. This strategy helps companies maintain their customer base and sustain operations even if profit margins are low. Small businesses and startups often use this pricing approach to establish themselves in the market and build brand recognition.

d) Customer Perception and Brand Image

Pricing directly impacts how customers perceive a brand. High prices

create an image of luxury and exclusivity, while lower prices attract budget-conscious consumers. For example, Rolex maintains high prices to reinforce its reputation as a premium watch brand, whereas budget airlines use low pricing to appeal to price-sensitive travelers.

e) Competitive Positioning

Companies adjust their prices based on competitor actions to remain competitive in the market. If a competitor lowers its prices, a business may do the same to retain customers. Alternatively, companies may focus on offering added value instead of lowering prices. For instance, some smartphone brands include free accessories or extended warranties instead of reducing product prices.

f) Cost Recovery

Certain industries focus on setting prices that recover production and operational costs. This is particularly relevant for industries with high research and development expenses, such as pharmaceuticals and automobile manufacturing. Companies in these industries set prices to ensure that all expenses are covered while maintaining profitability.

PRICING STRATEGIES

A pricing strategy is a structured approach businesses use to determine the price of their products or services. Different market conditions and business objectives require different pricing strategies to maximize revenue and maintain customer loyalty.

a) Cost-Based Pricing

Cost-based pricing involves calculating the total production cost of a product and adding a profit margin. This ensures that all costs are covered while maintaining profitability. This method is commonly used in manufacturing industries, where production costs remain relatively stable.

b) Competition-Based Pricing

In competition-based pricing, businesses analyze competitors' prices and set their own prices accordingly. Companies may choose to price their products lower, equal to, or higher than competitors based on their value proposition. For example, airlines adjust ticket prices based on competitor rates to attract passengers.

c) Value-Based Pricing

Value-based pricing focuses on the perceived value of a product rather than its production cost. Companies charge higher prices for products that offer superior quality, exclusivity, or unique benefits. This strategy is commonly used in luxury goods, software, and high-tech industries. For instance, Tesla prices its electric vehicles higher due to their advanced technology and environmental benefits.

d) Dynamic Pricing

Dynamic pricing allows businesses to change prices based on demand, market conditions, and competitor actions. This strategy is frequently used in the hospitality, travel, and e-commerce industries. For example, ride-sharing services like Uber increase prices during peak hours due to high demand.

e) Psychological Pricing

Psychological pricing influences consumer behavior by making prices appear more attractive. A common technique is setting prices at $9.99 instead of $10 to create the illusion of a lower price. This strategy is widely used in retail stores and online marketplaces.

f) Penetration Pricing

Penetration pricing involves setting a low initial price to attract customers and quickly gain market share. This is a common strategy for new product launches. For example, streaming services like Disney+ initially offered lower subscription rates to attract users before increasing prices.

g) Price Skimming

Price skimming is used when launching new products with unique features or innovations. Companies initially set high prices to maximize profits from early adopters, then gradually reduce prices over time. For example, new smartphones and gaming consoles start at a premium price before becoming more affordable.

h) Premium Pricing

Premium pricing is used for luxury and high-end products. Companies charge high prices to create an image of exclusivity and superior quality. This strategy is used by brands like Gucci, which maintain high prices to appeal to affluent customers.

i) Bundle Pricing

Bundle pricing involves selling multiple products together at a discounted rate compared to buying them separately. This strategy encourages customers to purchase more and increases overall sales. For example, fast-food restaurants offer combo meals at a lower price than individual items.

j) Promotional Pricing

Promotional pricing includes discounts, seasonal sales, and special offers to attract customers and increase sales in the short term. Events like Black Friday and Cyber Monday use promotional pricing to boost revenue.

PRICING METHODS

Pricing methods are specific techniques businesses use to calculate and finalize product prices. These methods ensure that prices align with the company's financial goals and market conditions.

a) Cost-Plus Pricing

In cost-plus pricing, businesses calculate the total production cost of a product and add a fixed percentage as profit. This method is simple and ensures profitability, making it widely used in manufacturing and retail industries.

b) Markup Pricing

Markup pricing is commonly used by retailers and wholesalers. They add a fixed percentage markup to the cost of goods before selling them to consumers. This ensures a consistent profit margin on each product sold.

c) Demand-Based Pricing

Demand-based pricing adjusts prices according to consumer demand. If demand is high, prices increase, and if demand decreases, prices are lowered to attract more buyers. This is common in hotel pricing and airline ticketing.

d) Geographical Pricing

Different prices are set based on location due to varying costs, demand, and competition. For instance, fuel prices vary by region based on transportation and tax differences.

e) Differential Pricing

Businesses charge different prices to different customer segments. For

example, movie theaters offer lower ticket prices to students and senior citizens.

GAME THEORY

Introduction to Game Theory

Game theory is a mathematical framework used to analyse strategic interactions among rational decision-makers. It is widely applied in economics, business, political science, psychology, and even biology. Game theory helps in understanding how individuals or firms make decisions in situations where the outcome depends not only on their own choices but also on the actions of others.

Developed by John von Neumann and Oskar Morgenstern in the 1940s, and later advanced by John Nash, game theory has become a crucial tool in analysing competitive and cooperative behaviours.

Key Concepts in Game Theory

1. Players

The individuals, firms, or entities involved in a strategic interaction are called players. In an oligopoly, for example, firms like Coca-Cola and Pepsi are players competing for market share.

2. Strategies

A strategy is a plan of action chosen by a player. Strategies can be pure (choosing a specific action) or mixed (choosing actions with probabilities).

3. Payoffs

A payoff represents the reward or outcome a player receives based on the strategies chosen by all players. Payoffs can be profits in business, votes in politics, or utility in social interactions.

4. Rationality and Self-Interest

Game theory assumes that players are rational and act in their self-interest, meaning they aim to maximize their payoffs. However, in real-world scenarios, emotions, psychology, and bounded rationality may influence decisions.

5. Types of Games

Game theory is categorized into different types based on players' behaviour, information availability, and cooperation levels.

Types of Games in Game Theory

1. Cooperative vs. Non-Cooperative Games

- Cooperative Games: Players can form alliances or binding agreements (e.g., firms forming cartels).
- Non-Cooperative Games: Players make decisions independently (e.g., price competition between firms).

2. Zero-Sum vs. Non-Zero-Sum Games

- Zero-Sum Games: The gain of one player equals the loss of another (e.g., poker, where one player's winnings equal another's losses).
- Non-Zero-Sum Games: The total payoff can be increased or decreased based on players' actions (e.g., trade negotiations where both parties can benefit).

3. Symmetric vs. Asymmetric Games

- Symmetric Games: Players have identical strategies and payoffs (e.g., the Prisoner's Dilemma).
- Asymmetric Games: Players have different strategies or payoffs (e.g., employer-employee wage negotiations).

4. Simultaneous vs. Sequential Games

- Simultaneous Games: Players make decisions at the same time, without knowing the other's choice (e.g., Rock-Paper-Scissors).
- Sequential Games: Players make decisions one after another, considering previous moves (e.g., chess).

Important Game Theory Models

1. The Prisoner's Dilemma

The Prisoner's Dilemma is the most famous example in game theory, demonstrating how rational players may not cooperate, even if it leads to a worse outcome for both.

Example Scenario:

Two criminals are arrested and interrogated separately. Each has two choices:

1. Confess (Defect) – Betray the other prisoner.
2. Stay Silent (Cooperate) – Remain loyal to the other prisoner.

Prisoner B	Stays Silent	Confesses
Prisoner A Stays Silent	Both get 2 years	A gets 5 years, B goes free
Prisoner A Confesses	A goes free, B gets 5 years	Both get 4 years

- The rational choice (dominant strategy) is to confess because it minimizes the worst possible outcome.
- However, if both prisoners remained silent, they would receive only 2 years, which is a better overall outcome.
- This dilemma explains why firms might engage in price wars despite it being harmful to both.

2. Nash Equilibrium

Proposed by John Nash, the Nash Equilibrium occurs when no player can improve their payoff by unilaterally changing their strategy, assuming others stick to their chosen strategies.

Example: Consider two companies, A and B, deciding whether to advertise or not.

Firm B	Advertise	Don't Advertise
Firm A Advertise	5, 5	10, 2
Firm A Doesn't Advertise	2, 10	8, 8

- If both firms advertise, they earn 5 each.
- If one advertises and the other does not, the advertiser gets 10, and the other gets 2.
- If neither advertises, both earn 8.
- Nash Equilibrium: If both advertise (5,5) because switching alone would make a firm worse off.

This explains why businesses spend heavily on marketing even when it would be mutually beneficial to reduce spending.

3. The Cournot Model (Oligopoly Application)

In an oligopoly, firms decide output levels rather than prices. In the Cournot Model, two firms choose output quantities, considering the other's decision.

- If Firm A increases production, Firm B reduces its output to prevent excess supply.
- If Firm A reduces production, Firm B increases its output to capture more market share.
- Eventually, an equilibrium is reached where neither firm can increase profits by changing output alone.

This explains competition in markets like airlines and tech industries, where firms must consider rivals' reactions to pricing and production decisions.

4. The Bertrand Model (Price Competition in Oligopoly)

In the Bertrand Model, firms compete by setting prices rather than output.

- If one firm sets a lower price, customers switch, forcing competitors to lower prices further.
- If both firms price similarly, they split the market and maintain stable profits.
- In equilibrium, firms set prices equal to marginal cost, resembling perfect competition.

This model is evident in airline ticket pricing and retail store price wars, where companies undercut each other until profit margins become minimal.

Real-World Applications of Game Theory

Business Strategy – Companies use game theory to predict competitors' moves in pricing, advertising, and product launches.

Politics – Political candidates strategize based on opponents' positions and public reactions.

Military and War – Nations use game theory to determine nuclear deterrence and military strategies.

Auctions – Bidders in online auctions (e.g., eBay, Google Ads) use strategic bidding to maximize value.

Stock Markets – Investors anticipate others' buying and selling behaviours to make profitable trades.

Negotiations – Governments and companies negotiate trade deals, wages, and mergers using game theory principles.

CHAPTER V

MACROECONOMIC ENVIRONMENT AND BUSINESS DECISIONS

The macroeconomic environment refers to the overall economic conditions that affect businesses, industries, and markets on a national or global level. Businesses operate within this broader economic context and must adapt their strategies accordingly to remain competitive and profitable. The key components of the macroeconomic environment include economic growth, inflation, interest rates, unemployment, exchange rates, fiscal and monetary policies, and global economic trends. Understanding these factors enables businesses to make informed decisions related to pricing, investments, expansion, and operational strategies.

5.1.KEY MACROECONOMIC FACTORS AFFECTING BUSINESS DECISIONS

a) Economic Growth (GDP)

Economic growth is measured by the Gross Domestic Product (GDP), which reflects the total value of goods and services produced within a country. A growing economy creates higher demand for products and services, leading to increased revenue and investment opportunities for businesses. Conversely, during a recession, businesses may face lower demand and must adopt cost-cutting measures.

b) Inflation

Inflation refers to the general increase in prices over time. Moderate inflation can encourage spending and investment, while high inflation raises production costs and reduces consumer purchasing power. Businesses must adjust their pricing strategies and cost structures to remain competitive and profitable.

c) Interest Rates

Interest rates, controlled by central banks, influence borrowing and investment. Lower interest rates encourage businesses to take loans for expansion, while higher rates increase borrowing costs, discouraging new investments and reducing consumer spending on credit-based purchases.

d) Exchange Rates

Exchange rate fluctuations impact businesses involved in international trade. A strong domestic currency makes imports cheaper but reduces export competitiveness, whereas a weaker currency benefits exporters but raises the cost of imported raw materials.

e) Unemployment Levels

High unemployment reduces consumer spending, affecting demand for goods and services. On the other hand, low unemployment increases wages and labour costs for businesses, impacting profitability.

f) Government Policies and Regulations

Government policies, such as taxation, trade restrictions, and labour laws, influence business decisions. Favourable policies (e.g., tax incentives) encourage investment, while strict regulations or high taxes increase operational costs and limit business growth.

g) Global Economic Trends

Businesses must analyse global economic conditions, such as trade agreements, geopolitical risks, and economic trends in major markets, to make informed strategic decisions regarding expansion and supply chain management.

5.2. CONCEPTS OF NATIONAL INCOME

Gross Domestic Product (GDP):

Gross Domestic Product (GDP) is the total market value of all final goods and services currently produced within the domestic territory of a country in a year.

Four things must be noted regarding this definition.

First, it measures the market value of annual output of goods and services currently produced. This implies that GDP is a monetary measure.

Secondly, for calculating GDP accurately, all goods and services produced in any given year must be counted only once so as to avoid double counting. So, GDP should include the value of only final goods and services and ignores the transactions involving intermediate goods.

Thirdly, GDP includes only currently produced goods and services in a year. Market transactions involving goods produced in the previous

periods such as old houses, old cars, factories built earlier are not included in GDP of the current year.

Lastly, GDP refers to the value of goods and services produced within the domestic territory of a country by nationals or non-nationals.

Gross National Product (GNP): Gross National Product is the total market value of all final goods and services produced in a year. GNP includes net factor income from abroad whereas GDP does not. Therefore,
GNP = GDP + Net factor income from abroad.

Net factor income from abroad = factor income received by Indian nationals from abroad – factor income paid to foreign nationals working in India.

Net National Product (NNP) at Market Price: NNP is the market value of all final goods and services after providing for depreciation. That is, when charges for depreciation are deducted from the GNP we get NNP at market price. Therefore'

NNP = GNP – Depreciation

Depreciation is the consumption of fixed capital or fall in the value of fixed capital due to wear and tear.

Net National Product (NNP) at Factor Cost (National Income): NNP at factor cost or National Income is the sum of wages, rent, interest and profits paid to factors for their contribution to the production of goods and services in a year. It may be noted that:

NNP at Factor Cost = NNP at Market Price – Indirect Taxes + Subsidies.

Personal Income: Personal income is the sum of all incomes actually received by all individuals or households during a given year. In National Income there are some income, which is earned but not actually received by households such as Social Security contributions, corporate income taxes and undistributed profits. On the other hand, there are income (transfer payment), which is received but not currently earned such as old age pensions, unemployment doles, relief payments, etc. Thus, in moving from national income to personal income we must subtract the incomes earned but not received and add incomes received but not currently earned. Therefore,

Personal Income = National Income – Social Security contributions – corporate income taxes – undistributed corporate profits + transfer payments.

Disposable Income: From personal income if we deduct personal taxes like income taxes, personal property taxes etc. what remains is called disposable income. Thus,
Disposable Income = Personal income – personal taxes. Disposable Income can either be consumed or saved. Therefore, Disposable Income = consumption + saving.

The **Consumer Price Index (CPI)**, **Producer Price Index (PPI)**, and **Wholesale Price Index (WPI)** are essential economic tools used to measure inflation and price changes at different stages of the supply chain. Each index serves a unique purpose and provides insights into the economic health of a country.

The **Consumer Price Index (CPI)** focuses on the prices paid by consumers for a basket of goods and services, such as food, housing, transportation, and healthcare. It is a key measure of inflation from the consumer's perspective and reflects changes in the cost of living. Governments and central banks use CPI data to adjust wages, pensions, and monetary policies. By tracking the average price changes over time, CPI helps policymakers understand how inflation impacts household budgets and purchasing power.

The **Producer Price Index (PPI)** measures the average change in selling prices received by domestic producers for their output, including goods and services. It tracks inflation at the producer level, capturing changes in input costs like raw materials, labour, and energy. PPI is often seen as a leading indicator of consumer inflation, as price changes at the producer level tend to eventually affect retail prices. Businesses and economists use PPI data to analyse cost pressures and predict future trends in consumer prices.

The **Wholesale Price Index (WPI)** tracks the average change in prices of goods traded in bulk between businesses at the wholesale level, before they reach retail. It focuses on raw materials and intermediate goods, providing insights into inflation trends at the wholesale stage. While WPI

is less commonly used in some countries, it remains a critical tool in others, such as India, for monitoring inflation in the economy. Unlike CPI and PPI, WPI typically excludes services and focuses solely on goods.

5.3. INFLATION

Inflation is an economic concept that refers to the sustained increase in the general price level of goods and services in an economy over a period of time. It erodes the purchasing power of money, meaning that each unit of currency buys fewer goods and services than before. Inflation is typically measured as an annual percentage increase, and moderate inflation is often seen as a sign of a growing economy. However, excessive inflation can lead to economic instability, while deflation (a decrease in prices) can signal economic stagnation.

Definitions of Inflation

Economists and institutions have defined inflation in various ways:

1. According to Crowther: "Inflation is a state in which the value of money is falling, i.e., prices are rising."
2. According to Keynes: "Inflation is the result of an excess of aggregate demand over aggregate supply, leading to a rise in the price level."
3. Modern Definition: Inflation is a persistent and appreciable rise in the general level of prices, often caused by an increase in the money supply or demand-pull factors.

Inflation is not just a rise in the price of a single good or service but a widespread increase across a broad range of products and services. It is often measured using indices like the Consumer Price Index (CPI), Producer Price Index (PPI), or Wholesale Price Index (WPI).

TYPES OF INFLATION

Demand-Pull Inflation

Demand-pull inflation occurs when aggregate demand in an economy outpaces aggregate supply. This type of inflation is often summarized by the phrase "too much money chasing too few goods." It typically happens during periods of strong economic growth, increased consumer spending,

or expansionary fiscal and monetary policies. For example, if a government reduces taxes or increases public spending, disposable income rises, leading to higher demand for goods and services. If supply cannot keep up with this demand, prices rise. Demand-pull inflation is often associated with low unemployment and booming economies.

Cost-Push Inflation

Cost-push inflation arises when the costs of production increase, leading to higher prices for finished goods and services. This can be caused by rising wages, increased raw material costs, or supply chain disruptions. For instance, a sudden increase in oil prices can raise transportation and manufacturing costs, which are then passed on to consumers. Cost-push inflation is often accompanied by stagnant economic growth, as higher prices reduce consumer purchasing power and demand. This type of inflation can be particularly challenging to manage because it is driven by supply-side factors rather than demand.

Built-In Inflation (Wage-Price Spiral)

Built-in inflation, also known as the wage-price spiral, occurs when workers demand higher wages to keep up with rising living costs, and businesses, in turn, raise prices to maintain profit margins. This creates a self-perpetuating cycle where wages and prices continuously push each other higher. For example, if inflation is high, labour unions may negotiate for higher wages, which increases production costs for businesses. To offset these costs, businesses raise prices, leading to further inflation. This type of inflation is often linked to expectations of future inflation and can be difficult to break without intervention.

Hyperinflation

Hyperinflation is an extreme form of inflation where prices rise uncontrollably, often exceeding 50% per month. It is usually caused by a collapse in the monetary system, often due to excessive money printing by governments to finance deficits. Hyperinflation erodes savings, disrupts economic activity, and can lead to a loss of confidence in the currency. Historical examples include Zimbabwe in the late 2000s and Germany in the 1920s. Hyperinflation is rare but devastating, often requiring drastic measures such as currency reform or adopting a foreign

currency to stabilize the economy.

Stagflation

Stagflation is a unique and challenging economic condition characterized by high inflation, stagnant economic growth, and high unemployment. It contradicts the traditional Phillips curve, which suggests an inverse relationship between inflation and unemployment. Stagflation is often caused by supply shocks, such as a sudden increase in oil prices, combined with weak demand-side policies. For example, during the 1970s oil crisis, many economies experienced stagflation as energy prices soared, leading to higher production costs and reduced economic output.

Creeping Inflation

Creeping inflation refers to a mild and gradual rise in prices, typically ranging between 1% and 3% annually. It is often considered beneficial for economic growth as it encourages spending and investment. Central banks in many countries aim for a low and stable rate of creeping inflation to maintain economic stability. For example, the Federal Reserve in the United States targets an inflation rate of 2% as part of its monetary policy framework.

Walking Inflation

Walking inflation is a moderate form of inflation, with price increases ranging between 3% and 10% annually. While not as severe as hyperinflation, walking inflation can erode purchasing power over time and create uncertainty in the economy. If left unchecked, it can escalate into more severe forms of inflation. Policymakers often intervene through monetary tightening, such as raising interest rates, to control walking inflation.

Core Inflation

Core inflation measures the long-term trend in price levels by excluding volatile items such as food and energy. It provides a clearer picture of underlying inflation trends, as food and energy prices are often subject to short-term fluctuations due to factors like weather or geopolitical events. Central banks use core inflation to guide monetary policy decisions, as it helps distinguish between temporary price changes and persistent

inflationary pressures.

Imported Inflation

Imported inflation occurs when the prices of imported goods and services rise due to factors such as currency depreciation or higher global prices. For example, if a country's currency weakens against the US dollar, the cost of importing goods priced in dollars increases, leading to higher domestic prices. Imported inflation is particularly relevant for economies that rely heavily on imports for essential goods like oil, machinery, or electronics.

Deflation (Negative Inflation)

While not a type of inflation, deflation is the opposite phenomenon, where prices decrease over time. It can lead to reduced consumer spending, as people delay purchases in anticipation of further price declines, resulting in lower economic growth. Deflation is often associated with recessions or depressions and can be challenging to reverse, as seen in Japan's "Lost Decade" during the 1990s.

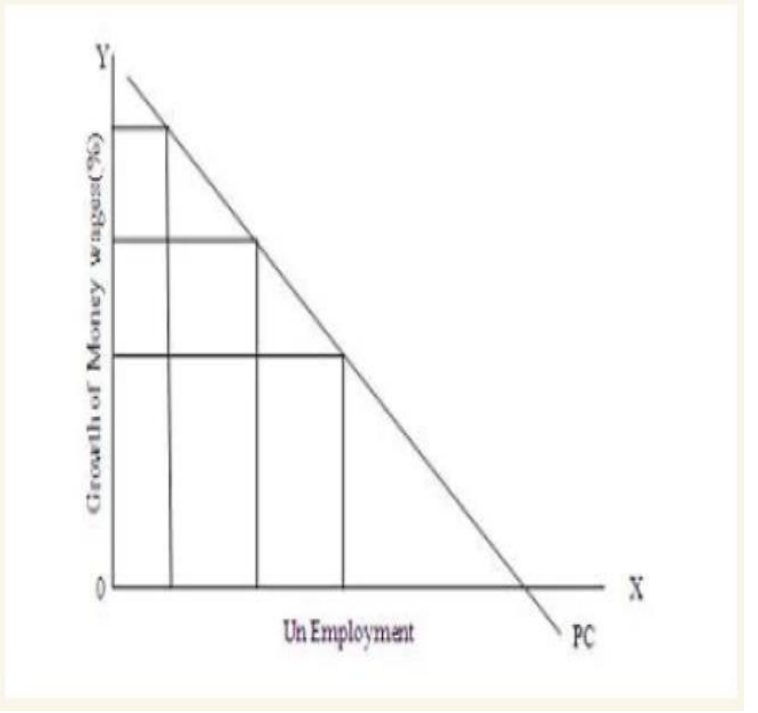
Meaning of Stagflation

The present day inflation is the best explanation for stagflation in the whole world. It is inflation accompanied by stagnation on the development front in an economy. Instead of leading to full employment, inflation has resulted in un-employment in most of the countries of the world. It is a global phenomenon today. Both developed and developing countries are not free from its clutches. **Stagflation** is a portmanteau term in macroeconomics used to describe a period with a high rate of inflation combined with unemployment and economic recession. Inflationary gap occurs when aggregate demand exceeds the available supply and deflationary gap occurs when aggregate demand is less than the aggregate supply. These are two opposite situations. For instance, when inflation goes unchecked for some time, and prices reach very high level, aggregate demand contracts and a slump follows. Private investment is discouraged. Inflationary and deflationary pressures exist simultaneously. The existence of an economic recession at the height of inflation is called '**stagflation**'. The effects of rising inflation and unemployment are especially hard to counteract for the government and the central bank. If monetary and fiscal measures are adopted to redress one problem, the other gets aggravated.

Say, if a cheap money policy and public works program are adopted to remedy unemployment inflation gets aggravated. On the other hand, if a dear money policy and stringent fiscal measures are followed unemployment will get aggravated. It is the most difficult type of inflation that the world is facing today. Keynesian remedial measures have not succeeded in containing inflation but actually have aggravated un-employment. Thus, the world stands today between the devil (inflation) and deep sea (unemployment).

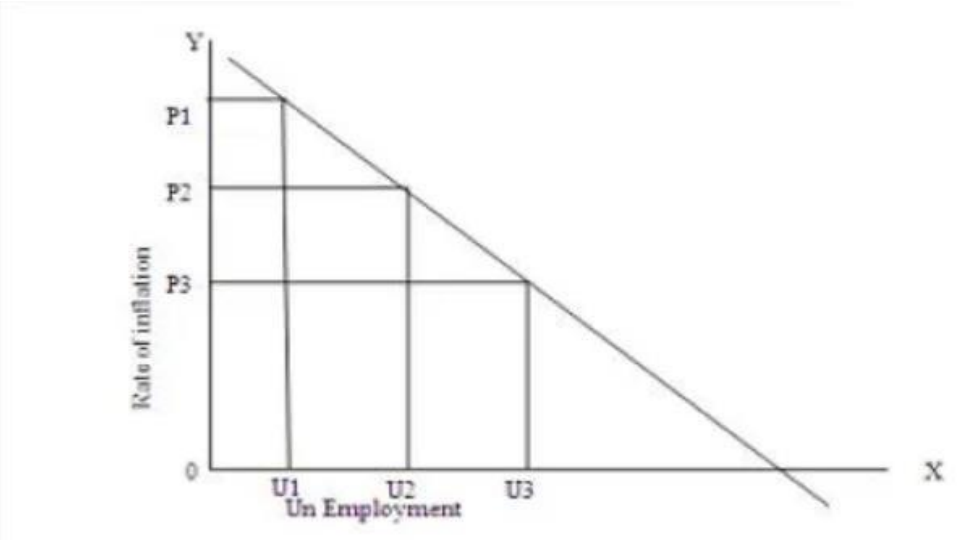
Phillips Curve: Unemployment – Inflation Relationship

A.W.Phillips the British economist was the first to identify the inverse relationship between the rate of unemployment and the rate of increase in money wages. Phillips in his empirical study found that when unemployment was high, the rate of increase in money wage rates was low; and when unemployment was low, the rate of increase in money wage rates was high. Phillips calls it as the trade-off between unemployment and money wages. This is illustrated in the figure below.



In the figure the horizontal axis represents the rate of unemployment and

the vertical axis represents the rate of money wages. In the figure PC represents the Phillips Curve; PC is sloping downwards and is convex to the origin of the two axes and cuts the horizontal axis. The convexity of PC shows that money wages fall with increase in the rate of unemployment or conversely money wages rise with decrease in the rate of unemployment. This inverse relationship between money wage rates and unemployment is based on the nature of business activity. During the period of rising business activity wage rate is high and the rate of unemployment is low and during periods of declining business activity wage rate is low and the rate of unemployment is high. Paul Samuelson and Robert Solow extended the Phillips curve analysis to the relationship between the rate of change in prices and the rate of unemployment and concluded that there is a trade-off between the level of unemployment in a country and the rate of inflation.



We can use the same figure to illustrate this concept, instead of money wages we show rise in the price level on the OY axis. It will be clear from the above figure, that the higher the rate of inflation, the lower is the rate of unemployment in the country; and lower the rate of inflation, the higher the rate of unemployment in the country i.e., one can be achieved at the cost of the other. Phillips curve analysis can be a guide to the government in striking a balance between the measures to be adopted to solve the problem of unemployment and inflation.

Measurement of Inflation

Inflation is measured in percentage which is obtained by calculating the change in percentage of current price index over the previous one. The price index is developed by carrying out a survey on costs of a number of goods and services that comprise the economy. These goods and services are put together into what is known as 'market basket'. The cost of identical market basket today is compared to the cost of identical basket in the previous year or a base year in order to determine the rate of inflation.

The inflation indices are developed to understand the levels of inflation for certain sets of population such as consumers, producers, retailers, wholesalers etc. Such indices are called Consumer Price Index (CPI), Producer Price Index (PPI), and Wholesale Price Index (WPI) etc. On the basis of items, the inflation indices are developed to understand the levels of inflation for certain sets / baskets of items.

Consumer Price Index (CPI)

Consumer Price Index or CPI is an internationally comparable measure of inflation which measures changes in price from the purchasers' perspective. It is a measure of price changes in consumer goods and services such as food, clothing, gasoline and automobiles but excludes housing costs and mortgage interest payments. It reflects changes in the prices of a market basket of goods and services purchased by consumers (individuals and households). CPI helps in the measurement of cost of living of urban consumers.

As defined by the U.S. Bureau of labor statistics, 'CPI is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services.'

CPI is a statistical estimate constructed with the help of prices of items that represent the economy, whose prices are collected periodically. The annual percentage change in CPI is taken as a measure of inflation.

Thus,

$$\text{CPI of a year} = \frac{\text{Cost of Market Basket (in a year)}}{\text{Cost of market basket (in base year)}} \times 100\ \%$$

$$\text{Inflation is year 2} = \frac{CPI_2 - CPI_1}{CPI_1} \times 100\%$$

Where,
CPI_1 = CPI in previous year CPI_2 = CPI in current year **Calculating CPI** Calculation of CPI and inflation requires data on prices of goods and services in large scale. But, for the simple understanding, let us consider a simple economy in which consumer goods include bread and egg.

A step-wise calculation on CPI and inflation is explained below:

Step 1: Determination of basket of goods and services Suppose, the market basket of a typical consumer contains 4 breads and 2 eggs.

Step 2: Determination of prices

Year	Per unit price of Bread ($)	Per unit price of Egg ($)
2005	1	2
2006	2	3
2007	3	4

Step 3: Computation of cost of basket of goods in each year

The costs of market basket is calculated with the help of individual prices and relative quantity of goods.

Year 2005: ($1 per bread x 4 breads) + ($2 per egg x 2 eggs) = $8 per basket. Year 2006: ($2 per bread x 4 breads) + ($3 per egg x 2 eggs) = $14 per basket. Year 2007: ($3 per bread x 4 breads) + ($4 per egg x 2 eggs) = $20 per basket.

Step 4: Selection of base year (year 2005 in this case) and computation of CPI

Taking 2005 as the base year, and using the formula of CPI, we compute CPI for each given year as Year 2005: ($8 / $8) x 100 = 100
Year 2006: ($14 / $8) x 100 = 175
Year 2007: ($20 / $8) x 100 = 250

Step 5: Computation of inflation rate using CPI

Using CPI from the above calculation and the formula of inflation, we derive inflation rate for each year

Inflation in 2006: (175 – 100) / 100 x 100 = 75%

Inflation in 2007: (250 – 175) / 175 x 100 = 43%

Product Price Index (PPI)

Product Price Index (PPI), also referred to as Wholesale Price Index (WPI), measures the average price changes of goods and services over time at wholesale level. In other words, PPI measures price change from the viewpoint of domestic producers.

PPI or WPI is an index of prices paid by retailers for the products that they would resale to the final consumers. It monitors the price changes made by manufacturers and wholesalers before the products reach the final consumers.

GDP Deflator

GDP deflator measures the changes in the overall prices of newly produced goods and services that are ready for consumption. It is an important economic metric that helps to determine the rate of inflation by converting output measured at current market prices into constant base year prices.

In other words, GDP deflator measures the relationship between nominal GDP (total output measured at current prices) and real GDP (total output measured at constant base year prices). It measures the current level of prices relative to the level of prices in the base year.

Since the GDP deflator is not based on a fixed market basket of products, it takes into account the change in consumption patterns of consumers as a result of newly manufactured products and services.

The GDP deflator is simply nominal GDP in a year divided by real GDP in that year, multiplied by 100. Thus,

$$\text{GDP Deflator} = \frac{\text{Nominal (Current price) GDP}}{\text{Real (Base year price) GDP}} \times 100$$

$$\text{Rate of Inflation} = \frac{\text{GDP deflator in year 2 - GDP deflator in year 1}}{\text{GDP deflator in year 1}} \times 100$$

Calculating GDP Deflator
A step-wise explanation of the GDP deflator is given below:

Step 1: Determination of basket of goods and services Suppose, the market basket of a typical consumer contains bread and egg.

Step 2: Determination of prices

Year	Per unit price of Bread ($)	Quantity of Bread	er unit price of Egg ($)	Quantity of Egg
2005	1	100	2	50
2006	2	150	3	100
2007	3	200	4	150

Step 3: Computation of Nominal GDP

Year 2005: ($1 per bread x 100 breads) + ($2 per egg x 50 eggs) = $200
Year 2006: ($2 per bread x 150 breads) + ($3 per egg x 100 eggs) = $600
Year 2007: ($3 per bread x 200 breads) + ($4 per egg x 150 eggs) = $1200

Step 4: Computation of Real GDP

Taking 2005 as the base year, we calculate real GDP as
Year 2005: ($1 per bread x 100 breads) + ($2 per egg x 50 eggs) = $200
Year 2006: ($2 per bread x 150 breads) + ($2 per egg x 100 eggs) = $350
Year 2007: ($3 per bread x 200 breads) + ($2 per egg x 150 eggs) = $500

Step 5: Computation of the GDP Deflator

Using the above mentioned formula of GDP Deflator, we derive Rate of Inflation in 2006: (171 – 100) / 100 x 100 = 71%

Rate of Inflation in 2007: (240 – 171) / 171 x 100 = 40.35%
After computation of various price indices, rate of inflation is calculated

using the following formula:

$$\text{Inflation} = \frac{P_t - P_{t-1}}{P_{t-1}} \times 100$$

Where,
P_t = Price index in current (t) period
P_{t-1} = Price index of previous (t – 1) period

5.4.MEANING AND DEFINITION OF ECONOMIC RISK

Generally speaking, **economic risk** can be described as the likelihood that an investment will be affected by macroeconomic conditions such as government regulation, exchange rates, or political stability, most commonly one in a foreign country. In other words, while financing a project, the risk that the output of the project will not produce adequate revenues for covering operating costs and repaying the debt obligations. Economic risk is, however, a nebulous term with various definitions. In a nutshell, economic risk refers to the risk that a venture will be economically unsustainable, due to various reasons vitiating from an alteration in economic trends to fraudulent activities which ruin a project's outcome. Before starting with the projects, it is important to consider economic risk for determining the likelihood of potential risks being outweighed by the benefits.

Example of economic risk

The economic risk can be looked upon in a variety of ways, with a wide range of modeling systems. In a simple example, let us presume a planned housing development. In this case, the economic risk is that the gains from the development will not cover the development costs, leaving the developer in debt. This can take place due to downturns in the real estate market, lack of interest in the housing, unexpected cost overruns, and various other factors.

Why economic risk matters

Economic risk is one of the reasons for international investing carrying higher risk as compared to domestic investing. Bondholders and

shareholders generally put up with the risk undertaken by international companies. Investors dealing in sale and purchase foreign government bonds are also exposed. Moreover, economic risk can also provide additional opportunities for investors. For example, foreign bonds allow investors to involve themselves circuitously in the foreign exchange markets as well as the interest rate environments of various countries. However, the foreign regulatory authorities can impose different requirements on the sizes, types, timing, credit quality, disclosures of bonds, and underwriting of bonds issued in their countries. Economic risk can be, however, reduced by opting for international mutual funds for they proffer instantaneous diversification, time and again investing in various countries, currencies, instruments, or international industries.

5.5. MONETARY POLICY AND FISCAL POLICY

Monetary policy and fiscal policy are two different tools that have an impact on the economic activity of a country. Monetary policies are formed and managed by the central banks of a country and such a policy is concerned with the management of money supply and interest rates in an economy. Fiscal policy is related to the way a government is managing the aspects of spending and taxation. It is the government's way of stabilizing the economy and helping in the growth of the economy. Governments can modify the fiscal policy by bringing in measures and changes in tax rates to control the fiscal deficit of the economy.

Below are certain points of difference between the monetary and fiscal policy

Monetary Policy	**Fiscal Policy**
Definition	
It is a financial tool that is used by the central banks in regulating the flow of money and the interest rates in an economy	It is a financial tool that is used by the central government in managing tax revenues and policies related to expenditure for the benefit of the economy

Managed By	
Central Bank of an economy	Ministry of Finance of an economy
Measures	
It measures the interest rates applicable for lending money in the economy	It measures
Focus Area	
Stability of an economy	Growth of an economy
Impact on Exchange rates	
Exchange rates improve when there is higher interest rates	It has no impact on the exchange rates
Targets	
Monetary policy targets inflation in an economy	Fiscal policy does not have any specific target
Impact	
Monetary policy has an impact on the borrowing in an economy	Fiscal policy has an impact on the budget deficit

5.6. TRADE CYCLE

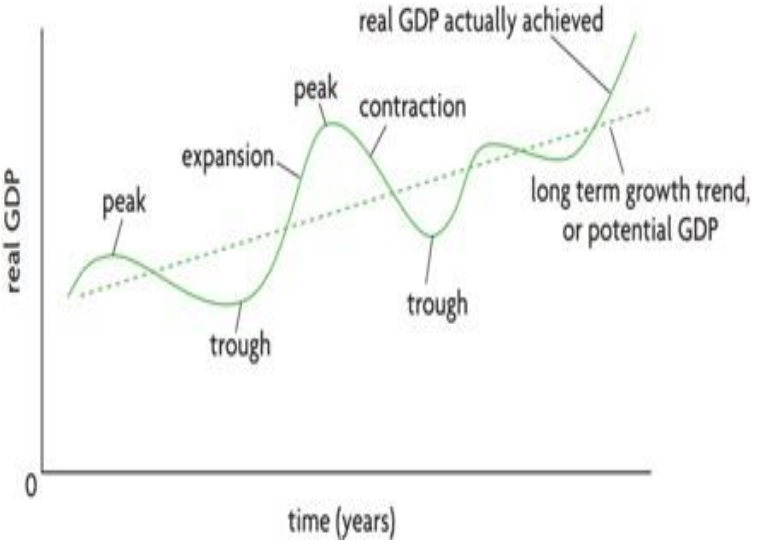
Meaning of Trade Cycle:

A trade cycle refers to fluctuations in economic activities specially in employment, output and income, prices, profits etc. According to Keynes, "A trade cycle is composed of periods of good trade characterized by rising prices and low unemployment percentages altering with periods of bad trade characterized by falling prices and high unemployment percentages".

What are trade or business cycles?

The fluctuations in the growth of real output, consisting of expansion and contraction in an alternate order, are called trade or business cycles. No

economy in the world is immune to business cycles, these are therefore experienced worldwide. The concept is important because it helps us in understanding the different phases every 'business' will experience and the consequences associated with them.



On Y axis, real GDP is plotted and on X axis we have time in years. GDP is measured in real terms, which means it is inflation adjusted.

Phases of Trade Cycle:

Expansion (Recovery)

An expansion occurs when there is positive growth in real GDP, shown by upward movement of the curve. During this period, employment of resources increases, and the general price level of the economy begins to rise more rapidly, also known as inflation. The businesses start growing resulting in improvement in the employment levels.

Peak (Boom)

A peak or boom, represents the cycle's maximum real GDP growth, marking the end of the expansion. When the economy reaches a peak, the resources are assumed to be fully employed, due to which, the economy is likely to be experiencing inflation. This point is the maximum any economy/ business can grow with given resources.

Contraction (Recession)

Contraction or Recession is the third phase of a trade cycle. The economy begins to experience negative growth, shown by the downward-sloping parts of the curve post peak. If the contraction lasts six months (two quarters) or more, it is termed a recession. It is characterized by falling real GDP and growing unemployment levels. The increase in the price level may start slowing down in some sectors.

Trough (Depression)

A trough represents the cycle's lowest phase. It is also the minimum level of GDP, or the end of the contraction. There may now be widespread unemployment. A trough is followed by a new period of expansion, also known as a recovery, thus marking the beginning of a new cycle.

Features of Trade Cycle:

1. The business cycles are synchronic in nature. This means they co-exist in different sectors at the same time. They are not limited to any one industry, sector or economy as they have cascading effects. E.g. a poor harvest in agriculture sector results in lesser quantity of raw materials available for industries.
2. A trade cycle is international in character. Through international trade, booms and depressions in one country are passed to other countries. E.g. during the financial crisis of 2008, the recession started in America but effects were experienced throughout the world.
3. The impact of a trade cycle is differential. It affects different industries in different ways. E.g., due to COVID-19, the service sector is adversely affected while the manufacturing sector is thriving.
4. There's no fixed time period for different phases. They may occur due to different reasons and last for different time periods. In a trade cycle, a period of prosperity is followed by a period of depression. giving it a wave like movement.
5. A trade cycle is cumulative and self-reinforcing. There's an upward movement achieved by feeding on itself.
6. The business cycle is non-periodical. Some trade cycles may last for only few months while others may last for few years. E.g. the Great Depression

of 1930's lasted for 10 years!

7. Trade cycles are asymmetrical too. The prosperity phase is slow and gradual and the phases of recession and depression are rapid.

Theories of Trade Cycle:

Non-Monetary Theories of Trade Cycle:

1. **Sunspot Theory or Climatic Theory:**
   It is the oldest theory of trade cycle. It is associated with W.S.Jevons and later on developed by H.C.Moore. According to this theory, the spot that appears on the sun influences the climatic conditions. When the spot appears, it will affect rainfall and hence agricultural crops. When there is crop failure, that will result in depression. On the other hand, if the spot did not appear on the sun, rainfall is good leading to prosperity. Thus, the variations in climate are so regular that depression is followed by prosperity. However, this theory is not accepted today. Trade cycle is a complex phenomenon and it cannot be associated with climatic conditions. If this theory is correct, then industrialized countries should be free from cyclical fluctuations. But it is the advanced, industrialized countries which are affected by trade cycles.

2. **Psychological Theory:**
   This theory was developed by A.C. Pigou. He emphasized the role of psychological factor in the generation of trade cycles. According to Pigou, the main cause for trade cycle is optimism and pessimism among business people and bankers. During the period of good trade, entrepreneurs become optimistic which would lead to increase in production. The feeling of optimism is spread to other. Hence investments are increased beyond limits and there is over production, which results in losses. Entrepreneurs become pessimistic and reduce their investment and production. Thus, fluctuations are due to optimism leading to prosperity and pessimism resulting depression. Though there is an element of truth in this theory, this theory is unable to explain the occurrence of boom and starting of revival. Further this theory fails to explain the periodicity of trade cycle.

3. **Overinvestment Theory:**
   Arthur Spiethoff and D.H. Robertson have developed the over investment theory. It is based on Say's law of markets. It believes that over

production in one sector leads to over production in other sectors. Suppose, there is over production and excess supply in one sector, that will result in fall in price and income of the people employed in that sector. Fall in income will lead to a decline in demand for goods and services produced by other sectors. This will create over production in other sectors. Spiethoff has pointed out that over investment is the cause for trade cycle. Over investment is due to indivisibility of investment and excess supply of bank credit. He gives the example of a railway company which lays down one more track to avoid traffic congestion. But this may result in excess capacity because the additional traffic may not be sufficient to utilize the second track fully.

Over investment and overproduction are encouraged by monetary factors. If the banking system places more money in the hands of entrepreneurs, prices will increase. The rise in prices may induce the entrepreneurs to increase their investments leading to over-investment. Thus Prof. Robertson has successfully combined real and monetary factors to explain business cycle.

This theory is realistic in the sense that it considers over investment as the cause of trade cycle. But it has failed to explain revival.

4. Over-Saving or Under Consumption Theory:

This theory is the oldest explanation of the cyclical fluctuations. This theory has been formulated by Malthus, Marx and Hobson. According to this theory, depression is due to over-saving. In the modern society, there is great inequalities of income. Rich people have large income but their marginal propensity to consume is less. Hence they save and invest which results in an increase in the volume of goods. This causes a general glut in the market. At the same time, as majority of the people are poor, they have low propensity to consume. Therefore, consumption will not increase. Increase in the supply of goods and decline in the demand create under consumption and hence over production. This theory is not free from criticism. This theory explains only the turning point from prosperity to depression. It does not say anything about recovery. This theory assumes that the amount saved would be automatically invested. But this is not true. It pays too much attention on saving and too little on others.

5. Keynes' Theory of Trade Cycles:

Keynes doesn't develop a complete and pure theory of trade cycles. According to Keynes, effective demand is composed of consumption and investment expenditure. It is effective demand which determines the level of income and employment. Therefore, changes in total expenditure i.e., consumption and investment expenditures, affect effective demand and this will bring about fluctuation in economic activity. Keynes believes that consumption expenditure is stable and it is the fluctuation in investment expenditure which is responsible for changes in output, income and employment.

Investment depends on rate of interest and marginal efficiency of capital. Since rate of interest is more or less stable, marginal efficiency of capital determines investment. Marginal efficiency of capital depends on two factors – prospective yield and supply price of the capital asset. An increase in MEC will create more employment, output and income leading to prosperity. On the other hand, a decline in MEC leads to unemployment and fall in income and output. It results in depression.

During the period of expansion businessmen are optimistic. MEC is rapidly increasing and rate of interest is sticky. So entrepreneurs undertake new investment. The process of expansion goes on till the boom is reached. As the process of expansion continues, cost of production increases, due to scarcity of factors of production. This will lead to a fall in MEC. Further, price of the product falls due to abundant supply leading to a decline in profits.

This leads to depression. As time passes, existing machinery becomes worn out and has to be replaced. Surplus stocks of goods are exhausted. As there is a fall in price of raw-materials and equipment, costs fall. Wages also go down. MEC increases leading to recovery. Keynes states that, "Trade cycle can be described and analyzed in terms of the fluctuations of the marginal efficiency of capital relatively to the rate of interest".

The merit of Keynes' theory lies in explaining the turning points-the lower and upper turning points of a trade cycle. The earlier economists considered the changes in the amount of credit given by banking system to

be responsible for cyclical fluctuations. But for Keynes, the change in consumption function with its effect on MEC is responsible for trade cycle. Keynes, thus, has given a satisfactory explanation of the turning points of the trade cycle, "Keynes consumption function filled a serious gap and corrected a serious error in the previous theory of the business cycle". (Metzler).

Critics have pointed out the weakness of Keynes' theory. Firstly, according to Keynes the main cause for trade cycle is the fluctuations in MEC. But the term marginal efficiency of capital is vague. MEC depends on the expectations of the entrepreneur about future. In this sense, it is similar to that of Pigou's psychological theory. He has ignored real factors.

Secondly, Keynes assumes that rate of interest is stable. But rate of interest does play an important role in decision making process of entrepreneurs.

Thirdly, Keynes does not explain periodicity of trade cycle. In a period of recession and depression, according to Keynes, rate of interest should be high due to strong liquidity preference. But, during this period, rate of interest is very low. Similarly, during boom, rate of interest should be low because of weak liquidity preference; but actually the rate of interest is high.

6. Schumpeter's Innovation Theory:

Joseph A. Schumpeter has developed innovation theory of trade cycles. An innovation includes the discovery of a new product, opening of a new market, reorganization of an industry and development of a new method of production. These innovations may reduce the cost of production and may shift the demand curve. Thus innovations may bring about changes in economic conditions. Suppose, at the full employment level, an innovation in the form of a new product has been introduced. Innovation is financed by bank loans. As there is full employment already, factors of production have to be withdrawn from others to manufacture the new product. Hence, due to competition for factors of production costs may go up, leading to an increase in price.

When the new product becomes successful, other entrepreneurs will also

produce similar products. This will result in cumulative expansion and prosperity. When the innovation is adopted by many, supernormal profits will be competed away. Firms incurring losses will go out of business.

Employment, output and income fall resulting in depression. Schumpeter's theory has been criticized on the following grounds.

Firstly, Schumpter's theory is based on two assumptions viz., full employment and that innovation is being financed by banks. But full employment is an unrealistic assumption, as no country in the world has achieved full employment. Further innovation is usually financed by the promoters and not by banks. Secondly, innovation is not the only cause of business cycle. There are many other causes which have not been analyzed by Schumpter.

Monetary Theories of Trade Cycles:

1. **Over-Investment Theory:**

Prof. Von Hayek in his books on "Monetary Theory and Trade Cycle" and "Prices and Production" has developed a theory of trade cycle. He has distinguished between equilibrium or natural rate of interest and market rate of interest. Market rate of interest is one at which demand for and supply of money are equal.

Equilibrium rate of interest is one at which savings are equal to investment. If both equilibrium rate of interest and market rate of interest are equal, there will be stability in the economy. If equilibrium rate of interest is higher than market rate of interest there will be prosperity and vice versa. For instance, if the market rate of interest is lower than equilibrium rate of interest due to increase in money supply, investment will go up. The demand for capital goods will increase leading to a rise in price of these goods. As a result, there will be a diversion of resources from consumption goods industries to capital goods industries. Employment and income of the factors of production in capital goods industries will increase.

This will increase the demand for consumption goods. There will be competition for factors of production between capital goods and consumption good industries. Factor prices go up. Cost of production increases. At this time, banks will decide to reduce credit expansion. This

will lead to rise in market rate of interest above the equilibrium rate of interest. Investment will fall; production declines leading to depression.

Hayek's theory has certain weaknesses:

1. It is not easy to transfer resources from capital goods industries to consumer goods industries and vice versa.
2. This theory does not explain all the phases of trade cycle.
3. It gives too much importance to rate of interest in determining investment. It has neglected other factors determining investment.
4. Hayek has suggested that the volume of money supply should be kept neutral to solve the problem of cyclical fluctuations. But this concept of neutrality of money is based on old quantity theory of money which has lost its validity.

2. Hawtrey's Monetary Theory:

Prof. Hawtrey considers trade cycle to be a purely monetary phenomenon. According to him non- monetary factors like wars, strike, floods, drought may cause only temporary depression. Hawtrey believes that expansion and contraction of money are the basic causes of trade cycle. Money supply changes due to changes in rates of interest.

When rate of interest is reduced by banks, entrepreneurs will borrow more and invest. This causes an increase in money supply and rise in price leading to expansion. On the other hand, an increase in the rate of interest will lead to reduction in borrowing, investment, prices and business activity and hence depression.

Hawtrey believes that trade cycle is nothing but small scale replica of inflation and deflation. An increase in money supply will lead to boom and vice versa, a decrease in money supply will result in depression.

Banks will give more loans to traders and merchants by lowering the rate of interest. Merchants place more orders which induce the entrepreneurs to increase production by employing more laborers. This results in increase in employment and income leading to an increase in demand for goods. Thus the phase of expansion starts.

Business expands; factors of production are fully employed; price increases further, resulting in boom conditions. At this time, the banks call

off loans from the borrowers. In order to repay the loans, the borrowers sell their stocks. This sudden disposal of goods leads to fall in prices and liquidation of marginal firms. Banks will further contract credit.

Thus the period of contraction starts making the producers reduce their output. The process of contraction becomes cumulative leading to depression. When the economy is at the level of depression, banks have excess reserves. Therefore, banks will lend at a low rate of interest which makes the entrepreneurs to borrow more. Thus revival starts, becomes cumulative and leads to boom.

Hawtrey's theory has been criticized on many grounds:

1. Hawtrey's theory is considered to be an incomplete theory as it does not take into account the non-monetary factors which cause trade cycles.
2. It is wrong to say that banks alone cause business cycle. Credit expansion and contraction do not lead to boom and depression. But they are accentuated by bank credit.
3. The theory exaggerates the importance of bank credit as a means of financing development. In recent years, all firms resort to plough back of profits for expansion.
4. Mere contraction of bank credit will not lead to depression if marginal efficiency of capital is high. Businessmen will undertake investment in-spite of high rate of interest if they feel that the future prospects are bright.
5. Rate of interest does not determine the level of borrowing and investment. A high rate of interest will not prevent the people to borrow. Therefore, it may be stated that banking system cannot originate a trade cycle. Expansion and contraction of credit may be a supplementary cause but not the main and sole cause of trade cycle

MEASURES TO CONTROL BUSINESS CYCLES OR STABILISATION POLICIES:

Various measures have been suggested and put into practice from time to time to control fluctuations in an economy. They aim at stabilizing economic activity so as to avoid the ill-effects of a boom and a depression. The following three measures are adopted for this purpose.

1. **Monetary Policy:**

Monetary policy as a method to control business fluctuations is operated by the central bank of a country. The central bank adopts a number of methods to control the quantity and quality of credit. To control the expansion of money supply during a boom, it raises its bank rate, sells securities in the open market, raises the reserve ratio, and adopts a number of selective credit control measures such as raising margin requirements and regulating consumer credit. Thus the central bank adopts a dear money policy. Borrowings by business and trade become dearer, difficult and selective. Efforts are made to control excess money supply in the economy. To control a recession or depression, the central bank follows an easy or cheap monetary policy by increasing the reserves of commercial banks. It reduces the bank rate and interest rates of banks. It buys securities in the open market. It lowers margin requirements on loans and encourages banks to lend more to consumers, businessmen, traders, etc.

Limitations of Monetary Policy:

But monetary policy is not so effective as to control a boom and a depression. If the boom is due to cost- push factors, it may not be effective in controlling inflation, aggregate demand, output, income and employment. So far as depression is concerned, the experience of the Great Depression of 1930s tells us that when there is pessimism among businessmen, the success of monetary policy is practically nil. In such a situation, they do not have any inclination to borrow even when the interest rate is very low. Similarly, consumers who are faced with reduced incomes and unemployment cut down their consumption expenditure. Neither the central bank nor the commercial banks are able to induce businessmen and consumers to raise the aggregate demand. Thus the success of monetary policy to control economic fluctuations is severely limited.

2. **Fiscal Policy:**

Monetary policy alone is not capable of controlling business cycles. It should, therefore, be supplemented by compensatory fiscal policy. Fiscal measures are highly effective for controlling excessive government expenditure, personal consumption expenditure, and private and public investment during a boom. On the other hand, they help in increasing

government expenditure, personal consumption expenditure and private and public investment during a depression.

Policy during Boom:

The following measures are adopted during a boom. During a boom, the government tries to reduce unnecessary expenditure on non-development activities in order to reduce its demand for goods and services. This also puts a check on private expenditure which is dependent on the government demand for goods and services. But it is difficult to cut government expenditure. Moreover, it is not possible to distinguish between essential and non-essential government expenditure. Therefore, this measure is supplemented by taxation.

To cut personal expenditure, the government raises the rates of personal, corporate and commodity taxes. The government also follows the policy of having a surplus budget when the government revenues exceed expenditures. This is done by increasing the tax rates or reduction in government expenditure or both. This tends to reduce income and aggregate demand through the reverse operation of the multipher. Another fiscal measure which is usually adopted is to borrow more from the public which has the effect of reducing the money supply with the public. Further, the repayment of public debt should be stopped and postponed to some future date when the economy stabilizes.

Policy during Depression:

During a depression, the government increases public expenditure, reduces taxes and adopts a budget deficit policy. These measures tend to raise aggregate demand, output, income, employment and prices. An increase in public expenditure increases the aggregate demand for goods and services and leads to increase in income via the multipher. The public expenditure is made on such public works as roads, canals, dams, parks, schools, hospitals and other construction works.

They create demand for labor and the products of private construction industries and helps in reviving them. The government also increases its expenditure on such relief measures as unemployment insurance, and other social security measures in order to stimulate the demand for consumer goods industries. Borrowing by the government to finance

budget deficits utilizes idle money lying with the banks and financial institutions for investment purposes.

3. Direct Controls:

The aim of direct controls is to ensure proper allocation of resources for the purpose of price stability. They are meant to affect strategic points of the economy. They affect particular consumers and producers. They are in the form of rationing licensing, price and wage controls, export duties, exchange controls, quotas, monopoly control, etc. They are more effective in overcoming bottlenecks and shortages arising from inflationary pressures. Their success depends on the existence of an efficient and honest administration. Otherwise, they lead to black marketing, corruption, long queues, speculation, etc. Therefore, they should be resorted to only in emergencies like war, crop failures and hyper-inflation.

5.7. AGGREGATE DEMAND

Aggregate demand is the total amount of final goods and services which all the sectors are planning to buy in an economy at a given level of income over a given period of time. For example, consumer goods, services, and capital goods.

Components of Aggregate Demand

There are four components in Aggregate Demand

1. Private Consumption Expenditure (C)
2. Investment Expenditure(I)
3. Government Expenditure(G)
4. Net Exports (X-M)

Aggregate Demand = C+I+G+(X-M)

1.Private consumption expenditure (C) or Household consumption expenditure: It refers to the expenditure on the final consumer's goods and services by the households to satisfy their wants.

2.Investment expenditure (I): It refers to the expenditure incurred on capital goods by private firms to increase their production capacity. These capital goods are in the form of machinery, building, land, etc.

3.Government expenditure (G): *It* refers to the expenditure incurred by the government on the purchase of goods and services to meet the needs of

the people in the economy.

4.Net Exports (X-M): It refers to the difference between exports and imports i.e., X-M Where X stands for Exports and M stands for Imports.

Aggregate Demand in Two-Sector Model

In a two-sector model, it is assumed that Aggregate demand is a function of Consumption and Investment also.

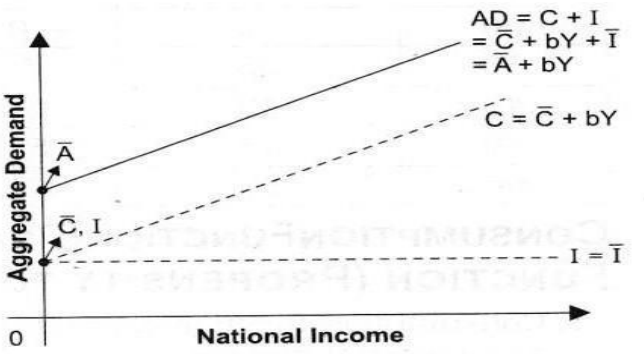
Aggregate Demand in Two-Sector Model = C+ I Where

C= consumption expenditure

I = Investment

Aggregate Demand Schedule and Graph Aggregate Demand Schedule

National income (Y)	Consumption (C)	Autonomous Investment (I)	AD = C + I
0	20	20	40
10	25	20	45
20	30	20	50
30	35	20	55
40	40	20	60
50	45	20	65



Important Concepts About Aggregate Demand

1. Aggregate demand is a function of Consumption and investment only.
2. The investment expenditure is assumed to be autonomous which means it

will remain constant at all the levels of income.

3. The investment curve will be a straight line, parallel to the X-axis as it is not affected by the change in income level.
4. Consumption will be positive even at zero level of income as the minimum level of consumption is done for survival. This consumption is known as 'Autonomous consumption'.
5. The slope of the consumption curve is positive which shows that when income increases consumption also increases.
6. The starting point of the AD curve is above zero as there is always a minimum level of consumption and investment in the economy.

5.8. AGGREGATE SUPPLY

Aggregate Supply is the value of all final goods and services that all the producers are planning to supply over a period of time.

Aggregate Supply =Y

HOW?: Output produced in an economy is always equal to the income generated. Aggregate Supply is equal to all final goods and services produced in the economy which is equal to the national income.

Aggregate Supply = OUTPUT =Y Y = Aggregate Supply
Components of Aggregate Supply

NATIONAL INCOME (Y) = CONSUMPTION (C) + SAVINGS (S) Y = C + S

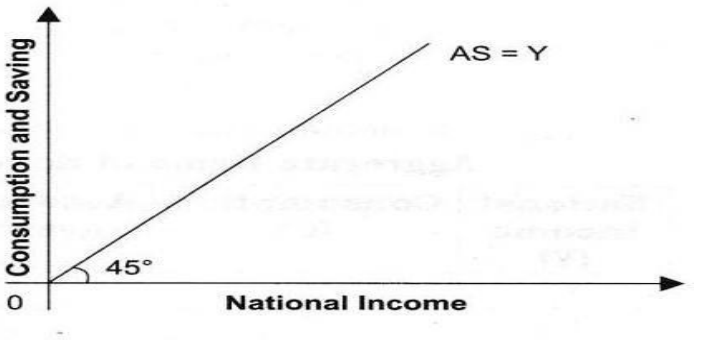
Consumption and savings are the two components of Aggregate Supply.

Aggregate Supply Schedule And Graph Aggregate Supply = C + S (i)Consumption(C)

Saving(S) AS = C + S

National Income (Y)	Consumption(C)	Saving (S)	AS = C + S
0	20	-20	0
10	25	-15	10
20	30	-10	20
30	35	-5	30

40	40	0	40
50	45	5	50
60	50	10	60



Important Concept About Aggregate Supply

The slope of the AS curve is positive as the level of income increases aggregate supply also increases.

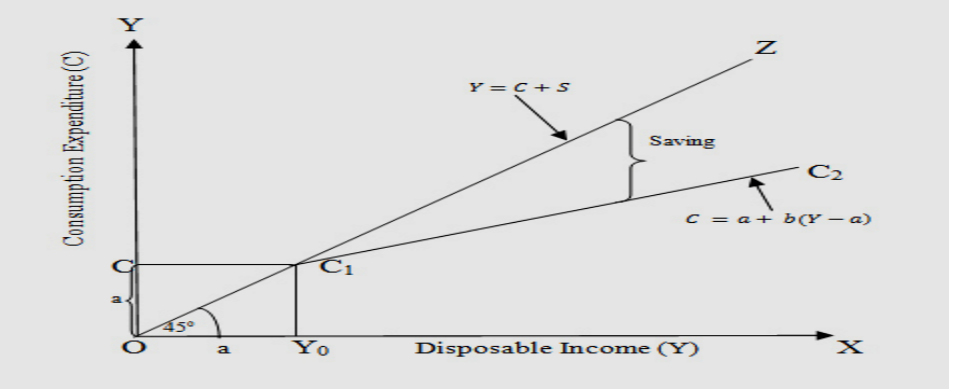
5.9.CONSUMPTION FUNCTION OR PROPENSITY TO CONSUME

Consumption function or propensity to consume is the functional relationship between consumption and income.

C= f (Y)

Consumption Schedule and Types of Propensity to Consume

Income(Y)	Consumption(C)	APC (C/Y)	ΔC	ΔY	MPC (ΔC/ΔY)
0	100	–	–	–	–
100	170	1.7	70	100	0.7
200	240	1.2	70	100	0.7
300	310	1.33	70	100	0.7
400	380	0.95	70	100	0.7
500	450	0.9	70	100	0.7



Important Points about Consumption

1. The slope of the consumption curve is positive as consumption increases when leveling of income increases.
2. The starting point of the consumption curve is above zero as the is always some minimum level of consumption which is termed as "Autonomous consumption".
3. The point where C=Y is termed as break-even point as at this point Consumption is equal to income.
4. Before the break-even point in the economy because consumption is more than income after the break-even point savings will start as now the increase in consumption is less than the increase in income.

Types of Propensity

1. Average Propensity to Consume (APC)
2. Marginal Propensity to Consume (MPC)

1. Average Propensity To Consume(APC)

APC is the ratio of total consumption to total income.
Average Propensity To Consume = C/Y

Important Concepts About APC

1. APC can never be zero as consumption can never be zero.
2. At the break-even point, APC is equal to 1.
3. Before the break-even point, APC is less than 1.
4. After the break-even point, APC is more than 1.
5. APC falls with an increase in income.

2. Marginal Propensity To Consume(MPC)

MPC is the ratio of change in consumption to change in income. MPC = ΔC / ΔY

Important Concepts About MPC

1. The value of MPC can never be greater than 1.
2. The value of MPC is 1 when the entire additional income is spent on consumption
3. The value of MPC is 0 when the entire additional income is saved.
4. The value of MPC lies between 0 to 1.

Consumption Equation $C = c^{-} + bY$

Where

C= Level of consumption

C^{-} = Autonomous consumption

b = MPC

Y = Level of income

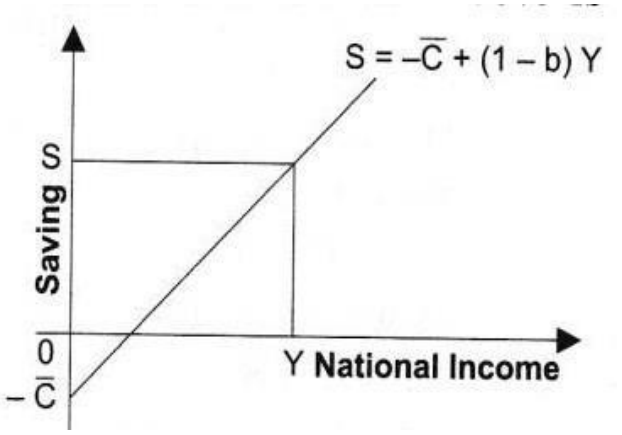
Savings Function or Propensity To Save

Savings function or propensity to save is the functional relationship between savings and income.

S= f (Y)

Savings Schedule And Types Of Propensity To Save

Income (Y)	**Consumption (C)**	**Saving (S)**	**APS (S/Y**	**ΔS**	**ΔY**	**MPS (ΔS/ΔY)**
0	100	-100	–	–	–	–
100	160	-60	-0.6	40	100	0.4
200	220	-20	-0.1	40	100	0.4
300	280	20	0.067	40	100	0.4
400	340	60	0.15	40	100	0.4
500	400	100	0.2	40	100	0.4
600	460	140	0.233	40	100	0.4



Important Points about Savings

1. Savings Curve starts from origin.
2. The slope of the savings curve is positive
3. At the break-even point, savings are equals to 0.
4. At the break-even point savings become positive.

Types of Propensity To Save

1. Average Propensity to Save (APS)
2. Marginal Propensity to Save (MPS)

Average Propensity To Save (APS)

APS is the ratio of total savings to total income.

APS = S/Y

Important Concepts about APS

1. APS is zero at the break-even point.
2. APS can never be equals to 1 or more than 1.
3. APS can be negative or less than when.

Marginal Propensity To Save

MPS is the ratio of change in savings to change in savings.

MPS = $\Delta S / \Delta Y$

Important Concepts about MPS

1. The value of MPS varies between 0 and 1.

2. If the entire increased income is saved the value of MPS will be 1.
3. If the entire increased income is consumed the value of MPS will be 0.

Savings Equation S = – ¯c+ (1- b)Y

Where

C= Level of consumption

– ¯c= Negative savings at zero level of income

1-b = MPS

Y = Level of income

Relationship Between APC And APS APC + APS = 1

Relationship Between MPC And MPS MPC + MPS = 1

5.10.INVESTMENT FUNCTION

Investment refers to the expenditure incurred on the creation of New Capital Asset. for example, expenditure incurred on the purchase of machinery, building, equipment, etc.

It can be of two types:

Induced investment

1. **Autonomous investment**

INDUCED INVESTMENT

Induced investment is that investment which is directly influenced by the level of income that is it increases with income and it falls with a fall in income. these are made for profit Motive. Real investment may be induced. Induced investment is profit or income motivated. Factors like prices, wages and interest changes that affect profits influence induced investment. Similarly, demand also influences it. When income increases, consumption demand also increases and to meet this, investment increases. In the ultimate analysis, induced investment is a function of income i.e.,

I = f(Y). It is income elastic. It increases or decreases with the rise or fall in income.

AUTONOMOUS INVESTMENT

Autonomous investment refers to investment which is not influenced by the level of income. these are not made for-profit motive. These types of investments are generally made by the government on infrastructure

activities.

- The level of autonomous investment depends upon social, economic and political conditions of any country hence its take it changes when there is a change in technology on the discovery of new resources or growth of population, etc.

  Autonomous investment is independent of the level of income and is thus income inelastic. It is influenced by exogenous factors like innovations, inventions, growth of population and labor force, research, social and legal institutions, weather changes, war, revolution, etc. But it is not influenced by changes in demand. Rather, it influences the demand. Investment in economic and social overheads whether made by the government or the private enterprise is autonomous. Such investment includes expenditure on building, dams, roads, canals, schools, hospitals, etc. Since investment in these projects is generally associated with public policy, autonomous investment is regarded as public investment.

DETERMINANTS OF INVESTMENT

Investment in a new project depends upon two factors:

1. Marginal efficiency of investment
2. Rate of interest.

MARGINAL EFFICIENCY OF INVESTMENT

Marginal efficiency of investment refers to the expected rate of return from additional investment. It is determined by two factors:

1. Supply price: it happens to the cost of producing a new asset of that kind. it is the price at which the new capital can be supplied or replaced. for example, if a machine of rupees 100000 is replaced in place of an old machine, then Rupees 1 lakh is supplied price
2. Protective yield: it refers to net return expected from the Capital Asset over its lifetime. for example, if the expected yield from a machine is rupees 8000 and running expenses are rupees 500 then protective Shield could be rupees 8000 - 500 is equal to Rs 7500. Here, in the above example MEI will be calculated as follows:

   MEI= Protective yield/ supply price X 100 MEI= 7500/100000 =7.5%

RATE OF INTEREST

It happens to the cost of borrowing money for financing Investments. there exists an inverse relationship between ROI and volume of investment as if ROI would be hiring people with borrow less money to make an investment and vice versa.

COMAPARISON OF MEI & ROI

Profitability of an investment can be worked out by comparing MEI with ROI. IF MEI >ROI, investment is profitable as at this point, return from investment is more as compared to cost and if MEI<ROI, investment is not profitable as at this point return from investment is less as compared to cost.

EX-ANTE & EX-POST SAVING AND INVESTMENT

EX-ante means planned or expected value of the variable, whereas EX-post means an actual or realized value of the variable.
Both are generally used in the context of saving and investment. There are two aspects of Savings and Investments:

1. **Ex Ante saving and Ex Ante investments**
2. **Ex-post saving and Ex post investments**

EX-ANTE SAVINGS

Refers to the amount which households are planning to save at different level of income in the economy. Ex-ante saving refers to the amount of savings that all the households intended to save at different levels of income in the economy at the beginning of the period. It is also known as planned savings.

EX-ANTE INVESTMENTS

It refers to the amount of investment which firms plan to invest at a different level of income in the economy.

It must be noted that an economy would be at equilibrium when ex-ante savings are equal to ex- ante investment.

Ex-ante investments refers to the amount of investment that all the firms plan to invest at a different level of income in the economy at the beginning of the period. It is also known as planned investment.

EX-POST SAVINGS

Ex-post saving refers to actually organized saving in an economy during the year.

Ex-post savings refer to the actual or realized savings in an economy during a financial year at end of the period.

EX-POST INVESTMENTS

It refers to actual or realized investment in an economy during a year.

Ex-post investment refers to the actual or realized investment in an economy during a financial year at the end of the period.

FULL EMPLOYMENT

Full employment refers to a situation in which all those people who are willing and able to work at the existing wage rate, get work without any due difficulty. Ordinarily, the term full employment refers to the situation in which no one is employed. However that can be some type of unemployment, they can be two types of unemployment:

1. Frictional unemployment: sometimes people leave one job in search for some other job and remain vacant between this period, which is termed as frictional unemployment.
2. Structural unemployment: effects on unemployment, where people remain unemployed because they do not match with a specific type of job. for example, due to the introduction of new technology, the old staff become unemployed as now they do not possess enough exercise to do a particular job.

FULL EMPLOYMENT

It refers to an unemployment people who are willing and able to work at the existing wage rate, do not get work. It must be noted that only involuntary unemployment is considered while estimating the total unemployment in an economy.

Full Employment and Involuntary Unemployment

FULL EMPLOYMENT: It is a situation when people who are willing and able to work are getting work. Under full employment, there can be two

types of unemployment

- Frictional Unemployment: Frictional unemployment can be defined as a type of unemployment that occurs when a person is in the process of moving from one job to another.
- Structural Unemployment: Structural unemployment occurs because of a mismatch between the skills workers have, and the jobs that are actually available in the market. Structural unemployment usually happens because of technological change.

Involuntary Unemployment
Involuntary unemployment refers to a situation when people are ready to work at the prevailing wage rate in the market but do not find a job.

5.11.IMPACT OF MACROECONOMIC FACTORS ON BUSINESS DECISIONS

a) Pricing and Cost Management
Inflation, exchange rates, and interest rates affect production costs and consumer purchasing power. Businesses must adjust pricing strategies to maintain profitability and competitiveness.

b) Investment and Expansion Plans
Economic growth and low interest rates encourage businesses to invest in new projects, while recessions or high interest rates may lead companies to delay expansion and focus on cost-cutting.

c) Hiring and Workforce Management
Unemployment levels determine hiring decisions and wage structures. High unemployment provides businesses with a larger labour pool at lower wages, while low unemployment increases labour costs and competition for skilled workers.

d) Supply Chain and Inventory Decisions
Fluctuations in global trade, exchange rates, and inflation affect the cost and availability of raw materials. Businesses must manage inventory efficiently and adopt flexible sourcing strategies to reduce risks.

e) Consumer Demand and Marketing Strategies
Economic conditions impact consumer behaviour. During downturns, businesses focus on affordability and value-based offerings, while during

booms, they market premium products to capitalize on increased spending power.

5.12.STRATEGIES FOR BUSINESSES TO NAVIGATE MACROECONOMIC CHANGES

a) Diversification

Expanding product lines, markets, or revenue streams reduces dependence on a single source of income, minimizing risks during economic downturns.

b) Cost Efficiency and Lean Management

Adopting lean management practices and optimizing costs help businesses maintain profitability, even in challenging economic conditions.

c) Flexible Pricing Strategies

Implementing dynamic pricing models allows businesses to adjust prices based on inflation, demand, and competition to sustain sales and revenue.

d) Strong Financial Planning

Maintaining a healthy cash flow, reducing unnecessary expenses, and securing alternative funding options help businesses withstand economic uncertainties.

e) Innovation and Technology Adoption

Investing in technology improves efficiency, reduces costs, and enhances competitiveness. Digital transformation enables businesses to adapt quickly to market changes.

f) Global Market Strategies

Businesses engaged in international trade must develop strategies to mitigate currency risks and economic uncertainties by expanding into multiple markets.