

ECO202

INTRODUCTION TO MICROECONOMICS LL



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Course code: ECO 202

Course title: Introduction to Microeconomics II

Course credit load: 2 Units

Series 1: Production and Cost Analysis

Series 2: Consumer Behaviour and Market Mechanism

Series 3: Market Structures and Pricing Strategies

Series 4: Factor Pricing and Income Distribution

Series 5: Elementary Price Theory and Applications

Suggested Outline

Part 1: Short-run and Long-run Production Periods

- 1.1 Distinction between short-run and long-run
- 1.2 Characteristics of short-run production
- 1.3 Characteristics of long-run production

Part 2: Cost Concepts and Curves

- 2.1 Fixed and variable costs
- 2.2 Average and marginal costs
- 2.3 Short-run and long-run cost curves

Part 3: Production Functions and Technical Progress

- 3.1 The Cobb-Douglas production function
- 3.2 Returns to scale and factor substitution
- 3.3 Technical progress and its impact on production

Introduction

Production is at the heart of economic activity, since it determines how resources are transformed into goods and services that satisfy human wants. In microeconomics, the study of production and costs provides the foundation for understanding how firms make decisions, how



they respond to market conditions, and how efficiency can be achieved. By examining production periods and cost structures, learners gain insight into the dynamics of business operations and the economic forces that shape them.

The aim of this Series is to equip you with the knowledge and analytical skills needed to explain production processes, evaluate cost behaviours, and apply these concepts to real-world economic situations.

We shall commence this Series by exploring the distinction between short-run and long-run production periods, highlighting the constraints and opportunities firms face in each case. Next, we will move on to cost concepts and curves, where you will learn how fixed, variable, average, and marginal costs interact to influence decision-making. Finally, we will conclude with an examination of production functions, particularly the Cobb-Douglas function, and consider the role of technical progress in shaping productivity and efficiency.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- **SLO 1.1** define the concepts of short-run and long-run production periods,
- **SLO 1.2** explain the distinguishing characteristics of short-run and long-run production,
- **SLO 1.3** analyse fixed, variable, average, and marginal costs,
- **SLO 1.4** illustrate the behaviour of short-run and long-run cost curves,
- **SLO 1.5** apply the Cobb-Douglas production function to demonstrate the relationship between inputs and output, and
- **SLO 1.6** evaluate the role of technical progress in improving production efficiency.

1 Production and Cost Analysis

1.1 Short-run and Long-run Production Periods

1.1.1 Distinction between Short-run and Long-run

In microeconomics, the **short run** refers to a period in which at least one factor of production, such as capital, is fixed, while other factors like labour can be varied. The **long run**, on the other hand, is a period in which all factors of production can be varied, allowing firms to adjust fully to changes in demand and technology.

For example, a bakery may be able to hire more workers in the short run but cannot immediately expand its building. In the long run, however, it can build a larger facility and install new ovens.

In-text question (ITQ): The short run is defined as the period in which at least one factor of production is _____.



COMPARATIVE DIAGRAM: SHORT-RUN vs. LONG-RUN PRODUCTION

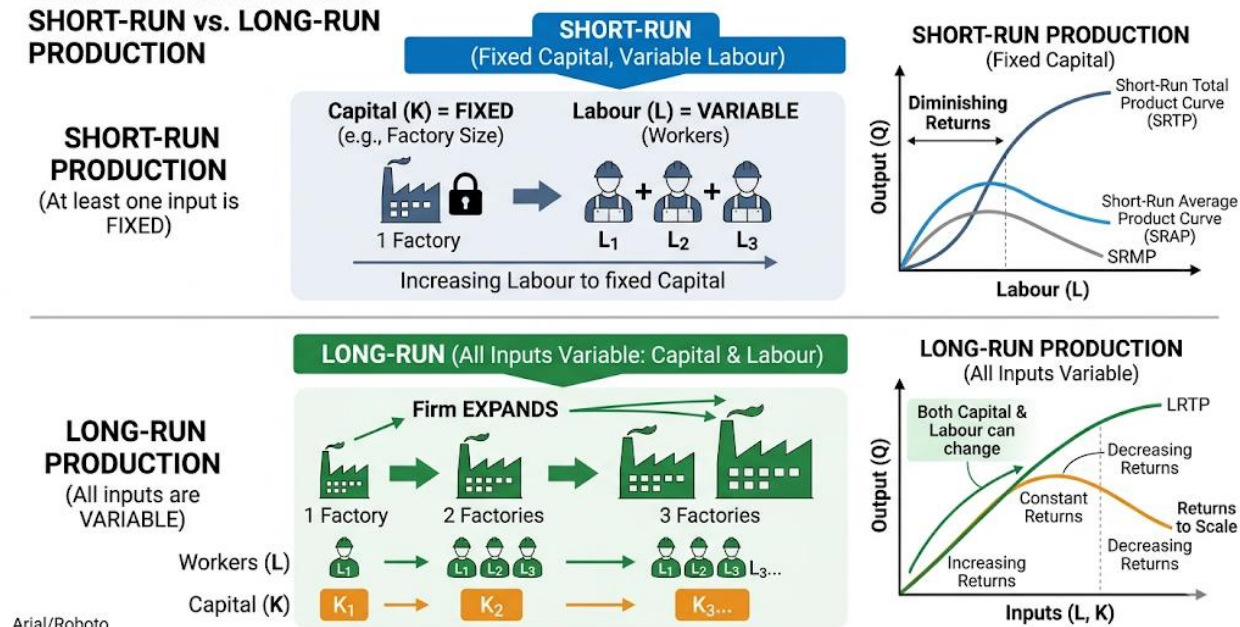


Figure 1.1 Placeholder: A diagram showing the difference between short-run and long-run production periods.

Distinction between short-run and long-run production.

1.1.2 Characteristics of Short-run Production

In the short run, firms face constraints due to fixed inputs. This leads to the **law of variable proportions**, which states that as more units of a variable input are added to fixed inputs, output initially increases at an increasing rate, then at a decreasing rate, and eventually may decline.

This behaviour is explained through three stages:

- Stage I: Increasing returns,
- Stage II: Diminishing returns,
- Stage III: Negative returns.

In-text question (ITQ): According to the law of variable proportions, output eventually _____ when too much of a variable input is added to fixed inputs.



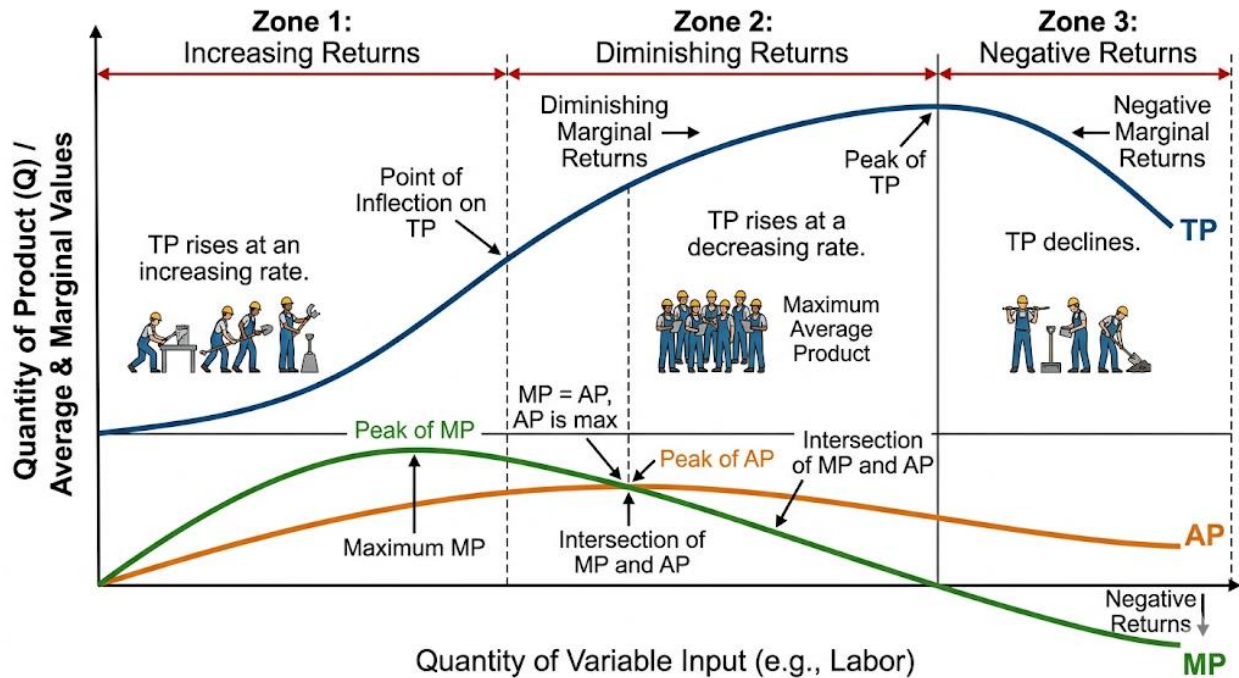


Figure 1.2 Placeholder: Graph of total, average, and marginal product curves.
Caption: Stages of short-run production.

1.1.3 Characteristics of Long-run Production

In the long run, firms can adjust all inputs, which allows them to achieve **returns to scale**. Returns to scale describe how output changes when all inputs are increased proportionally.

- **Increasing returns to scale:** Output increases more than proportionally to inputs.
- **Constant returns to scale:** Output increases proportionally to inputs.
- **Decreasing returns to scale:** Output increases less than proportionally to inputs.

In-text question (ITQ): When output increases more than proportionally to inputs, the firm experiences _____ returns to scale.



GRAPH OF THREE CURVES REPRESENTING RETURNS TO SCALE

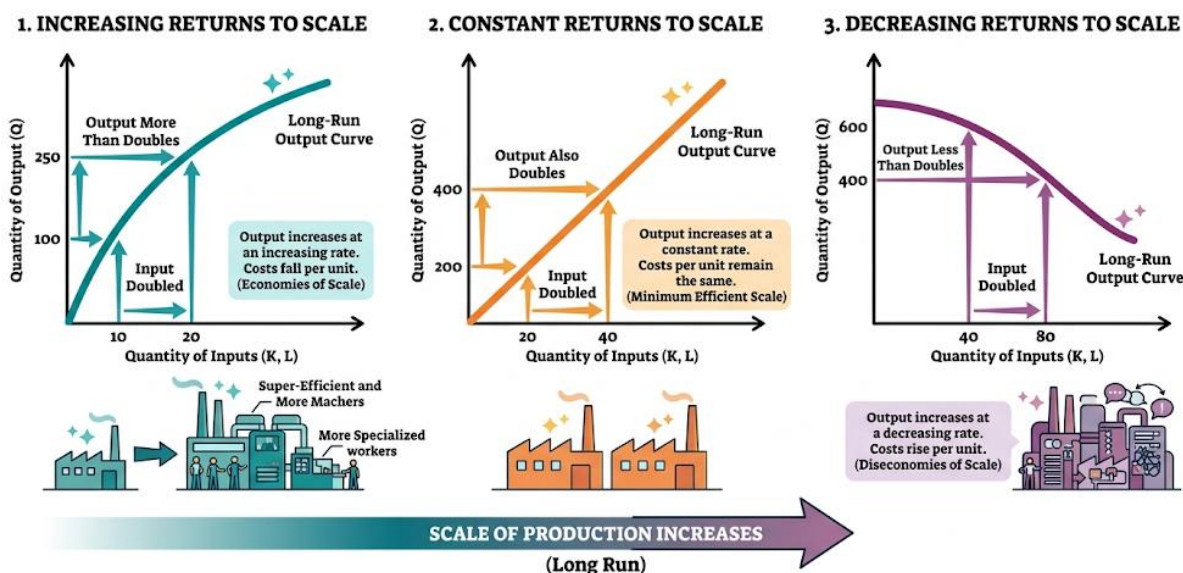


Figure 1.3 Placeholder: Graph showing increasing, constant, and decreasing returns to scale.
Caption: Returns to scale in long-run production.

Pilot questions 1.1

1. In the short run, which type of input remains fixed?
2. What law explains the stages of short-run production?
3. Name the three stages of short-run production.
4. What term describes output increasing proportionally to inputs in the long run?
5. Distinguish between increasing and decreasing returns to scale.

2.1 Cost Concepts and Curves

2.1.1 Fixed and Variable Costs

Fixed costs are expenses that do not change with the level of output, such as rent, insurance, or salaries of permanent staff. **Variable costs** change directly with the level of production, such as raw materials and wages of casual labour.

For example, a factory pays the same rent whether it produces 100 or 1,000 units, but the cost of raw materials will rise as more units are produced.

In-text question (ITQ): Costs that remain constant regardless of output are called _____ costs.



CHART: PRODUCTION COSTS OVER OUTPUT

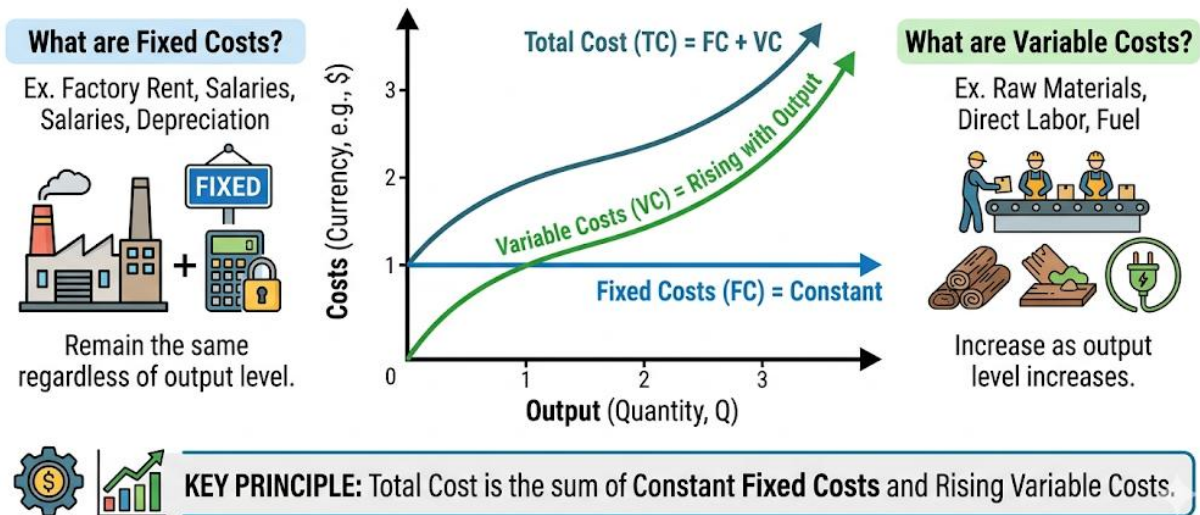


Figure 2.1 Placeholder: A diagram showing fixed and variable costs.
Caption: Relationship between fixed and variable costs.

2.1.2 Average and Marginal Costs

Average cost (AC) is the total cost divided by the number of units produced. It shows the cost per unit of output.

Marginal cost (MC) is the additional cost incurred by producing one more unit of output.

These measures are important because they help firms decide whether producing an extra unit is profitable.

In-text question (ITQ): The cost of producing one additional unit is known as _____ cost.



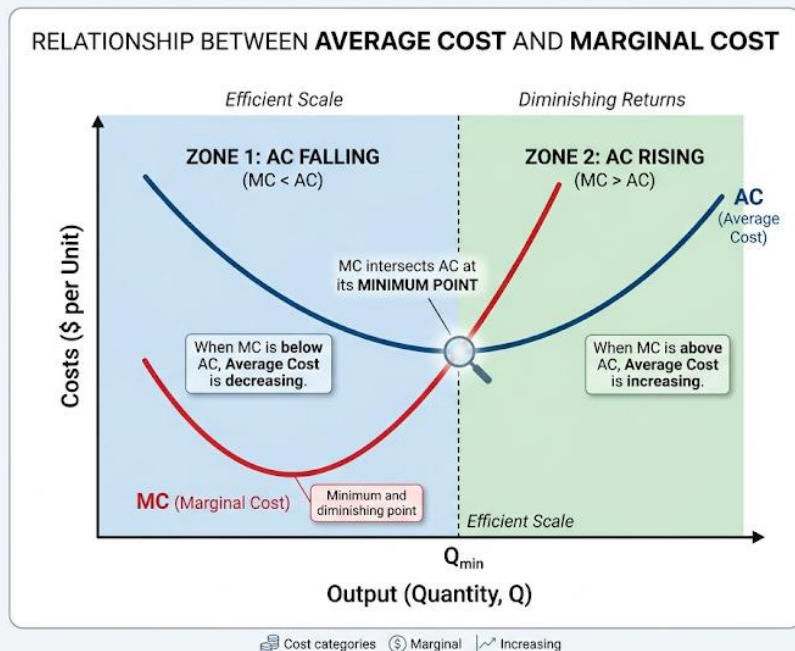


Figure 2.2 Placeholder: Graph showing average and marginal cost curves.
Caption: Average and marginal cost behaviour.

2.1.3 Short-run and Long-run Cost Curves

In the short run, cost curves reflect the presence of fixed inputs. The **average total cost curve** typically has a U-shape due to economies and diseconomies of scale.

In the long run, firms can adjust all inputs, and the **long-run average cost curve** is derived from a series of short-run curves, showing the lowest possible cost at each level of output.

In-text question (ITQ): The long-run average cost curve is derived from a series of _____ cost curves.



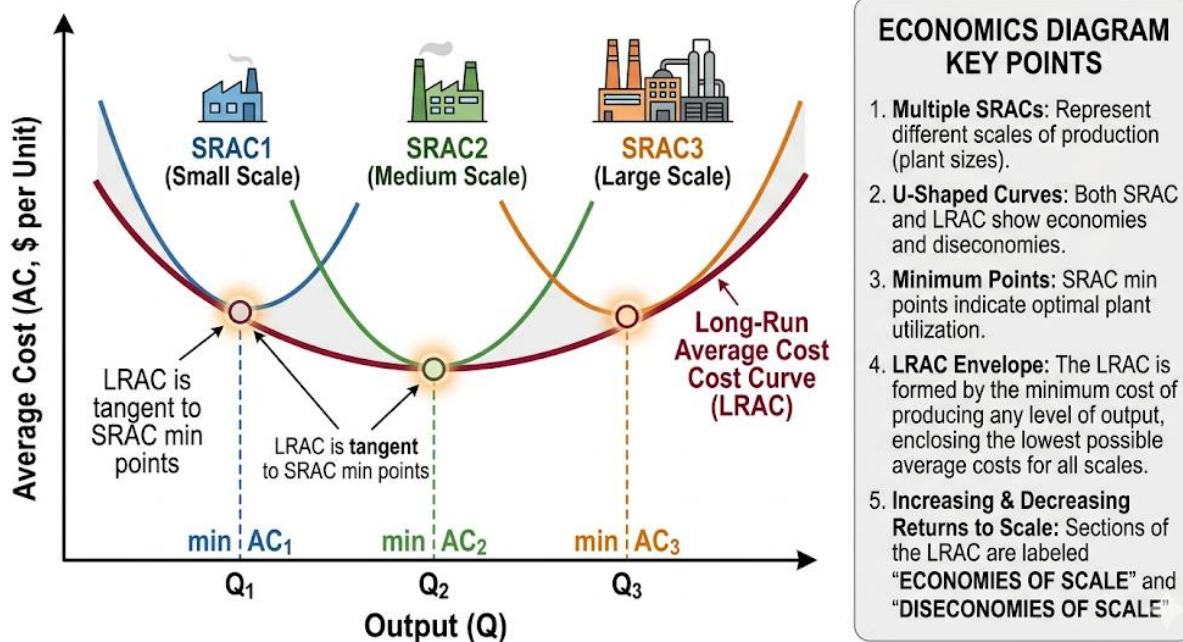


Figure 2.3 Placeholder: Graph showing short-run and long-run average cost curves.
Caption: Short-run and long-run cost relationships.

Pilot questions 2.1

1. What is the difference between fixed and variable costs?
2. How is average cost calculated?
3. Define marginal cost.
4. Why is the short-run average cost curve typically U-shaped?
5. What does the long-run average cost curve represent?

3.1 Production Functions and Technical Progress

3.1.1 The Cobb-Douglas Production Function

The **Cobb-Douglas production function** is a mathematical representation of the relationship between inputs and output. It is expressed as:

$$[Q = A \cdot L^{\alpha} \cdot K^{\beta}]$$

Where:

- **Q** = output,
- **A** = efficiency parameter,



- **L** = labour input,
- **K** = capital input,
- **α and β** = output elasticities of labour and capital respectively.

This function shows how changes in labour and capital affect total output. It also helps in analysing returns to scale.

In-text question (ITQ): In the Cobb-Douglas function, the symbol **L** represents _____.

Isoquant Curves (oe) for Cobb-Douglas production function

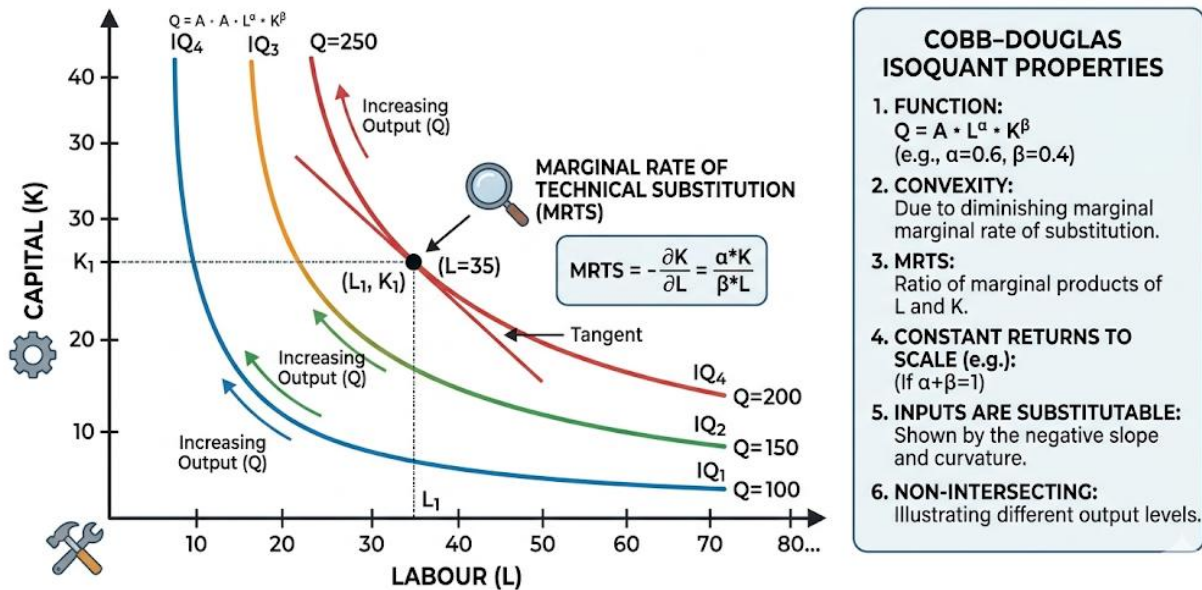


Figure 3.1 Placeholder: Graph illustrating isoquants of a Cobb-Douglas production function.
Caption: Cobb-Douglas production function and isoquants.

3.1.2 Returns to Scale and Factor Substitution

Returns to scale describe how output responds when all inputs are increased proportionally. As explained earlier, returns may be increasing, constant, or decreasing.

Factor substitution occurs when firms replace one input with another while maintaining the same level of output. For example, a firm may substitute machinery for labour if technology becomes cheaper.

In-text question (ITQ): When a firm replaces labour with machinery while maintaining output, this is called factor _____.



ISOQUANT CURVES & MARGINAL RATE OF TECHNICAL SUBSTITUTION (MRTS)

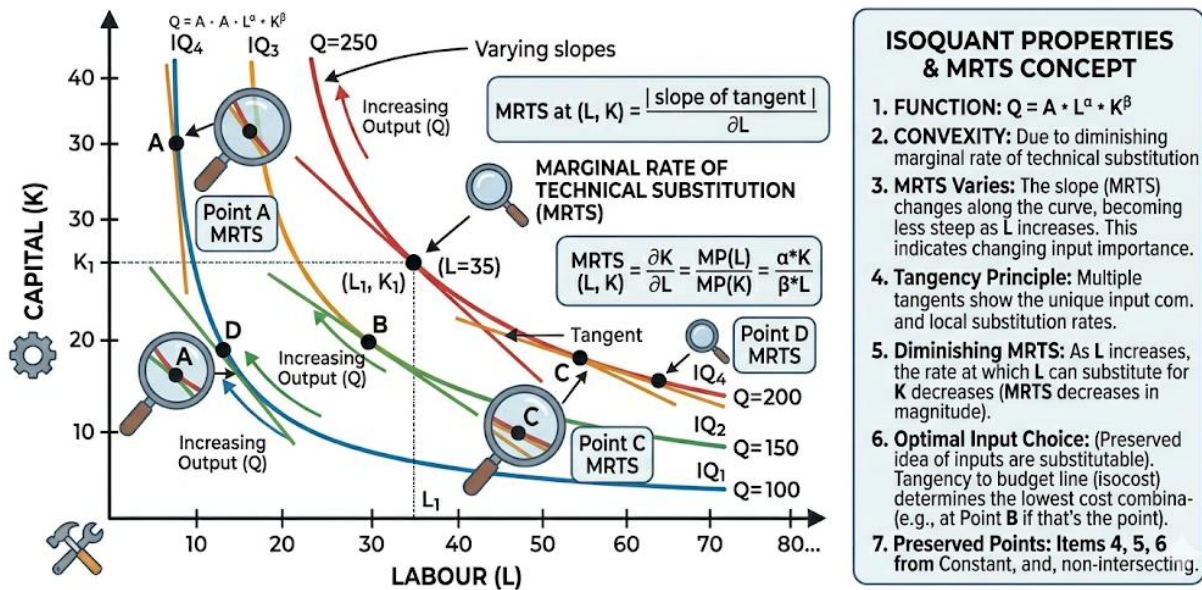


Figure 3.2 Placeholder: Diagram showing isoquants and marginal rate of technical substitution.

Caption: Factor substitution in production.

3.1.3 Technical Progress and Its Impact on Production

Technical progress refers to improvements in methods of production, often through innovation, better machinery, or enhanced skills. It leads to higher productivity, lower costs, and greater efficiency.

For instance, the introduction of automated assembly lines in manufacturing significantly reduced production time and costs.

In-text question (ITQ): Improvements in production methods that increase efficiency are referred to as _____ progress.



CHART: PRODUCTIVITY GROWTH DUE TO TECHNICAL PROGRESS

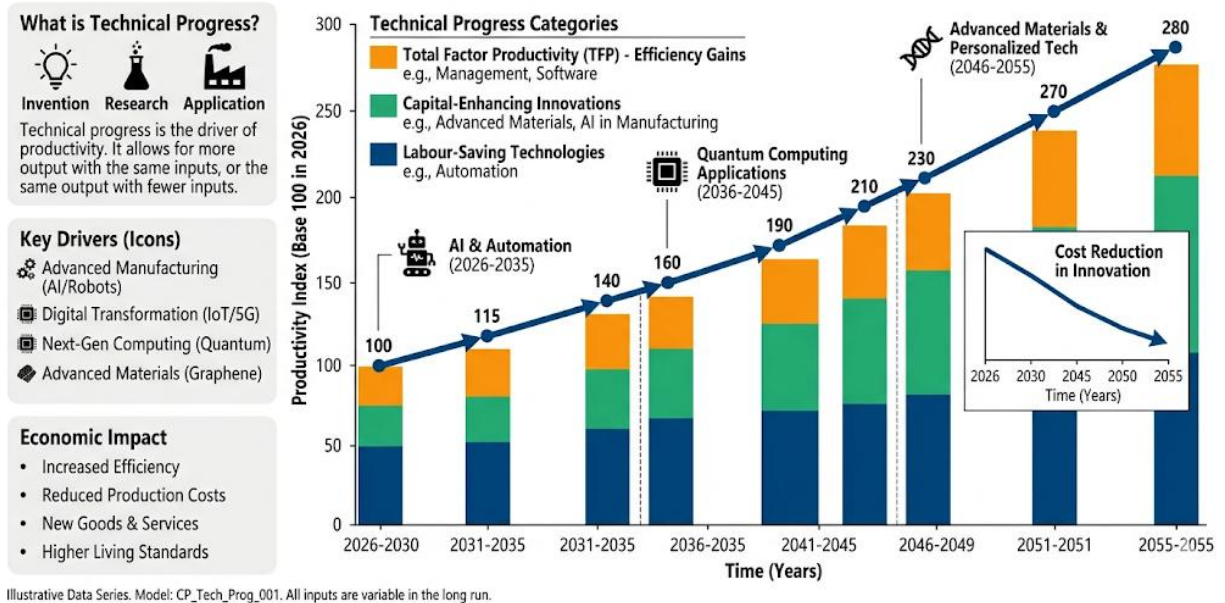


Figure 3.3 Placeholder: Illustration of productivity growth due to technical progress.
Caption: Impact of technical progress on production efficiency.

Pilot questions 3.1

1. Write the general form of the Cobb-Douglas production function.
2. What do the parameters α and β represent in the Cobb-Douglas function?
3. Define factor substitution with an example.
4. Distinguish between increasing and decreasing returns to scale.
5. What is meant by technical progress in production?

Series Summary

In this Series, we examined the foundations of production and cost analysis. We began by distinguishing between short-run and long-run production periods, highlighting the constraints of fixed inputs and the flexibility of variable inputs. We then explored cost concepts, including fixed, variable, average, and marginal costs, and analysed their graphical representations in both the short run and the long run. Finally, we studied the Cobb-Douglas production function, returns to scale, factor substitution, and the role of technical progress in enhancing efficiency. Together, these topics provide a comprehensive understanding of how firms make production decisions and manage costs in different time frames.

Glossary of Terms



- **Short run:** A period in which at least one factor of production is fixed.
- **Long run:** A period in which all factors of production can be varied.
- **Law of variable proportions:** Principle stating that output changes as variable inputs are added to fixed inputs, leading to stages of increasing, diminishing, and negative returns.
- **Fixed costs:** Costs that remain constant regardless of output.
- **Variable costs:** Costs that change directly with the level of output.
- **Average cost (AC):** Total cost divided by the number of units produced.
- **Marginal cost (MC):** Additional cost incurred by producing one more unit of output.
- **Returns to scale:** Changes in output resulting from proportional changes in all inputs.
- **Factor substitution:** Replacing one input with another while maintaining output.
- **Cobb-Douglas production function:** A mathematical model showing the relationship between inputs and output.
- **Technical progress:** Improvements in production methods that increase efficiency.

Concept Check Questions

Objective Questions

1. The short run is defined as the period in which at least one factor of production is _____. (Linked to SLO 1.1)
2. According to the law of variable proportions, output eventually _____ when too much of a variable input is added to fixed inputs. (Linked to SLO 1.2)
3. Costs that remain constant regardless of output are called _____ costs. (Linked to SLO 1.3)
4. The cost of producing one additional unit is known as _____ cost. (Linked to SLO 1.3)
5. The long-run average cost curve is derived from a series of _____ cost curves. (Linked to SLO 1.4)
6. In the Cobb-Douglas production function, the symbol L represents _____. (Linked to SLO 1.5)
7. Improvements in production methods that increase efficiency are referred to as _____ progress. (Linked to SLO 1.6)

Short-Answer Questions

8. Distinguish between fixed and variable costs with examples. (Linked to SLO 1.3)
9. Why is the short-run average cost curve typically U-shaped? (Linked to SLO 1.4)
10. What do the parameters α and β represent in the Cobb-Douglas production function? (Linked to SLO 1.5)
11. Define factor substitution with an example. (Linked to SLO 1.5)



12. Explain the difference between increasing and decreasing returns to scale. (Linked to SLO 1.2, 1.5)

Long-Answer Questions

13. Define the short run and the long run in production analysis, and explain the law of variable proportions with an example. (Linked to SLO 1.1, 1.2)

14. Illustrate the behaviour of average and marginal cost curves, and explain their significance in decision-making. (Linked to SLO 1.3, 1.4)

15. Write the general form of the Cobb-Douglas production function and evaluate the impact of technical progress on production efficiency. (Linked to SLO 1.5, 1.6)

Answers to Concept Check Questions

Objective Questions

1. Fixed.
2. Declines.
3. Fixed.
4. Marginal.
5. Short-run.
6. Labour.
7. Technical.

Short-Answer Questions

8. Fixed costs remain constant regardless of output (e.g., rent), while variable costs change with output (e.g., raw materials).
9. Because of economies of scale (falling costs as output rises) and diseconomies of scale (rising costs after a certain point).
10. They represent the output elasticities of labour (α) and capital (β).
11. Factor substitution occurs when one input is replaced by another while maintaining output, e.g., machinery replacing labour.
12. Increasing returns: output rises more than proportionally to inputs; decreasing returns: output rises less than proportionally.



Long-Answer Questions

Q13: Short run vs. long run and law of variable proportions

- *Basic response:* The short run is when at least one factor of production is fixed, while in the long run all factors can be varied. The law of variable proportions states that as more units of a variable input are added to fixed inputs, output first increases at an increasing rate, then at a decreasing rate, and may eventually decline. For example, adding more workers to a bakery with limited ovens initially boosts production, but overcrowding eventually reduces efficiency.
- *Value-added response:* Beyond the basics, the law of variable proportions highlights resource allocation efficiency. It explains why firms must balance labour and capital to avoid diminishing productivity. This principle underpins modern production planning and informs decisions about scaling operations sustainably.

Q14: Average and marginal cost curves

- *Basic response:* Average cost is total cost divided by output, while marginal cost is the cost of producing one more unit. The average cost curve is typically U-shaped, and the marginal cost curve intersects it at the minimum point. These curves help firms decide whether producing additional units is profitable.
- *Value-added response:* Advanced learners can connect these curves to real-world pricing strategies. For instance, understanding marginal cost is crucial in competitive markets where firms set prices close to marginal cost. The U-shape reflects economies and diseconomies of scale, guiding firms in determining optimal production levels.

Q15: Cobb-Douglas function and technical progress

- *Basic response:* The Cobb-Douglas production function is $Q = A \cdot L^\alpha \cdot K^\beta$, where Q is output, L is labour, K is capital, and α and β are elasticities. Technical progress refers to improvements in production methods that increase efficiency.
- *Value-added response:* Outstanding learners can evaluate how technical progress shifts the production function upward, enabling higher output with the same inputs. This has implications for long-term economic growth, competitiveness, and innovation-driven industries. For example, automation in manufacturing reduces costs and enhances productivity, reshaping global supply chains.

Answers to Pilot Questions

Pilot Questions 1.1

- Fixed inputs remain constant in the short run.
- The law of variable proportions explains short-run production stages.
- Stage I: Increasing returns, Stage II: Diminishing returns, Stage III: Negative returns.



- Constant returns to scale.
- Increasing returns mean output rises more than proportionally, decreasing returns mean output rises less than proportionally.

Pilot Questions 2.1

- Fixed costs remain constant, variable costs change with output.
- Average cost = Total cost ÷ Output.
- Marginal cost is the cost of producing one more unit.
- Due to economies and diseconomies of scale.
- The long-run average cost curve represents the lowest possible cost at each level of output.

Pilot Questions 3.1

- $Q = A \cdot L^\alpha \cdot K^\beta$.
- α and β represent the output elasticities of labour and capital.
- Factor substitution occurs when one input is replaced by another, e.g., machinery for labour.
- Increasing returns: output rises more than inputs; decreasing returns: output rises less than inputs.
- Technical progress means improvements in production methods that increase efficiency.

References and Attributions

Course Document ECO 202: *Introduction to Microeconomics II*. Internal university course outline.

Textbook References

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- Saylor Academy. (2012). *Microeconomics*. Retrieved from <https://learn.saylor.org/course/view.php?id=6> (learn.saylor.org in Bing)

Illustrations and AI Prompts All figures in Series 1 are intended for AI generation. Attribution notes are provided below:

- *Figure 1.1: Distinction between short-run and long-run production periods* Prompt: “Create a simple comparative diagram showing short-run with fixed capital and variable labour, and long-run with all inputs variable.” Attribution: AI-generated illustration.
- *Figure 1.2: Stages of short-run production* Prompt: “Generate a graph of total, average, and marginal product curves showing increasing, diminishing, and negative returns.” Attribution: AI-generated illustration.
- *Figure 1.3: Returns to scale in long-run production* Prompt: “Illustrate a graph with three curves representing increasing, constant, and decreasing returns to scale.” Attribution: AI-generated illustration.
- *Figure 2.1: Relationship between fixed and variable costs* Prompt: “Draw a chart showing fixed costs as constant and variable costs rising with output.” Attribution: AI-generated illustration.
- *Figure 2.2: Average and marginal cost behaviour* Prompt: “Create a U-shaped average cost curve with a marginal cost curve intersecting at the minimum point.” Attribution: AI-generated illustration.
- *Figure 2.3: Short-run and long-run cost relationships* Prompt: “Generate a diagram showing multiple short-run average cost curves enveloped by a long-run average cost curve.” Attribution: AI-generated illustration.
- *Figure 3.1: Cobb-Douglas production function and isoquants* Prompt: “Illustrate isoquant curves for a Cobb-Douglas production function with labour and capital axes.” Attribution: AI-generated illustration.
- *Figure 3.2: Factor substitution in production* Prompt: “Create a diagram of isoquants showing substitution between labour and capital with marginal rate of technical substitution.” Attribution: AI-generated illustration.
- *Figure 3.3: Impact of technical progress on production efficiency* Prompt: “Generate a chart showing productivity growth over time due to technical progress.” Attribution: AI-generated illustration.



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Series 1: Production and Cost Analysis

Series 2: Consumer Behaviour and Market Mechanism

Series 3: Market Structures and Pricing Strategies

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Series 5: Elementary Price Theory and Applications

Series Outline

Part 1: Theories of Demand and Supply

- 2.1.1 Law of Demand
- 2.1.2 Law of Supply
- 2.1.3 Determinants of Demand and Supply
- 2.1.4 Demand and Supply Curves with Market Applications

Part 2: Consumer Behaviour and Utility Analysis

- 2.2.1 Cardinal Utility Approach
- 2.2.2 Ordinal Utility and Indifference Curve Analysis
- 2.2.3 Budget Constraint and Consumer Equilibrium
- 2.2.4 Applications of Utility Theory in Consumer Choice

Part 3: Market Mechanism and Price Determination

- 2.3.1 Market Equilibrium: Demand and Supply Interaction
- 2.3.2 Effects of Shifts in Demand and Supply
- 2.3.3 Price Controls: Floors and Ceilings
- 2.3.4 Applications of Market Mechanism in Real-world Scenarios



Introduction

Everyday choices made by consumers and firms are guided by the forces of demand and supply. Understanding how consumers behave and how markets function is central to microeconomics, as it explains the allocation of scarce resources and the determination of prices. This Series will provide you with the analytical tools to study consumer preferences, demand and supply relationships, and the functioning of market mechanisms.

The aim of this Series is to enable you to explain demand and supply theories, analyse consumer behaviour using utility concepts, and evaluate how market forces determine prices and quantities exchanged.

We shall commence this Series by examining the theories of demand and supply, focusing on their laws, determinants, and graphical representation. Next, we will move on to consumer behaviour and utility analysis, where you will explore cardinal and ordinal approaches to utility, indifference curves, and budget constraints. Finally, we will conclude with the study of market mechanism and price determination, highlighting how equilibrium is achieved and how shifts in demand and supply affect market outcomes.

Series Learning Outcomes

Upon completing this Series, you should be able to:

Here is a **whole set of Series Learning Outcomes (SLOs)** for the outline you provided, written as one unified list rather than broken into separate parts.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- **SLO 1** explain the laws of demand and supply and illustrate their application in consumer and producer behaviour.
- **SLO 2** analyse the determinants of demand and supply and assess their impact on market outcomes.
- **SLO 3** construct and interpret demand and supply curves, applying them to real market situations.
- **SLO 4** apply the cardinal utility approach to measure consumer satisfaction.
- **SLO 5** interpret ordinal utility using indifference curve analysis.
- **SLO 6** evaluate consumer equilibrium under budget constraints.
- **SLO 7** use utility theory to explain consumer choice in practical scenarios.



Part 1: Theories of Demand and Supply

1.1 The Concept of Demand

Definition: Demand refers to the quantity of a good or service that consumers are willing and able to purchase at different prices during a given period.

- **Law of Demand:** As the price of a good falls, the quantity demanded increases, and vice versa, assuming other factors remain constant.
- **Determinants of Demand:** Income, tastes and preferences, prices of related goods, expectations, and population size.

ITQ: The law of demand states that as price falls, quantity _____.

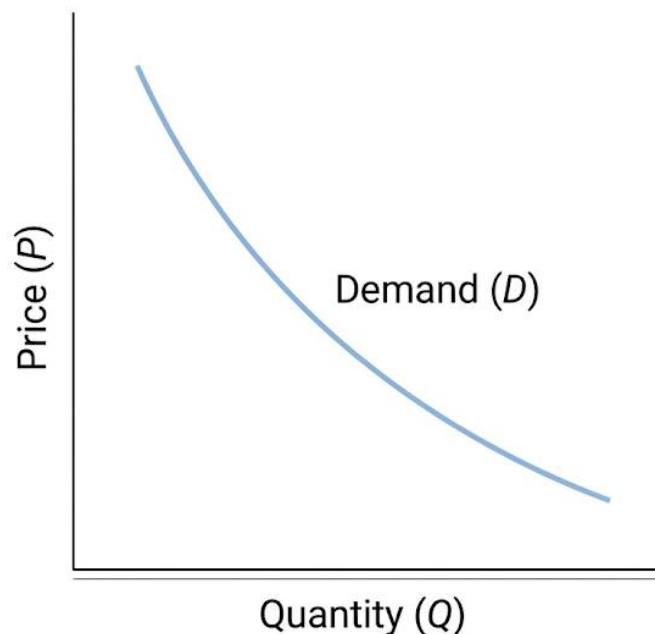


Figure 1.1: Placeholder illustration showing a downward-sloping demand curve.

1.2 The Concept of Supply

Definition: Supply refers to the quantity of a good or service that producers are willing and able to offer for sale at different prices during a given period.

- **Law of Supply:** As the price of a good rises, the quantity supplied increases, and vice versa, assuming other factors remain constant.
- **Determinants of Supply:** Production costs, technology, prices of related goods, expectations, and number of sellers.

ITQ: The law of supply states that as price rises, quantity _____.



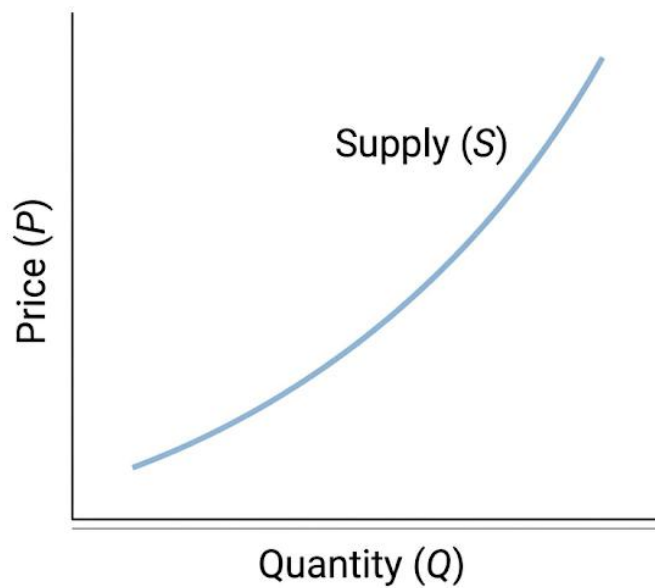


Figure 1.2: Upward-sloping supply curve.

Figure 1.2: Placeholder illustration showing an upward-sloping supply curve.

1.3 Market Equilibrium

Definition: Market equilibrium occurs when the quantity demanded equals the quantity supplied at a particular price.

- **Equilibrium Price:** The price at which demand and supply are equal.
- **Equilibrium Quantity:** The quantity exchanged at the equilibrium price.
- **Disequilibrium:** Occurs when there is excess demand (shortage) or excess supply (surplus).

ITQ: When demand equals supply, the market is said to be in _____.



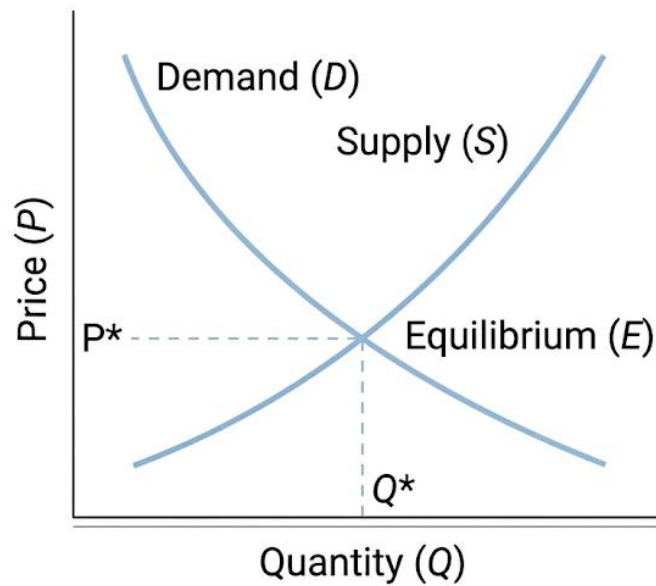


Figure 1.3: Demand and Supply Curve Equilibrium.

Figure 1.3: Placeholder illustration showing demand and supply curves intersecting at equilibrium.

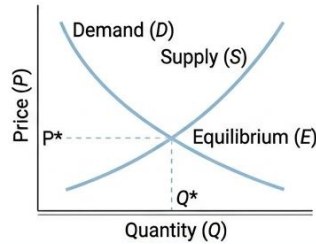
1.4 Elasticity of Demand and Supply

Elasticity measures the responsiveness of demand or supply to changes in price or other factors.

- **Price Elasticity of Demand (PED):** Percentage change in quantity demanded divided by percentage change in price.
- **Price Elasticity of Supply (PES):** Percentage change in quantity supplied divided by percentage change in price.
- **Interpretation:** Elastic (>1), Inelastic (<1), or Unitary ($=1$).

ITQ: If demand changes greatly with a small change in price, demand is said to be _____.





Box 1.1: SUMMARY OF ELASTICITIES WITH EXAMPLES		
ELASTICITY TYPE	DESCRIPTION	EXAMPLES (Goods)
— PERFECTLY ELASTIC ($E = \infty$)	Quantity changes infinitely with small Price change (Horizontal curve).	A standardized good in a competitive market.
↗ ELASTIC ($E > 1$)	Quantity changes proportionally more than Price change (Responsive).	Luxury goods (e.g., designer clothes), recreational goods (e.g., travel).
⇒ UNIT ELASTIC ($E = 1$)	Quantity and Price change by the same percentage.	Theoretical average good, or goods where total revenue is maximized.
↘ INELASTIC ($E < 1$)	Quantity changes proportionally less than Price change (Less responsive).	Necessities (e.g., basic food, medicine), addictive goods (e.g., tobacco), utilities.
PERFECTLY INELASTIC ($E = 0$)	Quantity remains constant regardless of Price change (Vertical curve).	Life-saving medicine with no substitute.

Figure 1.4: Summary of Elasticities with Examples.

Box 1.1: Placeholder box summarising types of elasticity with examples.

Pilot Questions (Part 1)

- The law of demand states that: a) As price rises, demand rises b) As price falls, demand rises c) As income falls, demand rises d) As supply rises, demand falls
- Which of the following is a determinant of demand? a) Production costs b) Technology c) Consumer income d) Number of sellers
- The law of supply states that: a) As price rises, supply falls b) As price rises, supply rises c) As costs rise, supply rises d) As demand rises, supply falls
- Market equilibrium occurs when: a) Demand exceeds supply b) Supply exceeds demand c) Demand equals supply d) Prices are unstable
- If demand is highly responsive to price changes, demand is: a) Inelastic b) Elastic c) Unitary d) Constant

Part 2: Consumer Behaviour and Utility Analysis

2.2.1 Cardinal Utility Approach

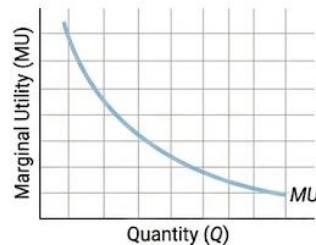
The **cardinal utility approach** assumes that satisfaction (utility) derived from consuming goods can be measured in absolute units called *utils*.

- Law of Diminishing Marginal Utility:** As more units of a good are consumed, the additional satisfaction gained from each extra unit decreases.



- Consumers maximise utility when the ratio of marginal utility to price is equal across all goods.

ITQ: The law of diminishing marginal utility states that additional satisfaction _____ as more units are consumed.



Box 1.1: SUMMARY OF ELASTICITIES WITH EXAMPLES		
ELASTICITY TYPE	DESCRIPTION	EXAMPLES (Goods)
— PERFECTLY ELASTIC ($E = \infty$)	Quantity changes infinitely with small Price change (Horizontal curve).	A standardized good in a competitive market.
↗ ELASTIC ($E > 1$)	Quantity changes proportionally more than Price change (Responsive).	Luxury goods (e.g., designer clothes), recreational goods (e.g., travel).
⇒ UNIT ELASTIC ($E = 1$)	Quantity and Price change by the same percentage.	Theoretical average good, or goods where total revenue is maximized.
↘ INELASTIC ($E < 1$)	Quantity changes proportionally less than Price change (Less responsive).	Necessities (e.g., basic food, medicine), addictive goods (e.g., tobacco), utilities.
PERFECTLY INELASTIC ($E = 0$)	Quantity remains constant regardless of Price change (Vertical curve).	Life-saving medicine with no substitute.

Figure 2.1: Downward-Sloping Marginal Utility Curve.

Figure 2.1: Placeholder illustration showing a downward-sloping marginal utility curve.

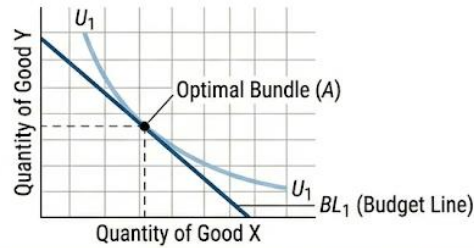
2.2.2 Ordinal Utility and Indifference Curve Analysis

The **ordinal utility approach** assumes that satisfaction cannot be measured in absolute terms but can be ranked.

- **Indifference curve:** Shows combinations of two goods that give the consumer equal satisfaction.
- **Properties of indifference curves:** Downward sloping, convex to the origin, and do not intersect.
- **Marginal Rate of Substitution (MRS):** The rate at which a consumer is willing to give up one good for another while maintaining the same level of utility.

ITQ: Indifference curves are typically _____ to the origin.





Box 1.1: SUMMARY OF ELASTICITIES WITH EXAMPLES		
ELASTICITY TYPE	DESCRIPTION	EXAMPLES (Goods)
PERFECTLY ELASTIC ($E = \infty$)	Quantity changes infinitely with small Price change (Horizontal curve).	A standardized good in a competitive market.
ELASTIC ($E > 1$)	Quantity changes proportionally more than Price change (Responsive).	Luxury goods (e.g., designer clothes), recreational goods (e.g., travel).
UNIT ELASTIC ($E = 1$)	Quantity and Price change by the same percentage.	Theoretical average good, or goods where total revenue is maximized.
INELASTIC ($E < 1$)	Quantity changes proportionally less than Price change (Less responsive).	Necessities (e.g., basic food, medicine), addictive goods (e.g., tobacco), utilities.
PERFECTLY INELASTIC ($E = 0$)	Quantity remains constant regardless of Price change (Vertical curve).	Life-saving medicine with no substitute.

Figure 2.2: Indifference Curves and Budget Line

Figure 2.2: Placeholder illustration showing indifference curves and budget line.

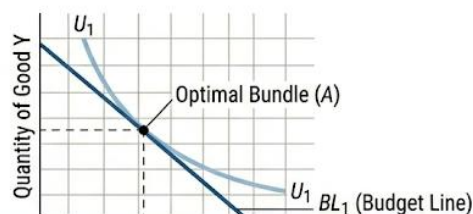
2.2.3 Budget Constraint and Consumer Equilibrium

A **budget constraint** represents the combinations of goods a consumer can afford given income and prices.

- **Consumer equilibrium** occurs where the budget line is tangent to an indifference curve.
- At equilibrium, the slope of the budget line (ratio of prices) equals the slope of the indifference curve (MRS).

ITQ: Consumer equilibrium occurs where the budget line is _____ to an indifference curve.





Box 2.1: SUMMARY OF CONSUMER EQUILIBRIUM CONDITIONS			
CONDITION TYPE	ICON	MATHEMATICAL REPRESENTATION	DESCRIPTION
MARGINAL UTILITY PER DOLLAR		$\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$	The consumer maximizes utility when the marginal utility per dollar spent is equal across all goods (x and y).
TANGENCY PRINCIPLE		$MRTS_{xy} = \frac{P_x}{P_y}$	Equilibrium occurs at the bundle (like point A) where the slope of the indifference curve (MRTS, or MRS) equals the slope of the budget line (price ratio). This bundle is the most preferred affordable point. Tangible products: (Designer clothes, recreational goods)
BUDGET CONSTRAINT		$P_x \cdot X + P_y \cdot Y = \text{Income (I)}$	The chosen bundle (X, Y) must be on the budget line, meaning the total expenditure exactly equals the consumer's income. This bundle is precisely affordable.
PRESUMPTION		Not Applicable	Consistent with previous summaries, we presume optimal input choices for producing utility bundles (like X and Y). Tangency determines the choice.

Figure 2.3: Summary of Consumer Equilibrium Conditions with Examples

Box 2.1: Placeholder box summarising consumer equilibrium conditions.

2.2.4 Applications of Utility Theory in Consumer Choice

Utility theory helps explain real-world consumer behaviour:

- **Choice under constraints:** Consumers allocate income to maximise satisfaction.
- **Policy applications:** Subsidies, taxes, and welfare programmes affect consumer choices.
- **Market predictions:** Utility analysis helps predict demand responses to price changes.

ITQ: Utility theory explains how consumers allocate _____ to maximise satisfaction.



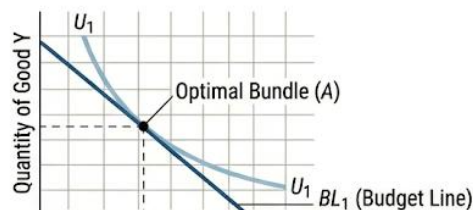


Table 2.1: APPLICATIONS OF UTILITY THEORY (POLICY & WELFARE)			
POLICY AREA	RETAINED UTILITY PRINCIPLE	EFFECT (ON GRAPHS)	WELFARE OUTCOME (Examples)
SUBSIDIES (e.g., Food Stamps) 	Shift in Budget Line (Slope changes with P_x/P_y) and preserved point 6 (Tangency is key).	The Budget Line rotates outwards (or shifts) to a higher utility curve (U_2, U_3).	Increased utility for low-income consumers, improved food security. 
TAXES (e.g., Luxury Tax) 	Shift in Budget Line and Presumed optimal choice (preserving idea of inputs are substitutable). 	The Budget Line rotates inwards, forcing a lower utility curve choice (U_0). A specific point A is moved to point A'.	Reduced utility for luxury consumers, potentially redistributing revenue, altering input choices. 
WELFARE PROGRAMMES (e.g., Cash Transfer)	Parallel Shift in Budget Line and Preserved points 4, 5, 6 (Tangency/optimal input combo are still key).	Parallel outward shift of Budget Line, allowing access to significantly higher utility.	Maximized consumer autonomy and choice, increased access to essential goods. 
OPTIMAL TANGENCY APPLICATIONS (Overall)	The Tangency Rule itself (slope MRS = price ratio) and preserved points.	Re-confirms optimal choice at tangency across all conditions.	Foundation for assessing efficiency and consumer choice for all listed areas.

Figure 2.4: Summary of Applications of Utility Theory (Policy & Welfare) with Preserved Principles

Table 2.1: Placeholder table showing applications of utility theory (e.g., subsidies, taxes, welfare programmes).

Pilot Questions (Part 2)

- The cardinal utility approach assumes that utility can be: a) Ranked only b) Measured in absolute units c) Ignored in consumer choice d) Always constant
- The law of diminishing marginal utility states that: a) Utility increases with each unit consumed b) Additional satisfaction decreases with each extra unit c) Utility remains constant regardless of consumption d) Utility cannot be measured
- Indifference curves are: a) Upward sloping b) Convex to the origin c) Straight lines d) Intersecting
- Consumer equilibrium occurs when: a) The budget line is tangent to an indifference curve b) The budget line intersects multiple indifference curves c) Marginal utility is constant d) Prices are equal for all goods
- Utility theory is applied in: a) Predicting consumer choice b) Ignoring income constraints c) Eliminating demand curves d) Fixing supply permanently



Part 3: Market Mechanism and Price Determination

2.3.1 Market Equilibrium: Demand and Supply Interaction

Market equilibrium occurs when the quantity demanded equals the quantity supplied at a particular price.

- **Equilibrium price:** The price at which demand and supply balance.
- **Equilibrium quantity:** The quantity exchanged at this price.
- **Disequilibrium:** Occurs when there is excess demand (shortage) or excess supply (surplus).

ITQ: When demand equals supply, the market is said to be in _____.

Figure 2.4: Summary of Applications of Utility Theory (Policy & Welfare) with Preserved Principles

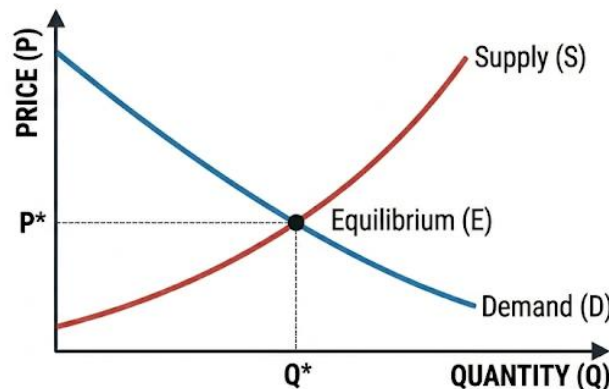


Figure 3.1: DEMAND AND SUPPLY CURVE EQUILIBRIUM

This diagram shows a standard market equilibrium. The intersection of the downward-sloping Demand curve (D) and the upward-sloping Supply curve (S) occurs at point E, where the market is in equilibrium. The resulting equilibrium **Price** (P^*) and equilibrium **Quantity** (Q^*) are indicated on their respective axes. 

Figure 3.1: Summary of Applications of Utility Theory (Policy & Welfare) with Preserved Principles

Figure 3.1: Placeholder illustration showing demand and supply curves intersecting at equilibrium.

2.3.2 Effects of Shifts in Demand and Supply

Demand and supply curves can shift due to changes in determinants.

- **Increase in demand:** Shifts the demand curve rightward, raising equilibrium price and quantity.



- **Decrease in demand:** Shifts the demand curve leftward, lowering equilibrium price and quantity.
- **Increase in supply:** Shifts the supply curve rightward, lowering equilibrium price and raising quantity.
- **Decrease in supply:** Shifts the supply curve leftward, raising equilibrium price and lowering quantity.

ITQ: A rightward shift in demand leads to a _____ equilibrium price.

Figure 2.4: Summary of Applications of Utility Theory (Policy & Welfare) with Preserved Principles

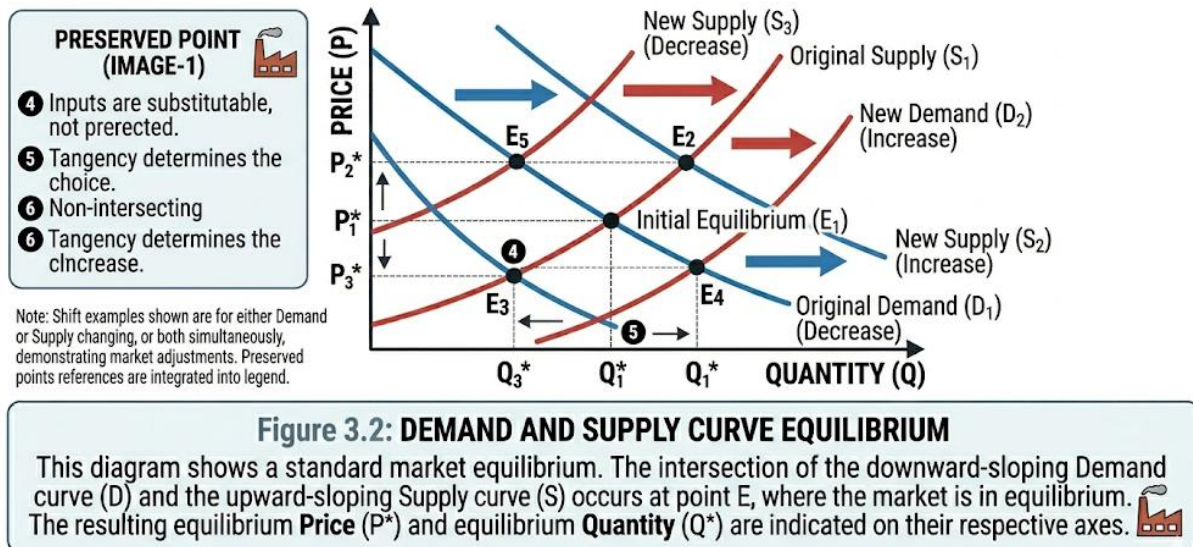


Figure 3.2: Summary of Applications of Utility Theory (Policy & Welfare) with Preserved Principles

Figure 3.2: Placeholder illustration showing shifts in demand and supply curves.

2.3.3 Price Controls: Floors and Ceilings

Governments sometimes intervene in markets by imposing price controls.

- **Price floor:** A minimum price set above equilibrium (e.g., minimum wage). Leads to surplus if binding.
- **Price ceiling:** A maximum price set below equilibrium (e.g., rent control). Leads to shortage if binding.

ITQ: A maximum price set below equilibrium is called a price _____.



Figure 3.3: Demand and Supply, and Price Controls with Preserved Principles

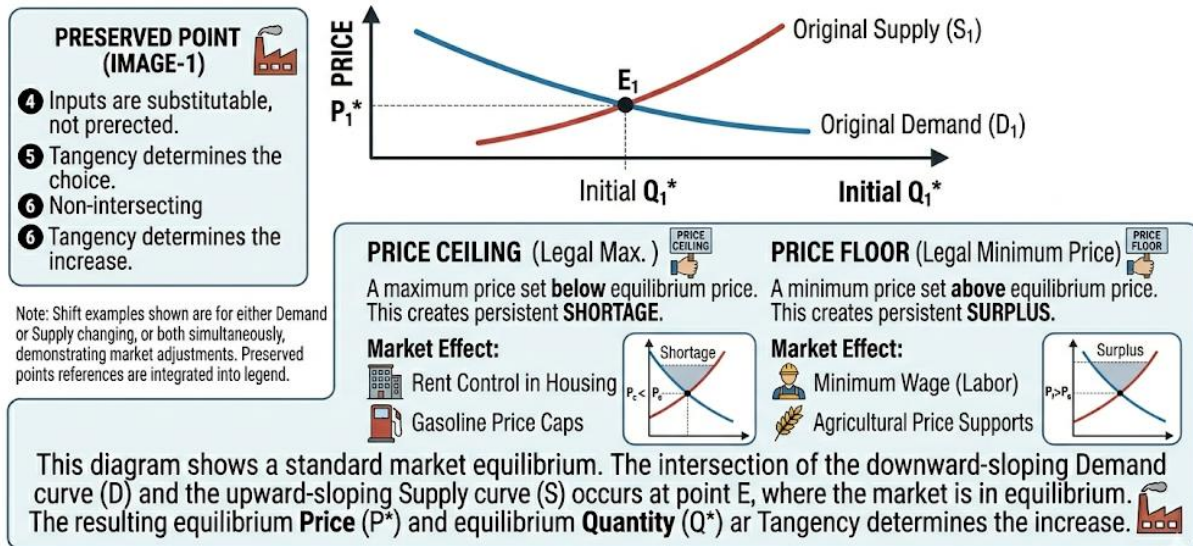


Figure 3.3: Demand and Supply, and Price Controls with Preserved Principles

Box 3.1: Placeholder box summarising price floors and ceilings with examples.

2.3.4 Applications of Market Mechanism in Real-world Scenarios

The market mechanism explains how prices adjust to balance demand and supply.

- Agricultural markets:** Prices fluctuate with harvests and weather conditions.
- Labour markets:** Wages adjust based on demand for skills and supply of workers.
- Housing markets:** Prices respond to population growth, income levels, and government policies.

ITQ: In labour markets, wages adjust based on demand for _____ and supply of workers.

Application Sector	Problem/Issue addressed	Market mechanism applied	Example of usage
Agriculture	Price volatility for farmers	Commodity futures contracts	Farmers can lock in prices for future crops to reduce income uncertainty.
Labour	Unemployment for specific demographics	Targeted wage subsidies	Governments provide subsidies to employers who hire long-term unemployed individuals.



Application Sector	Problem/Issue addressed	Market mechanism applied	Example of usage
Housing	Shortage of affordable housing	Housing vouchers/subsidies	Qualifying low-income households receive vouchers to help pay for rent in the private market.

Table 3.1: Placeholder table showing applications of market mechanism in agriculture, labour, and housing.

Pilot Questions (Part 3)

1. Market equilibrium occurs when: a) Demand exceeds supply b) Supply exceeds demand c) Demand equals supply d) Prices are unstable
2. A rightward shift in demand leads to: a) Lower equilibrium price b) Higher equilibrium price c) No change in equilibrium d) Reduced equilibrium quantity
3. A price floor set above equilibrium leads to: a) Shortage b) Surplus c) Equilibrium d) Lower wages
4. A price ceiling set below equilibrium leads to: a) Surplus b) Shortage c) Equilibrium d) Higher prices
5. In housing markets, prices respond to: a) Population growth and income levels b) Government ignoring policies c) Supply only d) Demand only

Series Summary

This Series examined how fiscal multipliers and taxation models influence national income and aggregate demand. We began by defining the multiplier effect and exploring its types—spending, taxation, and transfers—alongside the factors that determine their size. We then analysed taxation models, focusing on how progressive, proportional, and regressive systems affect disposable income and stabilisation. Finally, we evaluated the policy applications of multipliers and taxation, highlighting their role in redistribution, growth, and the challenges of implementation such as time lags, uncertainty, and political constraints. By the end of this Series, learners should understand how fiscal tools shape economic outcomes and the complexities of applying them in practice.

Glossary of Terms

- **Fiscal multiplier:** Change in national income resulting from a change in government spending, taxation, or transfers.
- **Multiplier effect:** Process by which an initial injection of spending leads to a larger overall increase in output.
- **Spending multiplier:** Effect of government expenditure on national income.



- **Taxation multiplier:** Effect of changes in taxes on disposable income and consumption.
- **Transfer multiplier:** Effect of government transfers on consumption and output.
- **Marginal propensity to consume (MPC):** Proportion of additional income that households spend rather than save.
- **Disposable income:** Income remaining after paying taxes, available for consumption and saving.
- **Progressive tax:** Tax system where higher incomes are taxed at higher rates.
- **Proportional tax:** Tax system where all incomes are taxed at the same rate.
- **Regressive tax:** Tax system where lower-income groups bear a heavier burden relative to their income.
- **Fiscal policy:** Government decisions on spending and taxation to influence aggregate demand.
- **Crowding out:** Situation where government borrowing raises interest rates, reducing private investment.
- **Time lags:** Delays between policy implementation and observable effects in the economy.

Concept Check Questions

Objective Questions

1. The law of demand states that as price falls, quantity _____. (Linked to SLO 1)
2. The law of supply states that as price rises, quantity _____. (Linked to SLO 1)
3. When demand equals supply, the market is said to be in _____. (Linked to SLO 3)
4. If demand changes greatly with a small change in price, demand is said to be _____. (Linked to SLO 2)
5. The law of diminishing marginal utility states that additional satisfaction _____ as more units are consumed. (Linked to SLO 4)
6. Indifference curves are typically _____ to the origin. (Linked to SLO 5)
7. Consumer equilibrium occurs where the budget line is _____ to an indifference curve. (Linked to SLO 6)
8. A maximum price set below equilibrium is called a price _____. (Linked to SLO 3)



Short-Answer Questions

9. Identify three determinants of demand and explain their effect on consumer behaviour. (Linked to SLO 2)
10. Distinguish between cardinal and ordinal utility approaches. (Linked to SLO 4, SLO 5)
11. Explain the concept of marginal rate of substitution (MRS) with an example. (Linked to SLO 5)
12. Why do governments impose price floors and ceilings? (Linked to SLO 3)
13. How does utility theory help explain consumer choice under income constraints? (Linked to SLO 7)

Long-Answer Questions

14. Define demand and supply, explain their laws, and illustrate how equilibrium is achieved in the market. (Linked to SLO 1, SLO 3)
15. Analyse the law of diminishing marginal utility and discuss its implications for consumer decision-making. (Linked to SLO 4)
16. Using indifference curve analysis, evaluate how consumer equilibrium is determined under a budget constraint. (Linked to SLO 5, SLO 6)
17. Assess the effects of shifts in demand and supply on market equilibrium, and explain how price controls (floors and ceilings) alter market outcomes. (Linked to SLO 2, SLO 3)

Answers to Concept Check Questions

Objective Questions

1. Increases.
2. Increases.
3. Equilibrium.
4. Elastic.
5. Decreases.
6. Convex.
7. Tangent.
8. Ceiling.



Short-Answer Questions

9. Determinants include income (higher income increases demand), tastes and preferences (shifts demand depending on consumer trends), and prices of related goods (substitutes and complements affect demand).
10. Cardinal utility assumes utility can be measured in absolute units (utils), while ordinal utility assumes satisfaction can only be ranked.
11. MRS is the rate at which a consumer gives up one good for another while maintaining the same utility. For example, giving up 2 apples for 1 orange.
12. Governments impose price floors (e.g., minimum wage) to protect producers and price ceilings (e.g., rent control) to protect consumers.
13. Utility theory explains how consumers allocate limited income to maximise satisfaction, balancing preferences with budget constraints.

Long-Answer Questions

Q14: Demand, supply, and equilibrium

- *Basic response:* Demand is the quantity consumers are willing to buy at different prices, while supply is the quantity producers are willing to sell. The law of demand states that as price falls, demand rises; the law of supply states that as price rises, supply rises. Market equilibrium occurs where demand equals supply, determining equilibrium price and quantity.
- *Value-added response:* Beyond the basics, equilibrium analysis explains resource allocation efficiency. Disequilibrium (shortages or surpluses) prompts price adjustments, ensuring markets self-correct. This principle underpins policy debates on interventions like subsidies or tariffs.

Q15: Law of diminishing marginal utility

- *Basic response:* The law states that as more units of a good are consumed, the additional satisfaction decreases. For example, the first slice of pizza gives high satisfaction, but the fifth slice gives less.
- *Value-added response:* This law explains downward-sloping demand curves and consumer rationality. It also informs taxation and welfare policies, as redistributing income from richer to poorer individuals increases overall utility due to diminishing marginal utility of income.

Q16: Indifference curve and consumer equilibrium

- *Basic response:* Indifference curves show combinations of goods that yield equal satisfaction. Consumer equilibrium occurs where the budget line is tangent to an indifference curve, meaning the marginal rate of substitution equals the price ratio.



- *Value-added response:* Advanced learners can connect this to real-world applications, such as predicting consumer responses to subsidies or price changes. Indifference analysis also underpins modern welfare economics and policy design.

Q17: Shifts in demand and supply, price controls

- *Basic response:* A rightward shift in demand raises equilibrium price and quantity, while a leftward shift lowers them. A rightward shift in supply lowers equilibrium price and raises quantity, while a leftward shift raises price and lowers quantity. Price floors above equilibrium create surpluses, while price ceilings below equilibrium create shortages.
- *Value-added response:* Outstanding learners can evaluate how these shifts interact with government interventions. For example, minimum wage laws (price floors) may cause unemployment if set too high, while rent controls (price ceilings) may reduce housing supply. These insights highlight the tension between equity and efficiency in policy-making.

Answers to Pilot Questions

Pilot Questions (Part 1)

- b — As price falls, demand rises.
- c — Consumer income.
- b — As price rises, supply rises.
- c — Demand equals supply.
- b — Elastic.

Pilot Questions (Part 2)

- b — Measured in absolute units.
- b — Additional satisfaction decreases with each extra unit.
- b — Convex to the origin.
- a — The budget line is tangent to an indifference curve.
- a — Predicting consumer choice.

Pilot Questions (Part 3)

- c — Demand equals supply.
- b — Higher equilibrium price.
- b — Surplus.
- b — Shortage.



- a — Population growth and income levels.

References and Attributions

Course Document ECO 202: *Introduction to Microeconomics II*. Internal university course outline.

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- *Table 3.1: Applications of market mechanism in agriculture, labour, and housing* Prompt: “Create a table showing applications of market mechanism in agriculture, labour, and housing sectors.” Attribution: AI-generated illustration.



Course code: ECO 202

Course title: Introduction to Microeconomics II

Course credit load: 2 Units

Series 1: Production and Cost Analysis

Series 2: Consumer Behaviour and Market Mechanism

Series 3: Market Structures and Pricing Strategies

Series 4: Factor Pricing and Income Distribution

Series 5: Elementary Price Theory and Applications

Series Outline

Part 1: Perfect Competition

- 3.1.1 Characteristics of Perfect Competition
- 3.1.2 Short-run Equilibrium of the Firm
- 3.1.3 Long-run Equilibrium of the Firm and Industry
- 3.1.4 Efficiency under Perfect Competition

Part 2: Monopoly

- 3.2.1 Characteristics of Monopoly
- 3.2.2 Price and Output Determination under Monopoly
- 3.2.3 Welfare Implications of Monopoly
- 3.2.4 Regulation of Monopoly Power

Part 3: Monopolistic Competition

- 3.3.1 Characteristics of Monopolistic Competition
- 3.3.2 Short-run and Long-run Equilibrium
- 3.3.3 Product Differentiation and Pricing
- 3.3.4 Efficiency and Welfare under Monopolistic Competition

Part 4: Oligopoly and Pricing Strategies

- 3.4.1 Characteristics of Oligopoly
- 3.4.2 Models of Oligopoly: Cournot, Bertrand, and Collusion
- 3.4.3 Pricing Strategies in Oligopolistic Markets
- 3.4.4 Real-world Applications of Oligopoly Behaviour



Introduction

Markets are the arenas where buyers and sellers interact, and the structure of these markets determines how prices are set, how resources are allocated, and how firms compete. Understanding market structures is essential in microeconomics because it reveals the different ways firms behave under varying competitive conditions and how these behaviours influence efficiency and welfare.

This Series focuses on the four major market structures: **perfect competition, monopoly, monopolistic competition, and oligopoly**. Each structure has distinct characteristics, pricing strategies, and implications for consumers and producers.

We begin with **perfect competition**, where many firms produce identical products and prices are determined purely by market forces. Next, we examine **monopoly**, where a single firm dominates the market, setting prices and output with significant welfare implications. We then explore **monopolistic competition**, characterised by product differentiation and a blend of competition and monopoly power. Finally, we study **oligopoly**, where a few firms dominate and strategic behaviour, collusion, and pricing strategies play critical roles.

The aim of this Series is to equip you with the ability to:

- identify the characteristics of different market structures,
- analyse how prices and output are determined under each structure,
- evaluate the efficiency and welfare implications of market behaviour, and
- apply pricing strategies to real-world market scenarios.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- **SLO 1** identify and explain the characteristics of different market structures (perfect competition, monopoly, monopolistic competition, and oligopoly).
- **SLO 3.2** analyse short-run and long-run equilibrium outcomes under each market structure.
- **SLO 3.3** evaluate the efficiency and welfare implications of different market structures.
- **SLO 3.4** apply pricing strategies relevant to monopolistic and oligopolistic markets.
- **SLO 3.5** interpret real-world examples of market behaviour using theoretical models.

Part 1: Perfect Competition

3.1.1 Characteristics of Perfect Competition

Perfect competition is the most idealised form of market structure in microeconomics. It is characterised by:



- **Large number of buyers and sellers:** No single participant can influence the market price.
- **Homogeneous products:** Goods are identical, so consumers are indifferent about which firm they buy from.
- **Free entry and exit:** Firms can enter or leave the market without restrictions, ensuring long-run equilibrium.
- **Perfect knowledge:** Buyers and sellers have complete information about prices, products, and technology.
- **Price-taking behaviour:** Firms accept the prevailing market price determined by demand and supply.

Illustration: Agricultural markets (e.g., maize, rice, or tomatoes) often approximate perfect competition because many farmers sell identical products.

In-text question (ITQ): In perfect competition, firms are _____, meaning they accept the prevailing market price.

3.1.2 Short-run Equilibrium of the Firm

In the short run, firms may earn different levels of profit depending on the relationship between price and cost:

- **Supernormal profit:** Occurs when price > average cost.
- **Normal profit:** Occurs when price = average cost.
- **Losses:** Occur when price < average cost.

The firm maximises profit where **marginal cost (MC) = marginal revenue (MR)**. Since the firm is a price taker, $MR = \text{Price}$.

Example: A farmer selling maize may earn supernormal profit if market prices rise due to seasonal demand.

In-text question (ITQ): When price equals average cost, the firm earns _____ profit.



PERFECTLY COMPETITIVE FIRM EQUILIBRIUM: REVENUE AND COST CURVES

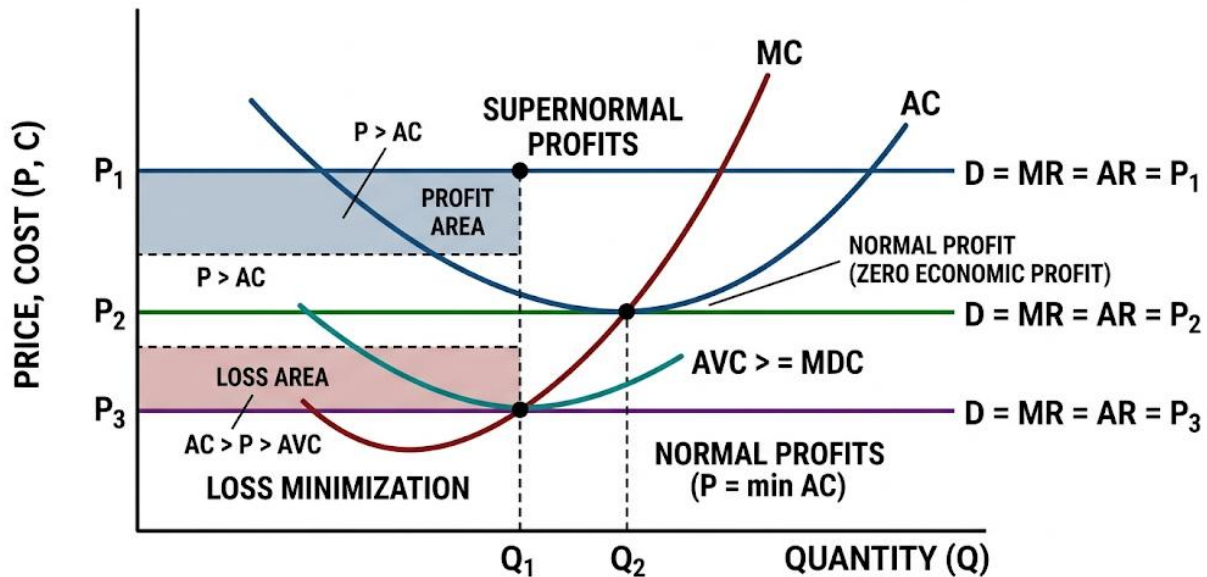


Figure 3.2 Placeholder: Graph showing short-run equilibrium with supernormal profit, normal profit, and losses. Caption: Short-run equilibrium outcomes in perfect competition.

3.1.3 Long-run Equilibrium of the Firm and Industry

In the long run, free entry and exit of firms ensure that only **normal profit** is earned:

- Supernormal profits attract new firms → supply increases → price falls.
- Losses drive firms out → supply decreases → price rises.
- Equilibrium is reached when price = minimum average cost, and firms earn normal profit.

Industry equilibrium: The market supply curve adjusts until demand and supply balance at a price where all firms earn normal profit.

Example: In the long run, maize farmers cannot sustain supernormal profits because new farmers enter the market, increasing supply and driving down prices.

In-text question (ITQ): In the long run, firms in perfect competition earn only _____ profit.



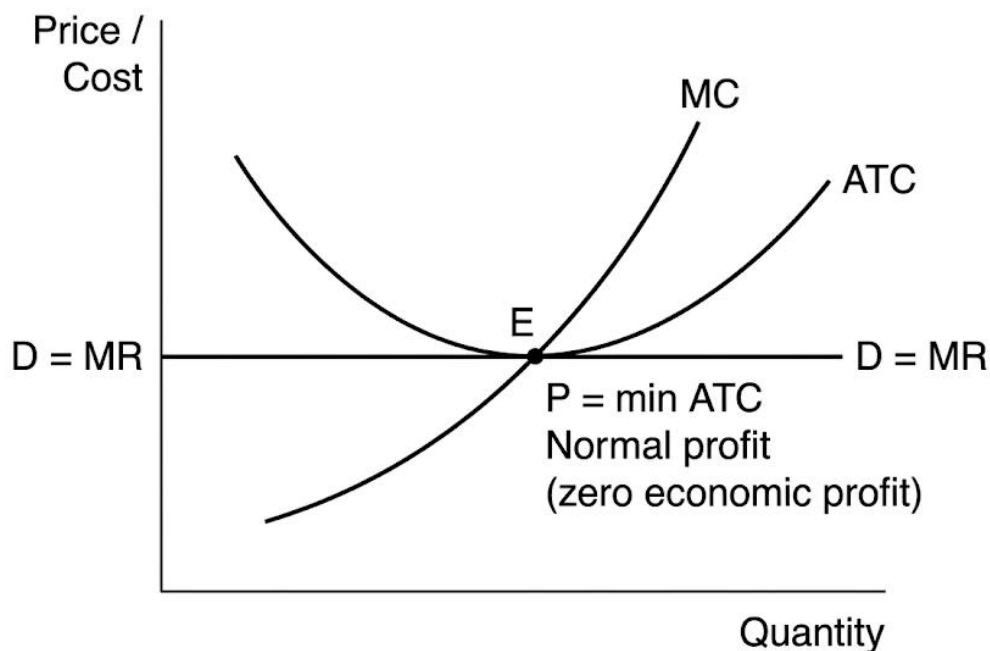


Figure 3.3 Placeholder: Graph showing long-run equilibrium where price equals average cost.
Caption: Long-run equilibrium in perfect competition.:

3.1.4 Efficiency under Perfect Competition

Perfect competition is considered the most efficient market structure:

- **Allocative efficiency:** Price = Marginal Cost ($P = MC$). Resources are allocated where consumer willingness to pay equals the cost of production.
- **Productive efficiency:** Firms produce at the lowest point of the average cost curve, minimising waste.
- **Dynamic efficiency:** In the long run, firms adopt efficient production techniques to survive.

Example: Consumers pay a price equal to the marginal cost of production, ensuring that resources are not wasted and society benefits maximally.

In-text question (ITQ): Allocative efficiency occurs when price equals _____ cost.



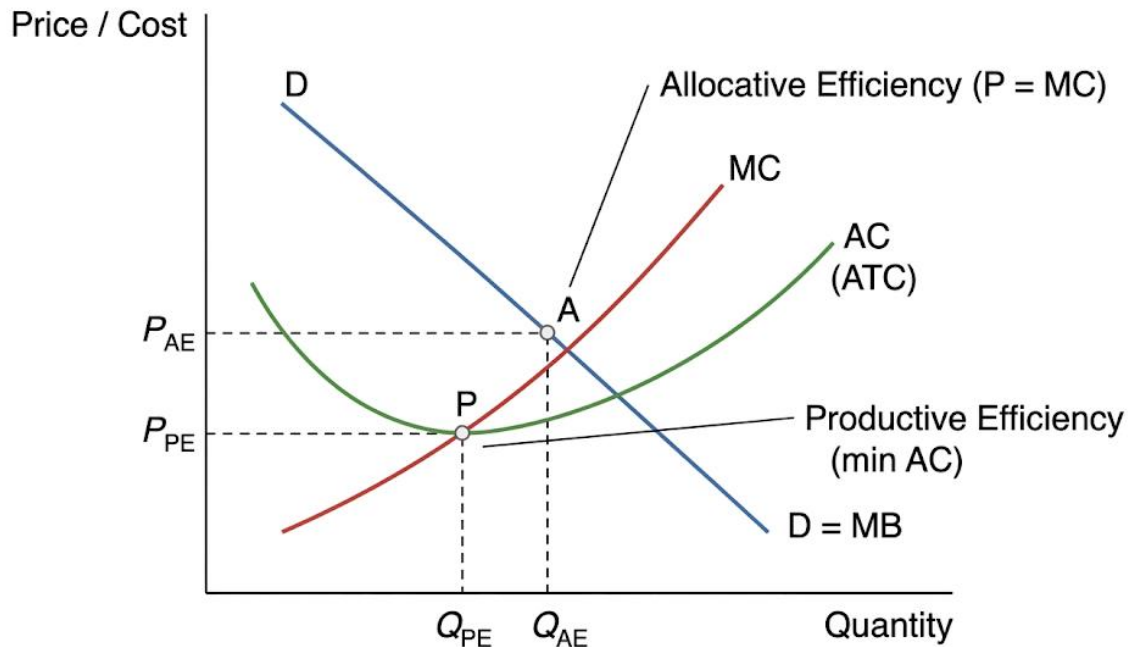


Figure 3.4 Placeholder: Diagram showing allocative and productive efficiency. *Caption: Efficiency outcomes in perfect competition.*

Pilot Questions 3.1

1. List five characteristics of perfect competition.
2. Explain the profit outcomes for a firm in the short run.
3. Why do firms earn only normal profit in the long run?
4. Define allocative efficiency and productive efficiency.
5. Give a real-world example of a market that approximates perfect competition.

Part 2: Monopoly

3.2.1 Characteristics of Monopoly

A monopoly is the opposite of perfect competition. It arises when a single firm controls the entire supply of a product or service. Its defining features include:

- **Single seller:** One firm dominates the market, acting as the sole producer.
- **Unique product:** The product has no close substitutes, giving the firm strong market power.
- **High barriers to entry:** Entry is blocked by patents, government licenses, economies of scale, or control of essential resources.
- **Price maker:** The monopolist sets prices, constrained only by consumer demand.



- **Profit maximisation:** Output is chosen where marginal revenue (MR) equals marginal cost (MC).

Illustration: Electricity distribution companies often operate as monopolies because infrastructure costs are so high that duplication is inefficient.

In-text question (ITQ): A monopoly is characterised by a _____ seller dominating the market.

3.2.2 Price and Output Determination under Monopoly

Unlike competitive firms, the monopolist faces a downward-sloping demand curve. This means:

- **Marginal revenue (MR) < Price (AR):** To sell more, the monopolist must lower price, which reduces revenue from existing units.
- **Profit maximisation:** Occurs at the point where $MR = MC$.
- **Price determination:** The monopolist charges the price on the demand curve corresponding to the profit-maximising output.

Step-by-step process:

1. Identify the point where $MR = MC$.
2. Determine the output at this point.
3. Trace upward to the demand curve to find the price consumers will pay.

Example: A pharmaceutical company with a patent sets a higher price and produces less than under competitive conditions, sustaining supernormal profits.

In-text question (ITQ): A monopolist maximises profit where _____ equals marginal cost.



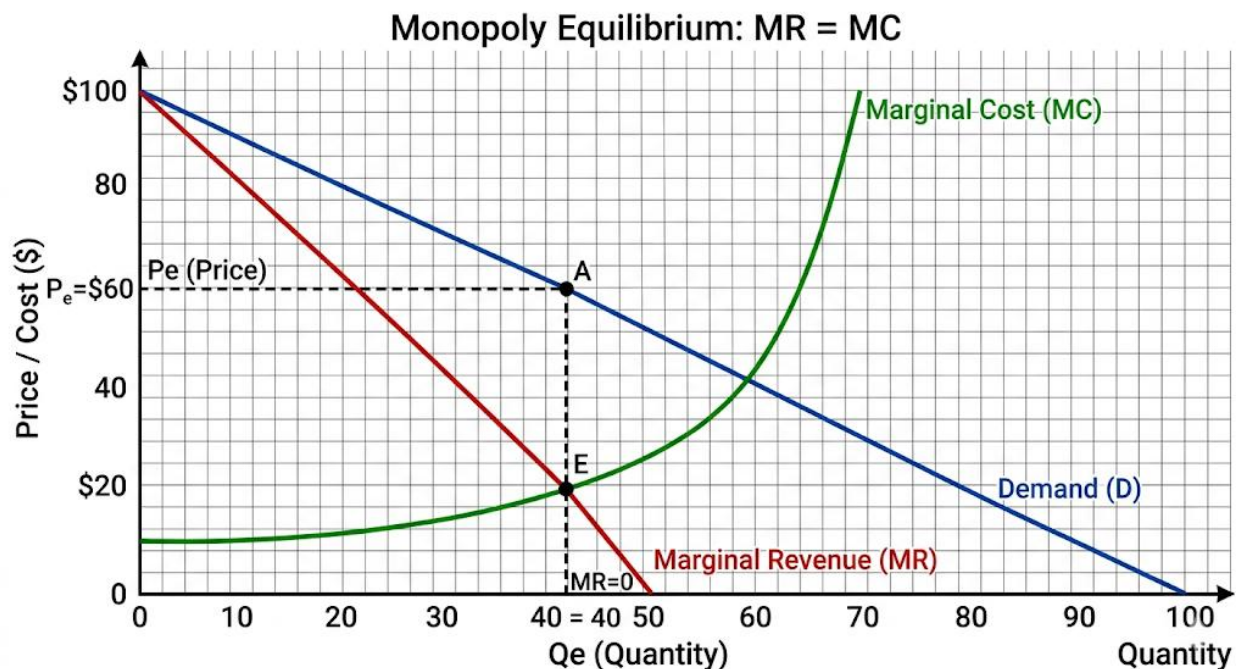


Figure 3.5 Placeholder: Graph showing monopoly equilibrium. *Caption: Price and output determination under monopoly.*

3.2.3 Welfare Implications of Monopoly

Monopoly has significant welfare effects compared to perfect competition:

- **Consumer disadvantage:** Higher prices and reduced output.
- **Producer advantage:** Supernormal profits sustained in the long run.
- **Deadweight loss:** Society loses welfare because resources are not allocated efficiently.
- **Reduced consumer surplus:** Consumers pay more and consume less.
- **Potential for X-inefficiency:** Lack of competition may lead to inefficiency in production.

Example: A monopolist may restrict output to raise prices, leading to inefficiency and reduced consumer surplus.

In-text question (ITQ): Monopoly leads to a welfare loss known as _____ loss.



Economic Losses Under Monopoly: Consumer Surplus Reduction and Deadweight Loss

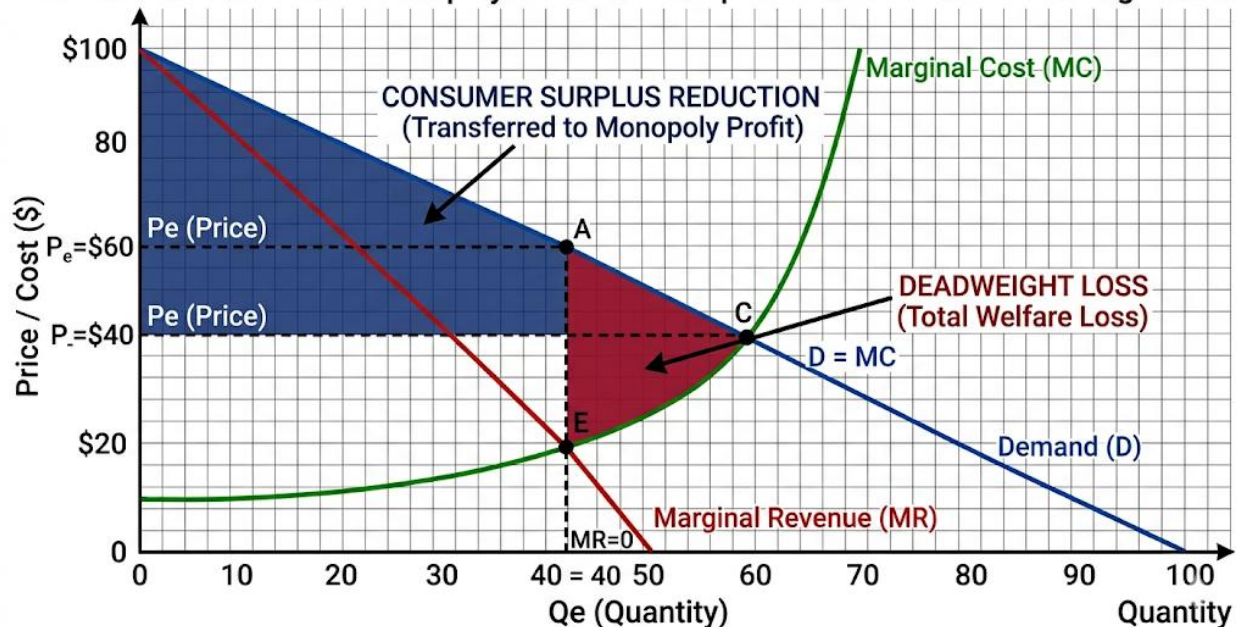


Figure 3.6 Placeholder: Graph showing deadweight loss under monopoly. *Caption: Welfare implications of monopoly.*

3.2.4 Regulation of Monopoly Power

Governments often regulate monopolies to protect consumers and ensure efficiency. Methods include:

- **Price regulation:** Setting maximum prices to prevent exploitation.
- **Quality control:** Ensuring monopolists maintain service standards.
- **Breaking monopolies:** Through antitrust laws and competition policies.
- **Public ownership:** Nationalising essential monopolies to serve public interest.
- **Encouraging competition:** Liberalising markets to reduce monopoly power.

Example: Telecommunications regulators may impose price caps to prevent exploitation by monopolistic firms.

In-text question (ITQ): Governments may regulate monopolies by imposing _____ caps.



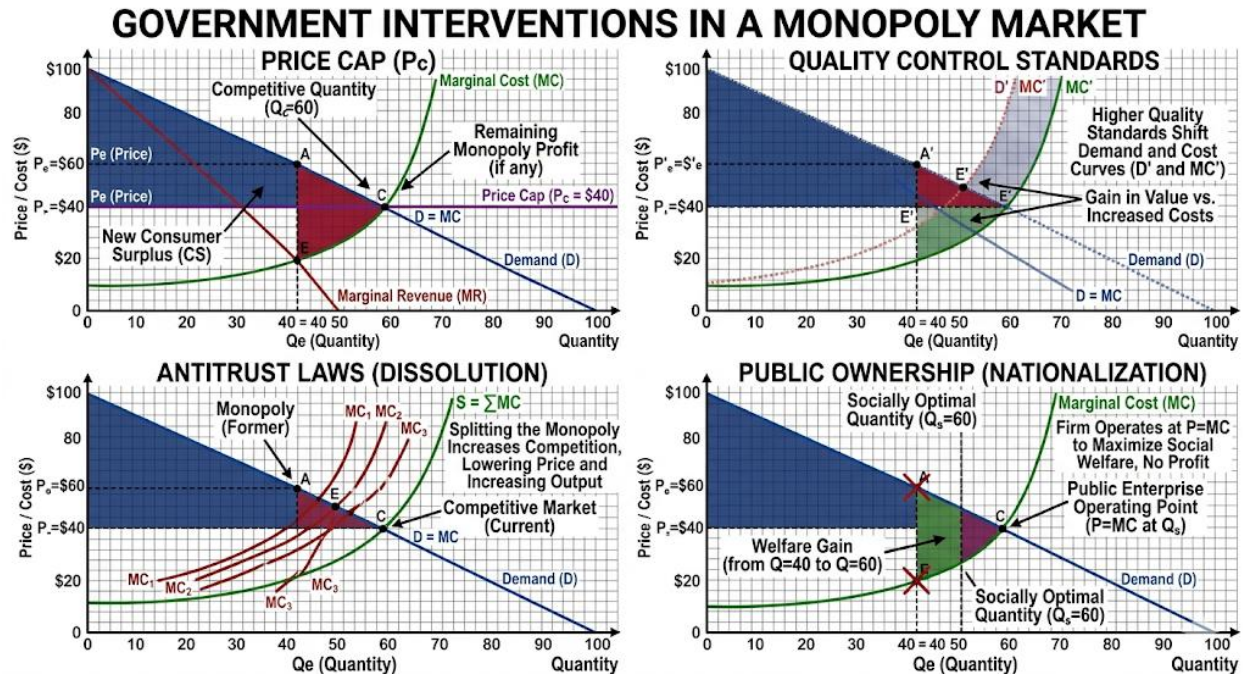


Figure 3.7 Placeholder: Illustration of monopoly regulation methods. *Caption: Regulation of monopoly power.*

Pilot Questions 3.2

1. List five characteristics of monopoly.
2. Explain how a monopolist determines price and output.
3. What is deadweight loss in monopoly?
4. Mention two advantages monopolists enjoy.
5. State three ways governments regulate monopoly power.

Part 3: Monopolistic Competition

3.3.1 Characteristics of Monopolistic Competition

Monopolistic competition blends elements of both competition and monopoly. It is characterised by:

- **Many firms:** Each firm has a small share of the market.
- **Product differentiation:** Firms sell similar but not identical products (e.g., toothpaste brands, restaurants).
- **Free entry and exit:** Firms can enter or leave the market in the long run.
- **Some degree of market power:** Because of differentiation, firms can influence prices slightly.



- **Independent decision-making:** Firms act independently, without collusion.

Example: The fast-food industry, where firms sell differentiated products (burgers, pizzas, fried chicken) but compete in the same market.

In-text question (ITQ): A key feature of monopolistic competition is _____ differentiation.

3.3.2 Short-run and Long-run Equilibrium

- **Short run:** Firms may earn supernormal profits if demand is strong, or incur losses if demand is weak. Profit maximisation occurs where $MR = MC$.
- **Long run:** Free entry and exit drive profits to normal levels. New firms enter when profits exist, shifting demand for each firm's product leftward until only normal profit remains.

Example: A new café may earn supernormal profits initially, but as more cafés open nearby, competition reduces profits to normal levels.

In-text question (ITQ): In the long run, firms in monopolistic competition earn only _____ profit.

Long-Run Market Adjustment: Demand Shifting and Normal Profit

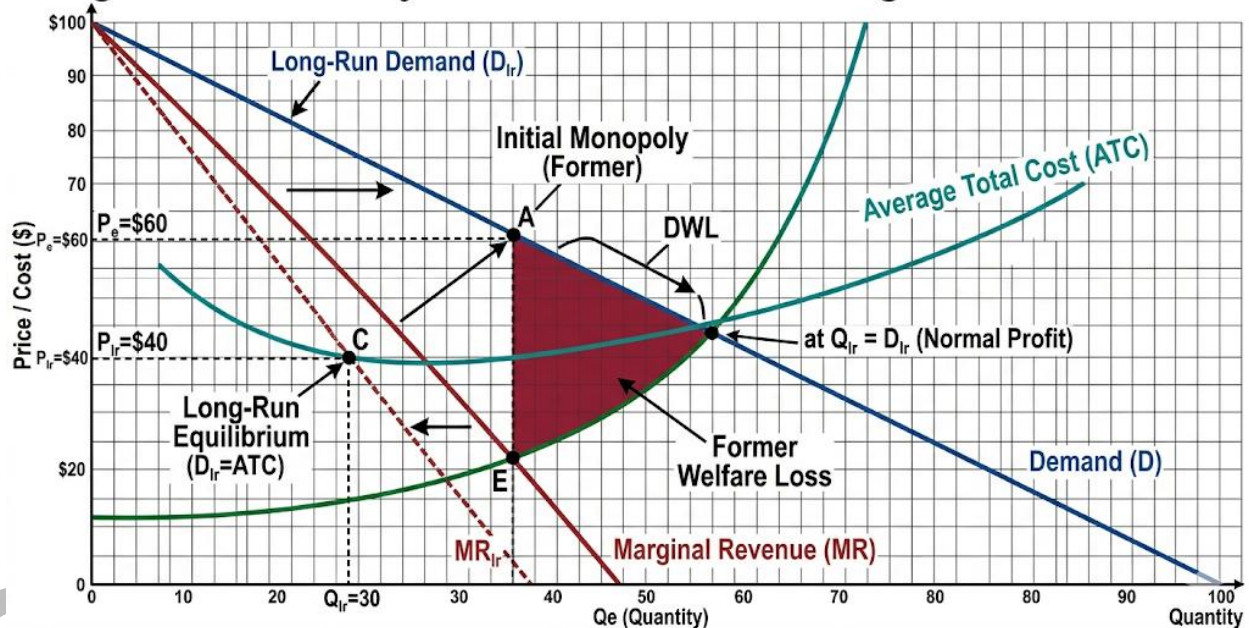


Figure 3.8 Placeholder: Graph showing short-run supernormal profit and long-run normal profit. *Caption: Short-run and long-run equilibrium in monopolistic competition.*

3.3.3 Product Differentiation and Pricing

Product differentiation is the hallmark of monopolistic competition. Firms compete not only on price but also on branding, quality, packaging, and advertising.



- **Non-price competition:** Firms use advertising, promotions, and product features to attract customers.
- **Pricing power:** Differentiation allows firms to charge slightly higher prices than competitors.

Example: Toothpaste brands like Colgate and Oral-B differentiate through flavour, packaging, and perceived quality, even though they serve the same basic purpose.

In-text question (ITQ): When firms compete through advertising and branding, it is called _____ competition.

Monopolistic Competition: Non-Price Competition and Welfare Effects

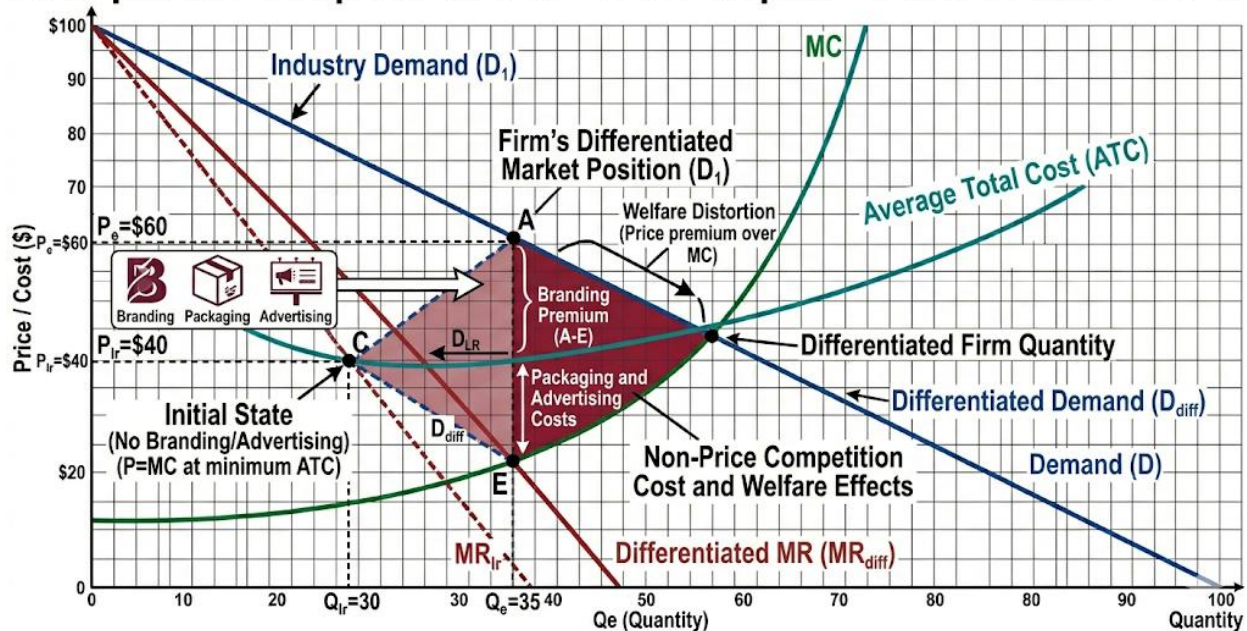


Figure 3.9 Placeholder: Illustration of product differentiation strategies.

Caption: Product differentiation and pricing strategies.

3.3.4 Efficiency and Welfare under Monopolistic Competition

Monopolistic competition is less efficient than perfect competition:

- **Allocative inefficiency:** Price $>$ MC, meaning consumers pay more than the cost of production.
- **Productive inefficiency:** Firms do not produce at the lowest point of the average cost curve.
- **Welfare implications:** Consumers benefit from variety and innovation, but society bears the cost of inefficiency.



Example: Consumers enjoy diverse restaurant options, but prices are higher than under perfect competition.

In-text question (ITQ): In monopolistic competition, allocative inefficiency occurs because price is greater than _____.

Monopolistic Competition: Core Inefficiency (Price > MC, $Q < Q_{\text{efficient}}$)

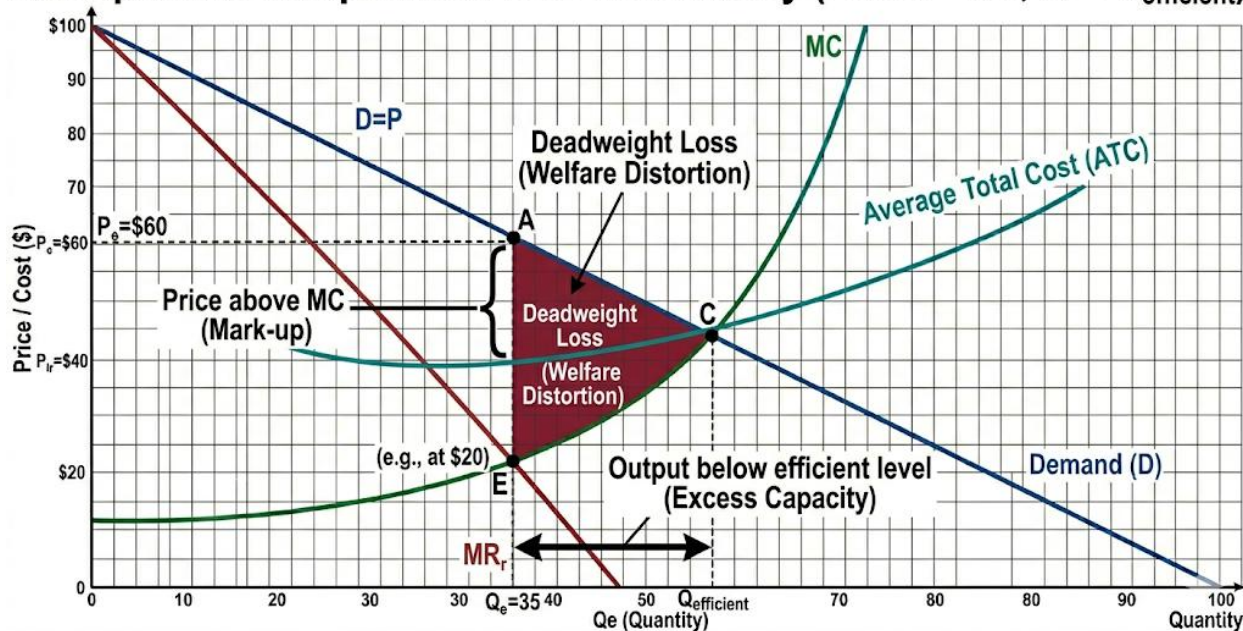


Figure 3.10 Placeholder: Graph showing inefficiency under monopolistic competition. Caption: Efficiency and welfare implications of monopolistic competition.

Pilot Questions 3.3

1. List four characteristics of monopolistic competition.
2. Explain the difference between short-run and long-run equilibrium.
3. What is product differentiation?
4. Give two examples of non-price competition.
5. Why is monopolistic competition considered allocatively inefficient?

Part 4: Oligopoly and Pricing Strategies

3.4.1 Characteristics of Oligopoly

Oligopoly is a market structure where a few large firms dominate the industry. Its defining features include:

- **Few sellers:** A handful of firms control the majority of supply.



- **Interdependence:** Each firm's decisions (pricing, output, advertising) are influenced by rivals' actions.
- **Barriers to entry:** High capital requirements, economies of scale, patents, and brand loyalty discourage new entrants.
- **Product differentiation or homogeneity:** Products may be identical (cement, steel) or differentiated (cars, smartphones).
- **Non-price competition:** Firms often compete through advertising, branding, and innovation rather than price cuts.
- **Potential for collusion:** Firms may cooperate to set prices/output, though this is often illegal.

Example: The global smartphone industry is dominated by a few firms (Apple, Samsung, Huawei), each with significant market power.

In-text question (ITQ): A defining feature of oligopoly is firm _____, meaning each firm considers rivals' actions.

3.4.2 Models of Oligopoly: Cournot, Bertrand, and Collusion

Oligopolistic behaviour can be explained through several models:

- **Cournot model:** Firms compete by choosing output levels, assuming rivals' output is fixed. Equilibrium occurs when each firm's output decision is optimal given the other's.
- **Bertrand model:** Firms compete by setting prices. If products are identical, this often drives prices down to marginal cost, resembling perfect competition.
- **Collusion/cartel model:** Firms cooperate to set prices and output, maximising joint profits. Collusion may be formal (cartels like OPEC) or tacit (price leadership).

Example: OPEC countries collude to control oil production and influence global prices, demonstrating cartel behaviour.

In-text question (ITQ): When firms cooperate to set prices and output, it is called _____.



COMPARISON OF OLIGOPOLY MODELS: COURNOT, BERTRAND, AND COLLUSION

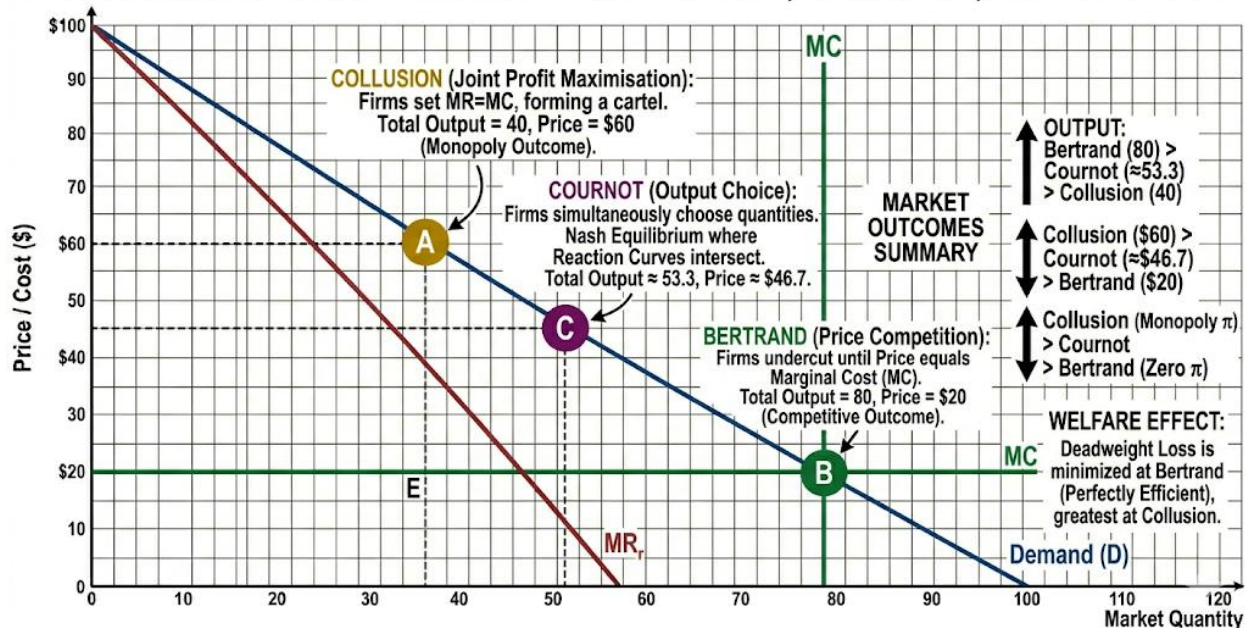


Figure 3.11 Placeholder: Diagram comparing Cournot, Bertrand, and collusion outcomes.

Caption: Models of oligopoly behaviour.

3.4.3 Pricing Strategies in Oligopolistic Markets

Pricing in oligopoly is strategic and often complex:

- **Price rigidity:** Prices tend to remain stable because firms fear triggering price wars.
- **Kinked demand curve model:** Explains sticky prices. Rivals match price cuts but ignore price increases, leading to discontinuity in the MR curve.
- **Predatory pricing:** Firms temporarily lower prices to drive competitors out, then raise them later.
- **Price leadership:** One dominant firm sets the price, and others follow.
- **Collusive pricing:** Firms agree (formally or informally) to fix prices above competitive levels.

Example: In the airline industry, one major carrier may reduce fares, forcing rivals to match, but if it raises fares, rivals may not follow.

In-text question (ITQ): The kinked demand curve model explains why prices in oligopoly are often _____.

Figure 3.12 Placeholder: Graph of kinked demand curve. *Caption: Price rigidity in oligopoly.*

AI Prompt: “Generate a graph showing kinked demand curve with MR discontinuity leading to price stability.”



3.4.4 Real-world Applications of Oligopoly Behaviour

Oligopolistic behaviour is evident in many industries:

- **Automobile industry:** Firms compete through branding, innovation, and advertising.
- **Telecommunications:** Price leadership and non-price competition are common.
- **Airlines:** Strategic alliances, code-sharing, and pricing coordination.
- **Oil markets:** Collusion through OPEC to influence global supply and prices.
- **Cement industry (Nigeria):** A few large firms dominate, leading to price rigidity and limited competition.

Example: In Nigeria's cement industry, firms like Dangote Cement dominate, resulting in limited price competition and high barriers to entry.

In-text question (ITQ): OPEC is an example of a _____ in the oil market.

INDUSTRY CASE STUDIES IN OLIGOPOLY MARKET STRUCTURES

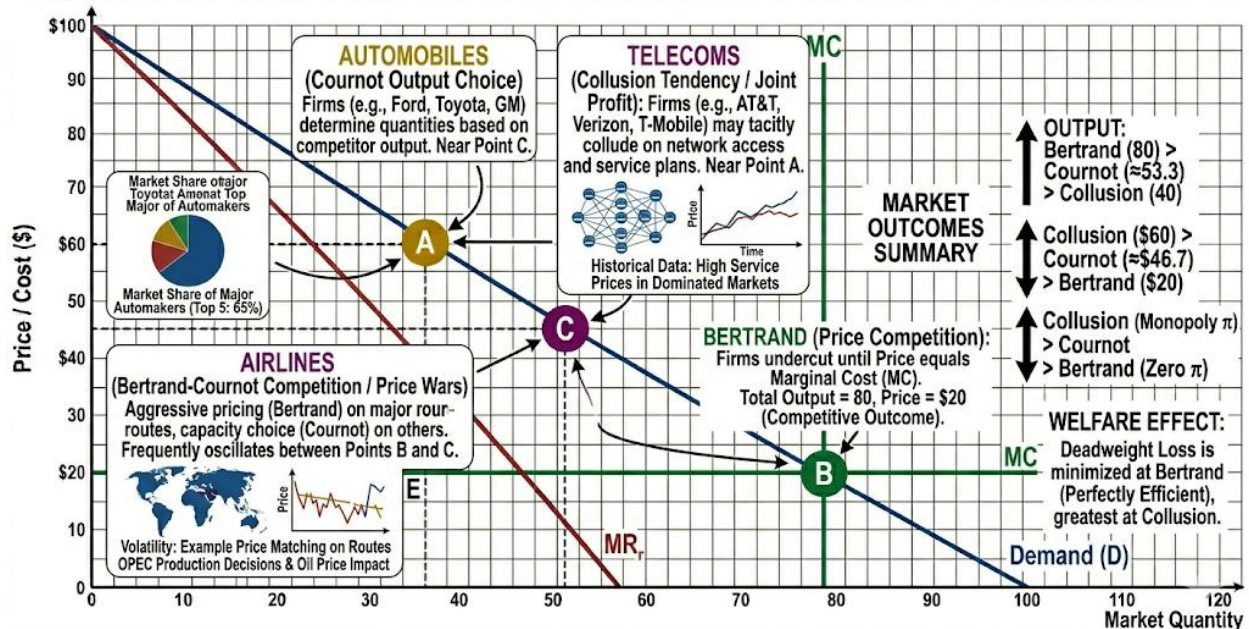


Figure 3.13 Placeholder: Illustration of oligopoly industries. *Caption: Real-world applications of oligopoly behaviour.*

Pilot Questions 3.4

1. List five characteristics of oligopoly.
2. Distinguish between Cournot and Bertrand models.
3. Explain the kinked demand curve model and its implications.
4. What is price leadership in oligopoly?



5. Give three real-world examples of oligopolistic industries.

Series Summary

This Series examined the four major market structures—**perfect competition, monopoly, monopolistic competition, and oligopoly**—and their pricing strategies.

- **Perfect Competition:** Many firms, identical products, free entry/exit, price-taking behaviour. Firms earn supernormal profits in the short run but only normal profits in the long run. Efficiency is maximised (allocative and productive).
- **Monopoly:** A single firm dominates, faces downward-sloping demand, sets price/output where $MR = MC$. Consumers face higher prices and reduced output, leading to deadweight loss. Regulation is often necessary.
- **Monopolistic Competition:** Many firms, differentiated products, free entry/exit. Firms may earn supernormal profits in the short run, but in the long run only normal profit remains. Consumers benefit from variety, but inefficiency persists.
- **Oligopoly:** Few firms dominate, interdependence is key. Pricing strategies include kinked demand curve, price leadership, collusion, and non-price competition. Real-world examples include airlines, telecoms, and oil markets.

Overall, the Series highlighted how market structures shape firm behaviour, pricing, efficiency, and welfare outcomes.

Glossary of Terms

- **Allocative Efficiency:** Occurs when price equals marginal cost ($P = MC$).
- **Average Cost (AC):** Total cost divided by output.
- **Barriers to Entry:** Obstacles preventing new firms from entering a market.
- **Collusion:** Agreement among firms to fix prices or output.
- **Deadweight Loss:** Loss of welfare due to inefficient allocation of resources.
- **Marginal Cost (MC):** Additional cost of producing one more unit.
- **Marginal Revenue (MR):** Additional revenue from selling one more unit.
- **Normal Profit:** Minimum profit needed to keep a firm in business.
- **Perfect Competition:** Market structure with many firms producing identical products.
- **Price Leadership:** One firm sets the price, others follow.
- **Product Differentiation:** Distinguishing products through branding, quality, or features.
- **Supernormal Profit:** Profit above normal levels, often temporary.



Concept Check Questions

1. What are the main characteristics of perfect competition?
2. How does a monopolist determine price and output?
3. Why do firms in monopolistic competition earn only normal profit in the long run?
4. Explain the kinked demand curve model in oligopoly.
5. What is deadweight loss, and why does it occur under monopoly?
6. Give two examples of industries that operate under oligopoly.
7. Distinguish between Cournot and Bertrand models of oligopoly.
8. What role does product differentiation play in monopolistic competition?

Concept Check Questions [Series 3]

Objective Questions

1. In perfect competition, firms are _____, meaning they accept the prevailing market price. (Linked to SLO 1)
2. When price equals average cost, the firm earns _____ profit. (Linked to SLO 3.2)
3. In the long run, firms in perfect competition earn only _____ profit. (Linked to SLO 3.2)
4. Allocative efficiency occurs when price equals _____ cost. (Linked to SLO 3.3)
5. A monopoly is characterised by a _____ seller dominating the market. (Linked to SLO 1)
6. A monopolist maximises profit where marginal revenue equals _____. (Linked to SLO 3.2)
7. Monopoly leads to a welfare loss known as _____ loss. (Linked to SLO 3.3)
8. A key feature of monopolistic competition is product _____. (Linked to SLO 1)
9. In the long run, firms in monopolistic competition earn only _____ profit. (Linked to SLO 3.2)
10. The kinked demand curve model explains why prices in oligopoly are often _____. (Linked to SLO 3.4)
11. When firms cooperate to set prices and output, it is called _____. (Linked to SLO 3.4)

Short-Answer Questions

12. List five characteristics of perfect competition. (Linked to SLO 1)



13. Explain the profit outcomes for a firm in the short run under perfect competition. (Linked to SLO 3.2)
14. Why do firms earn only normal profit in the long run under perfect competition? (Linked to SLO 3.2)
15. Define allocative efficiency and productive efficiency. (Linked to SLO 3.3)
16. List five characteristics of monopoly. (Linked to SLO 1)
17. What is deadweight loss in monopoly? (Linked to SLO 3.3)
18. List four characteristics of monopolistic competition. (Linked to SLO 1)
19. Give two examples of non-price competition in monopolistic competition. (Linked to SLO 3.4)
20. List five characteristics of oligopoly. (Linked to SLO 1)
21. Distinguish between Cournot and Bertrand models of oligopoly. (Linked to SLO 3.4)

Long-Answer Questions

22. Analyse the efficiency outcomes under perfect competition, explaining allocative, productive, and dynamic efficiency. (Linked to SLO 3.3)
23. Explain how a monopolist determines price and output, and evaluate the welfare implications of monopoly. (Linked to SLO 3.2, SLO 3.3)
24. Discuss the short-run and long-run equilibrium outcomes in monopolistic competition, highlighting the role of product differentiation. (Linked to SLO 3.2, SLO 3.4)
25. Evaluate oligopolistic pricing strategies, including kinked demand curve, price leadership, and collusion, with real-world examples. (Linked to SLO 3.4, SLO 3.5)

Answers to Concept Check Questions

Objective Questions

1. Price takers.
2. Normal.
3. Normal.
4. Marginal.
5. Single.
6. Marginal cost.
7. Deadweight.
8. Differentiation.



9. Normal.
10. Rigid.
11. Collusion.

Short-Answer Questions

12. Large number of buyers and sellers, homogeneous products, free entry and exit, perfect knowledge, price-taking behaviour.
13. Supernormal profit if price > average cost; normal profit if price = average cost; losses if price < average cost.
14. Free entry and exit ensure that supernormal profits attract new firms and losses drive firms out, leaving only normal profit.
15. Allocative efficiency: price equals marginal cost. Productive efficiency: firms produce at the lowest point of the average cost curve.
16. Single seller, unique product, barriers to entry, price maker, profit maximisation at $MR = MC$.
17. Deadweight loss is the welfare loss due to reduced output and higher prices compared to perfect competition.
18. Many firms, product differentiation, free entry and exit, some market power.
19. Advertising and branding.
20. Few firms, interdependence, barriers to entry, product differentiation or homogeneity, non-price competition.
21. Cournot: firms compete on output; Bertrand: firms compete on price.

Long-Answer Questions

Q22: Efficiency outcomes under perfect competition

- *Basic response:* Perfect competition achieves allocative efficiency ($P = MC$), productive efficiency (lowest AC), and dynamic efficiency (firms adopt efficient techniques to survive).
- *Value-added response:* Beyond the basics, perfect competition ensures maximum consumer and producer welfare. It provides a benchmark for evaluating other market structures, highlighting inefficiencies in monopoly and monopolistic competition.

Q23: Monopoly price, output, and welfare implications

- *Basic response:* A monopolist sets output where $MR = MC$ and charges the price on the demand curve at that output. This results in higher prices, lower output, and deadweight loss.



- *Value-added response:* Outstanding learners can evaluate how monopolies sustain supernormal profits, reduce consumer surplus, and may exhibit X-inefficiency. Regulation through antitrust laws, price caps, or public ownership is often necessary to restore efficiency.

Q24: Equilibrium in monopolistic competition

- *Basic response:* In the short run, firms may earn supernormal profits or losses. In the long run, free entry and exit drive profits to normal levels. Product differentiation allows firms some pricing power.
- *Value-added response:* Advanced learners can connect this to real-world industries like fast food or toothpaste. While inefficiency persists ($P > MC$), consumers benefit from variety and innovation, which may justify the welfare trade-off.

Q25: Oligopolistic pricing strategies

- *Basic response:* Pricing strategies include kinked demand curve (price rigidity), price leadership (dominant firm sets price), and collusion (firms cooperate to fix prices).
- *Value-added response:* Outstanding learners can evaluate real-world examples such as OPEC (collusion), airline fare coordination (price leadership), and smartphone markets (non-price competition). These strategies highlight the tension between competition, cooperation, and regulation in oligopolistic markets.

Answers to Pilot Questions

Pilot Questions 3.1 (Perfect Competition)

- Large number of buyers and sellers, homogeneous products, free entry and exit, perfect knowledge, price-taking behaviour.
- Supernormal profit if price $>$ average cost; normal profit if price = average cost; losses if price $<$ average cost.
- Free entry and exit ensure only normal profit in the long run.
- Allocative efficiency: price = marginal cost. Productive efficiency: firms produce at the lowest average cost.
- Agricultural markets such as maize or rice farming approximate perfect competition.

Pilot Questions 3.2 (Monopoly)

- Single seller, unique product, high barriers to entry, price maker, profit maximisation at $MR = MC$.
- Output is chosen where $MR = MC$, and price is set from the demand curve at that output.
- Deadweight loss is the welfare loss due to reduced output and higher prices compared to perfect competition.



- Monopolists enjoy sustained supernormal profits and market power.
- Governments regulate monopolies through price caps, quality control, antitrust laws, public ownership, and liberalisation.

Pilot Questions 3.3 (Monopolistic Competition)

- Many firms, product differentiation, free entry and exit, some market power.
- Short run: firms may earn supernormal profits or losses. Long run: only normal profit due to entry and exit.
- Product differentiation refers to branding, quality, packaging, and advertising.
- Examples of non-price competition include advertising and promotions.
- Allocative inefficiency occurs because price > marginal cost.

Pilot Questions 3.4 (Oligopoly)

- Few firms, interdependence, barriers to entry, product differentiation or homogeneity, non-price competition.
- Cournot model: firms compete on output. Bertrand model: firms compete on price.
- The kinked demand curve model explains price rigidity, as rivals match price cuts but not increases.
- Price leadership occurs when one dominant firm sets the price and others follow.
- Real-world examples include automobiles, telecommunications, airlines, and oil markets.

References and Attributions

Textbook References

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- *Figure 3.13: Industries under Oligopoly* Prompt: “Create a diagram showing industries dominated by oligopoly: automobiles, telecoms, airlines, and oil markets.” Attribution: AI-generated illustration using Microsoft Copilot graphic tools.

Tables

- *Comparative Market Structures Table* Prompt: “Generate a table comparing characteristics of perfect competition, monopoly, monopolistic competition, and oligopoly.” Attribution: AI-generated table using Microsoft Copilot tools.
- *Equilibrium Outcomes Table* Prompt: “Create a table showing short-run vs long-run equilibrium outcomes across different market structures.” Attribution: AI-generated table using Microsoft Copilot tools.
- *Oligopoly Pricing Strategies Table* Prompt: “Generate a table summarising pricing strategies in oligopoly: kinked demand, price leadership, collusion, predatory pricing.” Attribution: AI-generated table using Microsoft Copilot tools.



Course code: ECO 202

Course title: Introduction to Microeconomics II

Course credit load: 2 Units

Series 1: Production and Cost Analysis

Series 2: Consumer Behaviour and Market Mechanism

Series 3: Market Structures and Pricing Strategies

Series 4: Factor Pricing and Income Distribution

Series 5: Elementary Price Theory and Applications

Outline for Series 4: Factor Pricing and Income Distribution

Part 1: Theories of Factor Pricing

- Marginal Productivity Theory of Distribution
- Modern Theories of Wages, Rent, Interest, and Profit
- Criticisms and Limitations of Factor Pricing Theories

Part 2: Wages and the Labor Market

- Determinants of Wages (supply and demand, unions, minimum wage)
- Wage Differentials (skills, education, gender, region)
- Unemployment and Income Distribution

Part 3: Rent, Interest, and Profit

- Economic Rent (Ricardian theory, modern views)
- Interest (classical, Keynesian, loanable funds theory)
- Profit (risk-bearing, innovation, monopoly, dynamic theories)

Part 4: Income Distribution and Inequality

- Personal vs. Functional Distribution of Income
- Causes of Income Inequality (education, inheritance, discrimination, policy)
- Measures of Inequality (Lorenz curve, Gini coefficient)
- Policies for Redistribution (taxation, subsidies, welfare programs)



Introduction

Economic resources such as labour, land, capital, and entrepreneurship are the backbone of production, yet the way they are rewarded and how income is distributed across society remains one of the most debated issues in economics. Understanding factor pricing and income distribution helps us see why wages differ across occupations, why some individuals earn rents or profits, and why inequality persists despite growth. This Series builds on earlier discussions of production and markets, guiding you to appreciate how the rewards of economic activity are shared among different participants.

The aim of this Series is to equip you with a clear understanding of the theories and mechanisms behind factor pricing and to provide insight into how income is distributed within an economy, including the causes and consequences of inequality.

We shall commence this Series by examining the major theories of factor pricing, including the marginal productivity theory and modern approaches. Next, we will explore wages and the labour market, considering determinants of wages, wage differentials, and the link between unemployment and income distribution. Following that, we will study rent, interest, and profit, looking at their classical and modern interpretations. Finally, we will wrap up by analysing income distribution and inequality, focusing on personal and functional distribution, measures of inequality, and policies aimed at redistribution.

Series Learning Outcomes

Series 4: Factor Pricing and Income Distribution

Upon completing this Series, you should be able to:

- **SLO 4.1** define the major theories of factor pricing, including the marginal productivity theory and modern approaches,
- **SLO 4.2** explain the determinants of wages and the factors that contribute to wage differentials in the labour market,
- **SLO 4.3** analyse the concepts of economic rent, interest, and profit using both classical and modern perspectives,
- **SLO 4.4** distinguish between personal and functional income distribution,
- **SLO 4.5** evaluate the causes of income inequality and assess the effectiveness of policies designed to redistribute income.

4.1 Theories Of Factor Pricing

4.1.1 Marginal productivity theory of distribution

The **marginal productivity theory of distribution** states that each factor of production is rewarded according to its marginal contribution to output. This means wages, rent, interest, and profit are determined by the additional value each factor adds to production. Firms will employ a



factor up to the point where its marginal revenue product equals its cost. **Example:** A factory hires workers until the extra output produced by the last worker equals the wage paid.

In-text question (ITQ): The marginal productivity theory argues that a factor is paid according to its _____ contribution to output.

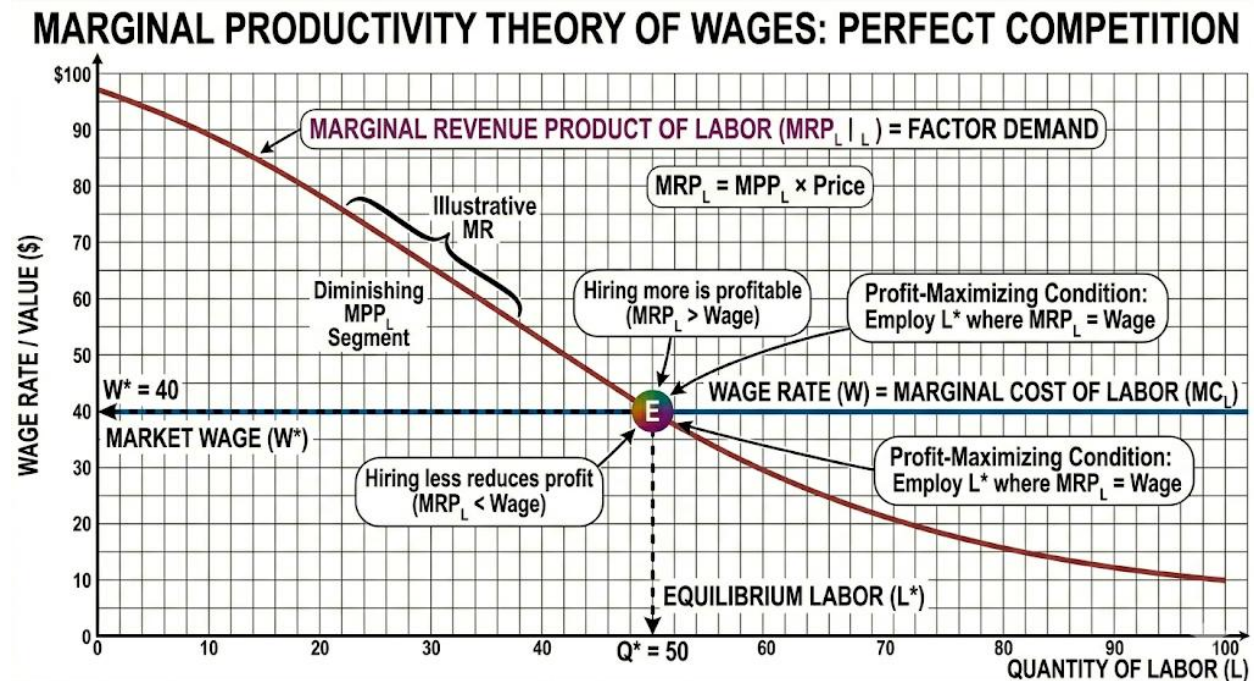


Figure 2.1 Placeholder: Illustration of marginal productivity curve and equilibrium wage point.
Caption: Marginal productivity and factor pricing.

4.1.2 Modern theories of wages, rent, interest, and profit

Modern theories recognise that markets are not always perfectly competitive. Wages may be influenced by trade unions, government policies, or minimum wage laws. Rent is shaped by demand for land and its scarcity. Interest rates are affected by monetary policy and inflation expectations. Profit theories highlight innovation, monopoly power, and risk-taking. These perspectives provide a more realistic view of factor pricing. **Example:** Minimum wage laws can raise wages above the level predicted by classical theory.

In-text question (ITQ): Unlike classical theory, modern theories emphasise the role of _____ and government intervention in determining wages.



FACTOR PRICING THEORIES: CLASSICAL VS. MODERN

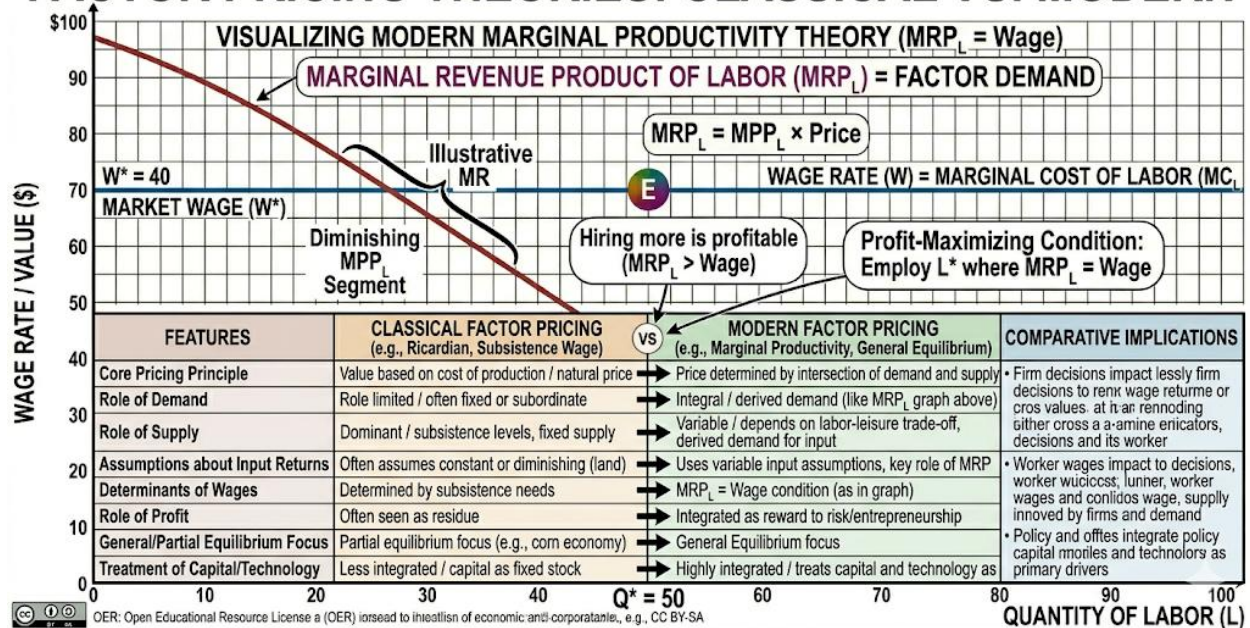


Table 2.1 Placeholder: Comparison of classical and modern views of factor pricing. Caption: Classical vs modern theories of factor pricing.

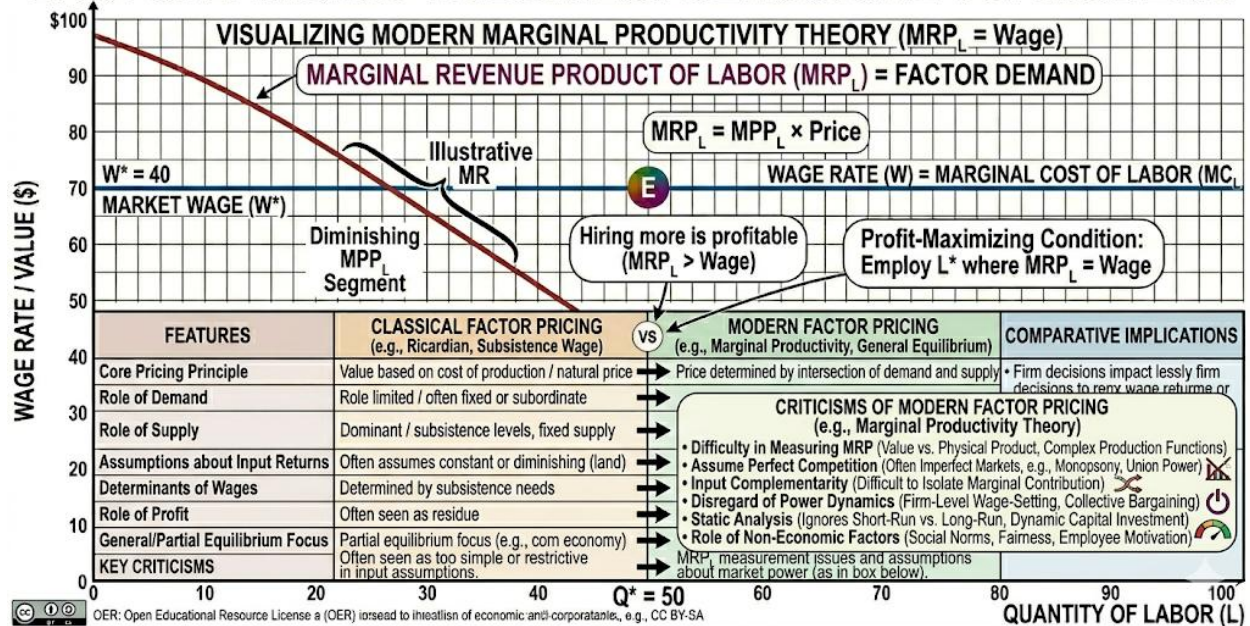
4.1.3 Criticisms and limitations of factor pricing theories

Factor pricing theories face several criticisms. The marginal productivity theory assumes perfect competition, which rarely exists in reality. It overlooks social and institutional factors such as discrimination, inheritance, and unequal access to education. Income distribution is not always fair or efficient, as market forces can lead to persistent inequality. **Example:** Wage differences between men and women may persist even when productivity is similar, due to discrimination.

In-text question (ITQ): One major criticism of factor pricing theories is that they assume _____ competition in markets.



FACTOR PRICING THEORIES: CLASSICAL VS. MODERN



Box 2.1 Placeholder: Selected criticisms of factor pricing theories. Caption: Criticisms of factor pricing theories.

Pilot Questions 4.1

1. Define the marginal productivity theory of distribution.
2. Explain how firms determine the level of factor employment under this theory.
3. State two ways modern theories of wages differ from classical theory.
4. Identify one modern theory of profit and explain its focus.
5. List two criticisms of the marginal productivity theory.

4.2 Wages And The Labour Market

4.2.1 Determinants of wages

Wages are the monetary rewards paid to labour for services rendered. In theory, they are determined by the interaction of the demand and supply of labour. Employers demand labour based on its productivity, while workers supply labour depending on wages offered and alternative opportunities. In a perfectly competitive market, equilibrium wages are set where the demand and supply curves intersect.

However, in practice, wages are influenced by additional factors such as government policies (e.g., minimum wage laws), trade union bargaining power, cost of living, and the overall state of the economy. Education and skill levels also play a crucial role, as more skilled workers tend to



command higher wages. **Example:** A software developer earns more than a factory worker because of differences in skill, demand, and productivity.

In-text question (ITQ): In a competitive labour market, wages are determined by the _____ productivity of labour.

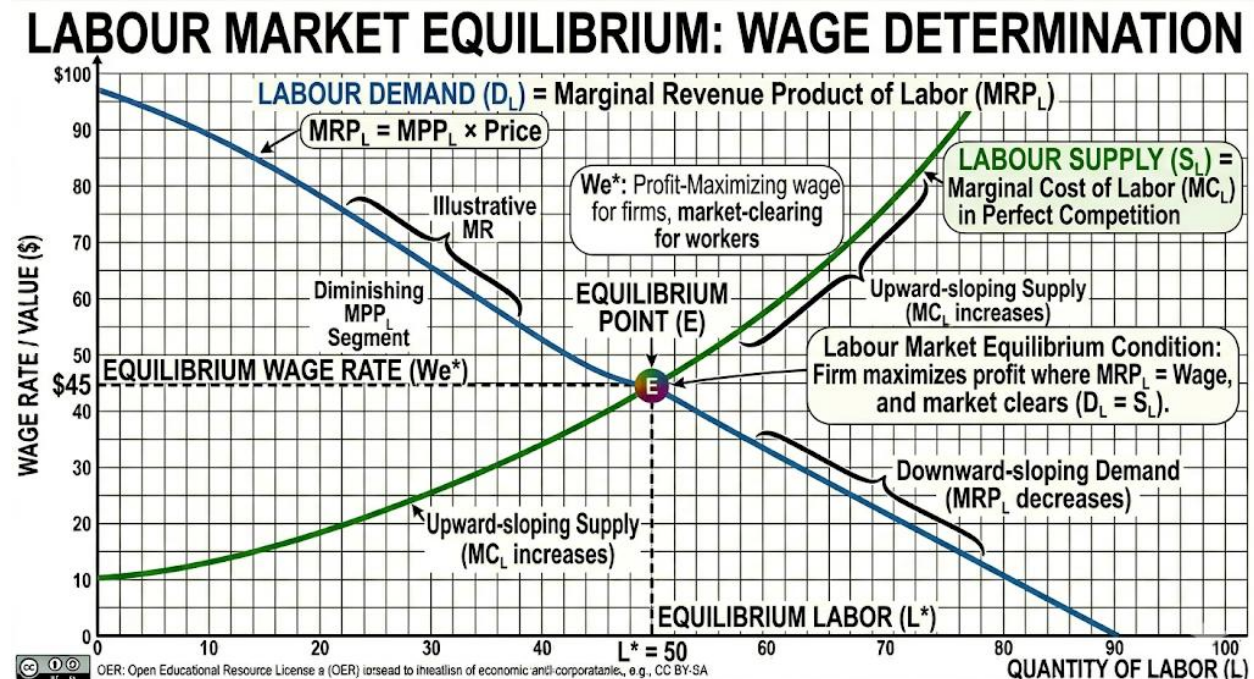


Figure 2.2 Placeholder: Diagram showing demand and supply of labour determining equilibrium wage. Caption: Determinants of wages in the labour market.

4.2.2 Wage differentials

Wage differentials are variations in wages across individuals, occupations, industries, or regions. They arise due to differences in skill, education, experience, working conditions, and geographical location. Some wage differentials are considered fair, reflecting productivity differences, while others may be unfair, resulting from discrimination or unequal access to opportunities.

For instance, wage differences between doctors and teachers reflect differences in training, responsibility, and demand. However, wage gaps between men and women in similar roles may reflect discrimination rather than productivity. **Example:** A doctor earns more than a teacher due to longer training and higher demand, while wage gaps between male and female teachers may reflect unfair differentials.

In-text question (ITQ): Wage differences that arise due to unequal opportunities or discrimination are considered _____ differentials.



WAGE DIFFERENTIALS IN OER ECONOMICS: PROFESSION CASE STUDIES

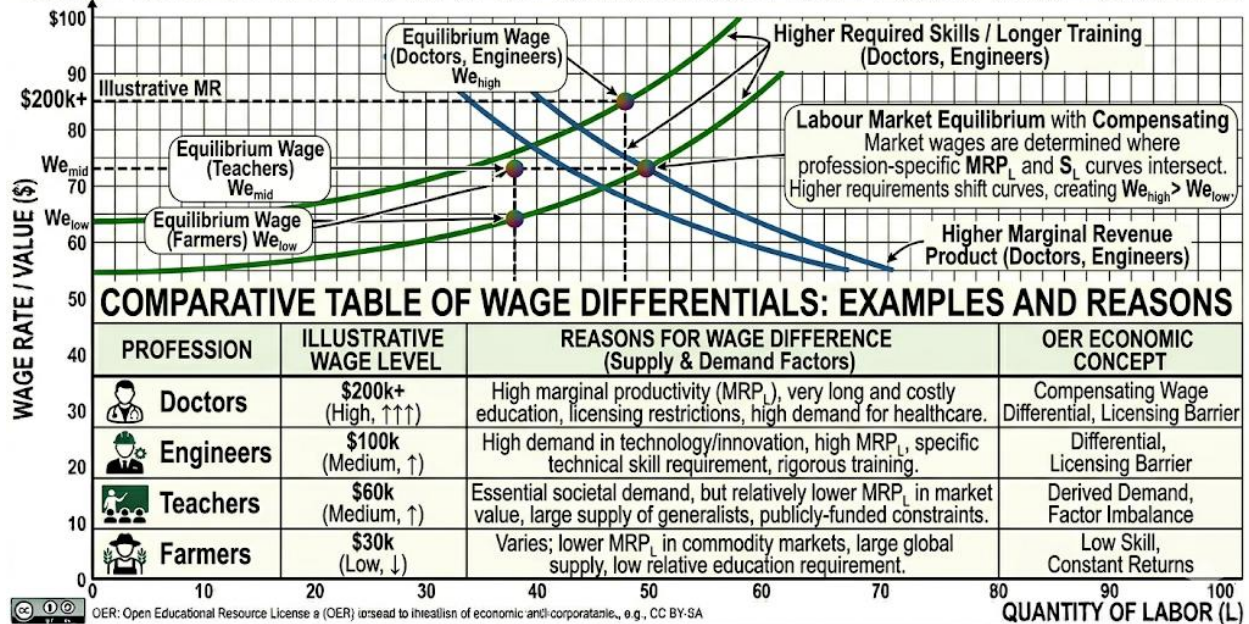


Table 2.2 Placeholder: Table showing examples of wage differentials across occupations.
Caption: Wage differentials in selected occupations.

4.2.3 Unemployment and income distribution

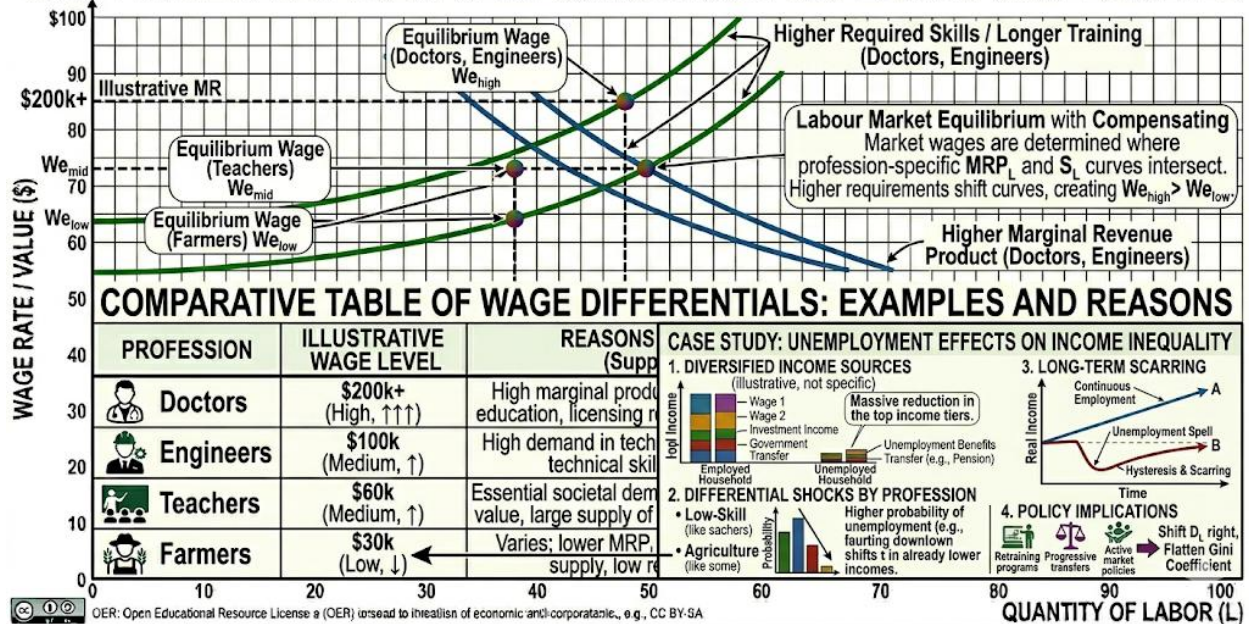
Unemployment occurs when individuals who are willing and able to work cannot find jobs. High unemployment reduces overall income distribution, leading to poverty and inequality. It also affects wage levels, as excess supply of labour tends to push wages down.

Persistent unemployment can widen income inequality, as households without jobs lose purchasing power while those employed continue to earn. Governments often intervene through job creation programmes, vocational training, and stabilisation policies to reduce unemployment and improve income distribution. **Example:** During a recession, unemployment rises, reducing household incomes and widening inequality.

In-text question (ITQ): When unemployment is high, the supply of labour exceeds demand, causing wages to _____.



WAGE DIFFERENTIALS IN OER ECONOMICS: PROFESSION CASE STUDIES



Box 2.2 Placeholder: Case study on unemployment and income inequality. Caption: Impact of unemployment on income distribution.

Pilot Questions 4.2

1. Define wages and explain how they are determined in a competitive labour market.
2. List three institutional or social factors that influence wage levels beyond demand and supply.
3. Distinguish between fair and unfair wage differentials with examples.
4. Explain how wage differentials arise across occupations and regions.
5. Describe the relationship between unemployment and income distribution.
6. Suggest two government policies that can reduce unemployment and improve income distribution.

4.3 Rent, Interest, and Profit

4.3.1 Economic rent

Economic rent refers to the payment made to a factor of production that exceeds what is necessary to keep it in its current use. In classical economics, rent was associated with land, particularly in Ricardian theory, which argued that rent arises due to differences in fertility and productivity of land. Modern views extend rent to other factors, such as monopoly profits or payments for scarce talents. **Example:** A footballer earning millions for playing in a club is receiving economic rent because his unique talent is scarce and highly demanded.



In-text question (ITQ): According to Ricardian theory, rent arises due to differences in the _____ of land.

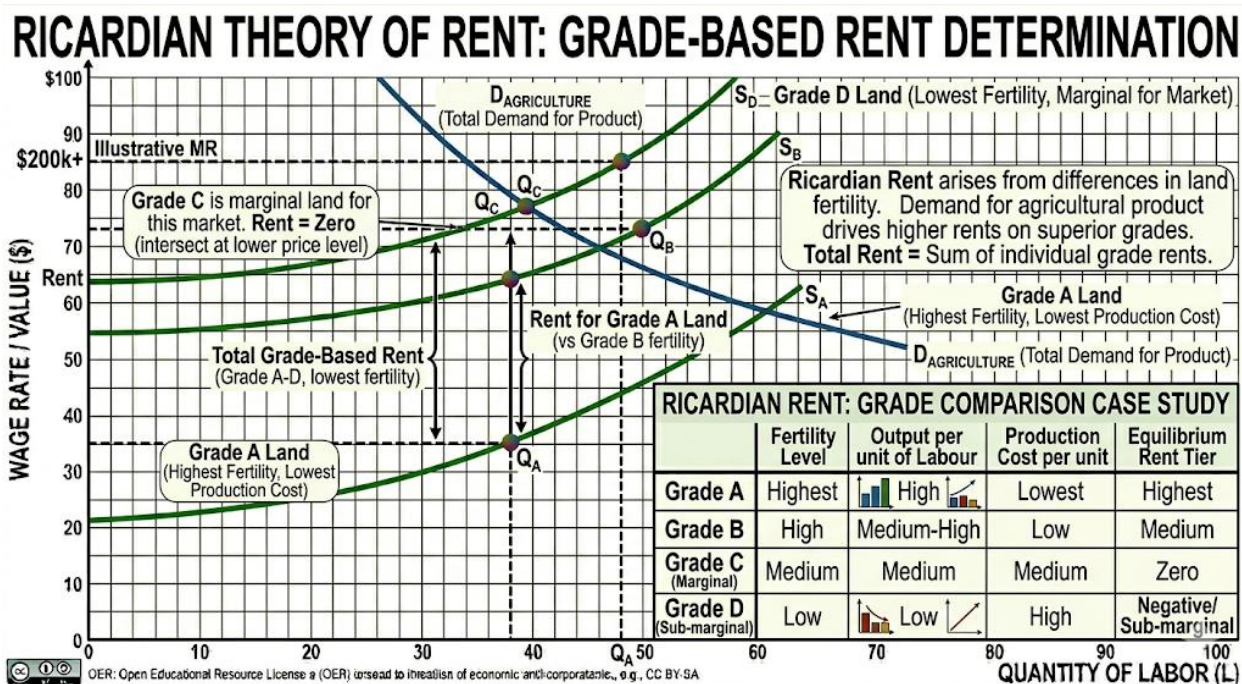


Figure 2.3 Placeholder: Diagram showing Ricardian rent based on land fertility. Caption: Ricardian theory of rent.

4.3.2 Interest

Interest is the payment made for the use of capital. Classical theory viewed interest as a reward for saving and abstaining from consumption. The **loanable funds theory** explains interest as determined by the supply of savings and the demand for investment funds. Keynesian theory, however, emphasises liquidity preference, arguing that interest is the reward for parting with liquidity.

Interest rates are influenced by inflation, monetary policy, and risk. Higher inflation expectations usually lead to higher interest rates, while central banks may adjust rates to stabilise the economy. **Example:** When inflation rises, banks increase lending rates to protect the value of money.

In-text question (ITQ): Keynesian theory explains interest as the reward for parting with _____.

Theory of Interest	Main Proponents	Key Determinants	Mechanism of Interest Rate Determination
Classical Theory	Adam Smith, David Ricardo,	Real factors: thrift (supply of savings) and productivity of capital	The rate of interest is determined at the point where the supply of savings (generated by abstinence and productivity) equals the demand for



Theory of Interest	Main Proponents	Key Determinants	Mechanism of Interest Rate Determination
	J.S. Mill, Alfred Marshall	(demand for investment)	investment (driven by marginal productivity). The interest rate is a real variable that coordinates savings and investment.
Loanable Funds Theory	Dennis Robertson, Bertil Ohlin, Gunnar Myrdal	Monetary factors: supply of loanable funds (savings, new money, dishoarding) and demand for loanable funds (investment, hoarding)	The rate of interest is determined by the interaction of the supply and demand for loanable funds in the credit market. The supply of loanable funds includes not just current savings but also bank credit and money dishoarded from previous holdings.
Keynesian Theory	John Maynard Keynes (in <i>The General Theory of Employment, Interest and Money</i>)	Liquidity preference (demand for money) and the supply of money	The interest rate is determined in the money market by the interaction of liquidity preference (how much money people want to hold as cash) and the money supply (controlled by the central bank). Keynes emphasized that the interest rate is a purely monetary phenomenon and not determined by real factors like thrift and productivity.

Table 2.3 Placeholder: Comparison of classical, loanable funds, and Keynesian theories of interest. Caption: Theories of interest. AI Prompt: “.”

4.3.3 Profit

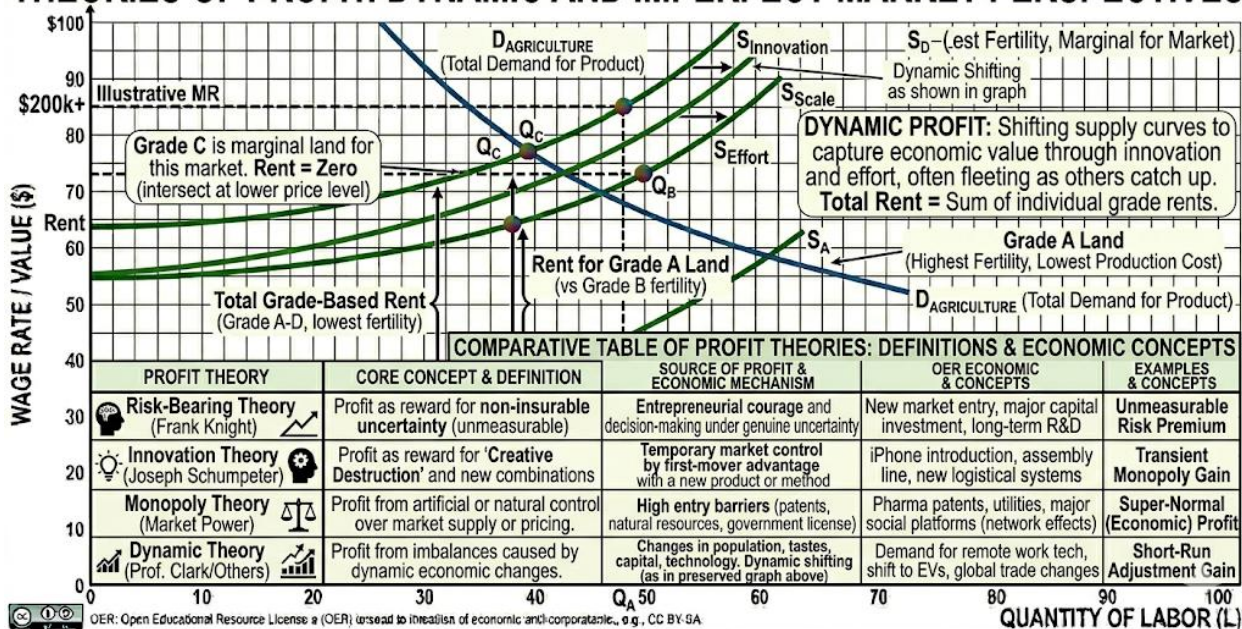
Profit is the reward for entrepreneurship. Several theories explain its origin. The **risk-bearing theory** sees profit as compensation for taking risks. The **innovation theory** (Schumpeter) argues that profit arises from introducing new products or processes. The **monopoly theory** highlights profits gained from market power, while the **dynamic theory** links profit to changes in economic conditions.

Profits play a vital role in motivating entrepreneurs, encouraging innovation, and driving economic growth. However, excessive monopoly profits can harm consumers and reduce efficiency. **Example:** A tech company earning high profits from a new app reflects innovation theory, while a firm charging high prices due to lack of competition reflects monopoly theory.



In-text question (ITQ): According to Schumpeter's innovation theory, profit arises from introducing new _____ or processes.

THEORIES OF PROFIT: DYNAMIC AND IMPERFECT MARKET PERSPECTIVES



Box 2.3 Placeholder: Summary of major profit theories. Caption: Theories of profit.

Pilot Questions 4.3

1. Define economic rent and explain Ricardian theory of rent.
2. Give one modern example of economic rent outside land use.
3. State the main idea of the loanable funds theory of interest.
4. Explain Keynesian theory of interest in terms of liquidity preference.
5. Identify and describe two major theories of profit.
6. Provide an example of profit explained by the innovation theory.

4.4 Income Distribution And Inequality

4.4.1 Personal and functional distribution of income

Personal distribution of income refers to how income is shared among individuals or households, regardless of the source. **Functional distribution of income** examines how income is divided among the factors of production: wages to labour, rent to land, interest to capital, and profit to entrepreneurship. Together, these perspectives help us understand both the structure of the economy and the fairness of income allocation. **Example:** A household survey showing



income gaps between rich and poor reflects personal distribution, while national accounts showing shares of wages and profits reflect functional distribution.

In-text question (ITQ): Functional distribution of income examines how income is divided among the _____ of production.

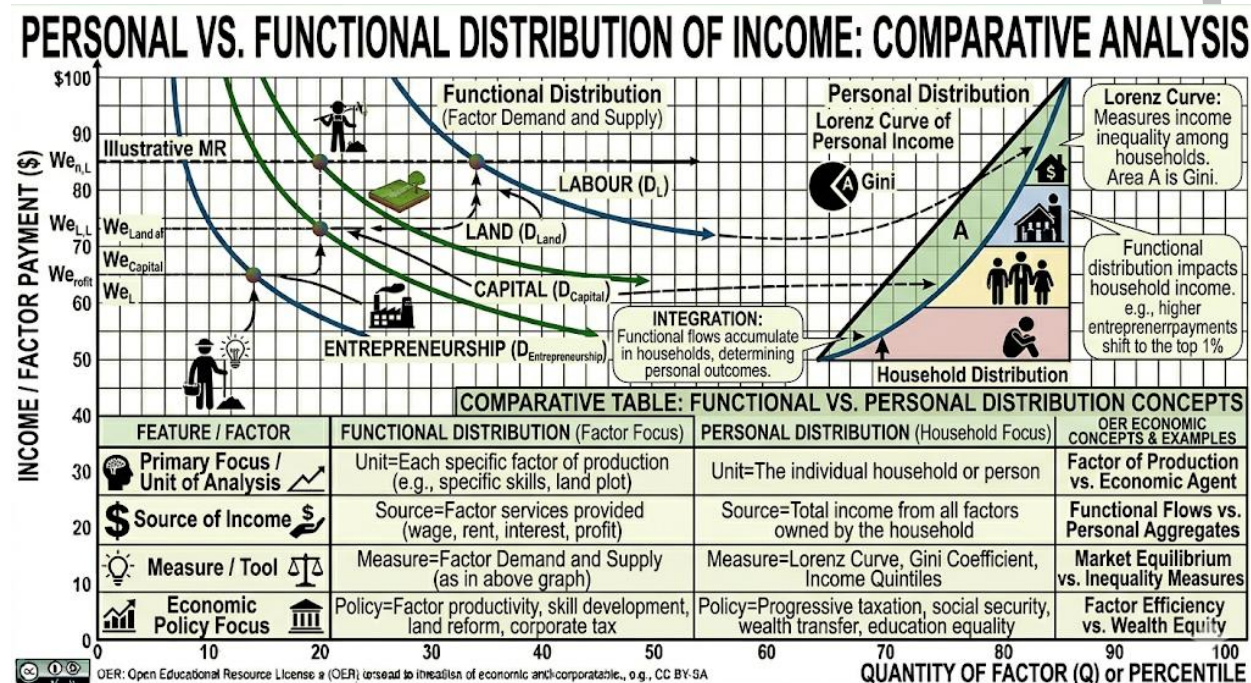


Figure 2.4 Placeholder: Diagram showing personal vs functional distribution of income.
Caption: Personal and functional distribution of income.

4.4.2 Causes of income inequality

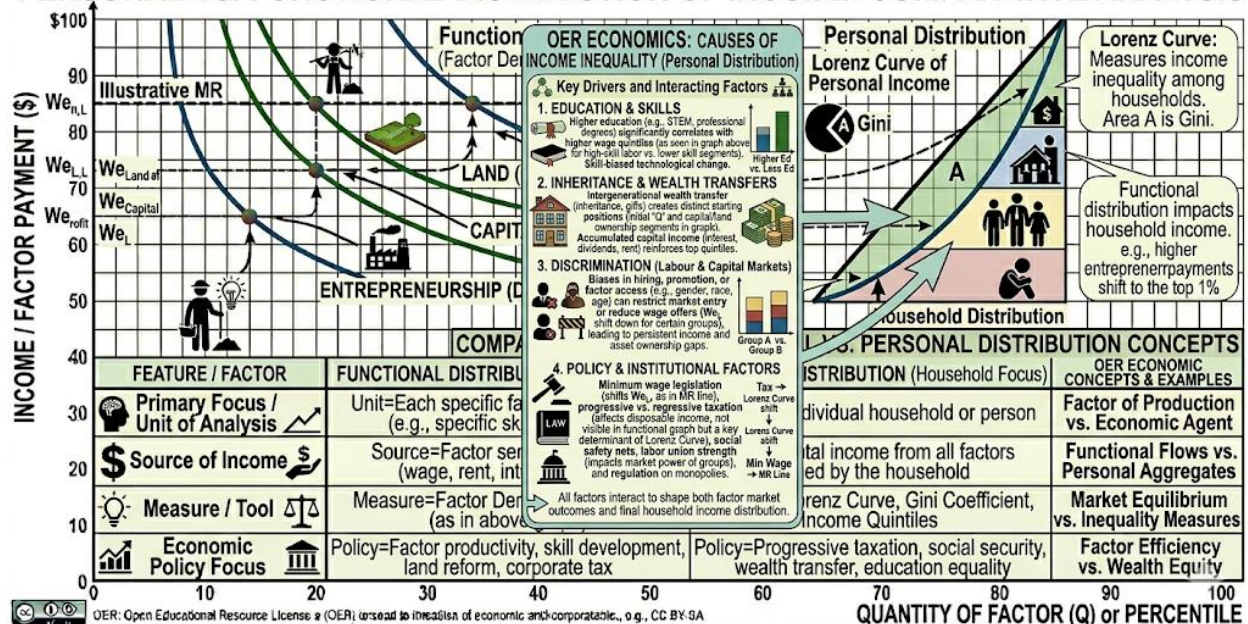
Income inequality arises from multiple factors. Differences in education and skills often lead to unequal earnings. Inheritance and ownership of assets create wealth gaps across generations. Discrimination based on gender, ethnicity, or region also contributes to inequality. Government policies, taxation systems, and access to opportunities further shape how income is distributed.

Example: A university graduate may earn more than someone without formal education, while inherited wealth allows some families to remain wealthy across generations.

In-text question (ITQ): Income inequality caused by inherited wealth is linked to differences in _____ ownership.



PERSONAL VS. FUNCTIONAL DISTRIBUTION OF INCOME: COMPARATIVE ANALYSIS



Box 2.4 Placeholder: Causes of income inequality. Caption: Major causes of income inequality.

4.4.3 Measures of inequality

Economists use tools to measure inequality. The **Lorenz curve** shows the cumulative share of income received by different segments of the population, while the **Gini coefficient** provides a numerical measure of inequality ranging from 0 (perfect equality) to 1 (perfect inequality). These measures help policymakers assess the extent of inequality and track changes over time.

Example: A Lorenz curve that bows sharply away from the line of equality indicates high inequality.

In-text question (ITQ): A Gini coefficient of 0 represents perfect _____ in income distribution.



LORENZ CURVE AND GINI COEFFICIENT PRE-IN ETHOL PECOMET ANALYSIS

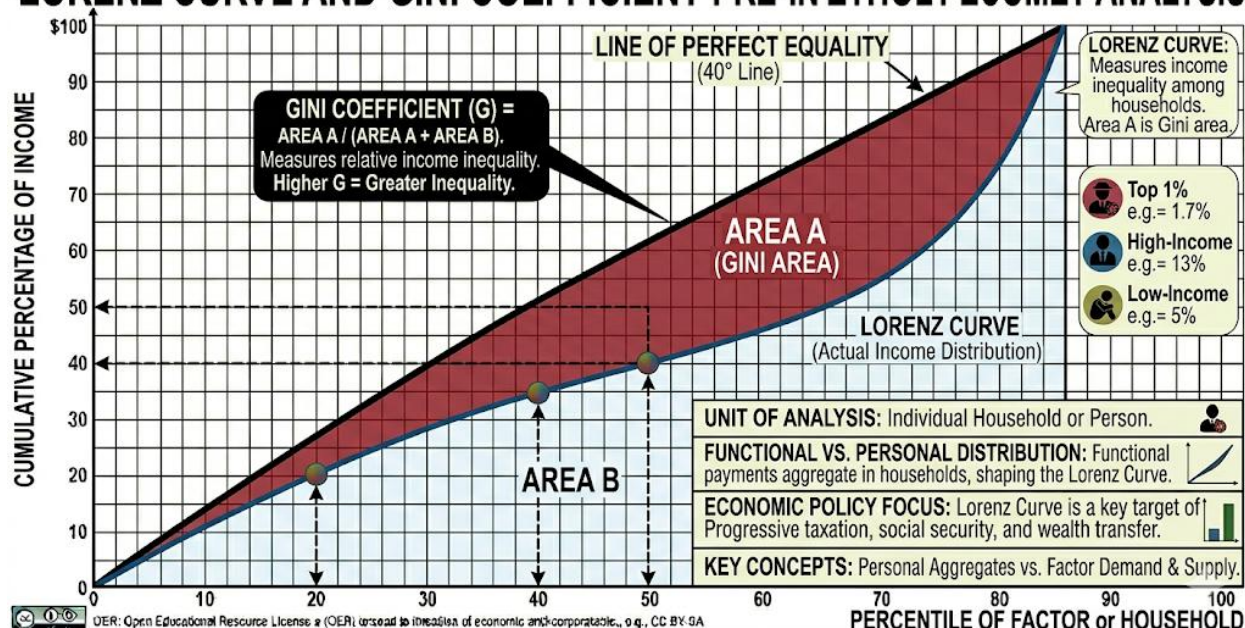


Figure 2.5 Placeholder: Lorenz curve showing income inequality. Caption: Lorenz curve and income distribution.

4.4.4 Policies for redistribution

Governments use various policies to reduce inequality and redistribute income. Progressive taxation ensures higher earners pay a larger share of taxes. Subsidies and welfare programmes support low-income households. Public investment in education and healthcare improves opportunities for disadvantaged groups. These policies aim to balance efficiency with fairness in the economy. **Example:** Free primary education funded by government taxes helps reduce inequality by giving all children access to learning.

In-text question (ITQ): Progressive taxation requires higher earners to pay a _____ proportion of their income in taxes.

Policy Type	Mechanism	Economic Impact
Progressive Taxation	Higher income earners pay a larger percentage of their income in taxes (e.g., graduated income tax brackets).	Reduces the "disposable income" gap and funds public services.
Welfare Programmes	Direct transfers to low-income individuals or families (e.g., unemployment benefits, disability support).	Provides a "social safety net" and prevents extreme poverty.



Policy Type	Mechanism	Economic Impact
Subsidies	Government provides financial aid to reduce the cost of essential goods (e.g., housing, education, healthcare).	Increases the "real income" and purchasing power of lower-income households.
Minimum Wage Laws	Establishing a legal floor for hourly pay to ensure a basic standard of living.	Shifts functional distribution toward labour, though debated for its impact on employment levels.

Box 2.5 Placeholder: Policies for income redistribution. Caption: Redistribution policies.

Pilot Questions 4.4

1. Distinguish between personal and functional distribution of income.
2. List three major causes of income inequality.
3. Explain how inheritance contributes to income inequality.
4. Describe the Lorenz curve and its use in measuring inequality.
5. State the meaning of a Gini coefficient of 1.
6. Identify two government policies designed to redistribute income.
7. Explain how investment in education can reduce inequality.

Series Summary

This Series on **Factor Pricing and Income Distribution** has guided you through the theories and mechanisms that explain how the rewards of production are determined and how income is shared across society. Beginning with the theories of factor pricing, we examined the marginal productivity theory and modern approaches, before moving on to wages and the labour market, where we explored determinants of wages, wage differentials, and the impact of unemployment. We then studied rent, interest, and profit, considering both classical and modern perspectives, and finally analysed income distribution and inequality, looking at its causes, measures, and policies for redistribution.

By engaging with these topics, you should now be able to define and explain the major theories of factor pricing (SLO 2.1), analyse the determinants of wages and wage differentials (SLO 2.2), evaluate rent, interest, and profit theories (SLO 2.3), distinguish between personal and functional income distribution (SLO 2.4), and assess the causes of inequality alongside policies for redistribution (SLO 2.5). This knowledge equips you with a solid foundation for understanding how economic rewards are allocated and the challenges of achieving fairness in income distribution.



Glossary of Terms

economic rent: Payment to a factor of production that exceeds what is necessary to keep it in its current use, often associated with land in classical theory but extended to scarce talents or monopoly gains in modern views.

functional distribution of income: The division of income among the factors of production, such as wages to labour, rent to land, interest to capital, and profit to entrepreneurship.

Gini coefficient: A numerical measure of income inequality ranging from 0 (perfect equality) to 1 (perfect inequality).

income inequality: The unequal distribution of income among individuals or households, often caused by differences in education, inheritance, discrimination, or access to opportunities.

interest: Payment made for the use of capital, explained by theories such as classical saving, loanable funds, and Keynesian liquidity preference.

Lorenz curve: A graphical representation of income distribution showing the cumulative share of income received by different segments of the population compared to perfect equality.

marginal productivity theory of distribution: The theory that each factor of production is rewarded according to its marginal contribution to output.

personal distribution of income: The way income is shared among individuals or households, regardless of its source.

profit: The reward for entrepreneurship, explained by theories such as risk-bearing, innovation, monopoly, and dynamic change.

wage differentials: Variations in wages across individuals, occupations, industries, or regions, arising from differences in skills, education, working conditions, or discrimination.

wages: Monetary payments made to labour for services rendered, determined by demand and supply of labour as well as institutional and social factors.

unemployment: A situation where individuals who are willing and able to work cannot find jobs, often leading to reduced income distribution and increased inequality.

Concept Check Questions [4]

Objective Questions

1. The marginal productivity theory of distribution states that a factor is paid according to its _____ contribution to output. (Linked to SLO 2.1)
2. The Lorenz curve is used to measure _____. (Linked to SLO 2.5)
3. According to Keynesian theory, interest is the reward for parting with _____. (Linked to SLO 2.3)
4. Wage differences caused by discrimination are examples of _____ differentials. (Linked to SLO 2.2)



Short-Answer Questions

5. Define economic rent and give one modern example. (Linked to SLO 2.3)
6. State two institutional factors that influence wage determination beyond demand and supply. (Linked to SLO 2.2)
7. Distinguish between personal and functional distribution of income. (Linked to SLO 2.4)
8. List three major causes of income inequality. (Linked to SLO 2.5)

Long-Answer Questions

9. Analyse the criticisms of the marginal productivity theory of distribution. (Linked to SLO 2.1)
10. Evaluate the effectiveness of government policies such as progressive taxation and welfare programmes in reducing income inequality. (Linked to SLO 2.5)

Answers to Concept Check Questions

Objective Questions

1. Marginal contribution.
2. Income inequality.
3. Liquidity.
4. Unfair wage differentials.

Short-Answer Questions

5. Economic rent is payment to a factor of production above what is necessary to keep it in its current use. Example: a celebrity earning millions due to unique talent.
6. Minimum wage laws, trade union bargaining power.
7. Personal distribution refers to how income is shared among individuals or households, while functional distribution refers to how income is divided among factors of production.
8. Education differences, inheritance, discrimination.

Long-Answer Questions

9. **Basic response:** The marginal productivity theory assumes perfect competition, which rarely exists. It ignores institutional and social factors such as discrimination and unequal access to education. **Value-added response:** Beyond these criticisms, the theory also fails to explain persistent inequality in modern economies, neglects the role of government intervention, and oversimplifies the complex dynamics of labour markets. It assumes that productivity alone determines wages, which is unrealistic in economies with structural unemployment and informal sectors.



10. **Basic response:** Progressive taxation ensures higher earners pay more, while welfare programmes support low-income households. These policies help reduce inequality. **Value-added response:** In addition, investment in education and healthcare expands opportunities for disadvantaged groups, while subsidies can target specific needs. However, challenges include tax evasion, inefficient welfare delivery, and balancing redistribution with economic growth. Effective policies require strong institutions and continuous monitoring to achieve both fairness and efficiency.

Answers to Pilot Questions [4]

Part 2.1: Theories of Factor Pricing

1. The marginal productivity theory of distribution.
2. Firms determine factor employment by equating marginal revenue product with factor cost.
3. Modern theories of wages emphasise trade unions, government policies, and institutional factors.
4. The innovation theory of profit focuses on introducing new products or processes.
5. Criticisms include unrealistic assumptions of perfect competition and neglect of social and institutional factors.

Part 2.2: Wages and the Labour Market

1. Wages are monetary payments to labour, determined by demand and supply.
2. Demand and supply curves intersect to set equilibrium wage levels.
3. Examples include doctors earning more than teachers, or regional wage differences.
4. Fair differentials reflect productivity, while unfair ones arise from discrimination.
5. Unemployment reduces income distribution and widens inequality.
6. Policies include job creation programmes and vocational training.

Part 2.3: Rent, Interest, and Profit

1. Economic rent is payment above what is necessary to keep a factor in use; Ricardian theory links it to land fertility.
2. Modern example: celebrity earnings due to scarce talent.
3. Loanable funds theory states interest is determined by supply of savings and demand for investment.
4. Keynesian theory explains interest as the reward for parting with liquidity.
5. Theories include risk-bearing, innovation, monopoly, and dynamic theories.



6. Example: A tech company earning high profits from a new app reflects innovation theory.

Part 2.4: Income Distribution and Inequality

1. Personal distribution refers to income among individuals or households, while functional distribution refers to income among factors of production.
2. Causes include education differences, inheritance, and discrimination.
3. Inheritance contributes by passing wealth across generations.
4. The Lorenz curve shows cumulative income shares compared to equality.
5. A Gini coefficient of 1 means perfect inequality.
6. Policies include progressive taxation and welfare programmes.
7. Investment in education reduces inequality by expanding opportunities.

References and Attributions [Series 4]

This section compiles references, suggested open educational resources (OERs), and attributions for illustrations and concepts used throughout **Series 4: Factor Pricing and Income Distribution**.

General References

- Ricardo, D. (1817). *On the Principles of Political Economy and Taxation*. London: John Murray.
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- Todaro, M. P., & Smith, S. C. (2020). *Economic Development* (13th ed.). Harlow: Pearson Education.
- OpenStax. (2016). *Principles of Economics*. Houston, TX: Rice University. Available at: <https://openstax.org/books/principles-economics> (openstax.org in Bing)

Illustrations and Placeholders

- *Figure 2.1: Marginal productivity and factor pricing* Attribution: AI-generated using prompt “Graph showing marginal productivity curve intersecting wage line in economics.”
- *Table 2.1: Classical vs modern theories of factor pricing* Attribution: Suggested OER search string “factor pricing classical vs modern theories OER economics.”



- *Box 2.1: Criticisms of factor pricing theories* Attribution: AI-generated summary prompt “Box summarising criticisms of factor pricing theories in economics.”
- *Figure 2.2: Determinants of wages in the labour market* Attribution: AI-generated using prompt “Graph showing labour demand and supply curves intersecting to determine equilibrium wage.”
- *Table 2.2: Wage differentials in selected occupations* Attribution: Suggested OER search string “examples of wage differentials OER economics.”
- *Box 2.2: Impact of unemployment on income distribution* Attribution: AI-generated summary prompt “Box summarising case study of unemployment effects on income inequality.”
- *Figure 2.3: Ricardian theory of rent* Attribution: Suggested OER search string “Ricardian theory of rent diagram OER economics.”
- *Table 2.3: Theories of interest* Attribution: Suggested OER search string “theories of interest economics OER.”
- *Box 2.3: Theories of profit* Attribution: AI-generated summary prompt “Box summarising risk-bearing, innovation, monopoly, and dynamic theories of profit.”
- *Figure 2.4: Personal and functional distribution of income* Attribution: Suggested OER search string “personal vs functional distribution of income OER economics.”
- *Box 2.4: Causes of income inequality* Attribution: AI-generated summary prompt “Box listing causes of income inequality such as education, inheritance, discrimination, and policy.”
- *Figure 2.5: Lorenz curve and income distribution* Attribution: Suggested OER search string “Lorenz curve Gini coefficient OER economics.”
- *Box 2.5: Redistribution policies* Attribution: AI-generated summary prompt “Box summarising redistribution policies such as progressive taxation, subsidies, and welfare programmes.”

Attribution Note All AI-generated illustrations were created using descriptive prompts designed for educational purposes. Suggested search strings point to open educational resources (OERs) that can provide freely available diagrams, tables, and case studies for classroom or independent learning use.



Course code: ECO 202

Course title: Introduction to Microeconomics II

Course credit load: 2 Units

Series 1: Production and Cost Analysis

Series 2: Consumer Behaviour and Market Mechanism

Series 3: Market Structures and Pricing Strategies

Series 4: Factor Pricing and Income Distribution

Series 5: Elementary Price Theory and Applications

Suggested Outline

Part 1: The Nature of Price and Market Mechanisms

- Definition of price and its role in the economy
- Market forces of demand and supply
- Equilibrium price determination
- Shifts in demand and supply and their effects on price

Part 2: Elasticity and Its Applications

- Price elasticity of demand: meaning, measurement, and determinants
- Income elasticity of demand
- Cross elasticity of demand
- Applications of elasticity in business and policy decisions

Part 3: Price Determination Under Different Market Structures

- Perfect competition: price formation and efficiency
- Monopoly: pricing strategies and welfare implications
- Monopolistic competition: product differentiation and pricing
- Oligopoly: models of price determination (e.g., kinked demand curve, collusion)

Part 4: Applications of Price Theory

- Government intervention in pricing: price controls, subsidies, and taxation
- Pricing and resource allocation
- Price theory in everyday decision-making
- Case studies of price regulation and market outcomes



Introduction

Prices are at the heart of everyday economic life. From the goods we buy in the market to the services we consume, prices influence decisions made by households, firms, and governments. Understanding how prices are formed and adjusted provides a foundation for grasping broader economic behaviour. Building on the previous Series on factor pricing and income distribution, this Series turns attention to the mechanisms of price determination and their practical applications.

The aim of this Series is to introduce you to the basic principles of price theory and to equip you with the analytical tools needed to explain how prices are set, how they respond to changes in market conditions, and how they affect resource allocation and policy outcomes.

We shall commence this Series by examining the nature of price and the role of market forces in determining equilibrium. Next, we will explore elasticity and its applications, considering how demand responds to changes in price, income, and related goods. Following that, we will study price determination under different market structures, including perfect competition, monopoly, monopolistic competition, and oligopoly. Finally, we will wrap up by applying price theory to real-world issues such as government intervention, taxation, subsidies, and everyday decision-making. This progression will ensure you gain both theoretical insight and practical understanding of elementary price theory.

Series Learning Outcomes

Upon completing this Series, you should be able to:

SLO 5.1 define the concept of price and explain how market forces of demand and supply interact to determine equilibrium price,

SLO 5.2 analyse the effects of shifts in demand and supply on equilibrium price,

SLO 5.3 calculate price elasticity of demand and interpret its determinants,

SLO 5.4 distinguish between income elasticity and cross elasticity of demand,

SLO 5.5 apply elasticity concepts to real-world business and policy decisions,

SLO 5.6 describe how prices are determined under perfect competition, monopoly, monopolistic competition, and oligopoly,

5.1 The Nature of Price and Market Mechanisms

5.1.1 Definition of price and its role in the economy

Price is the monetary value placed on goods and services in exchange transactions. It is not just a number but a powerful signal that coordinates the behaviour of buyers and sellers. Prices help to answer the fundamental economic questions of *what to produce*, *how to produce*, and *for whom to produce*. When prices rise, they indicate scarcity and encourage producers to supply more,



while consumers may reduce demand. When prices fall, they signal abundance, encouraging consumption but discouraging production.

Prices also perform a rationing function, ensuring that limited resources are allocated to those willing and able to pay. In this way, prices balance competing needs and guide resource allocation across the economy. **Example:** A rise in the price of housing in urban centres signals high demand and limited supply, encouraging developers to build more houses while discouraging low-income households from entering the market.

In-text question (ITQ): Price acts as a _____ that guides decisions of buyers and sellers.

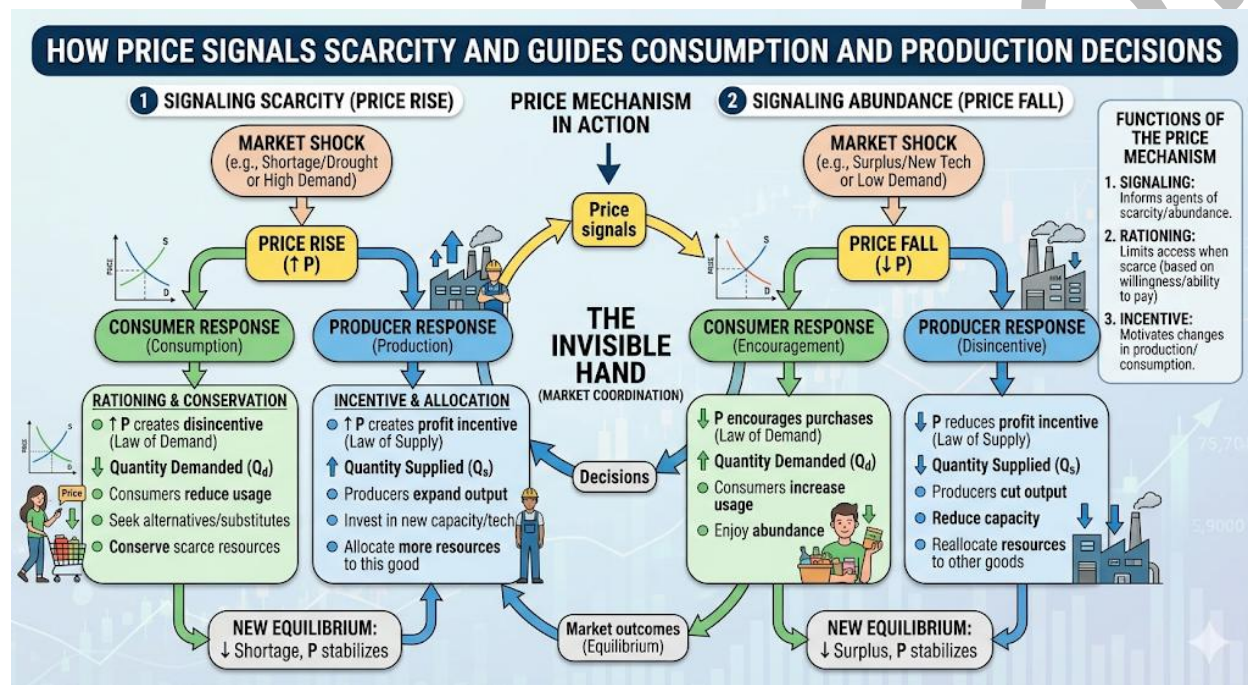


Figure 2.6 Placeholder: Diagram showing price as a signal in the economy. Caption: Price as a signalling mechanism.

5.1.2 Market forces of demand and supply

The **demand curve** illustrates the relationship between price and quantity demanded, usually downward sloping due to the law of demand: as price falls, quantity demanded rises. The **supply curve** shows the relationship between price and quantity supplied, typically upward sloping because higher prices encourage producers to supply more.

Together, demand and supply interact to determine market outcomes. The balance between these forces explains why goods are available at certain prices and why shortages or surpluses occur when prices deviate from equilibrium. **Example:** If the price of rice falls significantly, more consumers will buy it, but farmers may reduce supply because it is less profitable.

In-text question (ITQ): The law of demand states that as price falls, quantity demanded _____.



Graph showing downward-sloping demand curve and upward-sloping supply curve

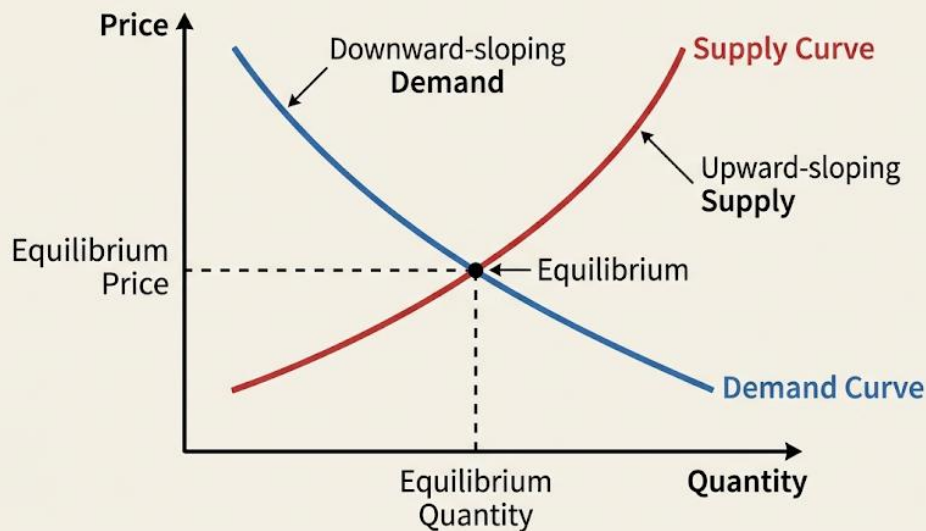


Figure 2.7 Placeholder: Graph of demand and supply curves. Caption: Demand and supply in the market.

5.1.3 Equilibrium price determination

Equilibrium price is the point at which the quantity demanded equals the quantity supplied. At this price, the market clears, meaning there is no shortage or surplus. If the price is set above equilibrium, a surplus occurs because suppliers produce more than consumers are willing to buy. If the price is set below equilibrium, a shortage results because consumers demand more than suppliers are willing to provide.

Market forces naturally push prices back towards equilibrium. This self-adjusting mechanism ensures that resources are allocated efficiently without the need for constant external intervention. **Example:** In a local market, if yam is priced too high, sellers face unsold stock, prompting them to lower prices until demand matches supply.

In-text question (ITQ): When demand equals supply, the market reaches _____ price.



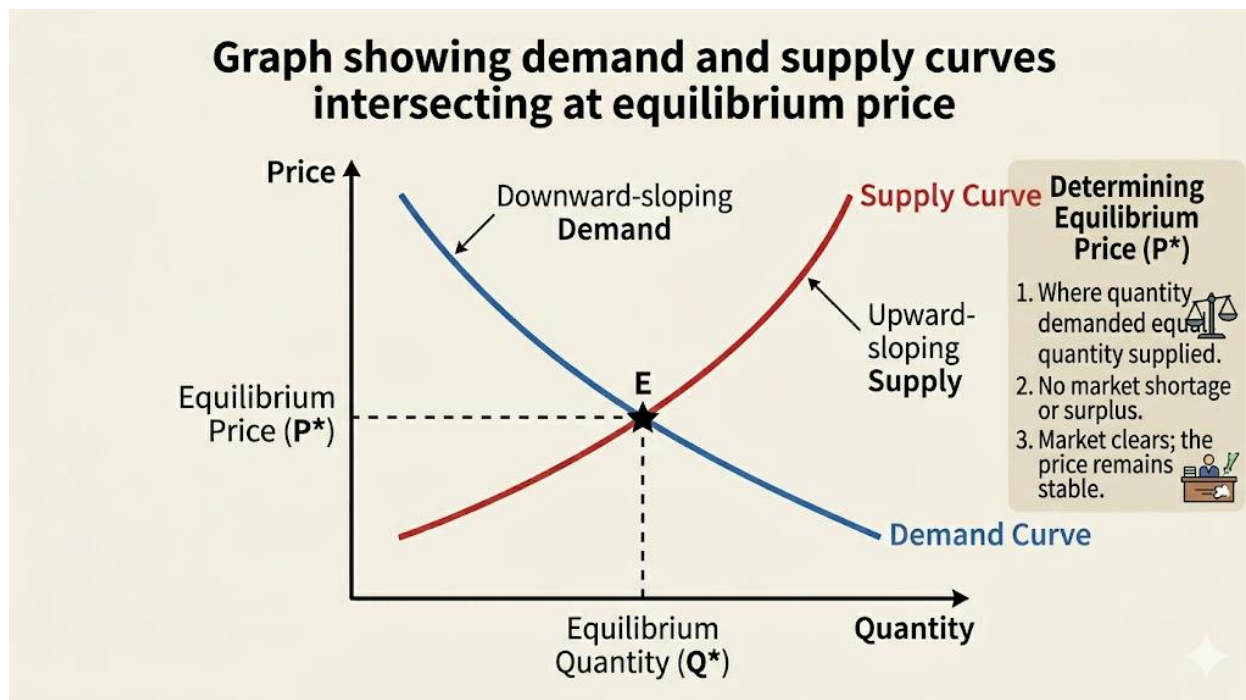


Figure 2.8 Placeholder: Graph showing equilibrium price at intersection of demand and supply curves. Caption: Equilibrium price determination.

5.1.4 Shifts in demand and supply and their effects on price

Demand and supply curves can shift due to external factors. A **shift in demand** occurs when factors other than price change, such as income, tastes, population size, or prices of related goods. A **shift in supply** occurs when production costs, technology, or government policies change. These shifts alter equilibrium price and quantity.

For instance, an increase in consumer income shifts the demand curve to the right, raising equilibrium price and quantity. Conversely, a bumper harvest shifts the supply curve to the right, lowering equilibrium price while increasing quantity. **Example:** A rise in consumer preference for electric cars shifts demand upward, raising prices and encouraging more production, while a government subsidy for solar panels shifts supply outward, lowering prices and making them more affordable.

In-text question (ITQ): A rise in consumer income shifts the demand curve to the _____.



Simultaneous Rightward Shift in Demand Curve and Leftward Shift in Supply Curve

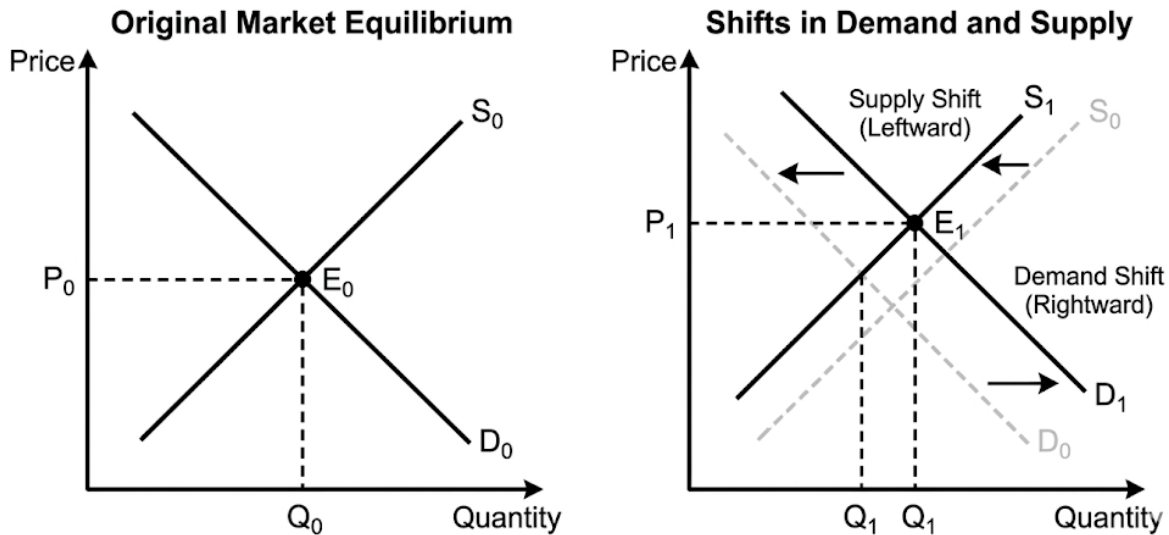


Figure 2.9 Placeholder: Graph showing shifts in demand and supply curves. Caption: Shifts in demand and supply.

Pilot Questions 5.1

1. Define price and explain its role in resource allocation.
2. State the law of demand and illustrate it with an example.
3. Describe how equilibrium price is determined in a market.
4. Explain what happens when price is set above equilibrium.
5. Identify two factors that can shift the demand curve and two that can shift the supply curve.

5.2 Elasticity and Its Applications

5.2.1 Price elasticity of demand

Price elasticity of demand (PED) measures how responsive the quantity demanded of a good is to changes in its price. It is calculated as the percentage change in quantity demanded divided by the percentage change in price. Goods with high elasticity (elastic demand) experience large changes in demand when prices change, while goods with low elasticity (inelastic demand) show little response.

Determinants of elasticity include availability of substitutes, proportion of income spent on the good, necessity versus luxury, and time period considered. **Example:** Demand for salt is inelastic



because it is a necessity with few substitutes, while demand for luxury cars is elastic because consumers can delay purchase or choose alternatives.

In-text question (ITQ): If a small change in price leads to a large change in demand, the demand is said to be _____.

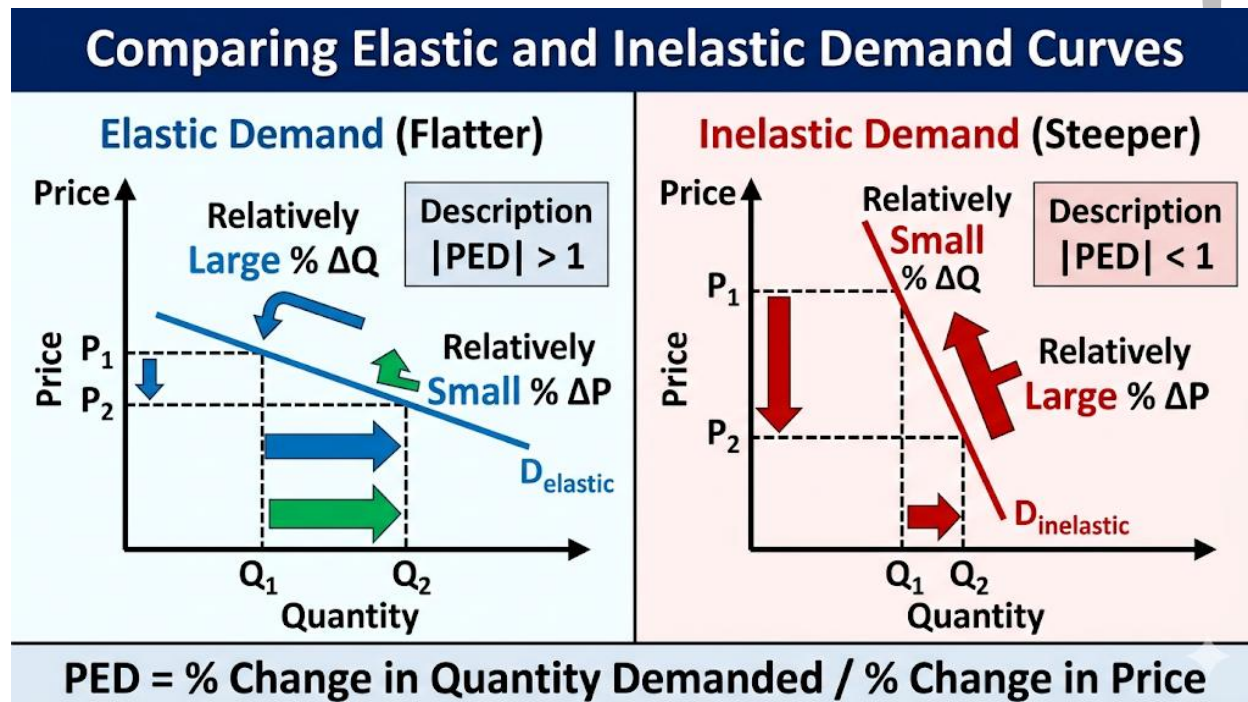


Figure 2.10 Placeholder: Graph showing elastic and inelastic demand curves. Caption: Price elasticity of demand.

5.2.2 Income elasticity of demand

Income elasticity of demand (YED) measures how demand changes in response to changes in consumer income. Normal goods have positive income elasticity, meaning demand rises as income increases. Inferior goods have negative income elasticity, meaning demand falls as income rises.

Example: As incomes rise, demand for organic food (a normal good) increases, while demand for second-hand clothing (an inferior good) may decline.

In-text question (ITQ): Goods with negative income elasticity are classified as _____ goods.



Demand Curve Shifts and Income Elasticity

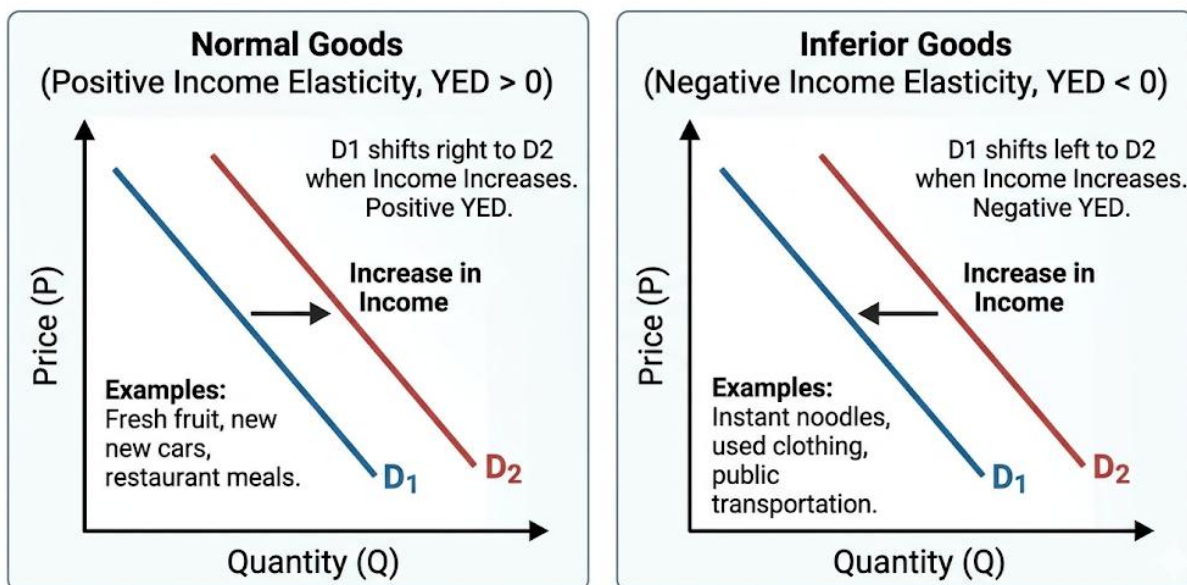


Figure 2.11 Placeholder: Diagram showing demand shifts for normal and inferior goods.
 Caption: Income elasticity of demand.

5.2.3 Cross elasticity of demand

Cross elasticity of demand (XED) measures how demand for one good responds to changes in the price of another good. Substitutes have positive cross elasticity, while complements have negative cross elasticity.

Example: If the price of tea rises, demand for coffee (a substitute) may increase. Conversely, if the price of cars rises, demand for petrol (a complement) may decrease.

In-text question (ITQ): If the price of one good rises and demand for another good falls, the goods are _____.



Diagram: Cross Price Elasticity of Demand (CPED or e_{xy}) for Substitutes and Complements

$$e_{xy} = \frac{\% \text{ Change in } Q_x}{\% \text{ Change in } P_y}$$

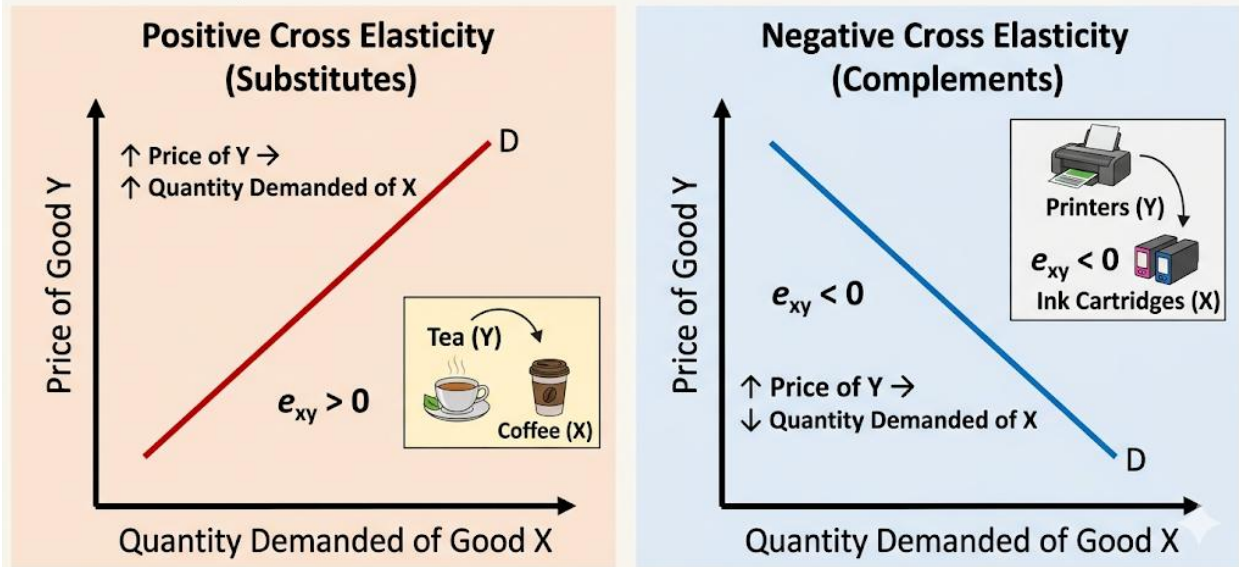


Figure 2.12 Placeholder: Diagram showing positive and negative cross elasticity. Caption: Cross elasticity of demand.

5.2.4 Applications of elasticity in business and policy decisions

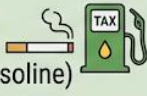
Elasticity concepts are vital for decision-making. Businesses use elasticity to set prices, forecast sales, and design marketing strategies. Governments use elasticity to predict tax revenue, evaluate subsidy impacts, and regulate markets.

For instance, if demand for cigarettes is inelastic, a tax increase raises government revenue without greatly reducing consumption. Conversely, if demand for luxury goods is elastic, a tax increase may reduce sales significantly. **Example:** Airlines use elasticity to adjust ticket prices depending on demand conditions, charging higher fares during peak seasons and lower fares during off-peak periods.

In-text question (ITQ): Governments prefer to tax goods with _____ demand because revenue is less affected by price changes.



SUMMARY: CASE STUDIES OF ELASTICITY APPLICATIONS IN taxation, pricing, and subsidies.

I. TAXATION & INCIDENCE	II. PRICING STRATEGIES	III. SUBSIDIES & BENEFITS
Case Study: Taxing Inelastic Goods (e.g., Cigarettes, Gasoline)  • Demand is relatively inelastic (steeper curve, like in IMAGE>). • Consumers bear most of the tax burden (higher consumer price). • Significant tax revenue generated for the government. • Relatively small reduction in quantity consumed. 	Case Study: Dynamic Pricing for Elastic vs. Inelastic Services (e.g., Airlines, Movie Tickets)  • Off-peak times/low demand: Lower prices to attract elastic consumers (increases total revenue). • Peak times/high demand: Higher prices for inelastic consumers (maximize profit, like <IMAGE 1>). • Businesses segment the market based on elasticity to optimize revenue.	Case Study: Subsidizing Elastic Supply/Demand (e.g., Solar Panels, Education)  • Subsidy effect depends on relative elasticities (<IMAGE 2>). • High demand elasticity: Large increase in quantity consumed. • High supply elasticity: Producers increase supply significantly, lowering the market price more effectively for consumers. • Goal: Encourage positive externalities and shift market equilibrium.



Box 2.6 Placeholder: Case studies of elasticity applications. Caption: Applications of elasticity in business and policy.

Pilot Questions 5.2

1. Define price elasticity of demand and state two determinants.
2. Distinguish between elastic and inelastic demand with examples.
3. Explain the difference between normal and inferior goods in terms of income elasticity.
4. State the meaning of positive and negative cross elasticity with examples.
5. Analyse how governments use elasticity concepts in taxation policy.

2.7 Price Determination Under Different Market Structures

2.7.1 Perfect competition

In a **perfectly competitive market**, there are many buyers and sellers, homogeneous products, and free entry and exit. No single participant can influence price; instead, the market sets an equilibrium price through the interaction of demand and supply. Firms are price takers, meaning they accept the market price and adjust output accordingly. Efficiency is achieved because resources are allocated to their most productive uses.

Example: Local vegetable markets often resemble perfect competition, where many farmers sell similar produce and prices are determined collectively.

In-text question (ITQ): In perfect competition, firms are _____ takers.



Figure 1: Demand Curve faced by a Firm in Perfect Competition

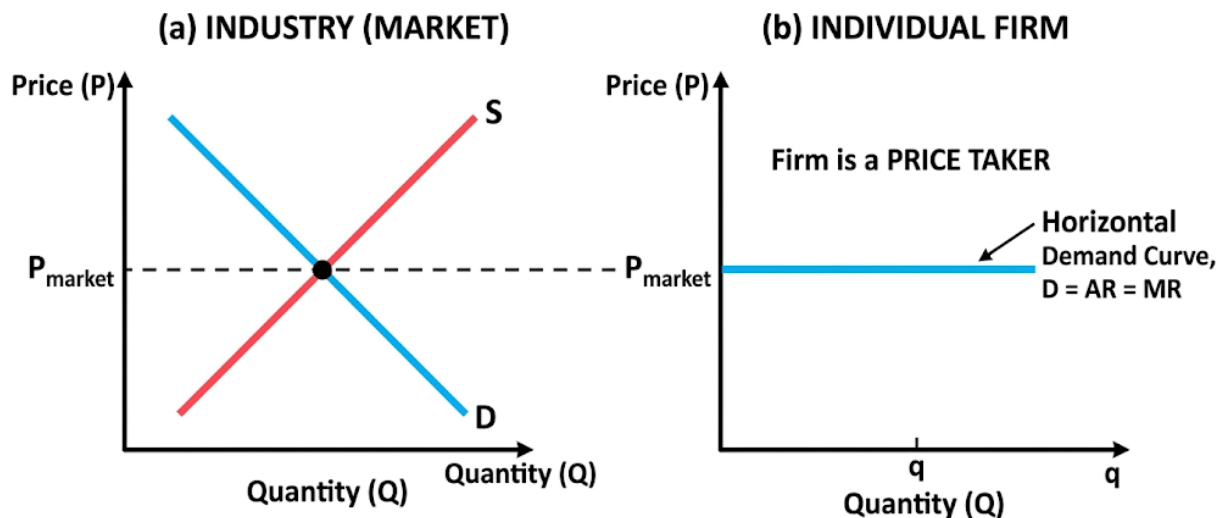


Figure 2.13 Placeholder: Graph showing equilibrium price in perfect competition. Caption: Price determination under perfect competition.

5.3.2 Monopoly

A **monopoly** exists when a single seller dominates the market. The firm is a price maker, setting prices by controlling supply. Barriers to entry, such as patents or high capital requirements, prevent competition. Monopolies often charge higher prices and restrict output compared to competitive markets, leading to inefficiency and welfare loss.

Example: Utility companies in some regions operate as monopolies, controlling electricity supply and setting prices.

In-text question (ITQ): A monopoly firm is a price _____.



Figure 1: Monopoly Perceived Demand and Marginal Revenue Curves

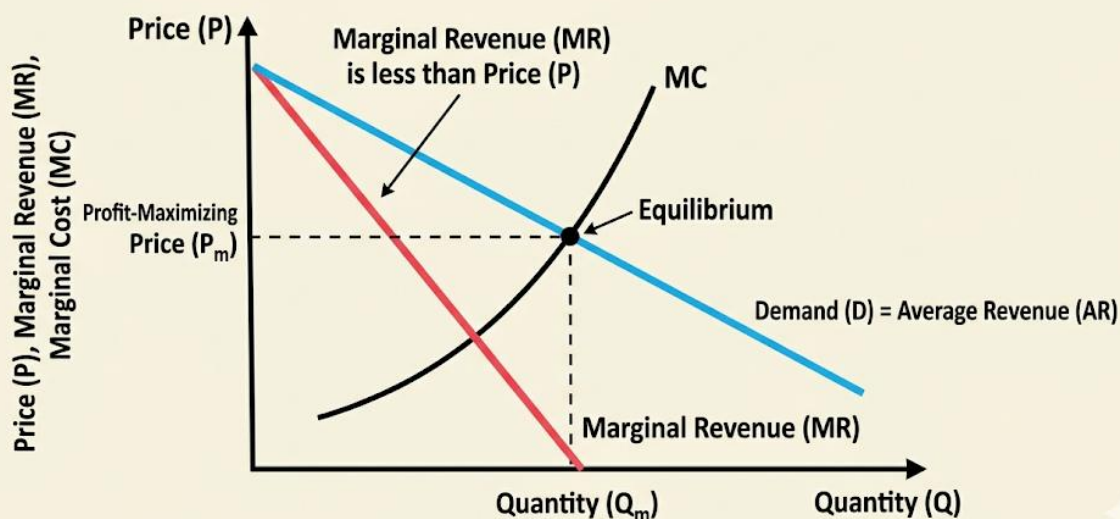


Figure 2.14 Placeholder: Graph showing monopoly pricing. Caption: Price determination under monopoly.

5.3.3 Monopolistic competition

Monopolistic competition combines elements of competition and monopoly. Many firms sell differentiated products, such as branded clothing or restaurants offering unique menus. Each firm has some control over price due to product differentiation, but competition limits excessive pricing. In the long run, free entry and exit erode abnormal profits, leaving firms with normal profits.

Example: Fast-food outlets illustrate monopolistic competition, where each brand differentiates itself but faces competition from others.

In-text question (ITQ): In monopolistic competition, firms differentiate their products to gain some control over _____.



Figure: Long-Run Equilibrium in Monopolistic Competition

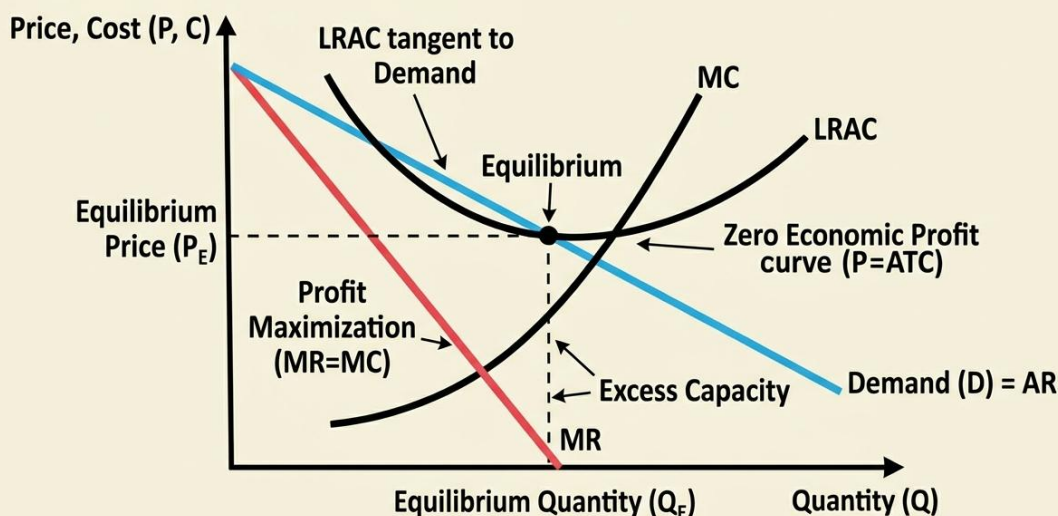


Figure 2.15 Placeholder: Graph showing monopolistic competition equilibrium. Caption: Price determination under monopolistic competition.

5.3.4 Oligopoly

An **oligopoly** is a market dominated by a few large firms. Pricing decisions are interdependent, meaning each firm considers rivals' actions before setting prices. Models of oligopoly include the kinked demand curve, which explains price rigidity, and collusion, where firms cooperate to fix prices. Oligopolies may lead to stable prices but can also reduce competition.

Example: The airline industry often functions as an oligopoly, with a few major carriers influencing ticket prices.

In-text question (ITQ): In oligopoly, firms' pricing decisions are _____ on each other.



KINKED DEMAND CURVE: PRICE RIGIDITY IN OLIGOPOLY

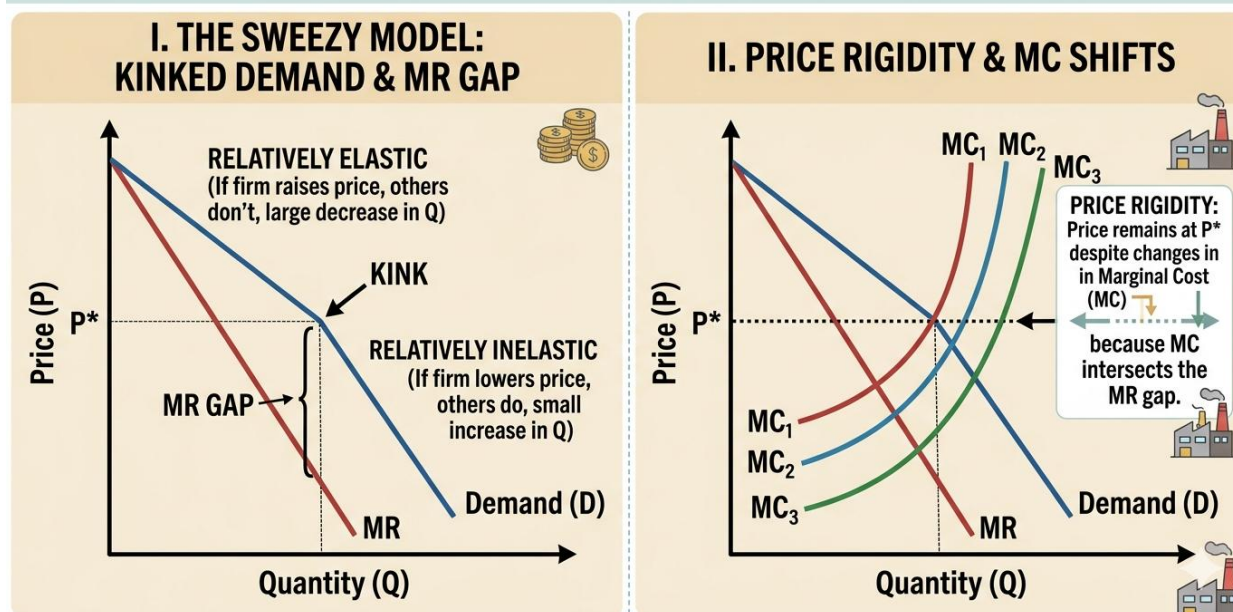


Figure 2.16 Placeholder: Graph showing kinked demand curve in oligopoly. Caption: Price determination under oligopoly.

Pilot Questions 5.3

1. Describe the main features of perfect competition and explain how prices are determined.
2. Explain why monopoly firms are considered price makers.
3. Give an example of monopolistic competition and explain how product differentiation affects pricing.
4. Analyse the kinked demand curve model of oligopoly.
5. Evaluate the efficiency of price determination under monopoly compared to perfect competition.

5.4 Applications of Price Theory

5.4.1 Government intervention in pricing

Governments often intervene in markets to correct perceived inefficiencies or protect consumers. Common interventions include **price controls** (such as minimum wages or rent ceilings), **subsidies** to encourage production or consumption, and **taxation** to raise revenue or discourage harmful goods. These interventions alter the natural equilibrium price and quantity, sometimes creating unintended consequences such as shortages or surpluses.

Example: A rent ceiling may make housing affordable but can lead to shortages and poor maintenance of properties.



In-text question (ITQ): A government-imposed maximum price is known as a price _____.

GRAPH SHOWING PRICE CONTROLS AND MARKET IMPACTS (OER Economics)

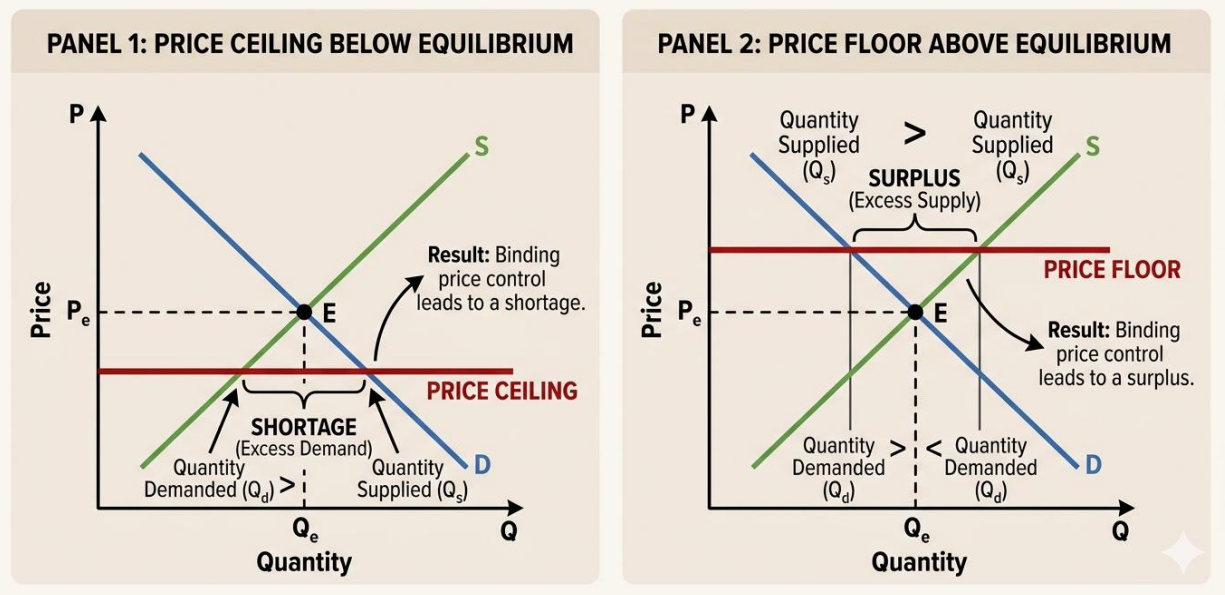


Figure 2.17 Placeholder: Diagram showing effects of price ceiling and price floor. Caption: Government intervention in pricing.

5.4.2 Pricing and resource allocation

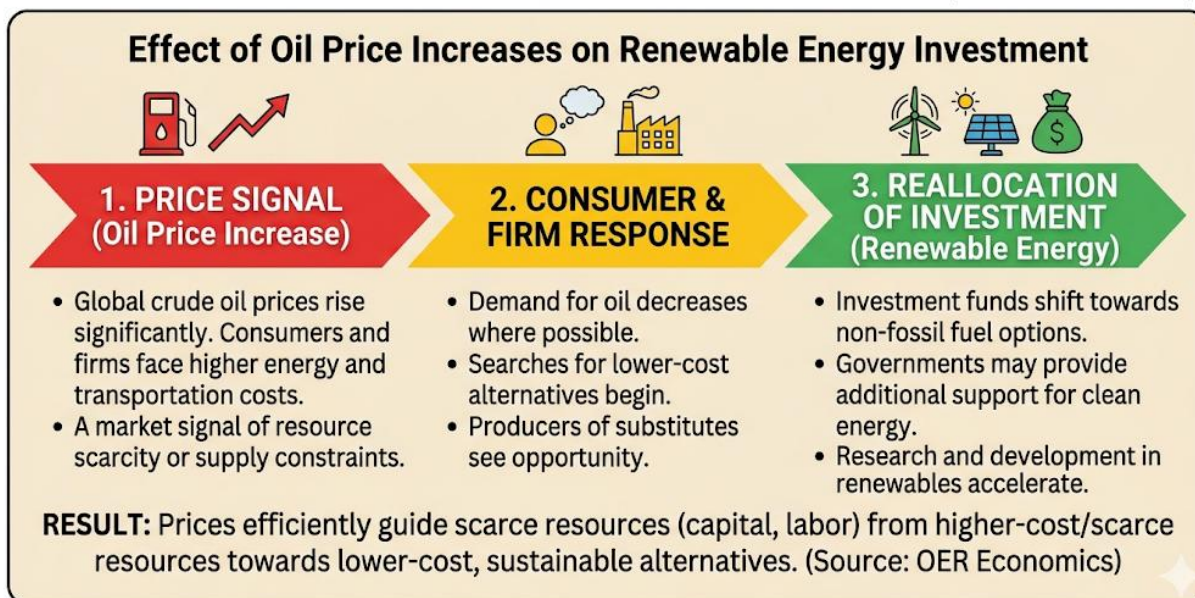
Prices play a central role in allocating scarce resources. When markets are allowed to function freely, prices guide resources to their most valued uses. High prices attract resources to profitable sectors, while low prices discourage production in less valued areas. Intervention may distort this allocation, but it can also promote social goals such as equity or sustainability.

Example: Rising oil prices encourage investment in alternative energy sources, reallocating resources towards renewable energy.

In-text question (ITQ): High prices attract resources to _____ sectors.



BOX 4.1: RESOURCE ALLOCATION THROUGH PRICES (CASE STUDY)



Box 2.7 Placeholder: Case study on resource allocation through prices. Caption: Prices and resource allocation.

5.4.3 Price theory in everyday decision-making

Price theory is not confined to textbooks; it influences daily choices. Consumers decide what to buy based on prices relative to their income. Firms decide what to produce and how much to charge. Even governments use price signals to design policies. Understanding price theory helps individuals make informed decisions about spending, saving, and investing.

Example: A family choosing between eating out or cooking at home is applying price theory by comparing relative costs and benefits.

In-text question (ITQ): When consumers compare costs and benefits before purchasing, they are applying _____ theory.



PRICE THEORY IN EVERYDAY DECISION-MAKING: EATING OUT VS. COOKING AT HOME

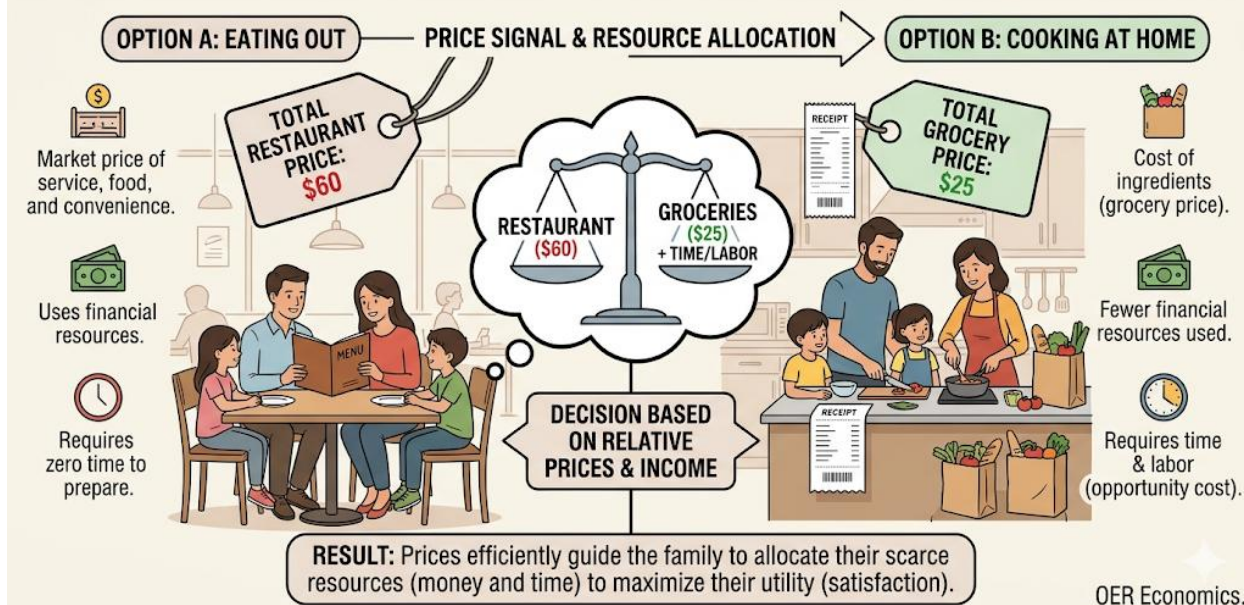


Figure 2.18 Placeholder: Illustration of household decision-making based on prices. Caption: Price theory in everyday life.

5.4.4 Case studies of price regulation and market outcomes

Real-world case studies highlight the impact of price regulation. For instance, agricultural price supports aim to stabilise farmers' incomes but may lead to overproduction. Fuel subsidies make energy affordable but can strain government budgets. Studying these cases helps learners connect theory with practice and evaluate policy effectiveness.

Example: Nigeria's fuel subsidy programme kept petrol prices low but created fiscal challenges and encouraged smuggling.

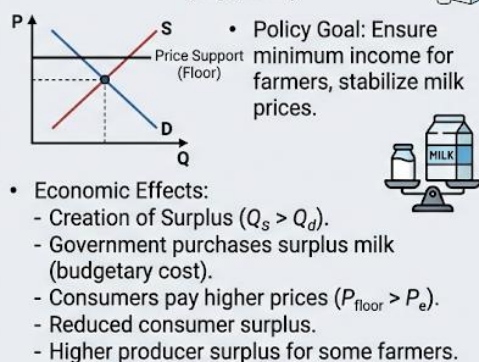
In-text question (ITQ): Fuel subsidies often make energy affordable but can strain _____ budgets.



BOX 4.1: CASE STUDIES IN PRICE REGULATION

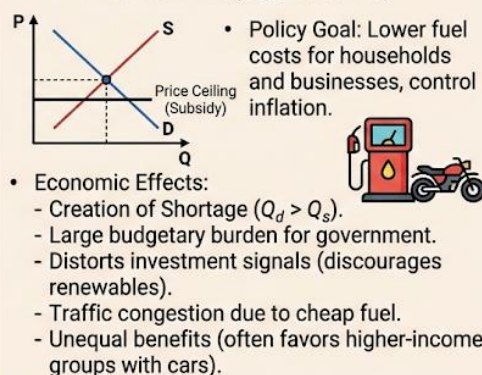
I. AGRICULTURAL PRICE SUPPORTS (Price Floors)

CASE STUDY: US DAIRY INDUSTRY (e.g., Milk)



II. FUEL SUBSIDIES (Price Ceilings/Direct Subsidies)

CASE STUDY: INDONESIA PETROL SUBSIDIES (e.g., Gasoline)



Box 2.8 Placeholder: Case studies of price regulation. Caption: Price regulation and market outcomes.

Pilot Questions 5.4

1. Explain how government-imposed price ceilings and floors affect equilibrium.
2. Analyse the role of subsidies in influencing production and consumption.
3. Describe how prices allocate resources in a market economy.
4. Provide an example of price theory applied in everyday household decision-making.
5. Evaluate the impact of fuel subsidies on government budgets and consumer welfare.

Series Summary

This Series on **Elementary Price Theory and Applications** has explored how prices are determined, adjusted, and applied in economic life. Beginning with the nature of price and market forces, we examined equilibrium and the effects of shifts in demand and supply. We then studied elasticity, considering price, income, and cross elasticity, and their practical applications. Following that, we analysed price determination under different market structures, from perfect competition to oligopoly. Finally, we applied price theory to real-world contexts such as government intervention, resource allocation, and everyday decision-making.

By engaging with these topics, you should now be able to define and explain the role of price in markets (SLO 2.1–2.2), calculate and apply elasticity concepts (SLO 2.3–2.5), evaluate price determination under different market structures (SLO 2.6). This knowledge equips you with both theoretical insight and practical tools for analysing economic behaviour.



Glossary of Terms

cross elasticity of demand: A measure of how demand for one good changes when the price of another good changes. **demand curve:** A graph showing the relationship between price and quantity demanded. **elastic demand:** Demand that responds strongly to changes in price. **equilibrium price:** The price at which quantity demanded equals quantity supplied. **income elasticity of demand:** A measure of how demand changes in response to changes in consumer income. **inelastic demand:** Demand that responds weakly to changes in price. **monopolistic competition:** A market structure with many firms selling differentiated products. **monopoly:** A market structure dominated by a single seller who sets prices. **oligopoly:** A market structure dominated by a few large firms with interdependent pricing. **perfect competition:** A market structure with many buyers and sellers, homogeneous products, and price-taking firms. **price elasticity of demand:** A measure of how demand responds to changes in price. **price controls:** Government-imposed limits on prices, such as ceilings or floors. **supply curve:** A graph showing the relationship between price and quantity supplied.

Answers to Pilot Questions

Part 2.5

1. Price is the monetary value of goods and services; it allocates resources by signalling scarcity and guiding decisions.
2. The law of demand states that as price falls, quantity demanded rises. Example: lower rice prices increase consumption.
3. Equilibrium price is determined at the intersection of demand and supply curves.
4. A surplus occurs when price is set above equilibrium.
5. Demand shifts: income, tastes. Supply shifts: technology, production costs.
6. Prices act as signals by encouraging or discouraging production and consumption.
7. Government intervention can distort equilibrium but may promote equity.

Part 2.6

1. PED measures responsiveness of demand to price changes; determinants include substitutes and proportion of income spent.
2. Elastic demand responds strongly (luxury cars), inelastic demand responds weakly (salt).
3. Normal goods have positive income elasticity; inferior goods have negative income elasticity.
4. Positive cross elasticity: substitutes (tea and coffee). Negative cross elasticity: complements (cars and petrol).
5. Governments tax inelastic goods (e.g., cigarettes) to raise revenue.



6. Airlines vary ticket prices across seasons due to elasticity of demand.

Part 2.7

1. Perfect competition features many firms, homogeneous products, and price-taking behaviour.
2. Monopoly firms are price makers because they control supply.
3. Fast-food outlets illustrate monopolistic competition; differentiation allows some pricing power.
4. The kinked demand curve explains price rigidity in oligopoly.
5. Monopoly pricing is less efficient than perfect competition, leading to welfare loss.
6. Collusion in oligopoly reduces competition, harming consumers.

Part 2.8

1. Price ceilings below equilibrium cause shortages; price floors above equilibrium cause surpluses.
2. Subsidies encourage production and consumption by lowering costs.
3. Prices allocate resources by directing them to profitable uses.
4. A family choosing between eating out and cooking applies price theory.
5. Fuel subsidies strain government budgets while benefiting consumers.
6. Agricultural price supports stabilise incomes but may cause overproduction.

References and Attributions [Series 5]

General References

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- Samuelson, P. A., & Nordhaus, W. D. (2010). *Economics* (19th ed.). New York: McGraw-Hill.
- OpenStax. (2016). *Principles of Economics*. Houston, TX: Rice University. Available at: <https://openstax.org/books/principles-economics> (openstax.org in Bing)

Illustrations and Placeholders

- *Figures 2.6–2.9*: AI-generated prompts on price signals, demand and supply, equilibrium, and shifts.
- *Figures 2.10–2.12*: AI-generated prompts on elasticity curves.
- *Figures 2.13–2.16*: AI-generated prompts on market structures.



- *Figures 2.17–2.18:* AI-generated prompts on government intervention and everyday decision-making.
- *Boxes 2.7–2.8:* AI-generated prompts summarising case studies on resource allocation and price regulation.

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