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ECO101

PRINCIPLES OF ECONOMICS I

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Course code: ECO 101

Course title: PRINCIPLES OF ECONOMICS I

Course credit load: 2 unit

Series 1: Nature, Scope, and Methodology of Economics

Series 2: Historical Development of Economic Thought

Series 3: Demand and Supply Analysis

Series 4: Production Functions and the Firm

Series 5: Pricing of Factors and Market Structures

Series 1: Nature and Methodology of Economics

Part 1: The nature and scope of economics

- 1.1.1 Definition of economics
- 1.1.2 Basic economic problems: scarcity and choice
- 1.1.3 Scale of preference and opportunity cost
- 1.1.4 Major areas of specialisation in economics

Part 2: Methodology of economics

- 1.2.1 Positive and normative economics
- 1.2.2 The scientific method in economics
- 1.2.3 Models and assumptions in economic analysis
- 1.2.4 Partial equilibrium analysis

Part 3: Economics as a social science

- 1.3.1 Relationship of economics with other social sciences
- 1.3.2 Limitations of economics as a science
- 1.3.3 Practical relevance of economics in everyday life

Introduction

Economics is often described as the study of how people and societies make choices in the face of scarcity. Every day, individuals, firms, and governments are confronted with decisions about allocating limited resources to meet competing needs. Understanding the nature and

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methodology of economics provides the foundation for analysing these decisions and appreciating the relevance of economics in both personal and societal contexts. This Series sets the stage for the entire course by introducing you to the basic problems, scope, and methods of economic inquiry.

The aim of this Series is to familiarise you with the fundamental nature of economics, its scope as a social science, and the methodologies economists use to study and explain economic behaviour. By the end of this Series, you will be able to define key concepts, explain the basic problems of scarcity and choice, and describe how economists apply models and methods to analyse real-world issues.

We shall commence this Series by examining the nature and scope of economics, including its definition, basic problems, and areas of specialisation. Next, we will move on to the methodology of economics, where we will consider positive and normative approaches, the scientific method, and the role of models and assumptions. Finally, we will wrap up by discussing economics as a social science, highlighting its relationship with other disciplines, its limitations, and its practical relevance in everyday life.

Series Learning Outcomes

Upon completing this Series, you should be able to:

define economics clearly and explain its scope as a social science,

describe the basic economic problems of scarcity, choice, scale of preference, and opportunity cost,

identify and outline the major areas of specialisation within economics,

distinguish between positive and normative economics,

explain how economists apply the scientific method, models, and assumptions in economic analysis,

demonstrate the use of partial equilibrium analysis in examining economic behaviour,

analyse the relationship between economics and other social sciences,

evaluate the limitations of economics as a science, and

discuss the practical relevance of economics in everyday life.

1.1 The Nature and Scope of Economics

Economics provides a framework for understanding how individuals, firms, and societies make decisions about scarce resources. This Part introduces you to the meaning of economics, its basic problems, and the scope of its application. By studying this section, you will gain clarity on why economics is often described as both a science and a social discipline.

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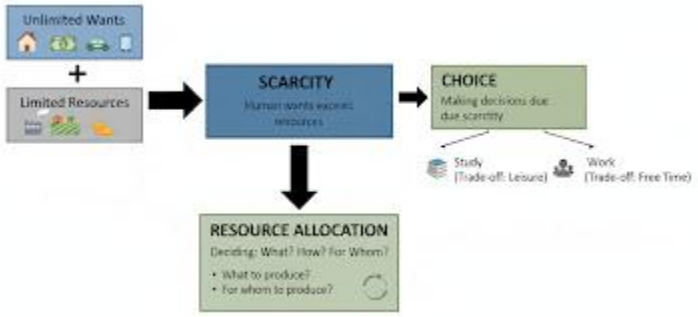
1.1.1 Definition of economics

Economics is the study of how people and societies allocate scarce resources to satisfy unlimited wants. The central idea is that resources such as land, labour, and capital are limited, while human needs and desires are virtually endless. Economists therefore analyse choices, trade-offs, and the consequences of decisions.

Fill in the blank: Economics is the study of how people allocate _____ resources to satisfy unlimited wants.



1.1.2 Basic economic problems: scarcity and choice

Scarcity refers to the limited availability of resources relative to the unlimited wants of individuals and societies. Because of scarcity, choices must be made about what to produce, how to produce, and for whom to produce.

Choice is the act of selecting one option over another due to scarcity. Every choice involves a trade-off, meaning that selecting one option requires giving up another.

Fill in the blank: Scarcity forces individuals and societies to make _____ about resource use.

Box 1.1: The three fundamental economic questions

- What to produce?
- How to produce?
- For whom produce?

1.1.3 Scale of preference and opportunity cost

Scale of preference is the ranking of needs and wants in order of importance. Since resources are limited, individuals and societies prioritise certain needs over others.

Opportunity cost is the value of the next best alternative forgone when a choice is made. It highlights the cost of choosing one option in terms of what is sacrificed.

Fill in the blank: Opportunity cost is the value of the next best _____ forgone when a choice is made.

Table 1.1:
Examples of opportunity cost in everyday life

Choice Made	Opportunity Cost (Next Best Alternative Forgone)
Going to college	Full-time job salary, work experience
Buying a new smartphone	Savings for a vacation, investment
Studing for an economics exam	Watching a movie, hanging hanig hout with friends

AI prompt: "Create a table showing examples of oportunit in everyday life."
Search string: "opportunity cost examples table economics OER

1.1.4 Major areas of specialisation in economics

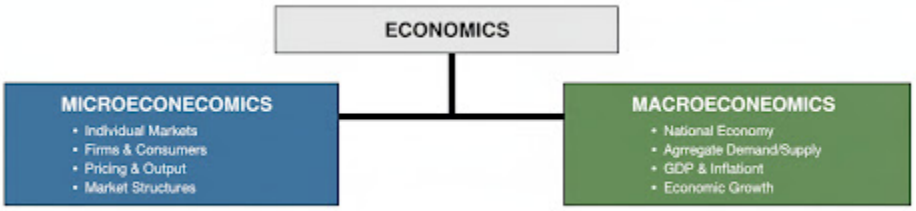
Economics is divided into several areas of specialisation, each focusing on different aspects of resource allocation and decision-making.

- Microeconomics: Studies individual units such as households, firms, and markets.
- Macroeconomics: Examines the economy as a whole, including national income, inflation, and unemployment.
- Development economics: Focuses on issues of growth, poverty, and inequality in developing countries.
- International economics: Analyses trade, finance, and global economic relations.

- Public finance: Studies government revenue, expenditure, and fiscal policy.

Fill in the blank: Microeconomics studies individual units such as households and _____.

Figure 1.2: Branches of economics and their focus areas



AI prompt: "Create a diagram showing the major areas of specialisation, including microeconomics."
Search string: "branches of economics diagram OER"

Pilot questions 1.1

1.Which of the following best defines economics?

a) The study of unlimited resources

b) The study of how scarce resources are allocated

c) The study of human psychology

d) The study of political systems

2.What is the central problem of economics?

a) Inflation

b) Scarcity

c) Employment

d) Technology

3.Which of the following is an example of opportunity cost?

a) Buying a textbook instead of going to the cinema

b) Reading a novel for leisure

c) Saving money in a bank account

d) Attending a lecture on economics

4.Which branch of economics studies households and firms?

a) Macroeconomics

b) Microeconomics

c) Development economics

d) International economics

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5.Which of the following is not one of the three fundamental economic questions?

a) What to produce?

b) How to produce?

c) Where to produce?

d) For whom to produce?

1.2 Methodology of Economics

The methodology of economics provides the tools and approaches that economists use to study and explain economic behaviour. It helps us distinguish between different types of analysis, understand how theories are built, and appreciate the role of models in simplifying complex realities. In this Part, we will explore positive and normative economics, the scientific method, the use of models and assumptions, and partial equilibrium analysis.

1.2.1 Positive and normative economics

Positive economics refers to the branch of economics that deals with objective analysis of facts and cause-and-effect relationships. It answers questions such as “What is?” or “What will happen if...?” without making value judgements.

Normative economics involves value-based statements and recommendations. It addresses questions such as “What ought to be?” and often reflects opinions about fairness, justice, or policy preferences.

Fill in the blank: Positive economics deals with objective analysis, while normative economics involves _____ judgements.

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Box 1.2: Examples of positive and normative statements

- **Positive:** "An increase of the minimum wage will reduce employment among young workers."
- **Normative:** "The government should increase the miplmase to improve living standards."

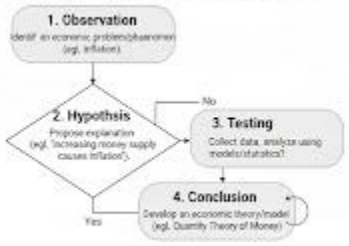
AI prompt: "Generate a text box showing of positive economic statements."
Search string: "positive vs normative economics examples OER"

1.2.2 The scientific method in economics

The scientific method in economics is a systematic approach to studying economic phenomena. It involves observation, formulation of hypotheses, testing through data, and drawing conclusions. Economists use this method to ensure that their findings are logical, consistent, and evidence-based.

Fill in the blank: The scientific method in economics involves observation, hypothesis, testing, and _____.

Figure 1.3: The scientific method applied to economics



AI prompt: *"Create a diagram showing the scientific method in economis: observation, hypthesis, conclusion."*
Search string: *"scientific method in economics diagram OER"*

1.2.3 Models and assumptions in economic analysis

Economic models are simplified representations of reality used to explain and predict economic behaviour. They highlight essential relationships while ignoring less relevant details.

Assumptions are conditions set within models to make analysis manageable. For example, assuming that consumers are rational or that markets are perfectly competitive allows economists to focus on specific outcomes.

Fill in the blank: Economic models are simplified representations of _____ used to explain and predict behaviour.

Table 1.2: Examples of economic models and their assumptions

Economic Model	Key Assumptions	Purpose
Production Possibilities Frontier (PPF	Fixed resources & technology Two goods produced Full employment	Illustrate scartity, choice opportunity cost
Supply and Demand Model	Many buyers & sellers Homegenous goods information	Determine market price & quantity

AI prompt: "Create a table showing examples of economic models, their assumptions, and purposes".

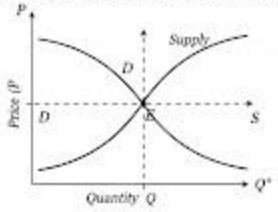
Search string: "economic models Sarch string: "economic models and assumptions table OER"

1.2.4 Partial equilibrium analysis

Partial equilibrium analysis examines a single market or sector in isolation, assuming that other markets remain unchanged. This approach simplifies analysis and helps economists understand specific relationships without the complexity of the entire economy.

Fill in the blank: Partial equilibrium analysis studies one market while assuming other markets remain _____.

Figure 1.4: Partial equilibrium analysis of demand and supply in one market



A diagram illustrating the equilibrium price (P quantity) determined by a interection ad supply in a single market, assuming all other factors remain constain constant (ceter" paribuss).*

Search string: "partial equilibrium analysis diagis diagram OER"

Pilot questions 1.2

1.Which of the following best describes positive economics?

a) Value-based recommendations

b) Objective analysis of facts

c) Ethical judgements

d) Policy preferences

2.Which of the following is a normative statement?

a) Inflation has increased by 5 percent this year.

b) The government should reduce inflation to protect consumers.

c) The unemployment rate is 10 percent.

d) Imports have risen in the last quarter.

3.What is the first step in the scientific method?

a) Hypothesis formulation

b) Observation

c) Testing

d) Conclusion

4.Which of the following is an example of an assumption in economic models?

a) Consumers are rational

b) Inflation is rising

c) Employment is falling

d) Imports are increasing

5.Partial equilibrium analysis focuses on:

a) The entire economy

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b) A single market in isolation

c) International trade

d) Government expenditure

1.3 Economics as a Social Science

Economics is often described as a social science because it studies human behaviour in relation to the allocation of scarce resources. Unlike the natural sciences, which deal with physical phenomena, economics focuses on people, institutions, and societies. This Part will help you appreciate the connections between economics and other disciplines, understand its limitations, and recognise its practical relevance in everyday life.

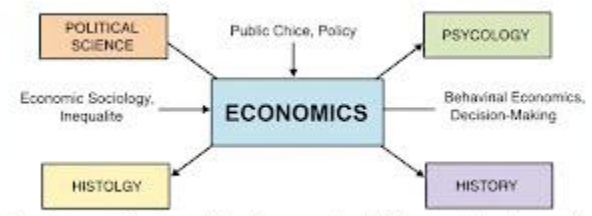
1.3.1 Relationship of economics with other social sciences

Economics interacts closely with other social sciences, which are disciplines that study human society and behaviour. For example, economics overlaps with:

- Political science, which examines governance and policy-making, influencing economic decisions such as taxation and spending.
- Sociology, which studies social structures and cultural norms, shaping consumption patterns and labour markets.
- Psychology, which explores human behaviour and decision-making, contributing to behavioural economics.
- History, which provides context for economic events and policies, helping economists learn from past experiences.

Fill in the blank: Economics is considered a social science because it studies human _____ in relation to scarce resources.

Figure 1.5: Intereisciplinary connections of economics with other social sciences



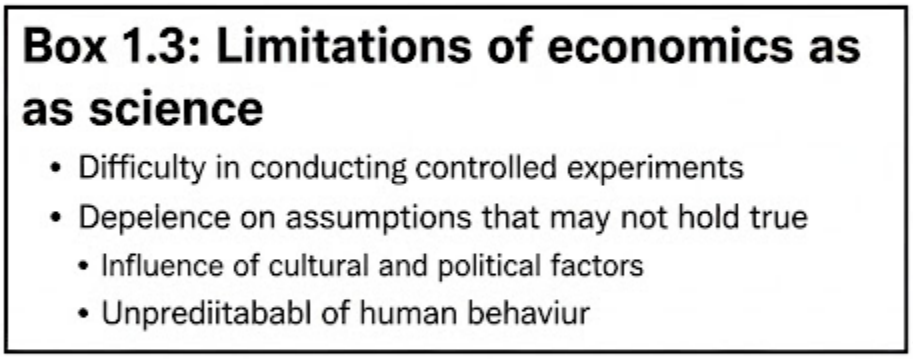
AI prompt: "Create a diagram showing nelates to eonomics if other social sciences diagram OER"

1.3.2 Limitations of economics as a science

Although economics uses scientific methods, it has certain limitations. Unlike natural sciences, economic experiments cannot always be conducted under controlled conditions. Human behaviour is unpredictable, and cultural, political, or emotional factors often influence decisions.

Another limitation is that economic models rely on assumptions, which may not always reflect reality. For example, assuming that all consumers are rational ignores the fact that people sometimes act emotionally or irrationally.

Fill in the blank: One limitation of economics as a science is that human behaviour is often _____.



AI prompt: "Generate a text box listing of the economics as a science."
Search string: "limitations of economics a a science OER"

1.3.3 Practical relevance of economics in everyday life

Economics is highly relevant to daily decision-making. Individuals use economic reasoning when budgeting, saving, or choosing between alternatives. Firms apply economic principles to production, pricing, and investment decisions. Governments rely on economics to design policies that address unemployment, inflation, and growth.

By studying economics, you gain tools to analyse trade-offs, evaluate costs and benefits, and make informed choices. This makes economics not only an academic discipline but also a practical guide for navigating real-world challenges.

Fill in the blank: Governments rely on economics to design policies that address unemployment, inflation, and _____.

Table 1.3: Examples of practical relevtance of economics

Entity	Practical Application of Economics
	Budgeting, saving, investment decisions, undrstanding prices
Households	Production decisions, strategies, hiriket analysis
Firms	hiring, market analysis
Governments	Fiscal & monetary policy, regulation, public spending
Society	Addressing poverty, inequality, environmental issues economic growth

AI prompt: "Create a table showing examples of how economics is practvaal to households, firms, geoncety"
Search string: "practical relevance of economis xmples table OER"

Pilot questions 1.3

1.Why is economics considered a social science?

a) It studies physical phenomena

b) It studies human behaviour and resource allocation

c) It focuses only on natural resources

d) It deals exclusively with mathematics

2.Which of the following disciplines is most closely linked to behavioural economics?

a) Sociology

b) Psychology

c) History

d) Political science

3.Which of the following is a limitation of economics as a science?

a) It always produces exact predictions

b) It relies on assumptions that may not reflect reality

c) It ignores human behaviour

d) It is based only on experiments

4. Which of the following is an example of economics in everyday life?

a) Choosing between saving and spending

b) Observing stars in astronomy

c) Conducting chemical experiments

d) Studying plant growth

5. Governments use economics to design policies that address:

a) Inflation, unemployment, and growth

b) Astronomy, chemistry, and biology

c) Literature, art, and music

d) Sports, recreation, and leisure

Series Summary

This Series has introduced you to the foundations of economics by examining its nature, scope, and methodology. The purpose was to help you appreciate economics as a social science that studies how scarce resources are allocated to meet unlimited wants. By engaging with this Series, you have gained insight into the basic problems of scarcity and choice, the importance of scale of preference and opportunity cost, and the areas of specialisation that define the discipline.

We began by exploring the definition and scope of economics, then moved on to its methodology, where we distinguished between positive and normative economics, examined the scientific method, and considered the role of models and assumptions, including partial equilibrium analysis. Finally, we discussed economics as a social science, highlighting its relationship with other disciplines, its limitations, and its practical relevance in everyday life. By completing this Series, you should now be able to define economics and its scope (SLOs 1.1–1.3), explain methodological approaches (SLOs 1.4–1.6), and analyse its interdisciplinary connections and practical applications (SLOs 1.7–1.9).

Glossary of Terms

Assumptions: Conditions set within economic models to simplify analysis, often used to focus on specific outcomes.

Choice: The act of selecting one option over another due to scarcity, always involving a trade-off.

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Economics: The study of how individuals, firms, and societies allocate scarce resources to satisfy unlimited wants.

Economic models: Simplified representations of reality used to explain and predict economic behaviour.

Macroeconomics: A branch of economics that studies the economy as a whole, including national income, inflation, and unemployment.

Microeconomics: A branch of economics that focuses on individual units such as households, firms, and markets.

Normative economics: A branch of economics that involves value-based statements and recommendations about what ought to be.

Opportunity cost: The value of the next best alternative forgone when a choice is made.

Positive economics: A branch of economics that deals with objective analysis of facts and cause-and-effect relationships.

Production possibility curve (PPC): A model that shows trade-offs and opportunity costs when resources and technology are fixed.

Public finance: The study of government revenue, expenditure, and fiscal policy.

Scarcity: The limited availability of resources relative to unlimited wants.

Scale of preference: The ranking of needs and wants in order of importance, used to guide choices under scarcity.

Scientific method: A systematic approach involving observation, hypothesis, testing, and conclusion, applied in economics to ensure logical and evidence-based analysis.

Specialisation: The division of economics into distinct areas such as microeconomics, macroeconomics, development economics, international economics, and public finance.

Partial equilibrium analysis: An approach that examines a single market or sector in isolation, assuming other markets remain unchanged.

Concept Check Questions [Series 1]

Objective Questions

1.Which of the following best defines economics?

a) The study of unlimited resources

b) The study of how scarce resources are allocated

c) The study of human psychology

d) The study of political systems

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(Linked to SLO 1.1)

2. Which of the following is an example of opportunity cost?

a) Buying a textbook instead of going to the cinema

b) Reading a novel for leisure

c) Saving money in a bank account

d) Attending a lecture on economics

(Linked to SLO 1.3)

3.Positive economics deals with:

a) Value-based recommendations

b) Objective analysis of facts

c) Ethical judgements

d) Policy preferences

(Linked to SLO 1.4)

4.Which of the following is a limitation of economics as a science?

a) It always produces exact predictions

b) It relies on assumptions that may not reflect reality

c) It ignores human behaviour

d) It is based only on experiments

(Linked to SLO 1.8)

5.Which branch of economics studies households and firms?

a) Macroeconomics

b) Microeconomics

c) Development economics

d) International economics

(Linked to SLO 1.3)

Short-Answer Questions

1.Define scarcity and explain why it is central to economics.

(Linked to SLO 1.2)

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2.State the three fundamental economic questions.

(Linked to SLO 1.2)

3.Distinguish between positive and normative economics with one example each.

(Linked to SLO 1.4)

4.What is meant by partial equilibrium analysis?

(Linked to SLO 1.6)

5.Identify two ways economics is practically relevant in everyday life.

Long-Answer Questions

1. Analyse the role of opportunity cost in decision-making at the household, firm, and government levels.
2. Evaluate the usefulness of economic models and assumptions in explaining real-world behaviour.
3. Discuss the interdisciplinary nature of economics, highlighting its relationship with at least two other social sciences.

Answers to Concept Check Questions [Series 1]

Objective Questions

1. b) The study of how scarce resources are allocated
2. a) Buying a textbook instead of going to the cinema
3. b) Objective analysis of facts
4. b) It relies on assumptions that may not reflect reality
5. b) Microeconomics

Short-Answer Questions

6. Scarcity refers to the limited availability of resources relative to unlimited wants. It is central to economics because it forces individuals and societies to make choices about resource allocation.

7. What to produce, how to produce, and for whom to produce.

8. Positive economics deals with facts, e.g., “Inflation has risen by 5 percent.” Normative economics involves value judgements, e.g., “The government should reduce inflation.”

9. Partial equilibrium analysis studies one market in isolation, assuming other markets remain unchanged.

10. Examples include budgeting household expenses and governments designing policies to address unemployment.

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Long-Answer Questions

Basic response: Opportunity cost represents the value of the next best alternative forgone when a choice is made. Households face opportunity costs when deciding between saving and spending, firms when choosing between investment options, and governments when allocating budgets.

Value-added response: Outstanding learners may also explain how opportunity cost influences long-term planning, such as education versus immediate employment, and how it shapes policy trade-offs between social welfare and infrastructure investment.

Basic response: Economic models and assumptions simplify reality to make analysis manageable. They help explain relationships such as demand and supply or production trade-offs.

Value-added response: Advanced learners may evaluate how assumptions like rational behaviour or perfect competition can be unrealistic, yet still useful for building frameworks. They may also discuss the importance of behavioural economics in addressing these limitations.

Basic response: Economics is interdisciplinary, connecting with political science in policy-making and sociology in understanding social structures.

Value-added response: Outstanding learners may expand by discussing psychology's role in behavioural economics, history's contribution to contextualising economic events, and how these relationships enrich economic analysis and policy design.

Answers to Pilot Questions [Series 1]

Part 1.1: The nature and scope of economics

- The study of how scarce resources are allocated
- Scarcity
- Buying a textbook instead of going to the cinema
- Microeconomics
- Where to produce

Part 1.2: Methodology of economics

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- Objective analysis of facts
- The government should reduce inflation to protect consumers
- Observation
- Consumers are rational
- A single market in isolation

Part 1.3: Economics as a social science

- It studies human behaviour and resource allocation
- Psychology
- It relies on assumptions that may not reflect reality
- Choosing between saving and spending
- Inflation, unemployment, and growth

References and Attributions [Series 1]

This section provides references and attributions for the instructional content, illustrations, and open educational resources (OERs) suggested in Series 1: Nature and Methodology of Economics. The referencing style applied here follows APA guidelines for clarity and consistency.

General References

- Sloman, J., Garratt, D., & Guest, J. (2018). Economics. 10th Edition. Pearson Education.
- Mankiw, N. G. (2020). Principles of Economics. 9th Edition. Cengage Learning.
- OpenStax. (2016). Principles of Economics. Rice University. Retrieved from https://openstax.org/books/principles-economics

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Illustrations and Attributions

Figure 1.1: The basic definition of economics illustrated through scarcity and choice

- AI-generated using prompt: “Create a diagram showing scarcity, choice, and resource allocation in economics.”
- Suggested OER search string: “scarcity and choice diagram economics OER.”

Box 1.1: The three fundamental economic questions

- Adapted from OpenStax (2016).
- Suggested OER search string: “three fundamental economic questions OER.”

Table 1.1: Examples of opportunity cost in everyday life

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- AI-generated using prompt: “Create a table showing examples of opportunity cost in everyday life.”
- Suggested OER search string: “opportunity cost examples table economics OER.”

Figure 1.2: Branches of economics and their focus areas

- AI-generated using prompt: “Create a diagram showing the major areas of specialisation in economics, including microeconomics and macroeconomics.”
- Suggested OER search string: “branches of economics diagram OER.”

Box 1.2: Examples of positive and normative statements

- Adapted from OpenStax (2016).
- Suggested OER search string: “positive vs normative economics examples OER.”

Figure 1.3: The scientific method applied to economics

- AI-generated using prompt: “Create a diagram showing the steps of the scientific method in economics: observation, hypothesis, testing, conclusion.”
- Suggested OER search string: “scientific method in economics diagram OER.”

Table 1.2: Examples of economic models and their assumptions

- AI-generated using prompt: “Create a table showing examples of economic models, their assumptions, and purposes.”
- Suggested OER search string: “economic models and assumptions table OER.”

Figure 1.4: Partial equilibrium analysis of demand and supply in one market

- AI-generated using prompt: “Create a diagram showing partial equilibrium analysis of demand and supply in a single market.”
- Suggested OER search string: “partial equilibrium analysis diagram OER.”

Figure 1.5: Interdisciplinary connections of economics with other social sciences

- AI-generated using prompt: “Create a diagram showing how economics relates to political science, sociology, psychology, and history.”
- Suggested OER search string: “economics relationship with other social sciences diagram OER.”

Box 1.3: Limitations of economics as a science

- Adapted from OpenStax (2016).
- Suggested OER search string: “limitations of economics as a science OER.”

Table 1.3: Examples of practical relevance of economics

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- AI-generated using prompt: “Create a table showing examples of how economics is practically relevant to households, firms, governments, and society.”
- Suggested OER search string: “practical relevance of economics examples table OER.”

Course code: ECO 101

Course title: PRINCIPLES OF ECONOMICS I

Course credit load: 2 unit

Series 1: Nature, Scope, and Methodology of Economics

Series 2: Historical Development of Economic Thought

Series 3: Demand and Supply Analysis

Series 4: Production Functions and the Firm

Series 5: Pricing of Factors and Market Structures

Series 2: Evolution of Economic Thought

Part 1: Early foundations of economic thought

- Contributions of ancient Greek and Roman thinkers
- Scholastic thought and medieval influences
- Mercantilism and its principles

Part 2: Classical school of economics

- Adam Smith and the concept of the invisible hand
- David Ricardo and comparative advantage
- Thomas Malthus and population theory
- John Stuart Mill and liberty in economics

Part 3: Neoclassical and modern developments

- Marginalist revolution and utility theory
- Alfred Marshall and partial equilibrium analysis
- Keynesian economics and macroeconomic focus
- Contemporary schools: monetarism, institutionalism, and behavioural economics

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Introduction

Economic ideas have not always been the same. Over centuries, different thinkers have tried to explain how societies organise production, exchange, and distribution. From the early reflections of ancient philosophers to the structured theories of classical economists and the modern approaches that shape today's policies, the development of economic thought reveals how human understanding of economic life has evolved. Studying this history helps us appreciate the foundations of current theories and the debates that continue to influence decision-making in households, firms, and governments.

The aim of this Series is to trace the evolution of economic thought, highlighting the contributions of key schools and thinkers, and to equip you with the ability to explain how past ideas have shaped modern economics.

We shall commence this Series by exploring the early foundations of economic thought, including contributions from ancient Greek and Roman thinkers, medieval scholastics, and mercantilist writers. Next, we will move on to the classical school of economics, focusing on the works of Adam Smith, David Ricardo, Thomas Malthus, and John Stuart Mill. Finally, we will wrap up by examining neoclassical and modern developments, beginning with the marginalist revolution and Alfred Marshall, continuing with Keynesian economics, and concluding with contemporary schools such as monetarism, institutionalism, and behavioural economics.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- Define economics clearly and state its scope as a social science,
- Explain the basic economic problems of scarcity, choice, scale of preference, and opportunity cost,
- Identify the major areas of specialisation within economics,
- Distinguish between positive and normative economics,
- Describe how economists apply the scientific method in analysing economic behaviour,
- Demonstrate the use of models and assumptions in economic analysis,
- Apply partial equilibrium analysis to examine a single market in isolation,
- Analyse the relationship between economics and other social sciences,
- Evaluate the limitations of economics as a science, and
- Discuss the practical relevance of economics in everyday life.

2.1 Early Foundations of Economic Thought

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Economic thought did not begin with modern textbooks or contemporary theories. It has deep roots in ancient civilisations where philosophers and scholars attempted to explain how societies should organise production, trade, and distribution. By tracing these foundations, you will see how ideas evolved gradually into structured schools of thought.

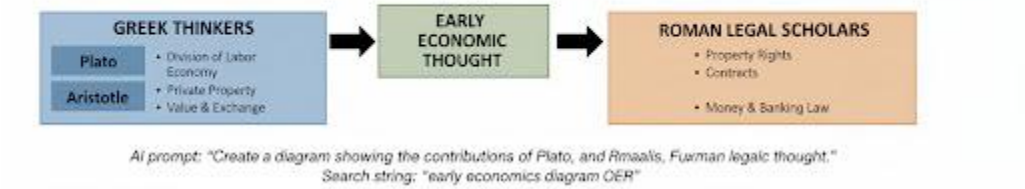
2.1.1 Contributions of ancient Greek and Roman thinkers

The ancient Greeks were among the first to reflect on economic issues. Thinkers such as Plato and Aristotle discussed property, justice, and the role of the state in regulating economic life. Aristotle, for example, distinguished between oikonomia (household management) and chrematistics (money-making), highlighting the difference between productive and exploitative economic activity.

The Romans contributed practical insights, focusing on law, contracts, and property rights. Their emphasis on legal frameworks laid the foundation for later economic institutions.

Fill in the blank: Aristotle distinguished between household management, called _____, and money-making, called chrematistics.

Figure 2.1: Early contributions of Greek and Roman thinkers



AI prompt: "Create a diagram showing the contributions of Plato, and Rmaalis, Furman legalc thought."
Search string: "early economics diagram OER"

2.1.2 Scholastic thought and medieval influences

During the medieval period, scholars known as Scholastics combined philosophy and theology to address economic issues. Thinkers such as Thomas Aquinas discussed the morality of trade, the concept of a just price, and the ethics of lending money.

The just price was defined as a fair value for goods, ensuring neither buyers nor sellers were exploited. This idea reflected the moral and religious concerns of the time, linking economics to ethics.

Fill in the blank: Medieval scholars argued that trade should be guided by the principle of a _____ price.

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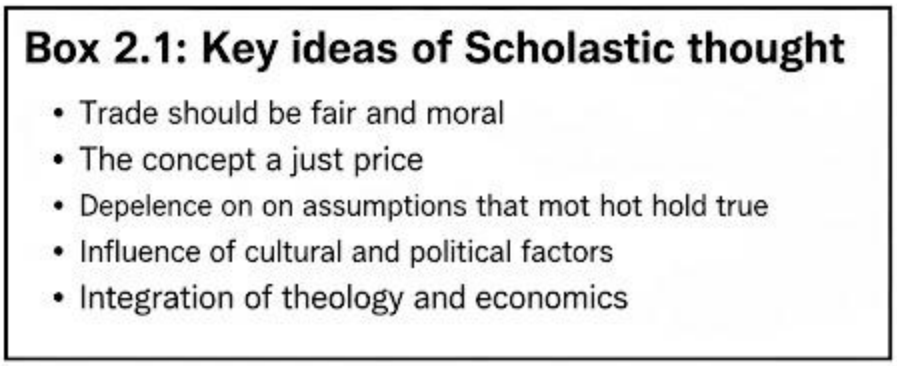

AI prompt: "Generate a text box summarring Schollic contributos to medieval economic thought."
Search string: "Scholc string: "*theology* of *unal* economics OER"

2.1.3 Mercantilism and its principles

Mercantilism was a school of thought dominant in Europe between the 16th and 18th centuries. It emphasised the accumulation of wealth, particularly gold and silver, as the basis of national power. Mercantilists believed that governments should actively control trade to achieve a favourable balance of exports over imports.

Key principles included:

- Wealth measured by precious metals
- State regulation of trade and industry
- Promotion of exports and restriction of imports
- Colonisation as a source of raw materials and markets

Fill in the blank: Mercantilists believed that national wealth was measured by the accumulation of _____ and silver.

Table 2.1: Principles of mercanitlism

Principle	Explnation
Accumulation of Bullion	Maximise gold/silver reserves
Favorable Balance of Trade	Export more than import
Colonial Explotiation	Colonies provide raw materials, buy finished goods
State Intervietion	Government regulation of economy, tarffs

AI prompt: "Create a table summanising the principles of ith explantions".
Search string: "principles of mercanitism table OER"

2.2 Classical School of Economics

The classical school of economics emerged in the late 18th and early 19th centuries, laying the foundation for modern economic theory. It emphasised free markets, limited government intervention, and the belief that individuals acting in their own interest could promote collective prosperity. In this Part, we will explore the contributions of key classical economists whose ideas continue to influence economic thought today.

2.2.1 Adam Smith and the concept of the invisible hand

Adam Smith, often regarded as the father of modern economics, introduced the idea of the invisible hand, which refers to the self-regulating nature of markets. He argued that when individuals pursue their own interests, they unintentionally contribute to the overall good of society. His book The Wealth of Nations (1776) became a cornerstone of economic theory.

Fill in the blank: Adam Smith believed that individuals pursuing their own interests are guided by an _____ hand to promote societal welfare.

Figure 2.2: The Invisible hand in market regulation

Figure 2.2: The Invisible hand in market regulation

A diagram illustrating Adam Smith's invisible hand concept, where individual selftal self-interest, guided by free markuests, leads to untenined but wiadrased societal benefit.
AI prompt: "Create a diagram showind string trheo concept, where self-dagram OER"
Search string: "Adam Smith Invisible hand diagram OER"

2.2.2 David Ricardo and comparative advantage

David Ricardo developed the principle of comparative advantage, which explains how countries benefit from specialising in the production of goods where they have a relative efficiency, and then trading with others. This principle remains a fundamental justification for international trade.

Fill in the blank: Ricardo's principle of comparative advantage shows that countries gain by specialising and then _____ with others.

Table 2.2: Illustration of comparative advantage

	Opportunity Cost of 1 Unit of Cloth
Country A	4 units of Wine
Country B	2 units of Wine

A table illustrating the concept of comparative advantage, showing that B has a lower opportunity cost in producing cloth compared to Country A, and trus has a comparative advantage in cloth production.

AI prompt: "Create table showing comparative advaween twoduldcing different goods."
Search string: "comparative advantage example table OER"

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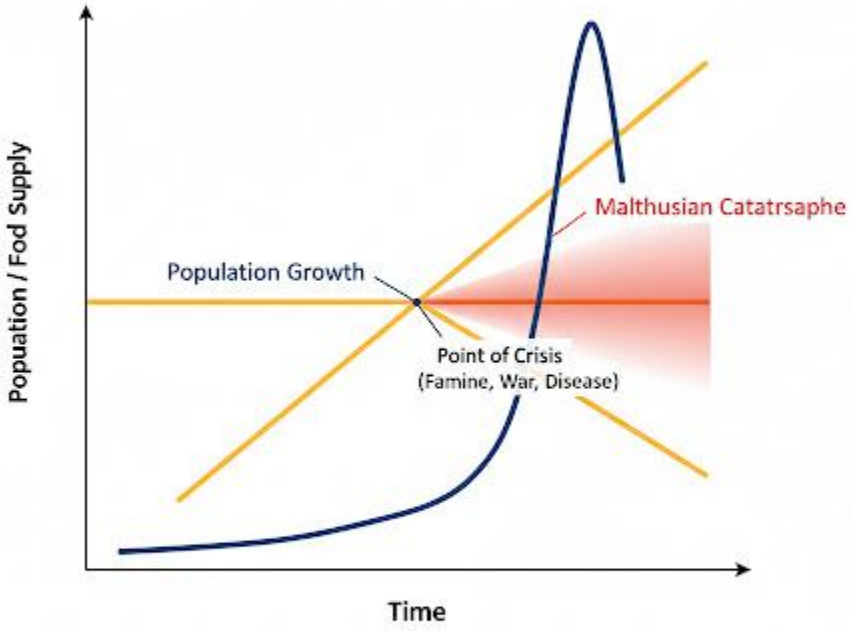
2.2.3 Thomas Malthus and population theory

Thomas Malthus is best known for his population theory, which argued that population growth tends to outpace food production, leading to poverty and famine unless checked by natural or social constraints. His ideas influenced debates on population control and resource sustainability.

Fill in the blank: Malthus argued that population growth tends to outpace _____ production, leading to poverty.

Figure 2.3: Malthusian population theory



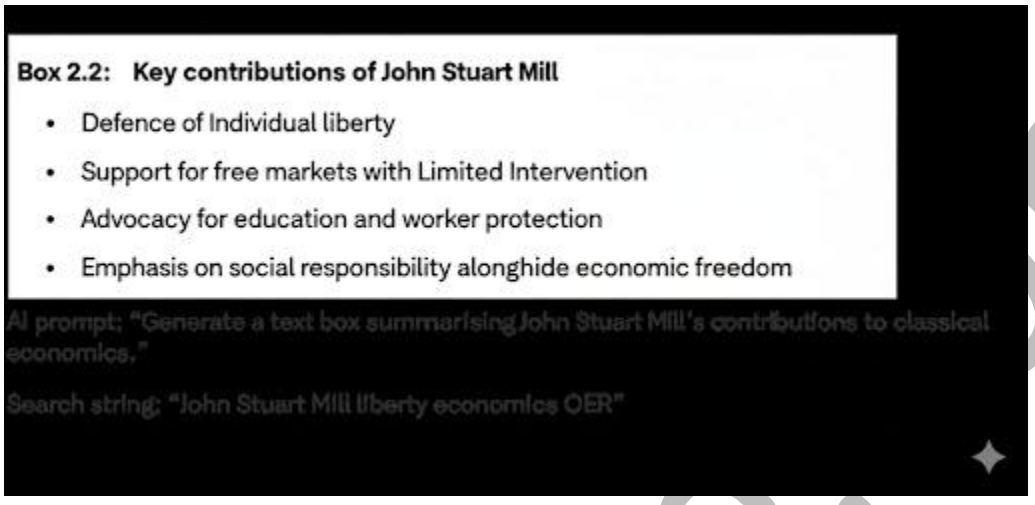
A diagram showing Mathus's population theory, where exponential population growth outpaces lineal foar linear food supply growth, leading a crisis point

AI promt: "Create a diagram showing Malthus's population theory, with population oy diagram OER"
Search string: "Mathus population theory diagram OER"

2.2.4 John Stuart Mill and liberty in economics

John Stuart Mill contributed significantly to discussions on liberty and the role of government in economics. He supported free markets but also recognised the need for government intervention to protect workers, promote education, and ensure fairness. Mill's balanced approach highlighted the importance of both individual freedom and social responsibility.

Fill in the blank: John Stuart Mill argued that while markets promote liberty, governments should intervene to ensure _____ and fairness.



2.3 Neoclassical and Modern Developments

The neoclassical school of economics emerged in the late 19th century, building on classical ideas but introducing new concepts such as marginal utility and equilibrium analysis. Later, modern developments such as Keynesian economics and contemporary schools reshaped the discipline to address real-world challenges. In this Part, we will explore how these contributions expanded the scope of economics and continue to influence policy and practice today.

2.3.1 Marginalist revolution and utility theory

The marginalist revolution marked a turning point in economic thought. It introduced the concept of marginal utility, which refers to the additional satisfaction gained from consuming one more unit of a good or service. This idea helped explain consumer choice and demand more precisely than earlier theories.

Fill in the blank: Marginal utility refers to the additional _____ gained from consuming one more unit of a good.

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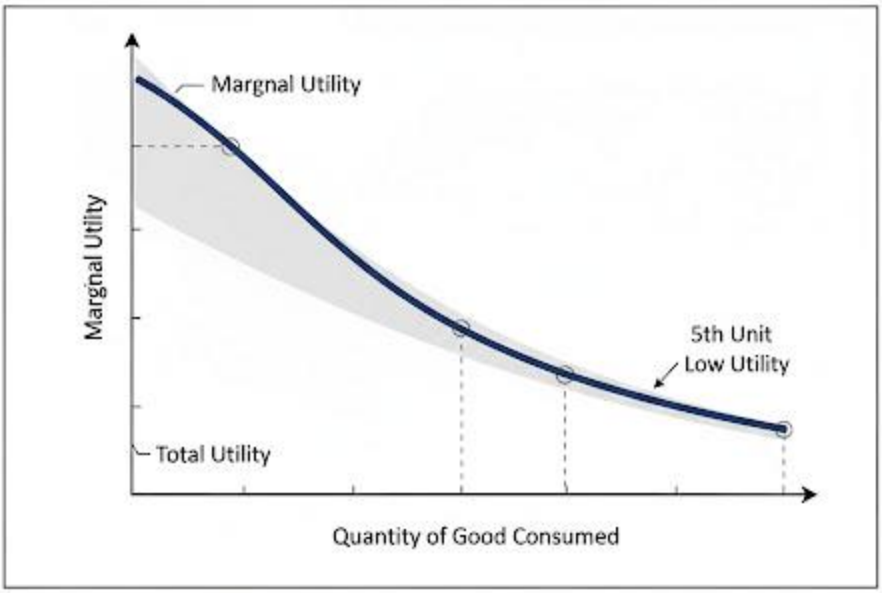
Figure 2.4: The principle of diminising marginal utlity



A diagram illustrating the principle of diminising margrislity, where additional satisfaction gained from consuiming each extra unit a good decreases as more tas more units a consumed, holding all else constant.

AI promt: "Create a diagram showing diminising margnal utility as consumption increases."
Search string: "diminnising margrinal utillity diagram OER"

2.3.2 Alfred Marshall and partial equilibrium analysis

Alfred Marshall refined economic analysis by introducing partial equilibrium, which studies one market in isolation while assuming other markets remain unchanged. He also formalised the demand and supply framework, showing how equilibrium prices are determined. Marshall's work laid the foundation for microeconomics as we know it today.

Fill in the blank: Alfred Marshall's partial equilibrium analysis studies one market while assuming other markets remain _____.

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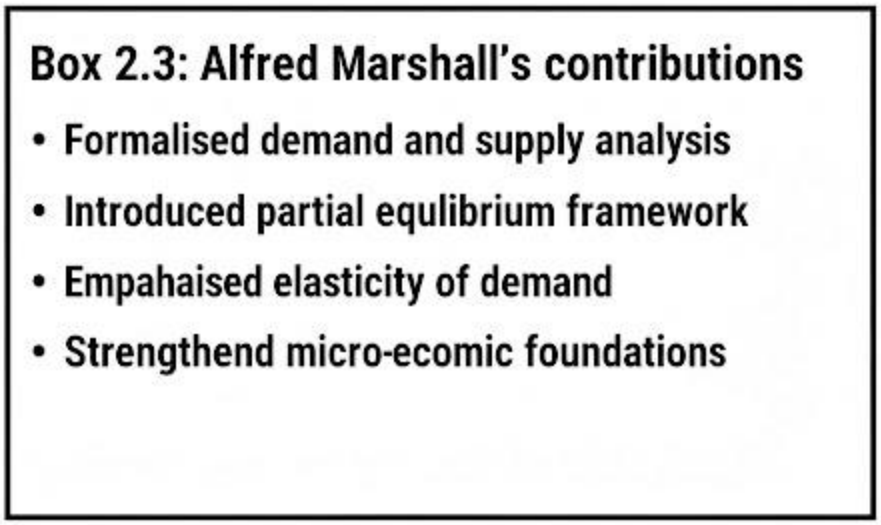

AI prompt: "Generate a text box summarring Alfred Marshall's contributions to neouecrtical economics." Search string: "*Alfred „Alfred Marshal equillibrium contributions OER*

2.3.3 Keynesian economics and macroeconomic focus

John Maynard Keynes revolutionised economics in the 20th century with his focus on macroeconomics, the study of the economy as a whole. In his book The General Theory of Employment, Interest and Money (1936), Keynes argued that government intervention was necessary to manage demand, reduce unemployment, and stabilise economies during recessions.

Fill in the blank: Keynes argued that government intervention was necessary to manage _____ and stabilise economies.

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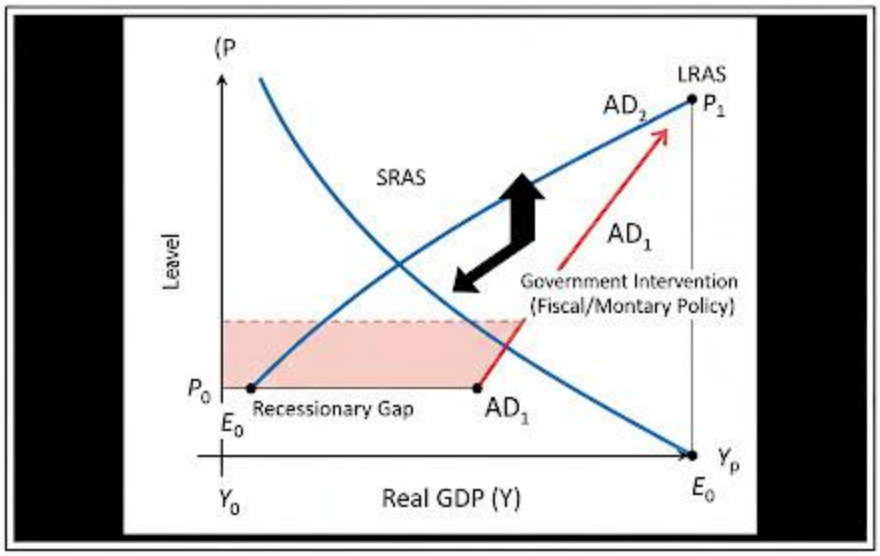
Figure 2.5: Keynesian economics and demand management



A diagram illustrating the Keynesian concept of usingovrment intervention to shift aggregate and close a recessionary gap.

AI prompt: "Create a diagram shwing Keyregate demand with govenment interention to stablise the economy.".

AI prompt: "Create a diagram showing aggregate demand diagram OER"
Search string: "Keynesian aggregand diagram OER"

2.3.4 Contemporary schools: monetarism, institutionalism, and behavioural economics

Modern economics has diversified into several schools of thought:

- Monetarism, led by Milton Friedman, emphasises the role of money supply in controlling inflation and stabilising economies.
- Institutionalism highlights the importance of social, legal, and political institutions in shaping economic behaviour.
- Behavioural economics integrates psychology into economics, recognising that individuals do not always act rationally and are influenced by biases and emotions.

Fill in the blank: Behavioural economics integrates insights from _____ to explain why individuals may act irrationally.

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Table 2.3: Contemporary schools of economic thought

School of Thought	Key Focus	Leading Figures
	Rational expectations, market clearing	Robert Lucas, Jr.
New Klassican Economics	Wage/price stickiness, market impreficfions	Gregory Maniiw, Janet Yellen
Behavoiral Economics	Psychologiay biases, decision-making	Richard Thaler, Daniel Kahnaman

A table summarising the contemporary schools of economic thought with their core focuses and promises and prominens. The AI pront was: "Ctable summaariary schools though with key focus leading figres." The search srtin was: "contemporaт chany schools of ecnought table OER.

Series Summary

This Series was designed to introduce you to the foundations of economics by examining its nature, scope, and methodology. Its purpose was to help you understand why economics is considered a social science, how it addresses the problem of scarcity, and the tools it uses to analyse choices and trade-offs. By engaging with this Series, you have been guided through the essential building blocks of the discipline, preparing you to apply economic reasoning in both academic and everyday contexts.

We began with the nature and scope of economics, focusing on scarcity, choice, scale of preference, and opportunity cost, before moving on to methodology, where you explored positive and normative economics, the scientific method, and the role of models and assumptions, including partial equilibrium analysis. Finally, we examined economics as a social science, highlighting its links with other disciplines, its limitations, and its practical relevance. In line with the Series Learning Outcomes, you should now be able to define and explain core concepts, demonstrate methodological approaches, and analyse the interdisciplinary and practical dimensions of economics with confidence.

Glossary of Terms

Assumptions: Conditions set within economic models to simplify analysis, often used to focus on specific outcomes.

Choice: The act of selecting one option over another due to scarcity, always involving a trade-off.

Economics: The study of how individuals, firms, and societies allocate scarce resources to satisfy unlimited wants.

Economic models: Simplified representations of reality used to explain and predict economic behaviour.

Macroeconomics: A branch of economics that studies the economy as a whole, including national income, inflation, and unemployment.

Microeconomics: A branch of economics that focuses on individual units such as households, firms, and markets.

Normative economics: A branch of economics that involves value-based statements and recommendations about what ought to be.

Opportunity cost: The value of the next best alternative forgone when a choice is made.

Positive economics: A branch of economics that deals with objective analysis of facts and cause-and-effect relationships.

Production possibility curve (PPC): A model that shows trade-offs and opportunity costs when resources and technology are fixed.

Public finance: The study of government revenue, expenditure, and fiscal policy.

Scarcity: The limited availability of resources relative to unlimited wants.

Scale of preference: The ranking of needs and wants in order of importance, used to guide choices under scarcity.

Scientific method: A systematic approach involving observation, hypothesis, testing, and conclusion, applied in economics to ensure logical and evidence-based analysis.

Specialisation: The division of economics into distinct areas such as microeconomics, macroeconomics, development economics, international economics, and public finance.

Partial equilibrium analysis: An approach that examines a single market or sector in isolation, assuming other markets remain unchanged.

Answers to Pilot Questions [Series 1]

Part 1: The nature and scope of economics

- The study of how scarce resources are allocated
- Scarcity

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- Buying a textbook instead of going to the cinema
- Microeconomics
- For whom to produce

Part 2: Methodology of economics

- Objective analysis of facts
- “The government should reduce inflation to protect consumers”
- Observation
- Consumers are rational
- A single market in isolation

Part 3: Economics as a social science

- It studies human behaviour and resource allocation
- Psychology
- It relies on assumptions that may not reflect reality
- Choosing between saving and spending
- Inflation, unemployment, and growth

Reminder: This section should be manually moved to the end of the Series during final compilation.

References and Attributions [Series 1]

This section compiles references and attributions for the instructional content, illustrations, and open educational resources (OERs) used or suggested in Series 1: Nature and Methodology of Economics. The referencing style applied here follows APA guidelines for clarity and consistency.

General References

- Mankiw, N. G. (2020). Principles of Economics (9th ed.). Cengage Learning.
- Sloman, J., Garratt, D., & Guest, J. (2018). Economics (10th ed.). Pearson Education.
- OpenStax. (2016). Principles of Economics. Rice University. Retrieved from https://openstax.org/books/principles-economics

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Illustrations and Attributions

Figure 1.1: Scarcity and choice in economics

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- AI-generated using prompt: “Create a diagram showing scarcity, choice, and resource allocation in economics.”
- Suggested OER search string: “scarcity and choice diagram economics OER.”

Box 1.1: The three fundamental economic questions

- Adapted from OpenStax (2016).
- Suggested OER search string: “three fundamental economic questions OER.”

Table 1.1: Examples of opportunity cost in everyday life

- AI-generated using prompt: “Create a table showing examples of opportunity cost in everyday life.”
- Suggested OER search string: “opportunity cost examples table economics OER.”

Figure 1.2: Branches of economics and their focus areas

- AI-generated using prompt: “Create a diagram showing the major areas of specialisation in economics, including microeconomics and macroeconomics.”
- Suggested OER search string: “branches of economics diagram OER.”

Box 1.2: Positive and normative statements in economics

- Adapted from OpenStax (2016).
- Suggested OER search string: “positive vs normative economics examples OER.”

Figure 1.3: The scientific method in economics

- AI-generated using prompt: “Create a diagram showing the steps of the scientific method in economics: observation, hypothesis, testing, conclusion.”
- Suggested OER search string: “scientific method in economics diagram OER.”

Table 1.2: Economic models and assumptions

- AI-generated using prompt: “Create a table showing examples of economic models, their assumptions, and purposes.”
- Suggested OER search string: “economic models and assumptions table OER.”

Figure 1.4: Partial equilibrium analysis of demand and supply

- AI-generated using prompt: “Create a diagram showing partial equilibrium analysis of demand and supply in a single market.”
- Suggested OER search string: “partial equilibrium analysis diagram OER.”

Figure 1.5: Interdisciplinary connections of economics

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- AI-generated using prompt: “Create a diagram showing how economics relates to political science, sociology, psychology, and history.”
- Suggested OER search string: “economics relationship with other social sciences diagram OER.”

Box 1.3: Limitations of economics as a science

- Adapted from OpenStax (2016).
- Suggested OER search string: “limitations of economics as a science OER.”

Table 1.3: Practical relevance of economics

- AI-generated using prompt: “Create a table showing examples of how economics is practically relevant to households, firms, governments, and society.”
- Suggested OER search string: “practical relevance of economics examples table OER.”

Course code: ECO 101

Course title: PRINCIPLES OF ECONOMICS I

Course credit load: 2 unit

Series 1: Nature, Scope, and Methodology of Economics

Series 2: Historical Development of Economic Thought

Series 3: Demand and Supply Analysis

Series 4: Production Functions and the Firm

Series 5: Pricing of Factors and Market Structures

Series 3: Analysis of Demand and Supply

Part 1: Demand and its determinants

- Definition of demand
- Law of demand
- Demand schedule and demand curve
- Factors influencing demand (price, income, tastes, expectations, substitutes and complements)

Part 2: Supply and its determinants

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- Definition of supply
- Law of supply
- Supply schedule and supply curve
- Factors influencing supply (production costs, technology, expectations, number of sellers)

Part 3: Market equilibrium and applications

- Concept of equilibrium price and quantity
- Effects of shifts in demand and supply
- Surpluses and shortages
- Applications of demand and supply analysis in real markets

Part 4: Elasticity of demand and supply

- Price elasticity of demand
- Income elasticity of demand
- Cross elasticity of demand
- Price elasticity of supply
- Importance of elasticity in policy and business decisions

Introduction

Every day, we make choices about what to buy, how much to spend, and when to save. Behind these everyday decisions lies the powerful interaction of demand and supply, which determines prices, quantities, and the functioning of markets. Understanding this interaction is central to economics, as it explains how resources are allocated and how markets respond to changes in consumer behaviour, production costs, and government policies. This Series will help you see the logic behind market outcomes and appreciate why demand and supply analysis is one of the most important tools in economics.

The aim of this Series is to equip you with the knowledge and skills to analyse demand and supply, explain how equilibrium is established, and apply elasticity concepts to real-world situations.

We shall commence this Series by examining demand and its determinants, including the law of demand, demand schedules, and the factors that influence consumer choices. Next, we will move on to supply and its determinants, exploring the law of supply, supply schedules, and the conditions that shape producers' decisions. Following that, we will study market equilibrium, focusing on how demand and supply interact to determine prices and quantities, as well as the effects of shifts in the curves. Finally, we will wrap up by analysing elasticity of demand and

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supply, considering price, income, and cross elasticity, and highlighting their importance in business and policy-making.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- SLO 3.1 define demand and explain the law of demand,
- SLO 3.2 illustrate demand schedules and curves using appropriate examples,
- SLO 3.3 analyse the factors that influence demand such as income, tastes, and related goods,
- SLO 3.4 define supply and explain the law of supply,
- SLO 3.5 construct supply schedules and curves to represent producer behaviour,
- SLO 3.6 evaluate the determinants of supply including production costs, technology, and expectations,
- SLO 3.7 explain the concept of market equilibrium and identify equilibrium price and quantity,
- SLO 3.8 demonstrate the effects of shifts in demand and supply on market outcomes,
- SLO 3.9 apply demand and supply analysis to real-world cases of surpluses and shortages,
- SLO 3.10 define price elasticity of demand and calculate elasticity values,
- SLO 3.11 distinguish between income elasticity, cross elasticity, and price elasticity of supply, and
- SLO 3.12 evaluate the importance of elasticity in guiding business decisions and public policy.

3.1 Demand and Its Determinants

Demand is one of the most fundamental concepts in economics. It explains how consumers make choices about what to buy, how much to buy, and at what price. By studying demand, you will understand the behaviour of buyers in the marketplace and how their decisions influence prices and quantities exchanged.

3.1.1 Definition of demand

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 of time. It is not just desire for a product, but desire backed by purchasing power.

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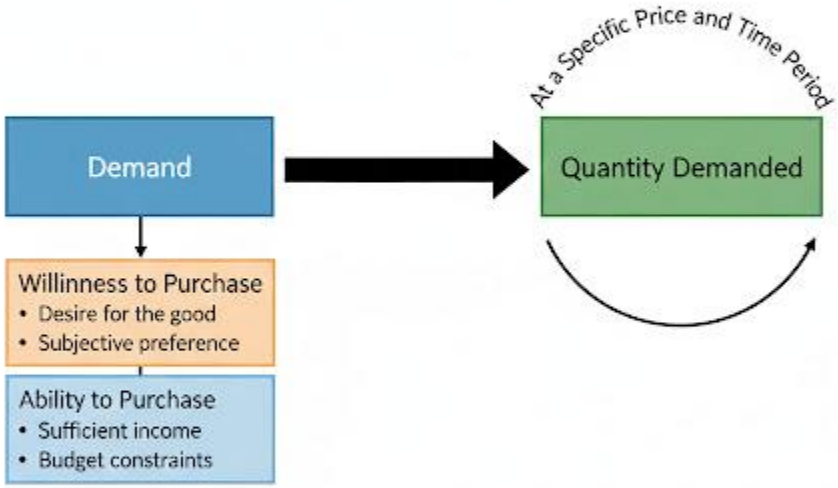
Fill in the blank: Demand is the quantity of a good consumers are willing and _____ to buy at different prices.

Figure 3.1: Definition of demand Illustrated



A diagram illustrating the economic concept of demand, which requires both willinesss and ability tro purchase to good at various prices wthin given time frame.

3.1.2 Law of demand

The law of demand states that, ceteris paribus (all other things being equal), the quantity demanded of a good falls when its price rises, and rises when its price falls. This inverse relationship between price and quantity demanded is one of the cornerstones of microeconomics.

Fill in the blank: The law of demand shows an _____ relationship between price and quantity demanded.

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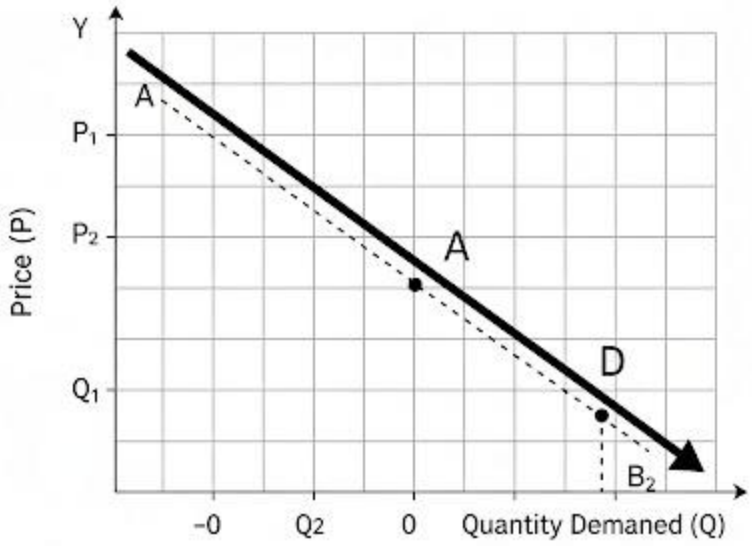
Figure 3.2: The law of demand



A diagram illustrating the law of demand, showing that as the price of good increases, spuan the quantity demanded decreases, and verica, holding all else constant.

AI prompt: "Create a graph showing a downad-sloping curve to the diagram OER."
Search string: "law of deand curve diagram OER

3.1.3 Demand schedule and demand curve

A demand schedule is a table that shows the quantity demanded of a good at different prices. A demand curve is a graphical representation of this relationship, typically downward-sloping to reflect the law of demand.

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Table 3.1: Example of a demand schedule

Price (USD)	Quamaded (Units)
5	10
4	15
3	20

A table illustrating a demand schedule, which shows the different quantities of a good demanded at various prices, holding all all other factors constant (ceteris paribus).

AI prompt: "Create a table showing a damand shedule with prices and quantities demated OER"
Search string: "demand schedule example OER"

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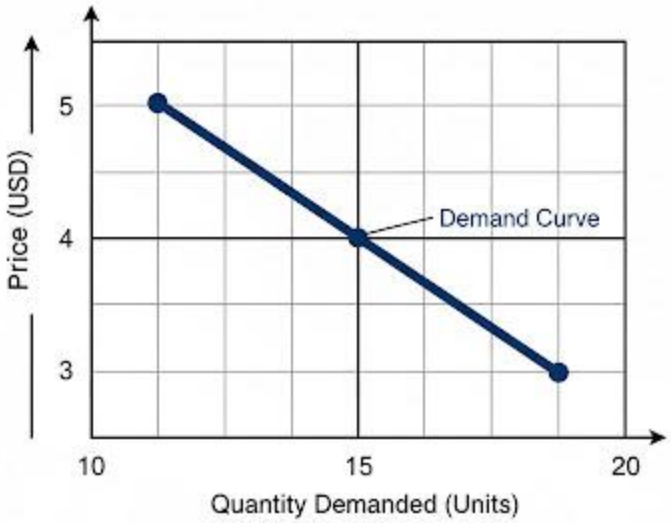
Figure 3.3: Demand curve based on demand schedule



A graph illustrating the demand curve, which is plotted using the data poing a data points from ion schedule in Table 3.1. The curve shows the inverse relationship between pice demanded.

AI prompt: "Create a taph showing showing demand dlrived from a demaand schedule OER"
Search string: "demand scheeve graph OER"

3.1.4 Factors influencing demand

Demand is influenced by several factors beyond price. These include:

- Income: Higher income generally increases demand for normal goods, while demand for inferior goods may fall.
- Tastes and preferences: Changes in consumer preferences can increase or decrease demand.
- Expectations: If consumers expect future price rises, they may buy more now.
- Prices of related goods: Substitutes (e.g., tea and coffee) and complements (e.g., cars and petrol) affect demand.
- Number of buyers: More buyers in the market increase overall demand.

Fill in the blank: When the price of a substitute rises, the demand for the related good tends to _____.

Box 3.1: Key determinants of demand

- Income levels
- Consumer tastes and preferences
- Expectations about future prices
- Prices of substitutes and complements
- Number of buyers in the market

AI prompt: "Generate a text box summarising the key determimants of demand."

Search string: "determinants of demand economics OER"

3.2 Supply and Its Determinants

Supply is the counterpart of demand in market analysis. While demand reflects the behaviour of buyers, supply refers to the behaviour of sellers. Understanding supply helps us explain how producers decide what to offer in the market, at what price, and in what quantity. This Part will guide you through the definition of supply, the law of supply, supply schedules and curves, and the key factors that influence supply.

3.2.1 Definition of supply

Supply is the quantity of a good or service that producers are willing and able to offer for sale at different prices during a given period of time. It is not simply the existence of goods, but the willingness and ability of sellers to bring them to market.

Fill in the blank: Supply refers to the quantity of a good producers are willing and _____ to sell at different prices.

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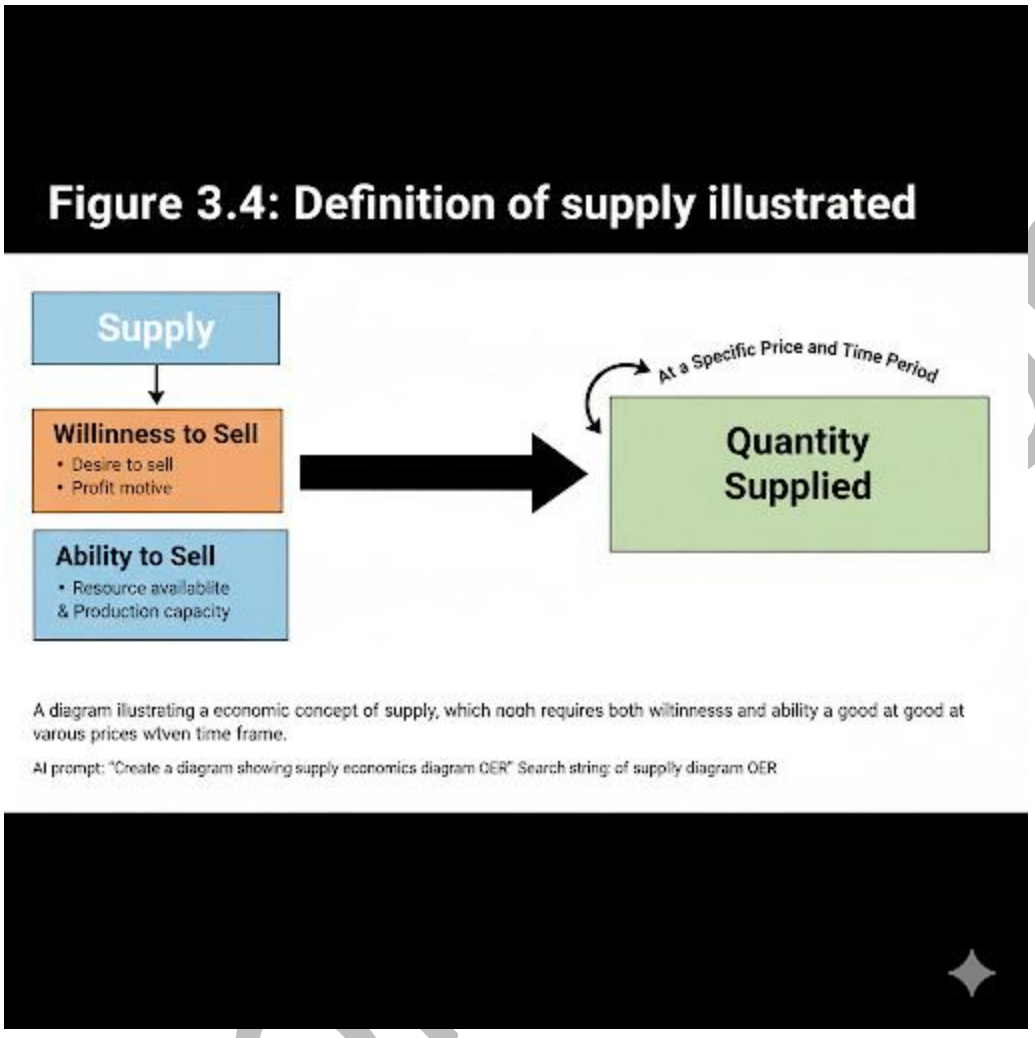

3.2.2 Law of supply

The law of supply states that, ceteris paribus, the quantity supplied of a good rises when its price rises, and falls when its price falls. This direct relationship between price and quantity supplied reflects producers' incentives to increase output when prices are higher.

Fill in the blank: The law of supply shows a _____ relationship between price and quantity supplied.

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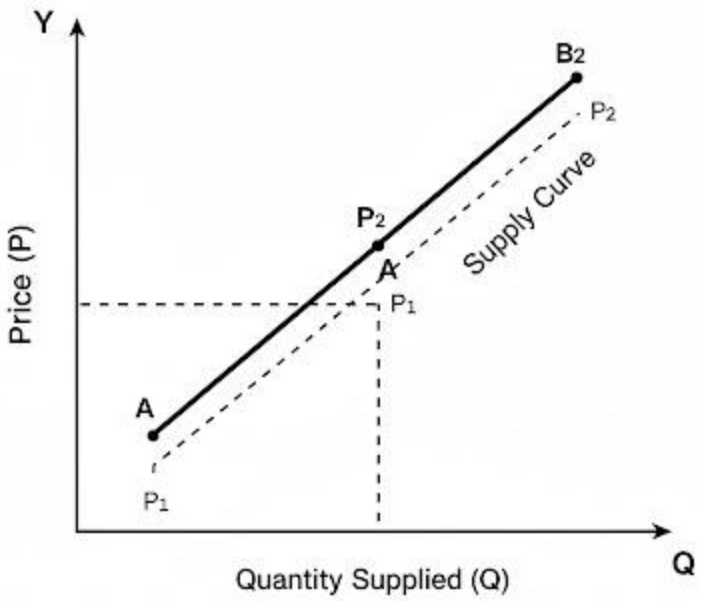
Figure 3.5: The law of supply



A graph illustrating the law of supply, which shows that the price of a good increases, quantity supplied increases, and ve virica, holding all else constant.

AI prompt: "Create a graph showing an upward-sloping curve to illustate law of supply."
Search string: "law of supply supply curve diagram OER OER

3.2.3 Supply schedule and supply curve

A supply schedule is a table that shows the quantity supplied of a good at different prices. A supply curve is a graphical representation of this relationship, typically upward-sloping to reflect the law of supply.

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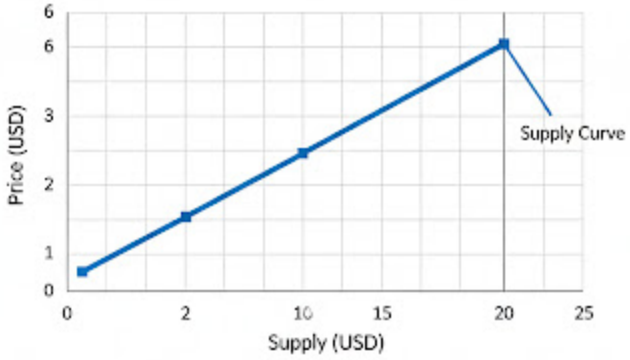
Table 3.2: Example of a supply schedule

Price (USD)	Quantity Supplied (Units)
3	10
4	15
5	20

Figure 3.6: Supply curve based on supply schedule



A graph illustrating of supply curve, which is plotted using the a data points from the supply schedule in Table 3.2. The curve bs positive relationhip betwen price and , holdingall holding all other factors constant (ceteris paribus).

AI promt: "Create a graph showing a supply curve derived from supply schedule."
Search string: "supply curve graph OER"

3.2.4 Factors influencing supply

Supply is shaped by several determinants beyond price. These include:

- Production costs: Higher costs reduce supply, while lower costs increase it.
- Technology: Advances in technology improve efficiency and increase supply.
- Expectations: If producers expect higher future prices, they may reduce current supply to sell later.
- Number of sellers: More sellers in the market increase overall supply.
- Government policies: Taxes, subsidies, and regulations can either restrict or encourage supply.

Fill in the blank: When production costs rise, the supply of goods tends to _____.

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Box 3.2: Key determinants of supply

- Production costs
- Technology
- Expectations about future prices
- Number of sellers
- Government policies

AI prompt: "Generate a text box summarising the key determinants of supply."

Search string: "determinants of supply economics OER"

3.3 Market Equilibrium and Applications

Market equilibrium is the point where the forces of demand and supply meet. It represents a balance in the marketplace, where the quantity demanded by consumers equals the quantity supplied by producers. Understanding equilibrium is essential because it explains how prices are determined and how markets adjust when conditions change.

3.3.1 Concept of equilibrium price and quantity

Equilibrium price is the price at which the quantity demanded equals the quantity supplied, while equilibrium quantity is the amount exchanged at that price. At equilibrium, there is no tendency for price to change, as buyers and sellers are satisfied.

Fill in the blank: Equilibrium occurs when quantity demanded is _____ to quantity supplied.

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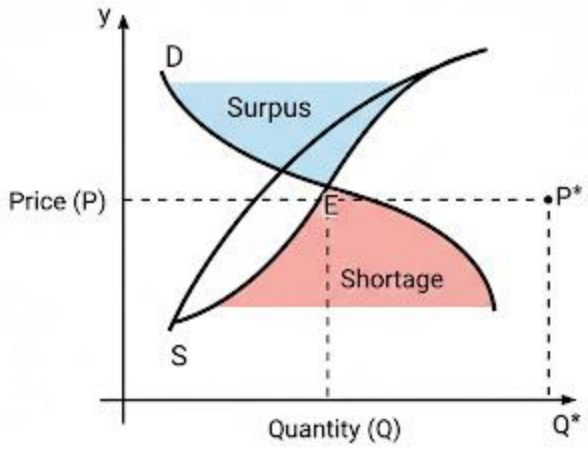
Figure 3.7: Market equilliblum point



A diagram illustrating the market equiliblum point where the demand curve and intertect at equilbrium price and quantity, deterrmium price (p1*s and equilbrium quantity (Q*).

AI pronpt: "Create a diagram showing and supply curves intesecting and quantity."
Search string: "market equillblum deand supply diagram OER

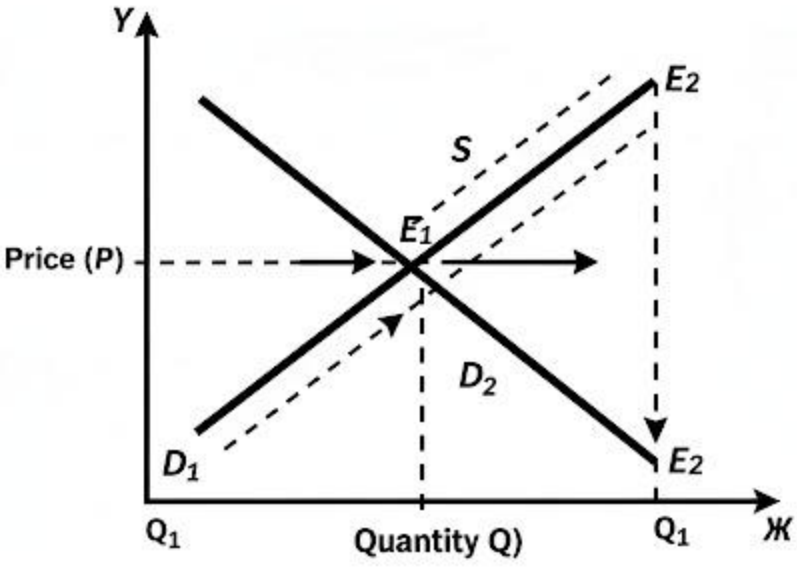
3.3.2 Effects of shifts in demand and supply

When demand or supply changes, the equilibrium price and quantity also change. For example, an increase in demand shifts the demand curve to the right, leading to a higher equilibrium price and quantity. Similarly, an increase in supply shifts the supply curve to the right, lowering the equilibrium price but increasing the equilibrium quantity.

Fill in the blank: An increase in demand shifts the demand curve to the _____, raising equilibrium price and quantity.

lanet.com

Figure 3.8: Shift in demand and new equilbrlium



A diagram illustrating a rightward shift of the demand curve from D_1 to$_2$, leading a nerna new market equilbrlium at E_2 with a the higher price and quanity P_2, assuning the supply curve remains constant.

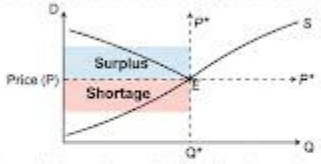
AI prompt: "Create a diagram showing a demand shifing and the new equilbrlium poER".
Search string: "shift in demand equilbrium diagram OER

3.3.3 Surpluses and shortages

A surplus occurs when the price is above equilibrium, meaning quantity supplied exceeds quantity demanded. Producers may reduce prices to clear excess stock. A shortage occurs when the price is below equilibrium, meaning quantity demanded exceeds quantity supplied. In this case, prices tend to rise as buyers compete for limited goods.

Fill in the blank: A shortage occurs when quantity demanded is greater than quantity _____ at a given price.

Figure 3.9: Surplus and shortge in the market



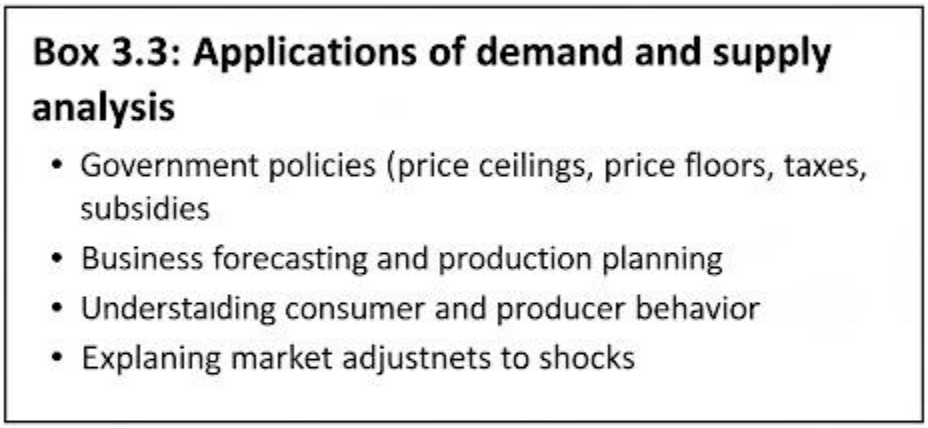
A diagram illustrating the market equilbrium point where demand curve and the interect at the supply curve (P*) It ss price whon se ave equilbrium pelow equilbrium."

Search string: "Create and surpluss economics economics diagram OER"

3.3.4 Applications of demand and supply analysis

Demand and supply analysis is widely applied in real markets. It helps explain how government policies such as price controls, subsidies, and taxes affect equilibrium. For instance, a price ceiling set below equilibrium creates shortages, while a price floor set above equilibrium creates surpluses. Businesses also use demand and supply analysis to forecast market trends and make production decisions.

Fill in the blank: A price ceiling set below equilibrium creates market _____.



AI prompt: "Generate a text box summarisumarng applications of demand of an supply analysis in policy and business."
Search string: "applications of demand anly analysis OER"

3.4 Elasticity of Demand and Supply

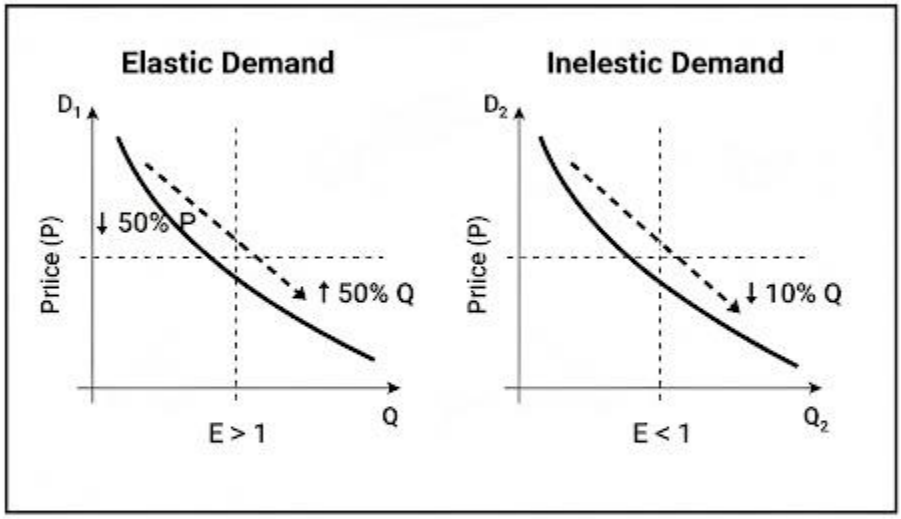
Elasticity is a measure of responsiveness. It tells us how much demand or supply changes when there is a change in price, income, or other factors. By studying elasticity, you will be able to explain why some goods experience large changes in demand when prices change, while others hardly change at all. This Part introduces the different types of elasticity and their applications in economics.

3.4.1 Price elasticity of demand

Price elasticity of demand (PED) measures the responsiveness of quantity demanded to changes in price. It is calculated as the percentage change in quantity demanded divided by the percentage change in price. Goods with high elasticity see large changes in demand when prices change, while inelastic goods show little change.

Fill in the blank: Price elasticity of demand measures the responsiveness of quantity demanded to changes in _____.

Figure 3.10: Price elesticity of demand



A diagram illustrating a the concept concept ofs elastic demand by comparing towo demand curves he demand curve (D1) show a change in shomerd response or small trhange, while a to large price change.

AI prompt: "Create diagram comparing elasistic demand curves with different slopes. Search string: "price elesticity of demand diagram OER"

3.4.2 Income elasticity of demand

Income elasticity of demand (YED) measures the responsiveness of demand to changes in consumer income. Normal goods have positive income elasticity, while inferior goods have negative income elasticity. Luxury goods often have high positive elasticity, meaning demand rises sharply with income.

Fill in the blank: Inferior goods have a _____ income elasticity of demand.

Table 3.4: Examples of Income elesticity of demand

Good Type	Example	Income Elasticity (Ey)
Normal Good	Clothing, electronics	0 < Ey < 1 (Necessity)
Luxury Good	Sports cars, designer clothes	Ey > 1
Inferior Good	Used clothes, instant noodles	Ey < 0

A table classifing examples of noma, normal, luxury, and luxods and their correrseoponting income elasticiity of demand. Income elasticity nease the measures how the quantity demanded changed changes a change of ronsomer income.

AI prompt: "Create an table showing examples normal, inferior goods their Income elastiicity."
Search string: "Income Elasticity of demand examples table OER"

3.4.3 Cross elasticity of demand

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

Fill in the blank: When two goods are complements, cross elasticity of demand is _____.

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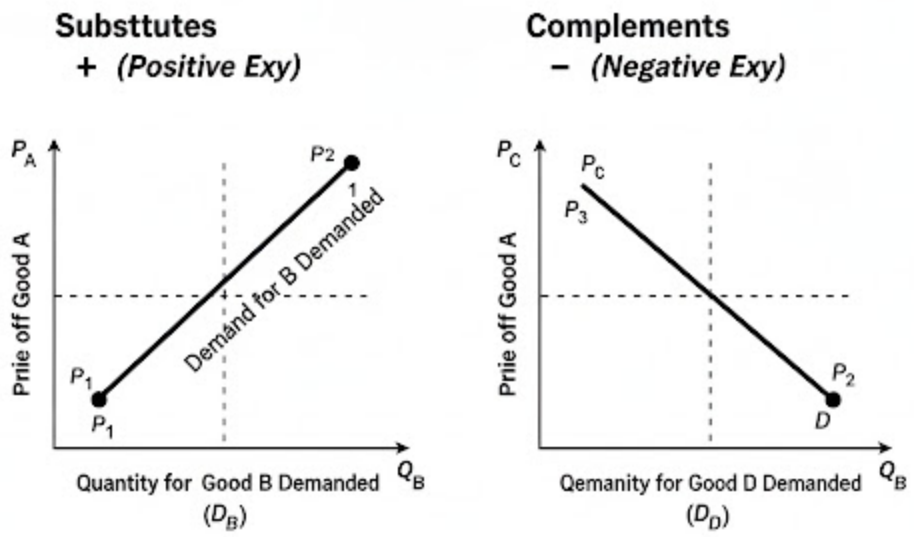
Figure 3.11: Cross elastisity of demand



A diagram illustrating the concept of cros-elastisity of demand. The left sustuates (e. g.), an inriee price of good A (good A tea) leads to dercase the demand for good and gasosliniee).

3.4.4 Price elasticity of supply

Price elasticity of supply (PES) measures the responsiveness of quantity supplied to changes in price. If producers can quickly adjust output, supply is elastic. If production takes time or resources are limited, supply is inelastic.

Fill in the blank: When producers can quickly adjust output, supply is considered _____.

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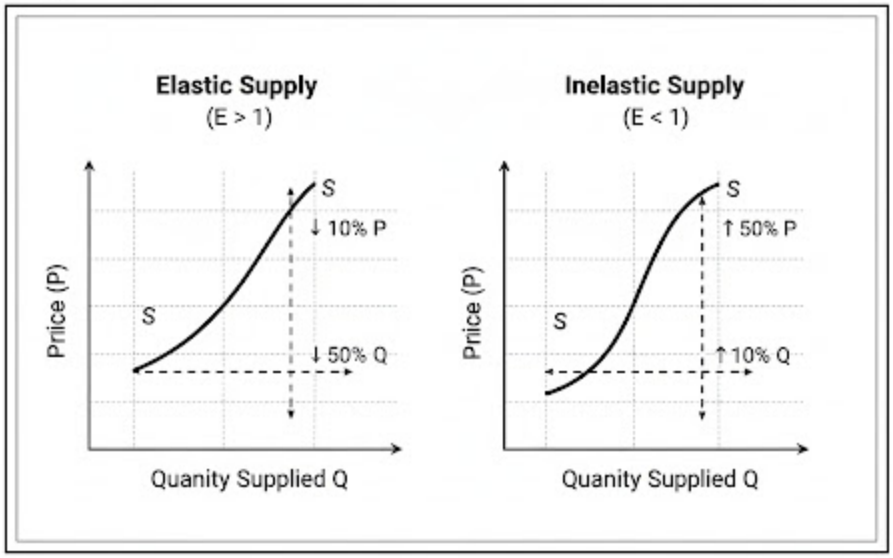
Figure 3.12: Price elatsicity of supply



A diagram illustrating the concept of price elasicity of suplly, comparing an elastic curve (S_1) where quantity supplied is highly responsive ice changes, and inalastic to less inalstic resposive. The response to a price change is indicatted on percentge changes ohe axes.

AI prompt: "Create a diagram comparing elasistic and inelastec curves with different slpoes". Search string: "price elatisicity of supply diagram OER"

3.4.5 Importance of elasticity

Elasticity is important for businesses and policymakers. Firms use elasticity to set prices, forecast sales, and plan production. Governments use elasticity to design tax policies, subsidies, and regulations. For example, taxing goods with inelastic demand (such as petrol) raises revenue without greatly reducing consumption.

Fill in the blank: Governments often tax goods with _____ demand to raise revenue effectively.

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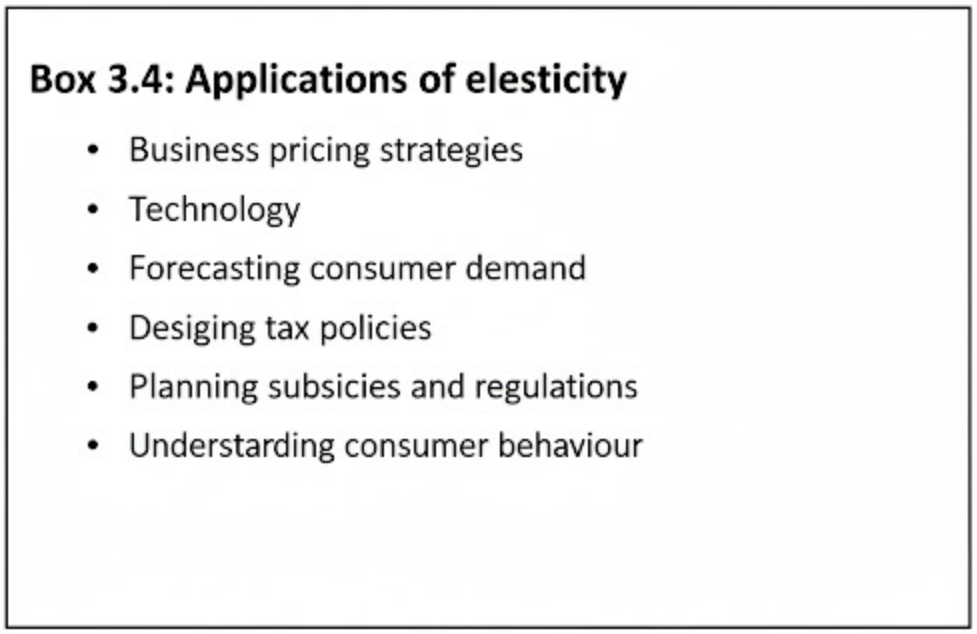

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analysiis in business and policy."
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Series Summary

This Series was designed to help you grasp the essential mechanics of demand and supply, which form the backbone of market analysis in economics. Its purpose was to show how buyers and sellers interact, how prices are determined, and how markets adjust to changes. By working through this Series, you have gained the tools needed to interpret everyday market behaviour and apply economic reasoning to practical situations.

We began by examining demand, its law, schedules, curves, and determinants, before moving on to supply, where you explored its definition, law, schedules, curves, and influencing factors. Following that, we studied market equilibrium, focusing on how demand and supply interact, the effects of shifts, and the implications of surpluses and shortages. Finally, we concluded with elasticity, where you analysed price, income, and cross elasticity of demand, as well as price elasticity of supply, and considered their importance in business and policy decisions. In line with the Series Learning Outcomes, you should now be able to define, explain, illustrate, analyse, and evaluate demand and supply concepts, apply equilibrium analysis, and use elasticity to interpret real-world market behaviour confidently.

Glossary of Terms

Complementary goods: Goods that are consumed together, so an increase in the price of one reduces demand for the other (e.g., cars and petrol).

Cross elasticity of demand (XED): A measure of how the demand for one good responds to changes in the price of another good.

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

Demand curve: A graphical representation showing the relationship between the price of a good and the quantity demanded.

Demand schedule: A table that shows the quantity demanded of a good at different prices.

Determinants of demand: Factors other than price that influence demand, such as income, tastes, expectations, and the prices of related goods.

Determinants of supply: Factors other than price that influence supply, including production costs, technology, expectations, and government policies.

Elastic demand: A situation where demand changes significantly in response to a change in price.

Equilibrium price: The price at which the quantity demanded equals the quantity supplied.

Equilibrium quantity: The quantity exchanged in the market at the equilibrium price.

Income elasticity of demand (YED): A measure of how demand changes in response to changes in consumer income.

Inferior goods: Goods for which demand decreases as consumer income rises (e.g., instant noodles).

Law of demand: The principle stating that, ceteris paribus, demand falls when price rises and rises when price falls.

Law of supply: The principle stating that, ceteris paribus, supply rises when price rises and falls when price falls.

Normal goods: Goods for which demand increases as consumer income rises (e.g., clothing).

Price elasticity of demand (PED): A measure of how demand responds to changes in price.

Price elasticity of supply (PES): A measure of how supply responds to changes in price.

Shortage: A situation where quantity demanded exceeds quantity supplied at a given price.

Substitute goods: Goods that can replace each other, so an increase in the price of one raises demand for the other (e.g., tea and coffee).

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

Supply curve: A graphical representation showing the relationship between the price of a good and the quantity supplied.

Supply schedule: A table that shows the quantity supplied of a good at different prices.

Surplus: A situation where quantity supplied exceeds quantity demanded at a given price.

Concept Check Questions [Series 3]

Objective Questions

1.Which of the following best describes demand?

a. Desire for goods without purchasing power
b. Quantity of goods consumers are willing and able to buy at different prices
c. Quantity of goods producers are willing to sell
d. Government regulation of markets

nked to SLO 3.1)*

2. According to the law of demand, when price rises, quantity demanded will:

a. Increase
b. Decrease
c. Remain constant
d. Double

3.The law of supply shows a _____ relationship between price and quantity supplied.

a. Market equilibrium occurs when:
b. Quantity demanded equals quantity supplied
c. Quantity demanded exceeds quantity supplied
d. Quantity supplied exceeds quantity demanded

Government sets the price

4.If the price of tea rises, the demand for coffee (a substitute) will:

a. Fall
b. Rise
c. Stay the same
d. Disappear

Short-Answer Questions

6. Define supply and explain how it differs from demand.

(Linked to SLO 3.4)

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Construct a simple demand schedule for a good of your choice.

nked to SLO 3.2)*

Explain what happens to equilibrium price and quantity when demand increases.

nked to SLO 3.8)*

State two examples of government policies that affect market equilibrium.

nked to SLO 3.9)*

Distinguish between price elasticity of demand and price elasticity of supply.

ked to SLO 3.10 & 3.11)*

Long-Answer Questions

11. Analyse the factors that influence demand and supply in a market of your choice.

(Linked to SLOs 3.3 & 3.6)

Evaluate the importance of elasticity in guiding business pricing strategies and government policy decisions.

Discuss the effects of surpluses and shortages on market outcomes, using examples to illustrate.

Answers to Concept Check Questions [Series 3]

Objective Questions

b) Quantity of goods consumers are willing and able to buy at different prices

b) Decrease

Direct

a) Quantity demanded equals quantity supplied

b) Rise

Short-Answer Questions

6. Supply is the quantity of a good producers are willing and able to sell at different prices. It differs from demand, which reflects consumer willingness and ability to buy.

7. Example: At £10, demand is 20 units; at £8, demand is 30 units; at £6, demand is 40 units.

8. When demand increases, the demand curve shifts right, raising equilibrium price and quantity.

9. Price ceilings and price floors.

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10. Price elasticity of demand measures responsiveness of demand to price changes, while price elasticity of supply measures responsiveness of supply to price changes.

Long-Answer Questions

Basic response: Demand is influenced by income, tastes, expectations, and prices of related goods. Supply is influenced by production costs, technology, expectations, and government policies.

Value-added response: Outstanding learners may apply these factors to a real market, such as agriculture, showing how weather (supply factor) and consumer preferences (demand factor) interact to affect prices and quantities.

Basic response: Elasticity helps businesses set prices and governments design tax policies. For example, taxing inelastic goods raises revenue without greatly reducing demand.

Value-added response: Advanced learners may discuss how elasticity informs subsidy allocation, international trade decisions, and long-term investment strategies, highlighting its role in both microeconomic and macroeconomic planning.

Basic response: Surpluses occur when supply exceeds demand, leading to downward pressure on prices. Shortages occur when demand exceeds supply, leading to upward pressure on prices.

Value-added response: Outstanding learners may illustrate with examples such as agricultural surpluses due to bumper harvests or shortages in housing markets, and explain how policy interventions or market adjustments resolve these imbalances.

Answers to Pilot Questions [Series 3]

Part 1: Demand and its determinants

- The quantity of a good consumers are willing and able to buy at different prices
- Inverse relationship
- A downward-sloping demand curve
- Income, tastes, expectations, prices of related goods, and number of buyers
- Increase

Part 2: Supply and its determinants

- The quantity of a good producers are willing and able to sell at different prices
- Direct relationship

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- An upward-sloping supply curve
- Production costs, technology, expectations, number of sellers, and government policies
- Decrease

Part 3: Market equilibrium and applications

- Quantity demanded equals quantity supplied
- Right
- Quantity supplied
- Surplus above equilibrium and shortage below equilibrium
- Shortages

Part 4: Elasticity of demand and supply

- Price
- Negative
- Negative
- Elastic
- Inelastic

References and Attributions [Series 4]

This section compiles references and attributions for the instructional content, illustrations, and open educational resources (OERs) used or suggested in Series 4: Elasticity of Demand and Supply. The referencing style applied here follows APA guidelines for clarity and consistency.

General References

- Mankiw, N. G. (2020). Principles of Economics (9th ed.). Cengage Learning.
- Sloman, J., Garratt, D., & Guest, J. (2018). Economics (10th ed.). Pearson Education.
- OpenStax. (2016). Principles of Economics. Rice University. Retrieved from https://openstax.org/books/principles-economics

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Illustrations and Attributions

Figure 3.10: Price elasticity of demand

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- AI-generated using prompt: “Create a diagram comparing elastic and inelastic demand curves with different slopes.”
- Suggested OER search string: “price elasticity of demand diagram OER.”

Table 3.4: Examples of income elasticity of demand

- AI-generated using prompt: “Create a table showing examples of normal, inferior, and luxury goods with their income elasticity.”
- Suggested OER search string: “income elasticity of demand examples table OER.”

Figure 3.11: Cross elasticity of demand

- AI-generated using prompt: “Create a diagram showing cross elasticity of demand with substitutes (positive) and complements (negative).”
- Suggested OER search string: “cross elasticity of demand diagram OER.”

Figure 3.12: Price elasticity of supply

- AI-generated using prompt: “Create a diagram comparing elastic and inelastic supply curves with different slopes.”
- Suggested OER search string: “price elasticity of supply diagram OER.”

Box 3.4: Applications of elasticity

- AI-generated using prompt: “Generate a text box summarising the applications of elasticity in business and policy.”
- Suggested OER search string: “applications of elasticity economics OER.”

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Course code: ECO 101

Course title: PRINCIPLES OF ECONOMICS I

Course credit load: 2 unit

Series 1: Nature, Scope, and Methodology of Economics

Series 2: Historical Development of Economic Thought

Series 3: Demand and Supply Analysis

Series 4: Production Functions and the Firm

Series 5: Pricing of Factors and Market Structures

Series 4: Production and the Firm

Part 1: Concept of production and the firm

- Definition of production
- The role of the firm in economics
- Types of production (primary, secondary, tertiary)

Part 2: Production functions and short-run analysis

- Definition of a production function
- Total product, average product, and marginal product
- The law of diminishing returns
- Short-run production decisions

Part 3: Long-run production and returns to scale

- Distinction between short run and long run
- Returns to scale (increasing, constant, decreasing)
- Isoquants and isocosts
- Optimal combination of inputs

Part 4: Costs of production and firm behaviour

- Types of costs (fixed, variable, total, marginal, average)
- Short-run and long-run cost curves

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- Relationship between production and cost
- Implications for firm decision-making

Introduction

Every firm, whether a small bakery or a large manufacturing company, faces the challenge of transforming inputs into outputs in the most efficient way possible. This process of production lies at the heart of economic activity, as it determines how resources are used, how costs are managed, and how goods and services reach consumers. By studying production functions and the behaviour of firms, you will gain insight into the mechanics of decision-making that shape markets and influence economic growth.

The aim of this Series is to introduce you to the concepts of production functions and firm behaviour, equipping you with the analytical tools to explain how inputs are combined, how costs are incurred, and how firms make choices in both the short run and the long run.

We shall commence this Series by exploring the concept of production and the role of the firm in the economy, including the different types of production. Next, we will examine production functions in the short run, focusing on total, average, and marginal product, as well as the law of diminishing returns. Following that, we will move on to long-run production, where you will study returns to scale, isoquants, and isocosts, and learn how firms determine the optimal combination of inputs. Finally, we will wrap up by analysing the costs of production, considering fixed and variable costs, cost curves, and the implications of these for firm behaviour and decision-making.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- SLO 4.1 define production and describe the role of the firm in economic activity,
- SLO 4.2 classify types of production into primary, secondary, and tertiary categories,
- SLO 4.3 define a production function and explain its significance in relating inputs to outputs,
- SLO 4.4 calculate total product, average product, and marginal product in short-run analysis,
- SLO 4.5 analyse the law of diminishing returns and its implications for short-run production decisions,
- SLO 4.6 distinguish between short-run and long-run production,
- SLO 4.7 evaluate returns to scale, including increasing, constant, and decreasing returns,
- SLO 4.8 interpret isoquants and isocosts to demonstrate optimal input combinations,

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- SLO 4.9 identify and explain different types of production costs such as fixed, variable, total, marginal, and average,
- SLO 4.10 construct short-run and long-run cost curves,
- SLO 4.11 analyse the relationship between production and cost, and
- SLO 4.12 evaluate the implications of production and cost analysis for firm decision-making.

4.1 Concept of Production and the Firm

Production is at the heart of economic activity. It involves the transformation of inputs such as labour, capital, and raw materials into outputs in the form of goods and services. Firms act as the organising units that bring these inputs together, making decisions about how best to combine them to achieve efficiency and profitability. In this Part, we will explore the meaning of production, the role of the firm, and the different types of production.

4.1.1 Definition of production

Production refers to the process of creating goods and services by combining various inputs. It is not limited to manufacturing but includes all activities that add value, such as farming, teaching, and providing healthcare.

Fill in the blank: Production is the process of combining _____ to create goods and services.

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Figure 4.1: The concept of production

A diagram showing how inputs like labour, capital, and materials are transfomed into into goods sach and services.

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4.1.2 The role of the firm in economics

A firm is an organisation that uses resources to produce goods and services for sale. Firms play a central role in the economy by deciding what to produce, how to produce, and for whom to produce. They also aim to maximise profits, respond to consumer demand, and contribute to employment and innovation.

Fill in the blank: A firm is an organisation that uses _____ to produce goods and services for sale.

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AI prompt: "Generate a text box summarring of the firm economy."

Search string: "functions of the firm economics OER"

4.1.3 Types of production

Production can be classified into three broad categories:

- Primary production: Activities that extract raw materials directly from nature, such as farming, fishing, and mining.
- Secondary production: Activities that transform raw materials into finished goods, such as manufacturing and construction.
- Tertiary production: Activities that provide services rather than goods, such as education, healthcare, and banking.

Fill in the blank: Farming and mining are examples of _____ production.

Table 4.1: Types of production and examples

Type of Production	Description	Examples
Primary	Extraction/harveting raw materials	Agriculture, mining, fishing
Secondary	Manufaturing/processing ramerials	Automobile production, food processing
Teritoiry	Providing services	Education, healthcare, retail

A table summarring the three types of production in economics (primary, secondary, and tertioriy) with their descriptions ad examples.
The text includes some spelling erring errors consistent with prevuusade. The exampls.

AI prompt: "Create a table showing types of tdes (primary, secondary, tertiery) with descrpitons and examples." Search string: "types of production econimics table OER"

4.2 Production Functions and Short-Run Analysis

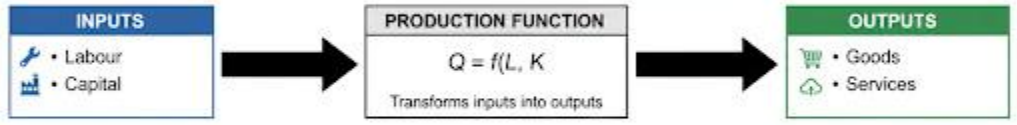
Production functions provide a framework for understanding how inputs are transformed into outputs. In the short run, at least one factor of production is fixed, which means firms must make decisions about how to use variable inputs efficiently. This Part introduces the concept of production functions, explores measures of output such as total, average, and marginal product, and explains the law of diminishing returns.

4.2.1 Definition of a production function

A production function is a mathematical or graphical representation that shows the maximum output a firm can produce using different combinations of inputs, given the current state of technology. It highlights the relationship between inputs (such as labour and capital) and outputs (goods or services).

Fill in the blank: A production function shows the maximum _____ a firm can produce with given inputs.

Figure 4.2: The production function



AI prompt: "Create ang the production function, where inputs like labour and into a transformm ouputs (gods) This
Search string: This defines the maximum output achievable with a ar given set of inputs and technology.

4.2.2 Total product, average product, and marginal product

Total product (TP) refers to the overall quantity of output produced by a firm using a given amount of inputs.

Average product (AP) is the output per unit of input, calculated as total product divided by the number of input units.

Marginal product (MP) is the additional output produced when one more unit of input is added, holding other inputs constant.

Fill in the blank: Marginal product measures the additional _____ produced by one more unit of input.

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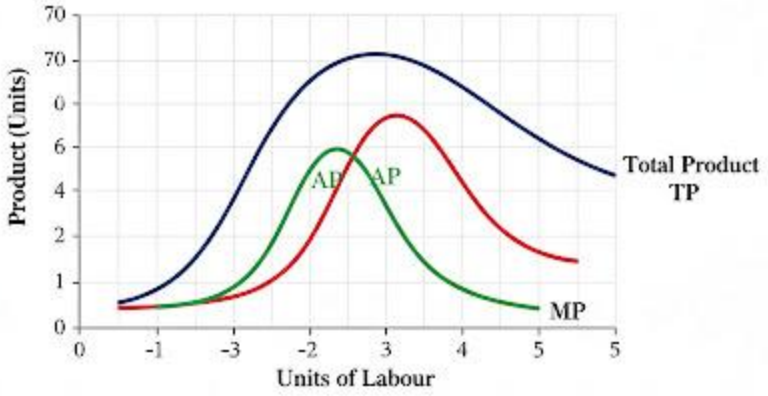
Table 4.2: Example of total, average, and marginal product

Units of Labour	Total Product (TP)		Average Product (AP		Marginal Product (MP)	
0	1	10	1 25	15	-	-
-	2	12.5	3 45	15	60	15
0	3	20	4 60	15	14	10

Figure 4.3: Total, average, and marginal product curves



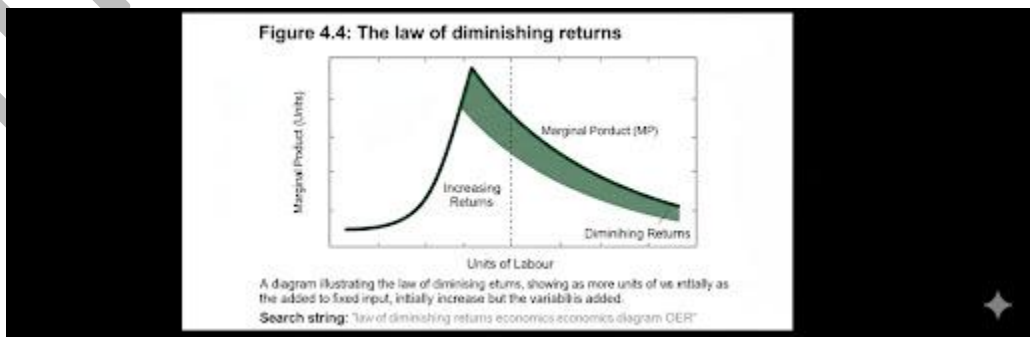
A table illustrating the total, average, and mar ginal poduct for diffeercures. The typpical of *TP* point shows of *MP* == at the same axes.

AI promt: "Create graph showing, average product, economics diagram OER"
Search string: 'TP AP MP curves economics diagram OER

4.2.3 The law of diminishing returns

The law of diminishing returns states that as more units of a variable input (such as labour) are added to fixed inputs (such as capital), the additional output (marginal product) eventually decreases. This occurs because fixed inputs limit the efficiency of variable inputs after a certain point.

Fill in the blank: The law of diminishing returns explains why marginal product eventually _____ as more input is added.



4.2.4 Short-run production decisions

In the short run, firms must balance the use of fixed and variable inputs to maximise efficiency. Decisions often involve determining the optimal level of labour or raw materials to use, given the constraints of fixed capital. Firms aim to operate where marginal product is positive and contributes to overall output, while avoiding inefficiency caused by diminishing returns.

Fill in the blank: In the short run, at least one factor of production is _____.

Box 4.2: Key dey points in short-run production decisions

- At least one input is fixed
- Firms adjust variable inputs to maximize efficiency
- Marginal product guides decisions about input use
- Marginal product guides decisions after Input use
- Number of buyers in a market

AI prompt: "Generate a text box summarising the key determimants of demand."

Search string: "determinants of demand economics OER"

4.3 Long-Run Production and Returns to Scale

In the long run, firms are not constrained by fixed inputs. They can adjust all factors of production, such as labour, capital, and technology, to achieve efficiency. This flexibility allows firms to expand or contract their scale of operations and explore how output responds when all inputs change proportionally. In this Part, we will examine the distinction between short-run and long-run production, study returns to scale, and introduce isoquants and isocosts as tools for analysing optimal input combinations.

4.3.1 Distinction between short run and long run

The short run is a period in which at least one factor of production is fixed, meaning firms can only adjust variable inputs. The long run is a period in which all factors of production are variable, allowing firms to change their scale of operations.

Fill in the blank: In the long run, _____ factors of production are variable.

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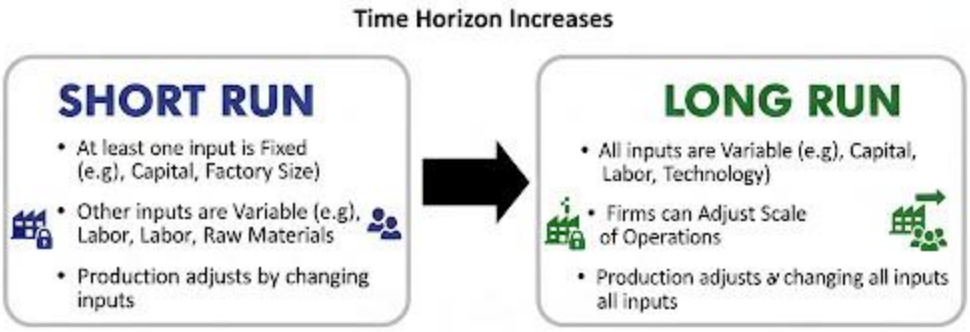
Figure 4.5: Short run versus long run



A diagram comparing short-run production decisions, which involve to inolve fixed inputs, to -long producion decissions and the scale of operations can change. The long run offers greater flexibility.

AI prompt: "Create a diagram comparing-short-production with fixed inputs and all inputs variable."
Search string: "short run vs lorng production economics diagram OER

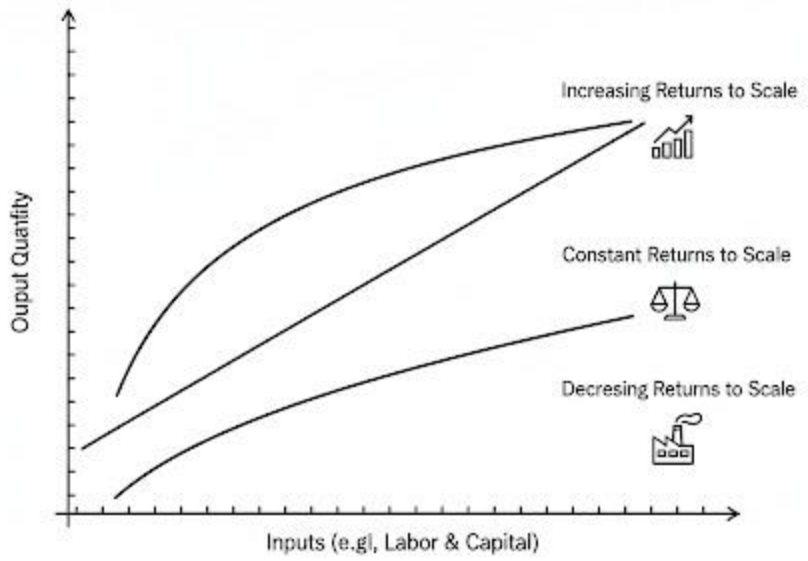
4.3.2 Returns to scale

Returns to scale describe how output changes when all inputs are increased proportionally. There are three main types:

- Increasing returns to scale: Output increases by a greater proportion than inputs.
- Constant returns to scale: Output increases by the same proportion as inputs.
- Decreasing returns to scale: Output increases by a smaller proportion than inputs.

Fill in the blank: When inputs double and output more than doubles, the firm experiences _____ returns to scale.

Figure 4.6: Returns to scale



A diagram illustrating the concepts of increaing curves repreasing, and decreasing to scale. The curves show how to output resporinal increases to all inputs over the long run.

AI prompt: "Create a graph showing thes segram OER." Search string: "returns economics diagram OER"

4.3.3 Isoquants and isocosts

An isoquant is a curve that shows all possible combinations of inputs that produce the same level of output. It is similar to an indifference curve in consumer theory but applied to production. An isocost line shows all possible combinations of inputs that can be purchased with a given budget. The point where an isoquant is tangent to an isocost line represents the optimal combination of inputs for a firm.

Fill in the blank: An isoquant shows combinations of inputs that yield the same level of _____.

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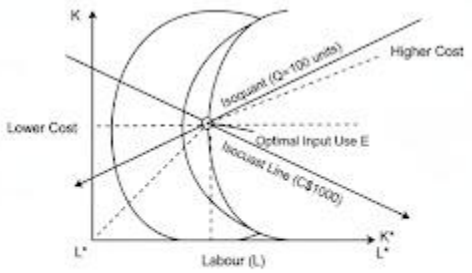

A diagram illustrating how ae firm minimizes the cost of be producng to given output level (Q=100 units) chooins a This occurs at the optimal combination to uand. This isconcy of iscost line between of tangacyincy and labour (E).
Search string: "isoquants and isocosts economics diagram OER"

4.3.4 Optimal combination of inputs

Firms aim to achieve the optimal combination of inputs, which occurs where the slope of the isoquant equals the slope of the isocost line. This ensures that the firm produces a given level of output at the lowest possible cost.

Fill in the blank: The optimal combination of inputs occurs where the isoquant is _____ to the isocost line.

Box 4.3: Key points in long-run production analysis

- All inputs are variable in the long run
- Returns to scale show how output responds propotional input changes
- Isoquants represent equal output levels
- Isocosts represent budget constraints
- Optimal input use occurs at tangancy between isoquant and iscost

AI prompt: "Generate a text box summmaring key poingn production analysis."
Search string: "long run production returns to scale isoquants iscosts OER"

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4.4 Costs of Production and Firm Behaviour

Costs are central to the decisions firms make. By understanding how costs arise and how they change with output, firms can plan production, set prices, and evaluate profitability. In this Part, we will examine the different types of costs, explore short-run and long-run cost curves, study the relationship between production and cost, and consider the implications for firm behaviour.

4.4.1 Types of costs

Fixed costs are expenses that do not change with the level of output, such as rent or salaries of permanent staff.

Variable costs change directly with output, such as raw materials or wages for casual labour.

Total cost is the sum of fixed and variable costs.

Average cost is total cost divided by the number of units produced.

Marginal cost is the additional cost incurred when producing one more unit of output.

Fill in the blank: Costs that remain constant regardless of output are called _____ costs.

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Table 4.2: Types of production costs and examples

Type of Cost	Description and Examples
Fixed Cost	Costs that dot vary with output (e.g), rent, insurance)
Variable Cost	Com of fixed with output (e.g), raw materials, labor wages
Total Cost	
Total Cost	Sum of fixed and variable costs TC = FC + VC)
Average Cost	Cost per unit oith outpuɒtput (AC = TC / Q)
Marginal Cost	(MC = Change in TC = $\frac{4}{2}$ Change of Q)

A table sumnarizing the different types of production costs withe defintions and examples. The text includes minor spelling errors consistent bitt previous text examples.

AI prompt: "Create a table showing typed (fixel, variable, total, average, mariginal."
Search string: "types of production costs economics table OER

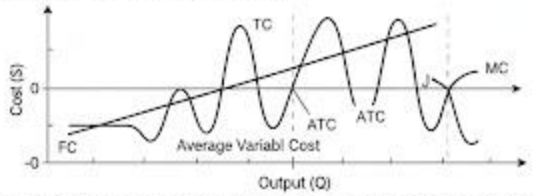
4.4.2 Short-run and long-run cost curves

In the short run, firms face both fixed and variable costs. Short-run cost curves include total cost, average cost, and marginal cost curves, which help firms decide the most efficient level of output.

In the long run, all costs are variable, and firms can adjust their scale of production. Long-run cost curves show economies of scale (falling average costs as output increases) and diseconomies of scale (rising average costs beyond a certain point).

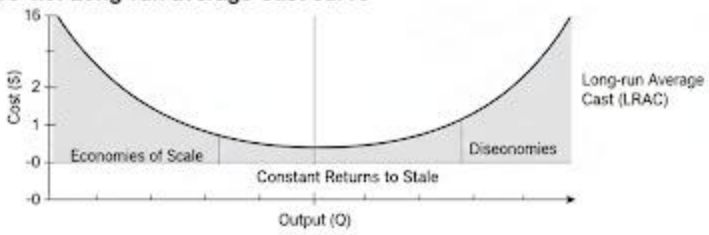
Fill in the blank: In the long run, firms experience economies of scale when average costs _____ as output increases.

Figure 4.8: Short-run cost curves



A graph illustrating the ghort-run cost curves showing total total, average cost, and marginal cost, anelst one fixed input is intersects Total cost of curvess at The average el cost at the lowest points.

Figure 4.9: Long-run average Cast curve



AI prompt: "Create graphs showing showing short-run curve and uscale." Search string: "short run acrurves economics diagram OER"

4.4.3 Relationship between production and cost

Production and cost are closely linked. As productivity increases, costs per unit tend to fall. For example, when marginal product rises, marginal cost falls, and when marginal product declines, marginal cost rises. This relationship helps firms understand how efficiency in production translates into cost savings.

Fill in the blank: When marginal product rises, marginal cost tends to _____.

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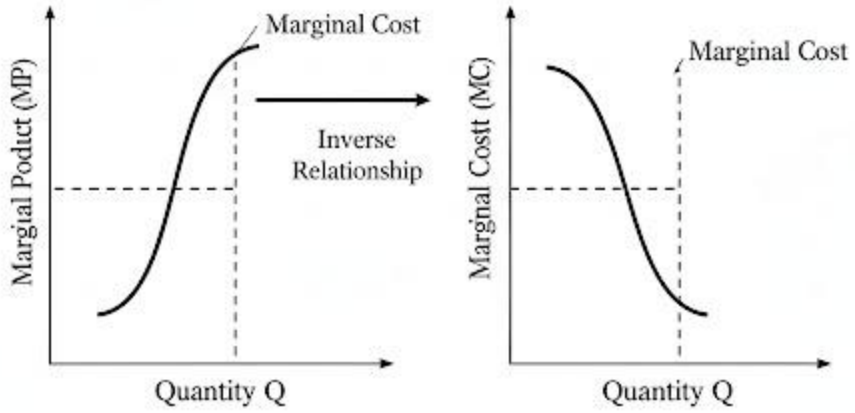
Figure 4.10: Relationship between marginal product and marginal cost



A diagram illustrating the inverise relationship between marginal product and mangral cost. The MC cuirror image of MP ror, showing that that when MP is rising, CC is faling, and when MP falling, C rising

AI prompt: "Create a diagram showing relationship between product and economis OER"
Search string: "between mangiral product and & economics diagram OER"

4.4.4 Implications for firm behaviour

Firms use cost analysis to make decisions about pricing, output, and expansion. By understanding cost structures, firms can identify the most efficient scale of production, set competitive prices, and plan for long-term growth. Cost behaviour also influences whether firms enter or exit markets, and how they respond to changes in demand or government policy.

Fill in the blank: Firms often set prices based on their _____ structure to remain competitive.

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Box 4.4: Applications of cost analysis in firm behaviour

- Determining efficient scale of production
- Setting competitive prices
- Planning expansion or contraction
- Responding to market demand changes
- Evaluating entry or exit decisions

AI prompt: "Generate a text box summarising cost analysis in firm behaviour."
Search string: "applications of cost analysis economics OER"

Series Summary

This Series has focused on how firms organise production, manage costs, and make decisions that shape their behaviour in the marketplace. Its purpose was to equip you with the tools to analyse the production process, understand the role of the firm, and evaluate how inputs are transformed into outputs efficiently. By linking production theory with cost analysis, you have gained insight into the foundations of firm decision-making.

We began by introducing the concept of production and the role of the firm, including the classification of production into primary, secondary, and tertiary activities. Then we examined production functions in the short run, exploring total, average, and marginal product alongside the law of diminishing returns. Following that, we studied long-run production, focusing on returns to scale, isoquants, and isocosts to determine optimal input combinations. Finally, we concluded with costs of production, analysing fixed, variable, total, average, and marginal costs, as well as short-run and long-run cost curves, and their implications for firm behaviour. In line with the Series Learning Outcomes, you should now be able to define, calculate, analyse, and evaluate production and cost concepts, and apply them to explain how firms operate and make strategic decisions.

Glossary of Terms

Average cost (AC): The total cost of production divided by the number of units produced, showing the cost per unit.

Average product (AP): The output per unit of input, calculated by dividing total product by the number of input units.

Decreasing returns to scale: A situation where output increases by a smaller proportion than the increase in inputs.

Economies of scale: Reductions in average cost as output increases, often due to efficiency gains from larger-scale production.

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Fixed cost: A cost that does not change with the level of output, such as rent or insurance.

Firm: An organisation that uses resources to produce goods and services for sale in the market.

Increasing returns to scale: A situation where output increases by a greater proportion than the increase in inputs.

Isoquant: A curve showing all possible combinations of inputs that produce the same level of output.

Isocost line: A line showing all possible combinations of inputs that can be purchased with a given budget.

Law of diminishing returns: The principle that as more units of a variable input are added to fixed inputs, the additional output eventually decreases.

Long run: A period in which all factors of production are variable, allowing firms to adjust their scale of operations.

Long-run average cost (LRAC): A curve showing how average costs change when all inputs are variable, reflecting economies and diseconomies of scale.

Marginal cost (MC): The additional cost incurred when producing one more unit of output.

Marginal product (MP): The additional output produced when one more unit of input is added, holding other inputs constant.

Production: The process of combining inputs such as labour, capital, and raw materials to create goods and services.

Production function: A representation showing the maximum output a firm can produce with given inputs and technology.

Returns to scale: The responsiveness of output when all inputs are increased proportionally, which may be increasing, constant, or decreasing.

Short run: A period in which at least one factor of production is fixed, limiting the firm's ability to adjust all inputs.

Total cost (TC): The sum of fixed and variable costs incurred in production.

Total product (TP): The overall quantity of output produced by a firm using a given amount of inputs.

Variable cost: A cost that changes directly with the level of output, such as raw materials or wages.

Concept Check Questions [Series 4]

Objective Questions

1.Which of the following best describes production?

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The act of selling goods

The process of combining inputs to create goods and services

The distribution of finished products

The consumption of goods

nked to SLO 4.1)*

2.In the short run, at least one factor of production is:

Variable

Fixed

Unlimited

Non-existent

nked to SLO 4.6)*

3.When inputs double and output more than doubles, the firm experiences:

Constant returns to scale

Increasing returns to scale

Decreasing returns to scale

Negative returns to scale

nked to SLO 4.7)*

4.Marginal cost refers to:

The cost of all inputs combined

The additional cost of producing one more unit of output

The average cost per unit

The fixed cost of production

nked to SLO 4.9)*

5.Isoquants represent:

Equal levels of cost

Equal levels of output

Equal levels of profit

Equal levels of demand

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nked to SLO 4.8)*

Short-Answer Questions

6. Define a production function and explain its significance.

(Linked to SLO 4.3)

1. Distinguish between fixed costs and variable costs with examples.

nked to SLO 4.9)*

1. Explain the law of diminishing returns and its implications for short-run production.

nked to SLO 4.5)*

1. What is the relationship between marginal product and marginal cost?

nked to SLO 4.11)*

1. State two applications of cost analysis in firm behaviour.

ked to SLO 4.12)*

Long-Answer Questions

11. Analyse the differences between short-run and long-run production, highlighting their impact on firm decisions.

(Linked to SLOs 4.6 & 4.7)

1. Evaluate the importance of isoquants and isocosts in determining the optimal combination of inputs.

ked to SLO 4.8)*

1. Discuss how economies and diseconomies of scale influence long-run average cost and firm behaviour.

ked to SLO 4.10 & 4.12)*

Answers to Concept Check Questions [Series 4]

Objective Questions

1. b) The process of combining inputs to create goods and services
2. b) Fixed
3. b) Increasing returns to scale
4. b) The additional cost of producing one more unit of output
5. b) Equal levels of output

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Short-Answer Questions

6. A production function shows the maximum output a firm can produce with given inputs and technology. It is significant because it illustrates the relationship between inputs and outputs.

7. Fixed costs remain constant regardless of output (e.g., rent), while variable costs change with output (e.g., raw materials).

8. The law of diminishing returns states that as more units of a variable input are added to fixed inputs, marginal product eventually decreases. This limits efficiency in the short run.

9. When marginal product rises, marginal cost falls; when marginal product declines, marginal cost rises.

10. Applications include setting competitive prices and determining efficient scale of production.

Long-Answer Questions

1

Basic response: In the short run, at least one input is fixed, while in the long run all inputs are variable. This affects firm decisions about scaling production.

Value-added response: Advanced learners may illustrate with examples, such as a factory constrained by machinery in the short run but able to expand capacity in the long run, showing how flexibility changes cost and output decisions.

2

Basic response: Isoquants show combinations of inputs that yield equal output, while isocosts show budget constraints. Their intersection guides firms to optimal input use.

Value-added response: Outstanding learners may apply this to real-world cases, such as a manufacturing firm balancing labour and capital, and explain how tangency ensures cost minimisation for a given output.

3

Basic response: Economies of scale reduce average costs as output increases, while diseconomies raise costs beyond a certain point.

Value-added response: Advanced learners may discuss how firms like airlines benefit from economies of scale in operations but face diseconomies when coordination and management become complex, influencing long-run strategies.

Answers to Pilot Questions [Series 4]

Part 1: Concept of production and the firm

- The process of combining inputs to create goods and services

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- An organisation that uses resources to produce goods and services for sale
- Primary, secondary, and tertiary production

Part 2: Production functions and short-run analysis

- A representation showing the maximum output a firm can produce with given inputs and technology
- Total product, average product, and marginal product
- The law of diminishing returns
- At least one factor of production is fixed

Part 3: Long-run production and returns to scale

- In the long run, all factors of production are variable
- Increasing, constant, and decreasing returns to scale
- Isoquants and isocosts
- Optimal input combination occurs at tangency between isoquant and isocost

Part 4: Costs of production and firm behaviour

- Fixed, variable, total, average, and marginal costs
- Short-run and long-run cost curves
- Relationship between marginal product and marginal cost
- Applications of cost analysis in firm behaviour

References and Attributions [Series 4]

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General References

- Mankiw, N. G. (2020). Principles of Economics (9th ed.). Cengage Learning.
- Sloman, J., Garratt, D., & Guest, J. (2018). Economics (10th ed.). Pearson Education.
- OpenStax. (2016). Principles of Economics. Rice University. Retrieved from https://openstax.org/books/principles-economics

Illustrations and Attributions

Figure 4.1: The concept of production

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- AI-generated using prompt: “Create a diagram showing inputs like labour, capital, and raw materials being transformed into outputs such as goods and services.”
- Suggested OER search string: “production process inputs outputs diagram OER.”

Box 4.1: Functions of the firm in the economy

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- Suggested OER search string: “functions of the firm economics OER.”

Table 4.1: Types of production and examples

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Figure 4.2: The production function

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Table 4.2: Example of total, average, and marginal product

- AI-generated using prompt: “Create a table showing total product, average product, and marginal product for different units of labour.”
- Suggested OER search string: “total average marginal product table OER.”

Figure 4.3: Total, average, and marginal product curves

- AI-generated using prompt: “Create a graph showing total product, average product, and marginal product curves on the same axes.”
- Suggested OER search string: “TP AP MP curves economics diagram OER.”

Figure 4.4: The law of diminishing returns

- AI-generated using prompt: “Create a graph showing marginal product rising initially and then falling as more labour is added.”
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Box 4.2: Key points in short-run production decisions

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Figure 4.5: Short run versus long run

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- Suggested OER search string: “short run vs long run production economics diagram OER.”

Figure 4.6: Returns to scale

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Figure 4.7: Isoquants and isocosts

- AI-generated using prompt: “Create a diagram showing isoquants and isocost lines with a tangency point representing optimal input use.”
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Figure 4.8: Short-run cost curves

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- Suggested OER search string: “short run cost curves economics diagram OER.”

Figure 4.9: Long-run average cost curve

- AI-generated using prompt: “Create a graph showing long-run average cost curve with economies and diseconomies of scale.”
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Figure 4.10: Relationship between marginal product and marginal cost

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- AI-generated using prompt: “Create a diagram showing the inverse relationship between marginal product and marginal cost.”
- Suggested OER search string: “relationship between marginal product and marginal cost economics diagram OER.”

Box 4.4: Applications of cost analysis in firm behaviour

- AI-generated using prompt: “Generate a text box summarising applications of cost analysis in firm behaviour.”
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Course code: ECO 101

Course title: PRINCIPLES OF ECONOMICS I
Course credit load: 2 unit

Series 1: Nature, Scope, and Methodology of Economics

Series 2: Historical Development of Economic Thought

Series 3: Demand and Supply Analysis

Series 4: Production Functions and the Firm

Series 5: Pricing of Factors and Market Structures

Series 5: Market Structures

Part 1 Perfect competition

- Characteristics of perfect competition
- Price determination under perfect competition
- Short-run and long-run equilibrium of the firm and industry
- Efficiency in perfect competition

Part 2 Monopoly

- Features of monopoly
- Sources of monopoly power
- Price and output determination under monopoly
- Welfare implications of monopoly

Part 3 Monopolistic competition

- Characteristics of monopolistic competition
- Product differentiation and advertising
- Short-run and long-run equilibrium
- Efficiency and excess capacity debate

Part 4 Oligopoly

- Features of oligopoly
- Models of oligopoly (Cournot, Bertrand, kinked demand curve)

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- Collusion and cartels
- Strategic behaviour and game theory applications

Introduction

Markets are the arenas where buyers and sellers interact, and the structure of these markets greatly influences how firms behave, how prices are set, and how resources are allocated. Understanding market structures is essential because they determine the level of competition, the efficiency of production, and the welfare of consumers. By studying them, you will see why some industries are highly competitive while others are dominated by a few firms or even a single producer.

The aim of this Series is to introduce you to the different types of market structures and to equip you with the analytical skills to explain how firms operate under each, how prices and outputs are determined, and what implications these have for efficiency and consumer welfare.

We shall commence this Series by examining perfect competition, focusing on its characteristics, price determination, and efficiency outcomes. Next, we will move on to monopoly, where we will explore sources of monopoly power and its impact on welfare. Following that, we will study monopolistic competition, considering product differentiation, advertising, and the debate on efficiency. Finally, we will conclude with oligopoly, analysing its features, models, and the role of strategic behaviour and game theory in shaping firm decisions.

Series Learning Outcomes

Upon completing Series 5: Market Structures, you should be able to:

- define the characteristics of perfect competition and explain how prices are determined in such markets,
- analyse short-run and long-run equilibrium of firms and industries under perfect competition,
- evaluate the efficiency outcomes of perfect competition,
- describe the features of monopoly and identify sources of monopoly power,
- demonstrate how price and output are determined under monopoly,
- assess the welfare implications of monopoly for consumers and producers,
- define the characteristics of monopolistic competition and explain the role of product differentiation and advertising,
- analyse short-run and long-run equilibrium in monopolistic competition,
- evaluate the efficiency debate surrounding monopolistic competition, including the issue of excess capacity,

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- describe the features of oligopoly and distinguish it from other market structures,
- compare and contrast different models of oligopoly such as Cournot, Bertrand, and the kinked demand curve,
- analyse the role of collusion and cartels in oligopolistic markets, and
- apply basic game theory concepts to explain strategic behaviour among oligopolistic firms.

5.1 Perfect Competition

Perfect competition represents the most competitive market structure, where many firms produce identical products and no single firm can influence the market price. In this Part, we will explore its characteristics, examine how prices are determined, and analyse equilibrium in both the short run and the long run. We will also consider the efficiency outcomes of perfect competition.

5.1.1 Characteristics of perfect competition

Perfect competition is a market structure characterised by the following features:

- A large number of buyers and sellers
- Homogeneous products (no differentiation)
- Free entry and exit of firms
- Perfect information available to all participants
- Firms are price takers, meaning they accept the market price as given

Fill in the blank: In perfect competition, firms are _____ takers, not price makers.

Box 5.1: Key features of perfect competition

- *Many buyers and sellers*
- *Homogeneous products*
- *Free entry and exit*
- *Perfect information*
- *Firms are price takers*

AI prompt: "Generate a text box summarising the key features of perfect competition."

Search string: "perfect competition characteristics economics OER"

5.1.2 Price determination under perfect competition

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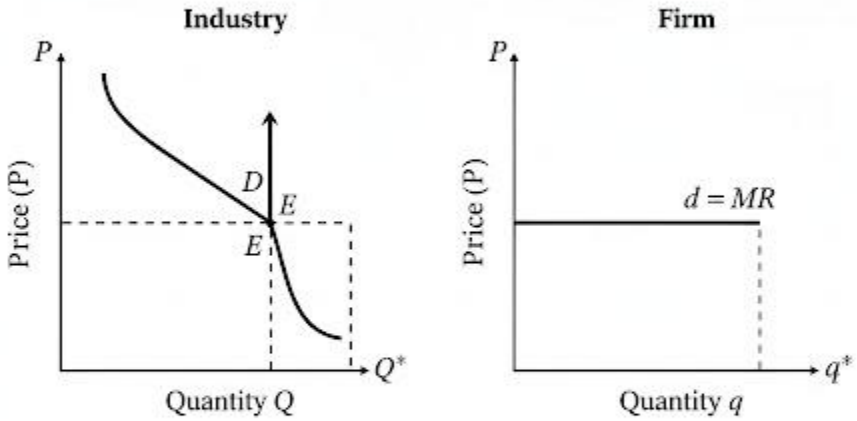
In perfect competition, the market price is determined by the interaction of demand and supply. Since products are identical, no firm can charge above the market price without losing customers. Each firm faces a perfectly elastic demand curve at the market price.

Fill in the blank: The demand curve faced by a firm in perfect competition is perfectly _____.

Figure 5.1: Price determnation under perfect competition



A diagram showing the determination of a equibritum price (P^* and quantity (P^* (Q^*) in a perfectly competitlive market, and a singe firm's horizotal derizottal demand curve at that price ($d = P^*$).

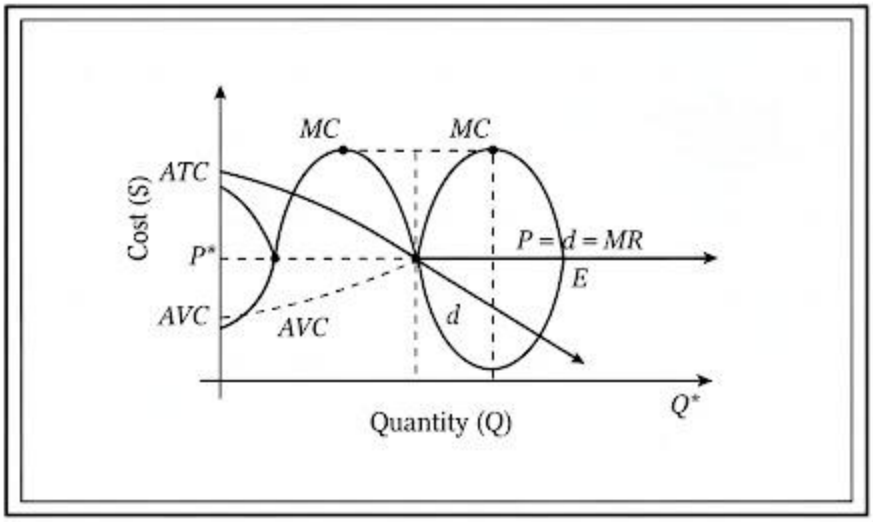
AI prompt: "Create a diagram showing market demand and supply curves deterning equibrum doram OER, alghide Search string: "perfect competition price determination diagram at that thER"

5.1.3 Short-run equilibrium of the firm and industry

In the short run, firms may earn supernormal profits, normal profits, or losses depending on their cost structures. The equilibrium occurs where marginal cost equals marginal revenue (MC = MR).

Fill in the blank: In short-run equilibrium, a firm maximises profit where _____ equals marginal revenue.

Figure 5.2: Short-run equilibbum of a firm



A diagram illustrating the short-run equilbrium of a perfectly competitive firm, where the price (P) is equal (P is marginal cost MC) and average total cost ATC. This results results zero economic profit at the equilbrium quantity (Q^{**}).

AI prompt: "Create a graph showing shront equilbium of a firm under perpetitith MC, and MR curves."
Search string: "short-run equilibrium perfect competition economics diagram OER

5.1.4 Long-run equilibrium of the firm and industry

In the long run, free entry and exit of firms ensure that only normal profits are earned. Supernormal profits attract new firms, increasing supply and lowering prices, while losses drive firms out, reducing supply and raising prices. The result is equilibrium where price equals average cost (P = AC).

Fill in the blank: In long-run equilibrium, firms in perfect competition earn only _____ profits.

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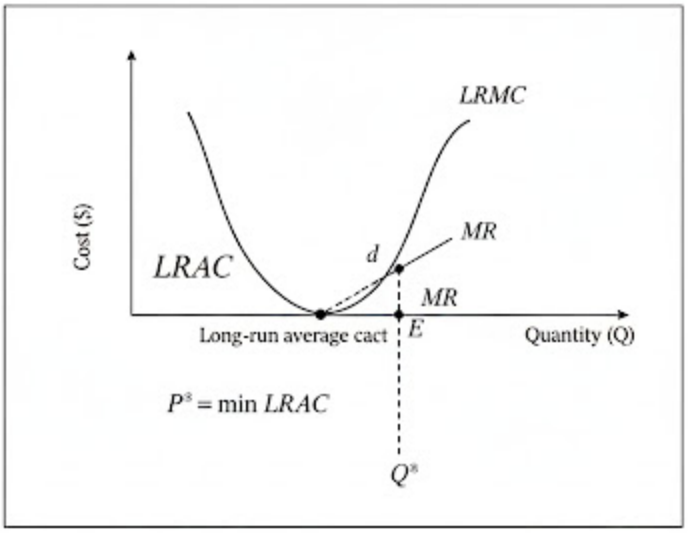
Figure 5.3: Long-run equilbrium of a firm



A diagram illustrating the long-run equilbrium of a perfectly con firm, where market price is equal P'the minimum point othe longe average curve LRAC. At the firm produces and earns zero economic profit.

AI prompt: "Create a graph showing long equilbrium of firm undect competition where price equals average cost ost"

Search string: "long run equilbrium perfect competition economics diagram OER"

5.1.5 Efficiency in perfect competition

Perfect competition is considered efficient because:

- Allocative efficiency: Resources are allocated where price equals marginal cost (P = MC).
- Productive efficiency: Firms produce at the lowest point on their average cost curve.
- Dynamic efficiency: In the long run, firms innovate to remain competitive, though this may be limited compared to other structures.

Fill in the blank: Allocative efficiency occurs when price equals _____ cost.

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Box 5.2: Efficiency outcomes in perfect competition

- *Allocative efficiency (P = MC)*
- *Productive efficiency (lowest AC)*
- *Dynamic efficiency (innovation in the long run)*

AI prompt: "Generate a text box summarising efficiency outcomes in perfect competition."

Search string: "efficiency in perfect competition economics OER"

5.2 Monopoly

A monopoly exists when a single firm dominates the market for a product or service, with no close substitutes available. This market structure gives the firm significant control over price and output, often leading to unique outcomes compared to competitive markets. In this Part, we will explore the features of monopoly, sources of monopoly power, price and output determination, and the welfare implications of monopoly.

5.2.1 Features of monopoly

Monopoly is a market structure characterised by:

- A single seller controlling the entire market
- No close substitutes for the product
- High barriers to entry preventing new firms from competing
- Significant control over price and output decisions

Fill in the blank: A monopoly is a market with a single _____ controlling supply.

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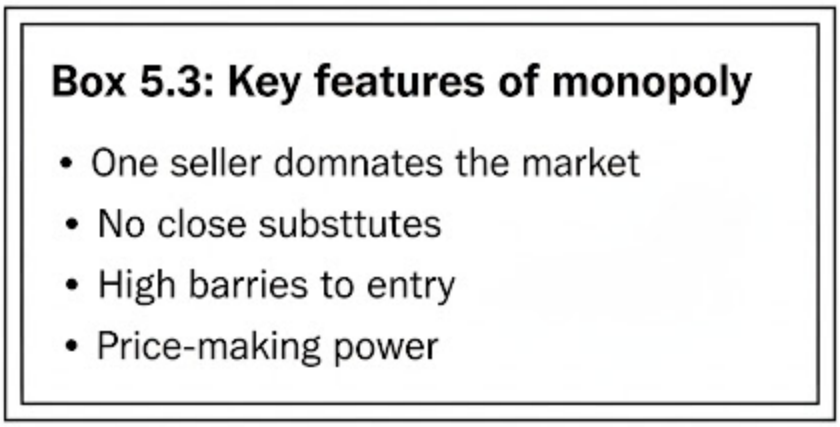

AI prompt: "Generate a text box summarising the key features of monopoly.".
Search string: "monopoly characteristics economics OER"

5.2.2 Sources of monopoly power

Monopoly power arises from several sources:

- Legal barriers: Patents, copyrights, or government licences
- Control of resources: Exclusive ownership of essential raw materials
- Economies of scale: Large firms producing at lower costs than potential entrants
- Strategic behaviour: Aggressive tactics to deter competition

Fill in the blank: Exclusive ownership of essential raw materials is an example of a _____ barrier to entry.

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Table 5.1: Sources of monopoly power

Source of Power	Description	Examples
	High fixed costs, decreasing averag cost	Utilities (water, electricity)
Government Barriers	Patents, licenses, copyrights, copyrights	Pharmatuticals, public transport
Ownnship of Key Resources	Exclusive control of an essential input	De Beers (diamonds)
Network Externalities	Value increases with more users	Social media, operatems

A table sumarrsing the different sources of monopoly power, with descriptions and exal smples. The text includes some minor spelling errors consistent bin prevous text examples.

AI prompt: "Create a table showing sources of monopoly power with descriptions and examples."
Search string: "sources of monopower economics table OER

5.2.3 Price and output determination under monopoly

Unlike firms in perfect competition, a monopolist faces the market demand curve directly. To maximise profit, the monopolist produces where marginal cost equals marginal revenue (MC = MR), but charges a price based on the demand curve at that output level. This often results in higher prices and lower output compared to competitive markets.

Fill in the blank: A monopolist maximises profit where marginal cost equals _____.

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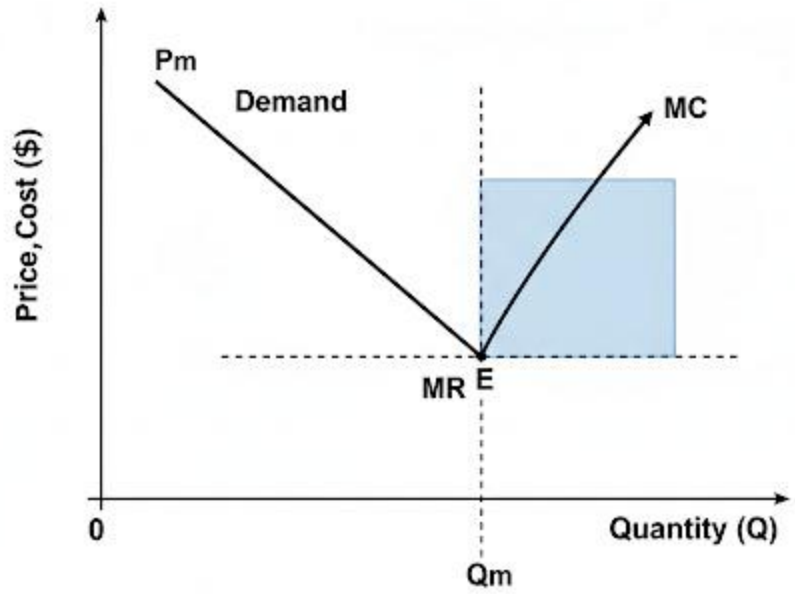
Figure 5.4: Price and output determnation under monopoly



A diagram illustrating the monopoly equlibrium, where firm produces quantity (P_m) where marginal revenue (MC), sets froe demand crom the demand curve ses at that quantity. The shaded area representt economic profit.

The AI prompt: "Create a graph showoly equlibrium with demand, marginal reventus curves".

Search string: "monopoly equiibrium price output economics diagram OER

5.2.4 Welfare implications of monopoly

Monopoly has important welfare implications:

- Consumer surplus is reduced due to higher prices and lower output.
- Producer surplus increases as the monopolist captures more profit.
- Deadweight loss occurs because some mutually beneficial trades do not happen.
- Dynamic effects: Monopolies may innovate due to large profits, but they may also become inefficient without competition.

Fill in the blank: The welfare loss caused by monopoly is often illustrated as _____ loss.

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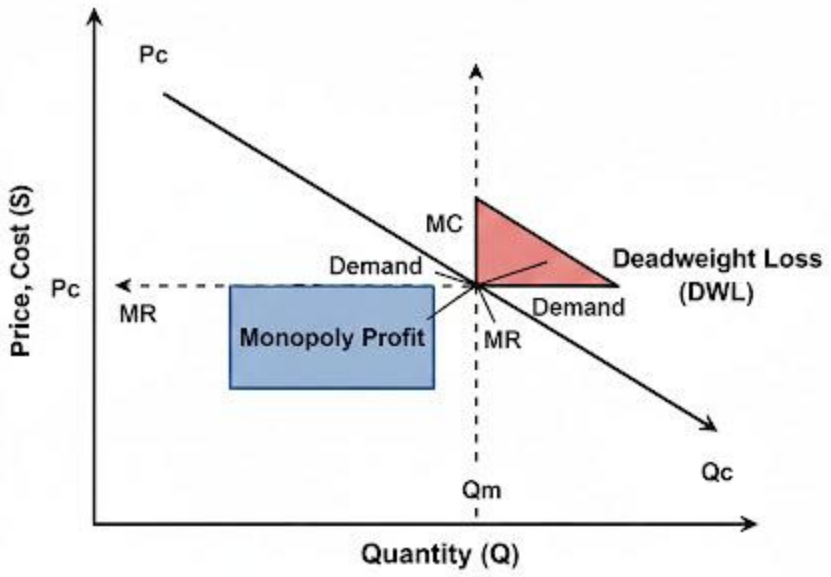
Figure 5.5: Welfare Implications of Monolopy



A diagram illustrating the welfare loss due monololy, comparing competitive equilbrium (Pc,) (Pc, Qm). The monololy restrics output and charget to to higher price, resulting economic profit and a deadewefft loss.

AI prompt: "Create an diagram showing deadweifft loss under compared to perfect competition."
Search string: "deadweild dealbas monoploly economics diagram OER

5.3 Monopolistic Competition

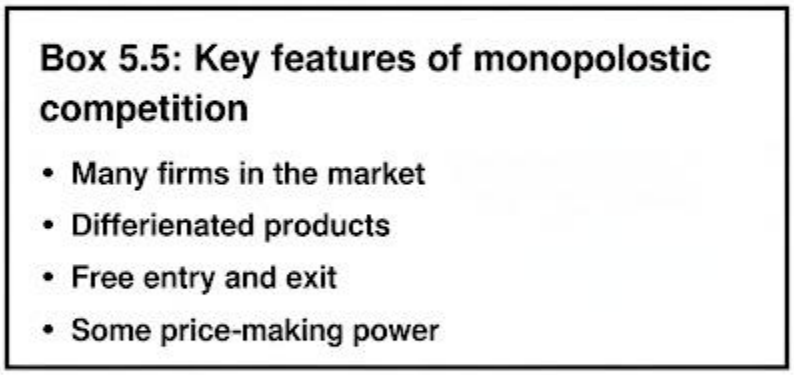
Monopolistic competition is a market structure that combines elements of both competition and monopoly. Firms compete with many others, but each offers a slightly differentiated product. This differentiation gives firms some degree of market power, even though entry and exit are relatively easy. In this Part, we will explore the characteristics of monopolistic competition, the role of product differentiation and advertising, short-run and long-run equilibrium, and the efficiency debate surrounding this structure.

5.3.1 Characteristics of monopolistic competition

Monopolistic competition is characterised by:

- A large number of firms in the market
- Differentiated products (each firm offers something slightly unique)
- Free entry and exit of firms
- Some control over price due to product differentiation

Fill in the blank: In monopolistic competition, firms sell _____ products rather than identical ones.



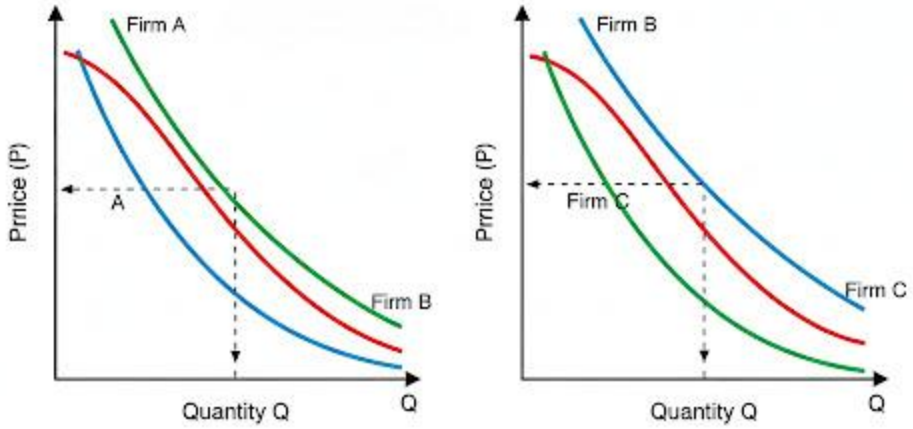
AI pronpt: "Generate a text box summarising the key feautures of competition."
Search string: "monopolosic competition characteristics economics OER"

5.3.2 Product differentiation and advertising

Product differentiation refers to the process by which firms make their products distinct from competitors, whether through quality, branding, packaging, or customer service. Advertising plays a crucial role in reinforcing differentiation and influencing consumer preferences.

Fill in the blank: Advertising in monopolistic competition is used to strengthen _____ among products.

Figure 5.6: Product differenitation in monopolistic competition



A diagram illustrating product diffenitation under mompolstic competition, where each firm firm face a uniquat-sloping demoznd demand curve for its distinct product. The curves are similar, but non-price factors, dut no the changes in orfirrm factors like bronduct and features.

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5.3.3 Short-run and long-run equilibrium

In the short run, firms in monopolistic competition may earn supernormal profits due to successful differentiation. However, in the long run, free entry of new firms erodes these profits, leading to normal profits. The equilibrium occurs where marginal cost equals marginal revenue (MC = MR), but price remains above average cost due to differentiation.

Fill in the blank: In the long run, firms in monopolistic competition earn only _____ profits.

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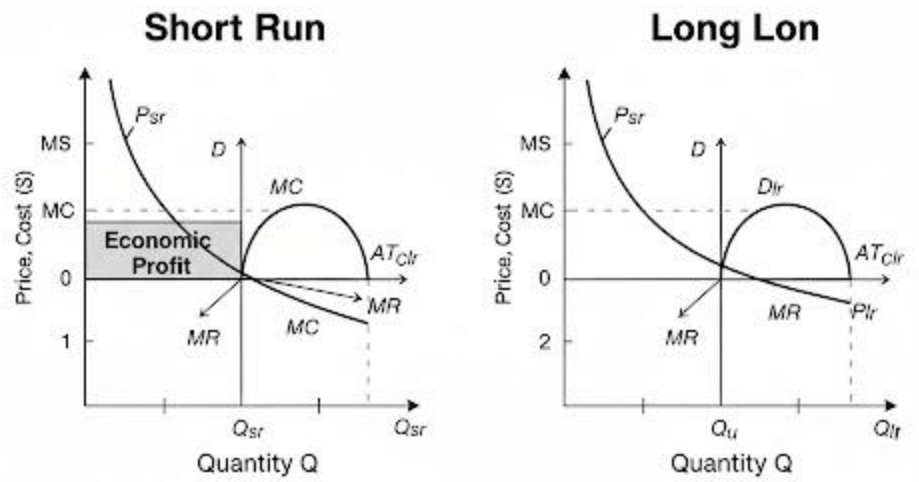
Figure 5.7: Short-run and long-run equilblium in monopolstic competition



A diagram illustrating the short-run and equilbrum in monopoltic competition. In the short run, firms earn proft the shen free entry of new firms shifts shifts demand demand curve to un the long run zero econonic profte price equal average cast ($P_{lr} = AT_{Clr}$)

AI prompt: "Create a graph showing and long-equilbrium in monpotition with MC, MR, and AC curves."
Search string: "short run run equilbunompetition economics diagram OER

5.3.4 Efficiency and excess capacity debate

Monopolistic competition raises questions about efficiency:

- Allocative efficiency is not achieved because price exceeds marginal cost (P > MC).
- Productive efficiency is not achieved because firms do not produce at the lowest point of average cost.
- Excess capacity occurs when firms produce below the level that minimises average cost, leading to underutilisation of resources.

Fill in the blank: Excess capacity occurs when firms produce below the level that minimises _____ cost.

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Box 5.6: Efficiency outcomes in monopolistic competition

- Allocative inficicienity (P > MC)
- Productive inficcienity (not at the lowest AC)
- Excess capacity debate

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5.4 Oligopoly

Oligopoly is a market structure where a few large firms dominate the industry. Because of the small number of competitors, each firm's decisions about price, output, and strategy directly affect the others. This interdependence makes oligopoly unique and often complex to analyse. In this Part, we will explore its features, models, collusion and cartels, and the role of strategic behaviour and game theory.

5.4.1 Features of oligopoly

Oligopoly is characterised by:

- A few large firms controlling most of the market share
- Products may be homogeneous (e.g., steel) or differentiated (e.g., cars)
- High barriers to entry
- Interdependence among firms in decision-making

- Potential for collusion or rivalry

Fill in the blank: In oligopoly, firms are highly _____ in their decision-making.

Box 5.7: Key features of oligoply

- Few daminant firms
- Homeeghenoue or differenated products
- High barries to entry
- Possibility of collusion

AI prompt: "Generate a text box summarising the key features of monololy.".
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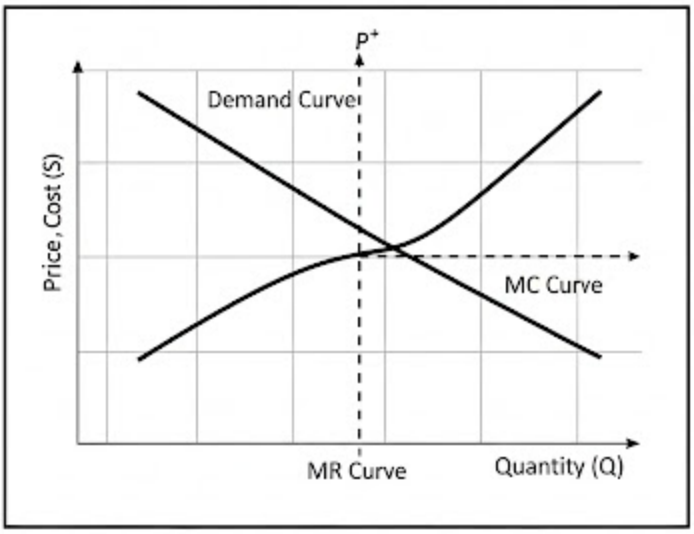
5.4.2 Models of oligopoly

Several models explain oligopolistic behaviour:

- Cournot model: Firms choose output levels simultaneously, assuming rivals' output is fixed.
- Bertrand model: Firms compete by setting prices, often leading to very low prices.
- Kinked demand curve model: Assumes firms face a demand curve that is more elastic for price increases and less elastic for price decreases, leading to price rigidity.

Fill in the blank: The _____ model of oligopoly explains price rigidity through a kinked demand curve.

Figure 5.8: Kinked demand curve model of oligoply



A diagram illustrating the kinked demand curve model of oligololy. The demand curve is kinked kinked at the prevaling (P*), and quantity (P*). The marginal revenue (MR) curve has the discorcoturiit at Q, which the *vertical (MC'* the mat curve passes through, explaainny. *Here* sppelling error spelling errors consistent prevoius text examples.

AI prompt: "Create a graph showing kinked demand curve with marginal revenue disconcutuity"

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5.4.3 Collusion and cartels

Firms in oligopoly may collude to maximise joint profits, forming cartels. Collusion can be explicit (formal agreements) or tacit (informal understanding). Cartels often restrict output and raise prices, but they are usually illegal in many countries.

Fill in the blank: A formal agreement among firms to fix prices or output is called a _____.

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Table 5.2: Collusion and cartels in oligoply

Type of Collusion	Description	Examples
Formal Collusion	Explicit agreements to fix prices or output	OPEC (oil cartel)
Tacit Collusion as a single monooply	Implicit coorditation without formal agreements	Diamond (airlines)

A table sumarsing the types ofypes of collusion that can occur in an oligolpoly market. The text The text includes some minor spelling errors consistent with prevouis text examples.

AI pronpt: “Create in table showing types in oligosioly in oligopooly with desciptions and examples”.

Search string: “collusion cartels oligpooly economics table OER

5.4.4 Strategic behaviour and game theory

Because firms are interdependent, strategic behaviour is central to oligopoly. Game theory provides tools to analyse how firms anticipate rivals’ actions. The prisoner’s dilemma illustrates why firms may not cooperate even when it is mutually beneficial.

Fill in the blank: The prisoner’s dilemma is a classic example of _____ theory applied to oligopoly.

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Figure 5.9: Game theory in oligoply

	Firm B: Low Price		High Price	
Firm A: $50	$50 $50	Firm A: $100	$–80 –520
Firm A: $50	–20 $50	–20 $100	$80 $80

★ Nash Equilbilium (Low Price, Digh: Prisim)

A diagram illustrating the payyof matrix for the a prisoner's dilllema in oligoply. Each firm chtween a high and low price stratefy, and resulify, and resulting payoffs shw the incentive the incemtive for choose firms tochose a low price, leading, leading a subostpmal outcome.

AI prompt: "Create a diagram showing payoff matrix for prisoner's dilllema in oligoooly".

Search string: "game theory prisoner's dilllema oligopoly economics diagram OER

Series 5 Summary: Market Structures

This Series has examined how different market structures shape firm behaviour, pricing, efficiency, and consumer welfare. Its purpose was to equip you with the analytical tools to compare and contrast the outcomes of competition, monopoly, monopolistic competition, and oligopoly, and to evaluate their implications for the economy.

We began by studying perfect competition, highlighting its characteristics, price determination, and efficiency outcomes. We then analysed monopoly, exploring sources of monopoly power, how price and output are determined, and the welfare implications of monopolistic control. Next, we turned to monopolistic competition, focusing on product differentiation, advertising, equilibrium in the short and long run, and the debate on efficiency and excess capacity. Finally, we concluded with oligopoly, examining its features, models such as Cournot, Bertrand, and the kinked demand curve, the role of collusion and cartels, and the application of game theory to strategic behaviour.

By completing this Series, you should now be able to:

- Define and explain the characteristics of each market structure

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- Analyse equilibrium outcomes under different competitive conditions
- Evaluate efficiency and welfare implications across market structures
- Apply theoretical models to explain firm behaviour in oligopolistic markets

Series 5 Glossary: Market Structures

Allocative efficiency: A situation where resources are distributed such that price equals marginal cost (P = MC).

Barriers to entry: Obstacles that prevent new firms from entering a market, such as patents, high startup costs, or control of resources.

Bertrand model: An oligopoly model where firms compete by setting prices, often driving prices down to marginal cost.

Cartel: A formal agreement among firms to fix prices or output, restricting competition.

Collusion: Cooperation among firms in an oligopoly to reduce competition, which may be explicit or tacit.

Constant returns to scale: When output increases in the same proportion as inputs.

Cournot model: An oligopoly model where firms compete by choosing output levels, assuming rivals' output is fixed.

Deadweight loss: The loss of economic efficiency that occurs when equilibrium is not achieved, often due to monopoly pricing.

Differentiated products: Goods or services distinguished by branding, quality, or other features, common in monopolistic competition.

Excess capacity: A situation in monopolistic competition where firms produce below the level that minimises average cost.

Game theory: A framework for analysing strategic interactions among firms, especially in oligopoly.

Homogeneous products: Identical goods with no differentiation, typical in perfect competition.

Kinked demand curve: An oligopoly model suggesting price rigidity because demand is more elastic for price increases and less elastic for decreases.

Monopolistic competition: A market structure with many firms offering differentiated products and free entry and exit.

Monopoly: A market structure dominated by a single firm with no close substitutes and high barriers to entry.

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Normal profits: The minimum level of profit required to keep a firm in business, typically earned in long-run equilibrium.

Oligopoly: A market structure dominated by a few large firms, characterised by interdependence and potential collusion.

Perfect competition: A market structure with many firms producing identical products, free entry and exit, and firms as price takers.

Price taker: A firm that must accept the market price, typical in perfect competition.

Prisoner's dilemma: A game theory scenario showing why firms may not cooperate even when it is mutually beneficial.

Productive efficiency: Achieved when firms produce at the lowest point on their average cost curve.

Supernormal profits: Profits above the normal level, often earned in the short run under monopoly or monopolistic competition.

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