

Cambridge AS & A Level · Economics 9708 · Notes

Scarcity, choice and opportunity cost AS

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What you need to know

By the end of this topic you should be able to:

1. **Explain the fundamental economic problem of scarcity:** people's wants are unlimited, but the resources that can satisfy them are limited.
2. **Explain why choices must be made at every level:** by individuals (consumers and workers), by firms and by governments, because none of them can have everything they want.
3. **Define opportunity cost and show how it arises from choices:** it is the next best alternative given up when a choice is made.
4. **State and explain the three basic questions** every economy has to answer when it allocates its resources: **what** to produce, **how** to produce it and **for whom** to produce it.

Production possibility curves are a separate topic, but Paper 2 essays often ask you to show scarcity, choice and opportunity cost on one, so this note shows how.

Understand it

The fundamental economic problem

People want food, housing, healthcare, phones, holidays, cleaner air, and when they get them they want more and better. **Wants are unlimited.** The things that make goods and services are the **factors of production** (land, labour, capital and enterprise), and there is only so much of each at any time. **Resources are limited (finite).**

Scarcity is this gap: there are not enough resources to produce everything that everyone wants. It is not the same as poverty. A rich family and a rich country still face scarcity, because they still want more than they can have, and their time is limited too. The only way to remove scarcity would be to have enough resources to satisfy every want, which never happens, so scarcity is a problem for every economy, rich or poor, market or planned.

Scarcity is also not the same as a shortage. A shortage is a market with more demanded than supplied at the current price, which a price change can clear. Scarcity is permanent.

Scarcity forces choice

Because resources cannot meet every want, they must be **allocated**: someone has to decide what they are used for. That is **choice**, and it happens at every level:

Who chooses	What is limited	An example choice
Individuals as consumers	Income and time	Buy a laptop or go on holiday; spend now or save
Individuals as workers	Time and skills	Take a job or go to university; work overtime or keep the leisure
Firms	Land, labour, capital, finance	Which products to make, which machines to buy, where to locate
Governments	Tax revenue and borrowing	Spend on healthcare, education or defence; which roads to build

Economists assume these decision makers try to get the most benefit they can from their limited resources.

Opportunity cost

Every choice closes off the other things the same resources, money or time could have done. **Opportunity cost is the next best alternative forgone** (given up) when a choice is made. Two parts of that definition matter:

- **next best**: only the single alternative you would have chosen instead, not every alternative;
- **forgone**: it is what you lose by choosing, not what you gain and not the price you pay.

So the chain behind the whole subject is

scarcity → choice → opportunity cost.

A farmer can plant one field with maize, beans or cotton, and would pick them in that order. If she plants maize, the opportunity cost is **the beans** only, not the beans and the cotton together.

Opportunity cost need not be money. It can be time, leisure, goods or a service:

- a government that closes shops during an emergency gives up **the goods and services those shops would have produced**;
- a hospital that moves money from new buildings to patient care gives up **the buildings** it would have put up, not the sum of money;
- a person who spends an evening at a film gives up **the next best use of the evening**, for example earnings from a shift.

When the alternative is paid work, the opportunity cost is often measured in money: a person who earns 25 dollars an hour and takes 4 hours off gives up $25 \times 4 = 100$ dollars of earnings.

What changes an opportunity cost? Anything that changes the value of the **alternative**. If the next best job pays more, staying in your current job costs you more. If it pays less, your choice costs you less.

Free goods such as air in most places use no scarce resources, so they have no opportunity cost. Something that is free **to you**, such as a state school, still has one: the resources used to provide it could have been used elsewhere.

The three basic questions

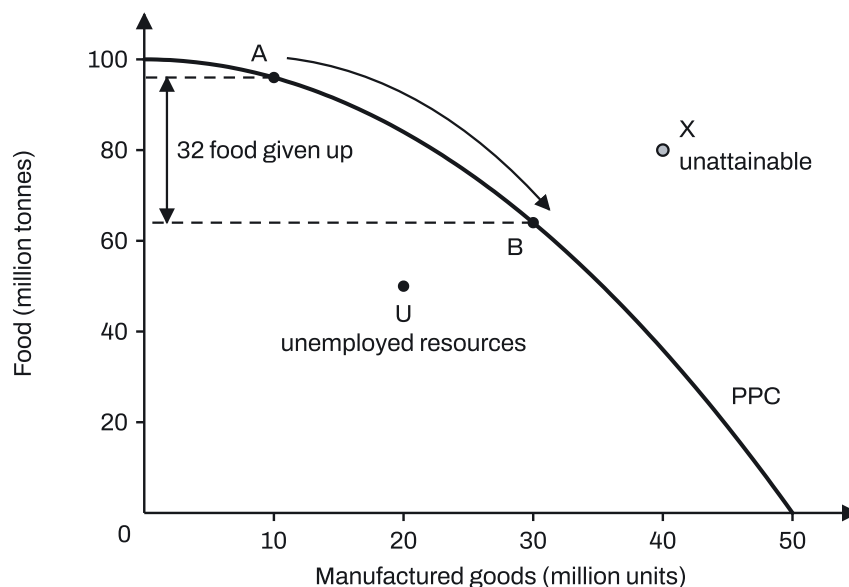
Every economy has to decide how to allocate its scarce resources. That comes down to three questions:

- **What to produce?** Which goods and services, and how much of each: more hospitals or more roads, more food or more manufactured goods.
- **How to produce?** Which combination of factors: labour-intensive methods (many workers) or capital-intensive ones (more machines), and which technology.
- **For whom to produce?** Who gets the output: it depends on who has income and wealth in a market, or on what the government decides in a planned economy.

Different economic systems answer them in different ways (the price mechanism, government planning, or a mix); that is the topic on resource allocation in different economic systems.

Showing all three ideas on a production possibility curve

A **production possibility curve (PPC)** shows the maximum combinations of two goods an economy can produce when it uses all its resources fully and efficiently, with its current technology. Label the axes with two real goods, never "P and Q" or "X and Y".



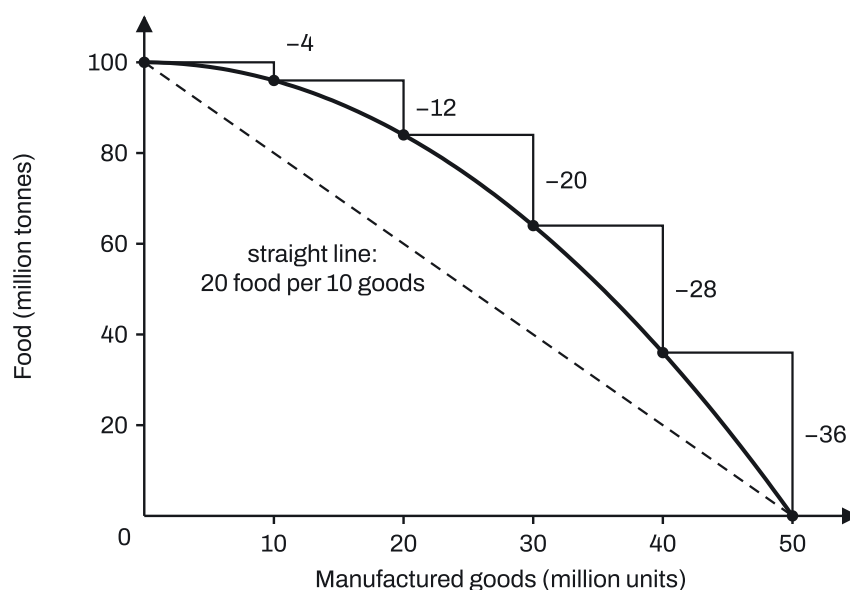
- **Scarcity** is the curve itself: there is a limit to what the economy can make, so combinations beyond it, such as X, cannot be reached with today's resources and technology. (Scarcity is the boundary, not the point X.)

- **Choice** is picking **one point on the curve**, or **moving along the curve** from one point to another: the economy can have A or B, not both.
- **Opportunity cost** is what the move along the curve gives up. From A to B the economy gains $30 - 10 = 20$ million manufactured goods and gives up $96 - 64 = 32$ million tonnes of food.
- A point inside the curve, such as U, means some resources are **unemployed**. There, more of one good can be made without giving up any of the other, so the opportunity cost of using the idle resources is close to zero.

Is every choice's opportunity cost the same?

It depends on the shape of the PPC. The curve above comes from this table:

Manufactured goods (million units)	0	10	20	30	40	50
Food (million tonnes)	100	96	84	64	36	0
Food given up for the last 10 manufactured goods		4	12	20	28	36



- **Concave PPC (bowed out): increasing opportunity cost.** Each extra 10 million manufactured goods costs more food than the one before: 4, then 12, then 20 million tonnes. The reason is that resources are **not equally good at everything**. The first land and workers moved out of farming are the ones least suited to it, so little food is lost; the last ones moved are the best farmland and most skilled farmers, so a lot of food is lost for each extra manufactured good.
- **Straight-line PPC: constant opportunity cost.** If resources were equally suited to both goods, every 10 manufactured goods would cost the same amount of food (20 million tonnes on the dashed line). This is rare in a whole economy.
- **Inside the curve**, a choice can have almost no opportunity cost, because idle resources are put to use.

So not every choice has an equal opportunity cost: it depends on the shape of the curve, on how suitable the resources are for each good, and on whether there are unemployed resources.

Key facts and formulas

This topic has no formula list in the exam. "Learn it" means you must remember it.

Fact	Status
Scarcity: unlimited wants, limited (finite) resources	Learn it
Scarcity forces choice at every level: individuals, firms and governments	Learn it
Opportunity cost: the next best alternative forgone when a choice is made	Learn it
The three basic questions: what to produce, how to produce, for whom to produce	Learn it
Opportunity cost in earnings = hourly pay × hours given up	Learn it
On a PPC: opportunity cost of a move = amount of the other good given up	Learn it
Opportunity cost of one more unit of X = $\frac{\text{units of Y given up}}{\text{units of X gained}}$	Learn it
Concave PPC: increasing opportunity cost; straight-line PPC: constant opportunity cost	Learn it
A free good has no opportunity cost	Learn it

How to do it

In the questions we have tagged for this topic (20 questions, 2021–2025), we counted only the part about this topic: one part in each question, so 20 parts.

Question type	Questions
Multiple choice (concept)	16
Multiple choice (calculation or diagram)	2
Essay part (a), 8 marks	2

1. Multiple choice (concept) (16 questions)

- Recall the definitions:** scarcity = unlimited wants, limited resources; opportunity cost = next best alternative forgone.
- Decide what the question asks:** the meaning of scarcity, what the opportunity cost is in a story, what would change it, or which three questions an economy faces.
- Cross out** options that name a price, a benefit, a cost to other people, a shortage in one market, or something from another topic.

Variations you will meet:

- **The basic economic problem and scarcity** (6 questions). The problem is **limited resources and unlimited wants**, so scarcity affects every person and every country, however rich. Only resources great enough to satisfy **every** want would remove it; anything that just balances one market, or the government's finances, still leaves wants greater than resources. Using scarce resources **efficiently** eases the problem. Scarcity of one resource means there is not enough of it to meet everything it is wanted for. The order of the ideas is **scarcity** → **choice** → **opportunity cost**.
- **What is the opportunity cost here?** (7 questions) Find the **next best alternative** that is given up: for a ranked list, the option ranked second; for a person, the next best job's pay or the one good the money would otherwise have bought; for an organisation, the use its resources would otherwise have gone to, usually a lost service or lost output. It is **not** a sum of money, not every alternative and not the benefit of the choice.
- **What changes the opportunity cost?** (1 question) Change the value of the **alternative**. A student who chooses a degree over a paid apprenticeship gives up the apprentice's earnings, so lower apprentice wages **decrease** the opportunity cost. Changes to the degree itself (how many take it, how many get top grades) do not.
- **The three basic questions** (1 question): **what**, **how** and **for whom** to produce. "When" and "where" are not among them.
- **A scarcity story that tests a type of good** (1 question): when a clean-air benefit is enjoyed by everyone, including those who did not pay, and one person's enjoyment does not reduce anyone else's, that is non-rival consumption (see the topic on classification of goods and services).

2. Multiple choice (calculation or diagram) (2 questions)

1. **Identify the next best alternative.**
2. **Value it** in the units asked (dollars, goods or welfare).
3. **Multiply by the time**, or add up over the options, as the question needs.

Variations you will meet:

- **Earnings given up:** a person paid 30 dollars an hour who spends 5 hours on something else gives up $30 \times 5 = 150$ dollars of earnings. That is the opportunity cost; the price paid for the activity chosen is **not** added to it.
- **Allocating a fixed budget between two uses to get the most welfare:** work out the **total** welfare for each split and choose the largest. A city has 12 million dollars to split between parks and public transport, in blocks of 4 million. With the welfare from each use as below, 8 million on parks and 4 million on transport gives the most:

Parks (\$m)	Transport (\$m)	Welfare from parks	Welfare from transport	Total
0	12	0	62	62
4	8	30	54	84
8	4	50	36	86
12	0	60	0	60

The more is spent on one use, the less each extra block adds, so the best split is usually some of each.

3. Essay part (a), 8 marks (2 questions)

Paper 2 Section B essays open with an 8-mark part (a) that is **point-marked**: up to **3** marks for knowledge and understanding (AO1), up to **3** for analysis (AO2) and up to **2** for evaluation (AO3, one of which is kept for a justified conclusion). A typical question asks you to use a PPC to explain the three ideas of this topic, and then to consider something about them, such as whether opportunity cost is always the same.

Answer plan, about one side of writing:

1. **A labelled PPC diagram** (AO1): two named goods on the axes, the curve **touching both axes**, two points on the curve (A and B) and the move between them.
2. **Define and explain** (AO1): scarcity is unlimited wants with finite resources, so choices must be made; opportunity cost is the next best alternative forgone.
3. **Apply each concept to the PPC separately** (AO2), one developed point each:
 - **scarcity** is shown by the curve itself, the limit of what can be produced (not by a point outside it);
 - **choice** is choosing a point on the curve, a movement along it;
 - **opportunity cost** is the amount of the other good given up in that movement; say how much, read from your diagram.
4. **The other side** (AO3, 1 mark): whether opportunity cost is equal depends on the **shape** of the PPC (concave: rising, because resources are not equally suited to both goods; straight line: constant) and on whether there are **unemployed resources** (inside the curve the cost is close to zero).
5. **Justified conclusion** (AO3, 1 mark): answer the question and say **why**, for example "in most economies choices do not have equal opportunity costs, because resources are specialised, so the curve is concave; only at full employment is there any cost at all."

Variations you will meet:

- **"Explain how a PPC can be used to demonstrate scarcity, choice and opportunity cost"** (no "consider"): the 8 marks are 2 for what a PPC shows (maximum output (1) with given resources and technology (1)) and 2 for each concept (what it means (1) + how the PPC shows it (1)). Keep the three concepts clearly separate.
- **"Explain the fundamental economic problem"**: unlimited wants, finite resources, therefore choice and opportunity cost, then the three basic questions. If the command word is only "explain", evaluation earns nothing, so don't spend time on it.

A diagram without explanation earns little: every feature you draw must be explained in words.

Worked examples

Example 1

A private tutor earns 25 dollars an hour. One evening he decides not to teach and goes to a concert for 4 hours instead. The concert ticket costs 30 dollars.

What is the opportunity cost of going to the concert?

- **A** 30 dollars
- **B** 70 dollars
- **C** 100 dollars
- **D** 130 dollars

[1]

The next best alternative is 4 hours of tutoring, which would have earned $25 \times 4 = 100$ dollars. The answer is **C**. (1)

A is the ticket price, which is what the concert costs, not what is given up by not teaching. B ($100 - 30$) and D ($100 + 30$) mix the price into the earnings forgone.

Example 2

A bank clerk chooses to leave her job to open her own café.

What would **decrease** the opportunity cost of this choice?

- **A** a fall in the salaries paid to bank clerks
- **B** a rise in the number of people who visit cafés
- **C** a rise in the price of coffee beans
- **D** a rise in the number of bank clerks leaving to start businesses

[1]

Her next best alternative is staying a bank clerk, so the opportunity cost is the clerk's salary she gives up. A lower salary means she gives up less. The answer is **A**. (1)

B and C change how well the café does, not the value of the alternative. D does not change what she personally gives up.

Example 3

Using a PPC diagram for capital goods and consumer goods, explain how scarcity, choice and opportunity cost arise in an economy, and consider whether each extra unit of capital goods costs the economy the same amount of consumer goods. [8]

Diagram: a concave PPC with "Capital goods" on the horizontal axis and "Consumer goods" on the vertical axis, touching both axes, points A and B on the curve (B with more capital goods), and a point U inside the curve. (AO1, 1)

Scarcity means that people's wants are unlimited but the factors of production available to meet them are finite (AO1, 1), so an economy cannot produce everything it wants and has to decide how to use its resources (AO1, 1).

On the diagram, scarcity is shown by the PPC itself: it marks the most the economy can produce with its current resources and technology, and any point beyond it cannot be reached (AO2, 1). Choice is shown by choosing one point on the curve, such as A or B, which is a movement along the PPC (AO2, 1). Opportunity cost is the next best alternative forgone: moving from A to B gains capital goods but gives up the consumer goods shown by the fall on the vertical axis (AO2, 1).

The opportunity cost is not always the same. Because the PPC is concave, each extra unit of capital goods costs more consumer goods than the last, since the resources moved later are less suited to making machines; only if resources were equally suited to both goods would the PPC be a straight line with a constant opportunity cost. And if the economy is at U, with unemployed resources, it can produce more capital goods without giving up any consumer goods (AO3, 1).

So the opportunity cost of more capital goods is usually not the same each time: it rises as more resources are switched, and it is only incurred at all when the economy is already on its PPC (AO3, 1, justified conclusion).

Total: $3 + 3 + 2 = 8$.

Example 4

Explain how the fundamental economic problem affects the decisions of individuals, firms and governments, and consider whether economic growth can solve the problem of scarcity. [8]

The fundamental economic problem is that wants are unlimited while resources are finite, so there is scarcity (AO1, 1). Because of it, choices must be made about what to produce, how to produce it and for whom (AO1, 1), and every choice has an opportunity cost, the next best alternative forgone (AO1, 1).

An individual with a limited income must choose between goods: a student who spends her savings on a laptop gives up the holiday she would have taken next, so she buys the laptop only if she values it more (AO2, 1). A firm with limited finance must choose what to produce and how: if it spends on new machinery, it cannot hire the extra workers the same money would have paid for (AO2, 1). A government with limited tax revenue must choose between services: building a new hospital means giving up the school it could otherwise have built, so it weighs which gives society the greater benefit (AO2, 1).

Economic growth lets an economy produce more of everything, so it can satisfy more wants and reduce hardship. But it cannot solve scarcity, because as incomes rise people want new and better goods, so wants keep growing, and resources such as land and time are still limited (AO3, 1).

Therefore growth can ease the effects of scarcity but never remove it, because the problem comes from wants being unlimited, not from any particular level of output (AO3, 1, justified conclusion).

Total: $3 + 3 + 2 = 8$.

Common mistakes

- **Defining opportunity cost as "the cost of a choice" or "all the alternatives".** It is the **next best** alternative, **given up**. Examiners found answers that wrote at length about costs in general and earned only 1 of 2 marks; a short, exact definition plus one relevant example is what scores.
- **Giving a sum of money when the question is about what is lost.** When a hospital moves 800 000 dollars to another use, the opportunity cost is what that money would have bought (the buildings), not "800 000 dollars".
- **Adding the price of the chosen option to the earnings forgone.** The opportunity cost of taking time off is the earnings of those hours; the ticket price is not part of it.
- **Showing scarcity as a point outside the PPC.** Examiners say scarcity is often shown vaguely this way. Scarcity is the **curve itself**, the limit set by finite resources.
- **Not showing choice as a movement along the curve.** Many answers merge choice into opportunity cost. Keep them separate: choice is picking a point (moving along the curve); opportunity cost is what that move gives up.
- **"All I know about the PPC" answers.** Drawing points inside, on and outside the curve, or shifts, without linking them to the question wastes time. Use only what the question asks for.
- **Diagram errors.** Axes labelled "P and Q" or "X and Y", or a curve that does not touch both axes, lose the diagram mark. Some candidates even draw a demand and supply diagram.
- **Ignoring the shape of the curve.** In PPC questions on opportunity cost, most answers ignored why the curve is concave, so they missed the mark for increasing opportunity cost.
- **Writing from one household's point of view** when the question is about the whole economy. A PPC is for an economy.
- **No judgement.** Only a small minority of answers to the 2025 PPC question gave a balanced, justified conclusion, and so missed the two evaluation marks.

How to get the marks

- **Command words.** *Explain*: give reasons, linking each step ("because", "so", "which means"); no evaluation needed. *Consider, assess, discuss, to what extent*: explain, then weigh the other side and reach a judgement.
- **Part (a) essays are point-marked, 3 + 3 + 2.** Knowledge (definitions, an accurate diagram), analysis (applying each concept to the diagram), evaluation (it depends on..., then a conclusion). Aim for at least three developed analysis points and two evaluative sentences, one of them a conclusion.
- **Diagrams must be accurate and labelled.** Two named goods, curve touching both axes, points labelled, and the change marked. Then **explain** the diagram in words; a diagram alone earns only the diagram mark.

- **Separate the concepts.** When asked for scarcity, choice and opportunity cost, write a sentence (or short paragraph) for each so the examiner can award each mark.
- **Conclusions must be justified.** "It depends" earns nothing on its own; say what it depends on (the shape of the PPC, unemployed resources, how suited resources are) and give your answer.
- **Read the question carefully.** Examiners repeatedly note answers that recite prepared material instead of answering the question set.
- **Multiple choice:** read what is asked (the opportunity cost, what **decreases** it, what is **essential**), then check each option against the definition: next best, given up.

Quick check

1. Which statement describes scarcity?
 - **A** A market in which demand is greater than supply at the current price.
 - **B** The resources available are not enough to satisfy all wants.
 - **C** A country cannot afford to import all the goods it needs.
 - **D** Poor households cannot buy all the necessities they need.
2. Use the table in "Understand it". The economy produces 20 million manufactured goods and 84 million tonnes of food. What is the opportunity cost of increasing manufactured goods to 30 million? What is the opportunity cost of each extra manufactured good?
3. The same economy is producing 40 million manufactured goods. It moves back to 30 million. What does it gain, and what is the opportunity cost of the move?
4. A school has 30 thousand dollars to spend on library books and computers, in blocks of 10 thousand. Welfare from books is 0, 25, 40 and 48 for spending of 0, 10, 20 and 30 thousand dollars; welfare from computers is 0, 20, 38 and 50 for the same amounts. Which split gives the most total welfare, and why is it not all 30 thousand on computers?
5. State the three basic questions of resource allocation, with an example of each for a government providing healthcare.

Answers

1. **B.** Scarcity is resources being insufficient for all wants. A is a shortage in one market; C and D describe particular countries or households, but scarcity affects everyone. (1)
2. Food falls from 84 to 64, so the opportunity cost is $84 - 64 = 20$ million tonnes of food. Per manufactured good: $20 \div 10 = 2$ tonnes of food.
3. It gains $64 - 36 = 28$ million tonnes of food, and the opportunity cost is the $40 - 30 = 10$ million manufactured goods given up.
4. Totals (books, computers): $0 + 50 = 50$, $25 + 38 = 63$, $40 + 20 = 60$, $48 + 0 = 48$. The best split is **10 thousand dollars on books and 20 thousand on computers** (total 63). All 30 thousand on computers gives only 50, because the last 10 thousand on computers adds just $50 - 38 = 12$, while the first 10 thousand on books adds 25.
5. **What to produce:** which treatments and how many hospital beds versus clinics. **How to produce:** more doctors and nurses (labour-intensive) or more scanners and online appointments (capital-intensive). **For whom:** free to everyone who needs it, or only to those who pay or are insured.

Past questions to try

- 9708/13/M/J/24 Q4: what it would take to eliminate scarcity.
- 9708/12/M/J/24 Q4: the opportunity cost to a health service of a virus.
- 9708/11/O/N/25 Q11: allocating a budget between health and education to get the most welfare.
- 9708/11/O/N/22 Q4: the opportunity cost of staying in a job.