Market failure and equity

IB DP Economics HL syllabus 2.8-2.9 and 2.12 full package

Market failure and equity

- explain negative and positive externalities with **marginal social cost** and benefit diagrams;
- calculate the **welfare loss** caused by an **externality**;
- explain common pool resources and the tragedy of the commons;

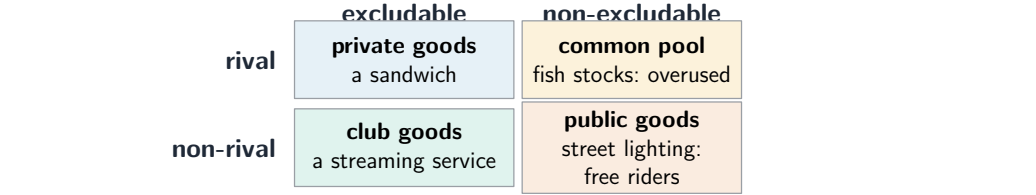
Market failure and equity (2)

- explain public goods and the **free-rider problem**;
- measure inequality with the **Lorenz curve** and **Gini coefficient**, and evaluate policies.
- demand, or **marginal private benefit** (MPB): $P = 70 - \frac{Q}{2}$;

Market failure and equity (3)

- supply, or **marginal private cost** (MPC): $P = \frac{Q}{4} - 5$;
- market equilibrium: $Q = 100$, $P = 20$.

Figure: Market failure and equity



non-rival + non-excludable → free-rider problem → the market under-provides or provides none

- Classify goods by rivalry and excludability.
- Match each part of the diagram to the text.

Externalities and common pool resources

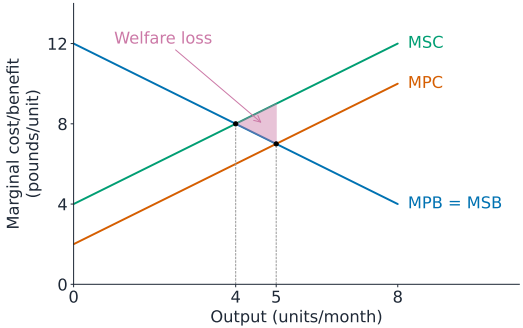
- An **externality** is a cost or benefit that falls on a **third party**, someone outside the transaction (2.8).
- The **social optimum** is where MSB = MSC.
- A free market produces where MPB = MPC, so when there is an **externality**, it produces the wrong amount.
- **Worked example: a negative production externality.** Production causes an external cost of 6 per unit, so $MSC = MPC + 6 = \frac{Q}{4} + 1$.

Figure: Externalities and common pool resources



- A trawler's net: fish stocks are a **common pool resource**, rivalrous but hard to exclude anyone from, so they tend to be overfished.
- Match each part of the diagram to the text.

Figure: Externalities and common pool resources ·



- Negative production **externality**: the market produces where MPC = MSB, more than the **social optimum**.
- Match each part of the diagram to the text.

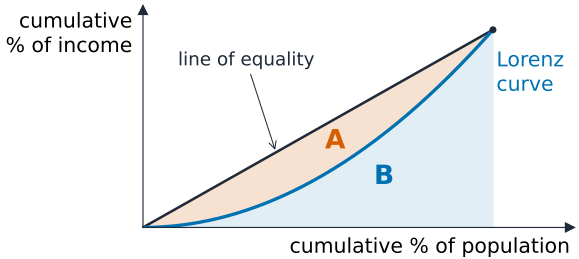
Public goods

- **non-rival** : one person's use does not reduce what is available to others;
- **non-excludable** : people cannot be stopped from using it, even if they do not pay.

The market's inability to achieve equity

- **progressive taxation**: higher rates on higher incomes; may reduce incentives to work or invest;
- **transfer payments**: pensions, unemployment benefits, child benefits; cost government money and may create dependency if badly designed;
- **public provision**: free education and health care raise poor families' opportunities; costly, and quality depends on funding;
- **minimum wage**: raises low pay; may reduce employment if set too high.

Figure: The market's inability to achieve equity



Gini $= A/(A+B)$ · 0 = equal, 1 = most unequal

- The further the **Lorenz curve** bows from the diagonal, the more unequal income is; Gini = A/(A+B).
- Read the axes and units first.

Data-response practice (Paper 2 style)

- (a) Define *negative **externality***. [2]
- (b) Using an externality diagram, explain why a market for electricity from coal produces more than the **social optimum**. [4]
- (c) Explain how a **cap and trade** scheme reduces emissions. [4]

Data-response practice (Paper 2 style) (2)

- (d) Calculate the cost to Firm K of each way to cover its extra 0.2 million tonnes, and state which it will choose. [2]
- (e) Using information from the text and your knowledge of economics, evaluate the use of tradable permits, compared with a **carbon tax** , to reduce carbon emissions. [15]
- **Certainty of quantity.** A permit scheme fixes the total emissions (the cap), and the market finds the price. A **carbon tax** fixes the price, and the quantity is uncertain, because the government does not know how strongly firms will respond. For a climate target in tonnes, the cap is the more direct tool.

Data-response practice (Paper 2 style) (3)

- **Cost-effectiveness.** Both tools give every firm the same price per tonne, so the cheapest cuts happen first: Firm K cuts, because €60 is below €90. Permits do this without the government needing to know each firm's costs.
- **Price instability.** The EU price stayed below €10 for years because too many permits were issued. That gave firms little reason to invest, and the price must be stable for firms to plan long-lived investments such as new furnaces. A **carbon tax** gives a known, steady price. Sweden has used one since 1991, and it is now among the highest in the world. The EU had to remove permits to make its price work, which shows the risk of government failure in setting the cap.
- **Revenue and fairness.** Auctioned permits and a tax both raise revenue that could cut other taxes or help poor households with higher energy bills. Permits given away free reward existing polluters.

Data-response practice (Paper 2 style) (4)

- **Carbon leakage** . If only one region prices carbon, production can move to places without a price, with no fall in world emissions. The EU's import charge tries to stop this, but it raises costs for trading partners and may cause trade disputes.
- **Monitoring.** Both tools need emissions to be measured accurately. Permits also need a working market. China's low permit price shows that the design (how tight the cap is, and the penalties) matters as much as the choice of tool.

Sources for this lesson

- International Baccalaureate, *Economics guide* (first assessment 2022).
- G. Hardin, "The **Tragedy of the Commons**", *Science* (1968); E. Ostrom, *Governing the Commons* (1990).
- R. Coase, "The Lighthouse in Economics", *Journal of Law and Economics* (1974).

Sources for this lesson (2)

- M. Kurlansky, *Cod: A Biography of the Fish That Changed the World* (1997).
- World Bank, **Poverty** and Inequality Platform (Gini estimates and poverty lines).

Common errors

- Defining an **externality** without saying that it affects a **third party**.
- Labelling the axes or curves wrongly: use MPB, MSB, MPC and MSC, and mark both quantities.
- Shading the wrong welfare-loss triangle: it lies between MSB and MSC over the units the market gets wrong.

Common errors (2)

- Mixing up public goods (**non-rival**) and **common pool resources** (rival).
- Treating equity and **equality** as the same thing.
- Recommending a policy without saying how it works on the diagram and what its weaknesses are.

Key terms

- **Market failure**: when a free market does not allocate resources efficiently.
- **Externality**: a cost or benefit that falls on a third party outside the transaction.
- **Social optimum**: the output where **marginal social benefit** equals **marginal social cost**.

Key terms (2)

- **Common pool resource**: a resource that is rival but **non-excludable**.
- **Public good**: a good that is **non-rival** and non-excludable.
- **Free-rider problem**: people use a good without paying, so the market under-provides it.
- **Gini coefficient**: a measure of income inequality from 0 (equal) to 1 (completely unequal).

Check yourself

- 1.
- Give one example each of a negative production **externality** and a positive consumption externality. 2.
- On the model with an external cost of 6, find the **social optimum** and the **welfare loss**. 3.
- Why did the Grand Banks cod collapse, even though each fisher acted rationally? 4.