

Exercise walk-through

10.1

Environmental economics: costs beyond the market price

International Baccalaureate · IB Diploma · Environmental Systems and Societies ·

10.1 Environmental economics: costs beyond the market price

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS externality • social cost

Objective

Environmental economics: costs beyond the market price. Supported HL concept preparation; original classroom practice, not an official IB paper or assessed learner work.

1 Key knowledge and worked examples

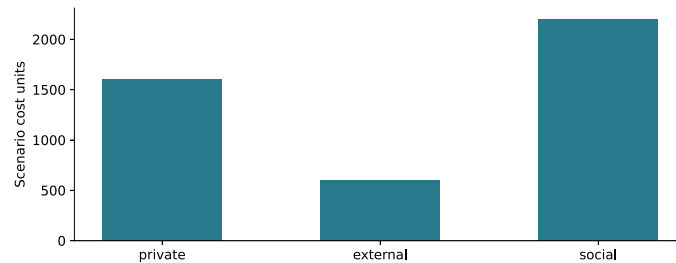
■ What would explain this observation?

- A cheap product can impose waste or pollution costs on people who did not buy it. Its market price may omit part of its environmental cost.
- Start with a prediction. State the quantities or features you would compare, then decide what evidence could distinguish two explanations.

■ Build the model

- An **externality** is a cost or benefit affecting a third party that is not fully reflected in a transaction. Environmental economics examines incentives and valuation, including instruments such as taxes, subsidies and tradable permits. Ecological economics also questions growth assumptions and emphasizes ecological limits and relationships between the economy and its supporting systems.

- externality: A transaction effect on a third party not fully reflected in its price; **social cost** : Private cost plus external cost within the stated model.
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■ Choose evidence that can test it

- In a simplified model, marginal social cost equals marginal private cost plus marginal external cost. A pollution charge can alter incentives, but selecting a charge requires evidence and a stated objective. Monetary totals do not by themselves settle distribution, irreversibility, uncertainty or whether a service can be substituted.
- Construct a transparent table with a common currency, time period and system boundary. Separate measured expenditure from estimated environmental damage. Compare at least two valuation assumptions, identify who pays and who benefits, and consider a non-monetary indicator such as habitat condition. Label these as classroom scenarios rather than forecasts.

■ Work from known quantities

- State the known values and their units. Choose the relation because its assumptions fit this case, then rearrange before substitution.
- Known: producing one item costs the producer 8 units, while the scenario estimates an external cost of 3 units. Social cost is 11 units per item. For 200 items, private cost is 1,600 units and estimated external cost is 600 units, giving 2,200 units total under this model. If external damage is estimated at 1–5 units per item, the social-cost range is 1,800–2,600 units.

Example:

Private cost is 6 units per item and external cost is 2 units. Calculate social cost for 50 items. Use the same sequence: known quantities → model → relation → substitution → unit and interpretation.

■ Check the conclusion and its limits

- A money value is an assumption-dependent estimate, not a measurement of intrinsic ecological value. A policy that lowers total cost can still place a disproportionate burden on a vulnerable group.
- Return to the original observation. Explain what the result supports, which conditions it assumes, and one way to test a competing explanation.

Warn:

The cheapest market price necessarily identifies the smallest total environmental cost. This claim is false: A money value is an assumption-dependent estimate, not a measurement of intrinsic ecological value. A policy that lowers total cost can still place a disproportionate burden on a vulnerable group.

Key:

Environmental economics: costs beyond the market price: In a simplified model, marginal social cost equals marginal private cost plus marginal external cost. A pollution charge can alter incentives, but selecting a charge requires evidence and a stated objective. Monetary totals do not by themselves settle distribution, irreversibility, uncertainty or whether a service can be substituted.

Exercises 2.1·2.2

2.1 What should accompany a single estimated social-cost total? Choose one answer.

- **A** Its boundary, valuation assumptions and distribution of effects
- **B** A claim that ecological limits no longer matter
- **C** Only the producer invoice

[1]

2.2 Private cost is 6 units per item and external cost is 2 units. Calculate social cost for 50 items. Show the relation, substitution and units.

[2]

Exercises 2.1-2.2

2.1 What should accompany a single estimated social-cost total? Choose one answer.

- **A** Its boundary, valuation assumptions and distribution of effects
- **B** A claim that ecological limits no longer matter
- **C** Only the producer invoice

[1]

2.1 A In a simplified model, marginal social cost equals marginal private cost plus marginal external cost. A pollution charge can alter incentives, but selecting a charge requires evidence and a stated objective. Monetary totals do not by themselves settle distribution, irreversibility, uncertainty or whether a service can be substituted.

2.2 Private cost is 6 units per item and external cost is 2 units. Calculate social cost for 50 items. Show the relation, substitution and units.

[2]

2.2 social cost = (private + external) × quantity = (6 + 2) × 50 = 400 units.

Exercises 2.3-3.1

2.3 Decide whether this claim is true and justify: The cheapest market price necessarily identifies the smallest total environmental cost. [2]

2.4 A transaction effect on a third party not fully reflected in its price: write the technical term. [1]

3.1 Fictional private cost is 5 per item; external cost is estimated at 1–4. Find social-cost range for 100 items and explain one policy limitation. [4]

Exercises 2.3-3.1

2.3 Decide whether this claim is true and justify: The cheapest market price necessarily identifies the smallest total environmental cost. [2]

2.3 False. A money value is an assumption-dependent estimate, not a measurement of intrinsic ecological value. A policy that lowers total cost can still place a disproportionate burden on a vulnerable group.

2.4 A transaction effect on a third party not fully reflected in its price: write the technical term. [1]

2.4 externality. externality means A transaction effect on a third party not fully reflected in its price.

3.1 Fictional private cost is 5 per item; external cost is estimated at 1–4. Find social-cost range for 100 items and explain one policy limitation. [4]

3.1 Total 600–900 units. External valuation, distribution and omitted effects are uncertain; a midpoint does not settle equity or policy.