INTRODUCTION

Externalities

From: Public goods LESSION

In the presence of public goods, a "**MARKET FAILURE**" (typically) occurs:

1. The market fails when for some reason it proves incapable of autonomously arriving at **(PARETO) EFFICIENT ALLOCATIONS** of resources

2. Failures must be traced back to the existence of **EXTERNALITIES**

Externalities

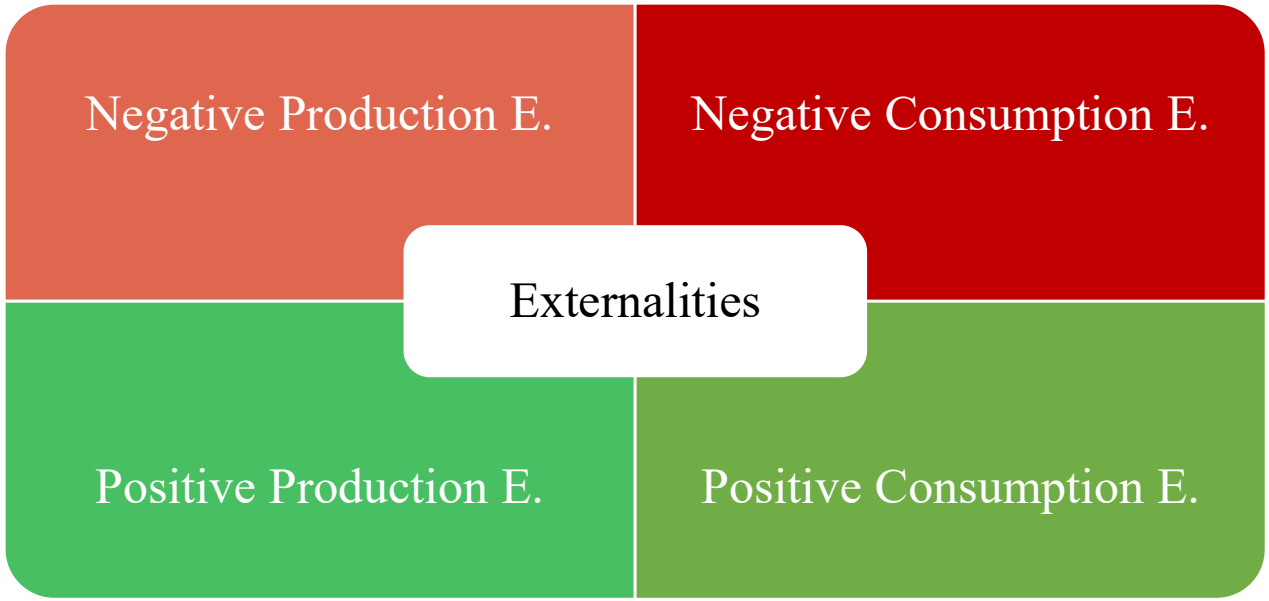
- Externality - a direct effect of the actions of one person or firm on the welfare of another person or firm, in a way that is not transmitted by market prices

- When the activity of one entity (a person or a firm) directly affects the welfare of another in a way that is not transmitted by market prices, that effect is called an externality (because one entity directly affects the welfare of another entity that is 'external' to it)

- Externalities can be **POSITIVE** or **NEGATIVE** (if you plant a beautiful flower garden in front of your house, your neighbors benefit directly by your action. This is an example of positive externality – the behavior of one entity has a positive effect on the welfare of another. If your neighbors do not pay you for these benefits, you may not consider them when deciding how many flowers to plant)

Externalities

- Unlike effects that are transmitted through market prices, externalities can adversely affect economic efficiency
- The need to intervene in response to externalities derives from efficiency concerns as well as from equity and fairness (e.g. polluters pay principle)
- Externalities are **spillover-effects** from production and consumption for which no appropriate compensation is paid/received
- Externalities **lie outside the initial market transaction price**



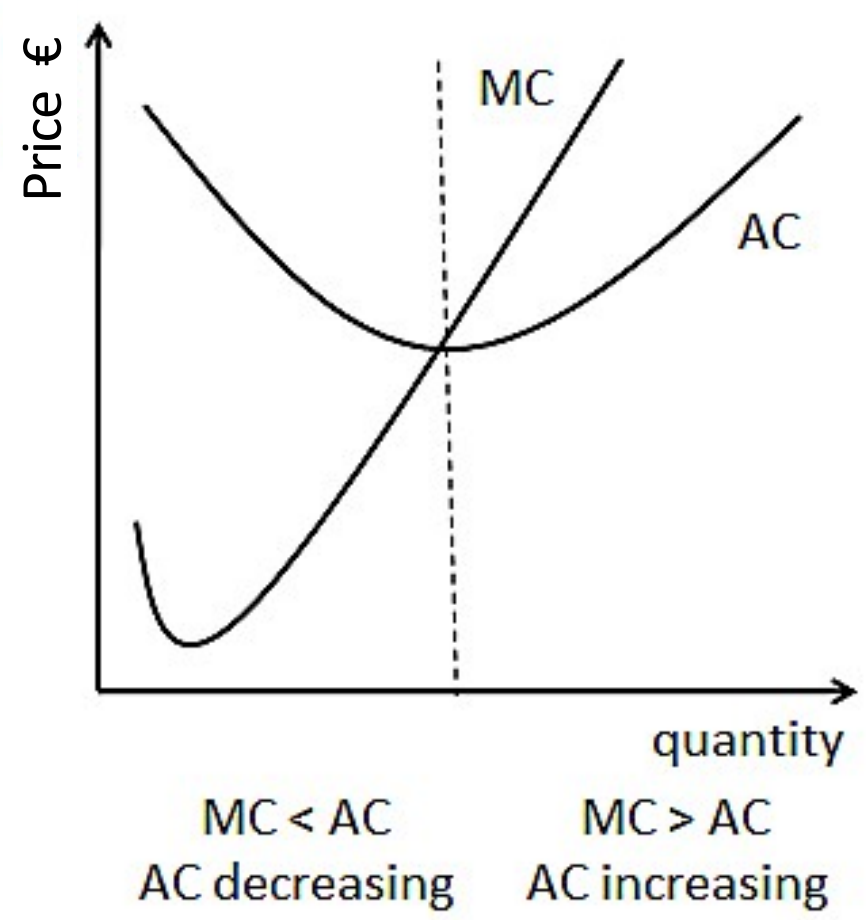
Externalities

COSTS

- How do firms choose the cheapest way to produce its chosen amount of output?
- First, they need to identify their options (the production function indicates which combination of factors can be used to produce any desired amount of output)
- Then they have to determine which of those input combinations that can produce the desired output level has the lowest (opportunity) cost

MARGINAL COSTS vs AVERAGE COSTS

- A **price-taking** firm 'chooses its actions under the assumption that it cannot influence the prices of output that it sells or the inputs that it buys
- Average economic costs (AC): the firm's total economic cost divided by the number of units produced
- Marginal cost (MC): the change in total cost due to the production of one more unit of product



Externalities

THE FIRM-SPECIFIC DEMAND CURVE

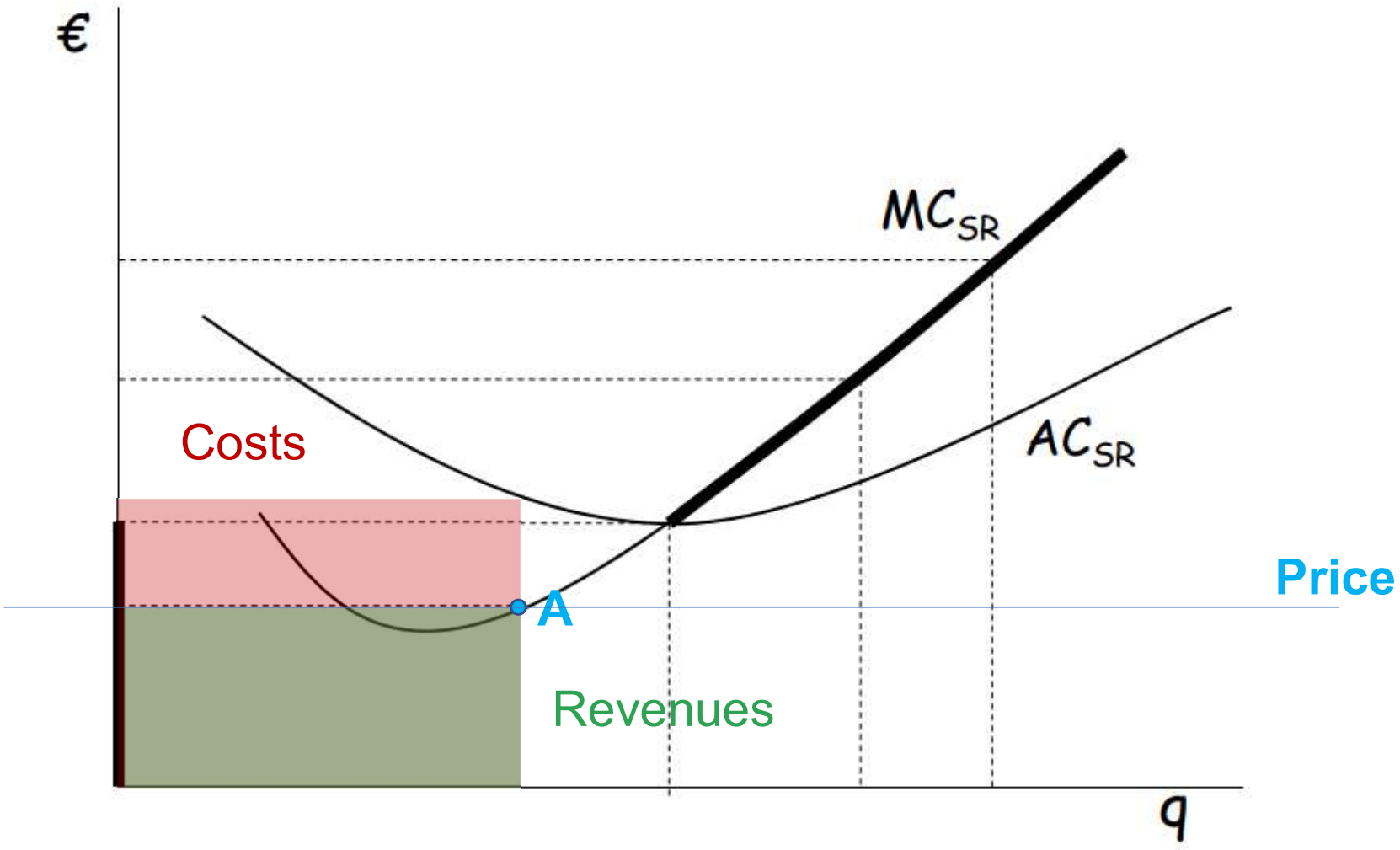
- A firm-specific demand curve is ‘a schedule showing the quantity of a single firm’s output demanded for any price charged by that particular firm’

- The firm-specific demand curve contains all of the information the firm needs to calculate its total revenue function

- **A competitive firm’s supply curve partially coincides with the firm’s MC curve**

Externalities

SHORT-RUN (SR) SUPPLY CURVE for a single firm



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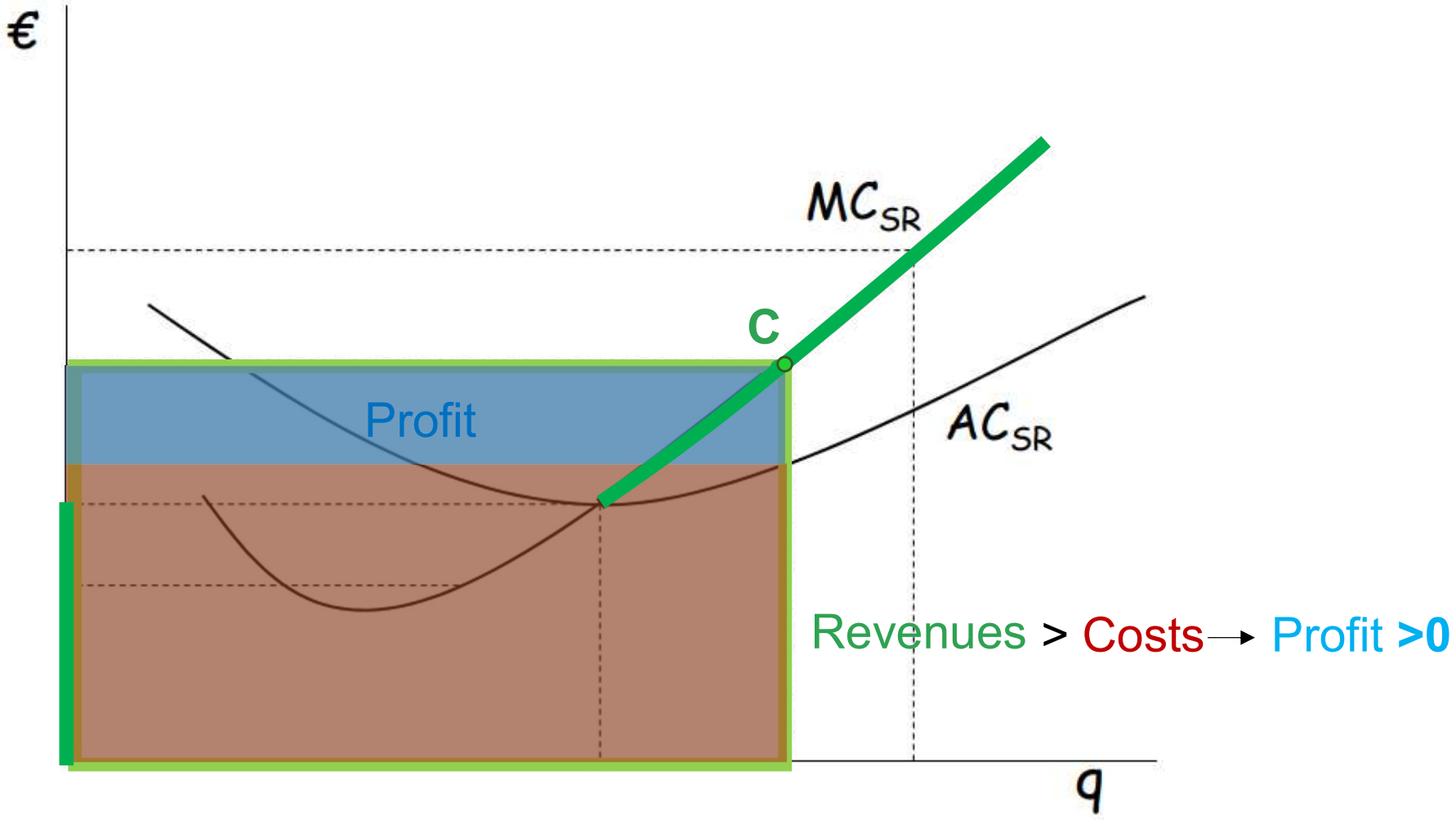

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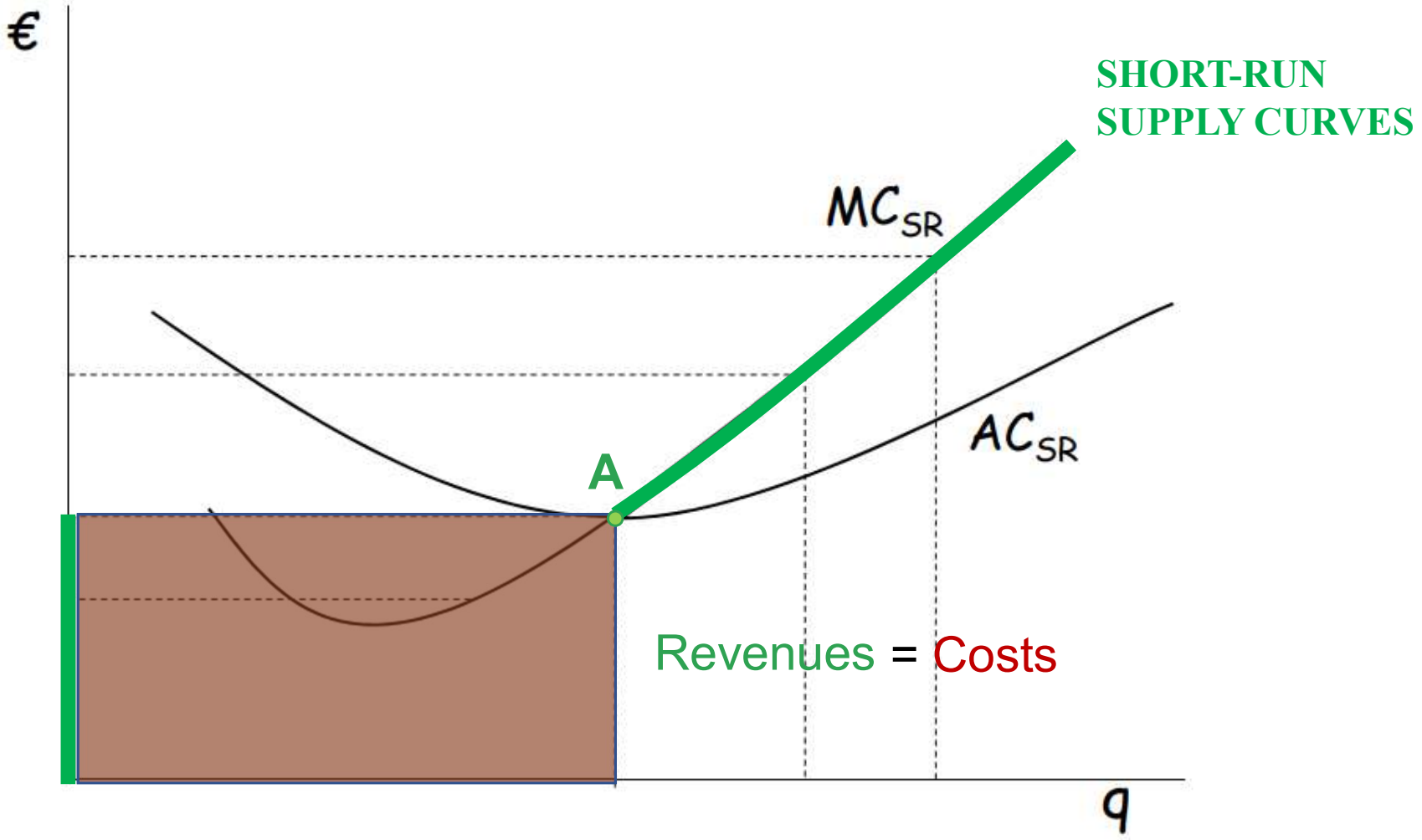


Externalities

PROFIT MAXIMIZATION

- To maximize its profit, a firm should produce at the output level where the total revenue curve is the greatest distant above the total economic cost curve

- Profit is maximized at the point where marginal cost and marginal revenue curves cross, where: Marginal revenue (MR) - the change in revenue due to the sale of one more unit of output

- Algebraically, the firm should produce where:

MR=MC

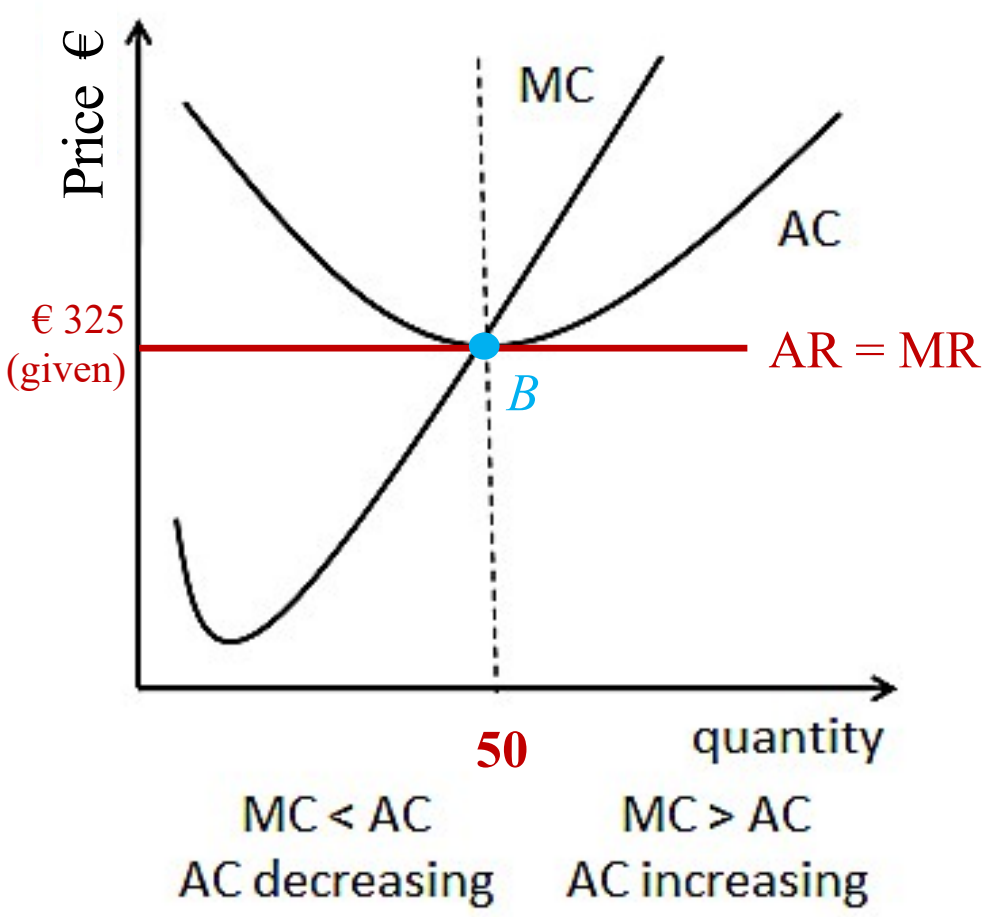
PROFIT MAXIMIZATION

A price-taking firm's marginal revenue is always equal to the price it takes as given

For profit maximization there are two rules:

- Marginal output rule: if the firm does not shut down, then it should produce output at a level where marginal revenue is equal to marginal cost
- Shut down rule: if, for every choice of output level, the firm's average revenue is less than its average economic cost, then the firm should shut down

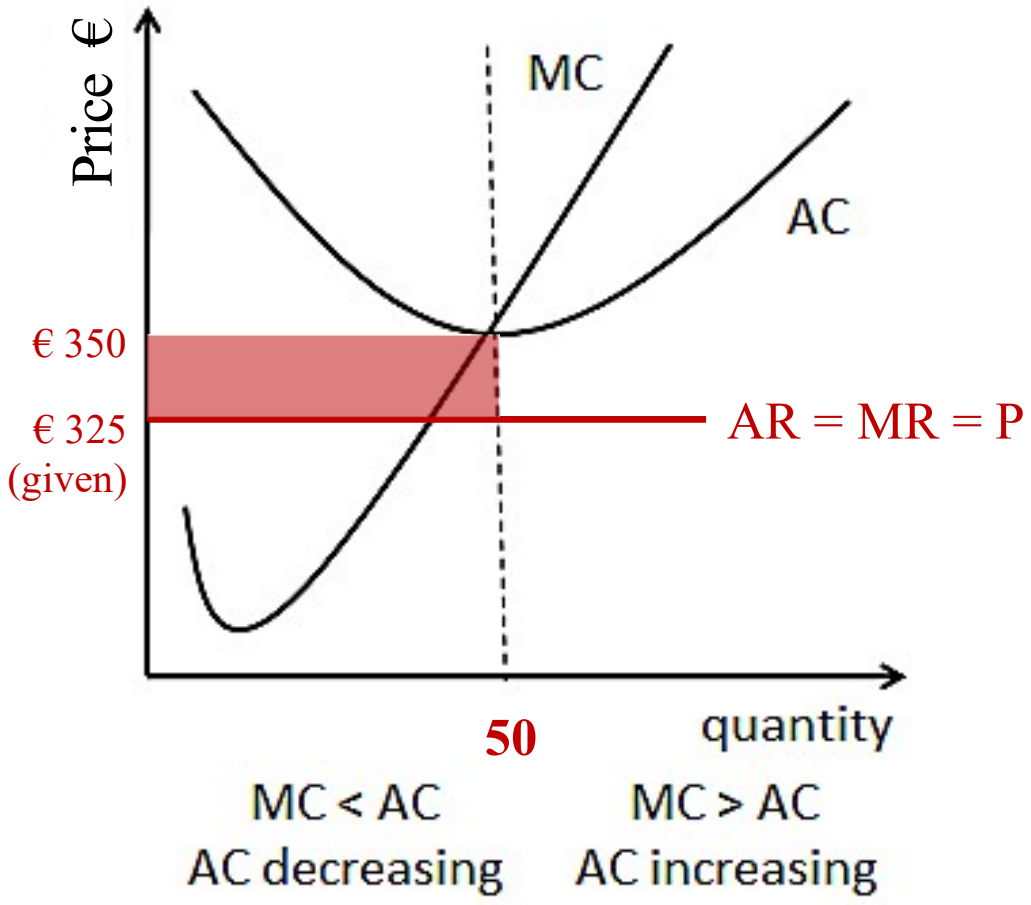
Profit is maximized in B



SHUT DOWN RULE FOR A PRICE- TAKING FIRM

For price-taking firm the shut down rule is represented in the figure.

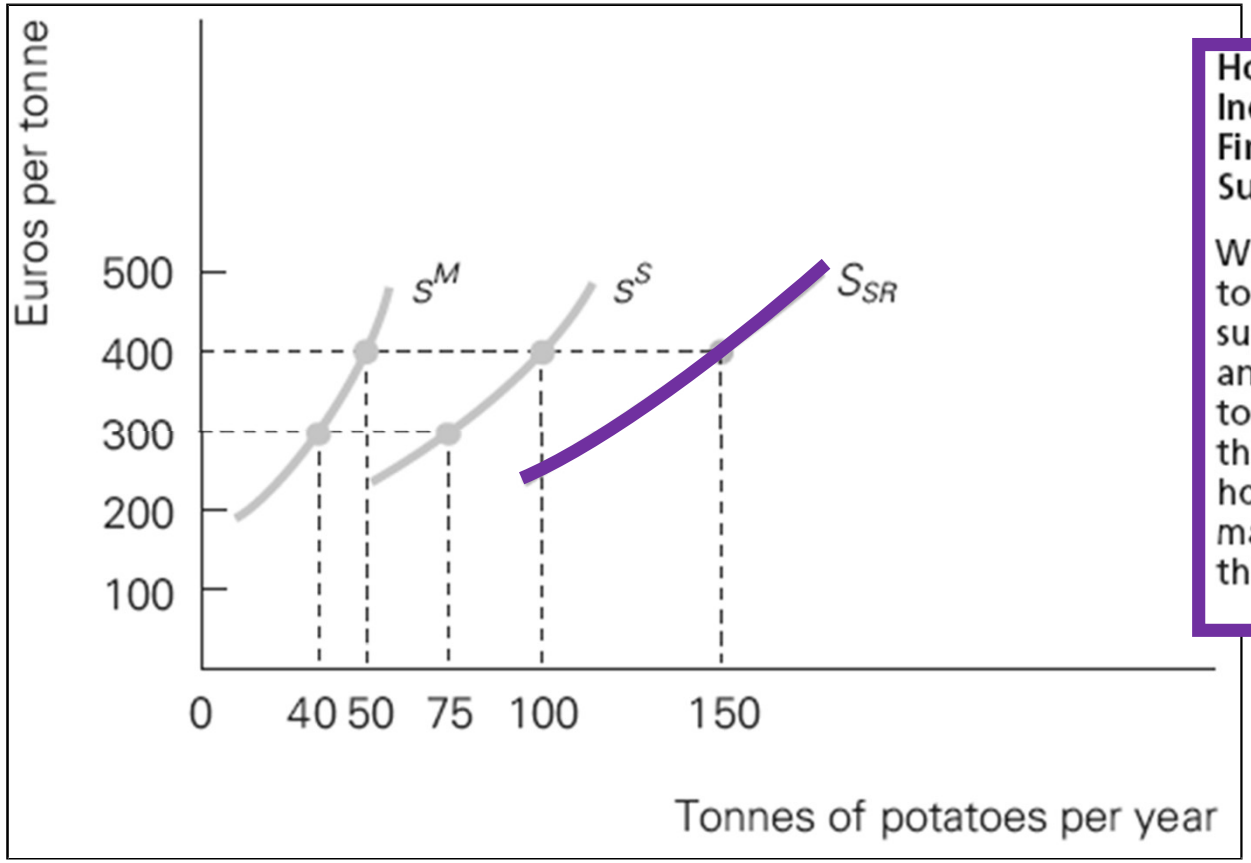
The figure illustrates the firm-specific demand curve which would be better off shutting down than producing. At every output level, the AC of production is grater than the AR of €325/piece, if the firm produce 50 pieces, it incurs losses equal to the shaded area (€25 * 50 = €1.250)



Externalities

The short run – MARKET SUPPLY

Since quantity is measured on the horizontal axis, we add the curves horizontally to answer this question



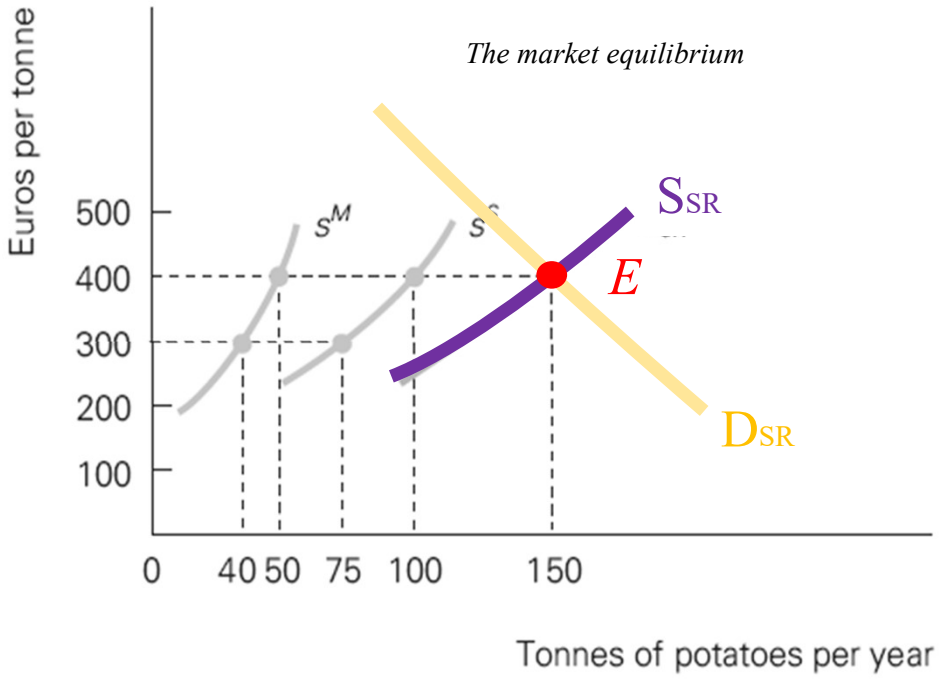
Horizontally Summing Individual Supply Curves to Find the Short-Run Market Supply Curve

When the price is €400 per tonne, Mash Farm is willing to supply 50 tonnes of potatoes and Spuds Suppliers is willing to supply 100 tonnes. Adding these two quantities (summing horizontally), we find that the market quantity supplied at this price is 150 tonnes.

EQUILIBRIUM IN COMPETITIVE MARKETS (short run)

- The competitive model relies on the following basic assumptions:
  - ✓ Firms are price takers (each firm acts as if it can sell as much or as little output as it wants to without affecting the prevailing market price)
  - ✓ Firms do not behave strategically
  - ✓ Entry into the market is free
  - ✓ Consumers are price takers

- Since all market participants are price takers, a competitive market is in equilibrium when:
  - ✓ Consumers are choosing their optimal purchase levels, given prevailing prices
  - ✓ Firms are choosing their optimal output levels, given prevailing prices
  - ✓ Firms are willing to produce as much as consumers wish to purchase and consumers are willing to purchase as much as firms choose to produce



Externalities

THE FIRM AND ITS GOALS

- The economic profit is the difference between the revenues that it takes in and the costs that it pays out

Economic Profit = *Total Revenues* - *Total Costs*

- Economic profit is the income that is left over for the owners of the firm after they pay for the factors of production that they utilize

- **Total economic cost must be calculated as the sum of the opportunity cost of all of the inputs**

Externalities

Externalities

A negative (positive) externality occurs when the production or consumption activity of an economic agent negatively (positively) influences the well-being of another agent without the latter receiving compensation (paying a price) for the damage suffered (the benefit received)

Externalities

Private and Social Costs and Benefits

- **Private costs** are the costs faced by the producer or consumer directly involved in the transaction
- **Private revenues/benefits** are the benefits for producer and or consumer directly involved in an economic transaction
- The existence of **externalities** creates a divergence between private and social costs of production and the private and social benefits of consumption
- **Social Cost** = Private Costs + External Costs
- **Social Benefit** = Private Benefit + External Benefit

Externalities

Externalities → **INEFFICIENCIES**

- In the case of a **negative externality (ES-)**, private production/consumption, linked to negative impacts on other economic agents, is pushed to a level **higher than the socially efficient one** (*to a level higher than it would have been pushed by the agent if he had to bear the costs himself*)

- In the case of a **positive externality (ES+)**, the private activity to which benefits accruing to other economic agents are linked is pushed to a **level lower than the socially efficient level** (*to a level lower than it would have been pushed by the agent if he received compensation for the provided benefits*)

Externalities

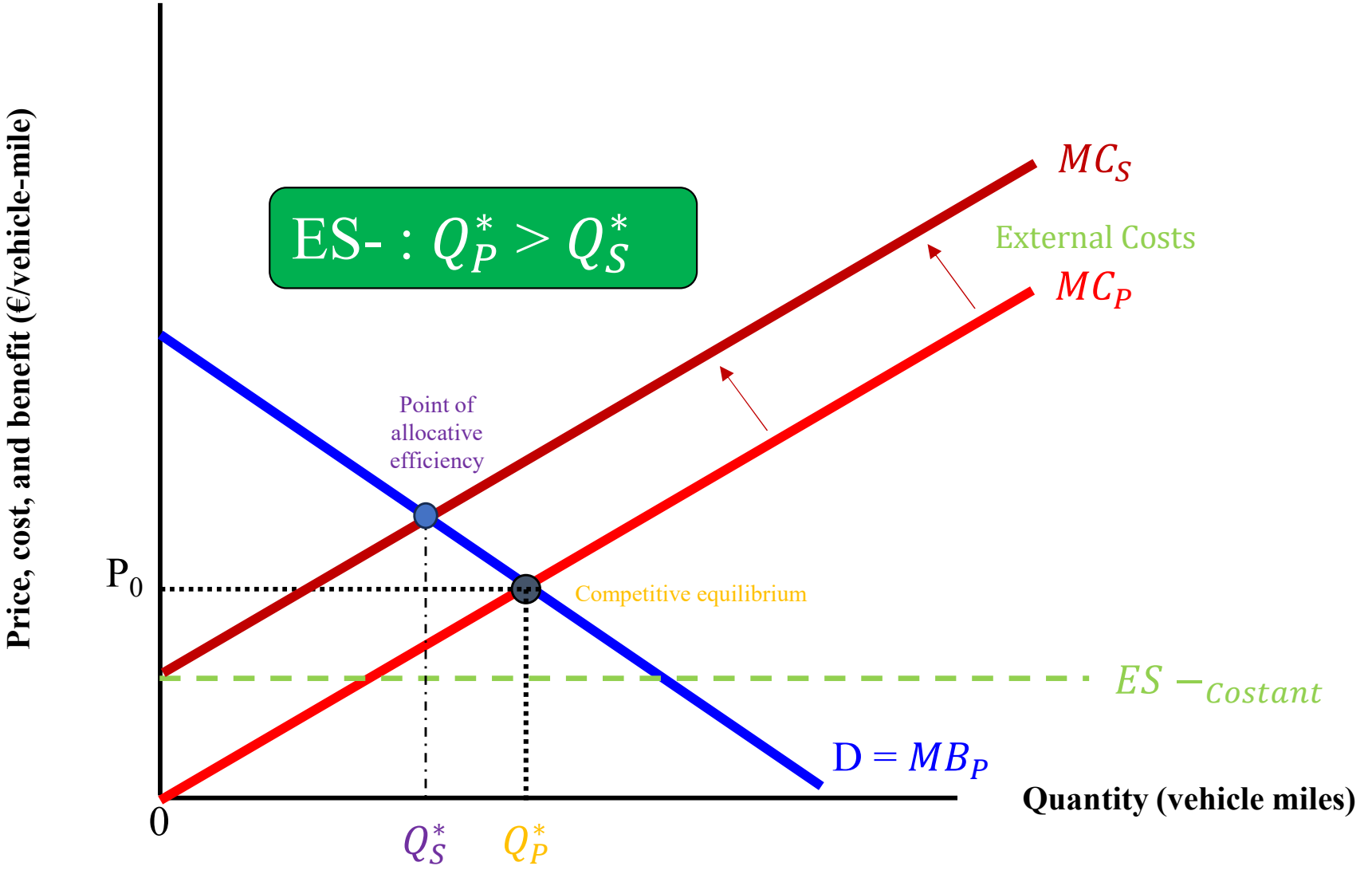
Externalities

- When **negative externalities (ES-)** exist, social cost exceed private cost. This leads to overproduction and market failure if producer does not take into account the externalities
- When **positive externalities (ES+)**occur, social benefits exceed private benefit, this can also lead to market failure.

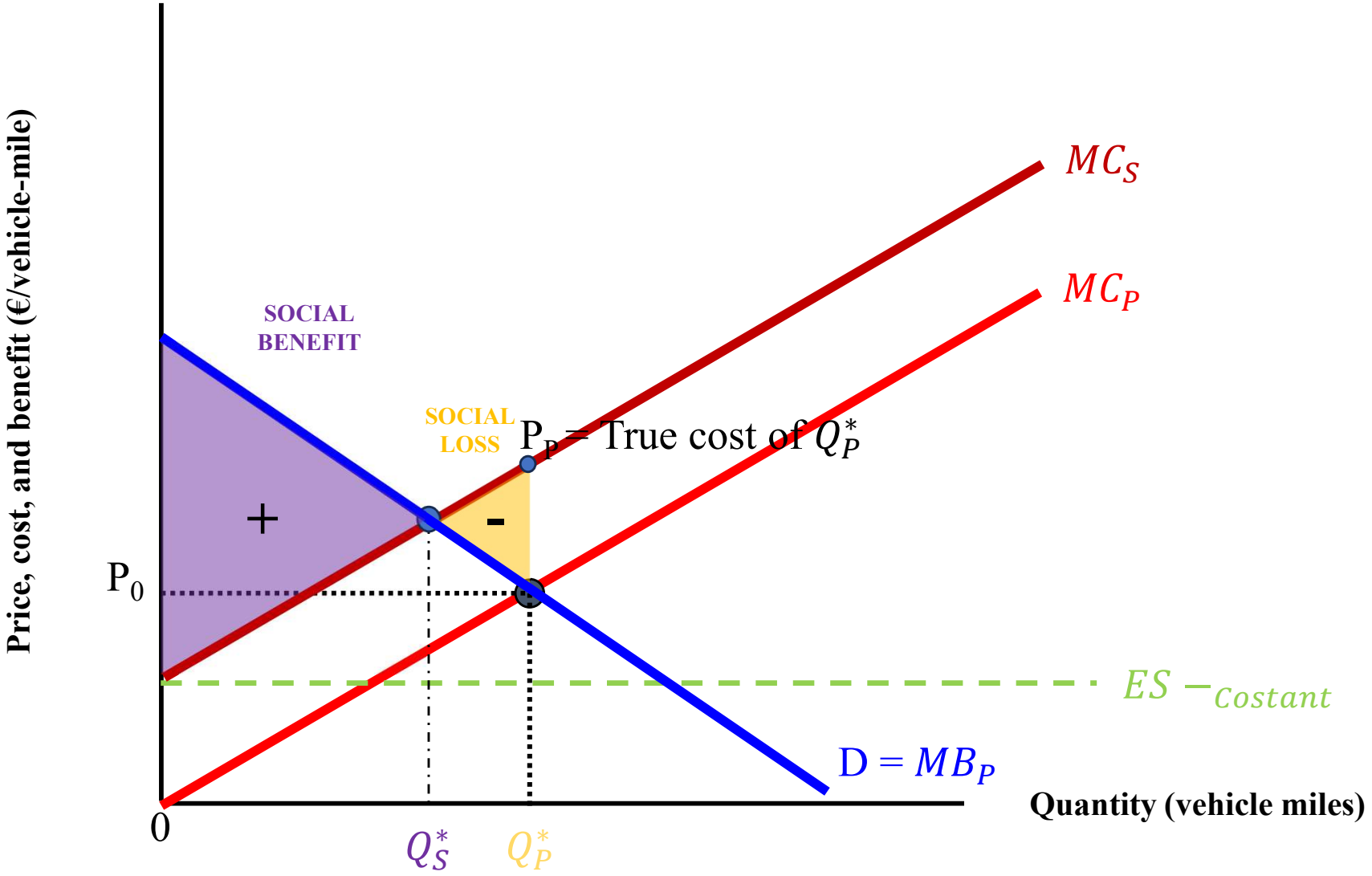
ES- : generates an **excess** of production (or consumption): → ES- : $Q_P^* > Q_S^*$

ES+ : generates a **deficit** of production (or consumption): → ES+ : $Q_P^* < Q_S^*$

Taxes and Pollution



Taxes and Pollution



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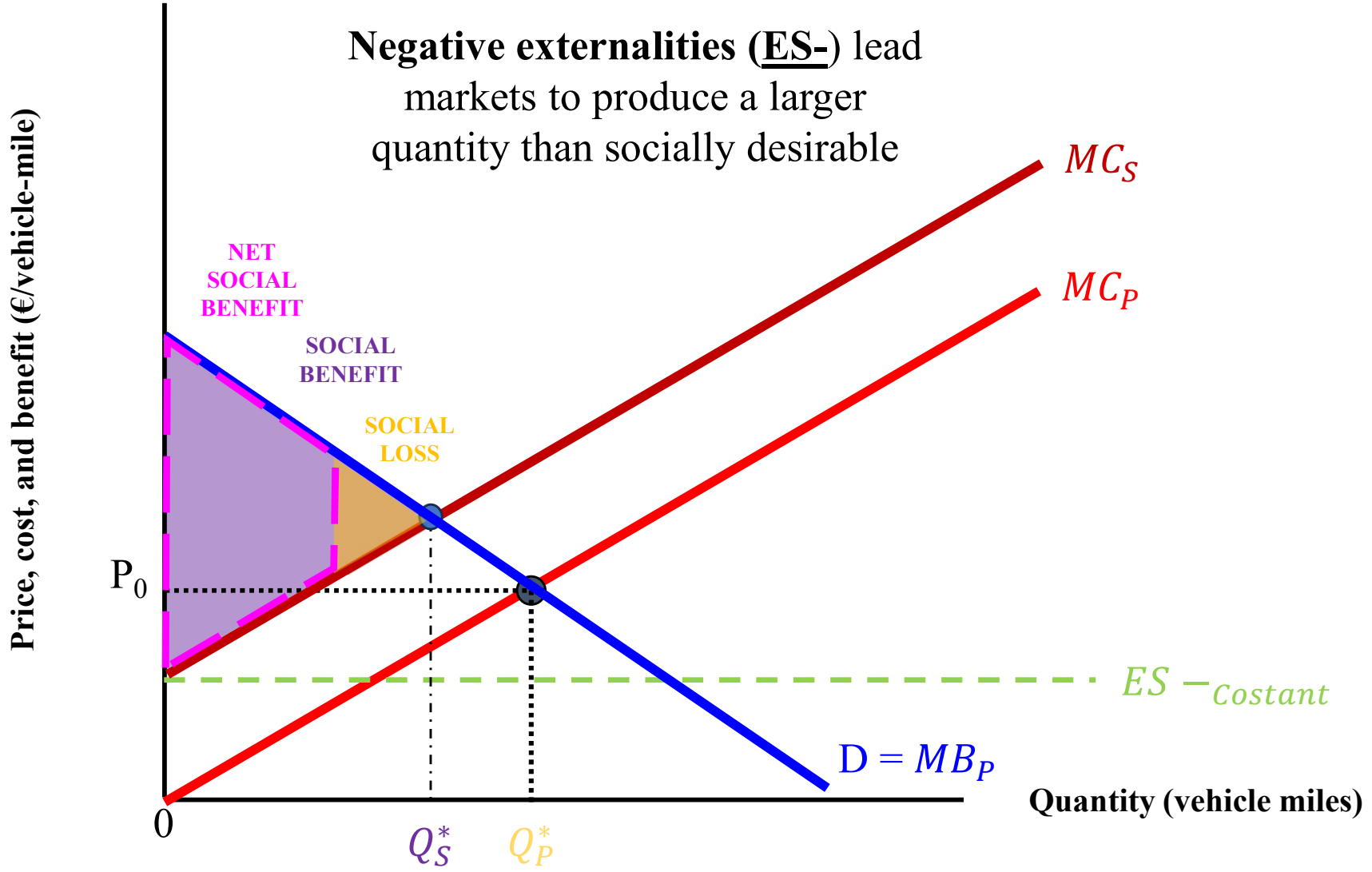
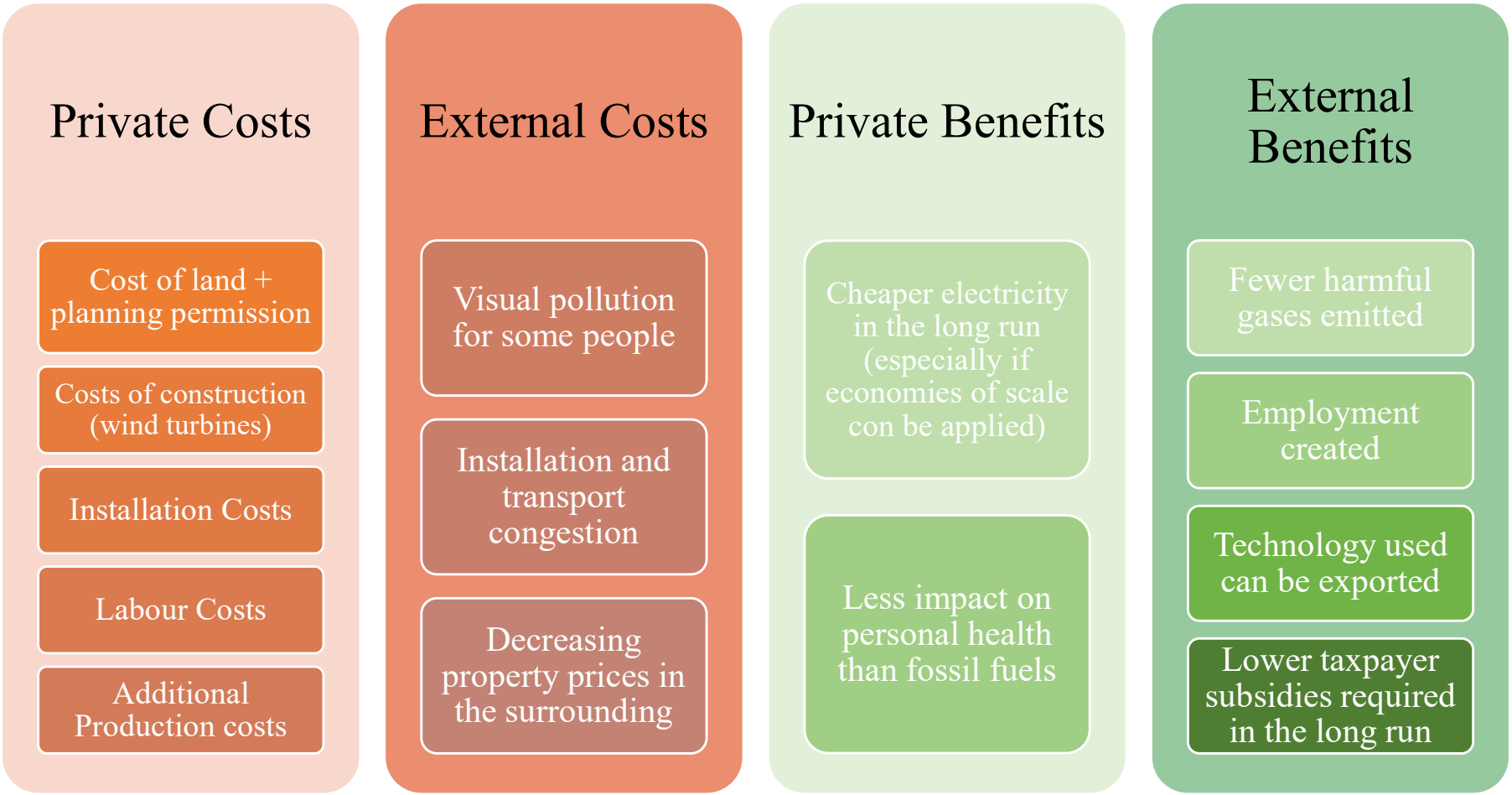


Externalities

Example: External Costs and Benefits from Wind Farms



Externalities

Externalities

To correct the allocative inefficiency generated by the presence of externalities:

- Non- Government interference to solve externalities, attributing property rights: **Coase Theorem**
- Government intervention to solve externalities, introducing fiscal incentives – Pigouvian taxes or subsidies: **Pigouvian Theory** *"Polluters Pay Principle" (PPP)*

Externalities

How do economists value externalities?

- ***Shadow Prices***: e.g. the external costs of a road congestion con be assessed by multiplying the number of hours lost by the average wage.

- ***Compensation:*** estimate the costs for remediate to a negative externality: e.g. the cost for installing double glazing in houses affected by increased road noise from a new motorway (200 affected houses * €10.000/each = €2 MLN)

- **Revealed preference:** How much people are willing to pay to avoid a negative externalities or to benefit from a positive one. E.g. 200 householders are willing to pay €2.000 each to avoid noise (200 * €2.000 = €400.000)

- ……**TBS**

REFERENCES

- Pearce D., Atkinson G., Mourato S. (2006): " Cost-Benefit Analysis and the Environment", OECD, Paris

- Pearce D.W., Turner R.K. (1990), "Economics of Natural Resources and the Environment", Harvester Wheatsheaf, London