Externalities

Definition of Externalities

- The cost or benefit that affects a party who did not choose to incur that cost or benefit

- The effects of a decision by consumers and producers that has an impact on a third party

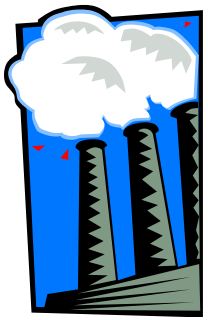
Positive and Negative Externalities

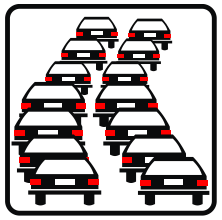
- **Positive Externalities** – beneficial effects on third parties

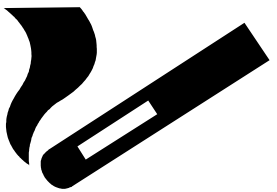
discovery,

education

- **Negative Externalities** – costs incurred by third parties







air-pollution, noise, congestion, smoking

Example of Externality

The Tragedy of Commons (共有地の悲劇)

- Suppose you run a manufactory, whose income is assumed to be proportional to the quality of the pound
- You have to decide **whether to introduce purification system or not**
- Assumption
  - Cost for purification system: 20
  - Benefit if one manufacture introduce purification system: 10

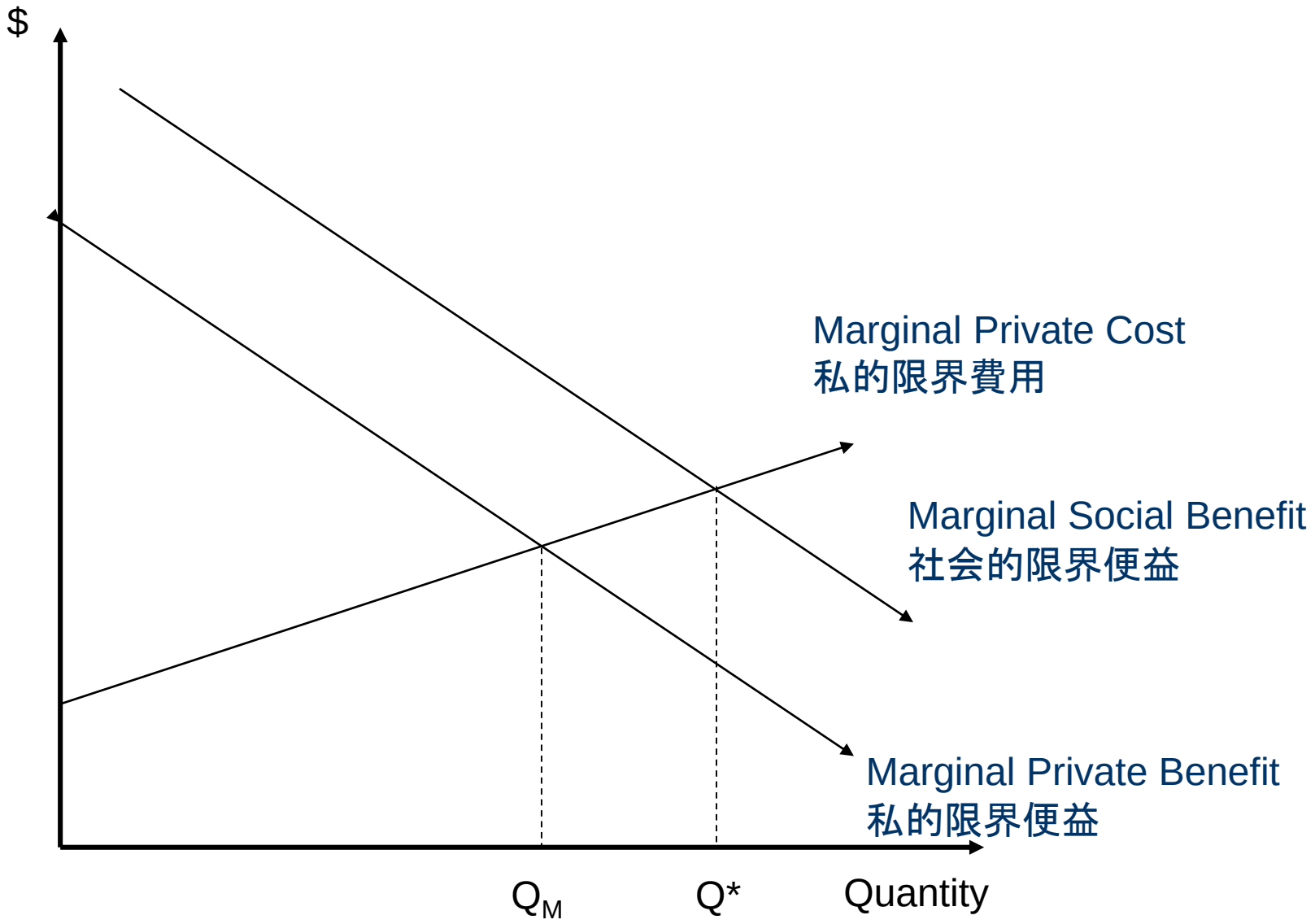
Profit

$\pi = 10(n+1) - 20$
(in case of introduce)

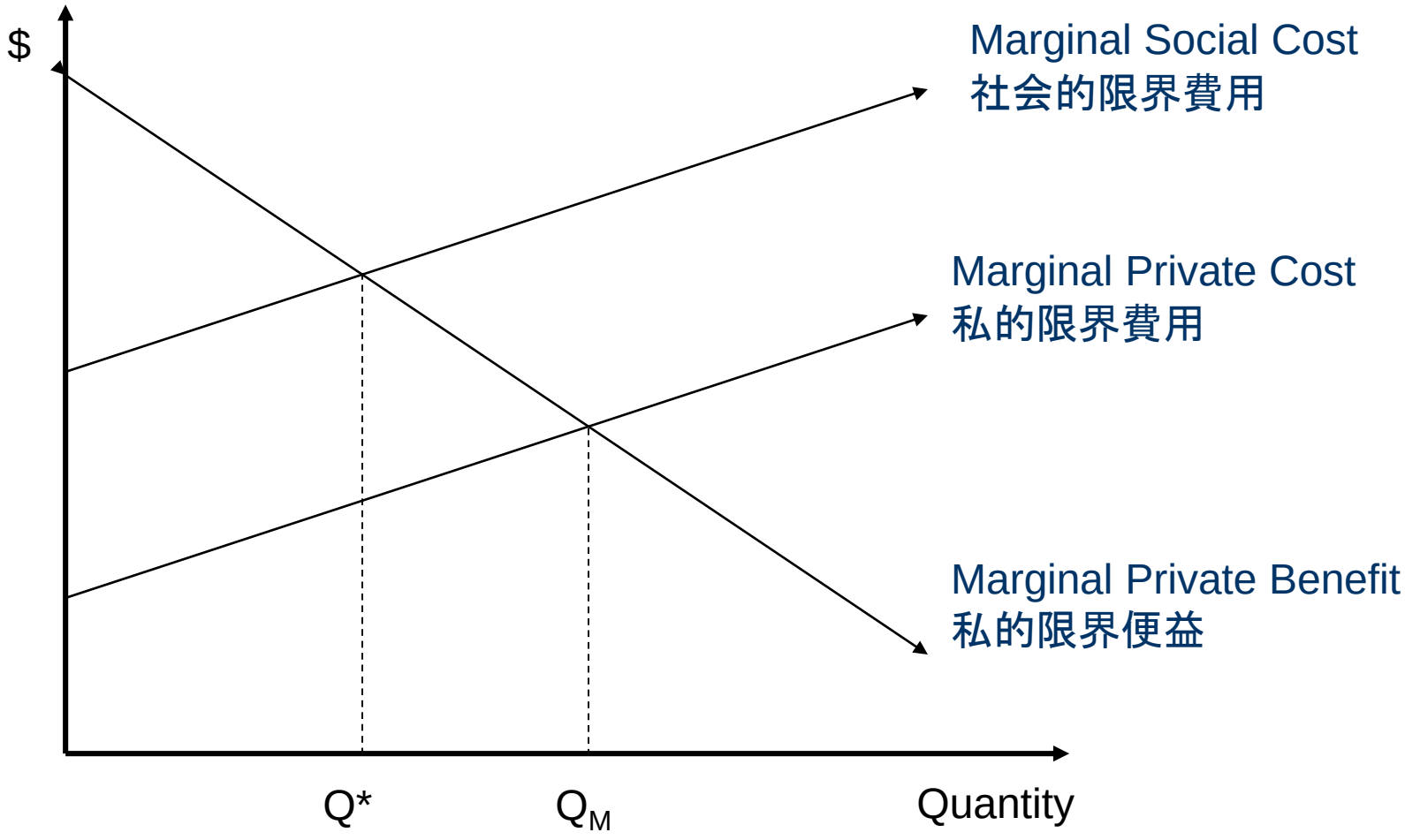
$\pi = 10n$
(in case of NOT introduce)

n: number of manufactories (except for you)which introduce purification system

Positive Externalities



Negative Externalities



Positive and Negative Externalities

Costs and benefits in production:

- External costs in production –

  where Marginal Social Cost > Marginal Private Cost

  – e.g. air and water pollution, congestion, housing development on green belt areas, destruction of hedgerows and wildlife, noise, pollution, anti-social behaviour, crime

- External benefits in production –

  where MSC < MPC

  – e.g. human resource development, research and development in industry

Positive and Negative Externalities

Costs and benefits in consumption:

- External costs in consumption – where MSB < MPB
  - e.g. passive smoking, litter, noise, anti-social behaviour

- External benefits in consumption – where MSB > MPB
  - e.g. preventative health care – vaccinations, public transport, attractive gardens, bathing regularly!

Positive and Negative Externalities

- **External costs**

  – socially efficient output is less than current output

- **External benefits**

  – socially efficient output is greater than current output

Socially efficient output satisfies **MSC = MSB.**

Way to Control Externality

- **Internalise** the externality by expanding the coverage area of the market
  - Role of Government
    - Penalty (罰金), Subsidise (補助金)
      - Pigouvian tax
      - Emission trading (排出権取引)
    - Quantity control (数量規制)
  - Negotiation by stakeholders
    - Coase Theorem (Coase(1960))
      - The market will automatically generate the optimal level of the externality. This optimal level of the externality will be generated regardless of the initial allocation of property rights.

Pigouvian Taxes

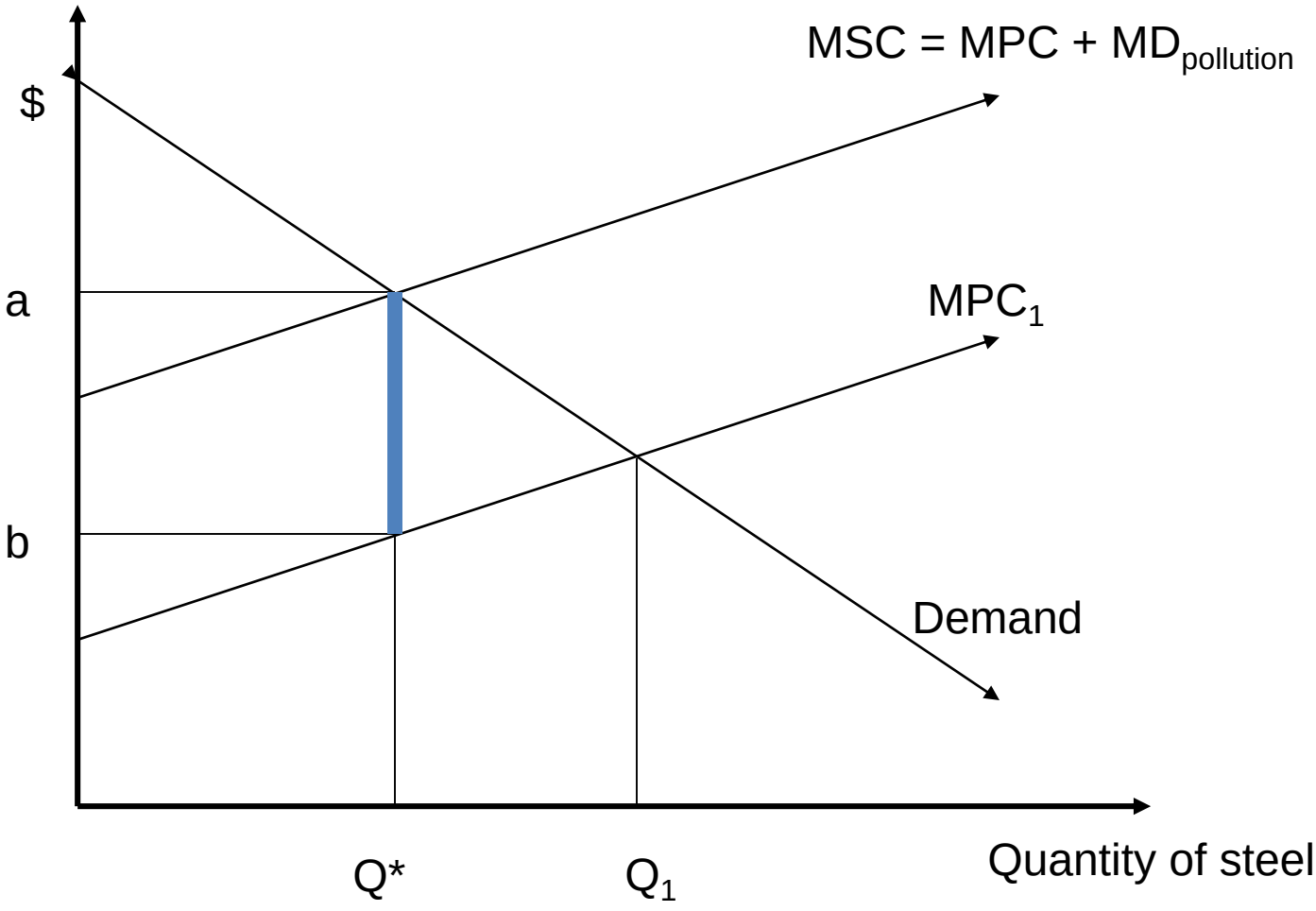
- A.C. Pigou (1938) argued that an externality cannot be mitigated by contractual negotiation between the affected parties.

- Pigou argued that direct coercion by the government or judicious use of taxes should be used against the offending party.

Pigouvian Taxes

- The basic principle behind the use of externality taxes is that the tax eliminates the divergence between the Marginal Private Cost (MPC) and the Marginal Social Cost (MSC).
- Q_1 represents the market equilibrium (where MPC=MPB), and
- Q* represents the optimal level of output (where MSC=MSB).

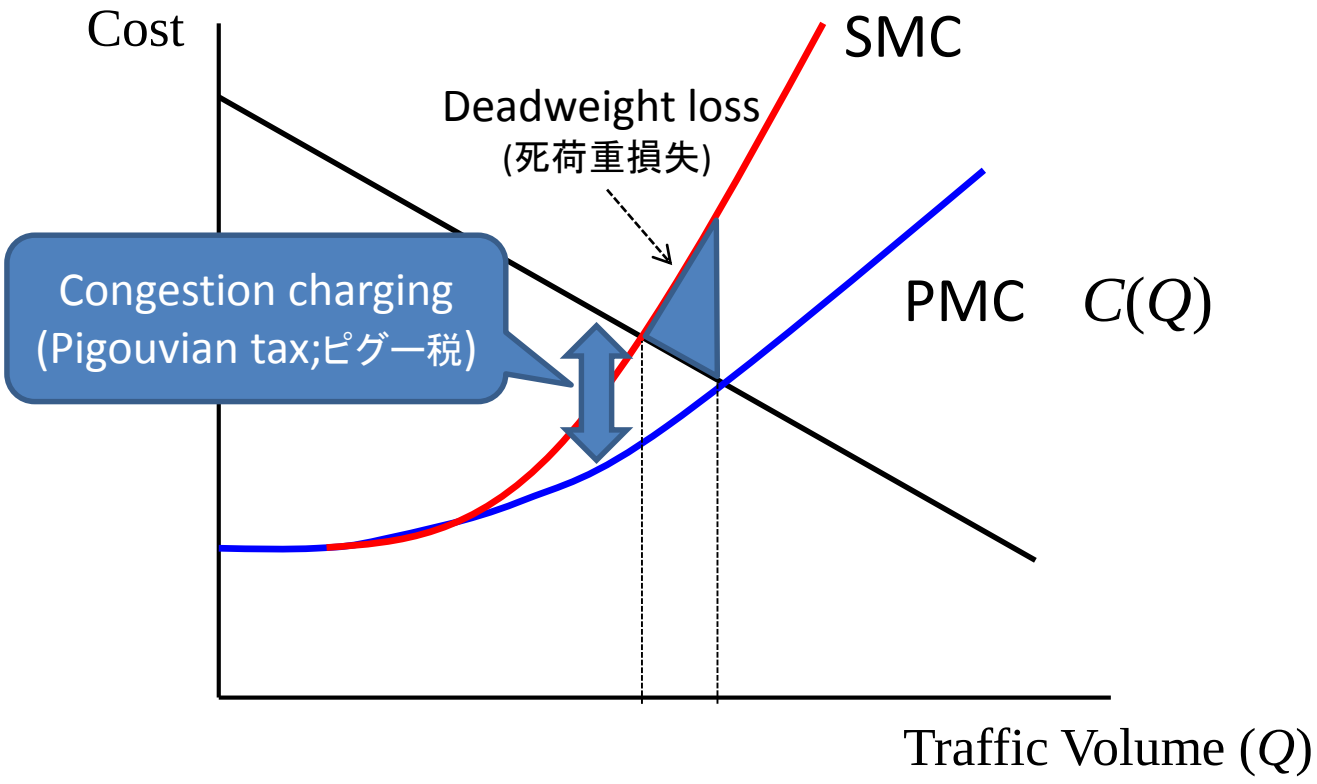
An Externality Tax on Output



Pigouvian Taxes

- An externalities tax equal to the divergence between MPC and MSC would raise the steel firms' private costs.
- The tax would shift the MPC curve by an amount equal to the distance from *a* to *b*.
- The market would arrive at an optimal equilibrium of Q*.
- This is known as **internalizing an externality.**

Road Congestion and Congestion Charge



$$SMC = \frac{d\{C(Q)\cdot Q\}}{dQ} = C(Q) + Q\frac{dC(Q)}{dQ} = PMC + Q\frac{dC(Q)}{dQ}$$