Chapter 10

Externalities

Externalities

- Government action can sometimes improve upon market outcomes
  - Why markets sometimes fail to allocate resources efficiently
  - How government policies can potentially improve the market's allocation
  - What kinds of policies are likely to work best

Externalities

- Externality
  - The uncompensated impact of one person's actions on the well-being of a bystander
  - Market failure
- Negative externality
  - Impact on the bystander is adverse
- Positive externality
  - Impact on the bystander is beneficial

Externalities

- Negative externalities
  - Exhaust from automobiles
  - Barking dogs
- Positive externalities
  - Restored historic buildings
  - Research into new technologies

Externalities and Market Inefficiency

- Welfare economics: A recap
  - Demand curve: value to consumers
    - Prices they are willing to pay
  - Supply curve: cost to suppliers
  - Equilibrium quantity and price
    - Efficient
    - Maximizes the sum of producer and consumer surplus

Figure 1 The Market for Steel

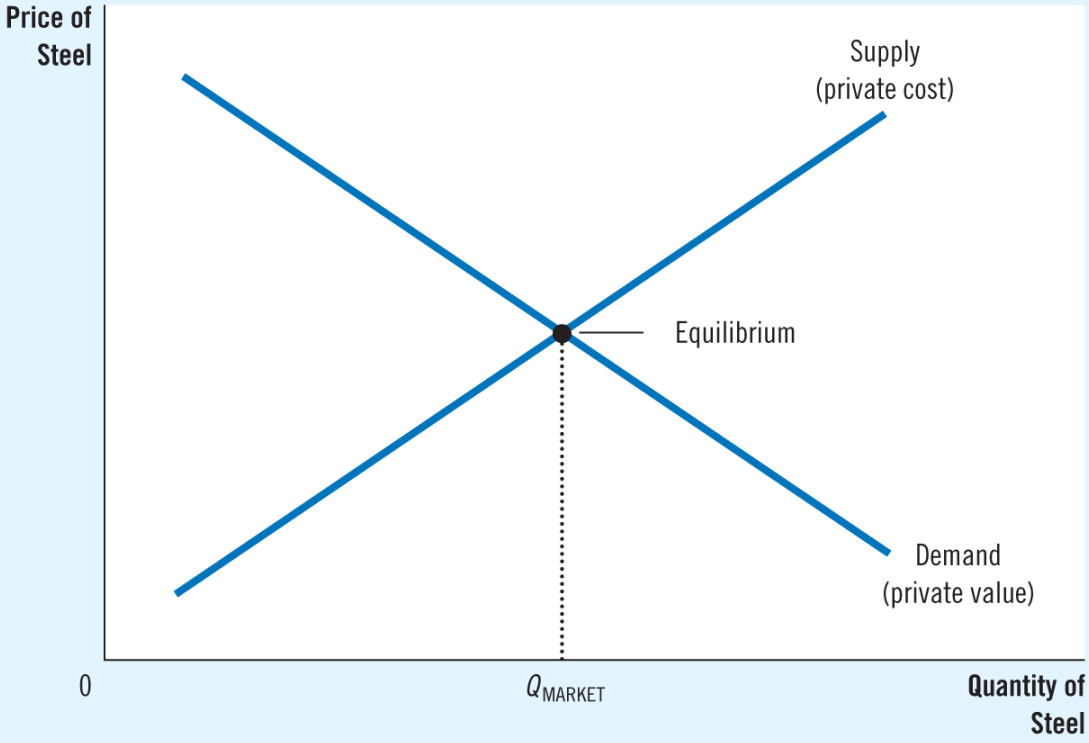


FIGURE 1

The Market for Steel

The demand curve reflects the value to buyers, and the supply curve reflects the costs of sellers. The equilibrium quantity, Q_{MARKET}, maximizes the total value to buyers minus the total costs of sellers. In the absence of externalities, therefore, the market equilibrium is efficient.

Externalities and Market Inefficiency

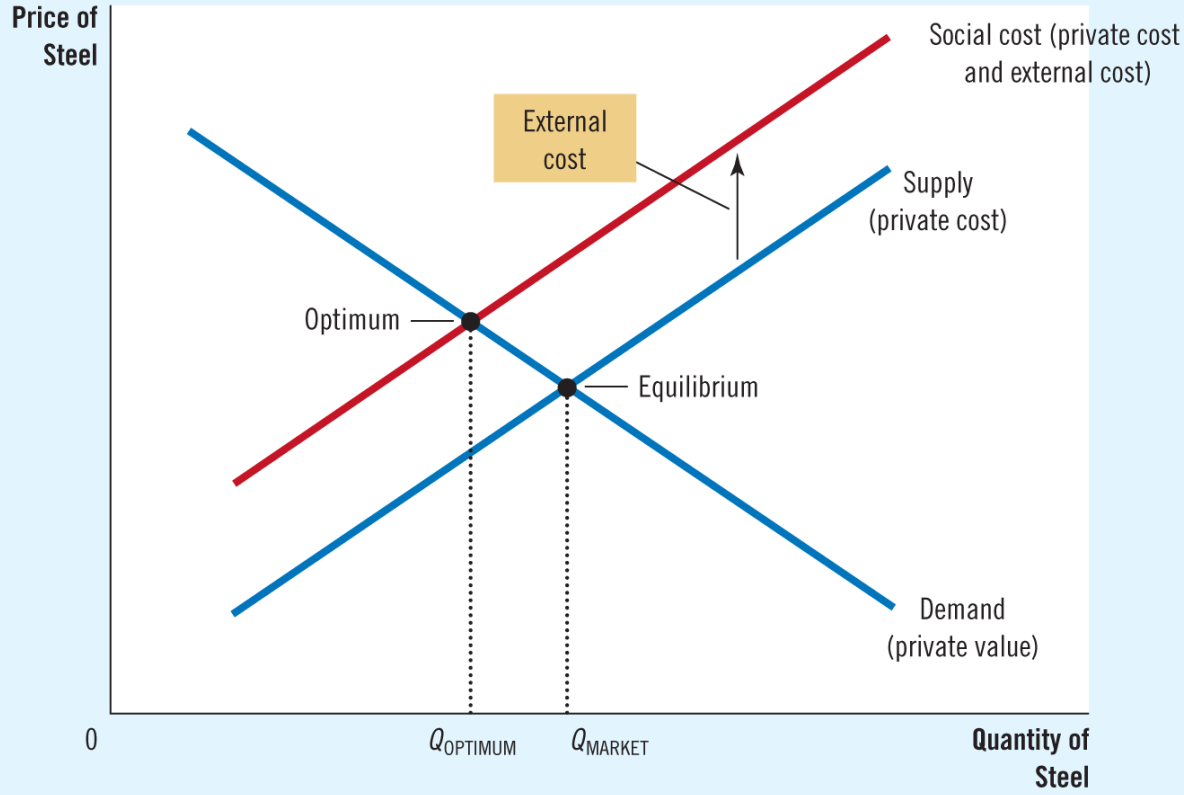
- Negative externalities
  - Social cost
    - Private costs of the producers (supply)
    - Plus the costs to those bystanders affected adversely by the negative externality
  - Social cost curve is above the supply curve

Figure 2 Pollution and the Social Optimum

FIGURE 2

Pollution and the Social Optimum

In the presence of a negative externality, such as pollution, the social cost of the good exceeds the private cost. The optimal quantity, $Q_{OPTIMUM}$, is therefore smaller than the equilibrium quantity, Q_{MARKET}.



Externalities and Market Inefficiency

- Negative externalities
  - Optimum quantity produced
    - Maximize total welfare
    - Smaller than market equilibrium quantity
- Government – correct market failure
  - Internalizing the externality
    - Altering incentives so that people take account of the external effects of their actions

Externalities and Market Inefficiency

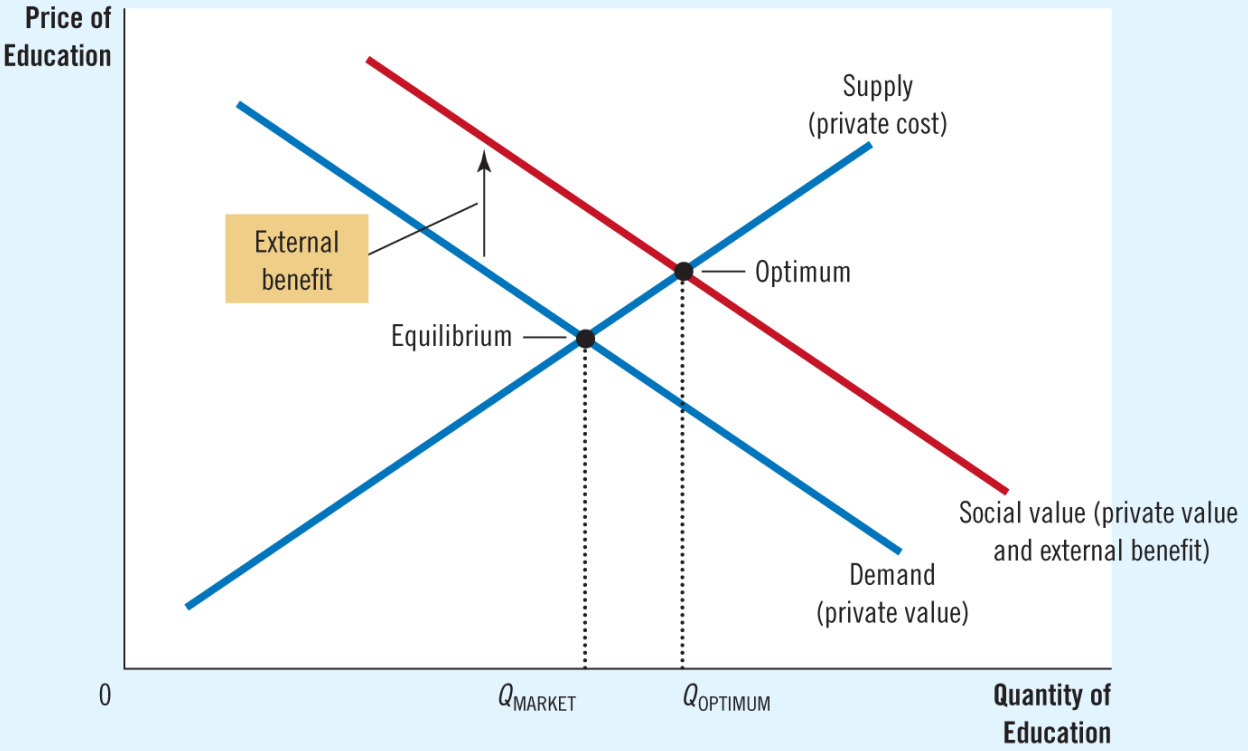
- Positive externalities
  - Education
    - Benefit of education is private
    - Externalities: better government, lower crime rates, higher productivity and wages
  - Social value is greater than private value
  - Social value curve
    - Above the demand curve

Figure 3 Education and the Social Optimum

FIGURE 3

Education and the Social Optimum

In the presence of a positive externality, the social value of the good exceeds the private value. The optimal quantity, $Q_{OPTIMUM}$, is therefore larger than the equilibrium quantity, Q_{MARKET}.



Externalities and Market Inefficiency

- Positive externalities
  - Socially optimal quantity is greater than market equilibrium quantity
  - Government – correct market failure
    - Internalize the externality
    - Subsidy

Externalities and Market Inefficiency

- Negative externalities
  - Markets produce a larger quantity than is socially desirable
  - Government: tax
- Positive externalities
  - Markets produce a smaller quantity than is socially desirable
  - Government: subsidy

Public Policies toward Externalities

- Regulation
  - Regulate behavior directly: making certain behaviors either required or forbidden
  - Cannot eradicate pollution
  - Environmental Protection Agency (EPA)
    - Develop and enforce regulations
    - Dictates maximum level of pollution
    - Requires that firms adopt a particular technology to reduce emissions

Public Policies toward Externalities

- Corrective taxes and subsidies
  - Corrective taxes (*Pigovian taxes)*
    - Induce private decision makers to take account of the social costs that arise from a negative externality
    - Places a price on the right to pollute
    - Reduce pollution at a lower cost to society
    - Raise revenue for the government
    - Enhance economic efficiency

Public Policies toward Externalities

- Tradable pollution permits
  - Voluntary transfer of the right to pollute from one firm to another
  - New scarce resource: pollution permits
  - Market to trade permits
  - Firm's willingness to pay
    - Depend on its cost of reducing pollution

Public Policies toward Externalities

- Advantage of free market for pollution permits
  - Initial allocation of pollution permits doesn't matter
  - If firms can reduce pollution at a low cost:
    - Sell whatever permits they get
  - If firms can reduce pollution only at a high cost: buy whatever permits they need
  - Efficient final allocation

Public Policies toward Externalities

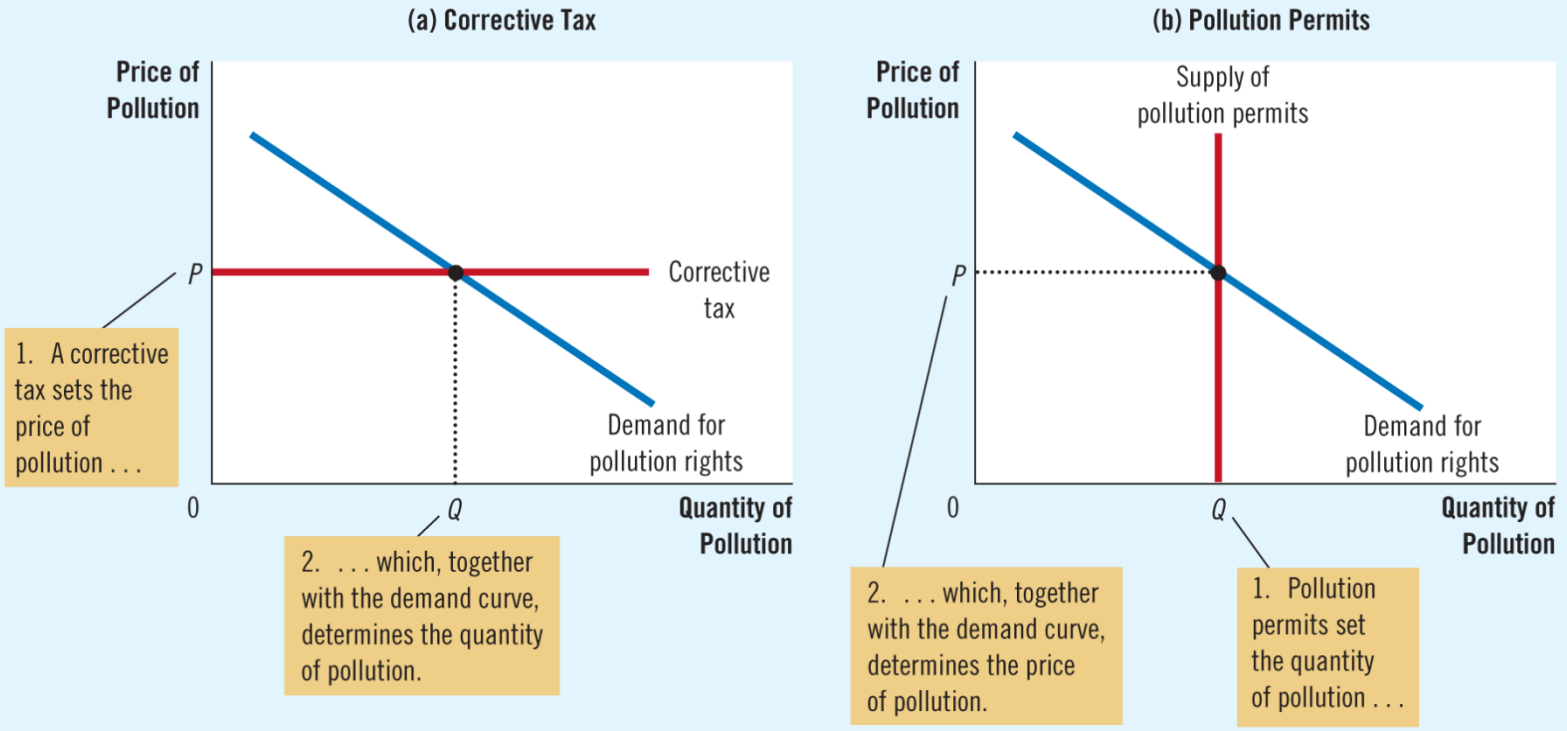
- Reducing pollution using pollution permits or corrective taxes
  - Firms pay for their pollution
    - Corrective taxes: pay to the government
    - Pollution permits: pay to buy permits
  - Internalize the externality of pollution

Figure 4 The Equivalence of Corrective Taxes and Pollution Permits

FIGURE 4

The Equivalence of Corrective Taxes and Pollution Permits

In panel (a), the EPA sets a price on pollution by levying a corrective tax, and the demand curve determines the quantity of pollution. In panel (b), the EPA limits the quantity of pollution by limiting the number of pollution permits, and the demand curve determines the price of pollution. The price and quantity of pollution are the same in the two cases.



Public Policies toward Externalities

- Objections to the economic analysis of pollution
  - "We cannot give anyone the option of polluting for a fee." – late Senator Edmund Muskie
- People face trade-offs
  - Eliminating all pollution is impossible
  - Clean water and clean air — opportunity cost: lower standard of living

Public Policies toward Externalities

- Clean environment is a normal good
  - Positive income elasticity
    - Rich countries can afford a cleaner environment
    - More rigorous environmental protection

Private Solutions to Externalities

1. Emily has the legal right to keep a barking dog.

- Emily gets a $500 benefit from the dog
- Horace bears an $800 cost from the barking
- Efficient outcome:
  - Horace can offer Emily $600 to get rid of the dog
  - Emily will gladly accept

Private Solutions to Externalities

2. Emily has the legal right to keep a barking dog.

- Emily gets a $1,000 benefit from the dog
- Horace bears an $800 cost from the barking
- Efficient outcome:
  - Emily turns down any offer below $1,000
  - Horace will not offer any amount above $800
  - Emily keeps the dog

Private Solutions to Externalities

3. Horace can legally compel Emily to get rid of the dog.

- Emily can offer to pay Horace to allow him to keep the dog
  - If the benefit of the dog to Emily exceeds the cost of the barking to Horace
  - Then Emily and Horace will strike a bargain in which Emily keeps the dog