Externalities

7

- Recall: Adam Smith's "invisible hand" of the marketplace leads self-interested buyers and sellers in a market to maximize the total benefit that society can derive from a market.

But market failures can still happen.

EXTERNALITIES AND MARKET INEFFICIENCY

- An *externality* refers to the uncompensated impact of one person's actions on the well-being of a bystander.
- Externalities cause markets to be inefficient, and thus fail to maximize total surplus.

EXTERNALITIES AND MARKET INEFFICIENCY

- An externality arises...

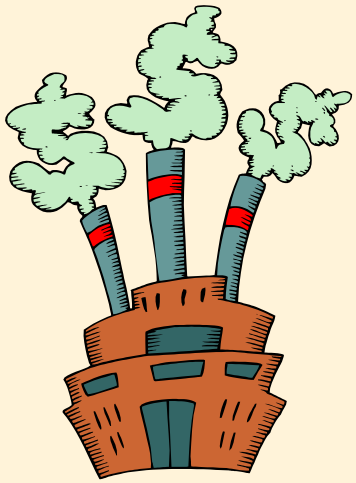
  . . . when a person engages in an activity that influences the well-being of a bystander and yet neither pays nor receives any compensation for that effect.

EXTERNALITIES AND MARKET INEFFICIENCY

- When the impact on the bystander is adverse, the externality is called a negative externality.
- When the impact on the bystander is beneficial, the externality is called a positive externality.

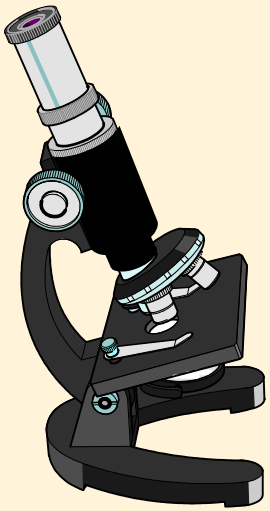
EXTERNALITIES AND MARKET INEFFICIENCY

- Negative Externalities
  - Automobile exhaust
  - Cigarette smoking
  - Barking dogs (loud pets)
  - Loud stereos in an apartment building



EXTERNALITIES AND MARKET INEFFICIENCY

- Positive Externalities
  - Immunizations
  - Restored historic buildings
  - Research into new technologies



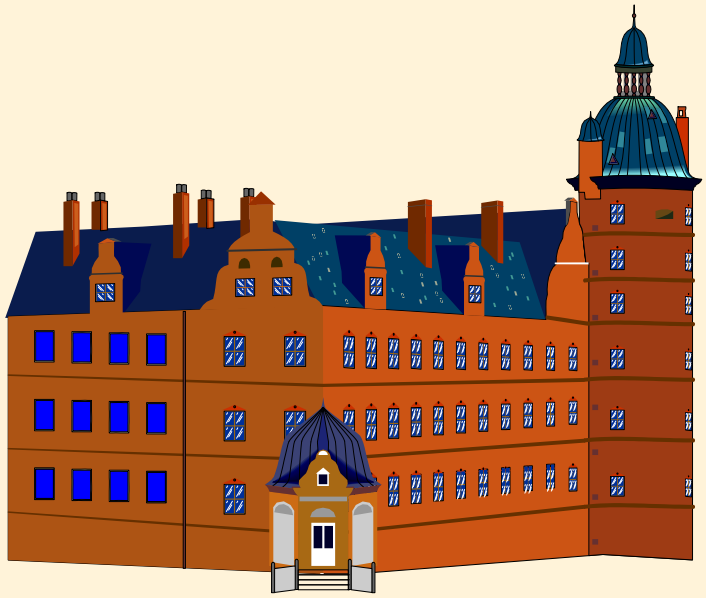
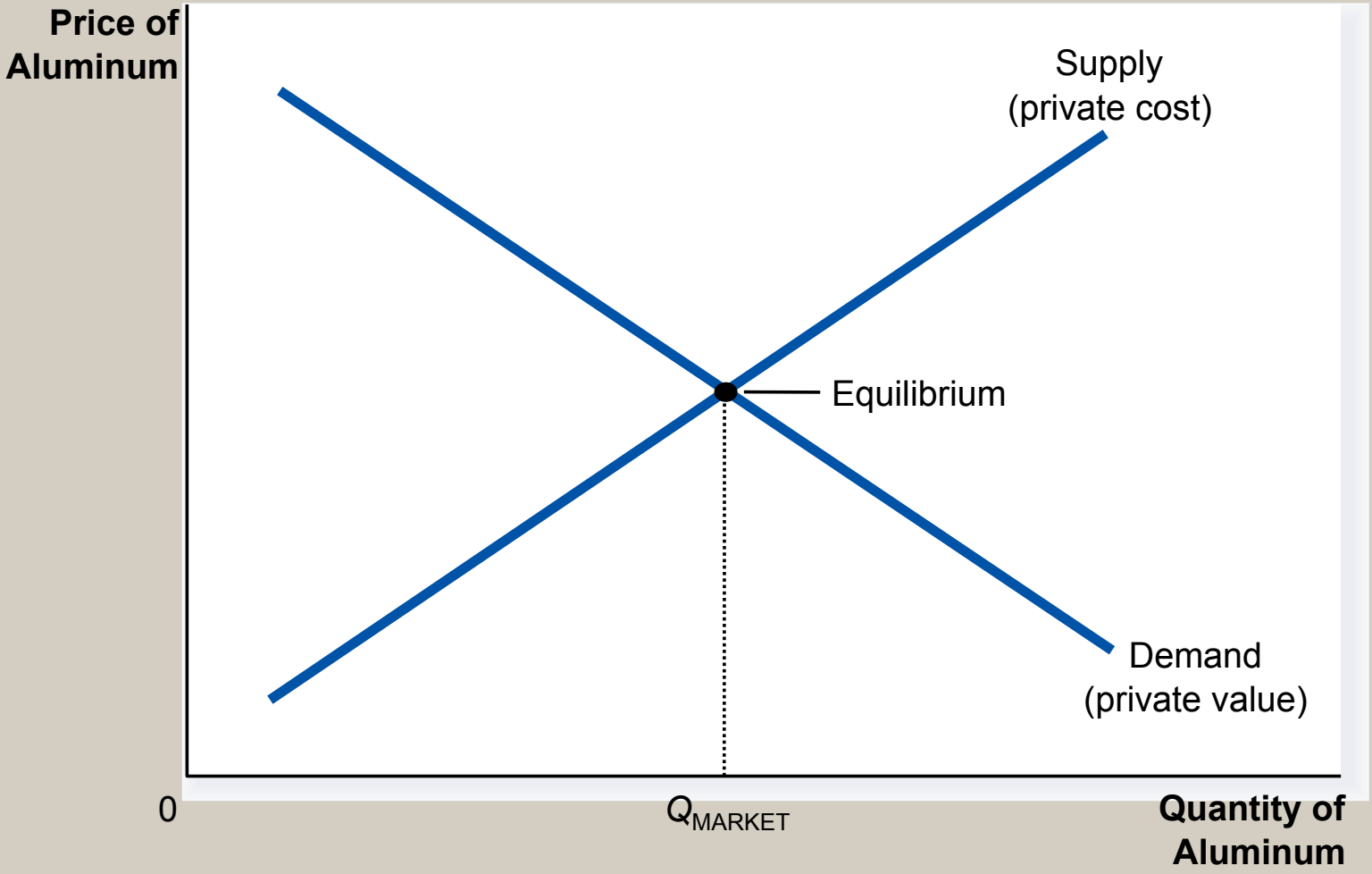


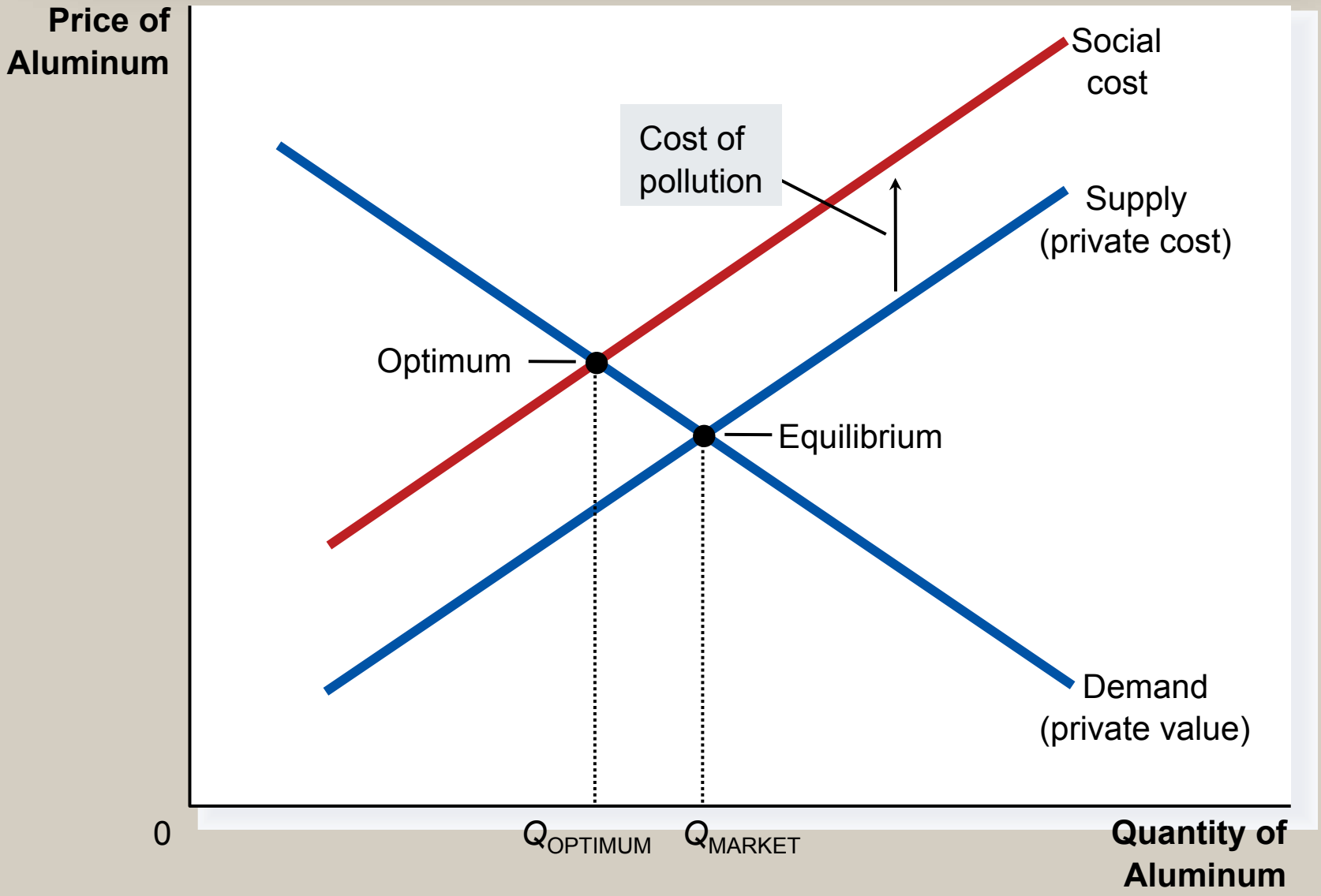
Figure 1 The Market for Aluminum



Welfare Economics: A Recap

- The Market for Aluminum
  - For each unit of aluminum produced, the *social cost* includes the private costs of the producers plus the cost to those bystanders adversely affected by the pollution.

Figure 2 Pollution and the Social Optimum



Negative Externalities

- The intersection of the demand curve and the social-cost curve determines the optimal output level.
  - The socially optimal output level *is less than* the market equilibrium quantity.

Negative Externalities

- *Internalizing an externality* involves altering incentives so that people take account of the external effects of their actions.

Negative Externalities

- Achieving the Socially Optimal Output
- The government can internalize an externality by imposing a tax on the producer to reduce the equilibrium quantity to the socially desirable quantity.

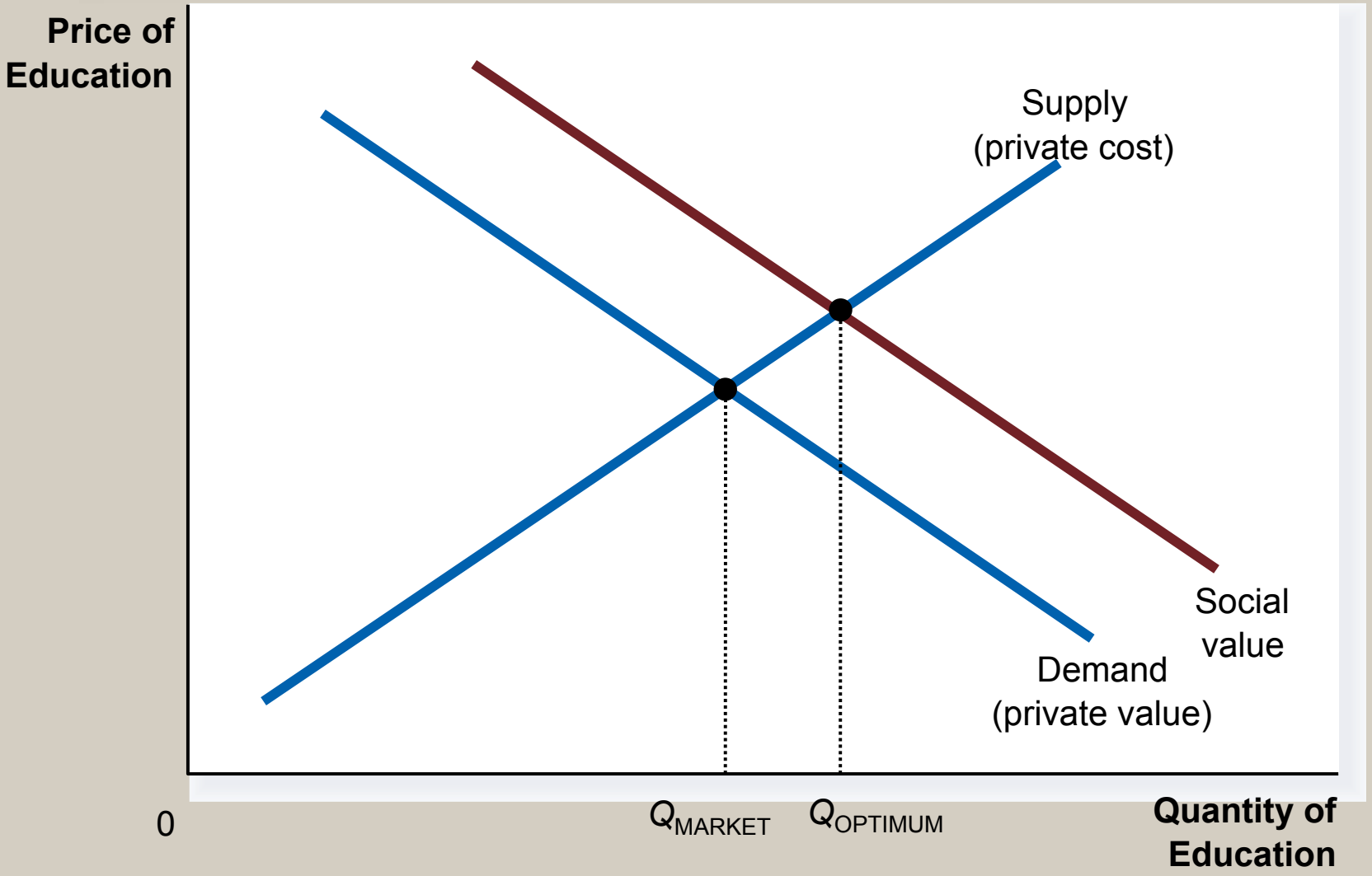
Positive Externalities

- When an externality *benefits* the bystanders, a positive externality exists.
  - The social value of the good exceeds the private value.

Positive Externalities

- A technology spillover is a type of positive externality that exists when a firm's innovation or design not only benefits the firm, but enters society's pool of technological knowledge and benefits society as a whole.

Figure 3 Education and the Social Optimum



Positive Externalities

- The intersection of the supply curve and the social-value curve determines the optimal output level.
  - The optimal output level is more than the equilibrium quantity.
  - The market produces a smaller quantity than is socially desirable.
  - The social value of the good exceeds the private value of the good.

Positive Externalities

- Internalizing Externalities: Subsidies
  - Used as the primary method for attempting to internalize positive externalities.
- Industrial Policy
  - Government intervention in the economy that aims to promote technology-enhancing industries
    - *Patent laws* are a form of technology policy that give the individual (or firm) with patent protection a *property right* over its invention.
    - The patent is then said to *internalize* the externality.

PRIVATE SOLUTIONS TO EXTERNALITIES

- Government action is not always needed to solve the problem of externalities.

PRIVATE SOLUTIONS TO EXTERNALITIES

- Moral codes and social sanctions
- Charitable organizations
- Integrating different types of businesses
- Contracting between parties

The Coase Theorem

- The *Coase Theorem* is a proposition that if private parties can bargain without cost over the allocation of resources, they can solve the problem of externalities on their own.
- Transactions Costs
  - *Transaction costs* are the costs that parties incur in the process of agreeing to and following through on a bargain.

Why Private Solutions Do Not Always Work

- Sometimes the private solution approach fails because transaction costs can be so high that private agreement is not possible.

PUBLIC POLICY TOWARD EXTERNALITIES

- When externalities are significant and private solutions are not found, government may attempt to solve the problem through . . .
  - command-and-control policies.
  - market-based policies.

PUBLIC POLICY TOWARD EXTERNALITIES

- Command-and-Control Policies
  - Usually take the form of regulations:
    - Forbid certain behaviors.
    - Require certain behaviors.
  - Examples:
    - Requirements that all students be immunized.
    - Stipulations on pollution emission levels set by the Environmental Protection Agency (EPA).

PUBLIC POLICY TOWARD EXTERNALITIES

- Market-Based Policies
  - Government uses taxes and subsidies to align private incentives with social efficiency.
  - *Pigovian taxes* are taxes enacted to correct the effects of a negative externality.

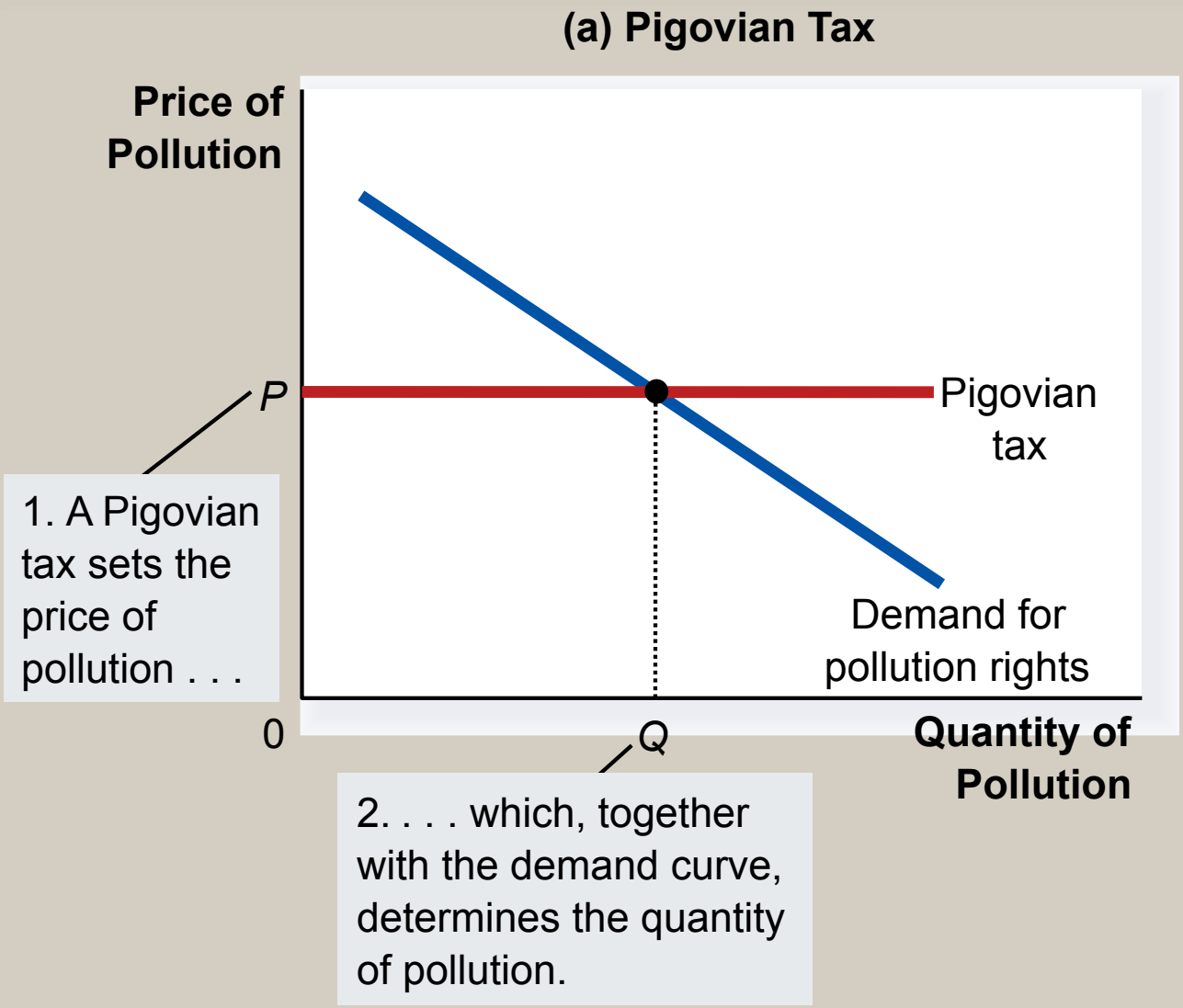
PUBLIC POLICY TOWARD EXTERNALITIES

- Examples of Regulation versus Pigovian Tax
  - If the EPA decides it wants to reduce the amount of pollution coming from a specific plant. The EPA could…
  - tell the firm to reduce its pollution by a specific amount (i.e. regulation).
  - levy a tax of a given amount for each unit of pollution the firm emits (i.e. Pigovian tax).

PUBLIC POLICY TOWARD EXTERNALITIES

- Market-Based Policies
- Tradable pollution permits allow the voluntary transfer of the right to pollute from one firm to another.
  - A market for these permits will eventually develop.
  - A firm that can reduce pollution at a low cost may prefer to sell its permit to a firm that can reduce pollution only at a high cost.

Figure 4 The Equivalence of Pigovian Taxes and Pollution Permits



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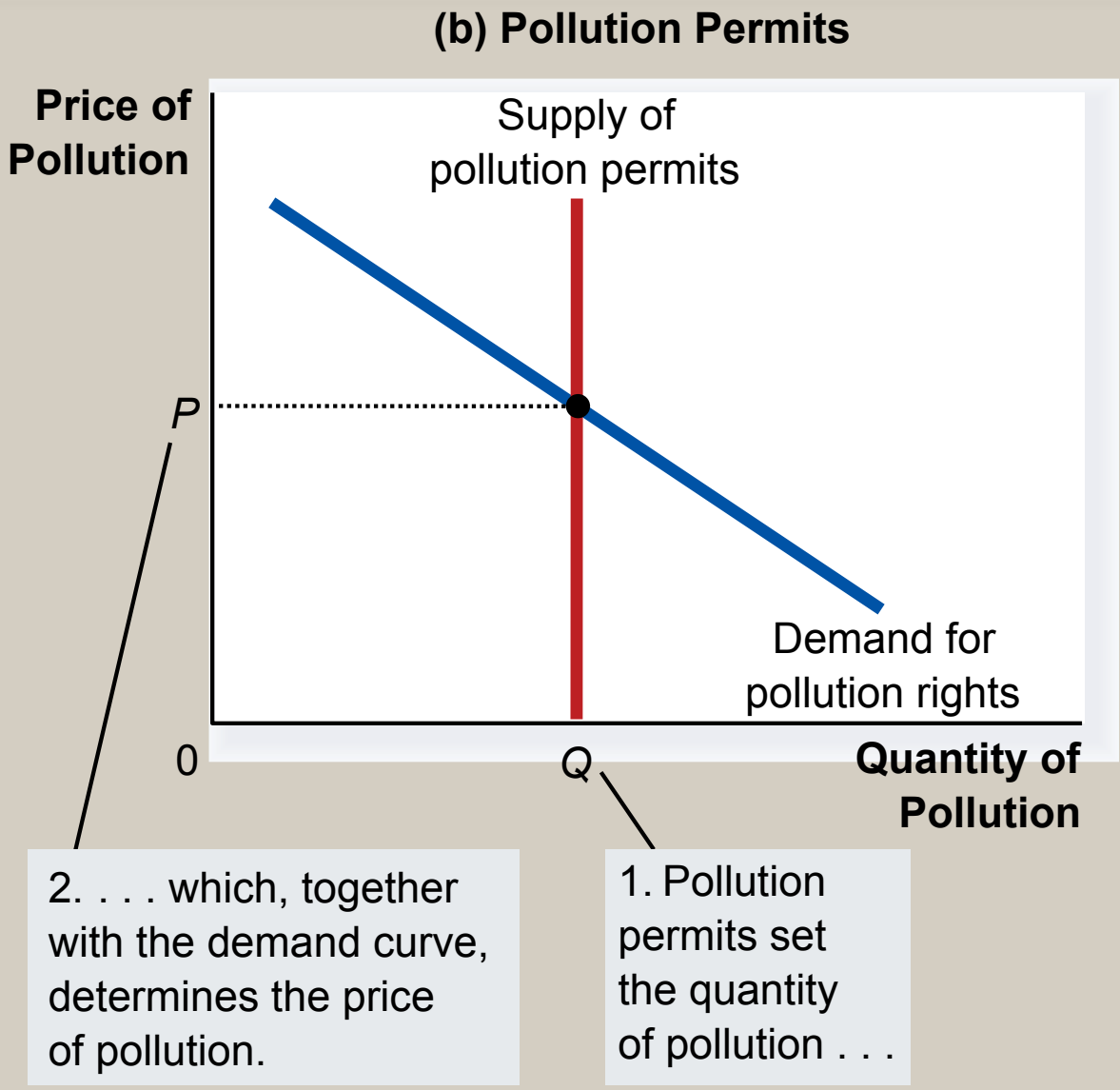


8

Public Goods and Common Resource

“The best things in life are free. . .”

- Free goods provide a special challenge for economic analysis.
- Most goods in our economy are allocated in markets…

“The best things in life are free. . .”

- When goods are available free of charge, the market forces that normally allocate resources in our economy are absent.

“The best things in life are free. . .”

- When a good does not have a price attached to it, private markets cannot ensure that the good is produced and consumed in the proper amounts.

“The best things in life are free. . .”

- In such cases, government policy can potentially remedy the market failure that results, and raise economic well-being.

THE DIFFERENT KINDS OF GOODS

- When thinking about the various goods in the economy, it is useful to group them according to two characteristics:
  - *Is the good excludable?*
  - *Is the good rival?*

THE DIFFERENT KINDS OF GOODS

- Excludability
  - *Excludability* refers to the property of a good whereby a person can be prevented from using it.
- Rivalry
  - *Rivalry* refers to the property of a good whereby one person's use diminishes other people's use.

Figure 1 Four Types of Goods

Excludable? \ Rival?	Yes	No
Yes	Private Goods • Ice-cream cones • Clothing • Congested toll roads	Natural Monopolies • Fire protection • Cable TV • Uncongested toll roads
No	Common Resources • Fish in the ocean • The environment • Congested nontoll roads	Public Goods • Tornado siren • National defense • Uncongested nontoll roads

THE DIFFERENT KINDS OF GOODS

- Private Goods
  - Are both excludable and rival.
- Public Goods
  - Are neither excludable nor rival.
- Common Resources
  - Are rival but not excludable.
- Natural Monopolies
  - Are excludable but not rival.

PUBLIC GOODS

- A *free-rider* is a person who receives the benefit of a good but avoids paying for it.

The Free-Rider Problem

- Since people cannot be excluded from enjoying the benefits of a public good, individuals may withhold paying for the good hoping that others will pay for it.
- The free-rider problem prevents private markets from supplying public goods.

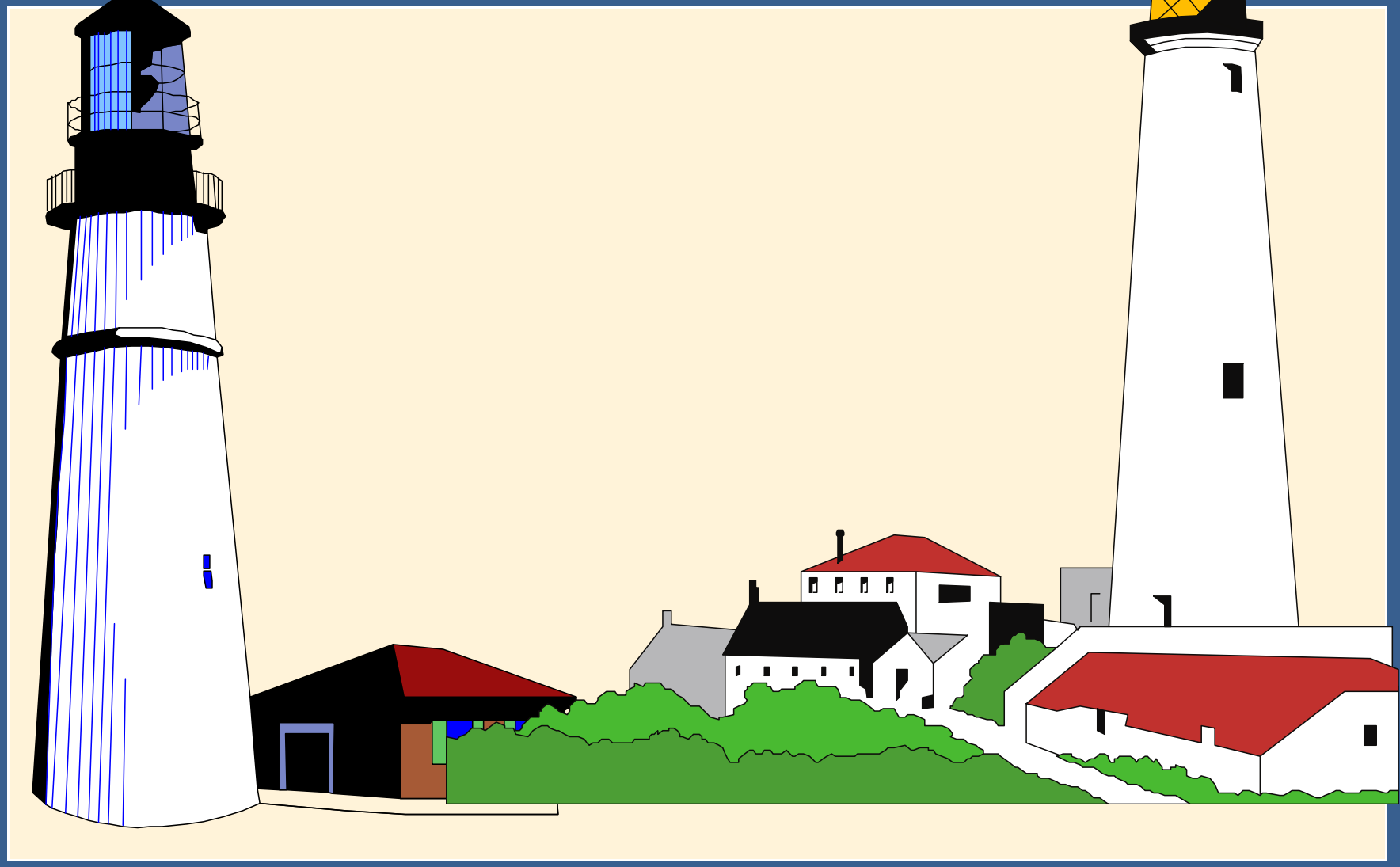
The Free-Rider Problem

- Solving the Free-Rider Problem
  - The government can decide to provide the public good if the total benefits exceed the costs.
  - The government can make everyone better off by providing the public good and paying for it with tax revenue.

Some Important Public Goods

- National Defense
- Basic Research
- Fighting Poverty

CASE STUDY: Are Lighthouses Public Goods?



The Difficult Job of Cost-Benefit Analysis

- *Cost benefit analysis* refers to a study that compares the costs and benefits to society of providing a public good.
- In order to decide whether to provide a public good or not, the total benefits of all those who use the good must be compared to the costs of providing and maintaining the public good.

The Difficult Job of Cost-Benefit Analysis

- A cost-benefit analysis would be used to estimate the total costs and benefits of the project to society as a whole.
  - It is difficult to do because of the absence of prices needed to estimate social benefits and resource costs.
  - The value of life, the consumer's time, and aesthetics are difficult to assess.

COMMON RESOURCES

- Common resources, like public goods, are not excludable. They are available free of charge to anyone who wishes to use them.

COMMON RESOURCES

- Common resources are rival goods because one person's use of the common resource reduces other people's use.

Tragedy of the Commons

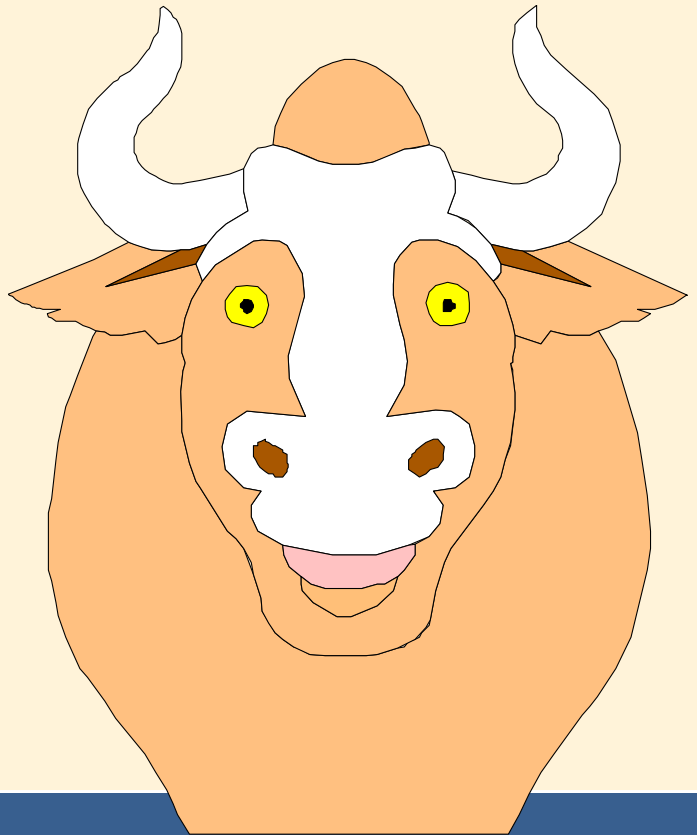
- The *Tragedy of the Commons* is a parable that illustrates why common resources get used more than is desirable from the standpoint of society as a whole.
  - Common resources tend to be used excessively when individuals are not charged for their usage.
  - This is similar to a *negative externality*.

Some Important Common Resources

- Clean air and water
- Congested roads
- Fish, whales, and other wildlife

CASE STUDY: Why Isn't the Cow Extinct?

- Will the market protect me?



Private Ownership and the Profit Motive!

CONCLUSION: THE IMPORTANCE OF PROPERTY RIGHTS

- The market fails to allocate resources efficiently when property rights are not well-established (i.e. some item of value does not have an owner with the legal authority to control it).

CONCLUSION: THE IMPORTANCE OF PROPERTY RIGHTS

- When the absence of property rights causes a market failure, the government can potentially solve the problem.