



 [Patreon.com/greb](https://patreon.com/greb)

@grebcomics   



# Externalities

Chapter 10

# Objectives

- To understand positive and negative externalities
  - What they mean?
  - How they affect market quantity and socially beneficial quantity?
  - What is Coase Theorem?

# Market Supply and Demand

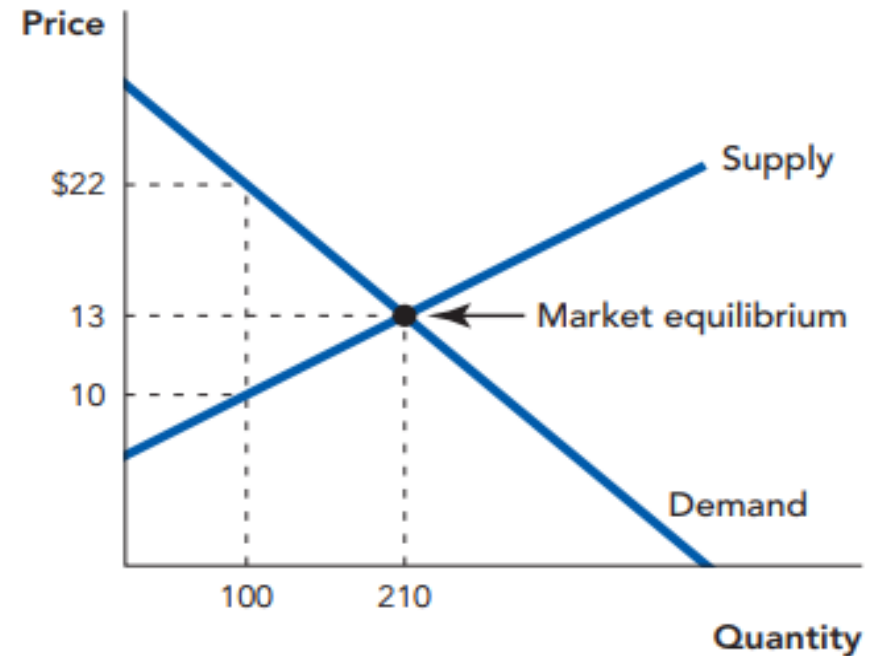
- *Typically*, well-functioning markets allocate the **sale** of goods to the buyers who value them the most.
- *Typically*, well-functioning markets allocate the **production** of goods to those who can produce the goods at the least cost.
- *Well-functioning* markets produce goods and services efficiently – and lead to **efficient outcomes**.

# Review of Gains from Trade

At the 210<sup>th</sup> unit:

- The value to buyers is \$13 and the cost to sellers of producing that additional unit is \$13, so there are no further incentives to trade.
- If any fewer units were traded, gains from trade would be left on the table.
- If any more units were traded, the cost of those units would exceed their value.

FIGURE 10.1



**Reviewing Gains from Trade** The value of the 100th unit to buyers is \$22. The cost of the 100th unit to sellers is \$10. At the 100th unit, there is a \$12 gain from exchange. Gains from trade are maximized when a total of 210 units are exchanged. Notice that the value of the 210th unit is just equal to the cost of the 210th unit.

# Market Supply and Demand

- Efficient outcomes arise because there are gains from trade and in these transactions the sellers and buyers typically incur (all) the **costs** and **benefits** from the transaction.
- Sometimes, however, there are some **costs** (or **benefits**) that are incurred by people **not involved** in the transaction.
  - **External costs** – the costs that fall on bystanders not involved in the market transaction.
  - **External benefits** – the benefits that fall on bystanders not involved in the market transaction.
  - **Externalities** are the external costs and benefits that fall on **bystanders**.

# An example: What is pollution?

- What we call “pollution” is not merely “waste”, but situations where actors foist some of the costs of their waste on others



# What is pollution (cont.)?

- Pollution is not simply waste.
- Pollution is waste imposed on non-consenting parties



# Vaccinations

- When I get a flu shot, I am not the only one that benefits –
  - Because I received the flu shot and am less likely to get the flu, others, that I come across, are less likely to get the flu (positive externality).
  - For example, one research study finds that for every **two** flu vaccinations it prevents **one** other person from getting the flu and for every **4,000** flu vaccinations **one** life is saved.
- When I consider the costs and benefits of getting the flu vaccine, I weigh
  - the **benefits** of me not getting the flu and **not spreading** it to my family and friends
  - the **costs** of getting the flu shot in terms of **time, money**, and some **minor inconveniences**.
  - I typically do not **fully weigh** all the benefits to society when I get a flu shot.

# Externalities

- Externalities arise when the **private costs** are not equal to total **social costs**.
- Externalities arise when the **private benefits** are not equal to total **social benefits**.
- When there are **negative externalities**, the market produces **too much** of the good.
- When there are **positive externalities**, the market produces **too little** of the good.

# Externalities

- An **externality** arises when a person engages in an activity that influences the well being of a *bystander* and the bystander neither pays nor receives compensation.

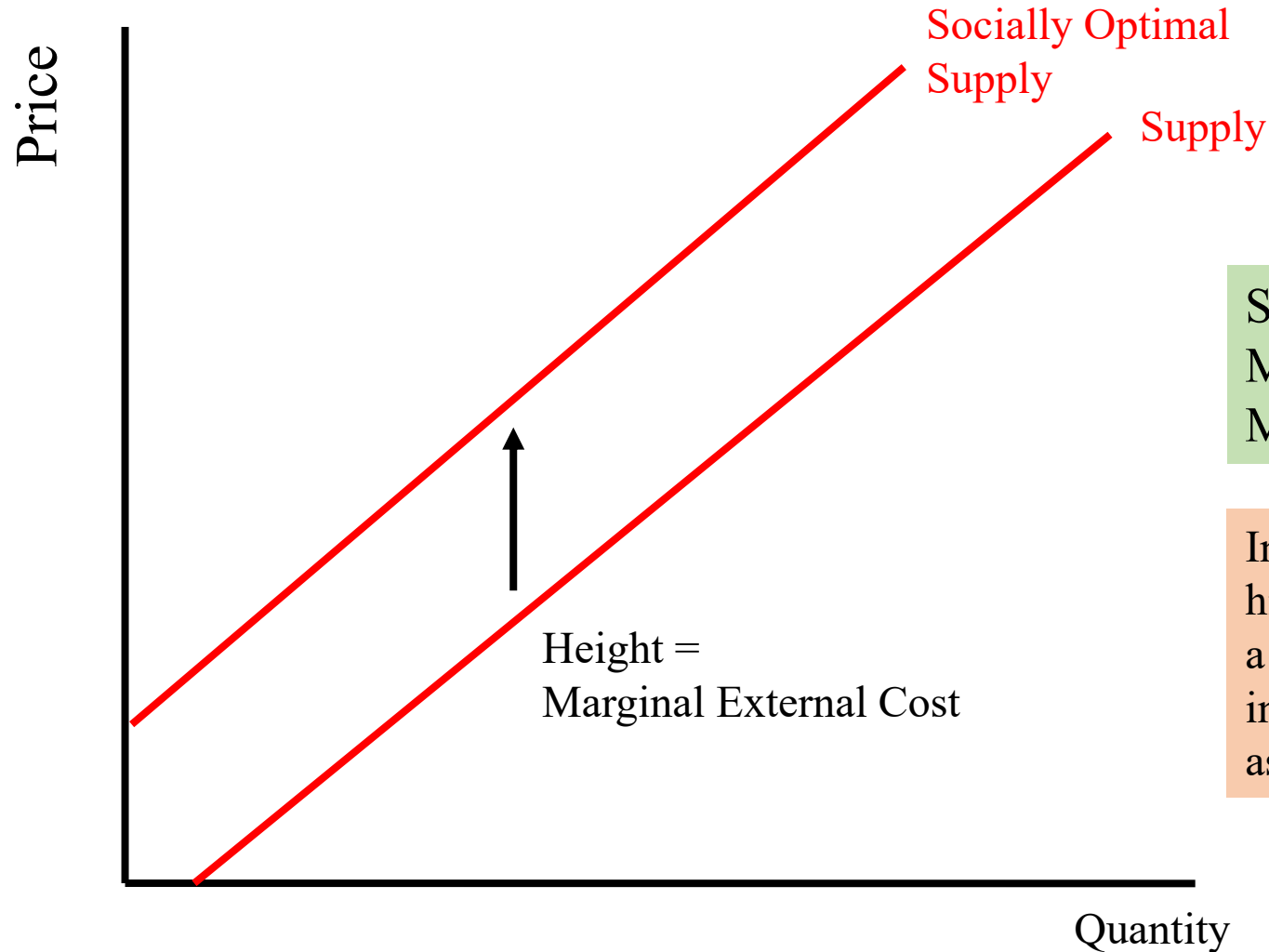
# Examples of Negative Externalities

- A negative externality exists when the production (or consumption) of a results in costs imposed on society that are not explicitly or implicitly paid for by the consumer (or producer)

## Examples:

- A business that pollutes the air or water.
- If you take antibiotics too often, a resistant bacterial strain is more likely to form and be less effective for others.
- If I smoke near you, you may be bothered by the second-hand smoke.
- If I play my music too loud, it may bother you.
- If I am trolling on social media websites, I make it less enjoyable for others.

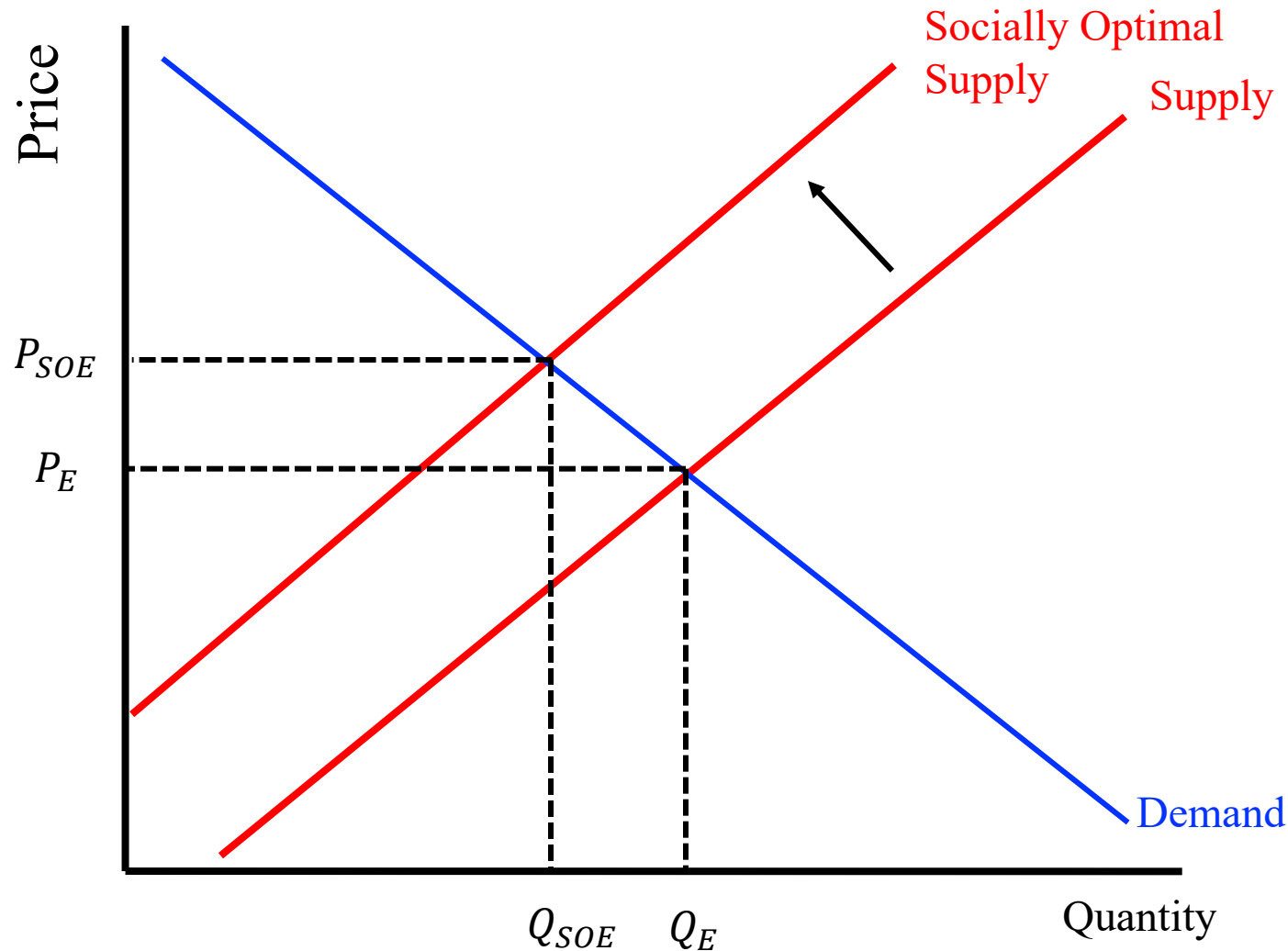
# Negative Externality and External Cost (Example: Pollution)



Socially Optimal Supply =  
Marginal Private Cost (Supply Curve) +  
Marginal External Benefit

Intuitively: A negative externality imposes higher costs than what is simply paid by the firm. a firm pays marginal cost of labor, capital and intermediate inputs but may not include costs associated with environmental damage

# Negative Externality and External Cost (Example: Pollution)



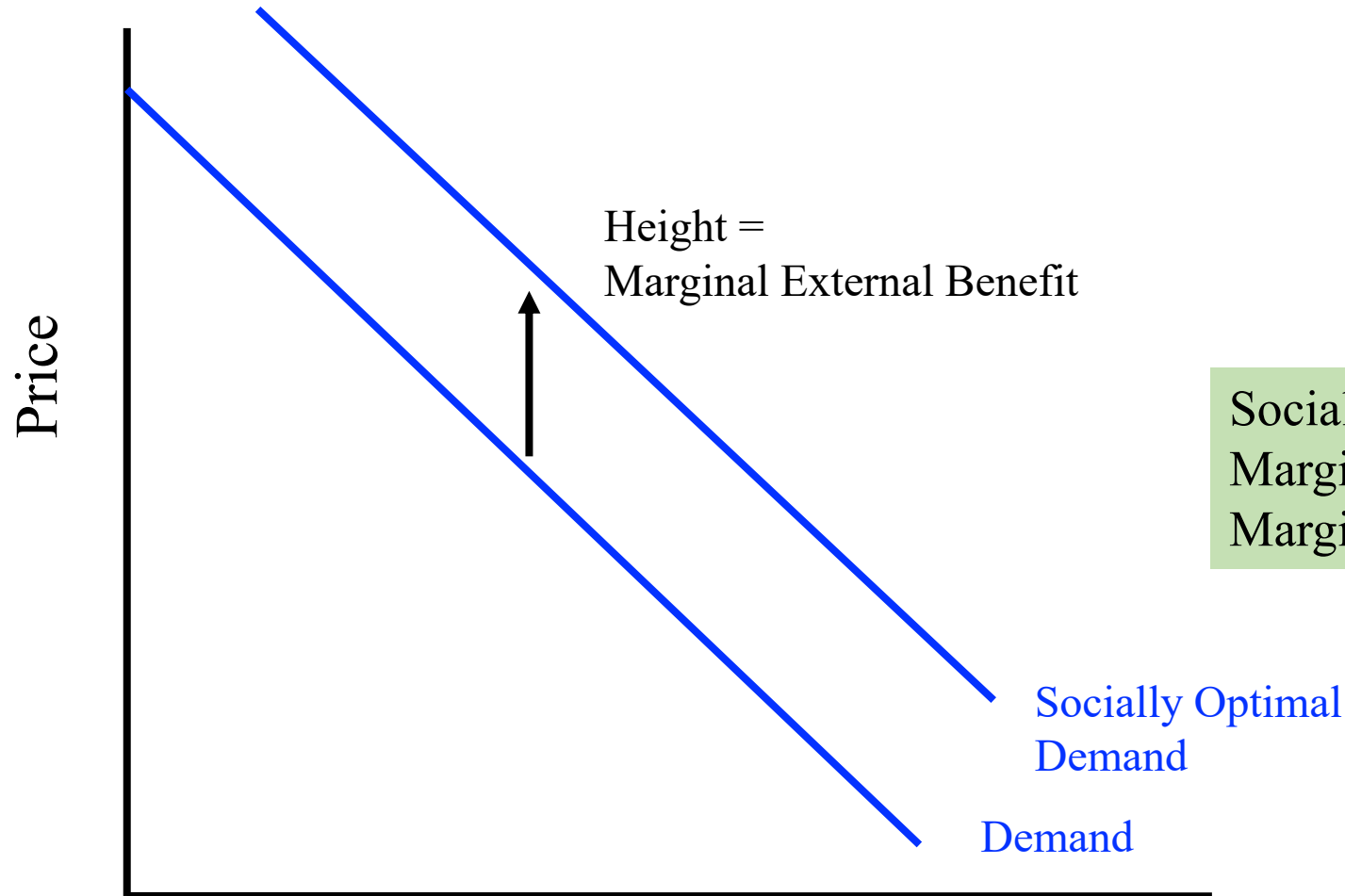
A socially optimal outcome would equate the Socially Optimal Supply with Demand.

A socially optimal outcome would correspond to a lower amount consumed and a higher price.

# Positive Externality

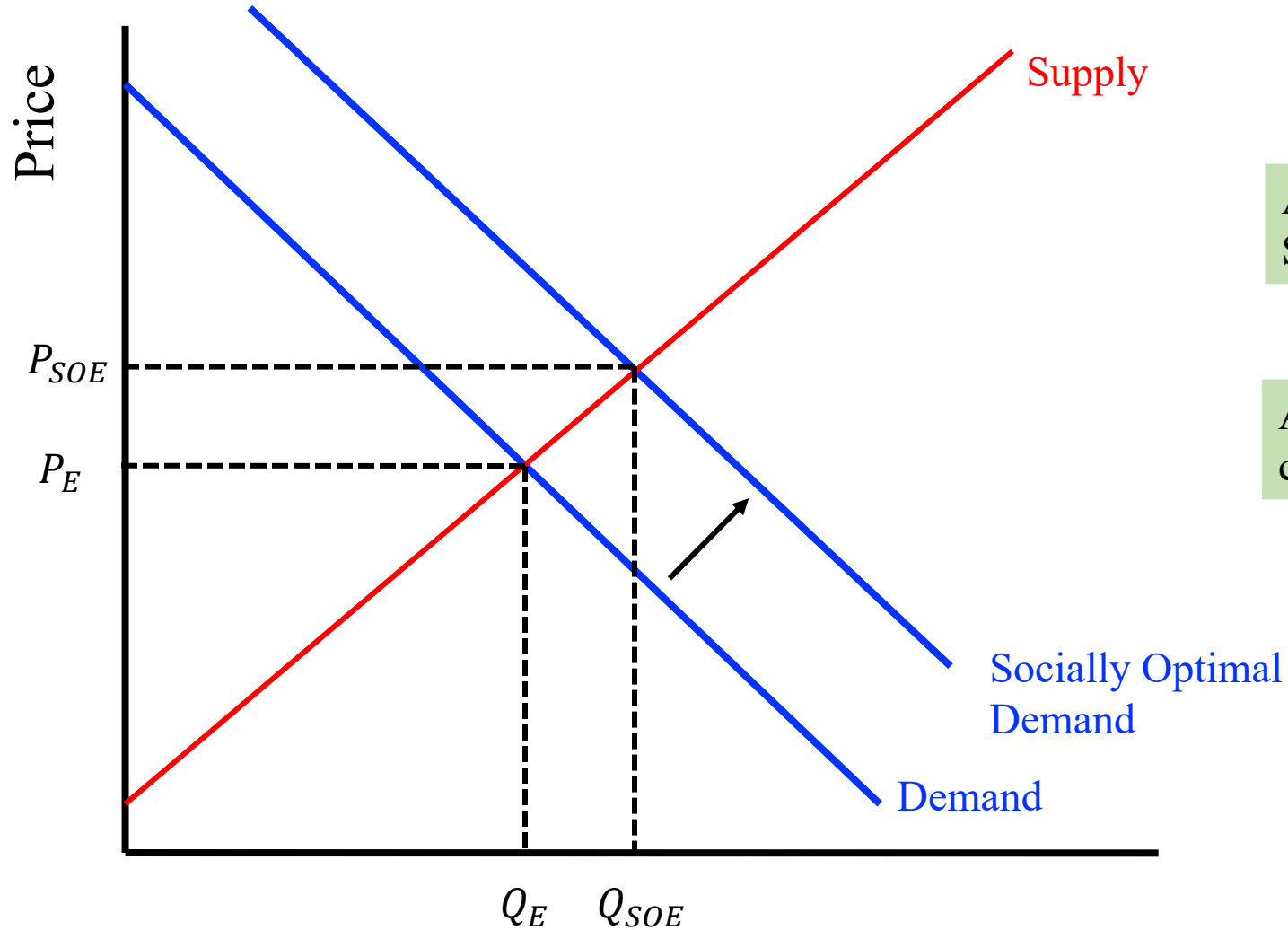
- A positive externality exists when the production (or consumption) of a provides benefits to society that are not explicitly or implicitly paid for by the consumer (or producer)
- EXAMPLES:
  - Vaccinations
  - Beekeeper and Flower gardens
  - Well kept yards / public parks
  - Innovations / Ideas

# Positive Externality and External Benefit(Example: Vaccination)



Socially Optimal Demand =  
Marginal Private Benefit (Demand Curve) +  
Marginal External Benefit

# Positive Externality and External Benefit(Example: Vaccination)

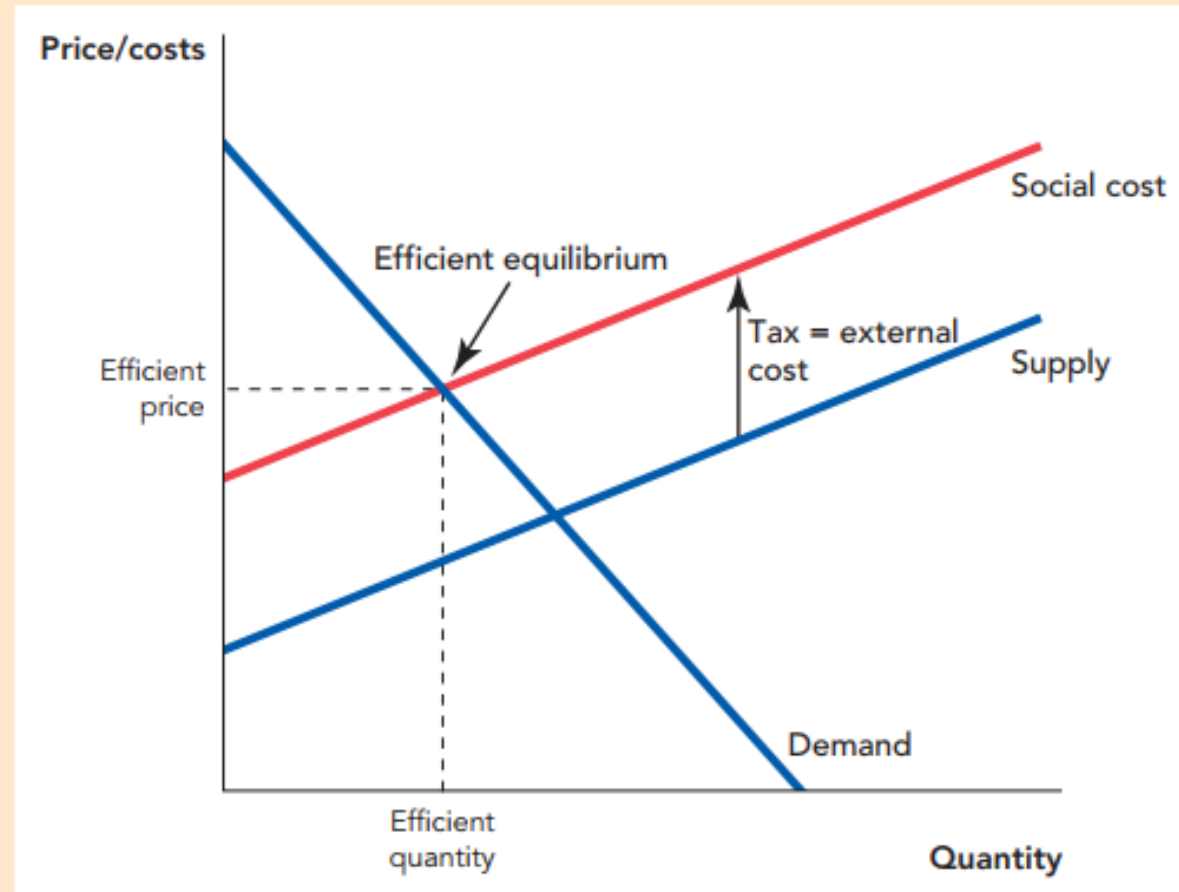


A socially optimal outcome would equate the Socially Optimal Demand and Supply

A socially optimal outcome would correspond to a higher amount consumed.

# Pigouvian Tax or Subsidy

FIGURE 10.5



**Comparing Tradable Allowances and Pigouvian Taxes** If we knew the exact positions of the supply and demand curves, then we could always use tradable allowances to hit the efficient quantity or a tax to hit the efficient price and the equilibrium would be identical.

A subsidy on a good with an external benefit is often called a Pigouvian subsidy.

A tax on a good with an external cost is often called a Pigouvian tax.

# Practice Questions

If you fail to take into account the true joy that your singing in the shower gives to the neighbors

- a. you sing too much.
- b. you sing too little.
- c. you have a comparative advantage in singing.
- d. there is a negative externality.

# Practice Questions

If you fail to take into account the true joy that your singing in the shower gives to the neighbors

- a. you sing too much.
- b. you sing too little.
- c. you have a comparative advantage in singing.
- d. there is a negative externality.

# Practice Questions

If after many arguments, I agree not to play loud music after 10 p.m. in return for your washing my car each week

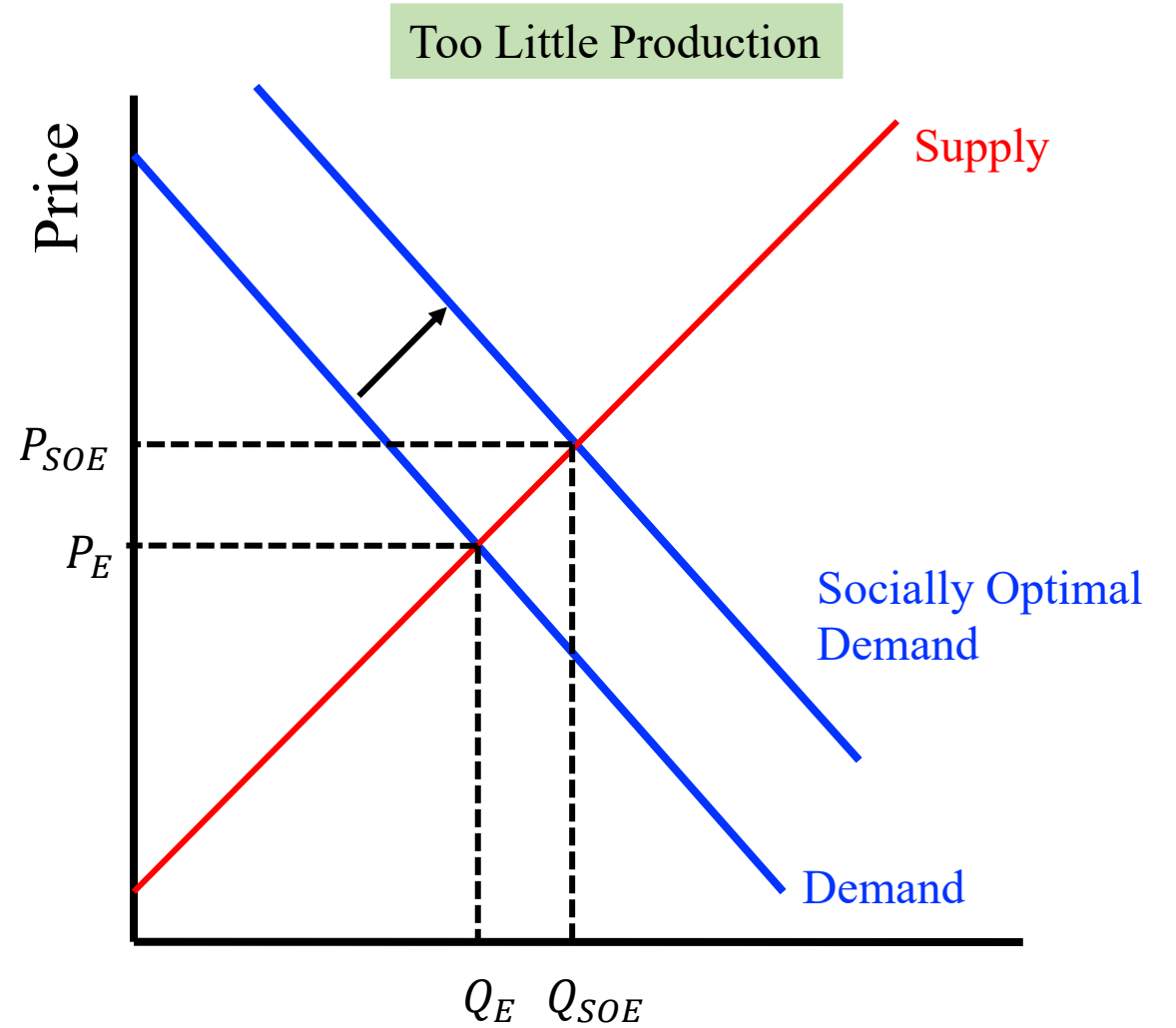
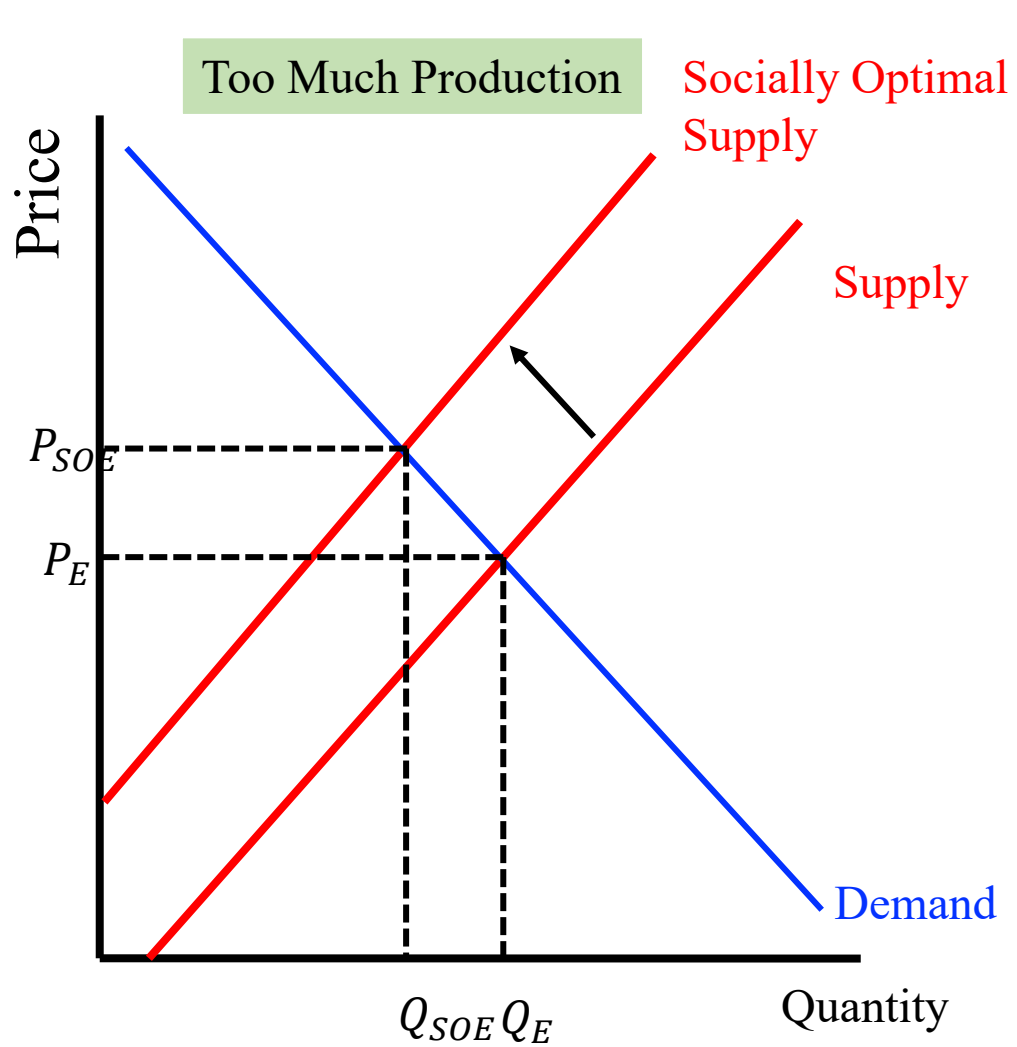
- a. my music playing has created a positive externality.
- b. your car washing creates a positive externality.
- c. there are no longer any externalities (the externality has been “internalized”).
- d. the positive and negative externalities balance exactly.

# Practice Questions

If after many arguments, I agree not to play loud music after 10 p.m. in return for your washing my car each week

- a. my music playing has created a positive externality.
- b. your car washing creates a positive externality.
- c. there are no longer any externalities (the externality has been “internalized”).
- d. the positive and negative externalities balance exactly.

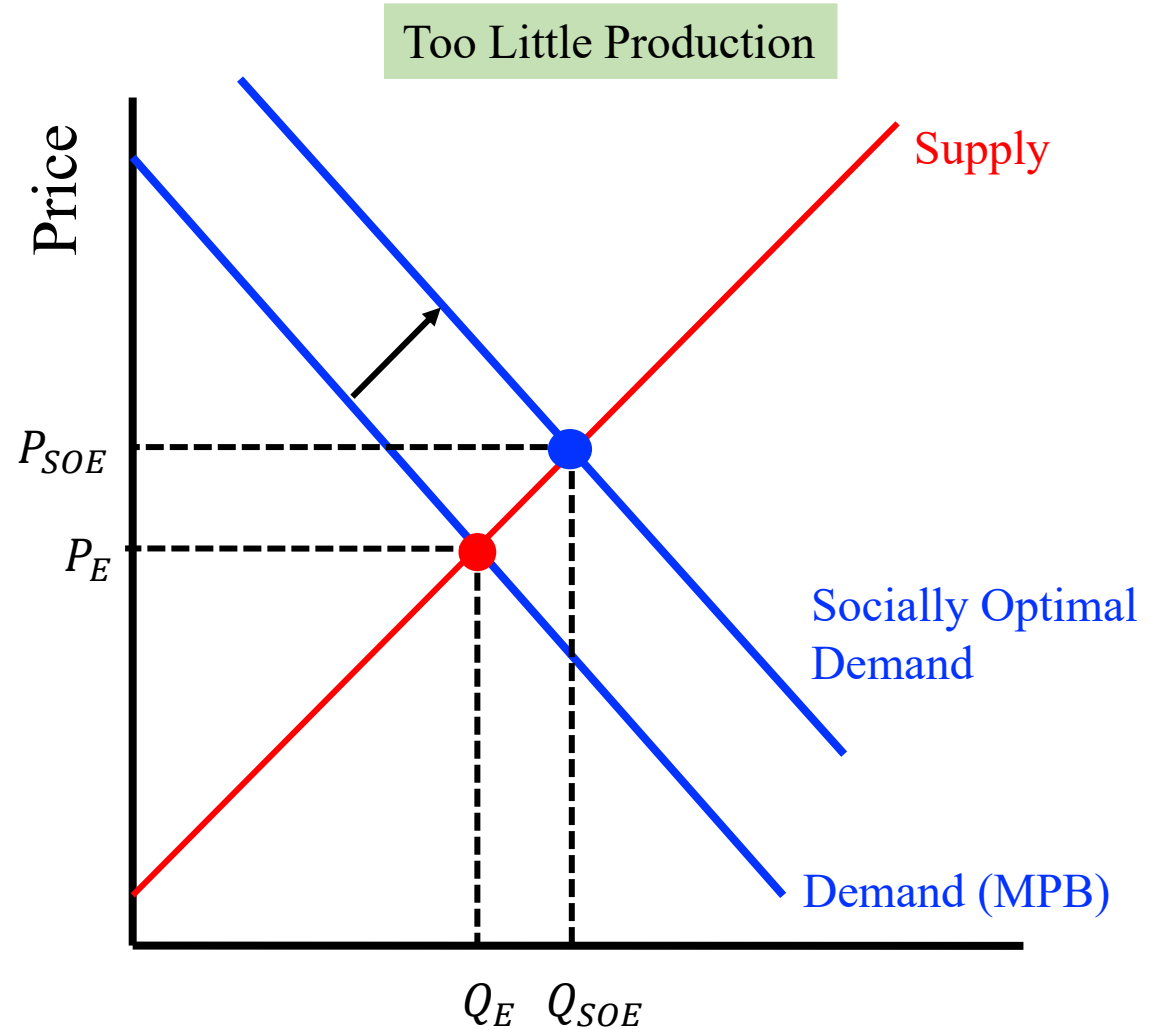
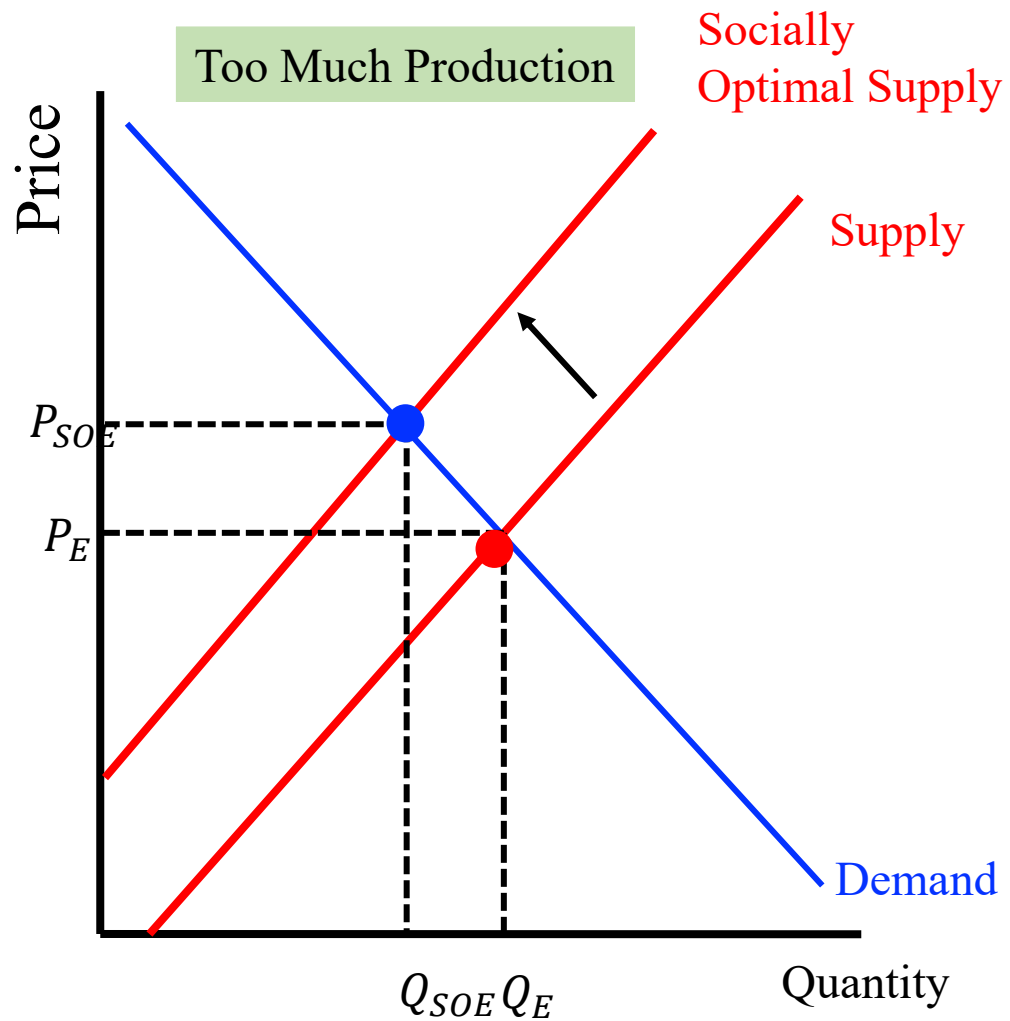
# Solutions to Externality Problem



# Solutions to Externality Problem

- The **socially optimal outcome** in the presence of externalities is to
  - Produce less of an item if its marginal social cost is greater than the marginal social benefit.
  - Produce more of an item if its marginal social benefit is greater than the marginal social cost.
  - The socially optimal amount of production would produce where the marginal social benefit equals the marginal social cost.

# Solutions to Externality Problem

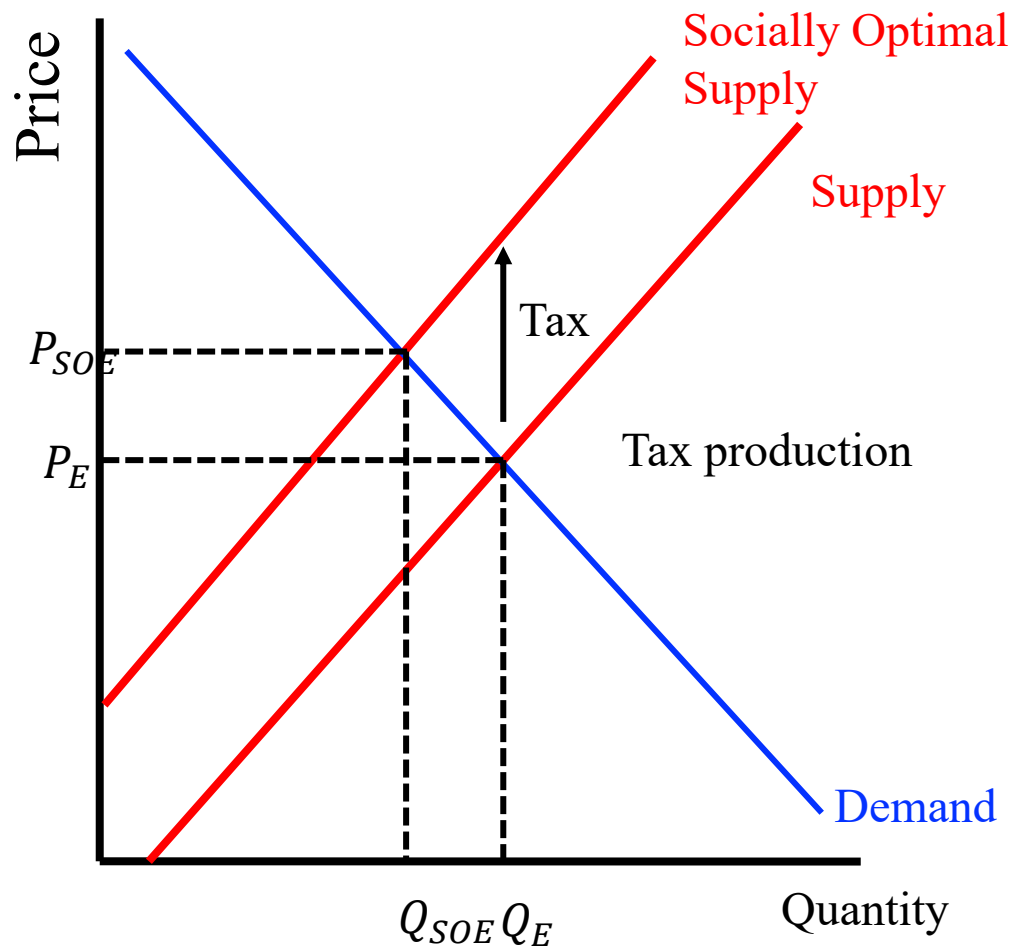


# Solutions to the Externality Problem,

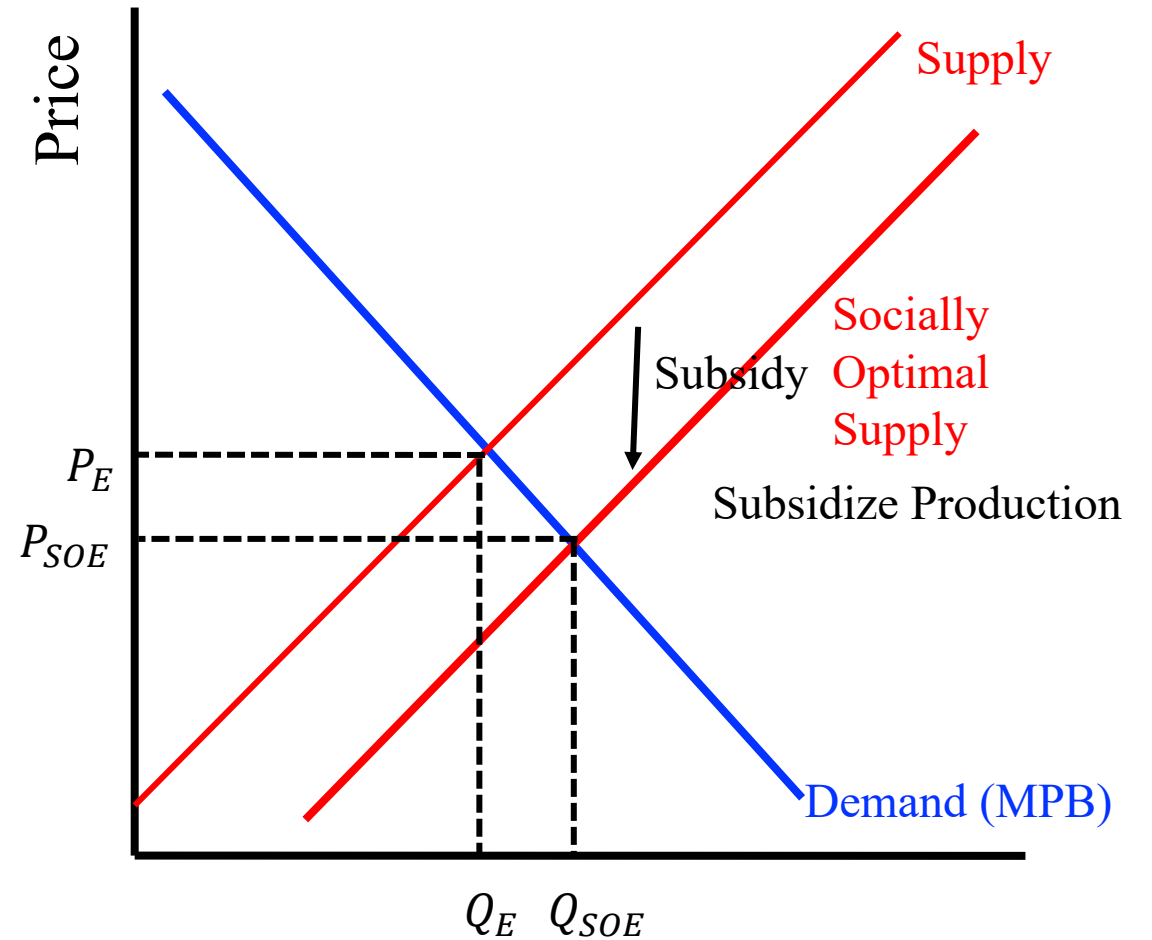
1. Fix the price: Taxes and Subsidies
2. Fix the quantity: Cap and Trade
3. Private Bargaining
4. Laws Rules and Regulations

# Taxes and Subsidies

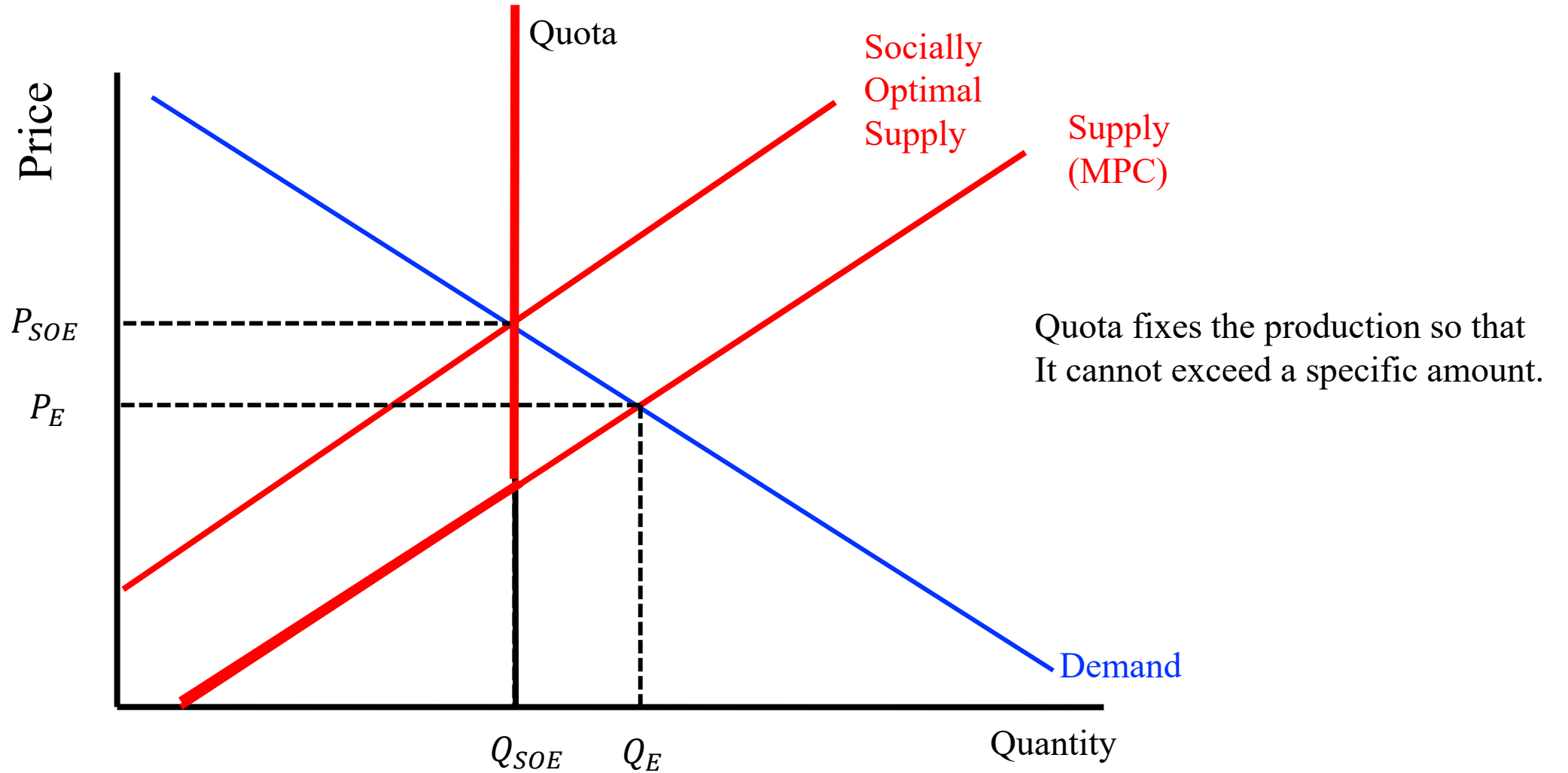
Negative Externality: Too Much Production



Positive Externality: Too Little Production



# Quota



# Cap and Trade

- Taxes and subsidies work well if we know (can measure) external costs and we can impose the correct tax.
- If we do not know the costs but we do have an idea of what the socially optimal quantity, then we can use quantity restrictions (quota).
- When using a quota, the government can tell each company that they can produce the same amount.
  - Government probably does not have enough information to identify which suppliers are efficient and which are less efficient.
- Cap and Trade: Government issues permits to the firms and allows them to use the permits or trade/sell to other companies.

# Cap and Trade: Outcome

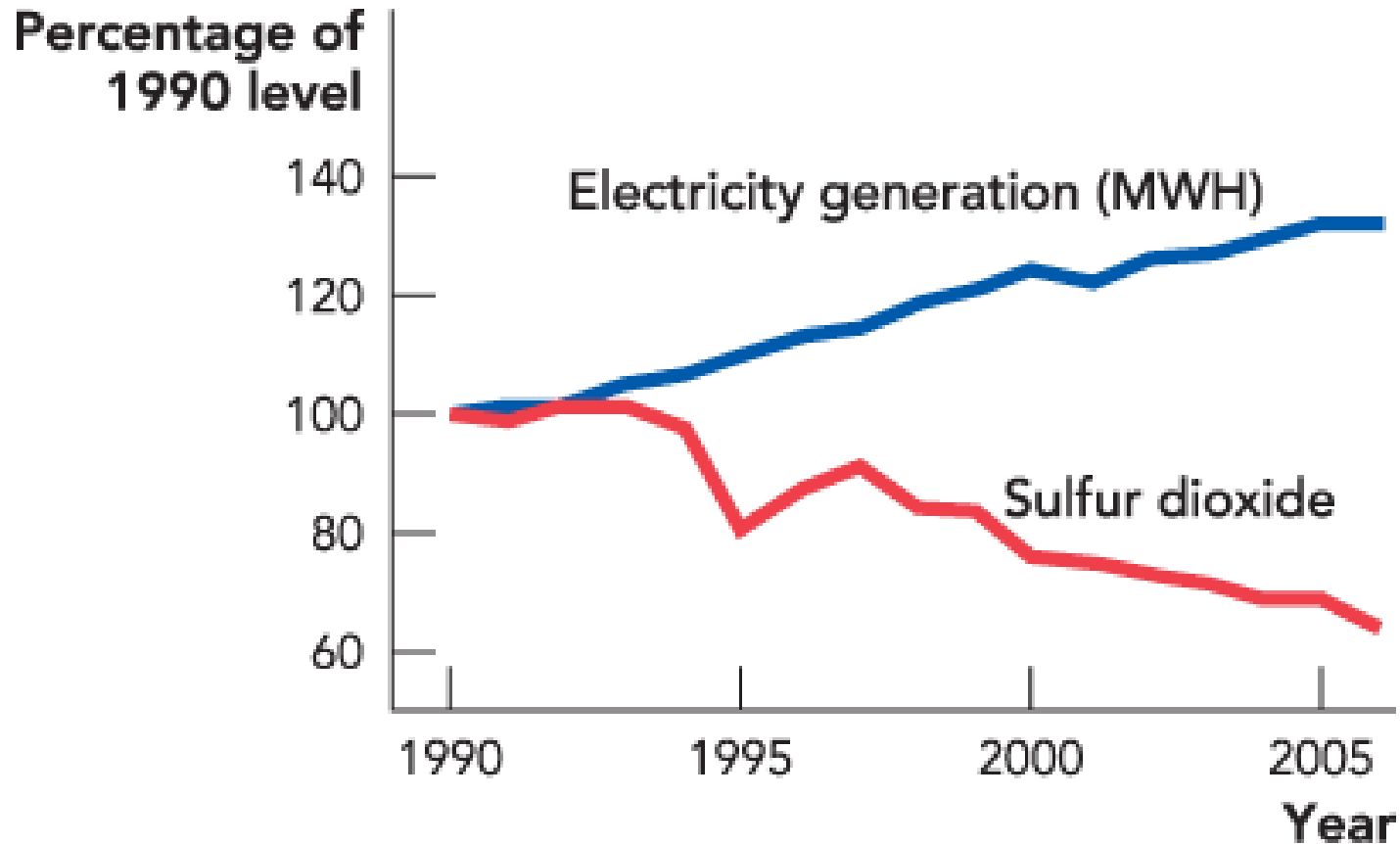
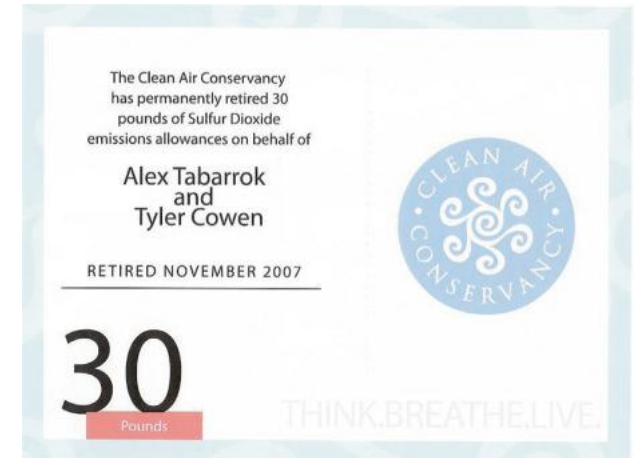


Figure 10.4



# Private Bargaining

- Coase Theorem: If bargaining is costless (or low) and property rights are clearly established and enforced, then externality problem can be solved by private bargaining.

# “Internalizing” externalities

- Ownership ensures that the doer will face the true cost of his/her action
  - Think of waste in my basement as opposed to waste along a roadside
- In this example, it doesn't matter who owns the lake
  - As long as ownership is defined, the efficient allocation is achieved
- What matters is that once ownership is clear, all costs are taken into account

# Coase Theorem

All **costs/benefits are internalized** and there is no externality if two conditions are met.

1. Property rights are clearly defined.
2. Transaction costs are low.

# Practice Questions

Externalities occur because

- a. people are short-sighted.
- b. property rights have not been clearly defined.
- c. waste is often a part of producing goods.
- d. all of the above

# Practice Questions

Externalities occur because

- a. people are short-sighted.
- b. property rights have not been clearly defined.
- c. waste is often a part of producing goods.
- d. all of the above

# Practice Questions

If my neighbors, without my consent, build a garage that leaves my yard in the shade,

- a. there is a negative externality.
- b. there is property rights problem—who owns the sun?
- c. they may not be taking costs imposed on me into account
- d. all of the above. \*\*

# Practice Questions

If my neighbors, without my consent, build a garage that leaves my yard in the shade,

- a. there is a negative externality.
- b. there is property rights problem—who owns the sun?
- c. they may not be taking costs imposed on me into account
- d. **all of the above.**

Credits to @grebcomics and Cowen and Tabarrok (2014)