



Efficiency and Equity

After studying this chapter you will be able to

- ◆ Describe the alternative methods of allocating scarce resources
- ◆ Explain the connection between demand and marginal benefit and define consumer surplus; and ...
explain the connection between supply and marginal cost and define producer surplus
- ◆ Explain the conditions under which markets are efficient and inefficient

Resource Allocation Methods

- Scarce resources might be allocated by
 - Market price
 - Command
 - Majority rule
 - Contest
 - First-come, first-served
 - Sharing equally
 - Lottery
 - Personal characteristics
 - Force
- How does each method work?

Resource Allocation Methods

- Market Price

- When a market allocates a scarce resource, the people who get the resource are those who are willing to pay the market price.
- Most of the scarce resources that you supply get allocated by market price.
- You sell your labour services in a market, and you buy most of what you consume in markets.
- For most goods and services, the market turns out to do a good job.

Resource Allocation Methods

- Command

- **Command system** allocates resources by the order (command) of someone in authority.
- For example, if you have a job, most likely someone tells you what to do. Your labour time is allocated to specific tasks by command.
- A command system works well in organizations with clear lines of authority but badly in an entire economy.

Resource Allocation Methods

- Majority Rule
 - Majority rule allocates resources in the way the majority of voters choose.
 - Societies use majority rule for some of their biggest decisions.
 - For example, tax rates that allocate resources between private and public use and tax dollars between competing uses such as defense and health care.
 - Majority rule works well when the decision affects lots of people and self-interest must be suppressed to use resources efficiently.

Resource Allocation Methods

- Contest
 - A contest allocates resources to a winner (or group of winners).
 - The most obvious contests are sporting events but they occur in other arenas:
 - For example: The Oscars are a type of contest. So is the CEO the winner of a contest.
 - Contest works well when the efforts of the “players” are hard to monitor and reward directly.

Resource Allocation Methods

- **First-Come, First-Served**

- A first-come, first-served allocates resources to those who are first in line.
- Casual restaurants use first-come, first served to allocate tables. Supermarkets also uses first-come, first-served at checkout.
- First-come, first-served works best when scarce resources can serve just one person at a time in a sequence.

Resource Allocation Methods

- ## Lottery

- Lotteries allocate resources to those with the winning number, draw the lucky cards, or come up lucky on some other gaming system.
- State lotteries and casinos reallocate millions of dollars worth of goods and services each year.
- But lotteries are more widespread. For example, they are used to allocate landing slots at some airports.
- Lotteries work well when there is no effective way to distinguish among potential users of a scarce resource.

Resource Allocation Methods

- Personal Characteristics
 - Personal characteristics allocate resources to those with the “right” characteristics.
 - For example, people choose marriage partners on the basis of personal characteristics.
 - But this method gets used in unacceptable ways: allocating the best jobs to white males and discriminating against minorities and women.

Resource Allocation Methods

- Force

- Force plays a role in allocating resources.
- For example, war has played an enormous role historically in allocating resources.
- Theft, taking property of others without their consent, also plays a large role.
- But force provides an effective way of allocating resources—for the state to transfer wealth from the rich to the poor and establish the legal framework in which voluntary exchange can take place in markets.

Benefit, Cost, and Surplus

- Demand, Willingness to Pay, and Value
 - Value is what we get, price is what we pay.
 - The *value* of one more unit of a good or service is its *marginal benefit*.
 - We measure value as the *maximum price* that a person is willing to pay.
 - But willingness to pay determines demand.
 - A *demand curve* is a *marginal benefit curve*.

Benefit, Cost, and Surplus

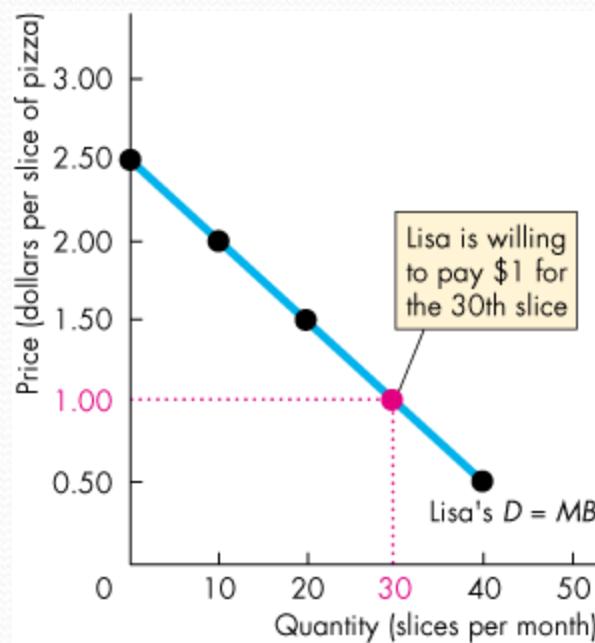
• Individual Demand and Market Demand

- The relationship between the price of a good and the quantity demanded by one person is called *individual demand*.
- The relationship between the price of a good and the quantity demanded by all buyers in the market is called *market demand*.
- Figure 5.1 on the next slide shows the connection between individual demand and market demand.

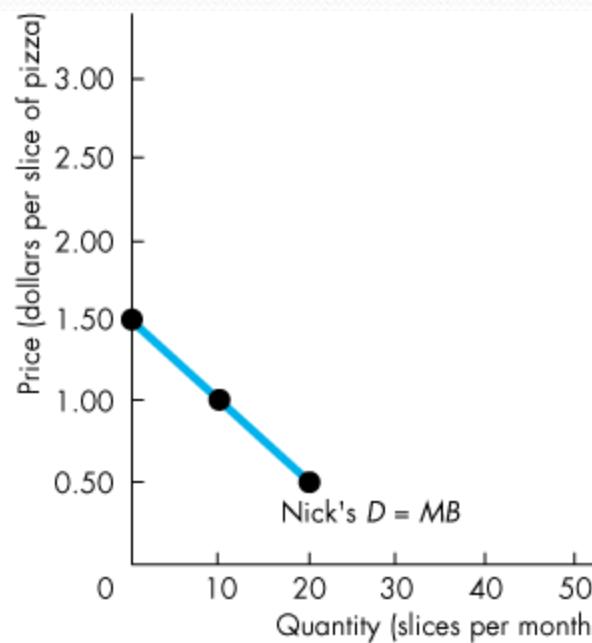
Benefit, Cost, and Surplus

- Lisa and Nick are the only buyers in the market for pizza.

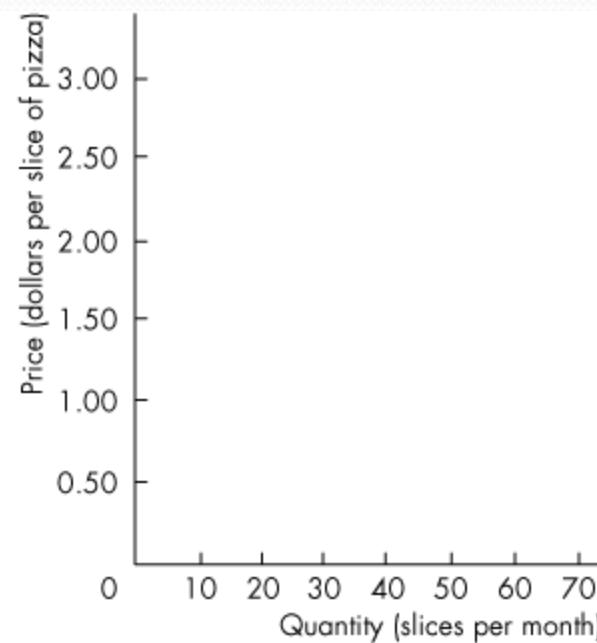
At \$1 a slice, the quantity demanded by Lisa is 30 slices.



(a) Lisa's demand



(b) Nick's demand

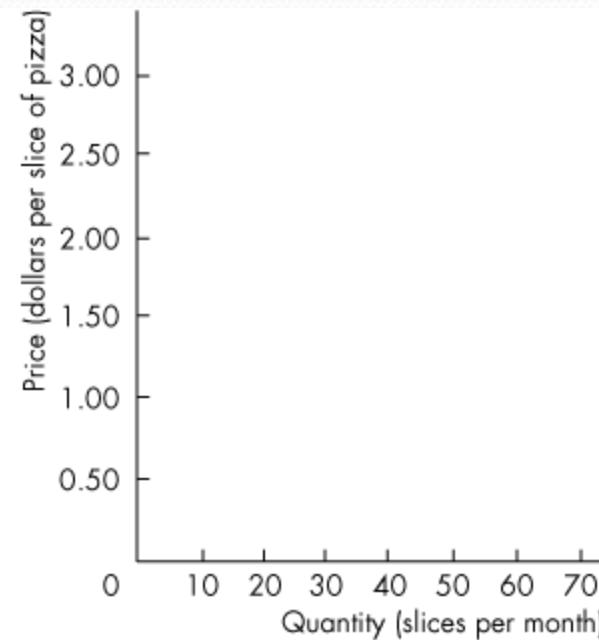
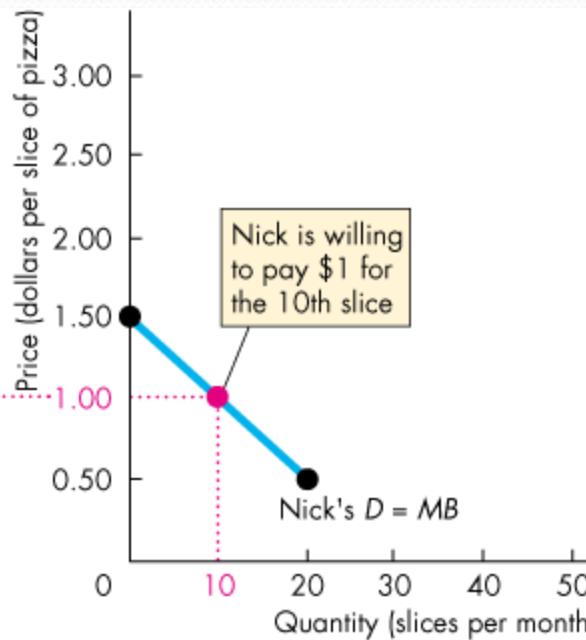
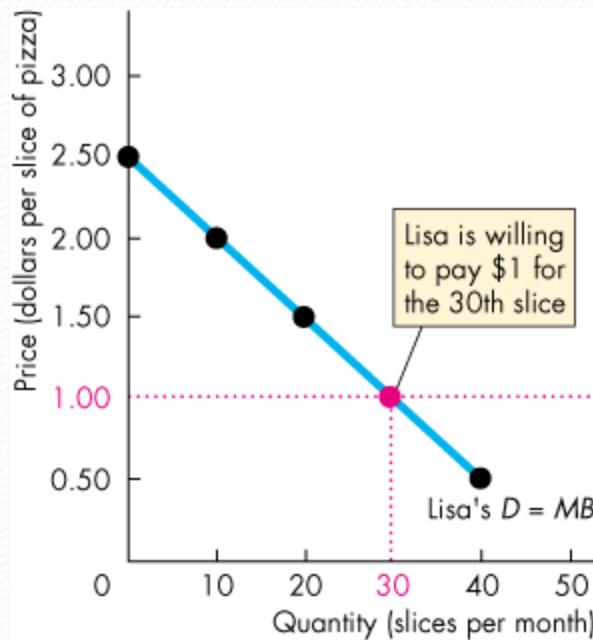


(c) Market demand

Benefit, Cost, and Surplus

- Lisa and Nick are the only buyers in the market for pizza.

At \$1 a slice, the quantity demanded by Nick is 10 slices.



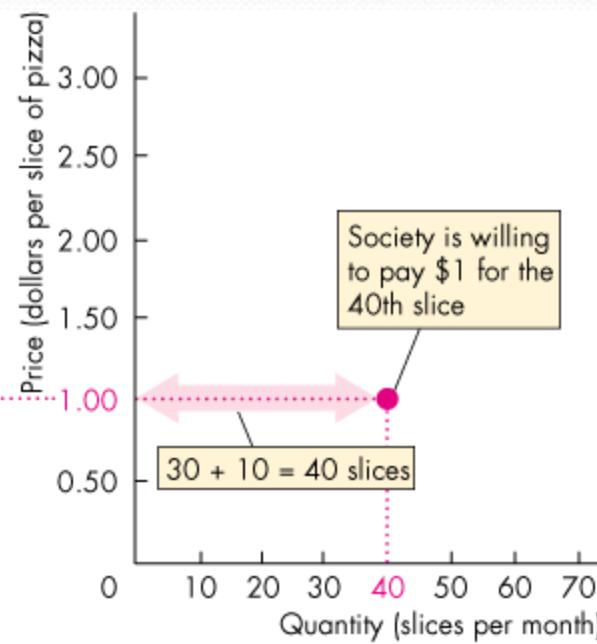
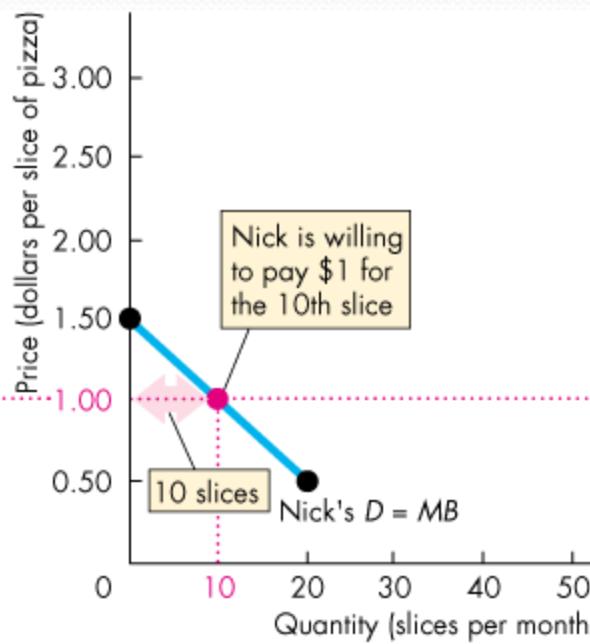
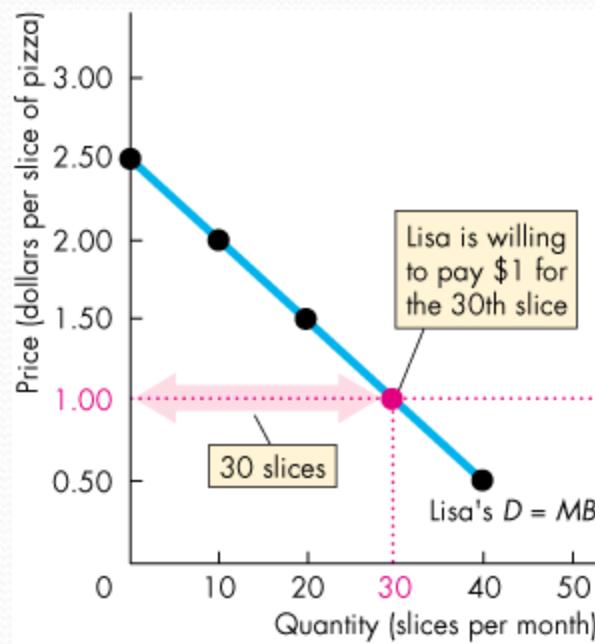
(a) Lisa's demand

(b) Nick's demand

(c) Market demand

Benefit, Cost, and Surplus

- At \$1 a slice, the quantity demanded by Lisa is 30 slices and by Nick is 10 slices.
The quantity demanded by all buyers in the market is 40 slices.



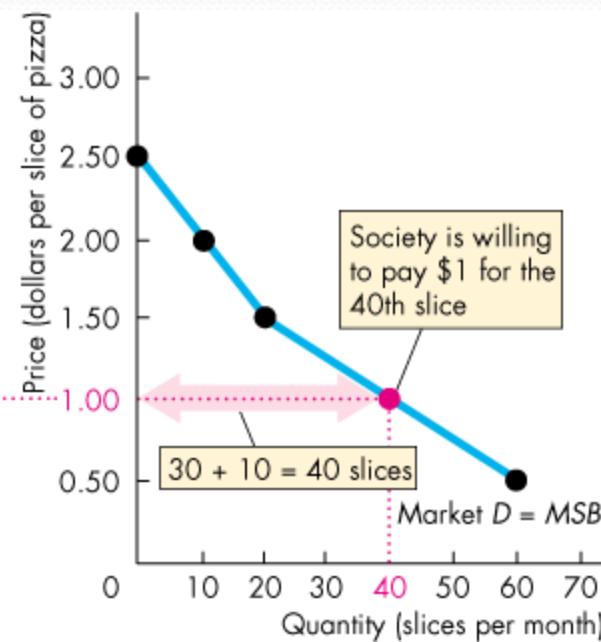
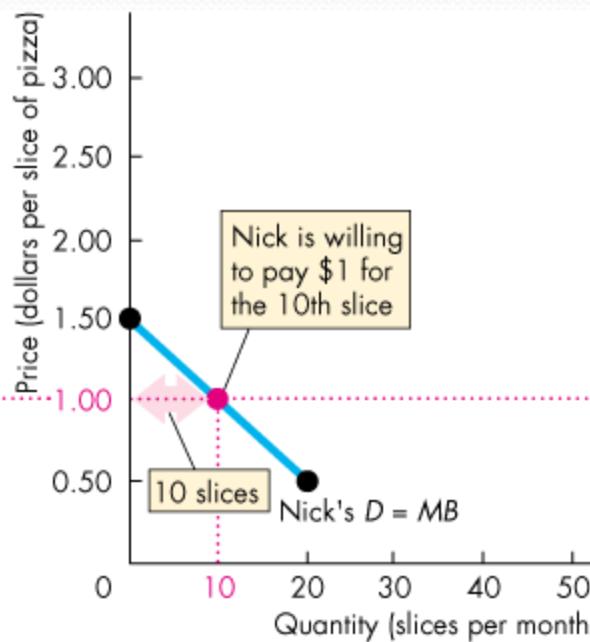
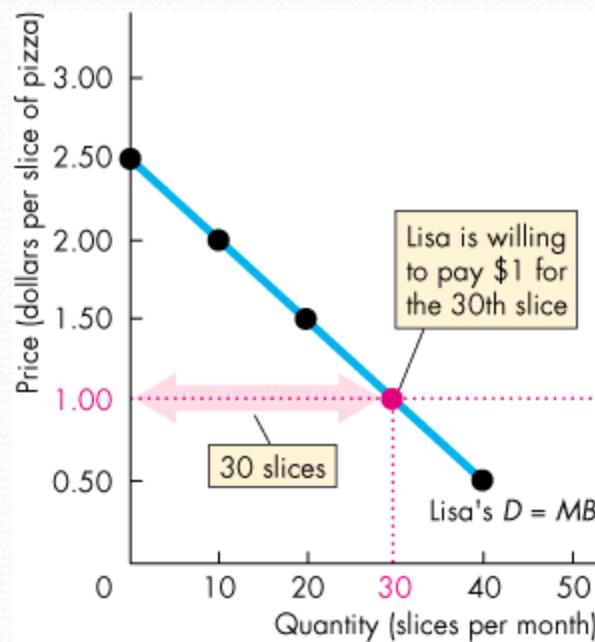
(a) Lisa's demand

(b) Nick's demand

(c) Market demand

Benefit, Cost, and Surplus

- The market demand curve is the horizontal sum of the individual demand curves.



(a) Lisa's demand

(b) Nick's demand

(c) Market demand

Benefit, Cost, and Surplus

• Consumer Surplus

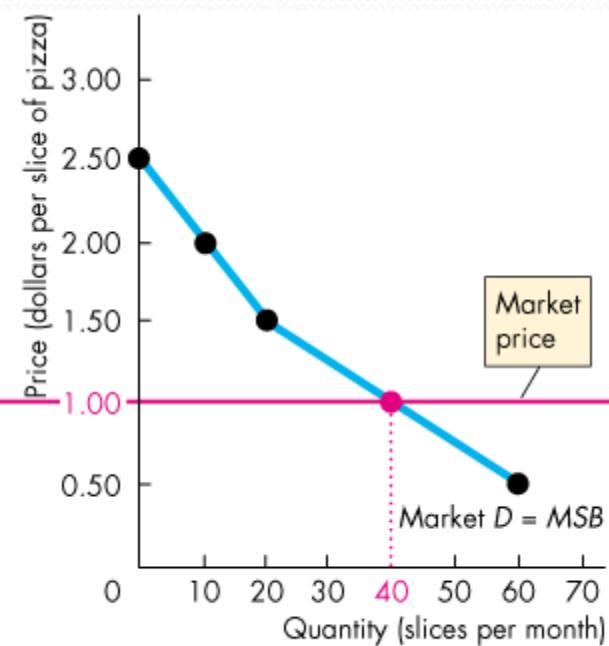
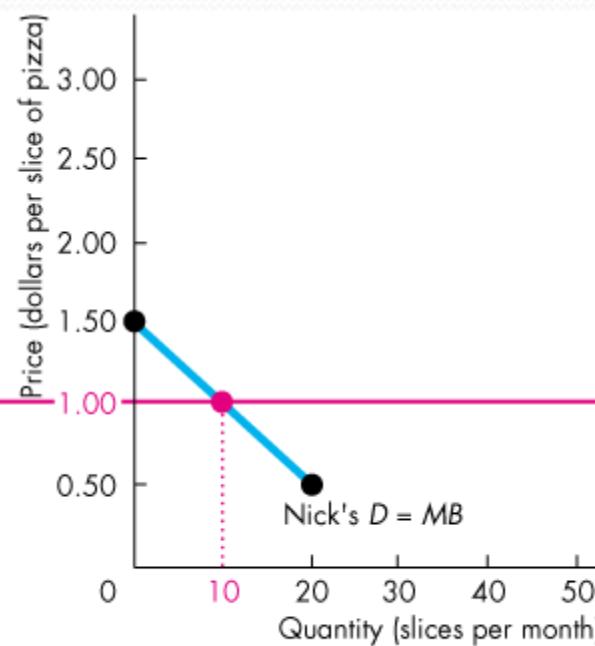
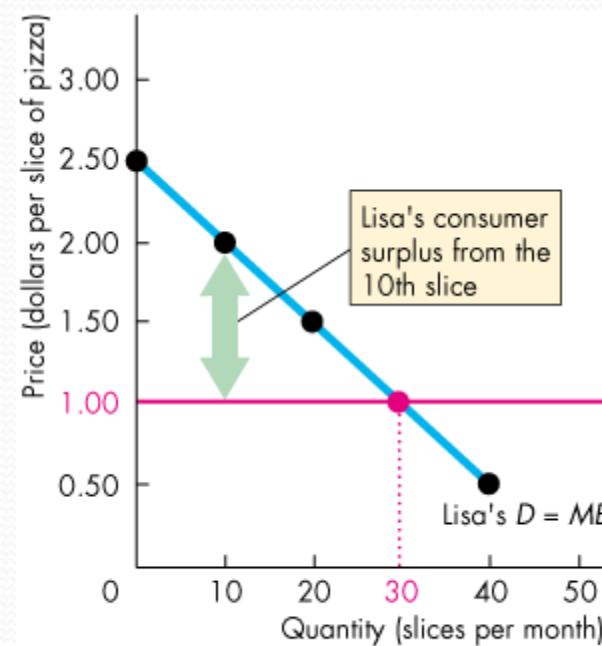
- **Consumer surplus** is the excess of the benefit received from a good over the amount paid for it.
- We can calculate consumer surplus as the marginal benefit (or value) of a good minus its price, summed over the quantity bought.
- It is measured by the area under the demand curve and above the price paid, up to the quantity bought.
- Figure 5.2 on the next slide shows the consumer surplus from pizza when the market price is \$1 a slice.

Benefit, Cost, and Surplus

Lisa and Nick pay the market price, which is \$1 a slice.

The value Lisa places on the 10th slice is \$2.

Lisa's consumer surplus from the 10th slice is the value minus the price, which is \$1.



(a) Lisa's consumer surplus

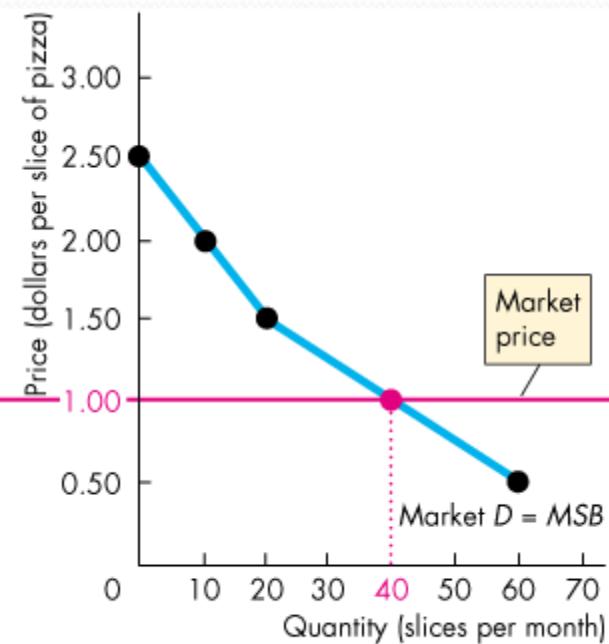
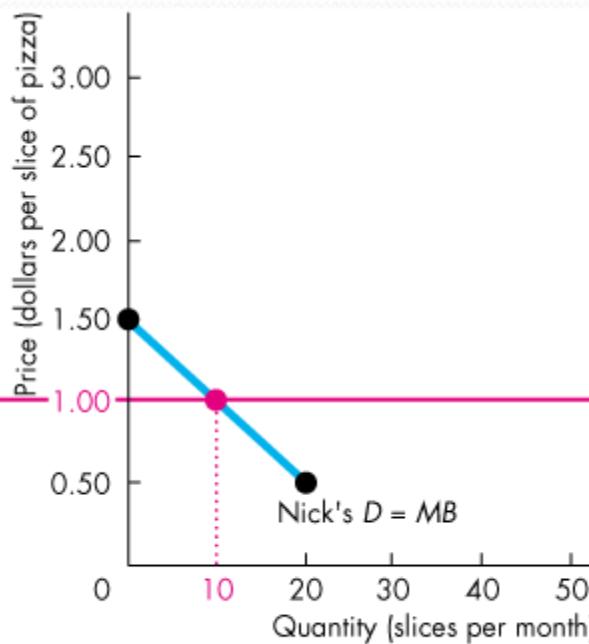
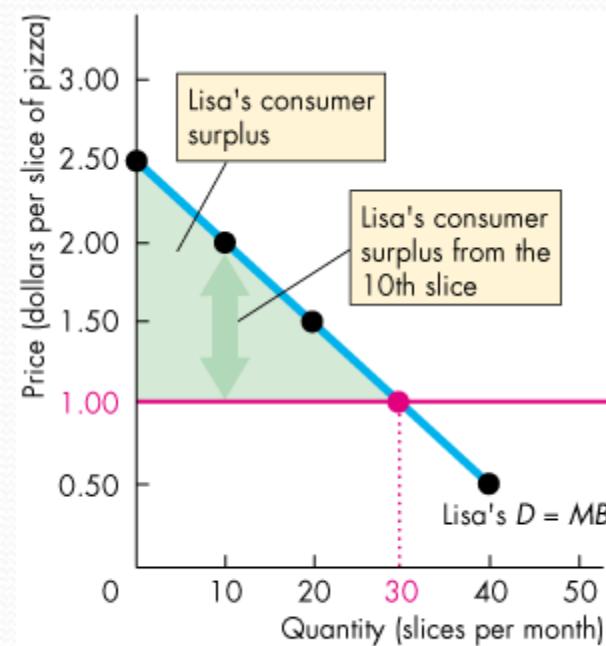
(b) Nick's consumer surplus

(c) Market consumer surplus

Benefit, Cost, and Surplus

At \$1 a slice, Lisa buys 30 slices.

So her consumer surplus is the area of the green triangle.



(a) Lisa's consumer surplus

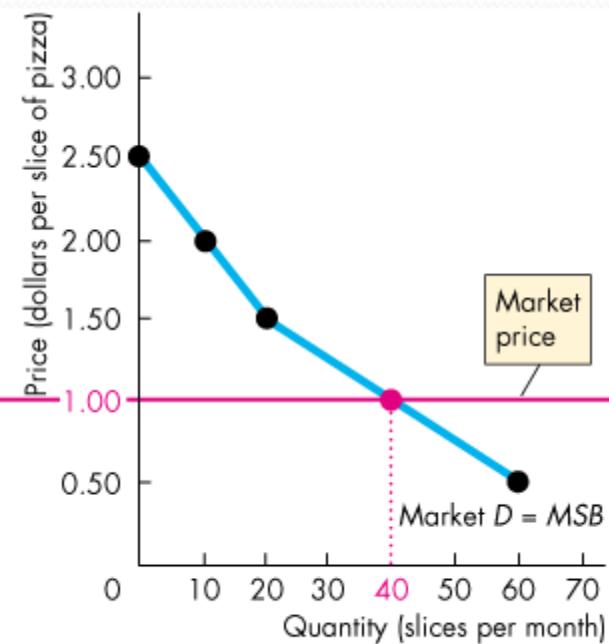
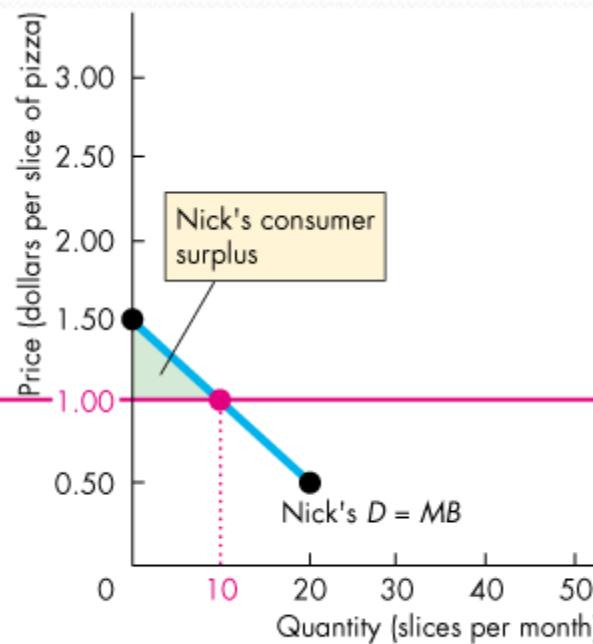
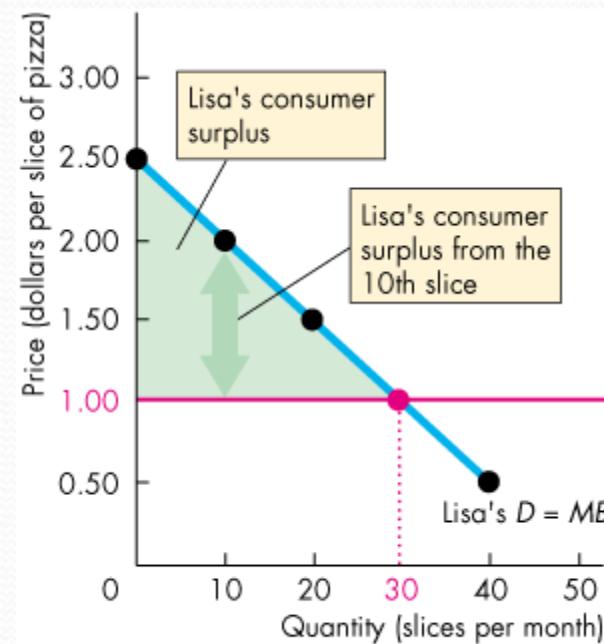
(b) Nick's consumer surplus

(c) Market consumer surplus

Benefit, Cost, and Surplus

At \$1 a slice, Nick buys 10 slices.

So his consumer surplus is the area of the green triangle.



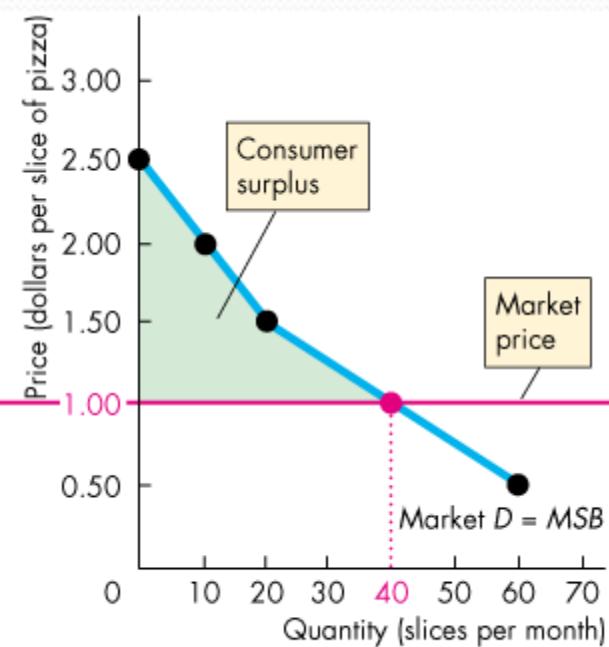
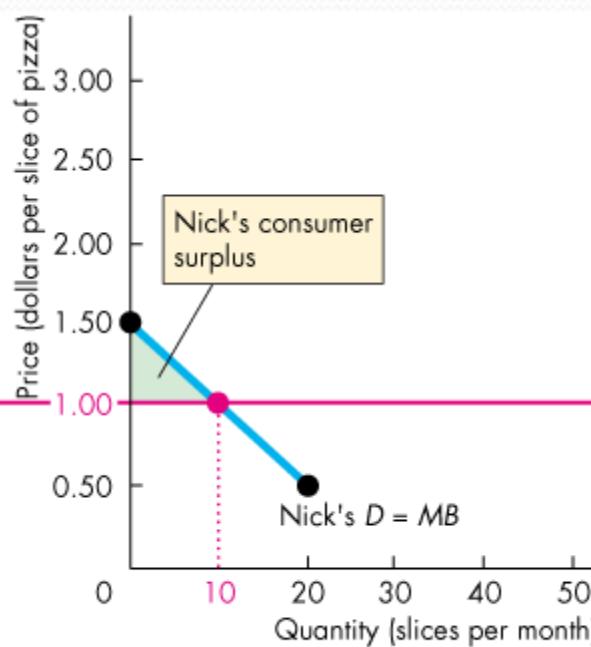
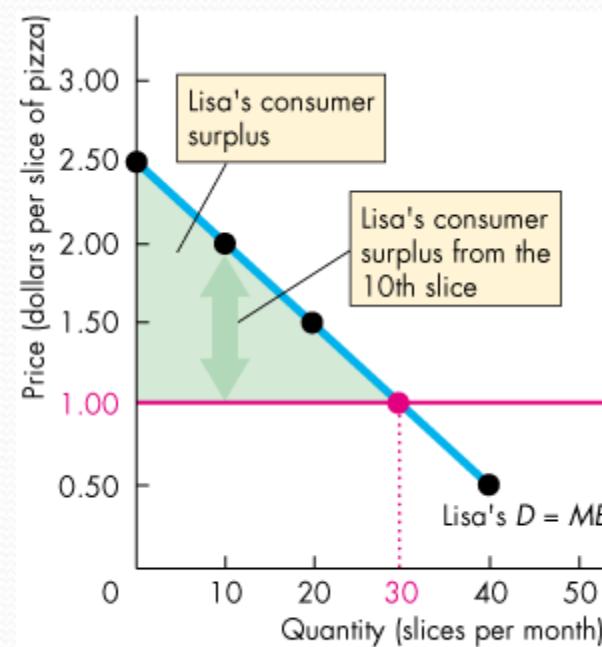
(a) Lisa's consumer surplus

(b) Nick's consumer surplus

(c) Market consumer surplus

Benefit, Cost, and Surplus

At \$1 a slice, the consumer surplus for the economy is the area under the market demand curve above the market price, summed over the 40 slices bought.



(a) Lisa's consumer surplus

(b) Nick's consumer surplus

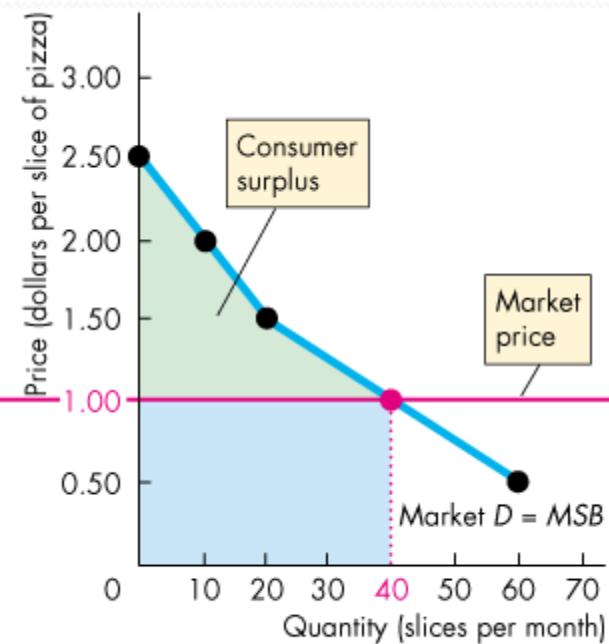
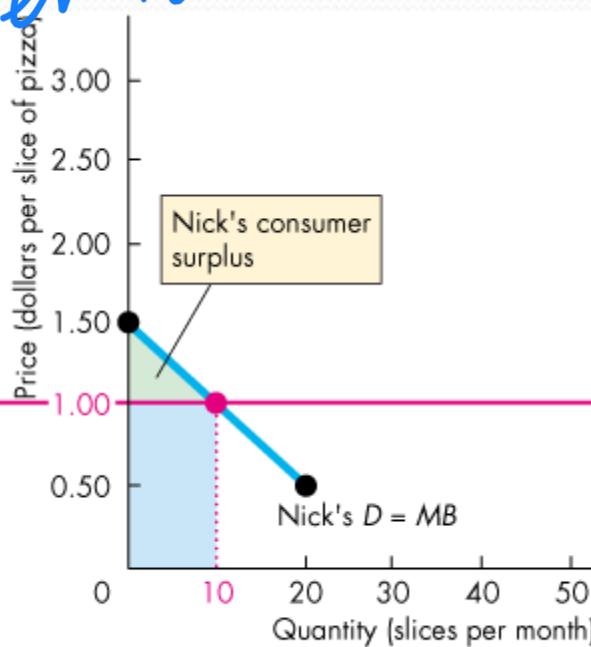
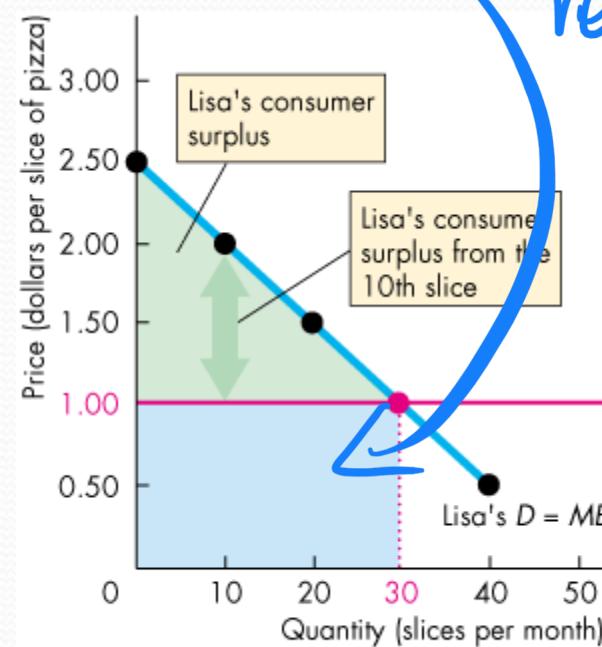
(c) Market consumer surplus

Benefit, Cost, and Surplus

At \$1 a slice, Lisa spends \$30, Nick spends \$10, and together they spend \$40 on pizza.

The consumer surplus is the value from pizza in excess of the expenditure on it.

refer to the blue areas



(a) Lisa's consumer surplus

(b) Nick's consumer surplus

(c) Market consumer surplus

Benefit, Cost, and Surplus

- Supply and Marginal Cost

- Firms are in business to make a profit.
- To make a profit, firms must sell their output for a price that exceeds the cost of production.
- Firms distinguish between *cost* and *price*.

Benefit, Cost, and Surplus

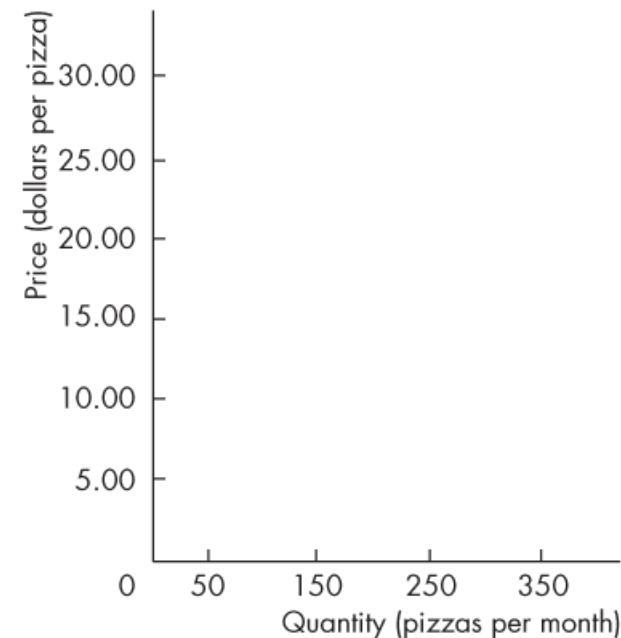
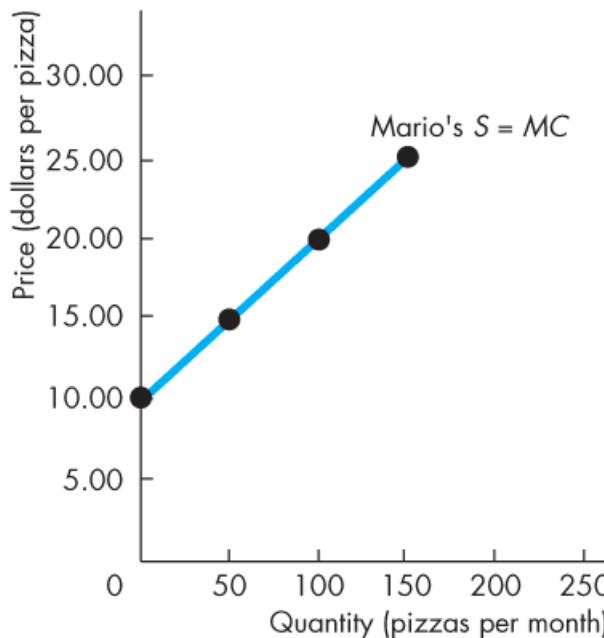
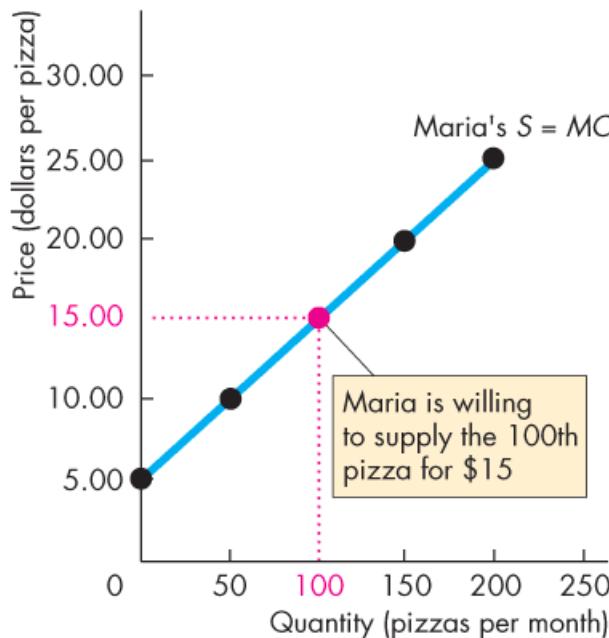
- Supply, Cost, and Minimum Supply-Price
- Cost is what the producer gives up, price is what the producer receives.
- The cost of one more unit of a good or service is its *marginal cost*.
- Marginal cost is the *minimum price* that a firm is willing to accept.
- But the minimum supply-price determines supply.
- *A supply curve is a marginal cost curve.*

Benefit, Cost, and Surplus

- Individual Supply and Market Supply
- The relationship between the price of a good and the quantity supplied by one producer is called *individual supply*.
- The relationship between the price of a good and the quantity supplied by all producers in the market is called *market supply*.
- Figure 5.3 on the next slide shows the connection between individual supply and market supply.

Benefit, Cost, and Surplus

- Maria and Mario are the only producers of pizza.
At \$15 a pizza, the quantity supplied by Maria is 100 pizzas.



(a) Maria's supply

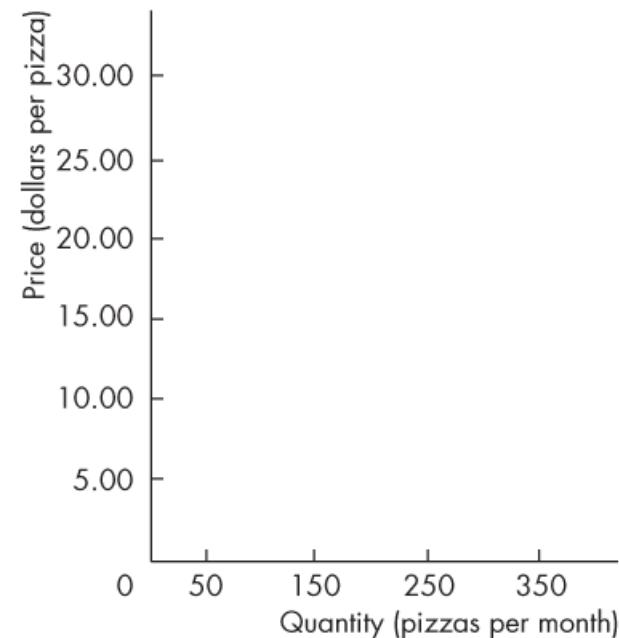
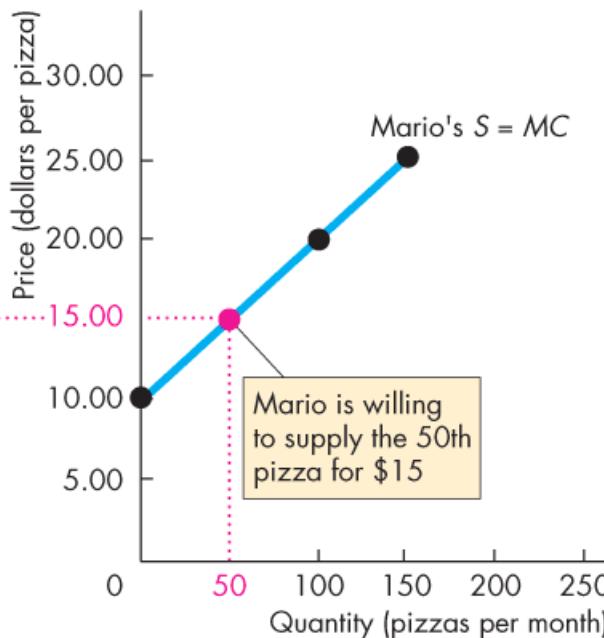
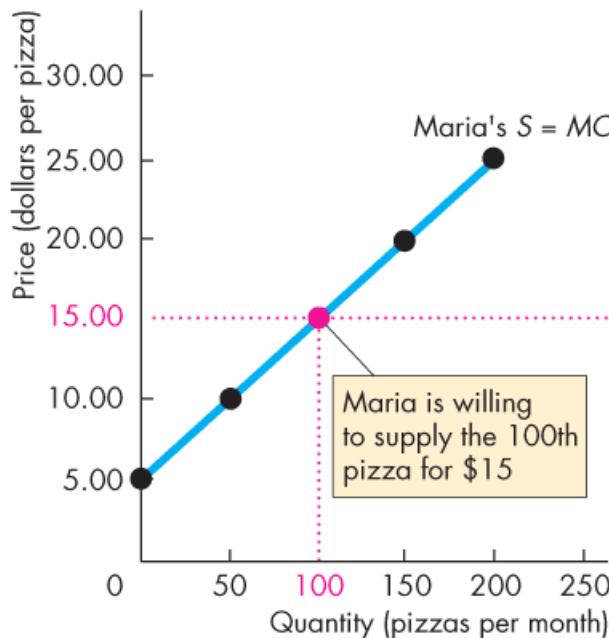
(b) Mario's supply

(c) Market supply

Benefit, Cost, and Surplus

- Maria and Mario are the only producers of pizza.

At \$15 a pizza, the quantity supplied by Mario is 50 pizzas.



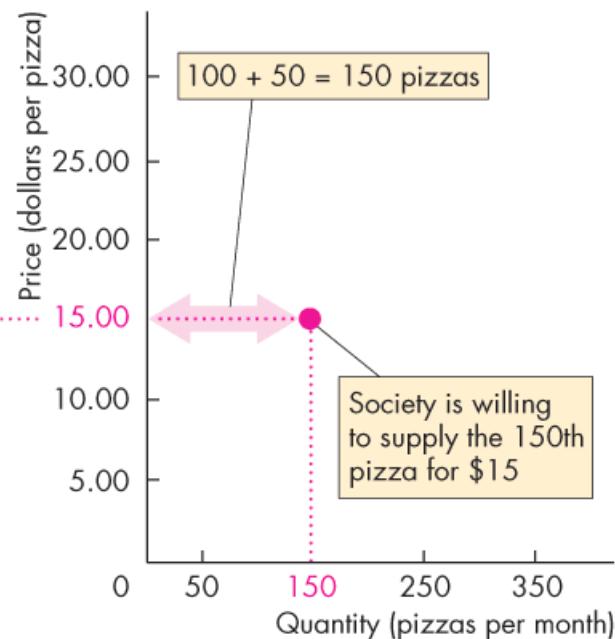
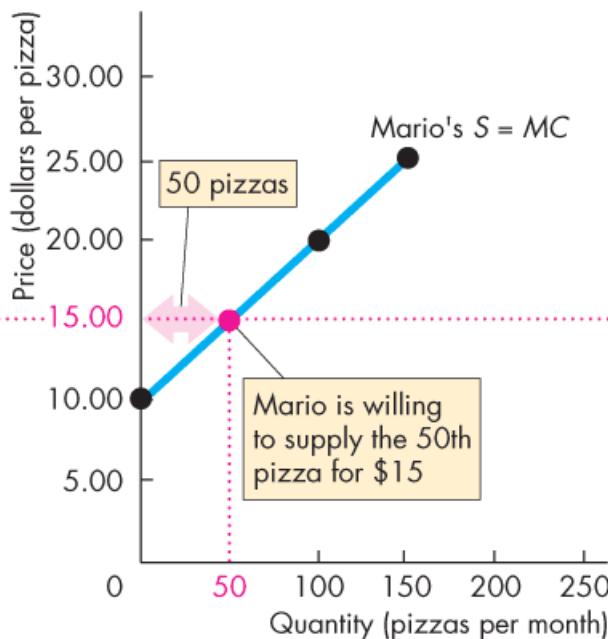
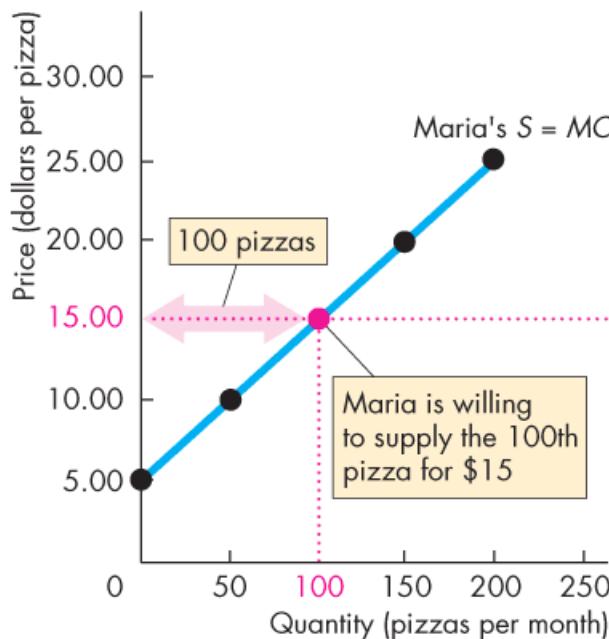
(a) Maria's supply

(b) Mario's supply

(c) Market supply

Benefit, Cost, and Surplus

- At \$15 a pizza, the quantity supplied by Maria is 100 pizzas and by Mario is 50 pizzas.
The quantity supplied by all producers is 150 pizzas.



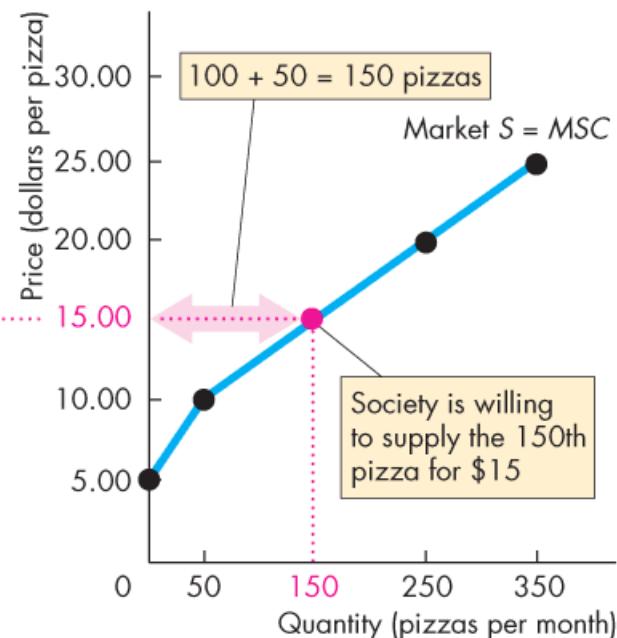
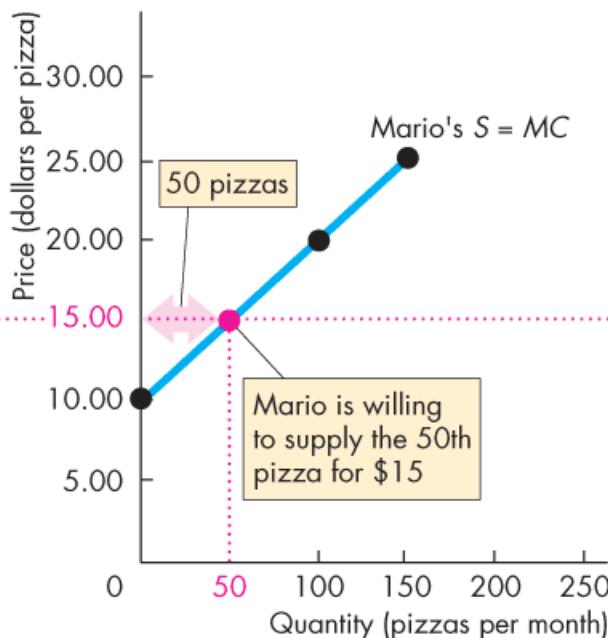
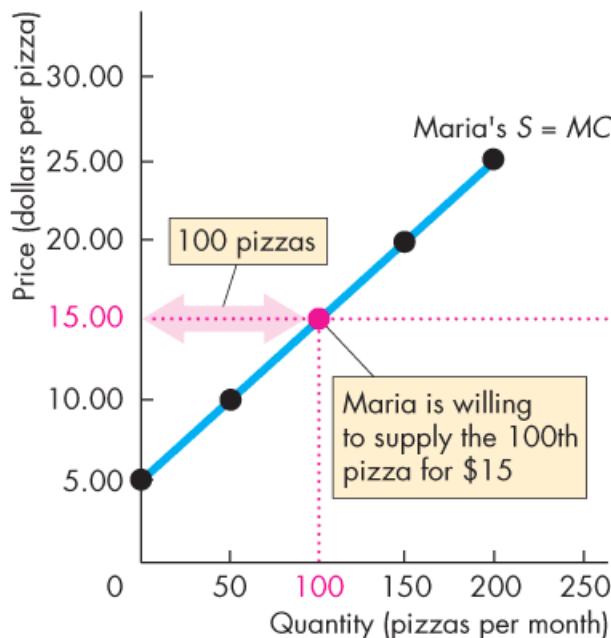
(a) Maria's supply

(b) Mario's supply

(c) Market supply

Benefit, Cost, and Surplus

- The market supply curve is the horizontal sum of the individual supply curves.



(a) Maria's supply

(b) Mario's supply

(c) Market supply

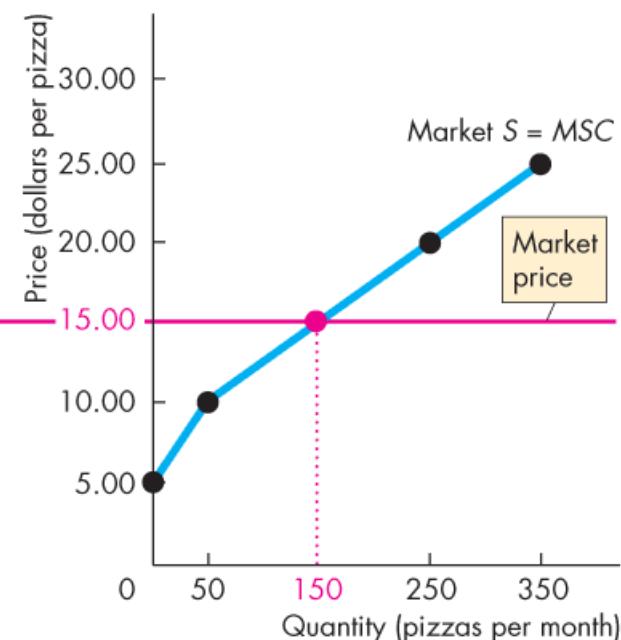
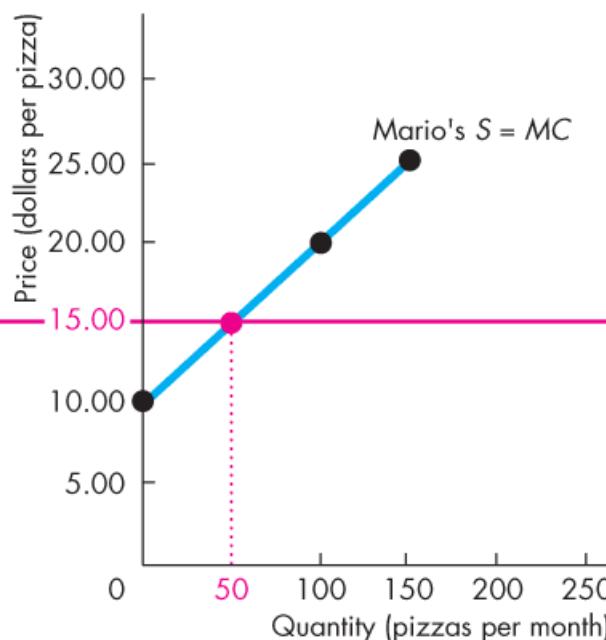
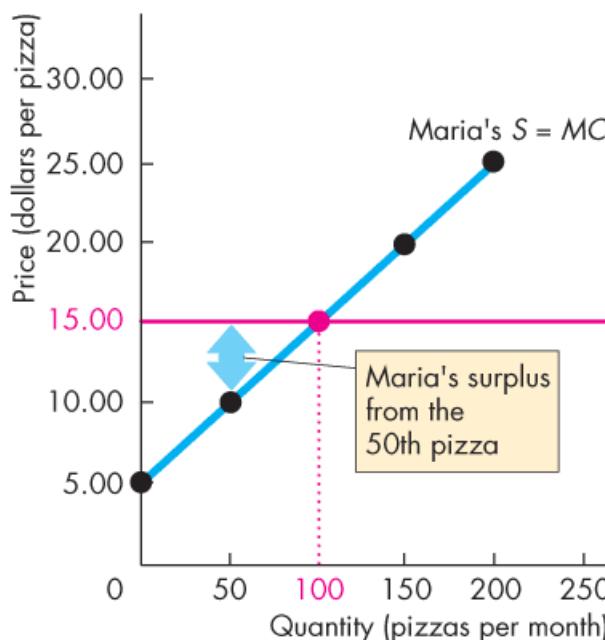
Benefit, Cost, and Surplus

- Producer Surplus
- Producer surplus is the excess of the amount received from the sale of a good over the cost of producing it.
- We calculate it as the price received for a good minus the minimum-supply price (marginal cost), summed over the quantity sold.
- On a graph, producer surplus is shown by the area below the market price and above the supply curve, summed over the quantity sold.
- Figure 5.4 on the next slide shows the producer surplus from pizza when the market price is \$15 a pizza.

Benefit, Cost, and Surplus

Maria is willing to produce the 50th pizza for \$10.

Maria's surplus from the 50th pizza is the price minus the marginal cost, which is \$5.



(a) Maria's producer surplus

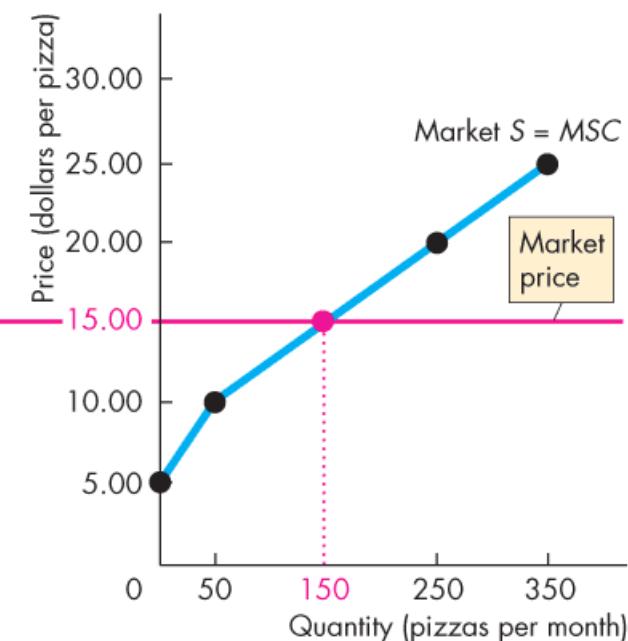
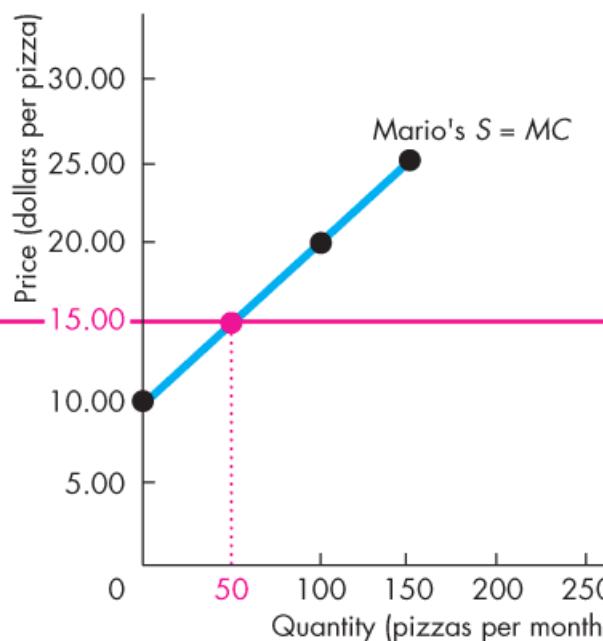
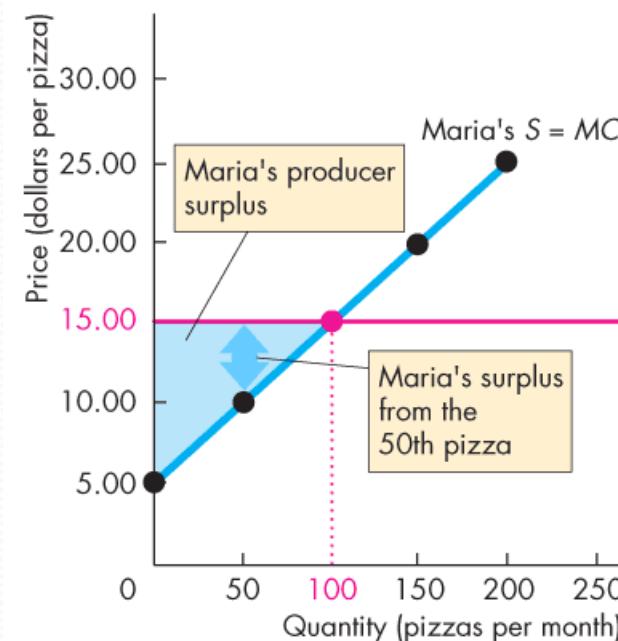
(b) Mario's producer surplus

(c) Market producer surplus

Benefit, Cost, and Surplus

At \$15 a pizza, Maria sells 100 pizzas.

So her producer surplus is the area of the blue triangle.



(a) Maria's producer surplus

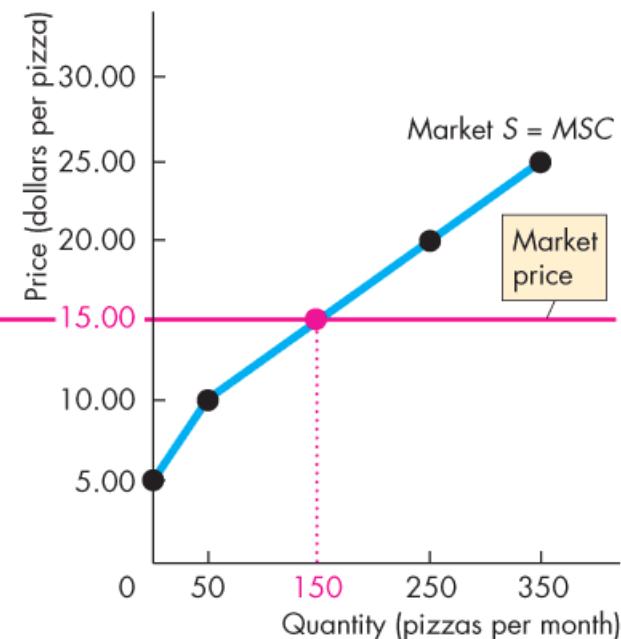
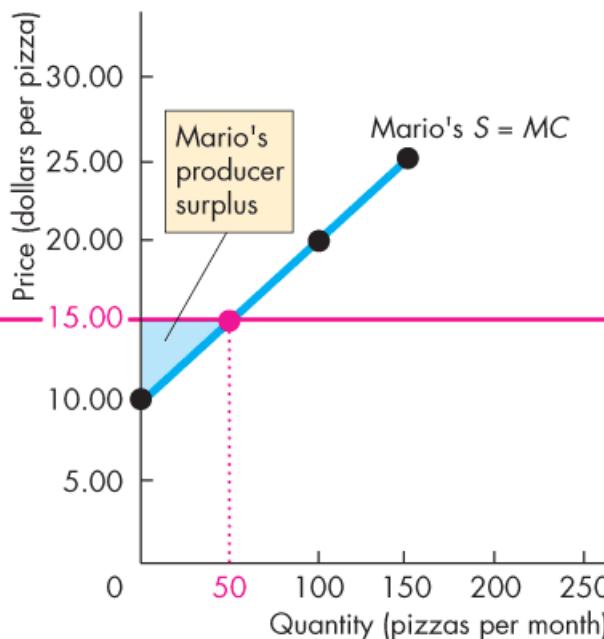
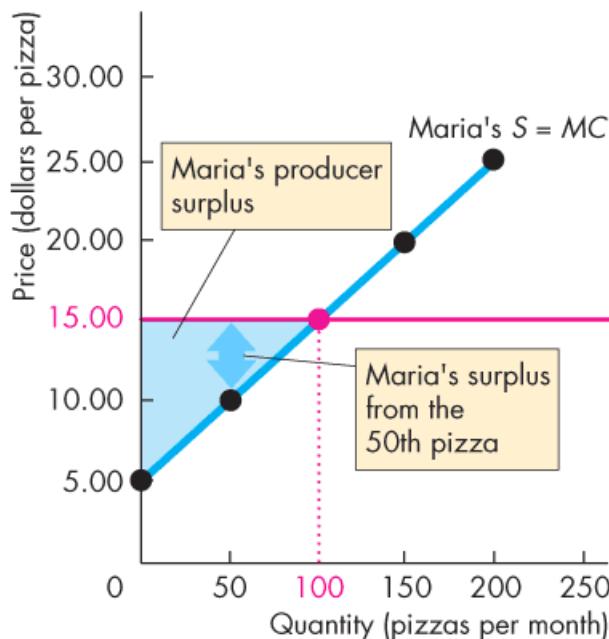
(b) Mario's producer surplus

(c) Market producer surplus

Benefit, Cost, and Surplus

At \$15 a pizza, Mario sells 50 pizzas.

So his producer surplus is the area of the blue triangle.



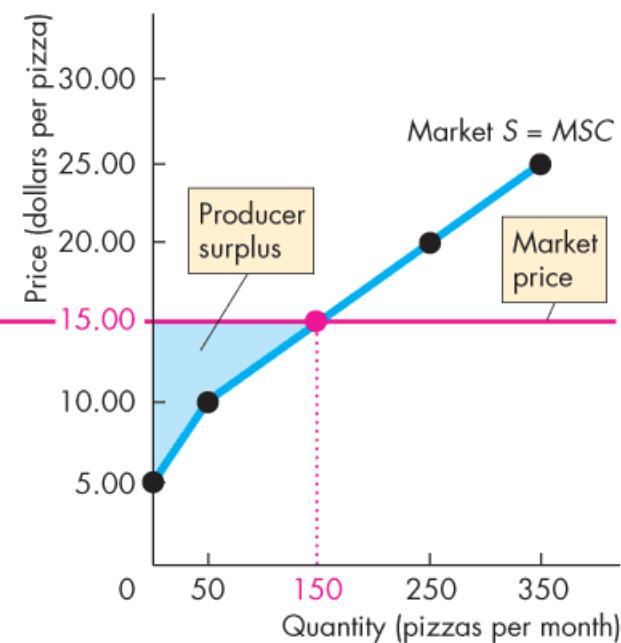
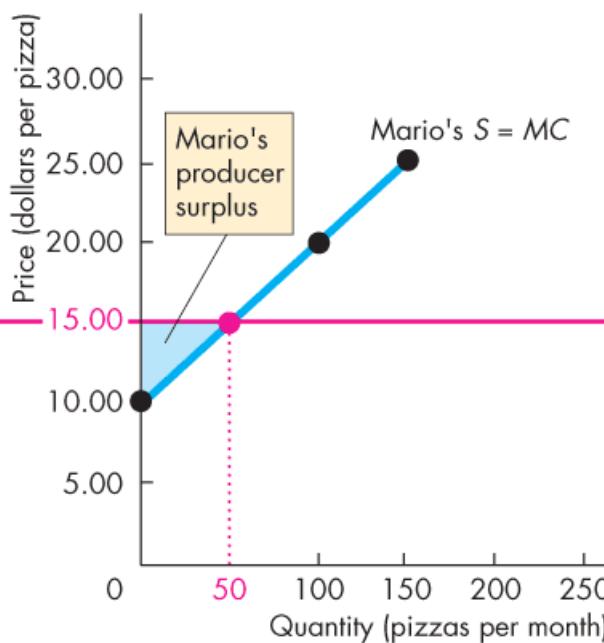
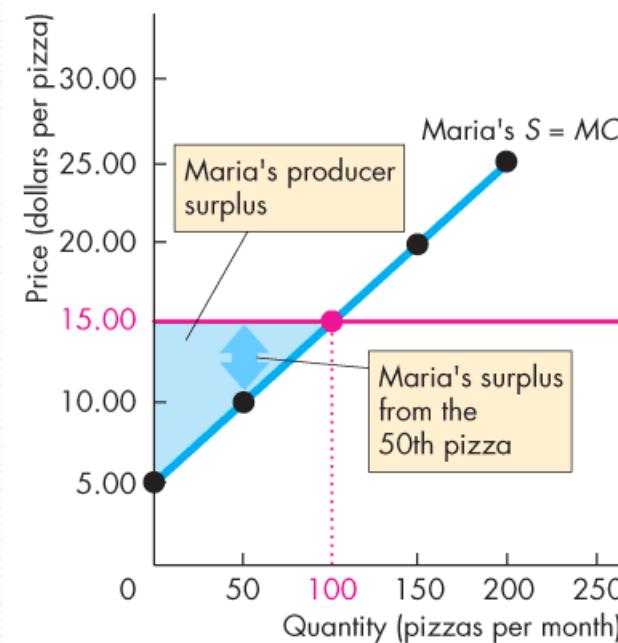
(a) **Maria's producer surplus**

(b) **Mario's producer surplus**

(c) **Market producer surplus**

Benefit, Cost, and Surplus

At \$15 a pizza, the producer surplus for the economy is the area under the market price above the market supply curve, summed over the 150 pizzas sold.



(a) **Maria's producer surplus**

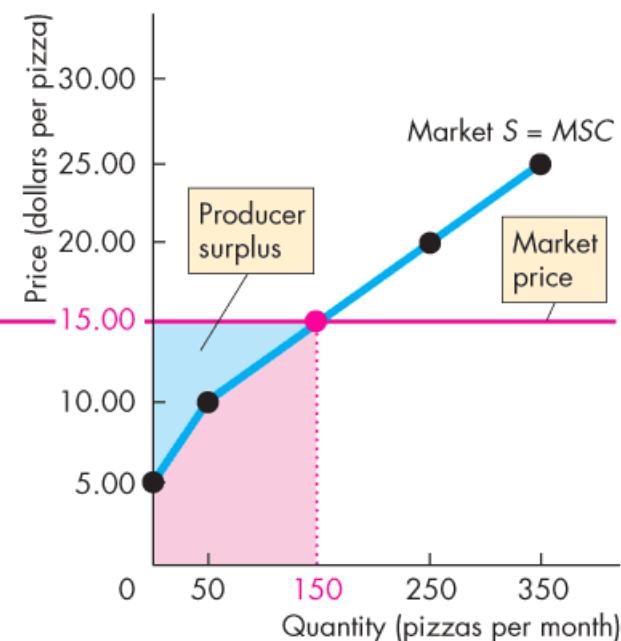
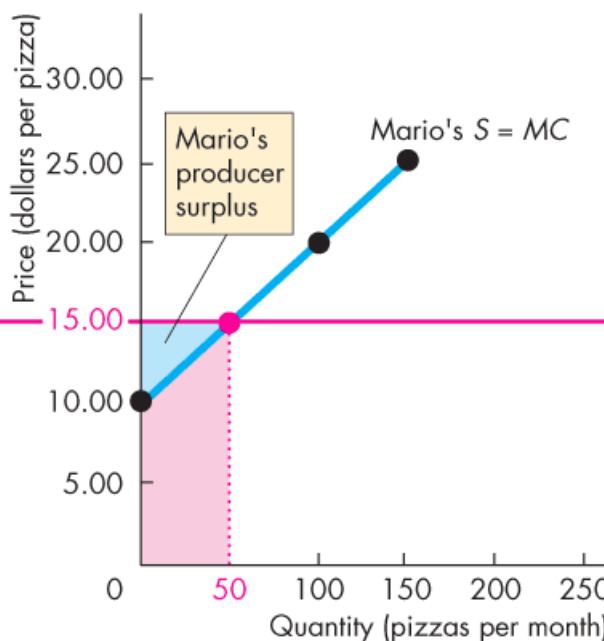
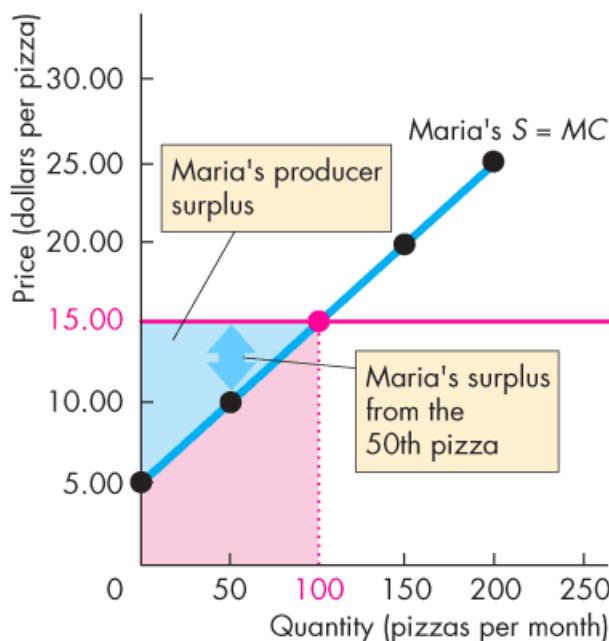
(b) **Mario's producer surplus**

(c) **Market producer surplus**

Benefit, Cost, and Surplus

The red areas show the cost of producing the pizzas sold. *producer cost*

The producer surplus is the value of the pizza sold in excess of the cost of producing it.



(a) **Maria's producer surplus**

(b) **Mario's producer surplus**

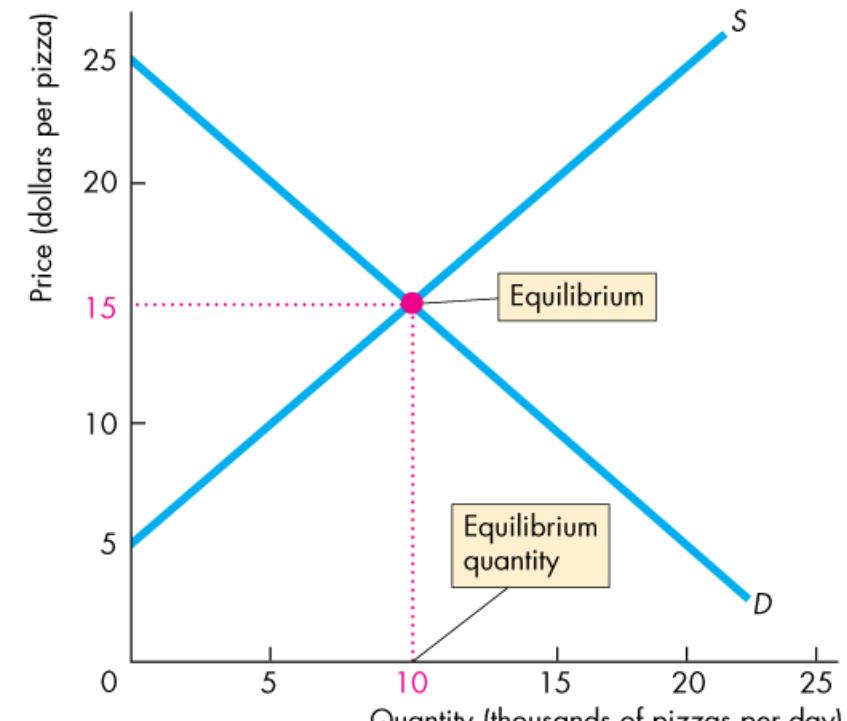
(c) **Market producer surplus**

Is the Competitive Market Efficient?

- Efficiency of Competitive Equilibrium

- Figure 5.5 shows that a competitive market creates an efficient allocation of resources at equilibrium.

- In equilibrium, the quantity demanded equals the quantity supplied.

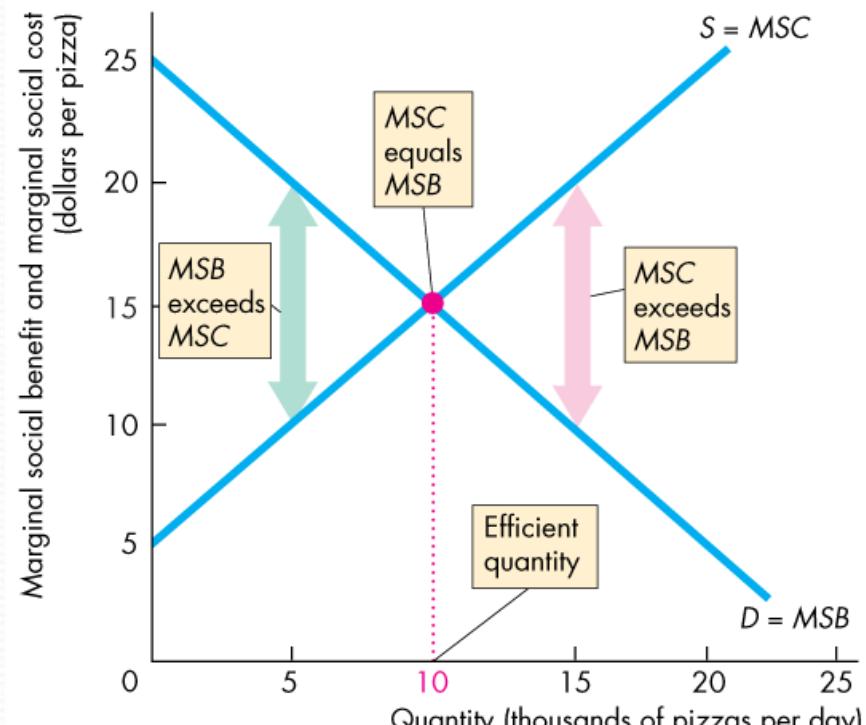


(a) Equilibrium and surpluses

Is the Competitive Market Efficient?

When production is:

- less than the equilibrium quantity, $MSB > MSC$.
- greater than the equilibrium quantity, $MSC > MSB$.
- equal to the equilibrium quantity, $MSC = MSB$.

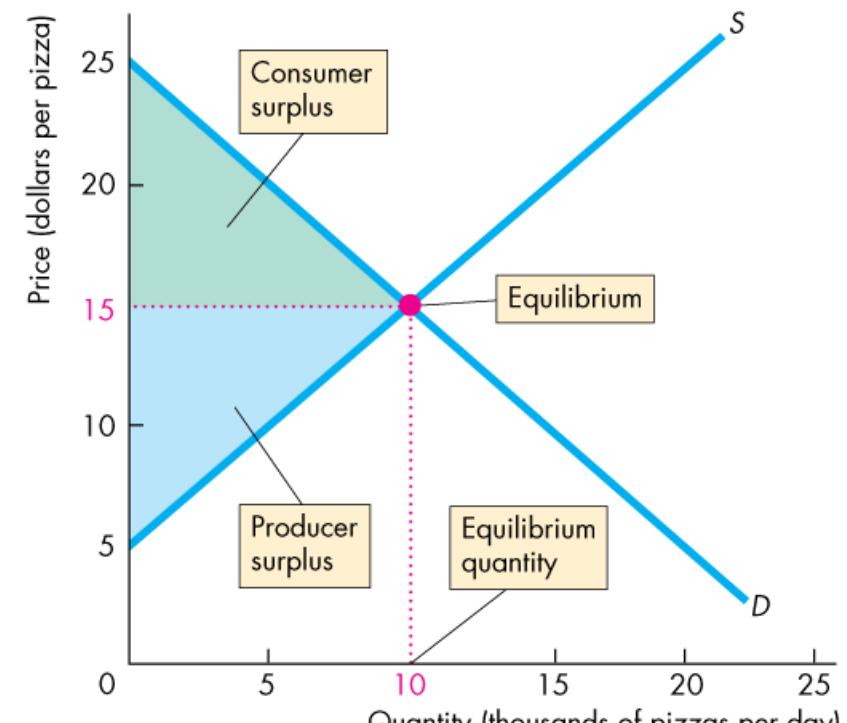


(b) Efficiency

Is the Competitive Market Efficient?

- Resources are used efficiently when marginal social benefit equals marginal social cost.

When the efficient quantity is produced, **total surplus** (the sum of consumer surplus and producer surplus) is maximized.



(a) Equilibrium and surpluses

Is the Competitive Market Efficient?

- The Invisible Hand

- Adam Smith's "invisible hand" idea in the *Wealth of Nations* implied that competitive markets send resources to their highest valued use in society.
- Consumers and producers pursue their own self-interest and interact in markets.
- Market transactions generate an efficient—highest valued—use of resources.

Is the Competitive Market Efficient?

- Market Failure
 - Markets don't always achieve an efficient outcome.
 - **Market failure** arises when a market delivers an inefficient outcome.
 - Market failure can occur because
 - Too little of an item is produced (underproduction) or
 - Too much of an item is produced (overproduction).

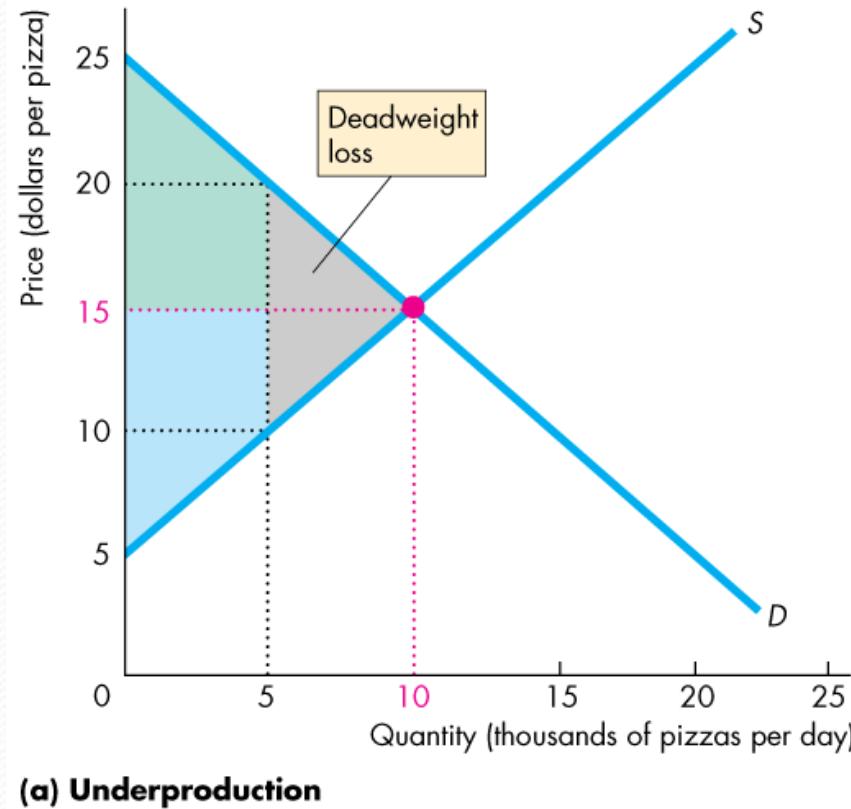
Is the Competitive Market Efficient?

- **Underproduction**

The efficient quantity is 10,000 pizzas a day.

If production is restricted to 5,000 pizzas a day, there is underproduction and the quantity is inefficient.

A **deadweight loss** equals the decrease in total surplus—the grey triangle.



This loss is a *social* loss.

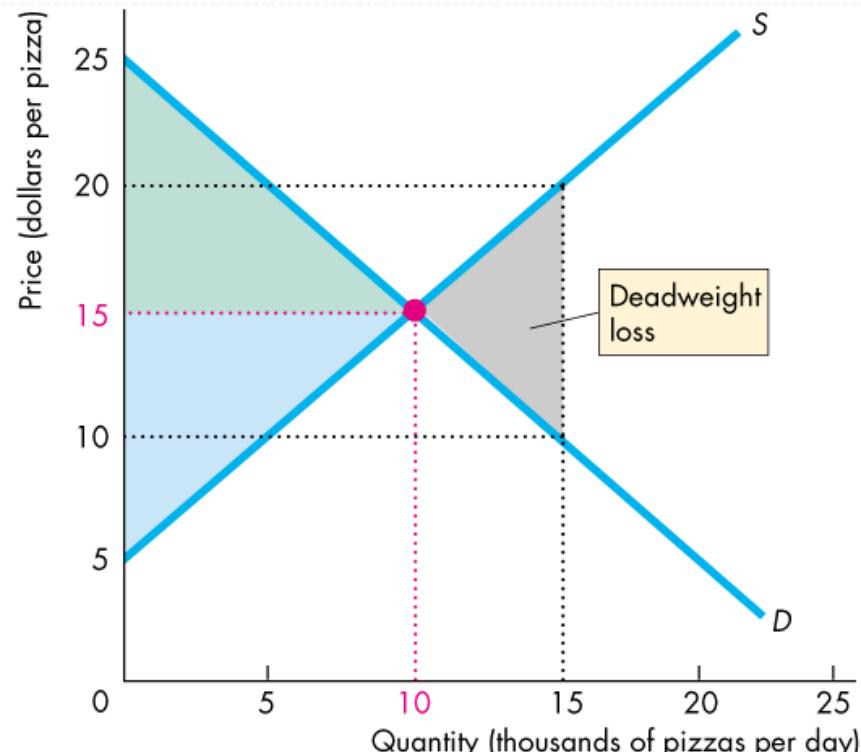
Is the Competitive Market Efficient?

- Overproduction**

Again, the efficient quantity is 10,000 pizzas a day.

If production is expanded to 15,000 pizzas a day, a deadweight loss arises from overproduction.

This loss is a *social* loss.



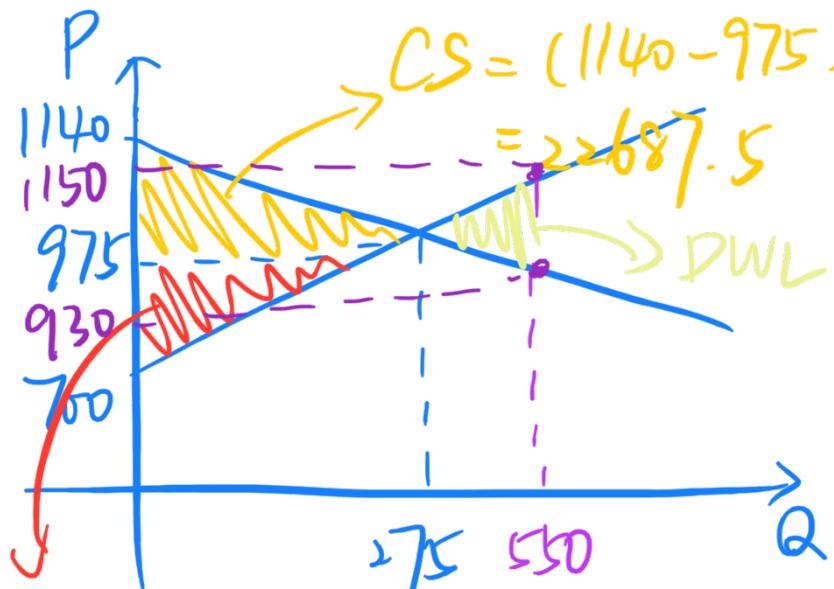
(b) Overproduction

$$D: P = 1140 - 0.6Q$$

$$S: P = 700 + Q$$

$$\Rightarrow \text{eq}^m = Q + 700 = 1140 - 0.6Q$$

$$\Rightarrow Q^{\text{eq}} = 275, P = 975$$



$$PS = (975 - 700) \times \frac{1}{2} \times 275$$

$$= 37812.5$$

If $Q > Q^e = 275$,
Say $Q = 550$
At $Q = 550$,

S: $P = \text{msc} = 350 + 700 = 1050$

\uparrow
marginal social cost

D: $P = \text{msb} = 0.6 \times 350 + 1140$

\uparrow
marginal social benefit

Is the Competitive Market Efficient?

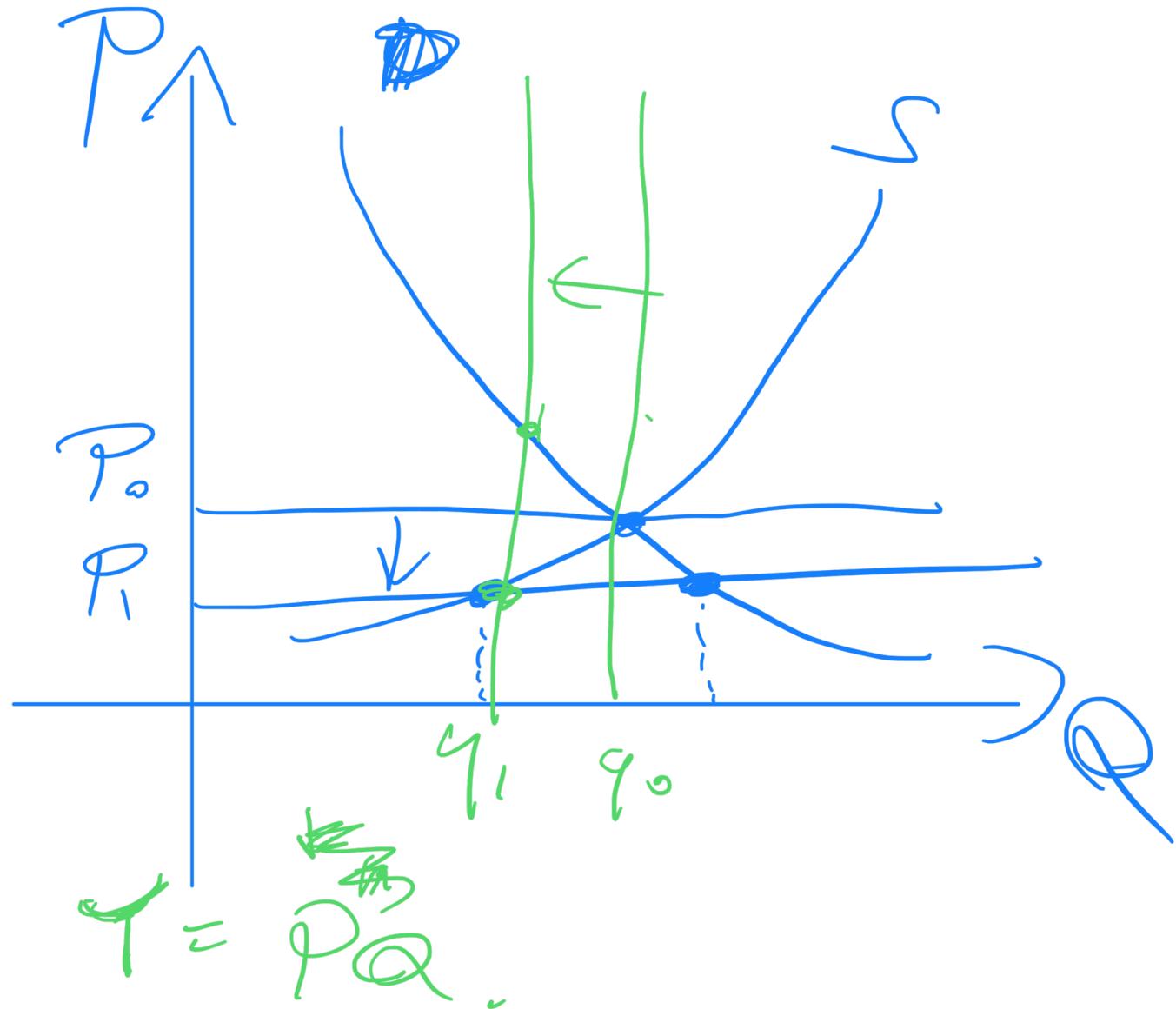
- **Sources of Market Failure**
- In competitive markets, underproduction or overproduction arise when there are
 - Price and quantity regulations
 - Taxes and subsidies
 - Externalities
 - Public goods and common resources
 - Monopoly
 - High transactions costs

Is the Competitive Market Efficient?



• Price and Quantity Regulations

- *Price regulations* sometimes put a block of the price adjustments and lead to underproduction.
- *Quantity regulations* that limit the amount that a farm is permitted to produce also leads to underproduction.

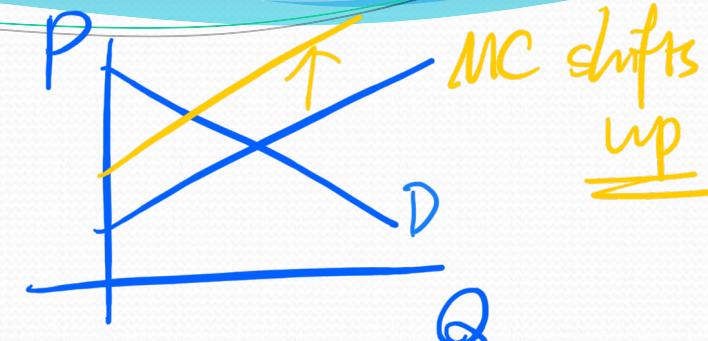


Is the Competitive Market Efficient?

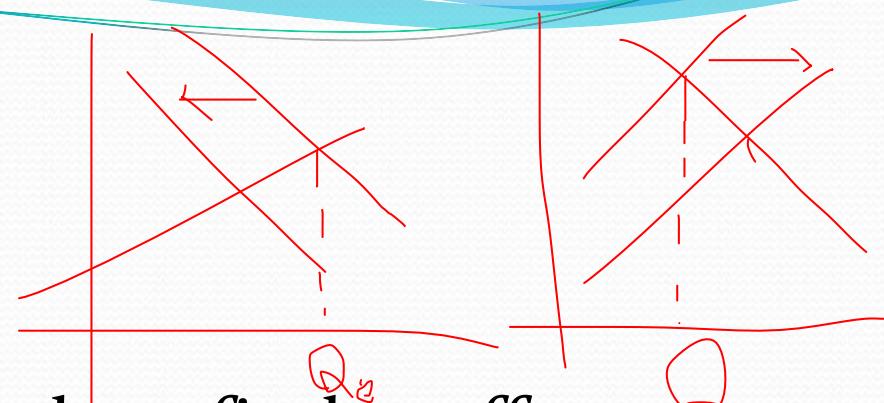


Taxes and Subsidies

- Taxes increase the prices paid by buyers and lower the prices received by sellers.
- So taxes decrease the quantity produced and lead to underproduction.
- Subsidies lower the prices paid by buyers and increase the prices received by sellers.
- So subsidies increase the quantity produced and lead to overproduction.



Is the Competitive Market Efficient?

- **Externalities** 
- An *externality* is a cost or benefit that affects someone other than the seller or the buyer of a good.
- An electric utility creates an *external cost* by burning coal that creates acid rain.
- The utility doesn't consider this cost when it chooses the quantity of power to produce. Overproduction results.

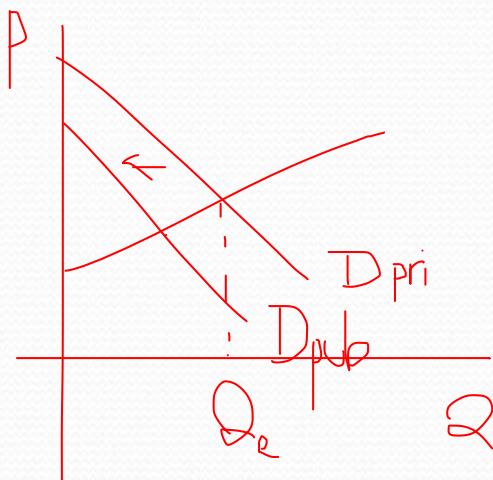
Is the Competitive Market Efficient?

- An apartment owner would provide an *external benefit* if she installed an smoke detector. But she doesn't consider her neighbor's marginal benefit and decides not to install the smoke detector.
- The result is underproduction.

Is the Competitive Market Efficient?

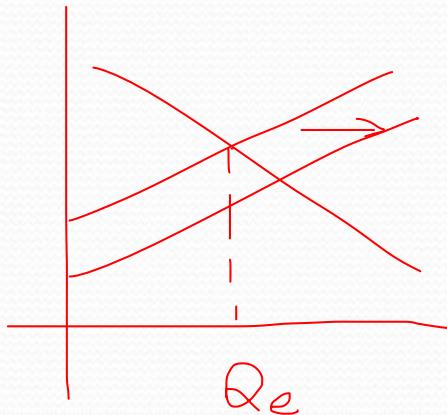
• Public Goods and Common Resources

- A *public good* benefits everyone and no one can be excluded from its benefits. Underproduction
- It is in everyone's self-interest to avoid paying for a public good (called the free-rider problem), which leads to underproduction.



Is the Competitive Market Efficient?

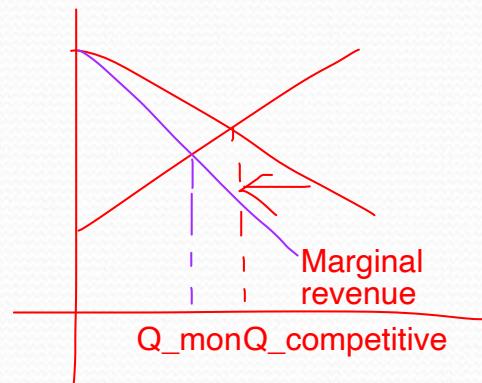
- A *common resource* is owned by no one but can be used by everyone.
- It is in everyone's self interest to ignore the costs of their own use of a common resource that fall on others (called *tragedy of the commons*).
- The *tragedy of the commons* leads to overproduction.



Is the Competitive Market Efficient?

•Monopoly

- A *monopoly* is a firm that has sole provider of a good or service.
- The self-interest of a monopoly is to maximize its profit. To do so, a monopoly sets a price to achieve its self-interested goal.
- As a result, a monopoly produces too little and underproduction results.



Is the Competitive Market Efficient?

- **High Transactions Costs**
- **Transactions costs** are the costs of services that enable a market to bring buyers and sellers together.
- To use the market price as the allocator of scarce resources, it must be worth bearing the transactions costs of establishing a market.
- Some markets are just too costly to operate.
- When transactions costs are high, the market might underproduce.

