Economics 1
Principles of Economics

Supply, Demand, and Government Policies (Chapter 6)

Dr. Randall R. Rojas

Look for the Answers to These Questions:

- What are price ceilings and price floors?
- What are some examples of each?
- How do price ceilings and price floors affect market outcomes?
- How do taxes affect market outcomes?
- How do the effects depend on whether the tax is imposed on buyers or sellers?
- What is the incidence of a tax?
- What determines the incidence?

I. Price Controls

There are two types of price controls:

- Def: Price Ceiling = A legal maximum on the price of a good or service. Example: Rent control.

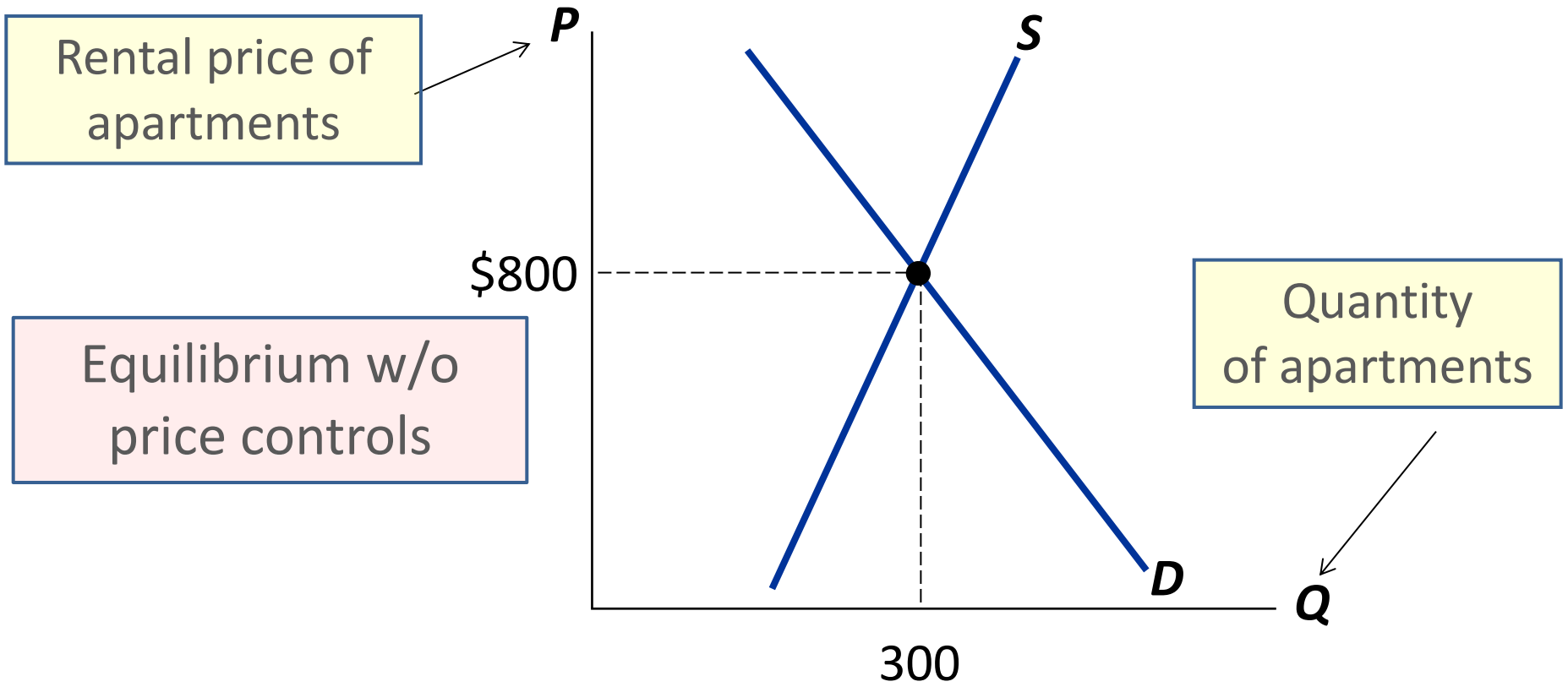
- Def: Price Floor = A legal minimum on the price of a good or service. Example: Minimum wage.

II. Price Ceilings

- Policy makers may respond to buyers' complaints that prices are "too high" by enacting price controls such as a price ceiling.
  - Price ceilings limit the price sellers can charge for their goods to the maximum price.
  - Prices cannot legally go higher than the ceiling.

II. Price Ceilings

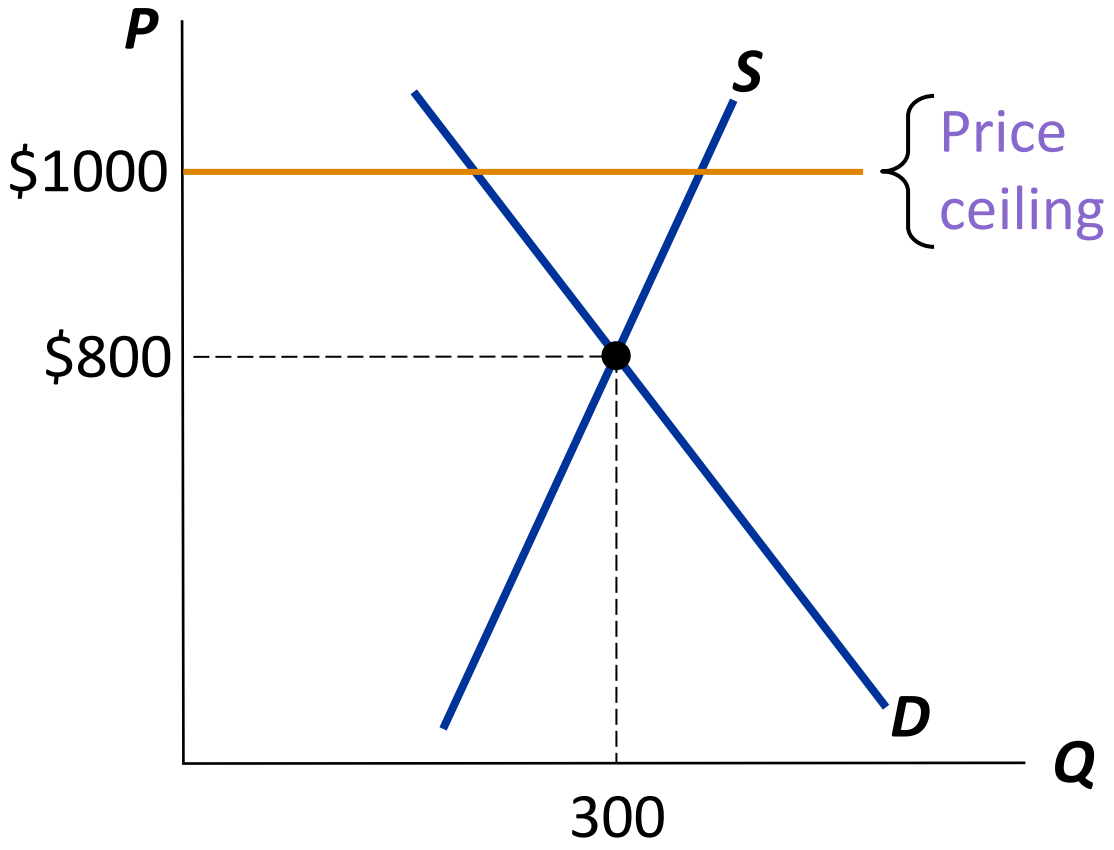
- Example: The Market for Apartments.



II. Price Ceilings

- Example: The Market for Apartments.

A price ceiling above the equilibrium price is not binding, i.e., has no effect on the market outcome.

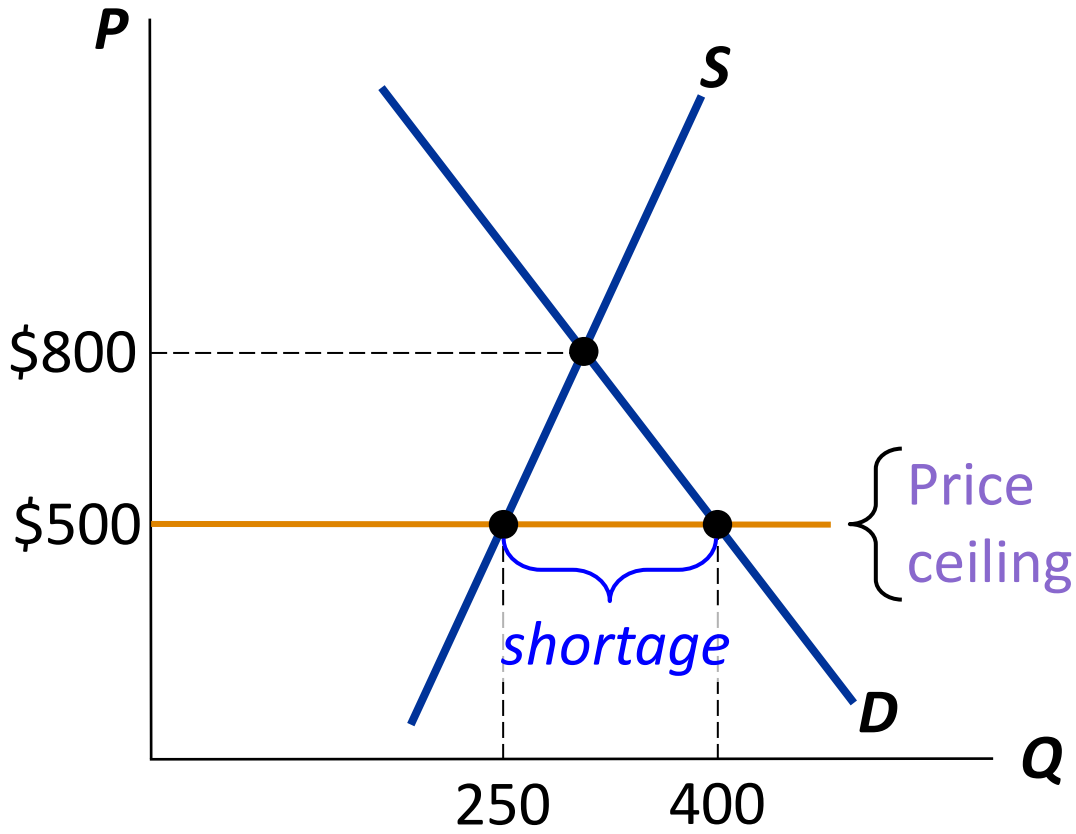


II. Price Ceilings

- Example: The Market for Apartments.

The equilibrium price ($800) is above the ceiling and therefore illegal.

The ceiling is a binding constraint on the price, causes a shortage.

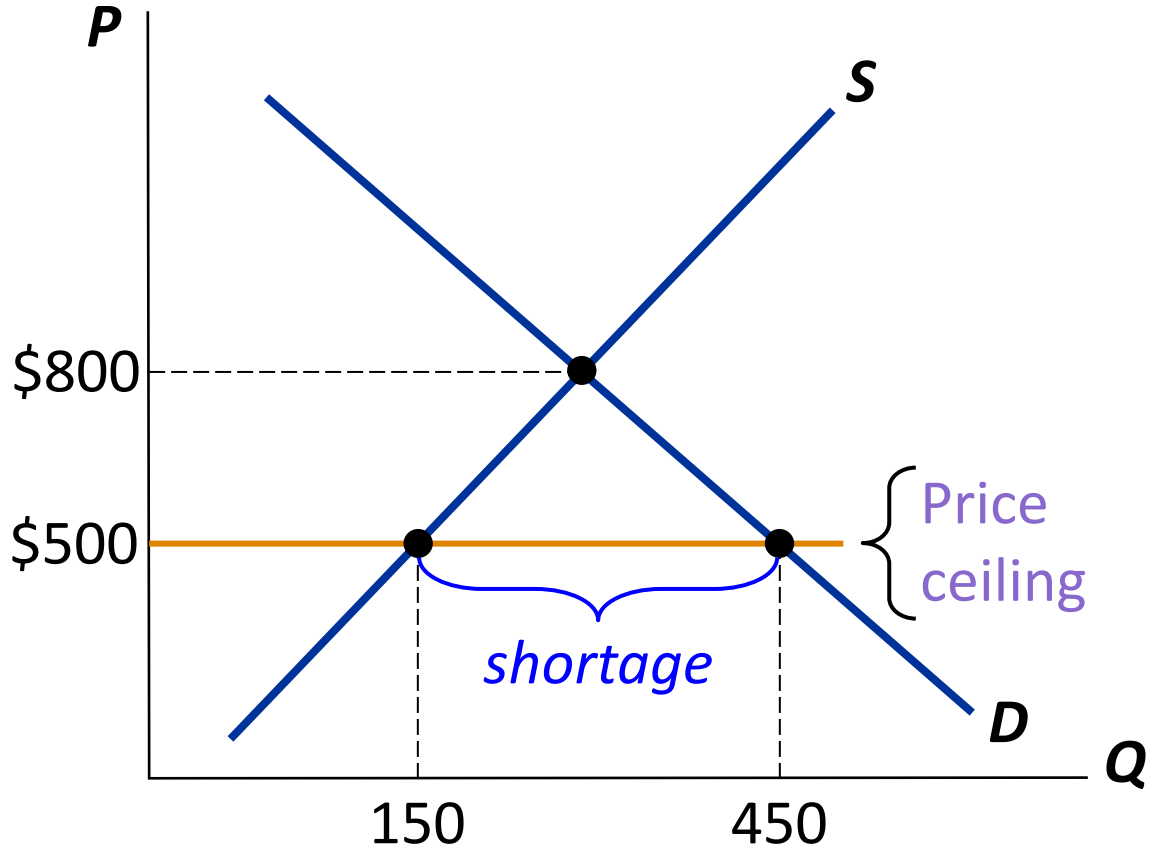


II. Price Ceilings

- Example: The Market for Apartments.

In the long run, supply and demand are more price-elastic.

Therefore, the shortage is larger.



II. Price Ceilings

Price ceilings that involve a maximum price below the market price create five important effects.

1. Shortages
2. Reduction in Product Quality
3. Wasteful Lines and Other Costs of Search
4. Loss of Gains from Trade
5. Misallocation of Resources

II. Price Ceilings

1. Shortages

- When prices are held below the market price shortages are created.
- The shortage = difference between the Q_D and the Q_S at the controlled price.
- The lower the controlled price relative to the market equilibrium price, the larger the shortage.
  - Example: A shortage of vinyl in 1973 forced Capitol Records to melt down slow sellers so they could keep pressing Beatles' albums.

II. Price Ceilings

2. Reduction of Product Quality

- At the controlled price, sellers have more customers than goods.
  - In a free market, this would be an opportunity to profit by raising prices.
  - But when prices are controlled, sellers cannot.
- Sellers respond to this problem in two ways:
  - Reduce quality.
  - Reduce service.

II. Price Ceilings

3. Wasteful Lines and Other Costs of Search

- When shortages occur not all buyers will be able to purchase the good.
- Normally, buyers would compete with each other by offering a higher price.
- If price is not allowed to rise, buyers must compete in other ways e.g., bribes or wait in line.

II. Price Ceilings

3. Wasteful Lines and Other Costs of Search (Bribes)

- Some buyers may be willing to bribe sellers in order to obtain the good.
- The highest bribe a buyer would pay is the difference between his (her) max price and the price ceiling.
- If bribes are common, then the total price of the good is the legal price plus the bribe.

II. Price Ceilings

3. Wasteful Lines and Other Costs of Search (Wasteful Lines)

- Buyers can also compete with each other through their willingness to wait in line.
- The maximum wait time (translated into monetary terms) for a buyer is the difference between the max price and the price ceiling.
- So the total price of the good is the legal price plus the time costs.

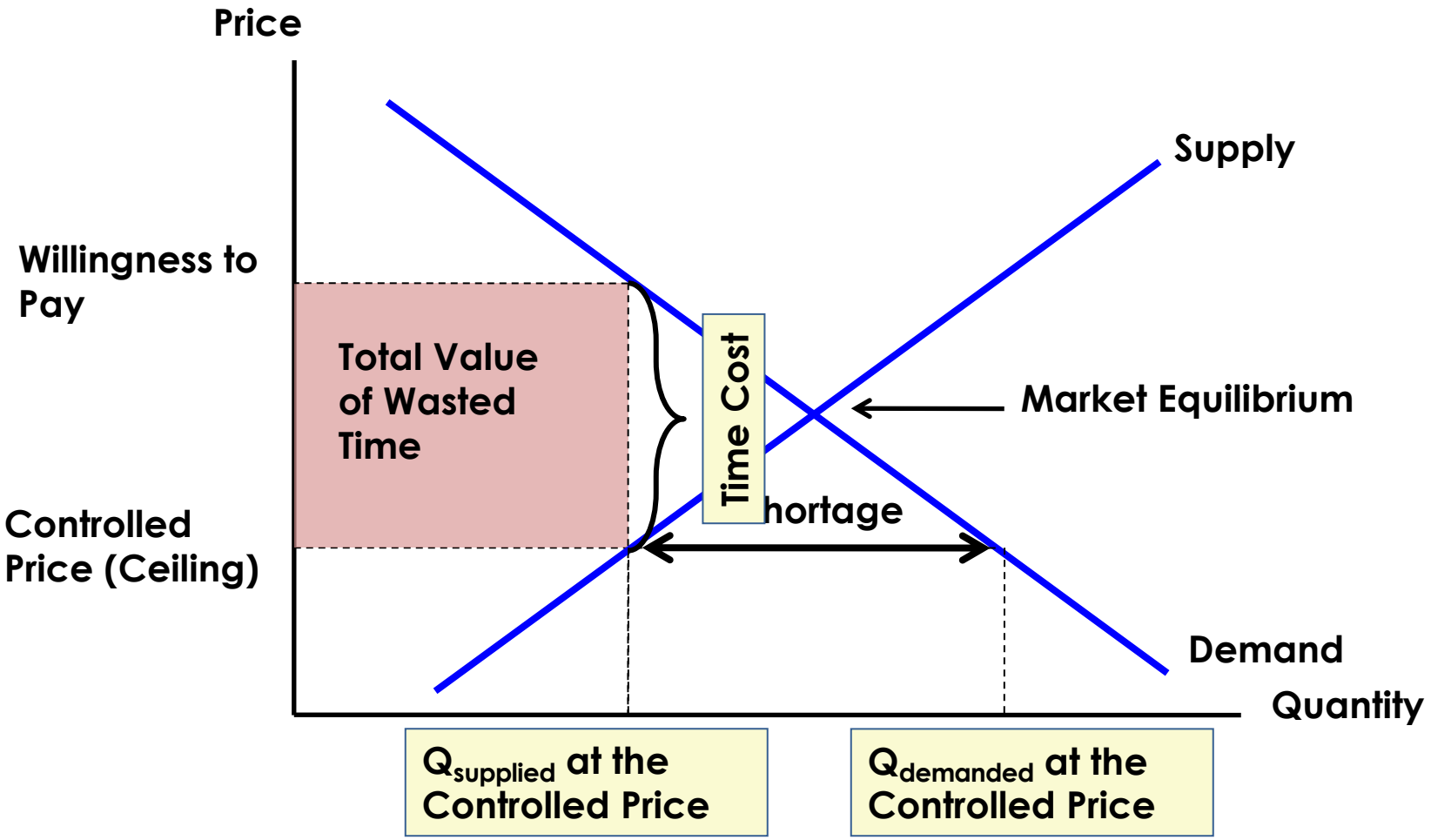
II. Price Ceilings

3. Wasteful Lines and Other Costs of Search

- Bribes and waits both lead to a total price that is greater than the controlled price, (but they are different.)
- Bribes involve a simple transfer from buyers to sellers.
- The time spent waiting in line, however, is simply lost – paying in time is much more wasteful.

II. Price Ceilings

3. Wasteful Lines and Other Costs of Search



II. Price Ceilings

4. Lost Gains from Trade

- Price controls reduce the gains from trade.
- Price ceilings set below the market price cause Q_S to be less than the market Q.
- When Q is below the equilibrium market Q, consumers value the good more than the cost of its production.
- This represents a gain from trade that would be exploited (if the market were free).

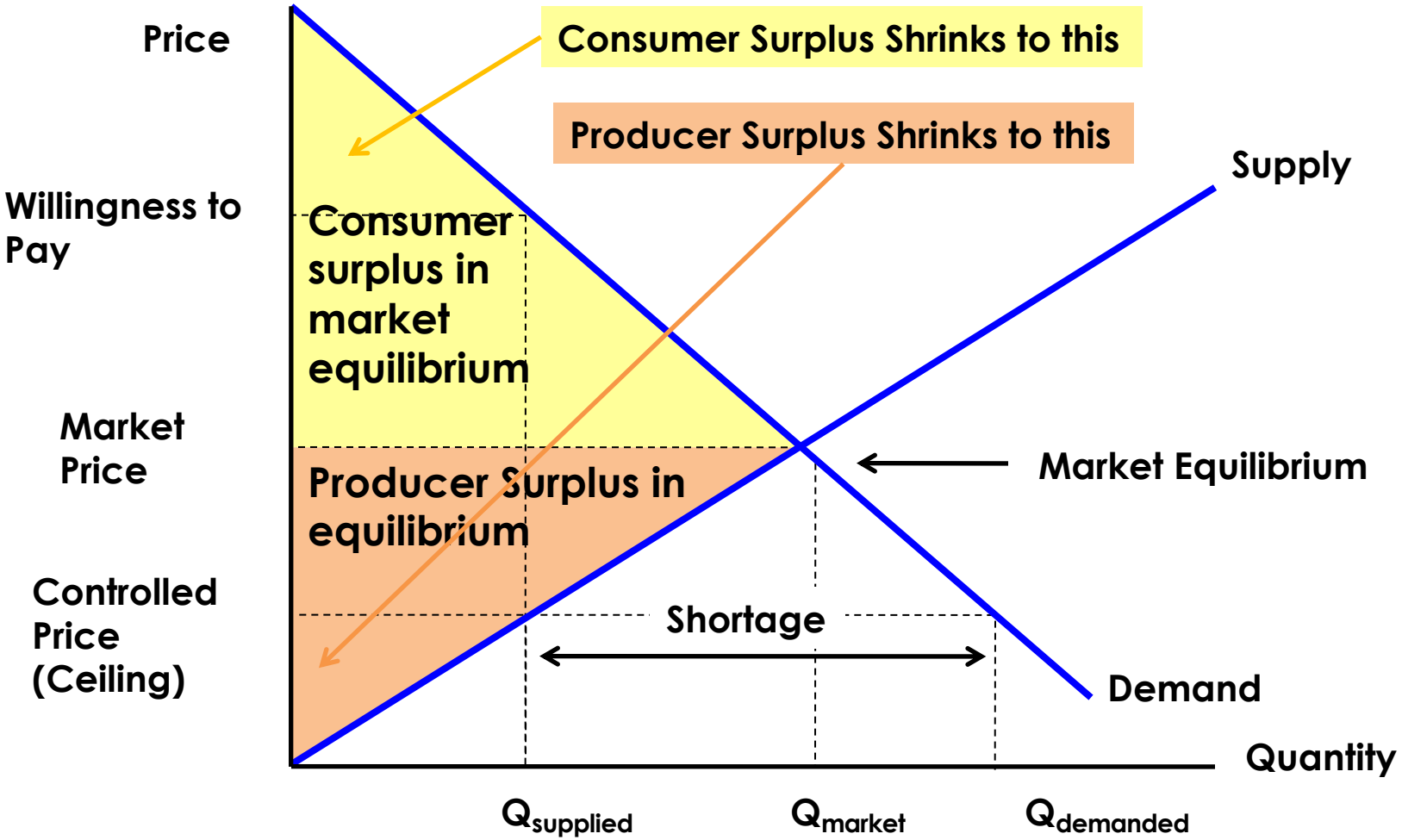
II. Price Ceilings

4. Lost Gains from Trade (Deadweight Loss)

- Dead-weight Loss is the total of lost consumer and producer surplus when all mutually profitable gains from trade are not exploited.
- Price ceilings create a dead-weight loss by forcing Qs below the market Q.
- Buyers and sellers would both benefit from trade at a higher price, but cannot since it is illegal for price to rise.

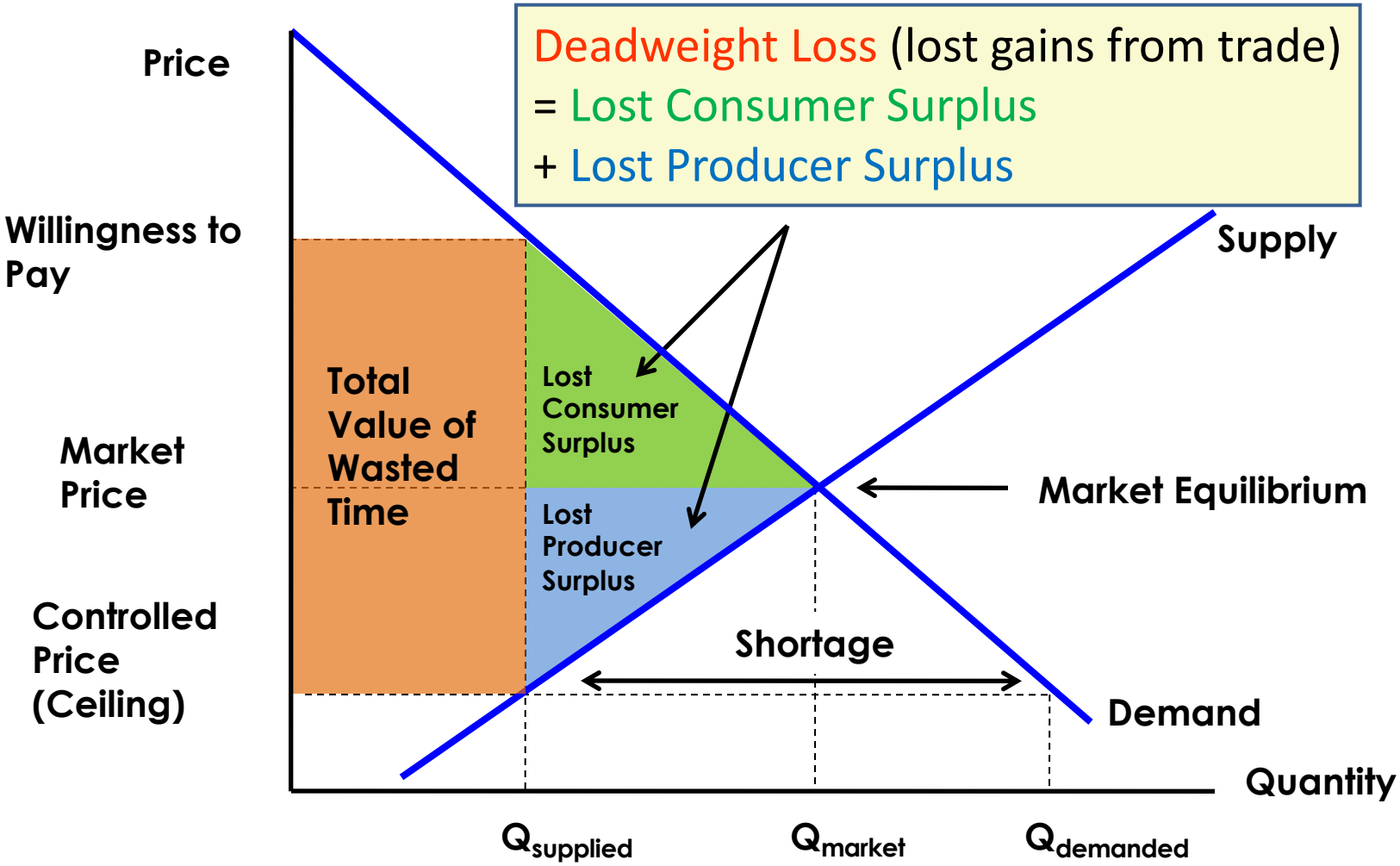
II. Price Ceilings

4. Lost Gains from Trade (Deadweight Loss)



II. Price Ceilings

4. Lost Gains from Trade (Deadweight Loss)



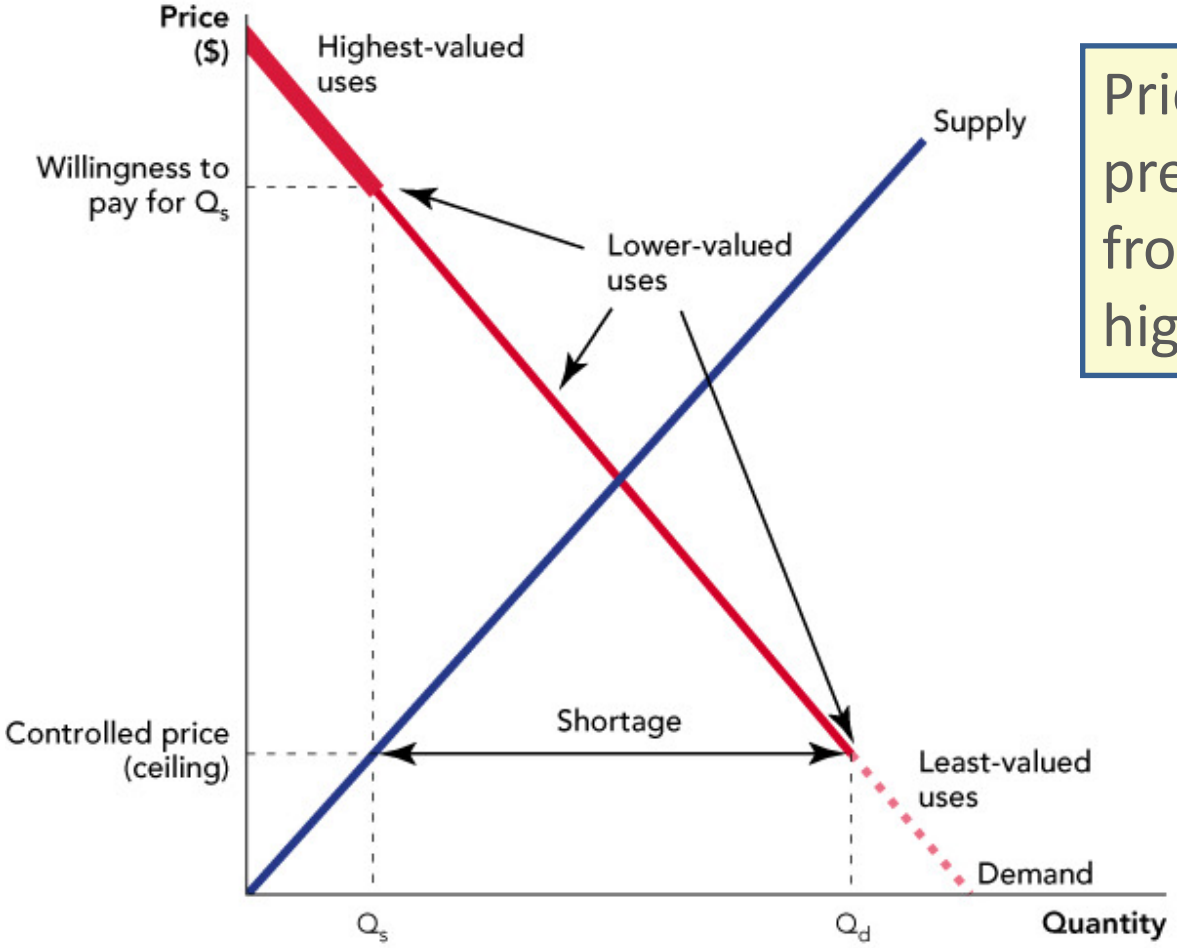
II. Price Ceilings

5. Misallocation of Resources

- Price controls distort signals and eliminate incentives -- leading to a misallocation of resources.
- Consumers who value a good most are prevented from signaling their preference (by offering sellers a higher price.)
- So producers have no incentive to supply the good to the “right” people first.
- As a result, goods are misallocated.

II. Price Ceilings

5. Misallocation of Resources

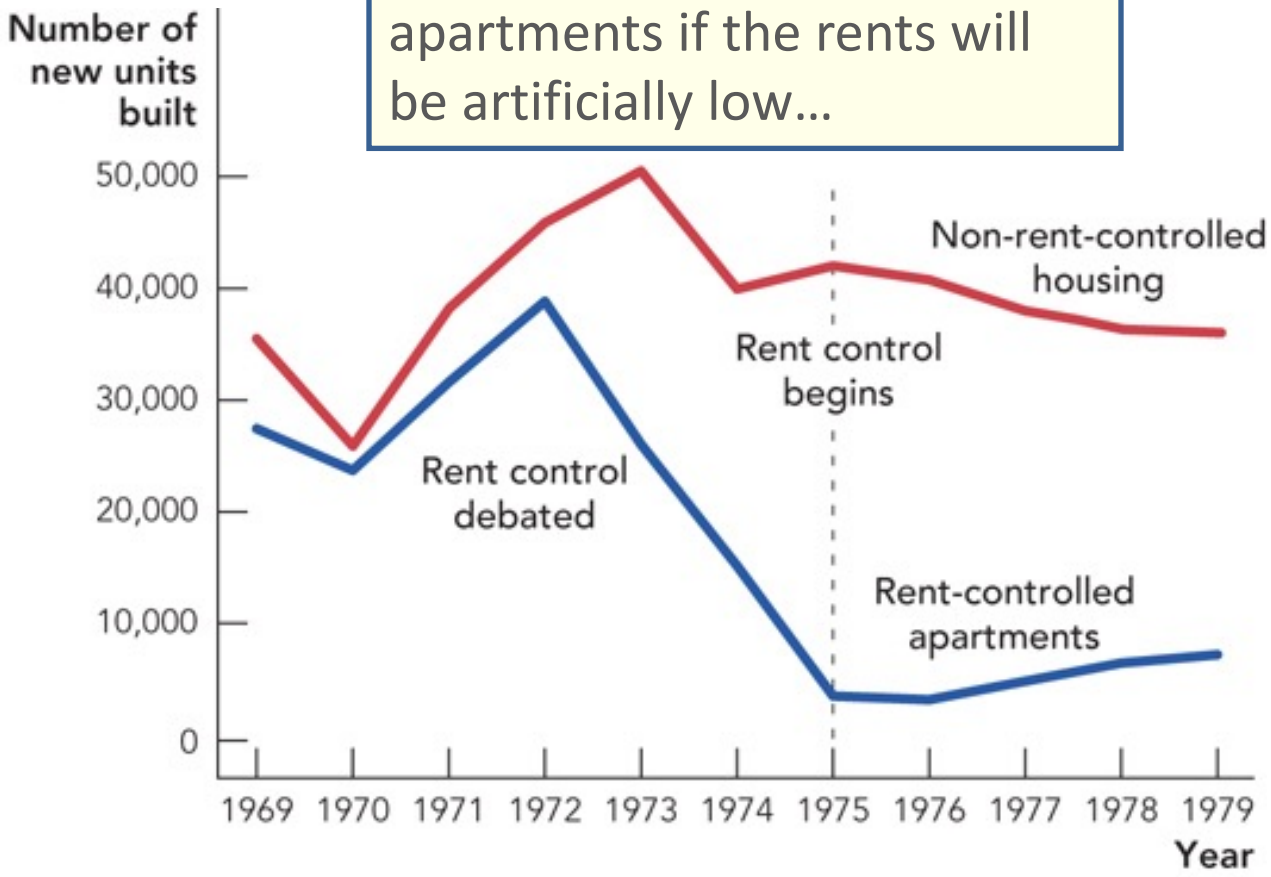


Price controls prevent resources from flowing to their highest-valued uses

II. Price Ceilings

5. Misallocation of Resources

No one wants to build new apartments if the rents will be artificially low…



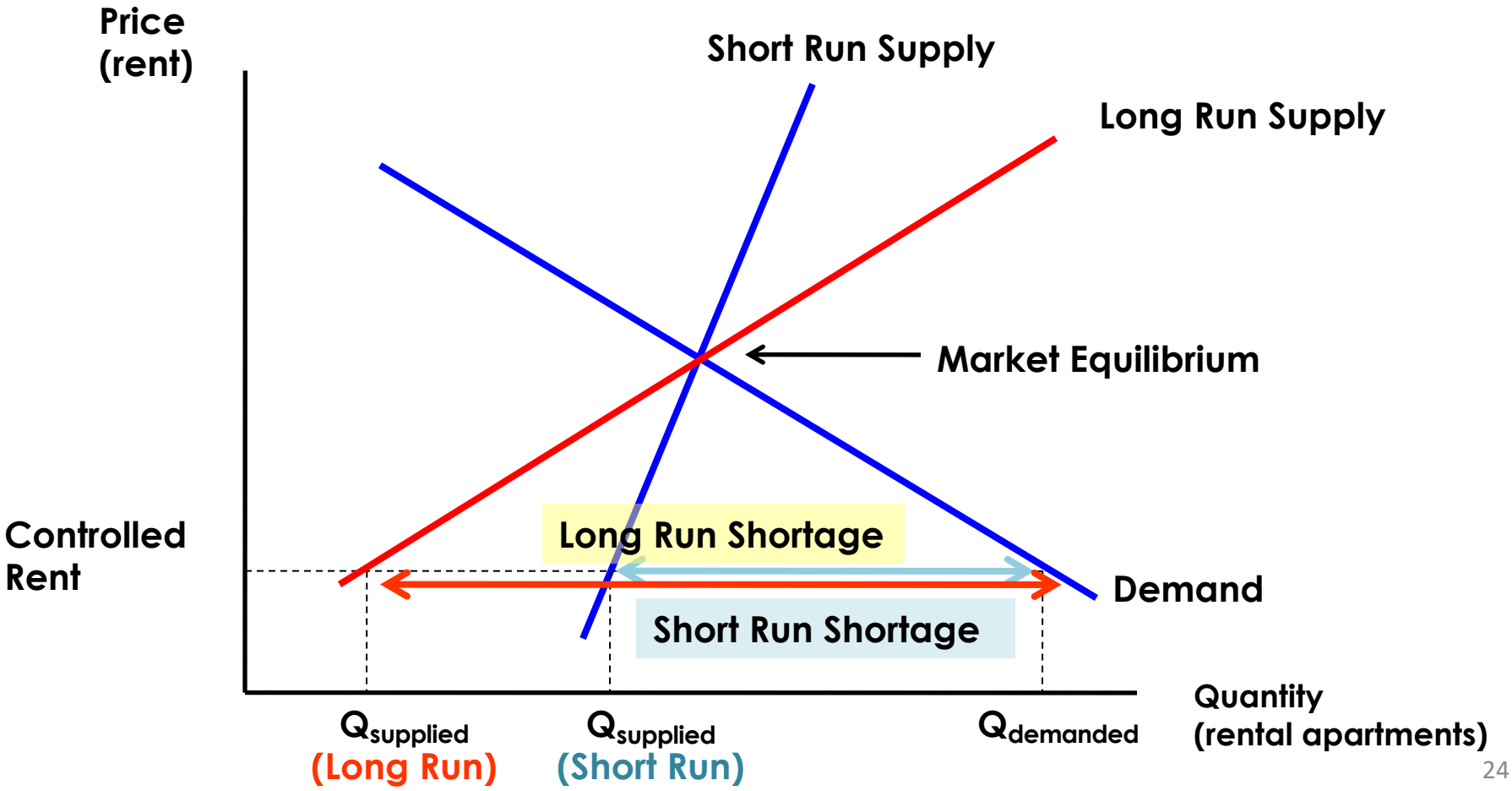
Example: Rent Control; a regulation that prevents rents from rising to equilibrium levels.

Rent control is a price ceiling whose effects worsen over time.

II. Price Ceilings

The shortage is smaller in the Short Run…

…..than in the Long Run



II. Price Ceilings

Arguments for Price Controls

Q: So why do price controls ever get passed?

A: The general public may not understand the nasty side-effects of price controls.

Shortages may benefit the ruling elite…

- In the former USSR, the communist party elite used Blat to obtain goods.
  - Blat = having connections that can be used to get favors.
- The party elite can use their connections and power to obtain goods for themselves or others.
- Without such leverage their power dissipates.

III. Price Floors

- Def: Price Floor = A minimum price allowed by law. They not as common as price ceilings (but still important).

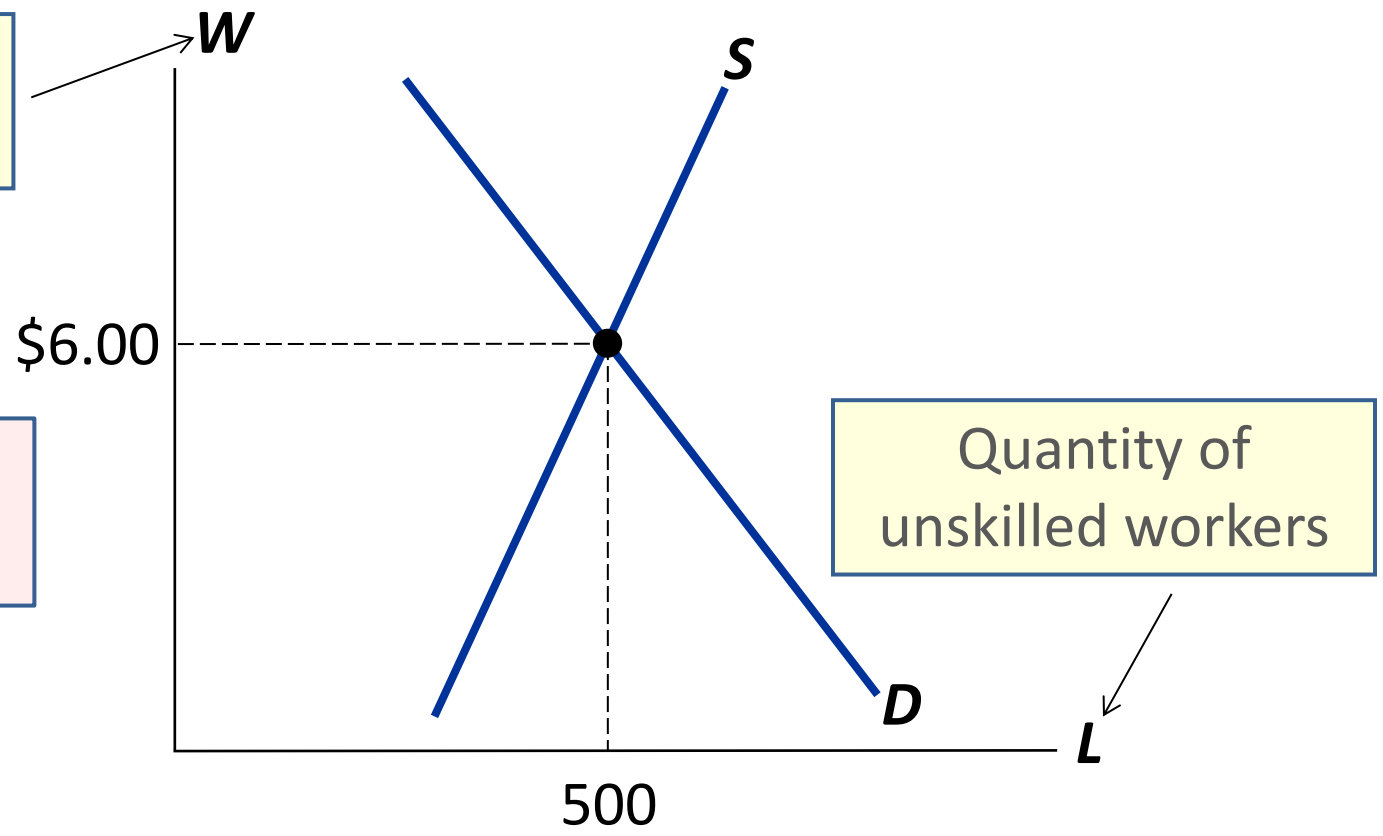
Price floors have four common effects:

1. Surpluses
2. Lost gains from trade (deadweight loss)
3. Wasteful increases in quality
4. A misallocation of resources

III. Price Floors

- Example: The Market for Unskilled Labor.

Wage paid to unskilled workers



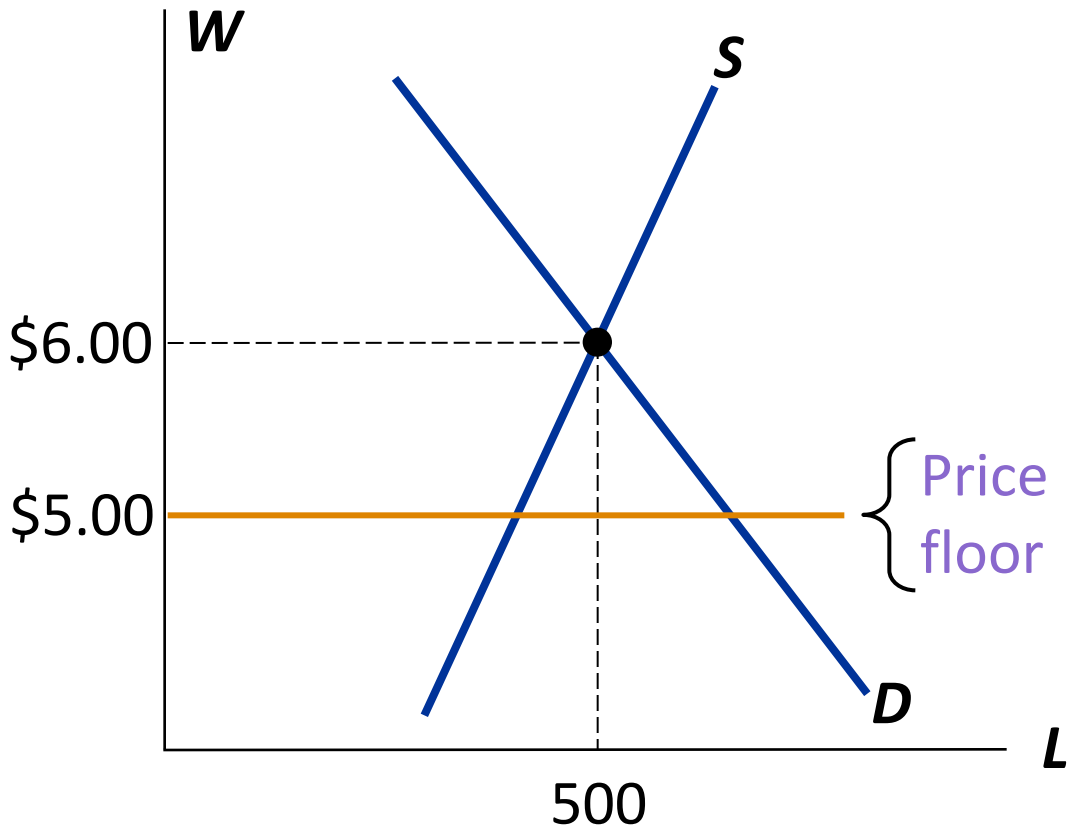
Equilibrium w/o price controls

Quantity of unskilled workers

III. Price Floors

- Example: The Market for Unskilled Labor.

A price floor below the equilibrium price is not binding – has no effect on the market outcome.

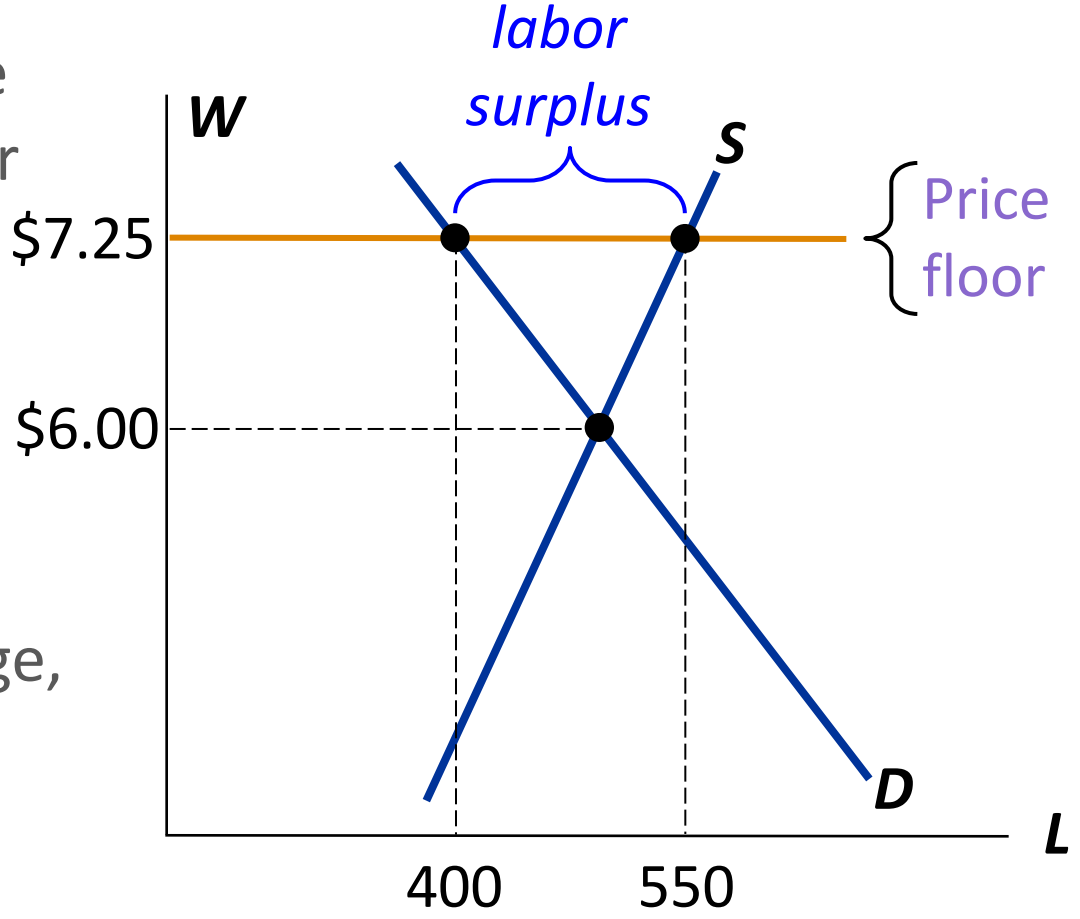


III. Price Floors

- Example: The Market for Unskilled Labor.

The equilibrium wage ($6) is below the floor and therefore illegal.

The floor is a binding constraint on the wage, causes a surplus (i.e., unemployment).

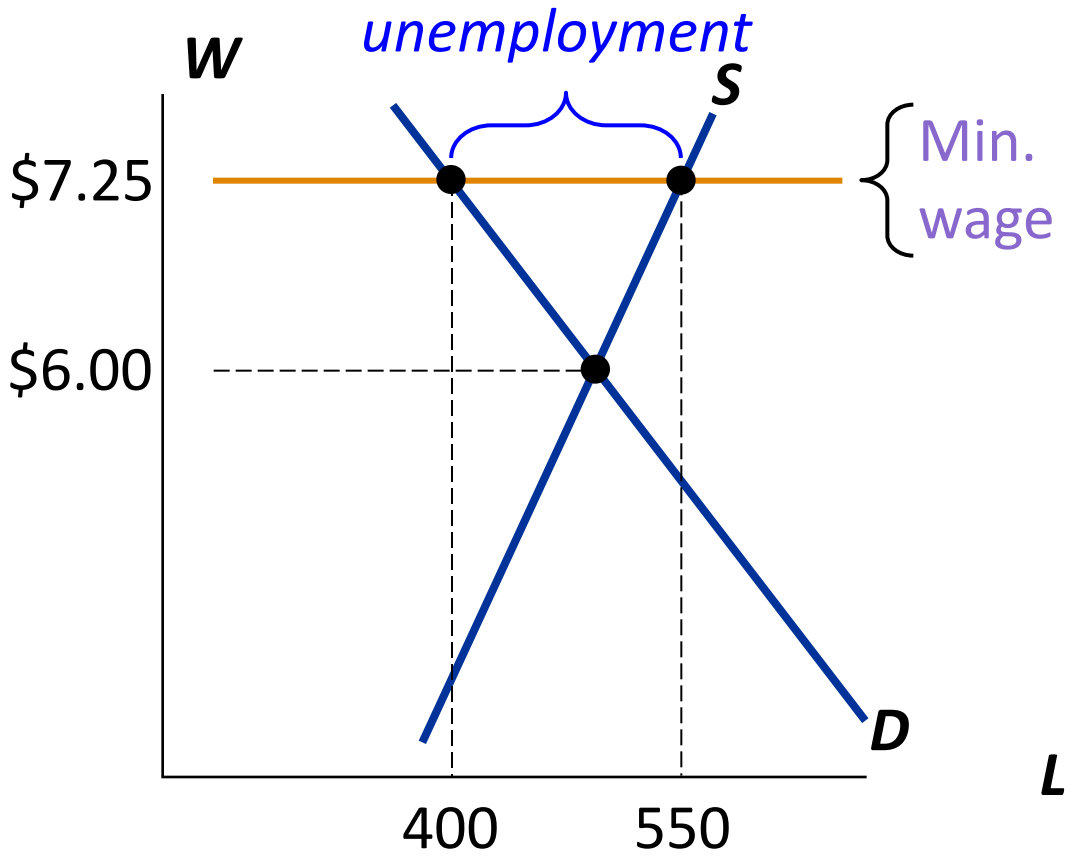


III. Price Floors

- Example: The Minimum Wage.

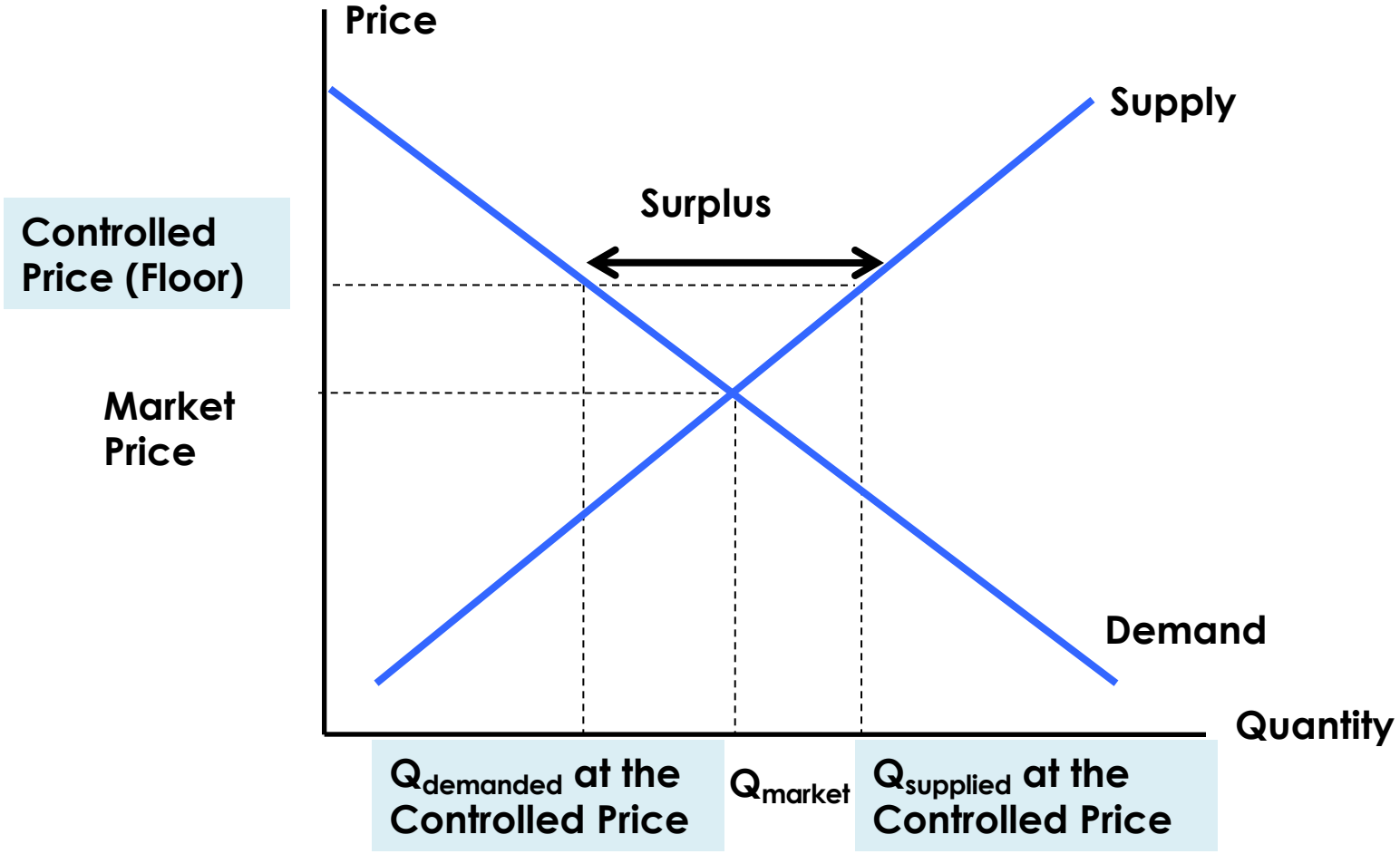
- Min wage laws do not affect highly skilled workers.
- They do affect teen workers.
- Studies:

A 10% increase in the min wage raises teen unemployment by 1–3%.



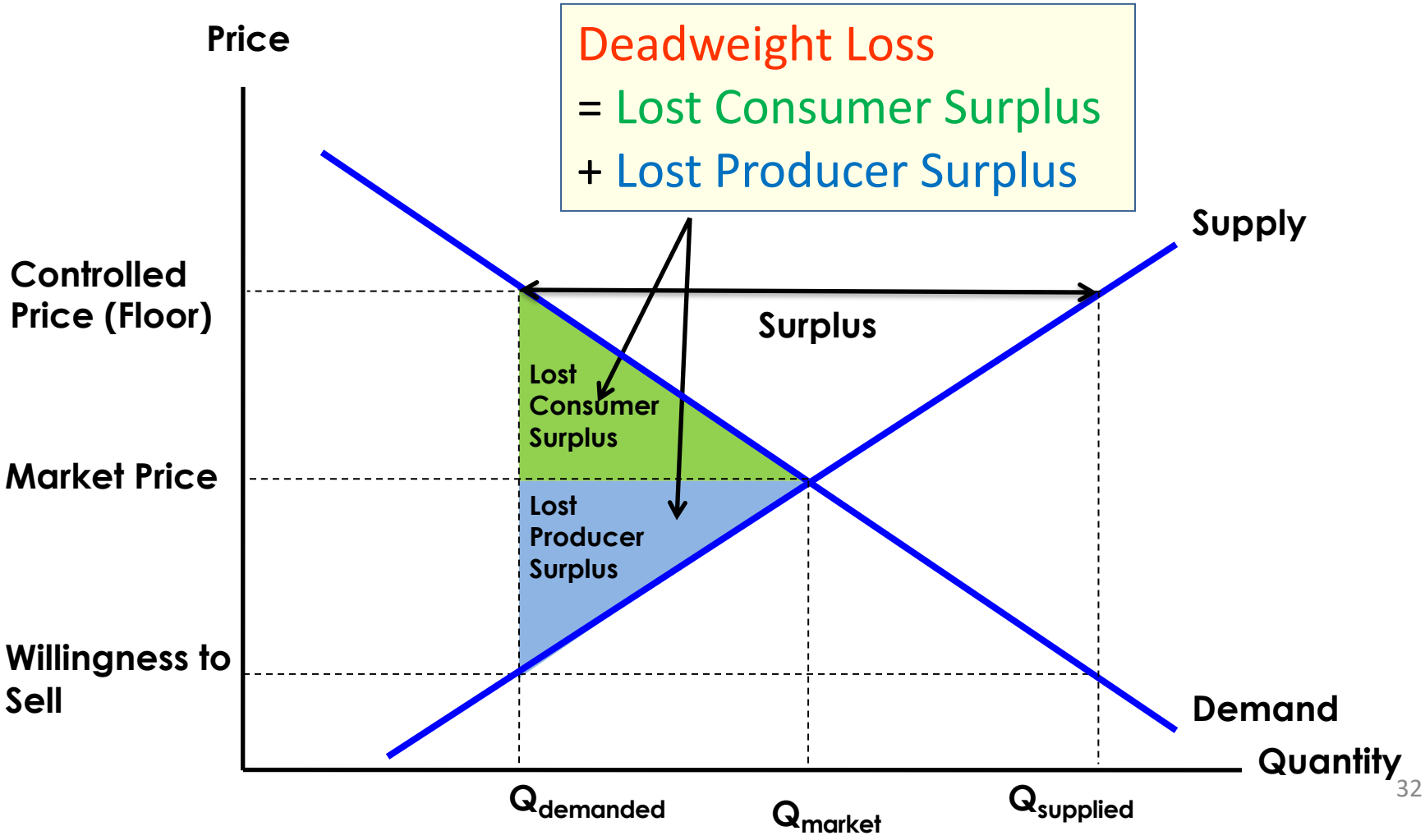
III. Price Floors

1. Surplus



III. Price Floors

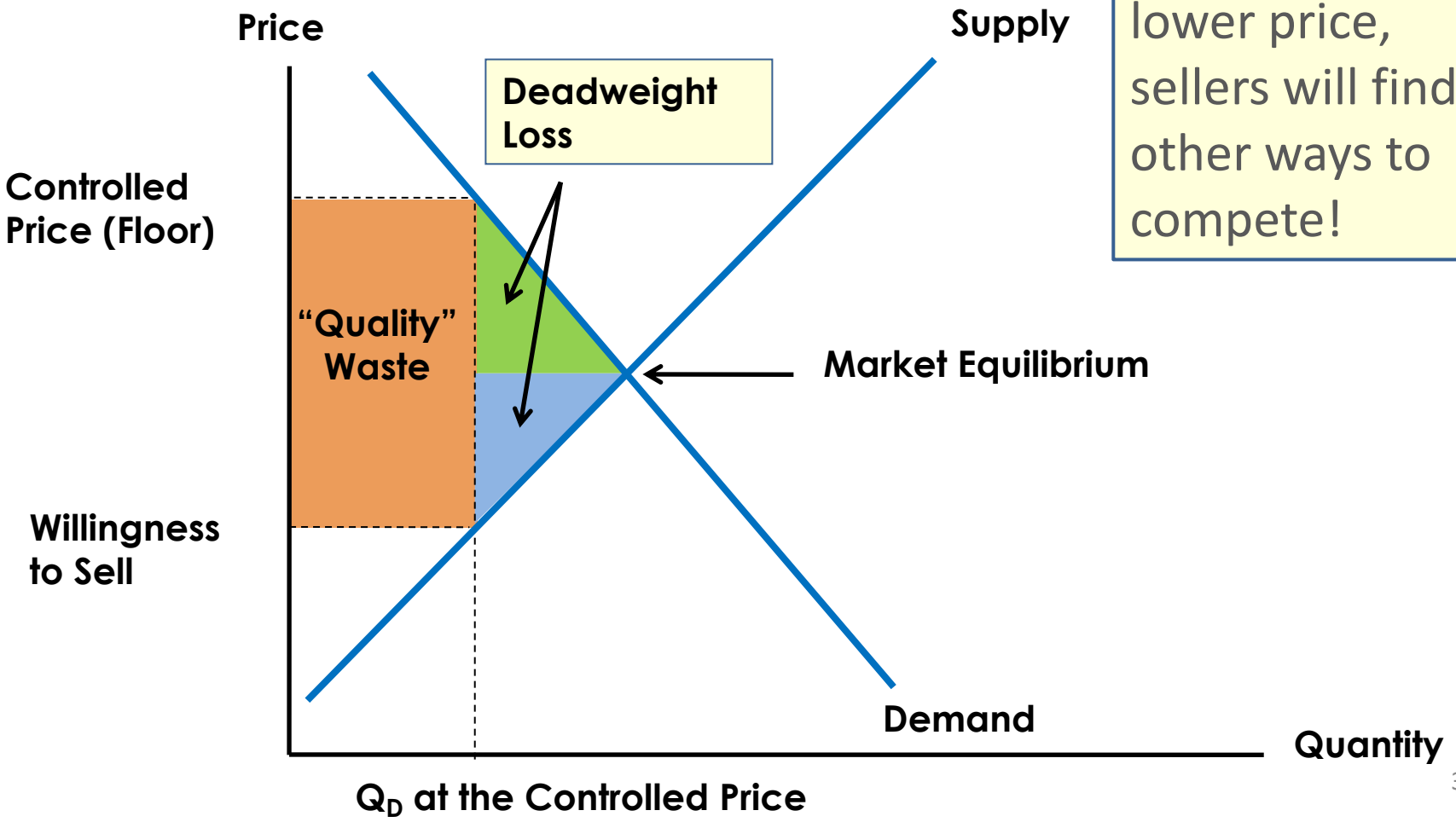
2. Lost Gains from Trade



III. Price Floors

3. Wasteful Increases in Quality

If they can't lower price, sellers will find other ways to compete!



III. Price Floors

3. Wasteful Increases in Quality

- Higher quality raises costs and reduces seller profit.
- Buyers get higher quality, but would prefer a lower price.
- Price floors encourage sellers to waste resources: higher quality than buyers are willing to pay for.

III. Price Floors

4. Misallocation of Resources

- Price controls misallocate resources by:
  - Allowing high-cost firms to operate.
  - Preventing low-cost firms from entering the industry.
- Example: Regulation prevented Southwest (and 79 other firms) from entering the national market.

III. Price Floors

- Example (1): President Jimmy Carter deregulated the price floors in much of the trucking industry. Trucks carry almost all of the consumer goods that you purchase, so almost every time you purchase something, you're paying money to a trucking company. What do you think happened in the trucking industry after deregulation?

a) The price of trucking services fell.
b) Truckers earned less money.
c) Consumers saved a lot of money.
d) All of the above are correct.

III. Price Floors 12 of 12

- Example (2): If the U.S. government sets a price floor on milk, it will not always lead to a surplus. Why not?

a) The price floor would be rarely enforced.
b) Because price floors most commonly lead to shortages, not surpluses.
c) The market price of milk will sometimes rise above the price floor, rendering the price floor irrelevant.
d) Price floors cause supply and demand to change, which leads to changes in equilibrium price.

IV. Taxes

- The government levies taxes on many goods & services to raise revenue to pay for national defense, public schools, etc.
- The government can make buyers or sellers pay the tax.
- The tax can be a % of the good's price, or a specific amount for each unit sold.
  - For simplicity, we analyze per-unit taxes only.

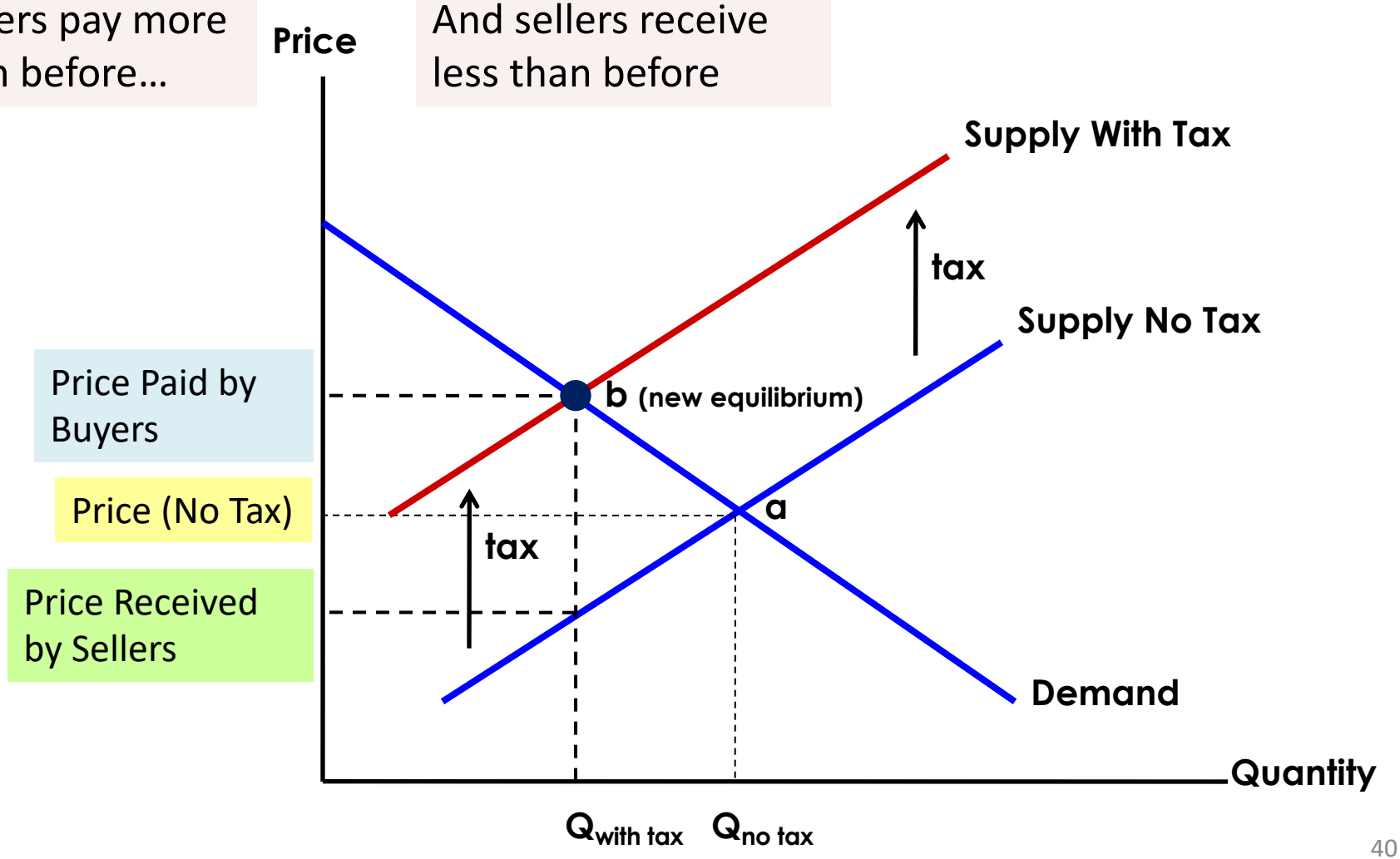
V. Commodity Taxes

- Def: Commodity Tax = A tax on goods.
- Some truths about commodity taxation:
  1. Who pays the tax does not depend on who writes the check to the government;
  2. Who pays the tax does depend on the relative elasticities of demand and supply;
  3. Commodity taxation raises revenue and creates lost gains from trade (dead-weight loss)

A Tax on Sellers Shifts the Supply Curve Up by the Tax

Buyers pay more than before…

And sellers receive less than before

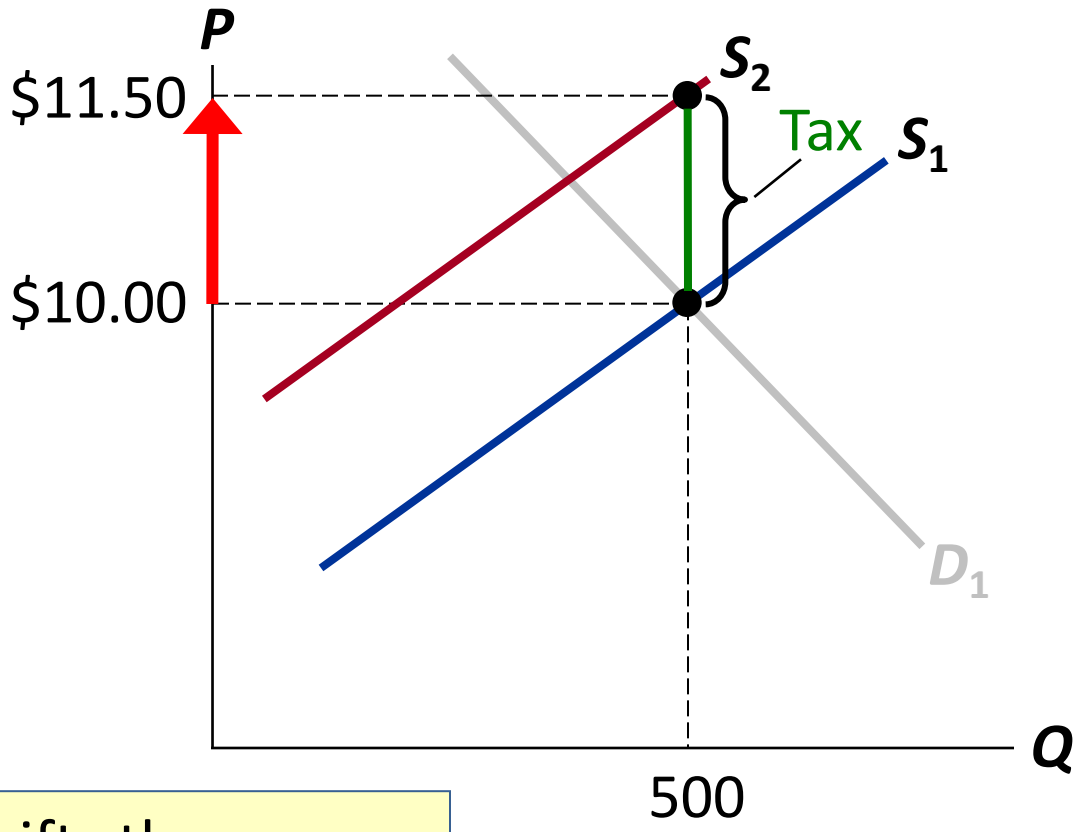


Example (Market for Pizza): A Tax on Sellers

The tax effectively raises sellers' costs by $1.50 per pizza.

Sellers will supply 500 pizzas only if ***P*** rises to $11.50, to compensate for this cost increase.

Effects of a $1.50 per unit tax on sellers



Hence, a tax on sellers shifts the ***S*** curve up by the amount of the tax.

Example (Market for Pizza): A Tax on Sellers

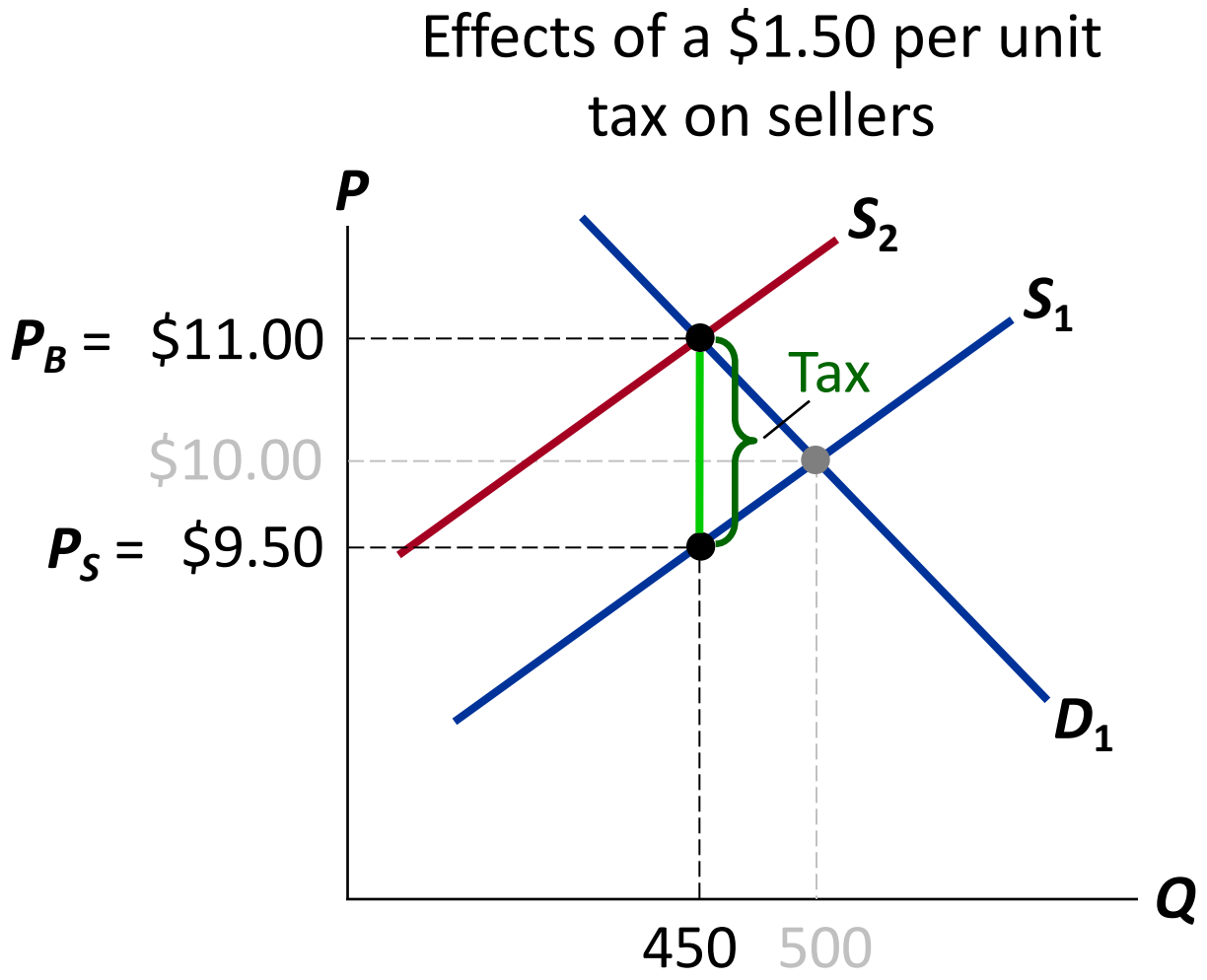
New Equilibrum:

Q = 450

Buyers pay
P_B = \$11.00

Sellers
receive
P_S = \$9.50

Difference
between them
= \$1.50 = tax



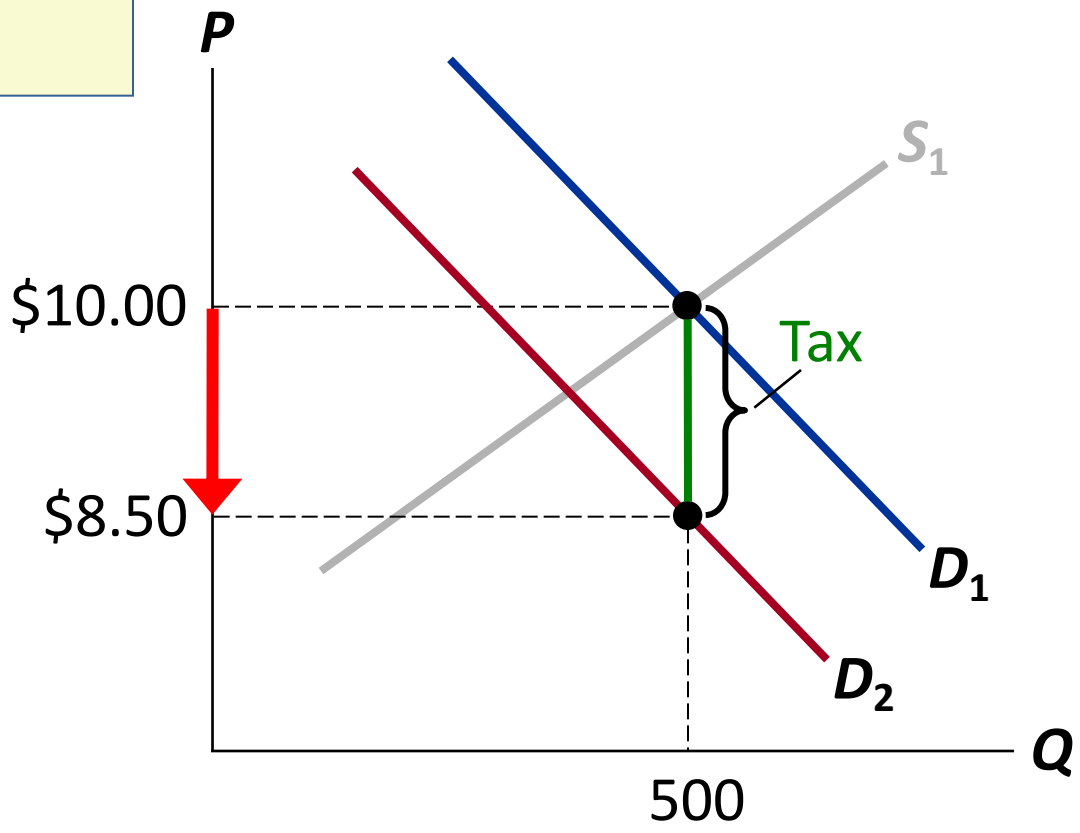
Example (Market for Pizza): A Tax on Buyers

Hence, a tax on buyers shifts the ***D*** curve down by the amount of the tax.

P would have to fall by $1.50 to make buyers willing to buy same ***Q*** as before.

E.g., if ***P*** falls from $10.00 to $8.50, buyers still willing to purchase 500 pizzas.

Effects of a $1.50 per unit tax on buyers



Example (Market for Pizza): A Tax on Buyers

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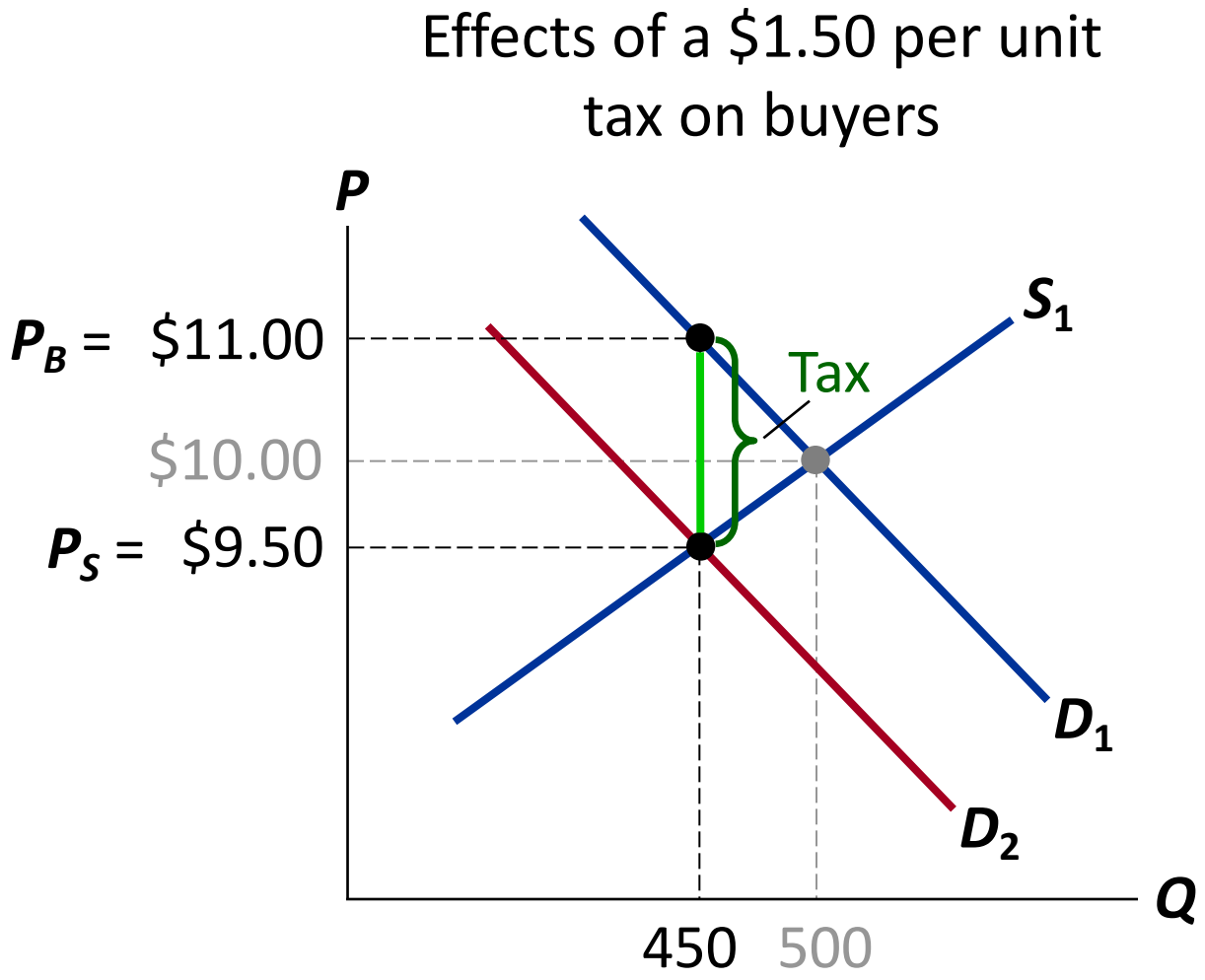


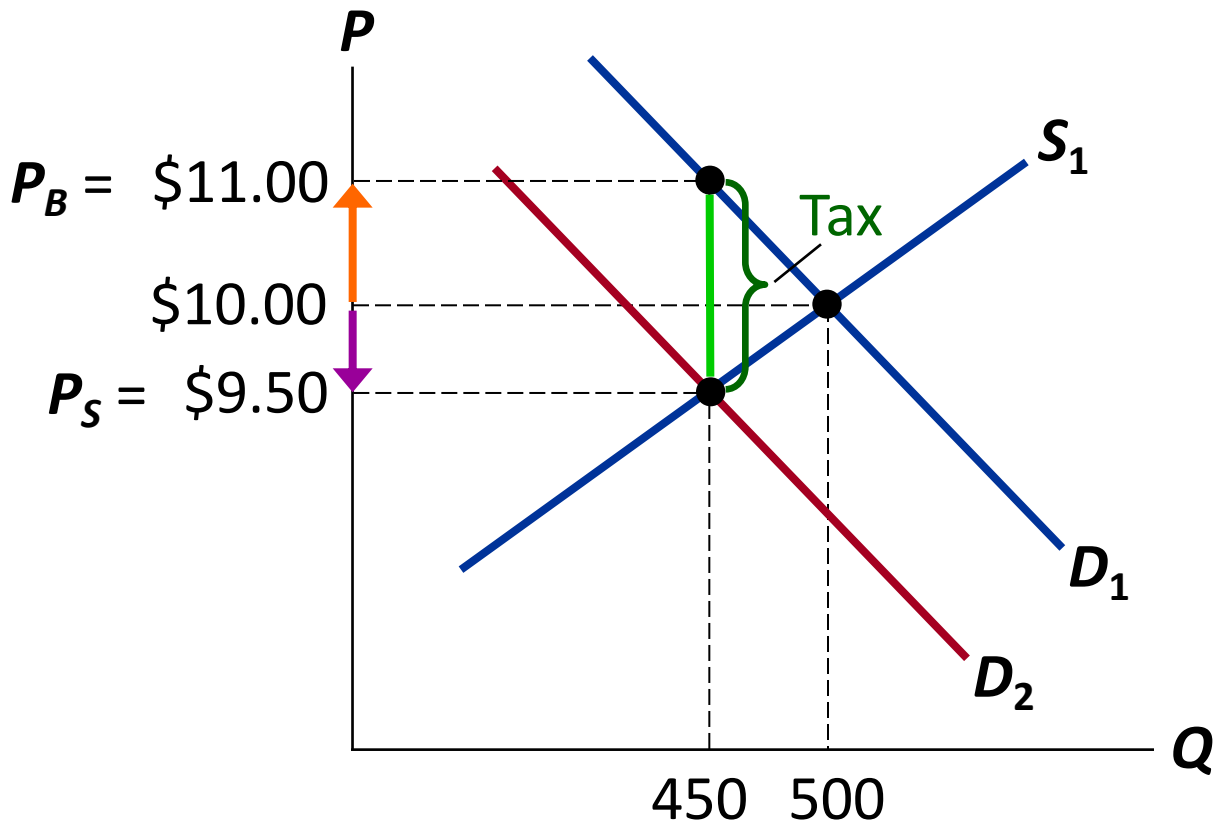
III. The Incidence of a Tax

Def: Incidence of Tax = How the burden of a tax is shared among market participants

In our example,

buyers pay $1.00 more,

sellers get $0.50 less.

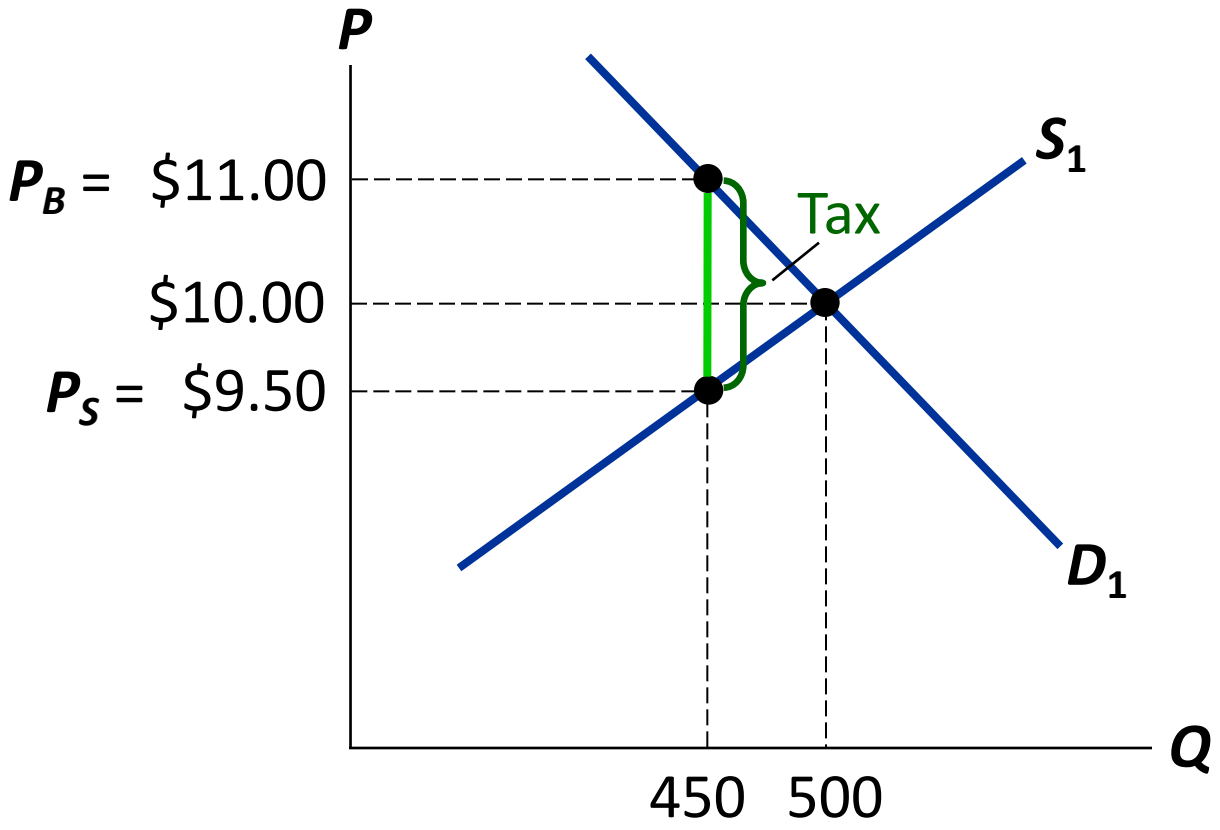


The Outcome Is the Same in Both Cases!

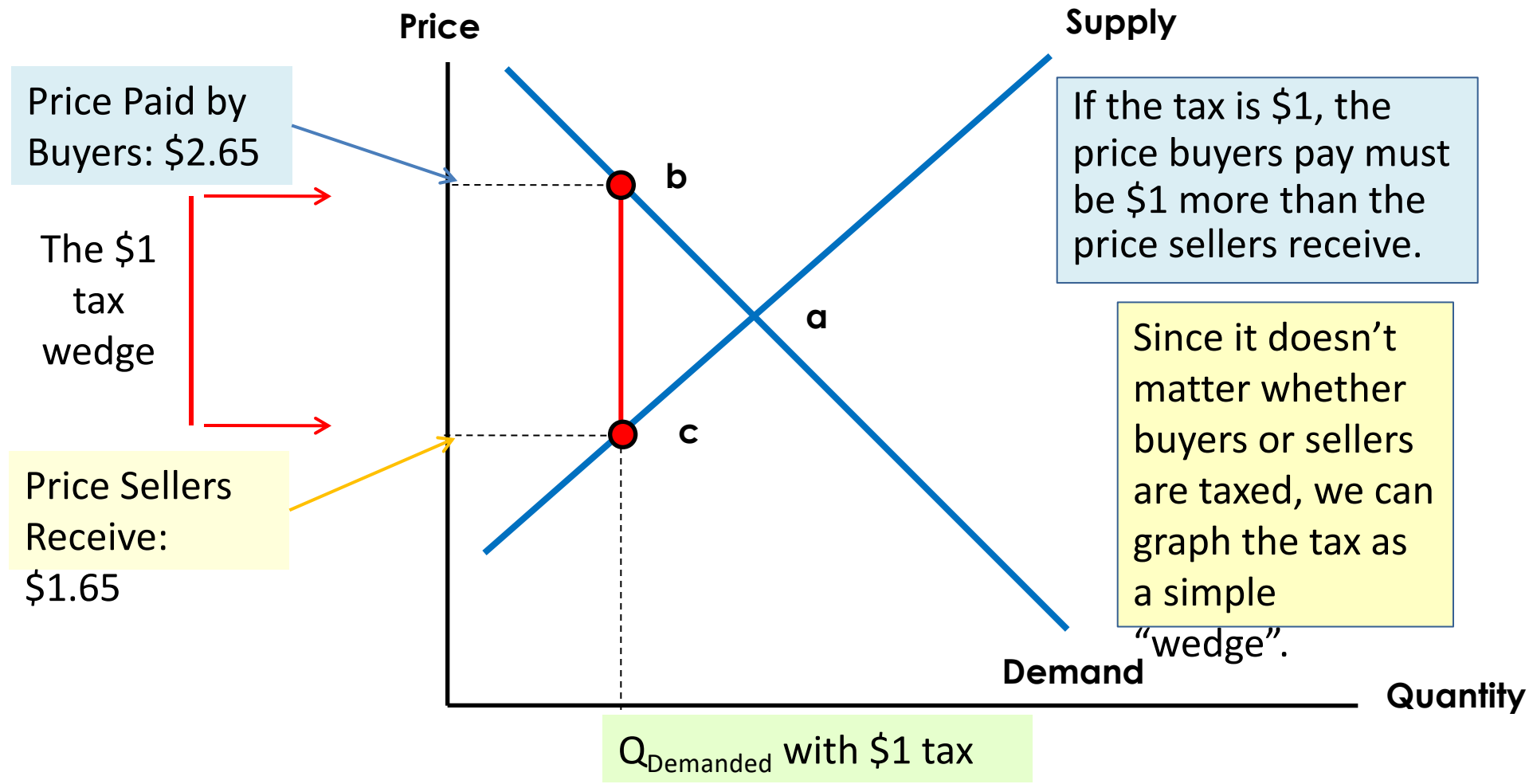
The effects on ***P*** and ***Q***, and the tax incidence are the same whether the tax is imposed on buyers or sellers!

What matters is this:

A tax drives a wedge between the price buyers pay and the price sellers receive.



VI. The Tax Wedge



If the tax is $1, the price buyers pay must be $1 more than the price sellers receive.

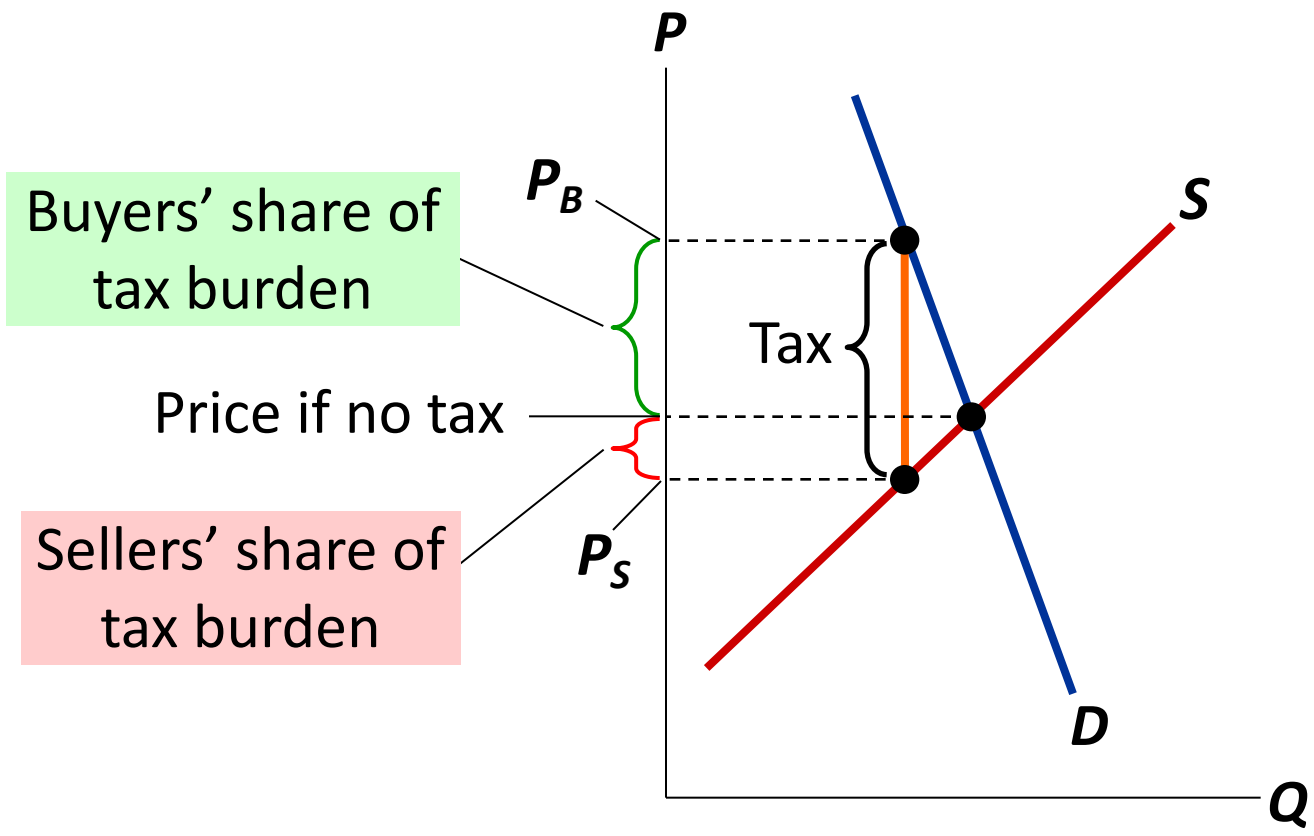
Since it doesn't matter whether buyers or sellers are taxed, we can graph the tax as a simple "wedge".

Who Pays the Tax? Depends

- Who pays the tax? It depends on the relative elasticities of supply and demand.
  - The less elastic side of the market will pay the greater share of a tax (bear more of the burden of a tax).

VII. Elasticity and Tax Incidence 1 of 2

CASE 1: Supply is more elastic than demand

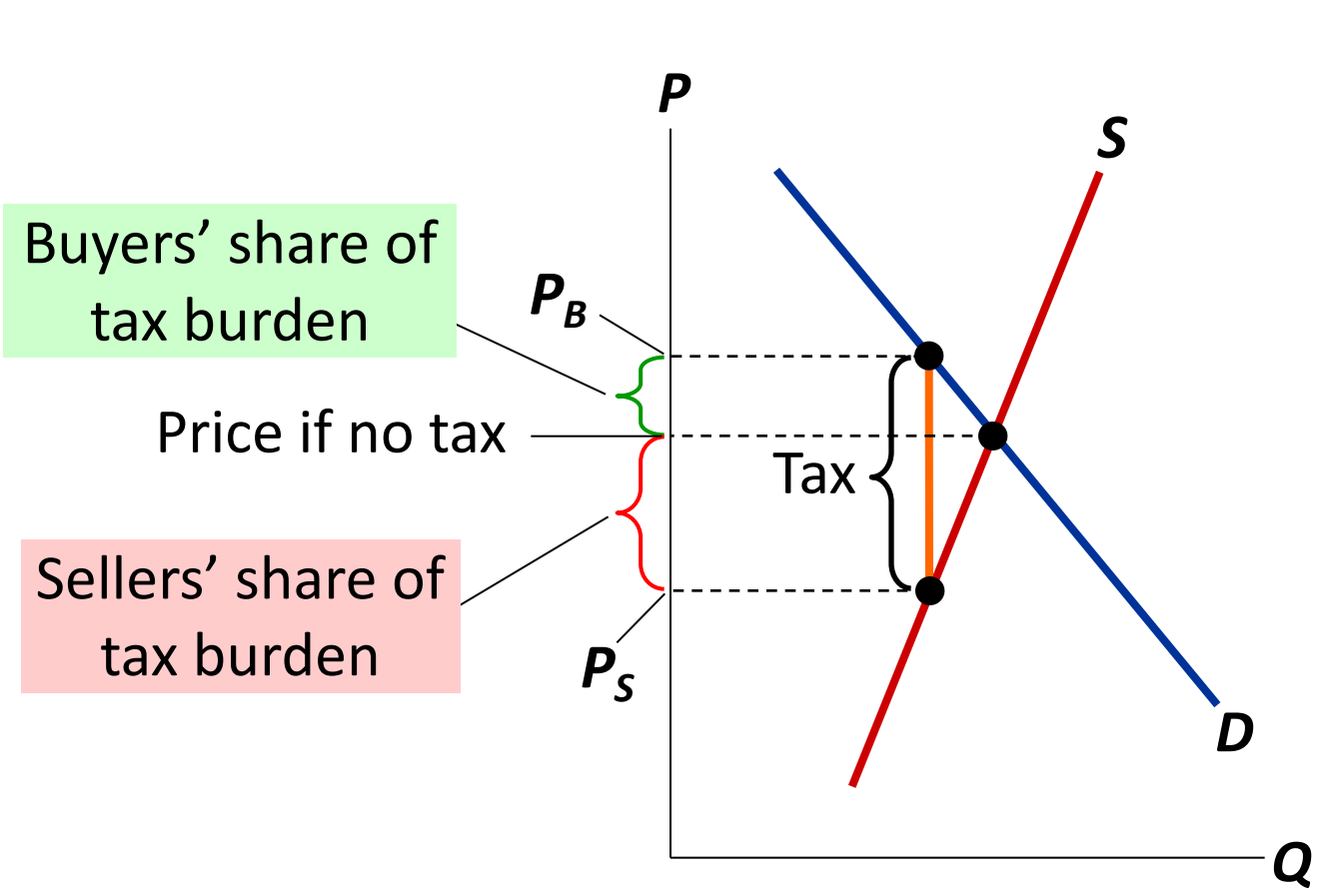


It's easier for sellers than buyers to leave the market.

So buyers bear most of the burden of the tax.

VII. Elasticity and Tax Incidence 2 of 2

CASE 2: Demand is more elastic than supply



It's easier for buyers than sellers to leave the market.

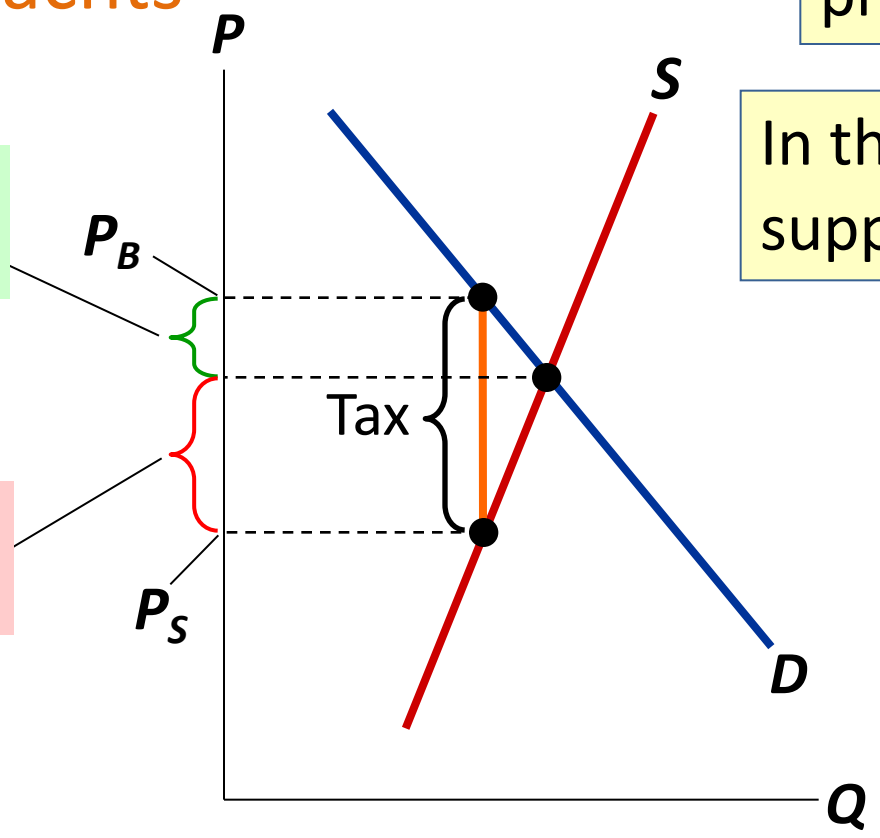
Sellers bear most of the burden of the tax.

Case Study: Who Pays the Luxury Tax? Objectives

- 1990: Congress adopted a luxury tax on yachts, private airplanes, furs, expensive cars, etc.
- Expected tax revenue? $9 billion. Reality?
- Goal: raise revenue from those who could most easily afford to pay—wealthy consumers.
- But who really pays this tax?

Case Study: Who Pays the Luxury Tax?

The Market for Yachts



Buyers' share of tax burden

Sellers' share of tax burden

Demand is price-elastic.

In the short run, supply is inelastic.

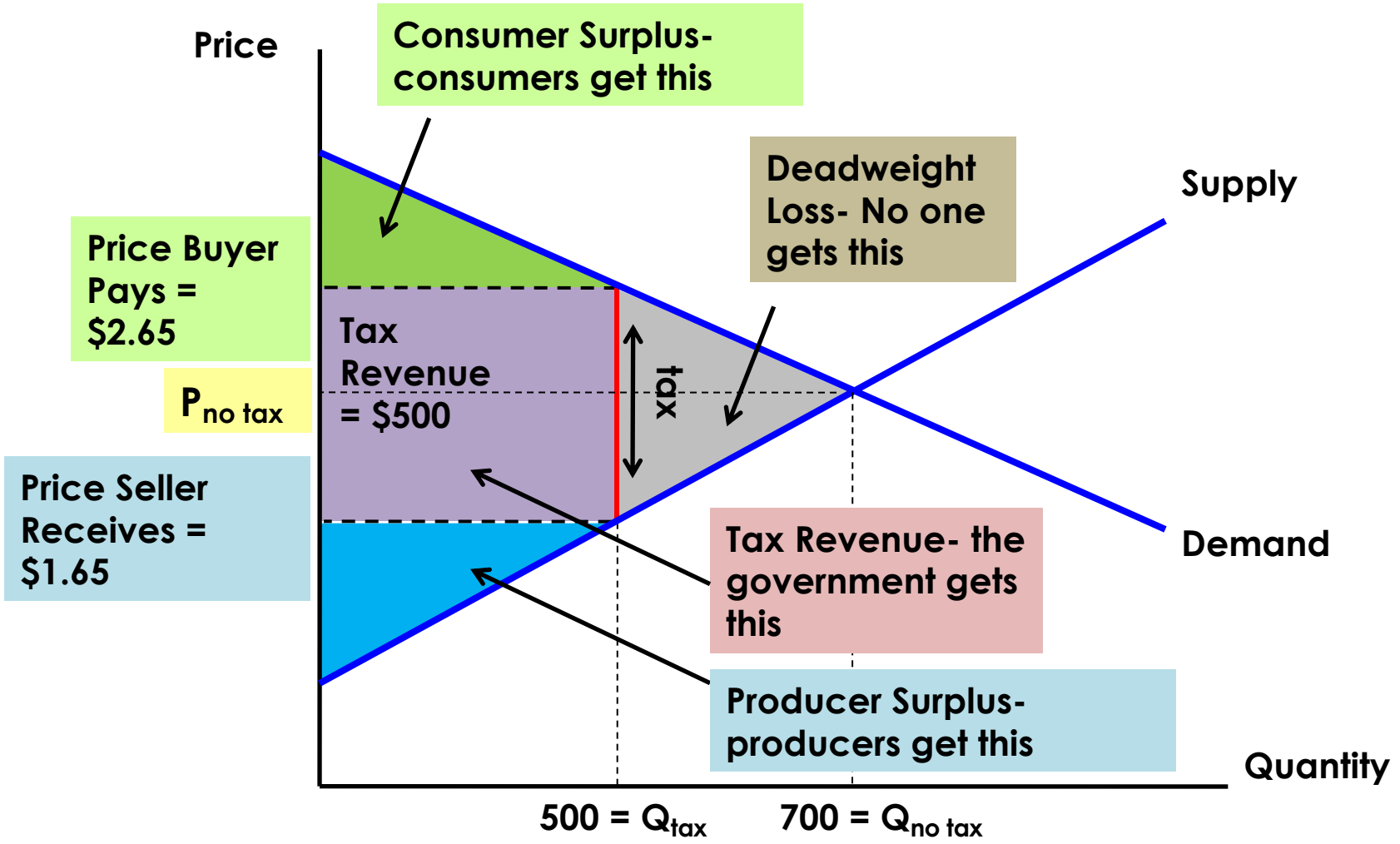
Hence, companies that build yachts pay most of the tax.

Case Study: Who Pays the Luxury Tax? Results

- The federal luxury tax was repealed in 1993.
- Sales of boats went down 52.7%.
- Net loss of 30,000 jobs.
- The federal government paid out > $7 million more in unemployment benefits to those workers than it collected in luxury tax revenues.

VIII. The Effects of a Tax

A Tax Generates Revenue and Creates a Deadweight Loss

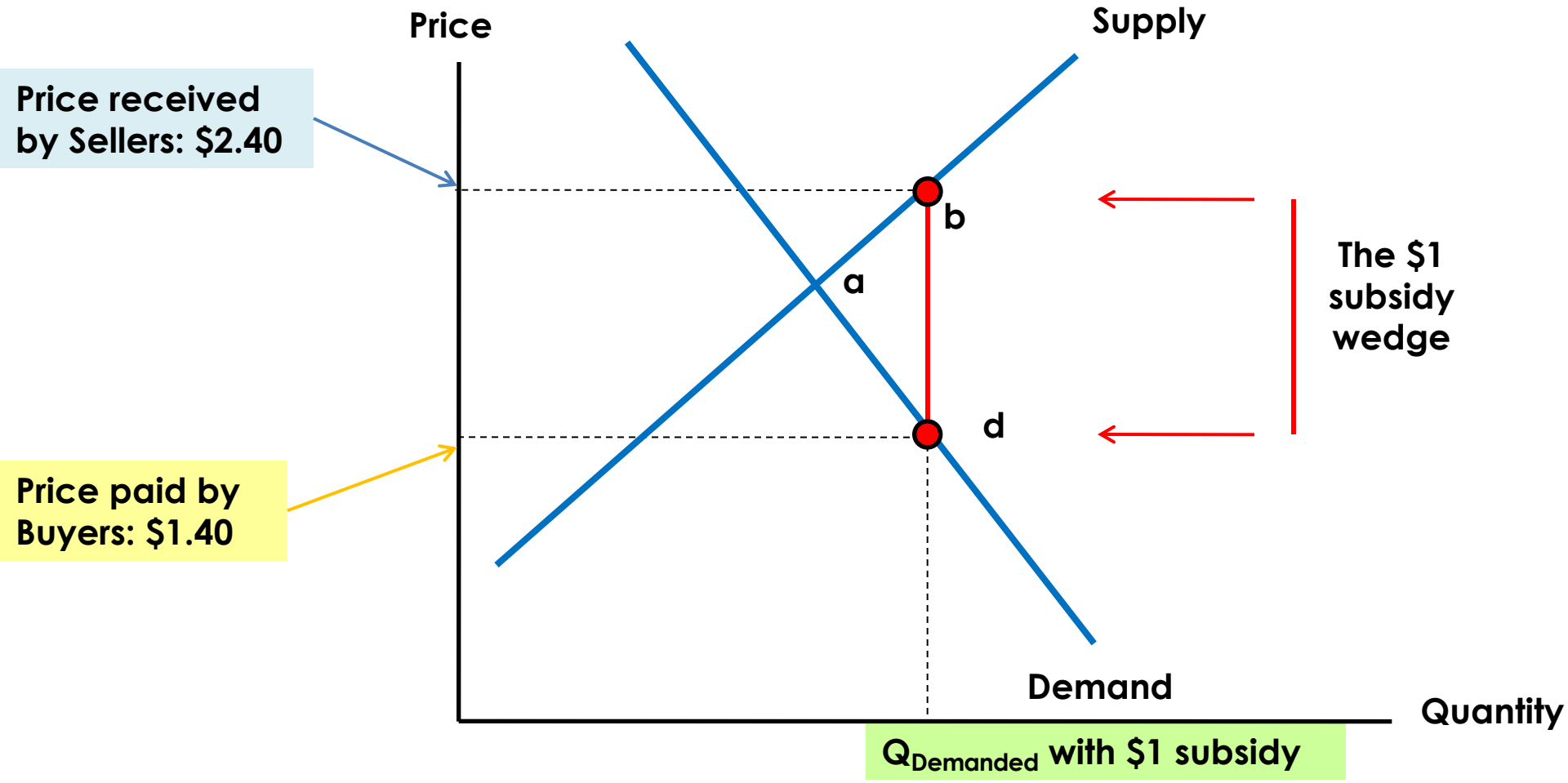


IX. Subsidies

- Def: Subsidy = is a reverse tax where the government gives money to consumers (or producers).
- Subsidy = Price Received by Sellers – Price Paid by Buyers
- Some truths about subsidies:
  1. Who gets the subsidy does not depend on who receives the check from the government
  2. Who benefits from the subsidy does depend on the relative elasticities of demand and supply;
  3. Subsidies must be paid for by taxpayers and they create inefficient increases in trade (deadweight loss).

X. The Subsidy Wedge

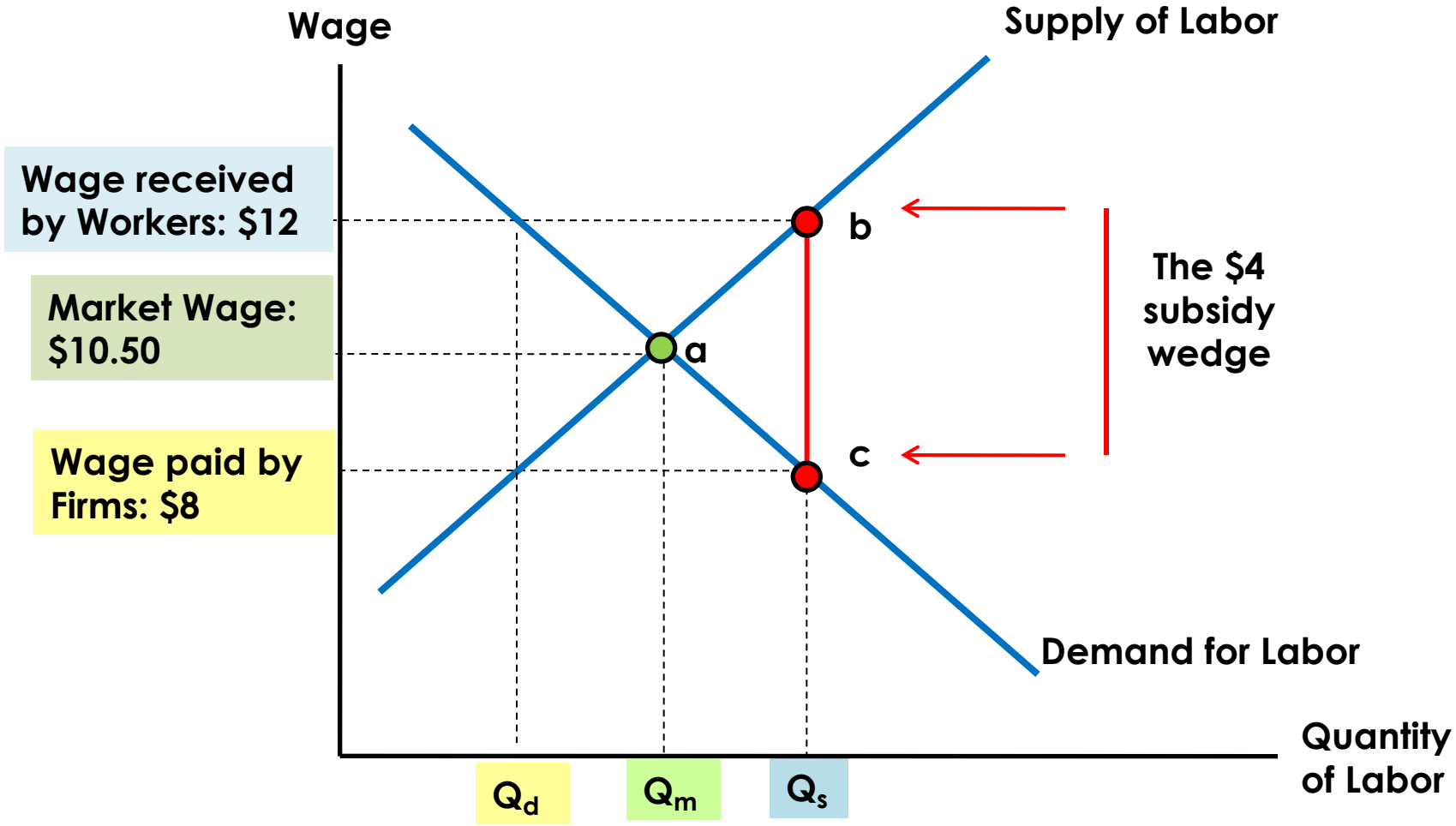
A subsidy drives a wedge between the price received by sellers and the price paid by the buyers.



*If the subsidy is $1, the price buyers pay must be $1 less than the price sellers receive.

Some Subsidies have Serious Benefits: Wage Subsidies Increase Employment

A wage subsidy costs the government money but increases employment from Q_m to Q_s (and reduces welfare payments)



Example 1

Which of the following statements are true?

I. A $0.50 tax on each fishing lure sold raises the price per lure by $0.50.

II. A tax on sellers is equivalent to a tax on buyers.

III. A tax on buyers is analyzed by shifting the demand curve up by the amount of the tax.

a) I and II

b) II and III

c) II only

d) I, II, and II

Example 2

If demand of some good is more elastic than supply and a tax is imposed on the consumption of the good, who will bear more of the burden of the tax?

a) Producers, because consumers have a greater ability to change their behavior in response to the tax.
b) Both parties will share the burden equally.
c) Consumers, because they pay the tax out of pocket.
d) The government, because the tax will cause less of the good to be produced and consumed.

Example 3

Junk food has been criticized for being unhealthy and too cheap, enticing the poor to adopt unhealthy lifestyles. Suppose that the state of Oklakansas imposes a tax on junk food. What needs to be true for the tax to actually deter most of the people from eating junk food: Should junk food demand be elastic or should it be inelastic?

a) Demand should be perfectly inelastic.
b) Demand should be elastic.

Summary

- A price ceiling is a legal maximum on the price of a good. An example is rent control. If the price ceiling is below the equilibrium price, it is binding and causes a shortage.
- A price floor is a legal minimum on the price of a good. An example is the minimum wage. If the price floor is above the equilibrium price, it is binding and causes a surplus. The labor surplus caused by the minimum wage is unemployment.

Summary

- A tax on a good places a wedge between the price buyers pay and the price sellers receive, and causes the equilibrium quantity to fall, whether the tax is imposed on buyers or sellers.
- The incidence of a tax is the division of the burden of the tax between buyers and sellers, and does not depend on whether the tax is imposed on buyers or sellers.
- The incidence of the tax depends on the price elasticities of supply and demand.