

# CHAPTER 4

## The Market Forces of Supply and Demand

PRINCIPLES OF  
**Economics**

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Premium PowerPoint Slides  
by Ron Cronovich



**In this chapter,  
look for the answers to these questions:**

- What factors affect buyers' demand for goods?
- What factors affect sellers' supply of goods?
- How do supply and demand determine the price of a good and the quantity sold?
- How do changes in the factors that affect demand or supply affect the market price and quantity of a good?
- How do markets allocate resources?

# Markets and Competition

- A **market** is a group of buyers and sellers of a particular product.
- A **competitive market** is one with many buyers and sellers, each has a negligible effect on price.
- In a **perfectly competitive** market:
  - All goods exactly the same
  - Buyers & sellers so numerous that no one can affect market price – each is a “**price taker**”
- In this chapter, we assume markets are perfectly competitive.

# Demand

- The **quantity demanded** of any good is the amount of the good that buyers are willing and able to purchase.
- **Law of demand**: the claim that the quantity demanded of a good falls when the price of the good rises, other things equal

# The Demand Schedule

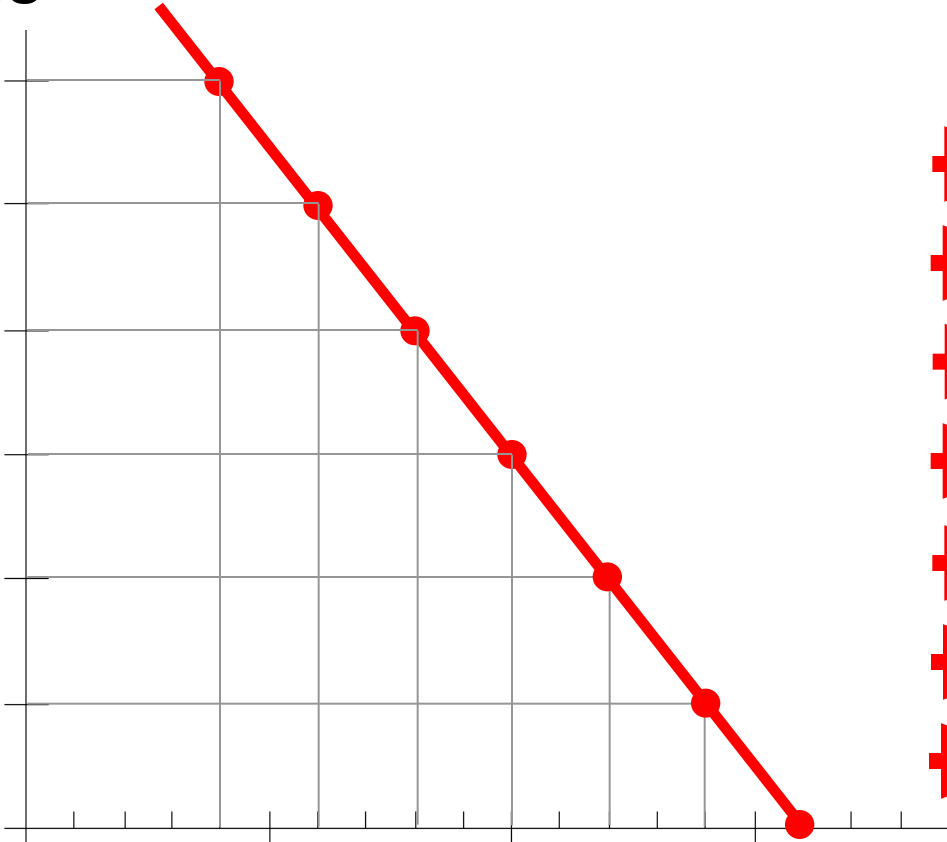
- **Demand schedule:**  
a table that shows the relationship between the price of a good and the quantity demanded
- **Example:**  
Helen's demand for lattes.
- Notice that Helen's preferences obey the Law of Demand.

Price of lattes	Quantity of lattes demanded
\$0.00	16
1.00	14
2.00	12
3.00	10
4.00	8
5.00	6
6.00	4

# Helen's Demand Schedule & Curve

**Price of Lattes**

\$6.00  
\$5.00  
\$4.00  
\$3.00  
\$2.00  
\$1.00  
\$0.00



**Quantity of Lattes**

Price of lattes

Quantity of lattes demanded

\$0.00

16

1.00

14

2.00

12

3.00

10

4.00

8

5.00

6

6.00

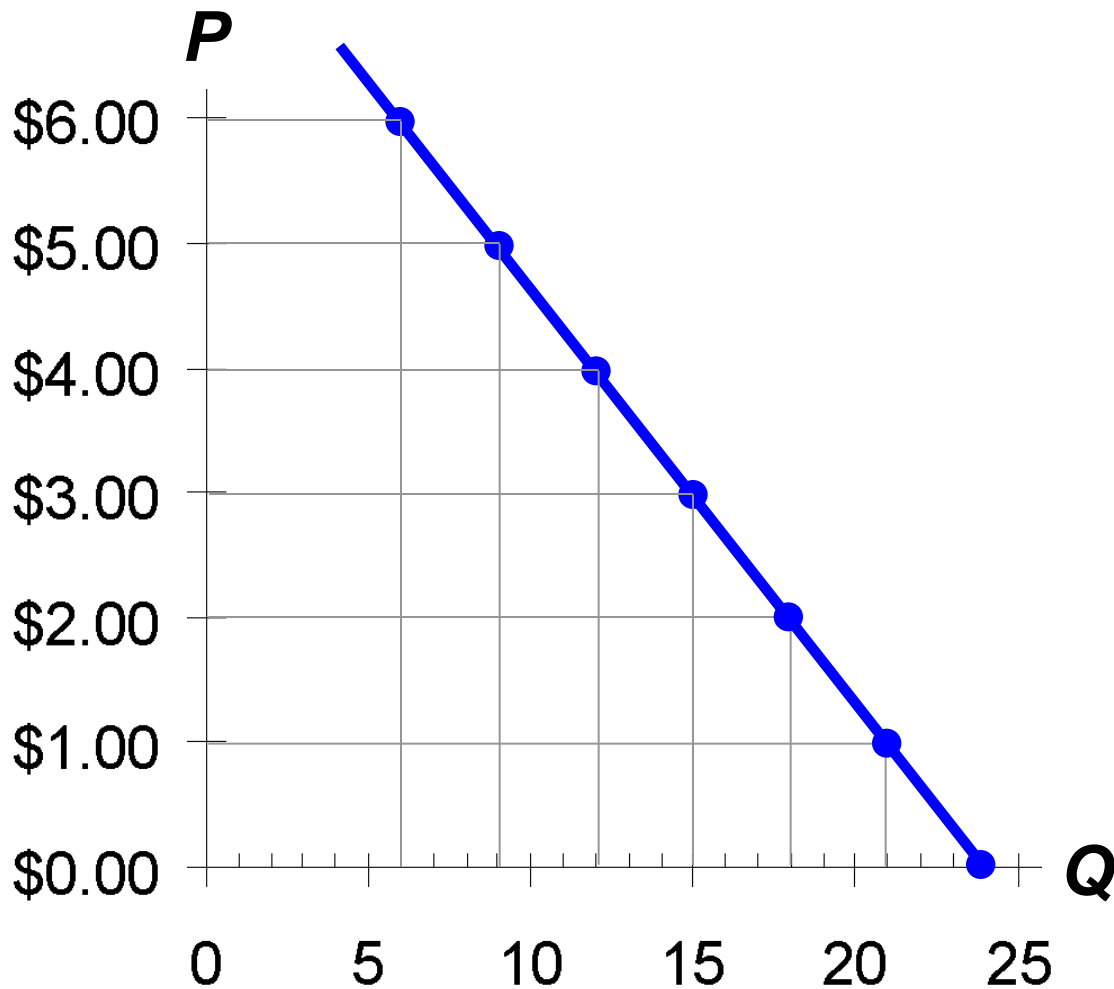
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# Market Demand versus Individual Demand

- The quantity demanded in the market is the sum of the quantities demanded by all buyers at each price.
- Suppose Helen and Ken are the only two buyers in the Latte market. ( $Q^d$  = quantity demanded)

Price	Helen's $Q^d$		Ken's $Q^d$		Market $Q^d$
\$0.00	16	+	8	=	24
1.00	14	+	7	=	21
2.00	12	+	6	=	18
3.00	10	+	5	=	15
4.00	8	+	4	=	12
5.00	6	+	3	=	9
6.00	4	+	2	=	6

# The Market Demand Curve for Lattes



$P$	$Q^d$ (Market)
\$0.00	24
1.00	21
2.00	18
3.00	15
4.00	12
5.00	9
6.00	6



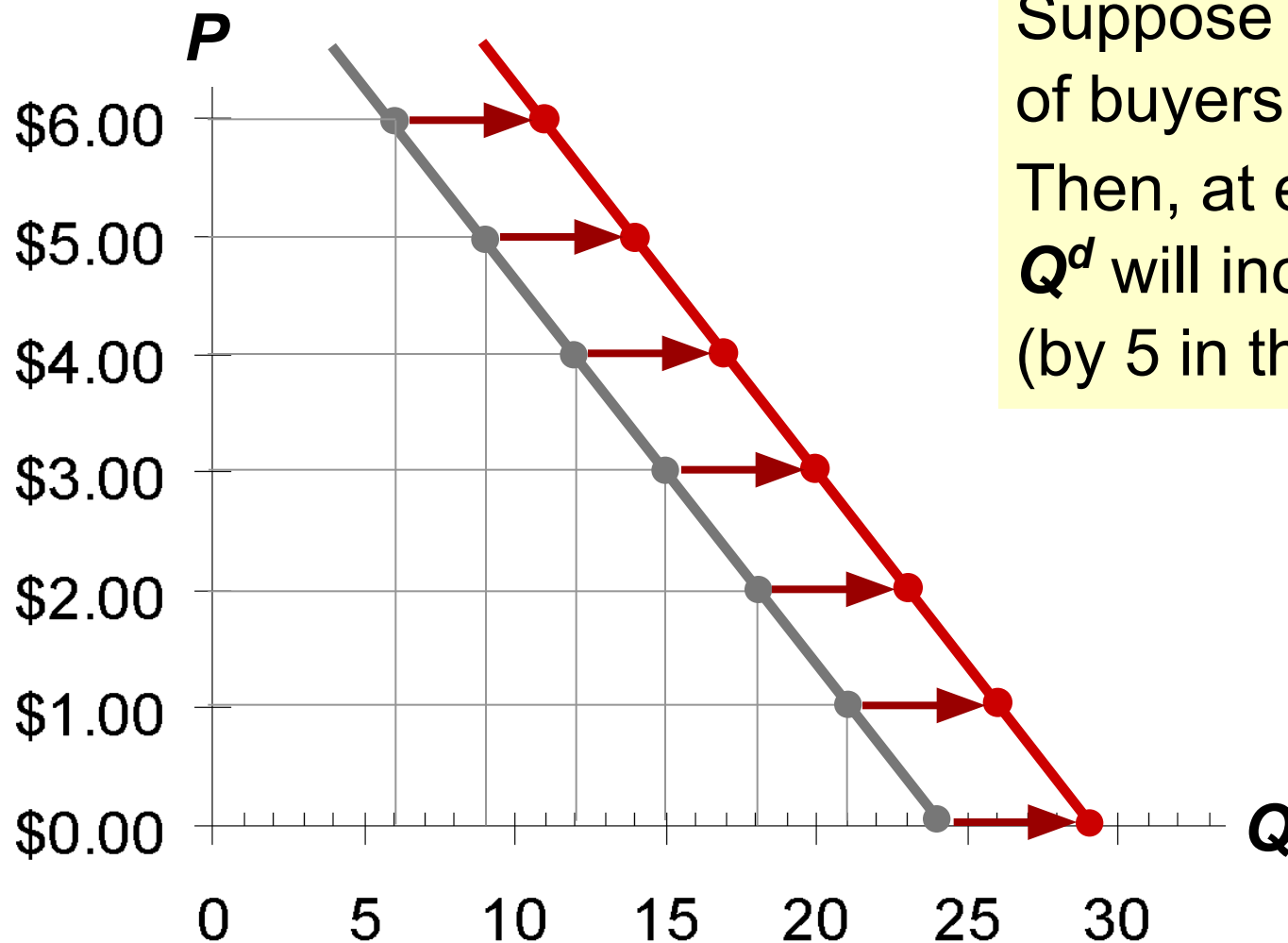
# Demand Curve Shifters

- The demand curve shows how price affects quantity demanded, *other things being equal*.
- These “other things” are non-price determinants of demand (*i.e.*, things that determine buyers’ demand for a good, other than the good’s price).
- Changes in them shift the ***D*** curve...

# Demand Curve Shifters: # of Buyers

- Increase in # of buyers  
increases quantity demanded at each price,  
shifts **D** curve to the right.

# Demand Curve Shifters: # of Buyers



Suppose the number of buyers increases. Then, at each  $P$ ,  $Q^d$  will increase (by 5 in this example).

# Demand Curve Shifters: **Income**

- Demand for a **normal good** is positively related to income.
  - Increase in income causes increase in quantity demanded at each price, shifts ***D*** curve to the right.

(Demand for an **inferior good** is negatively related to income. An increase in income shifts ***D*** curves for inferior goods to the left.)

# Demand Curve Shifters: Prices of Related Goods

- Two goods are **substitutes** if an increase in the price of one causes an increase in demand for the other.
- Example: pizza and hamburgers. An increase in the price of pizza increases demand for hamburgers, shifting hamburger demand curve to the right.
- Other examples: Coke and Pepsi, laptops and desktop computers, CDs and music downloads

# Demand Curve Shifters: Prices of Related Goods

- Two goods are **complements** if an increase in the price of one causes a fall in demand for the other.
- Example: computers and software.  
If price of computers rises, people buy fewer computers, and therefore less software.  
Software demand curve shifts left.
- Other examples: college tuition and textbooks, bagels and cream cheese, eggs and bacon

# Demand Curve Shifters: Tastes

- Anything that causes a shift in tastes *toward* a good will increase demand for that good and shift its **D** curve to the right.
- Example:  
The Atkins diet became popular in the '90s, caused an increase in demand for eggs, shifted the egg demand curve to the right.

# Demand Curve Shifters: Expectations

- Expectations affect consumers' buying decisions.
- Examples:
  - If people expect their incomes to rise, their demand for meals at expensive restaurants may increase now.
  - If the economy sours and people worry about their future job security, demand for new autos may fall now.



# Summary: Variables That Influence Buyers

## Variable A change in this variable...

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Price ...causes a movement  
along the **D** curve

# of buyers ...shifts the **D** curve

Income ...shifts the **D** curve

Price of  
related goods ...shifts the **D** curve

Tastes ...shifts the **D** curve

Expectations ...shifts the **D** curve

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# ACTIVE LEARNING 1

## Demand Curve

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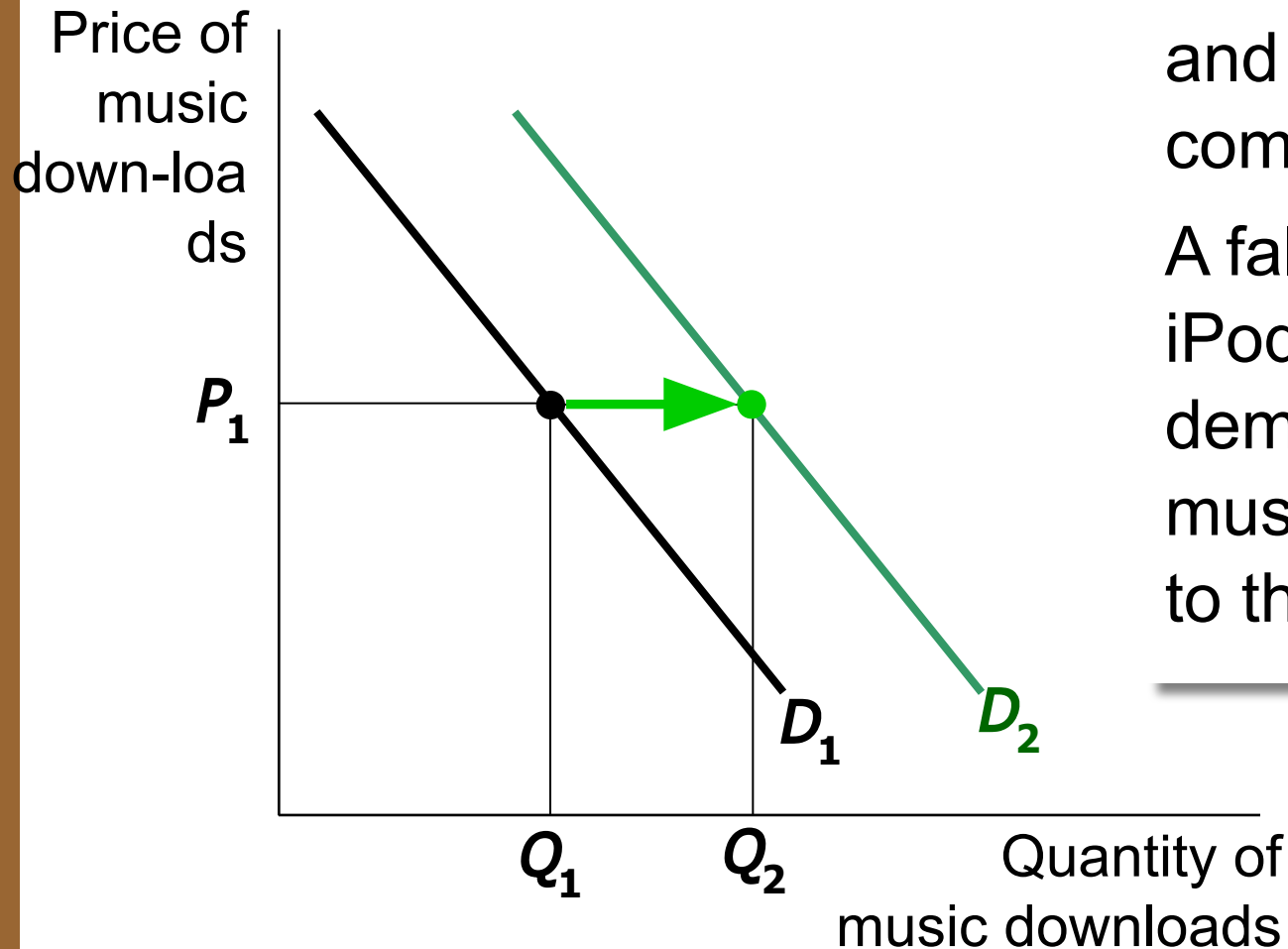
Draw a demand curve for music downloads.  
What happens to it in each of  
the following scenarios? Why?

- A.** The price of iPods falls
- B.** The price of music downloads falls
- C.** The price of CDs falls



# ACTIVE LEARNING 1

## A. Price of iPods falls

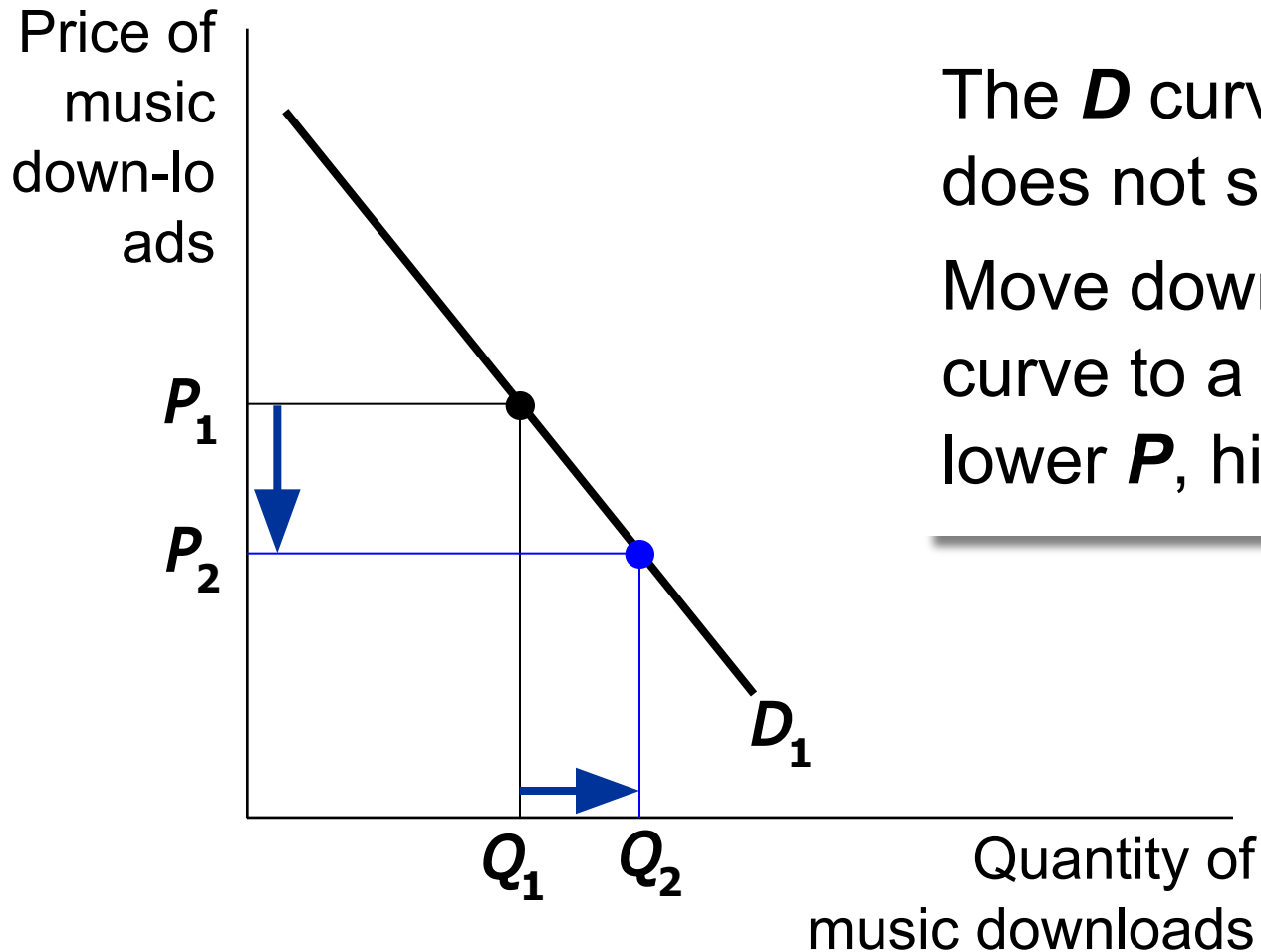


Music downloads and iPods are complements.

A fall in price of iPods shifts the demand curve for music downloads to the right.

# ACTIVE LEARNING 1

## B. Price of music downloads falls

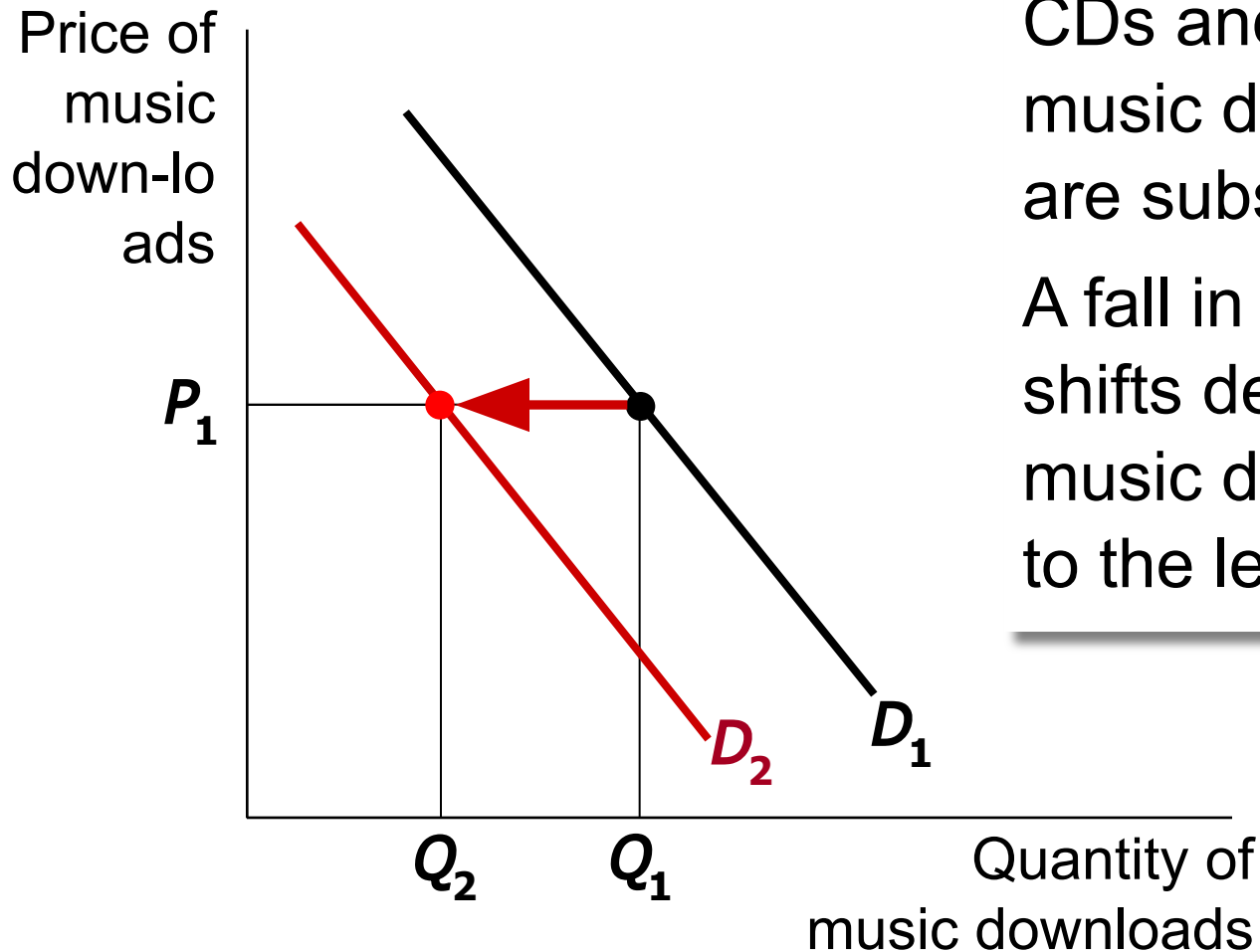


The  $D$  curve does not shift.

Move down along curve to a point with lower  $P$ , higher  $Q$ .

# ACTIVE LEARNING 1

## C. Price of CDs falls



CDs and music downloads are substitutes.

A fall in price of CDs shifts demand for music downloads to the left.

# Supply

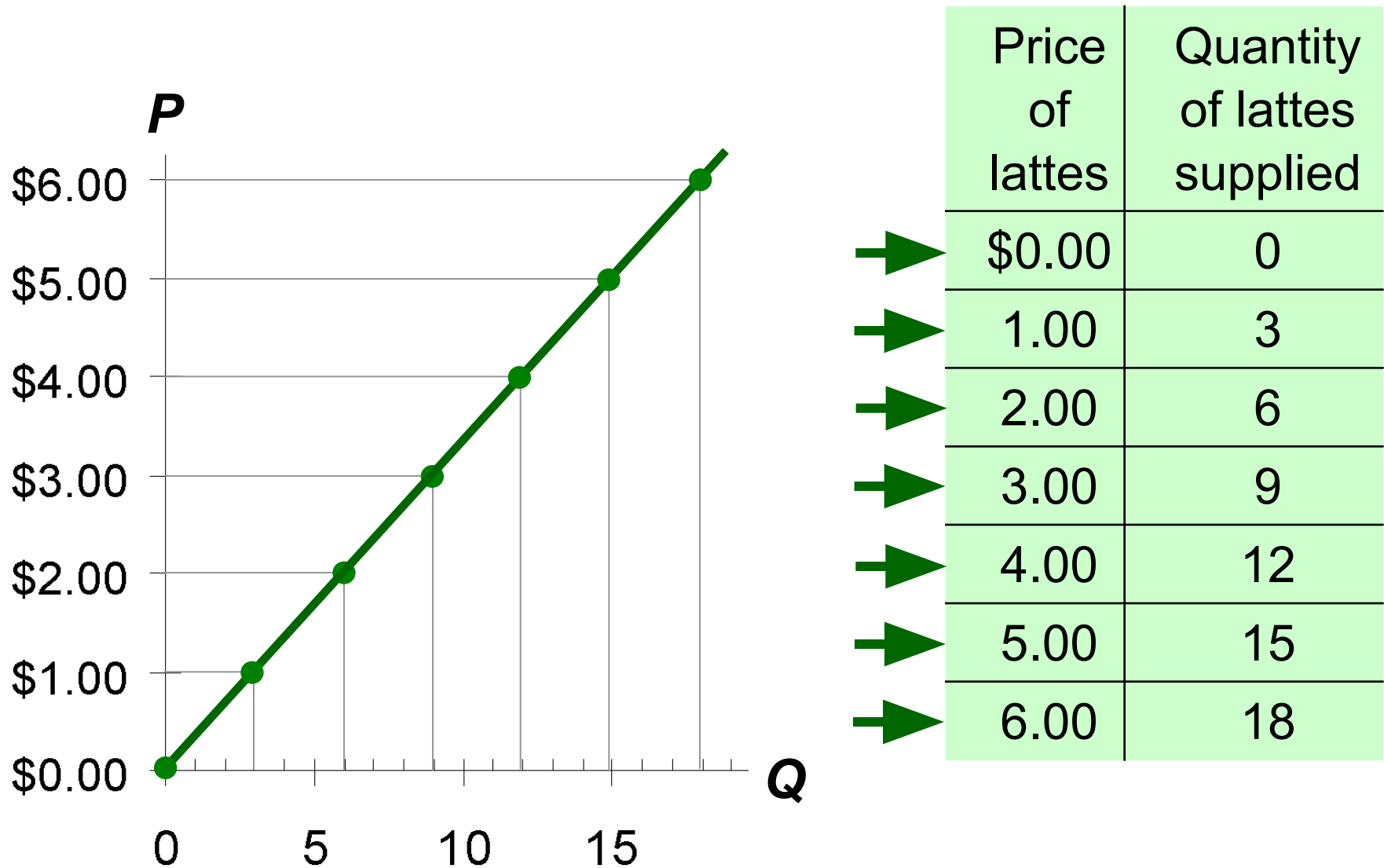
- The **quantity supplied** of any good is the amount that sellers are willing and able to sell.
- **Law of supply**: the claim that the quantity supplied of a good rises when the price of the good rises, other things equal

# The Supply Schedule

- **Supply schedule:**  
A table that shows the relationship between the price of a good and the quantity supplied.
- Example:  
Starbucks' supply of lattes.
- Notice that Starbucks' supply schedule obeys the Law of Supply.

Price of lattes	Quantity of lattes supplied
\$0.00	0
1.00	3
2.00	6
3.00	9
4.00	12
5.00	15
6.00	18

# Starbucks' Supply Schedule & Curve



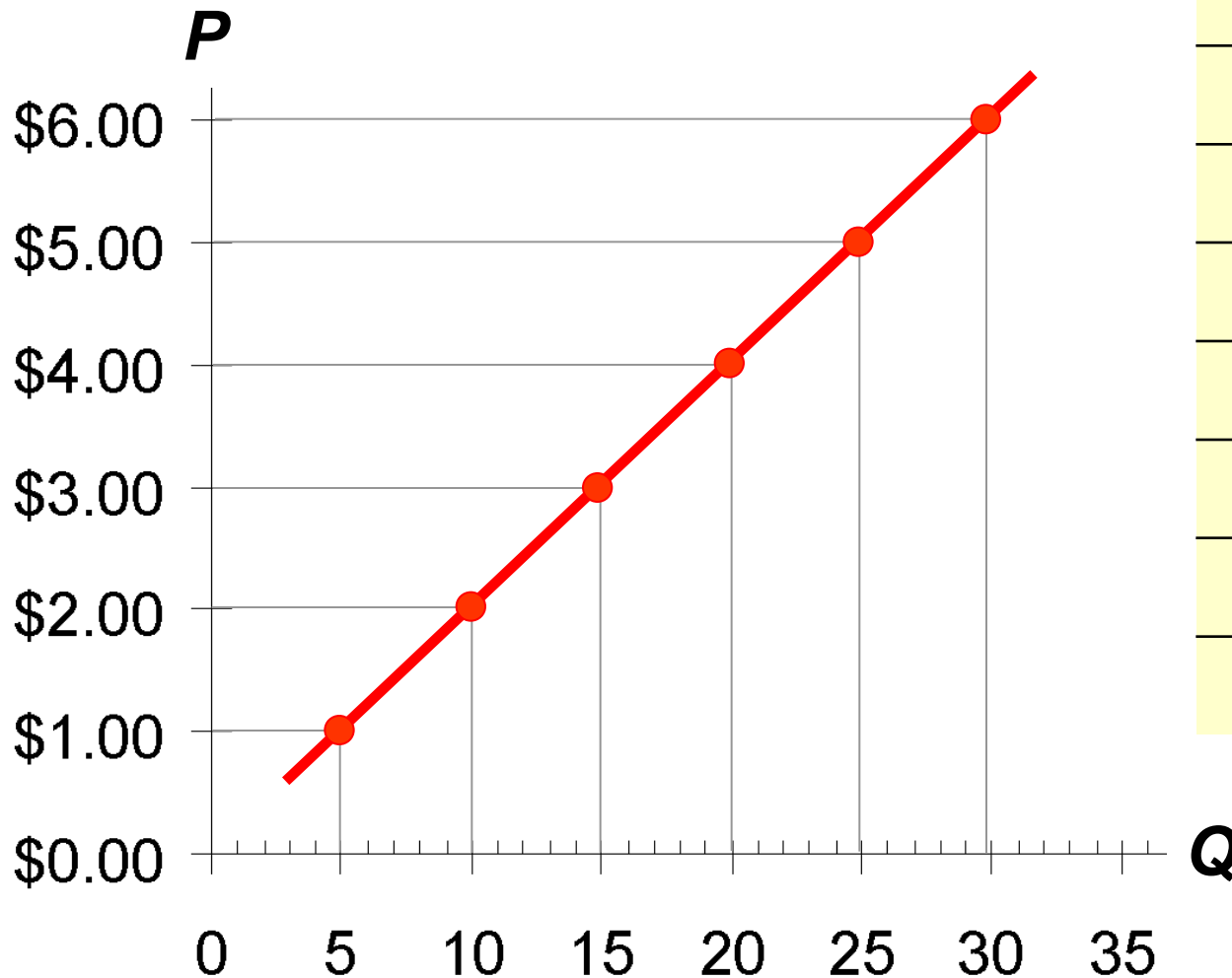


# Market Supply versus Individual Supply

- The quantity supplied in the market is the sum of the quantities supplied by all sellers at each price.
- Suppose Starbucks and Jitters are the only two sellers in this market. ( $Q^s$  = quantity supplied)

Price	Starbucks		Jitters		Market $Q^s$
\$0.00	0	+	0	=	0
1.00	3	+	2	=	5
2.00	6	+	4	=	10
3.00	9	+	6	=	15
4.00	12	+	8	=	20
5.00	15	+	10	=	25
6.00	18	+	12	=	30

# The Market Supply Curve



$P$	$Q^s$ (Market)
\$0.00	0
1.00	5
2.00	10
3.00	15
4.00	20
5.00	25
6.00	30

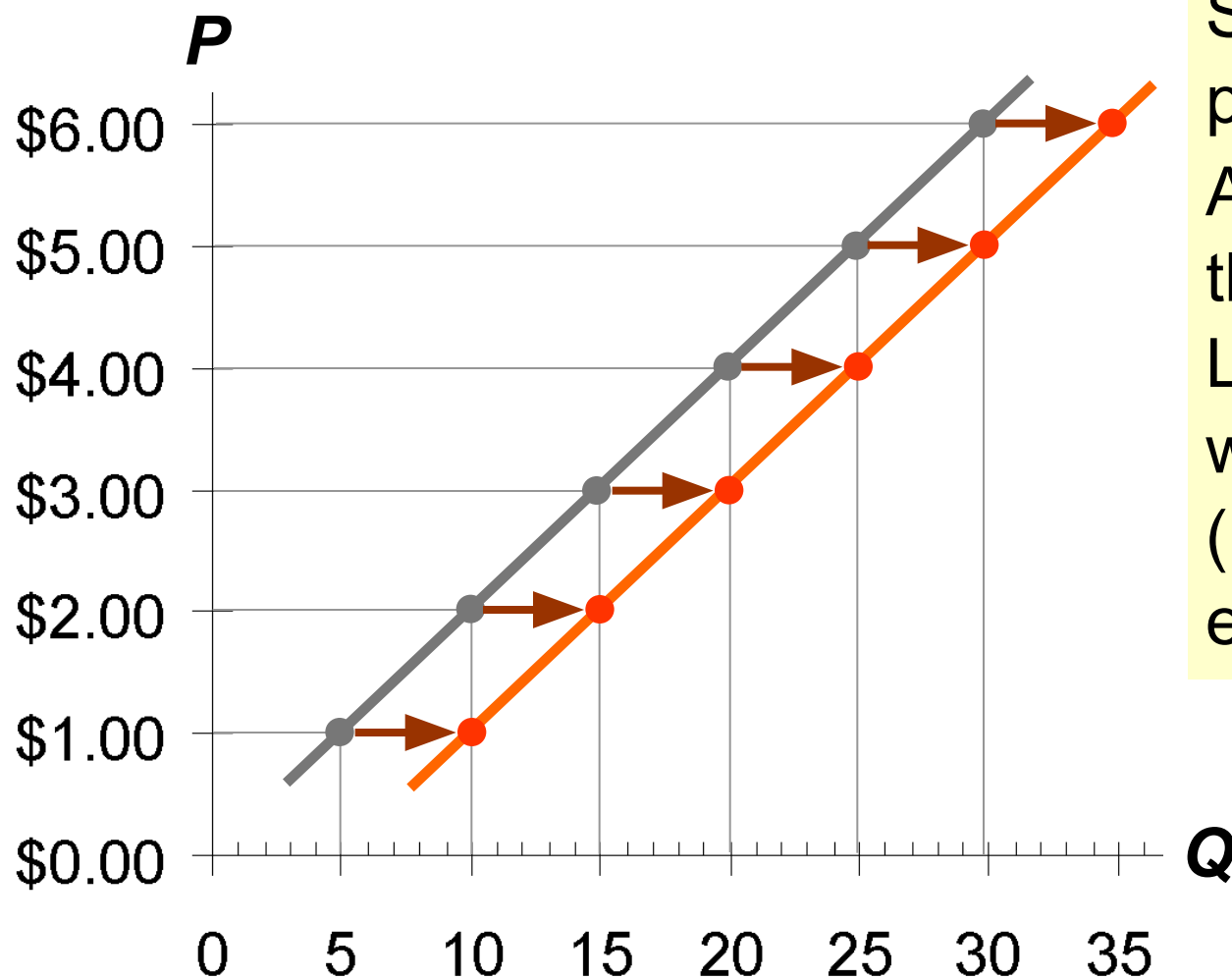
# Supply Curve Shifters

- The supply curve shows how price affects quantity supplied, *other things being equal*.
- These “other things” are non-price determinants of supply.
- Changes in them shift the **S** curve...

# Supply Curve Shifters: Input Prices

- Examples of input prices:  
wages, prices of raw materials.
- A fall in input prices makes production more profitable at each output price, so firms supply a larger quantity at each price, and the **S** curve shifts to the right.

# Supply Curve Shifters: Input Prices



Suppose the price of milk falls. At each price, the quantity of Lattes supplied will increase (by 5 in this example).

# Supply Curve Shifters: Technology

- Technology determines how much inputs are required to produce a unit of output.
- A cost-saving technological improvement has the same effect as a fall in input prices, shifts **S** curve to the right.

# Supply Curve Shifters: # of Sellers

- An increase in the number of sellers increases the quantity supplied at each price, shifts **S** curve to the right.

# Supply Curve Shifters: Expectations

Example:

- Events in the Middle East lead to expectations of higher oil prices.
- In response, owners of Texas oilfields reduce supply now, save some inventory to sell later at the higher price.
- **S** curve shifts left.

In general, sellers may adjust supply\* when their expectations of future prices change.

*(\* If good not perishable)*



# Summary: Variables that Influence Sellers

## Variable A change in this variable...

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Price ...causes a movement  
along the **S** curve

Input Prices...shifts the **S** curve

Technology ...shifts the **S** curve

# of Sellers ...shifts the **S** curve

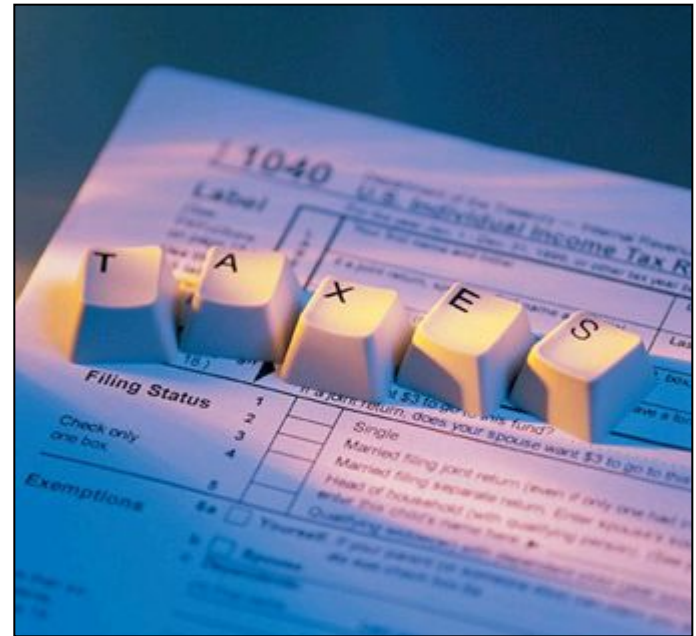
Expectations ...shifts the **S** curve

## ACTIVE LEARNING 2

# Supply Curve

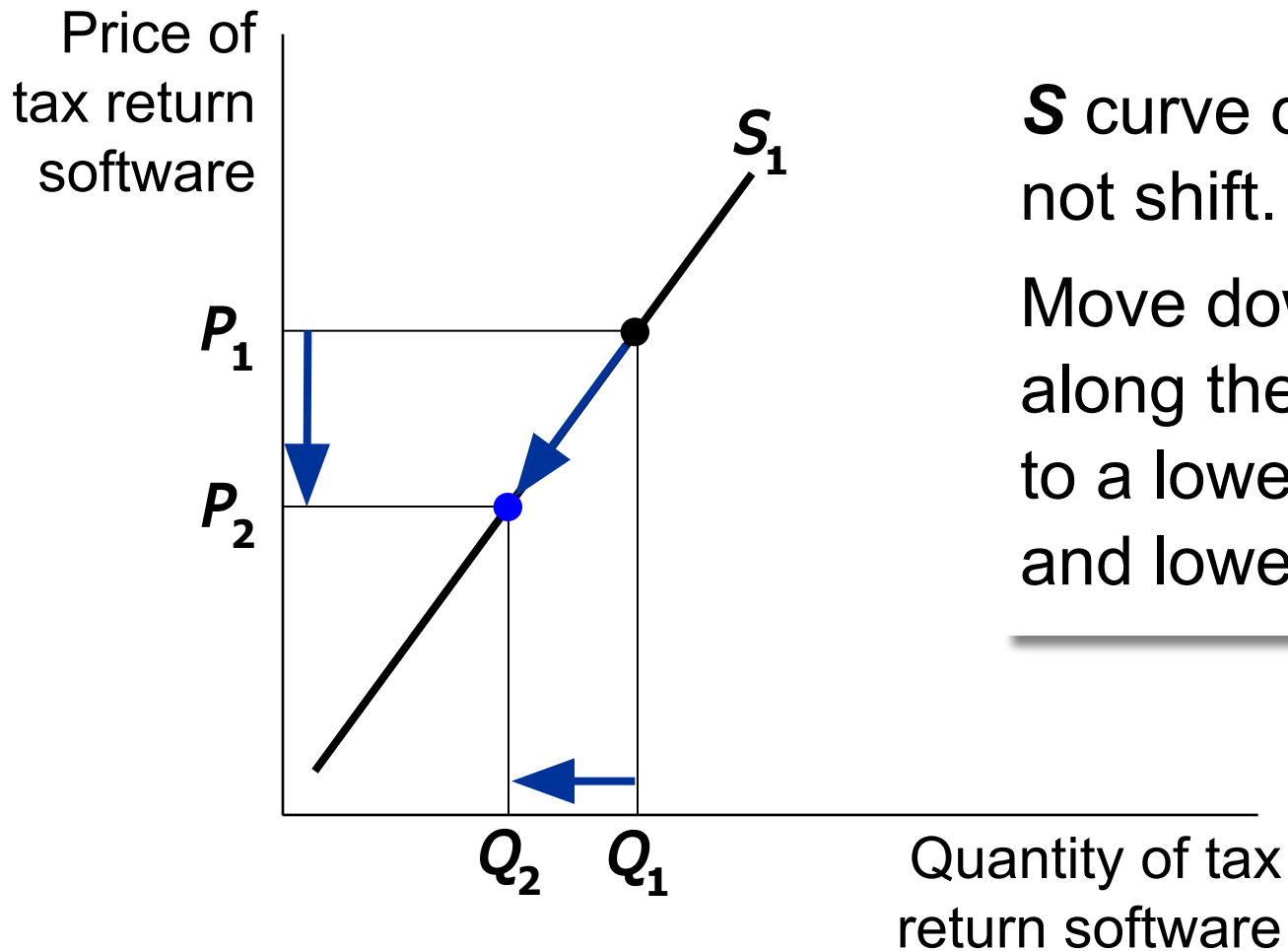
Draw a supply curve for tax return preparation software. What happens to it in each of the following scenarios?

- A.** Retailers cut the price of the software.
- B.** A technological advance allows the software to be produced at lower cost.
- C.** Professional tax return preparers raise the price of the services they provide.



## ACTIVE LEARNING 2

### A. Fall in price of tax return software

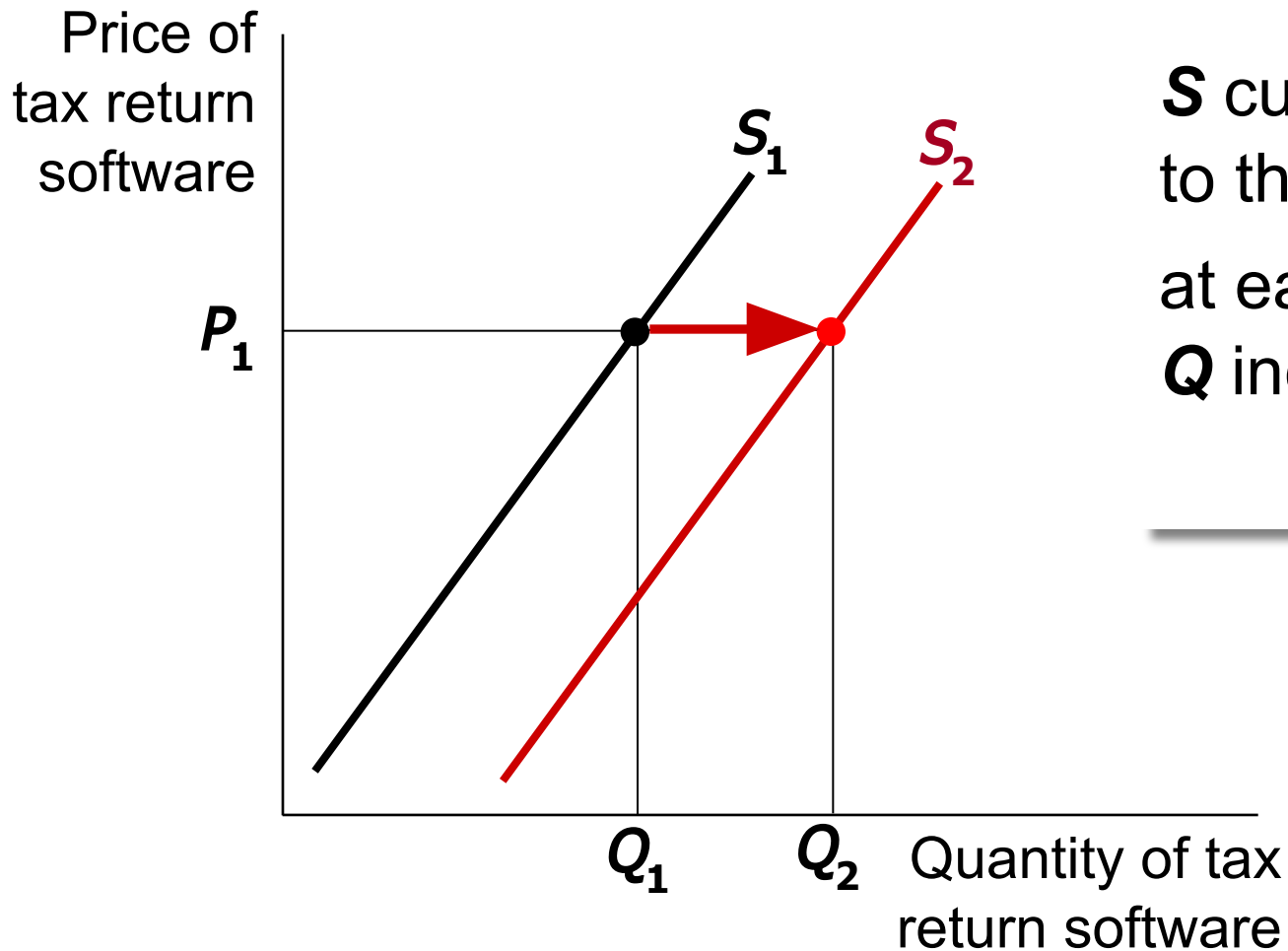


**S** curve does not shift.

Move down along the curve to a lower **P** and lower **Q**.

## ACTIVE LEARNING 2

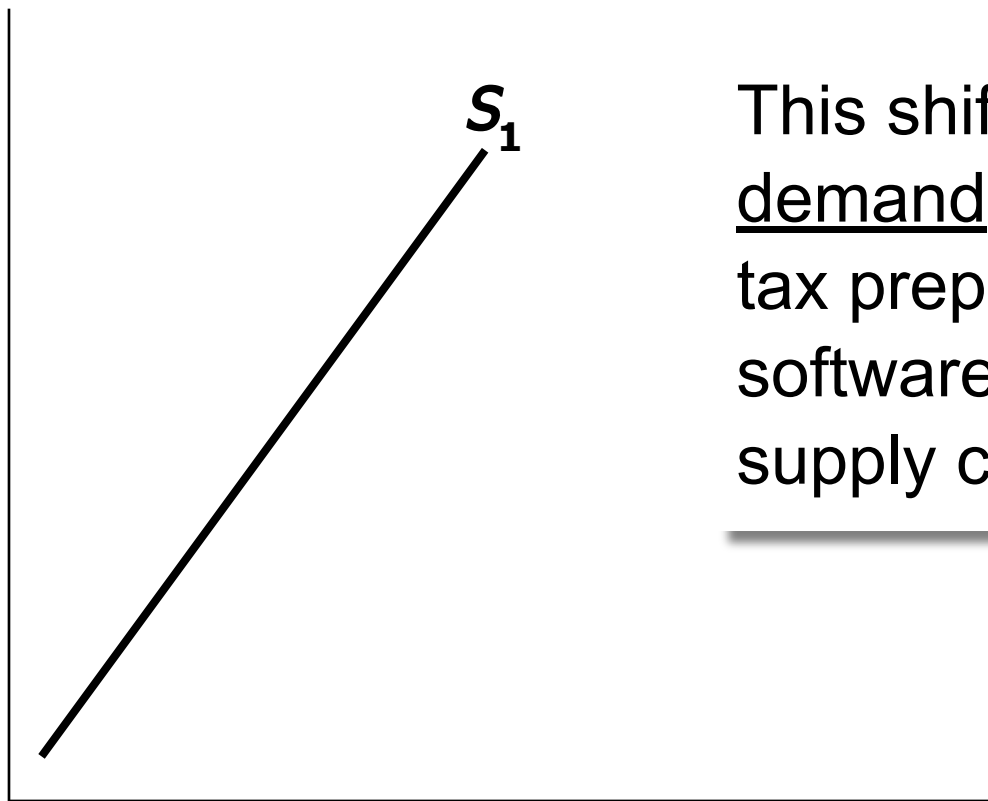
### B. Fall in cost of producing the software



## ACTIVE LEARNING 3

### C. Professional preparers raise their price

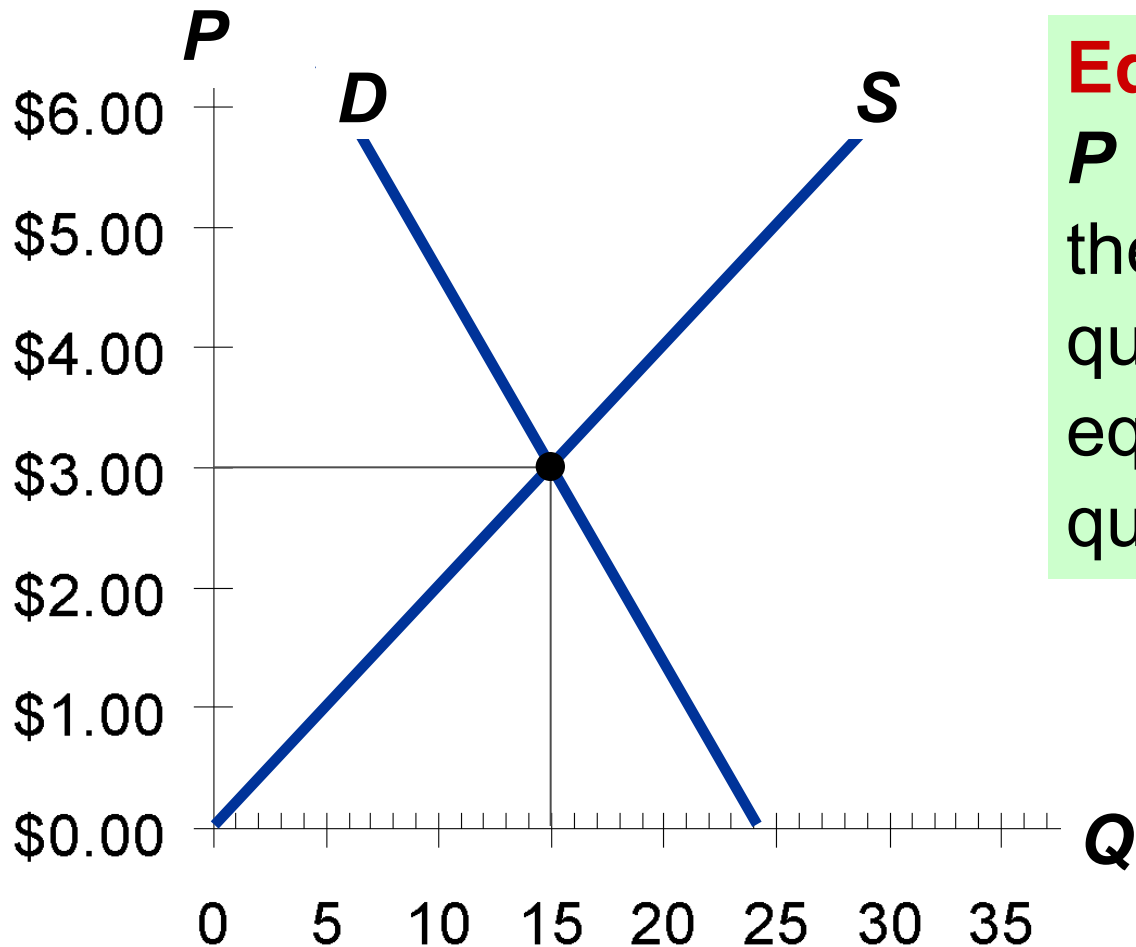
Price of  
tax return  
software



This shifts the demand curve for tax preparation software, not the supply curve.

Quantity of tax  
return software

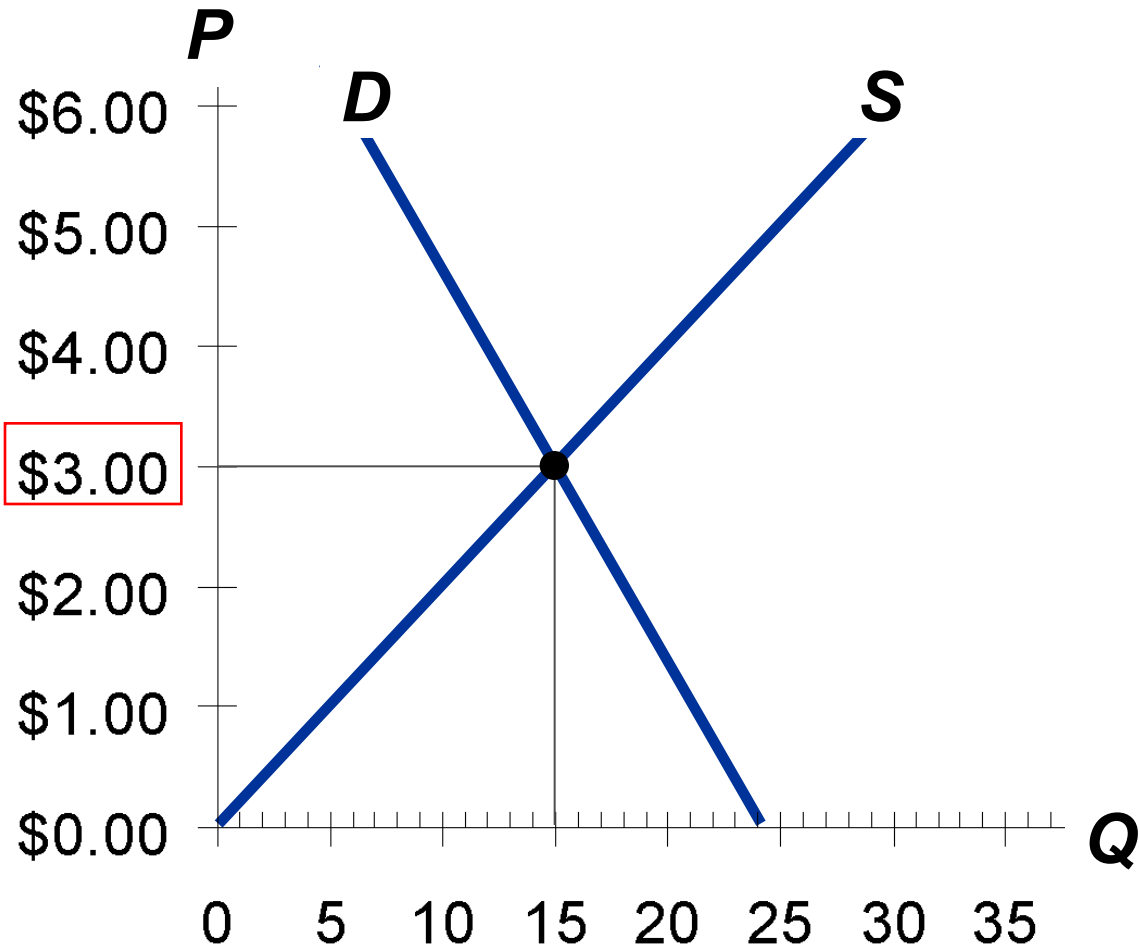
# Supply and Demand Together



**Equilibrium:**  
 $P$  has reached  
the level where  
quantity supplied  
equals  
quantity demanded

# Equilibrium price:

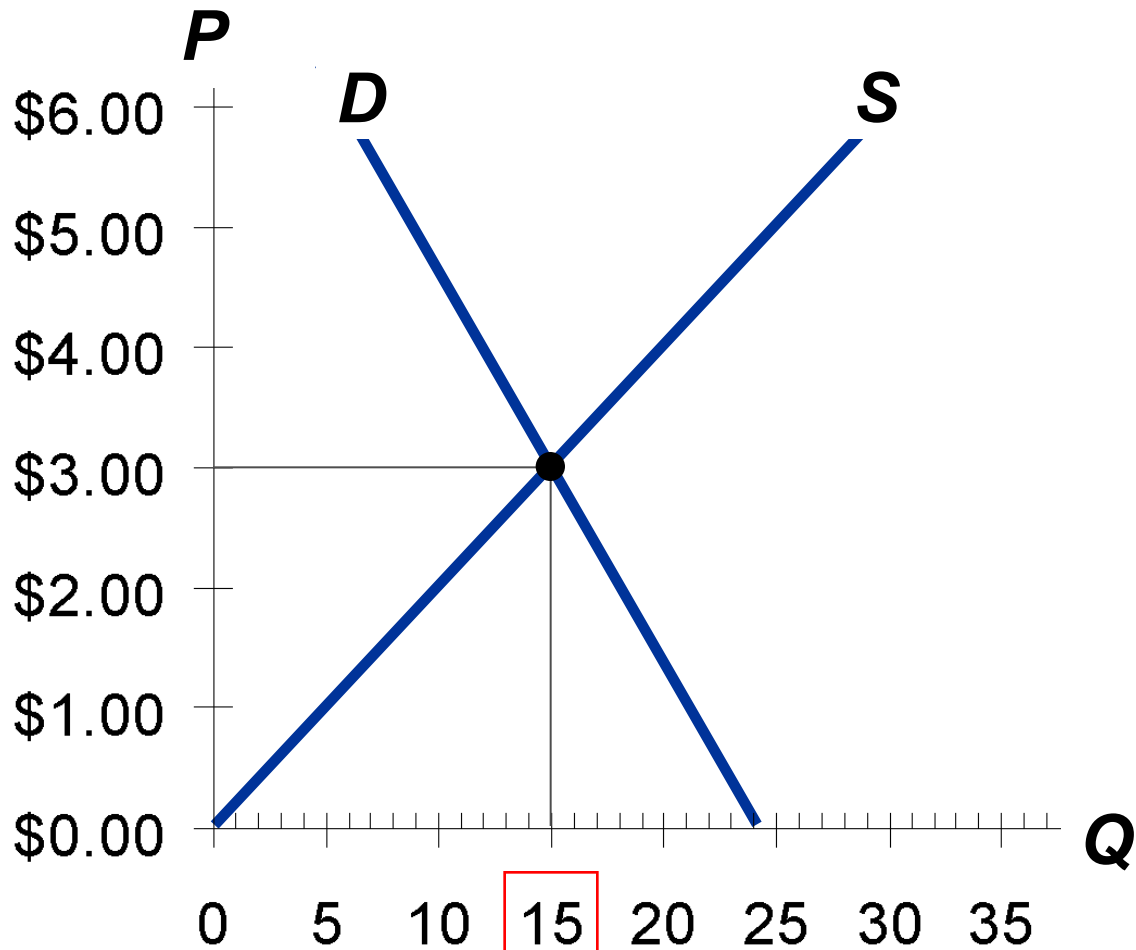
the price that equates quantity supplied with quantity demanded



$P$	$Q^D$	$Q^S$
\$0	24	0
1	21	5
2	18	10
3	15	15
4	12	20
5	9	25
6	6	30

# Equilibrium quantity:

the quantity supplied and quantity demanded at the equilibrium price

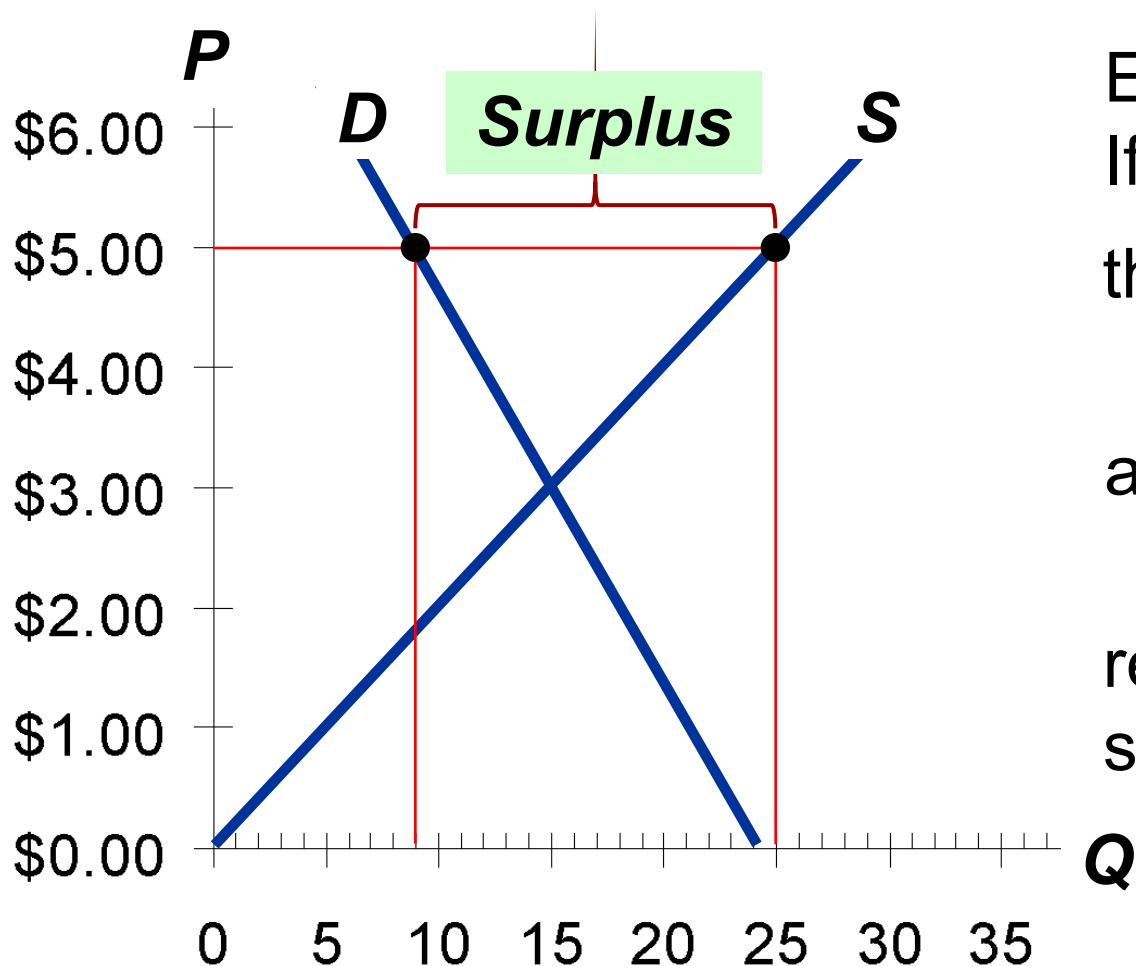


$P$	$Q^D$	$Q^S$
\$0	24	0
1	21	5
2	18	10
3	15	15
4	12	20
5	9	25
6	6	30



## Surplus (a.k.a. excess supply):

when quantity supplied is greater than quantity demanded



Example:

If  $P = \$5$ ,

then

$$Q^D = 9 \text{ lattes}$$

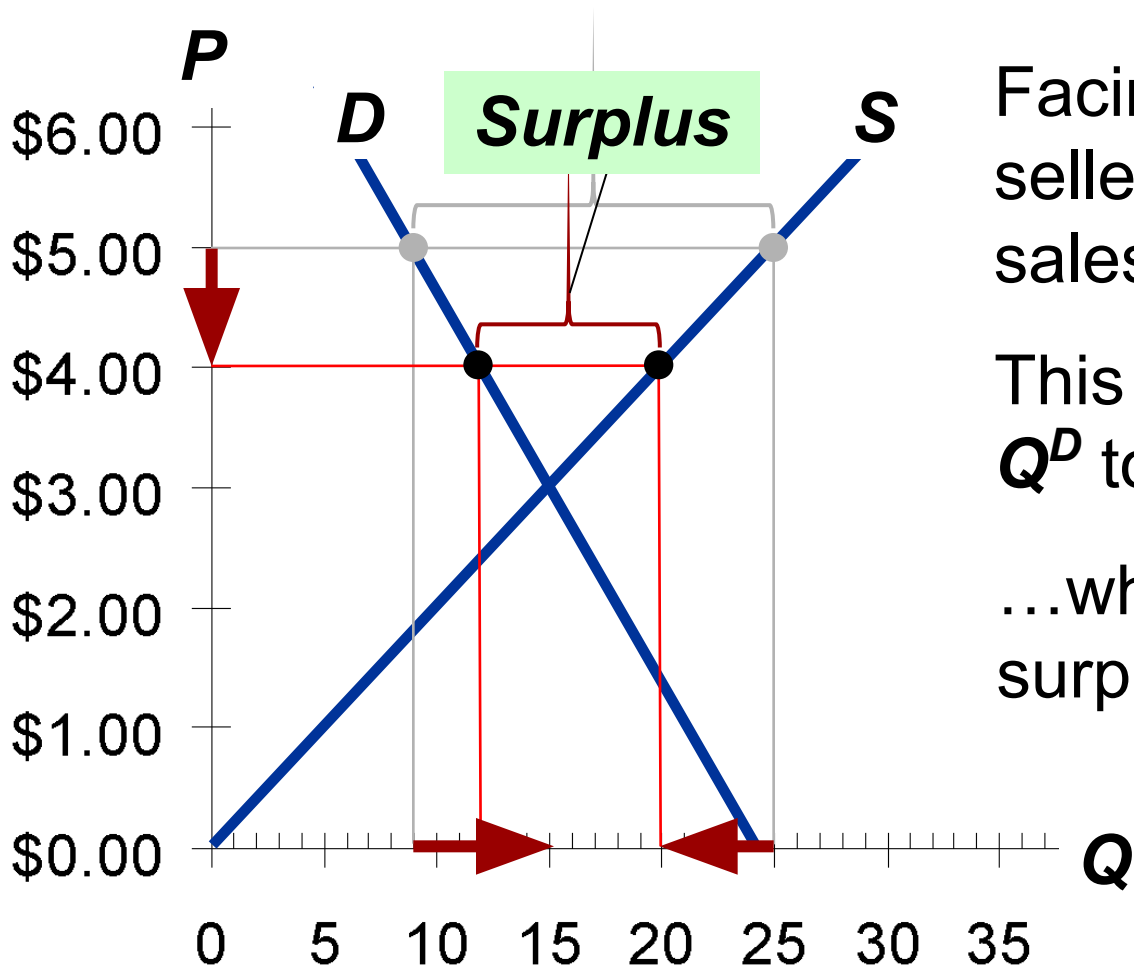
and

$$Q^S = 25 \text{ lattes}$$

resulting in a surplus of 16 lattes

# Surplus (a.k.a. excess supply):

when quantity supplied is greater than quantity demanded



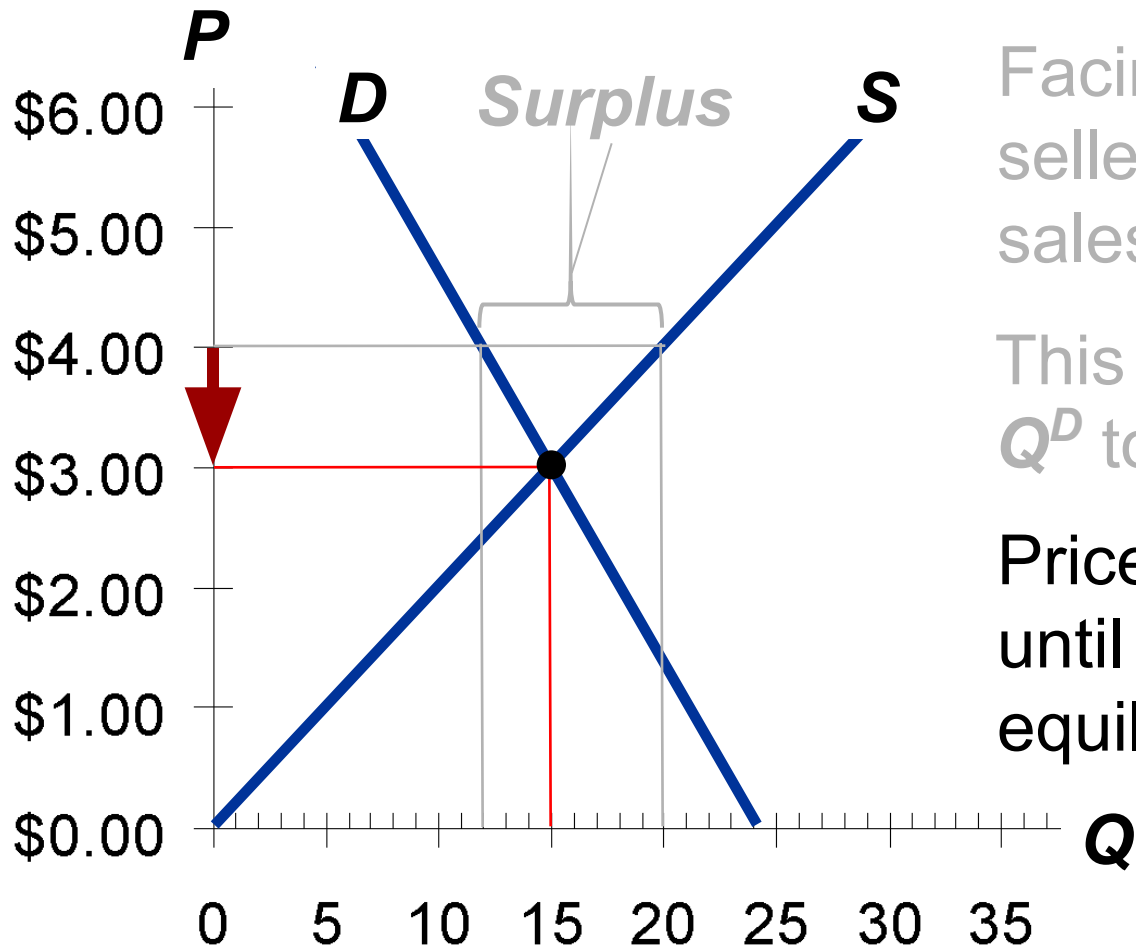
Facing a surplus, sellers try to increase sales by cutting price.

This causes  $Q^D$  to rise and  $Q^S$  to fall...

...which reduces the surplus.

# Surplus (a.k.a. excess supply):

when quantity supplied is greater than quantity demanded



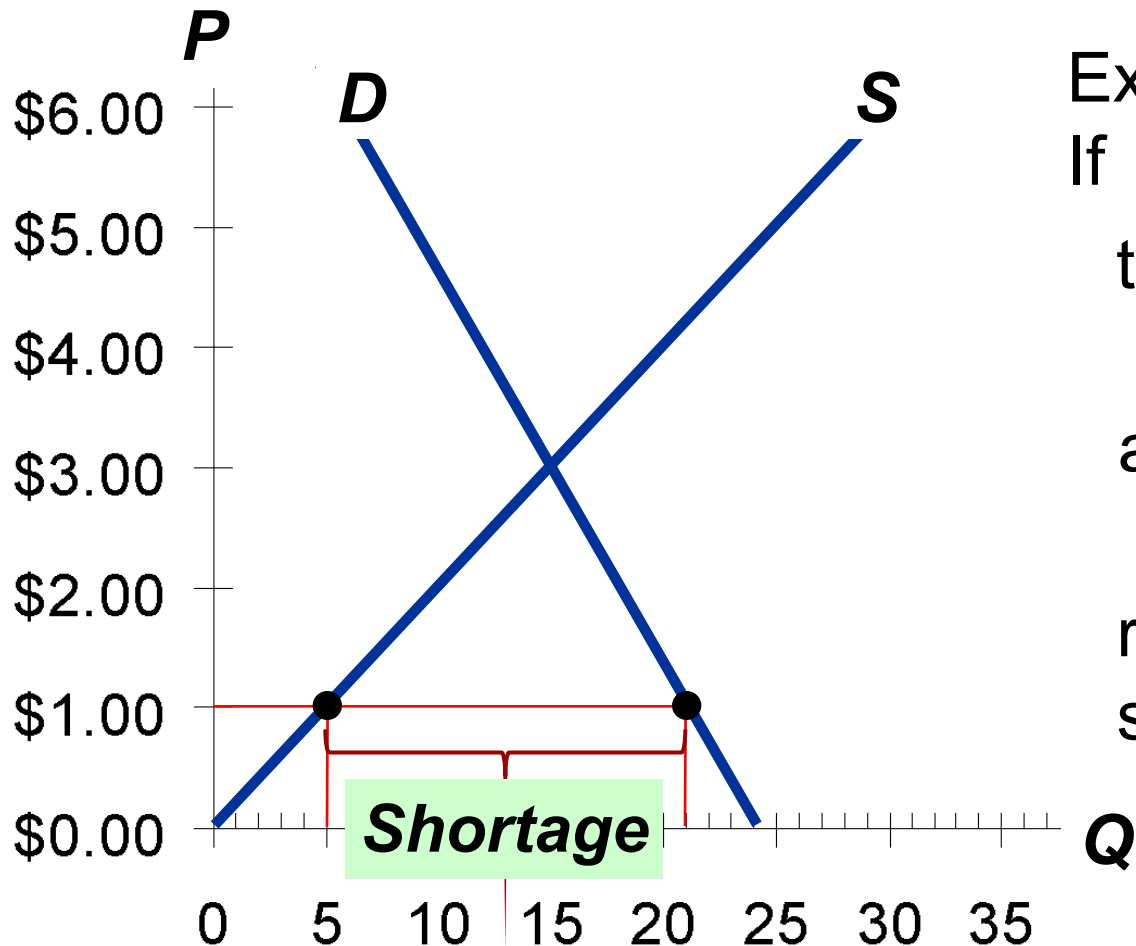
Facing a surplus, sellers try to increase sales by cutting price.

This causes  $Q^D$  to rise and  $Q^S$  to fall.

Prices continue to fall until market reaches equilibrium.

## Shortage (a.k.a. excess demand):

when quantity demanded is greater than quantity supplied



Example:

If  $P = \$1$ ,

then

$Q^D = 21$  lattes

and

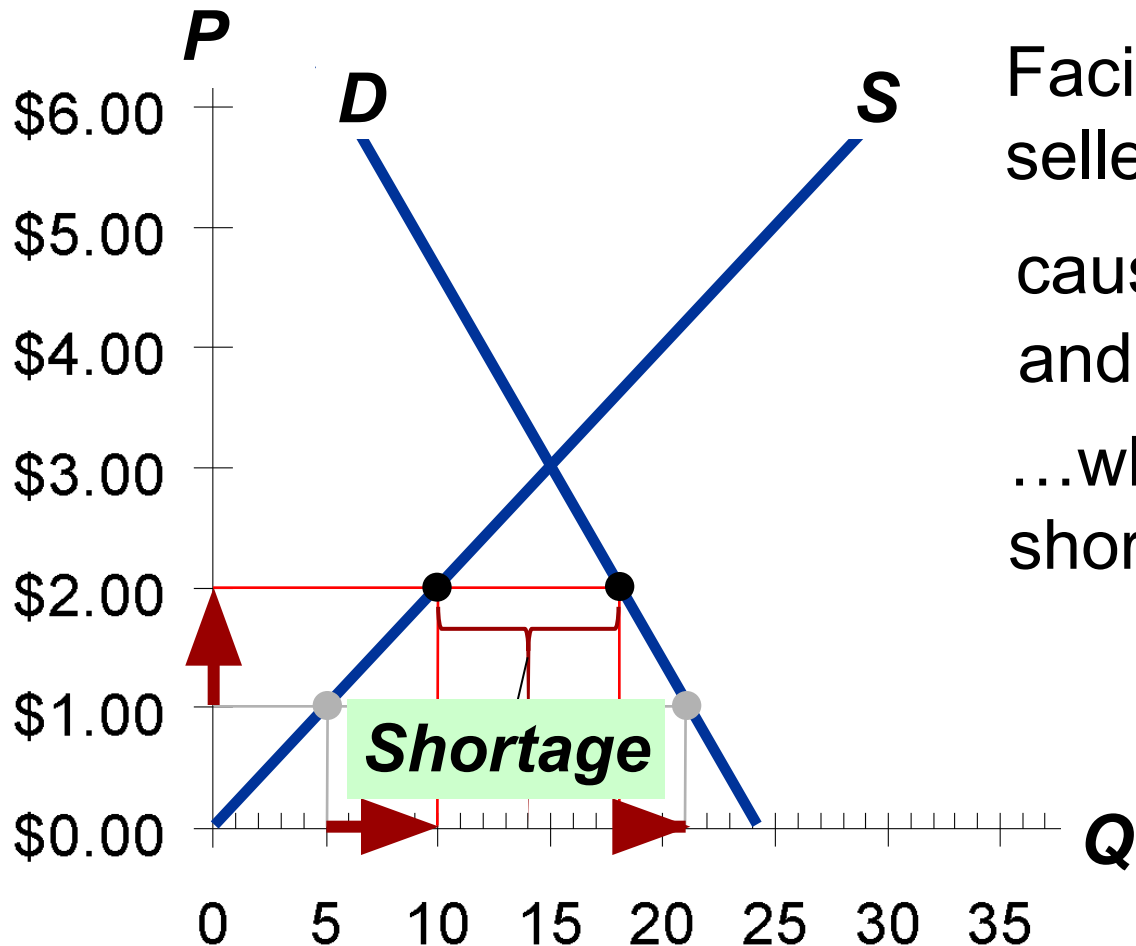
$Q^S = 5$  lattes

resulting in a

shortage of 16 lattes

## Shortage (a.k.a. excess demand):

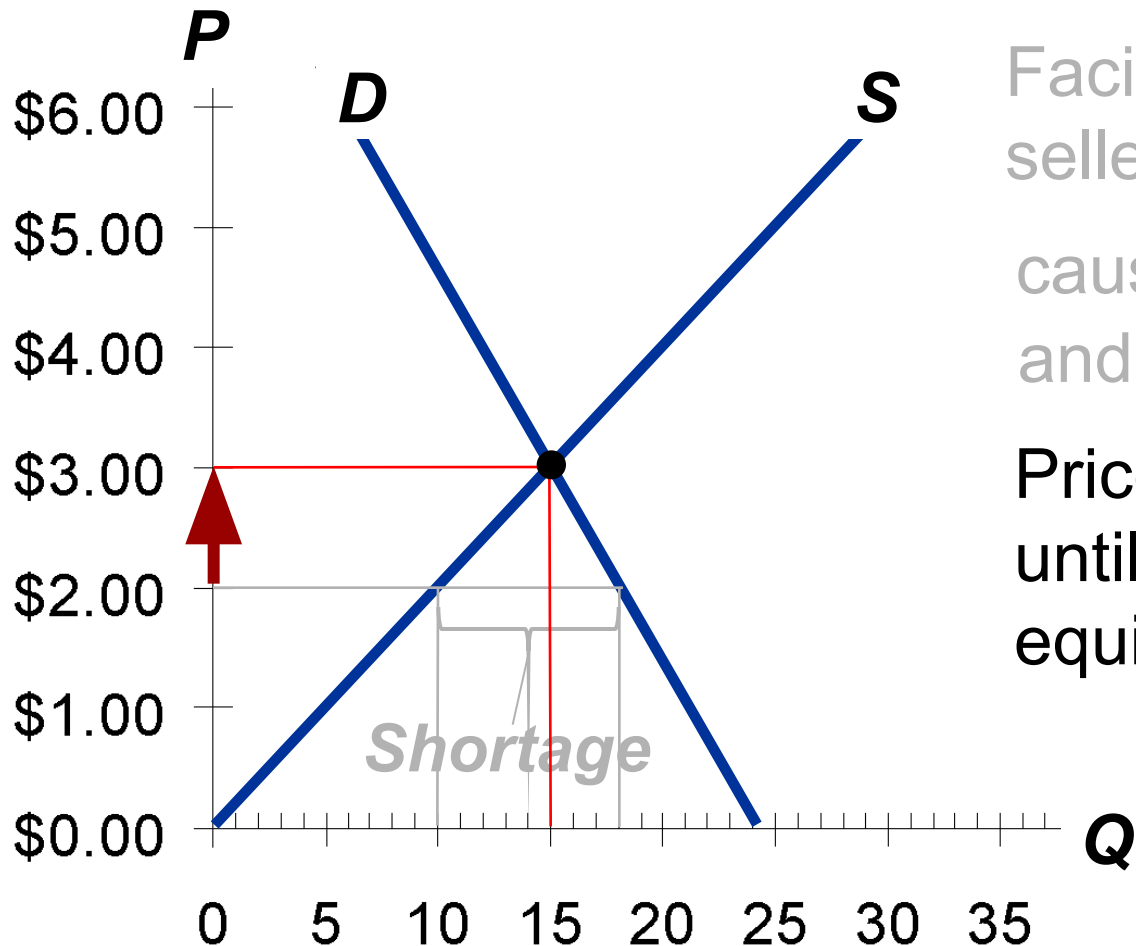
when quantity demanded is greater than quantity supplied



Facing a shortage, sellers raise the price, causing  $Q^D$  to fall and  $Q^S$  to rise, ...which reduces the shortage.

## Shortage (a.k.a. excess demand):

when quantity demanded is greater than quantity supplied



Facing a shortage, sellers raise the price, causing  $Q^D$  to fall and  $Q^S$  to rise.

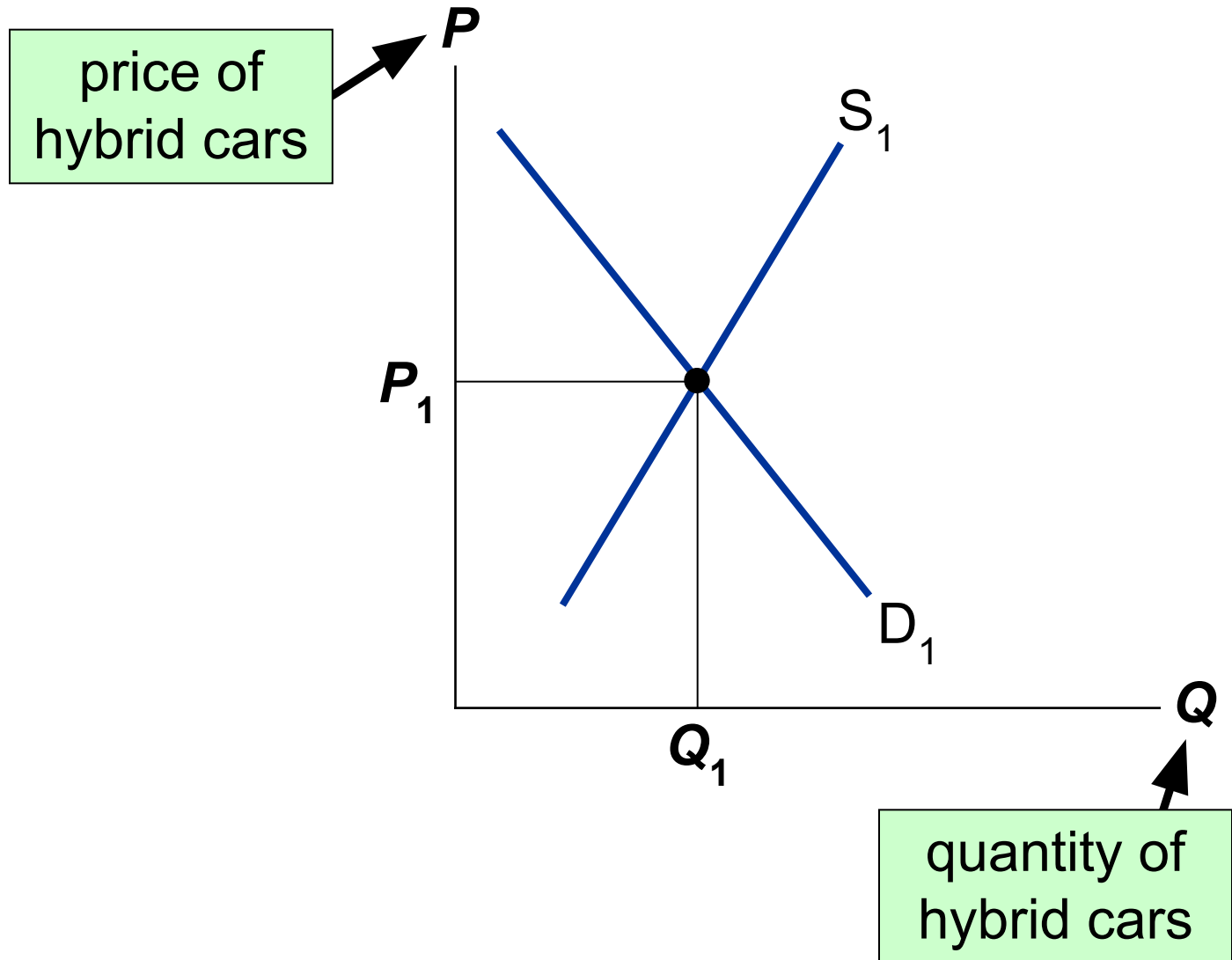
Prices continue to rise until market reaches equilibrium.

# Three Steps to Analyzing Changes in Eq'm

To determine the effects of any event,

1. Decide whether event shifts **S** curve, **D** curve, or both.
2. Decide in which direction curve shifts.
3. Use supply-demand diagram to see how the shift changes eq'm **P** and **Q**.

# EXAMPLE: The Market for Hybrid Cars





# EXAMPLE 1: A Shift in Demand

## EVENT TO BE

## ANALYZED:

Increase in price of gas.

## STEP 1:

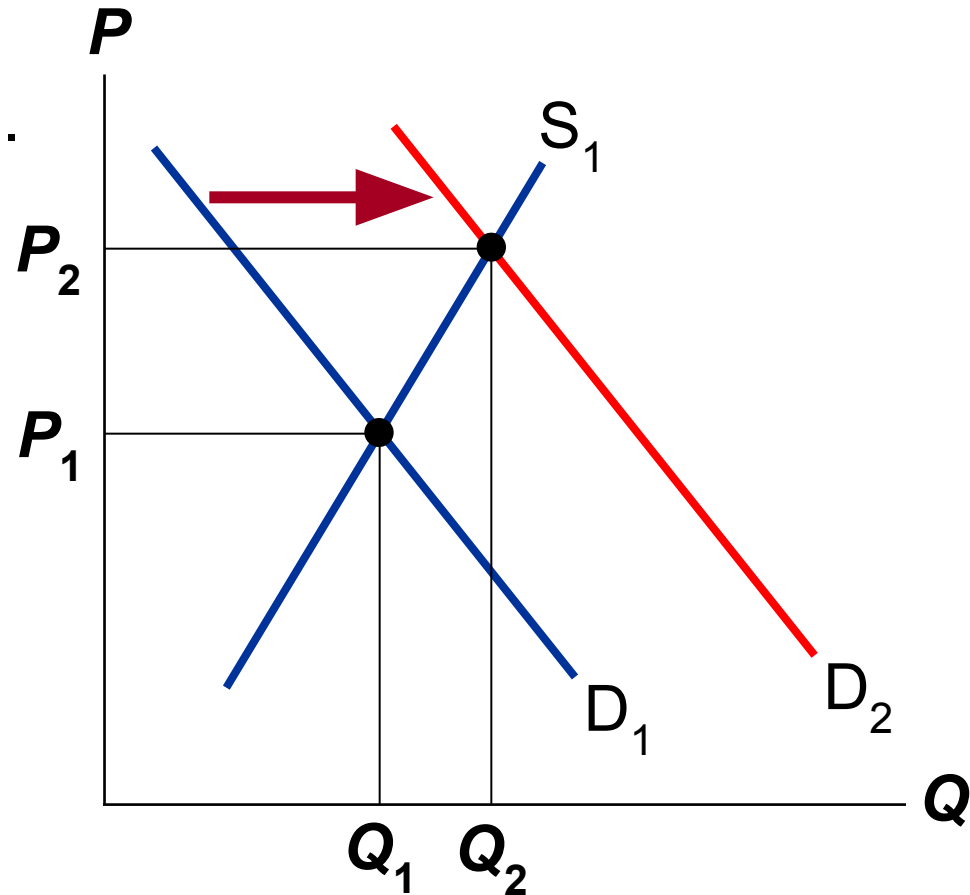
*D* curve shifts

## STEP 2:

*D* shifts right

## STEP 3:

The shift causes an increase in price and quantity of hybrid cars.

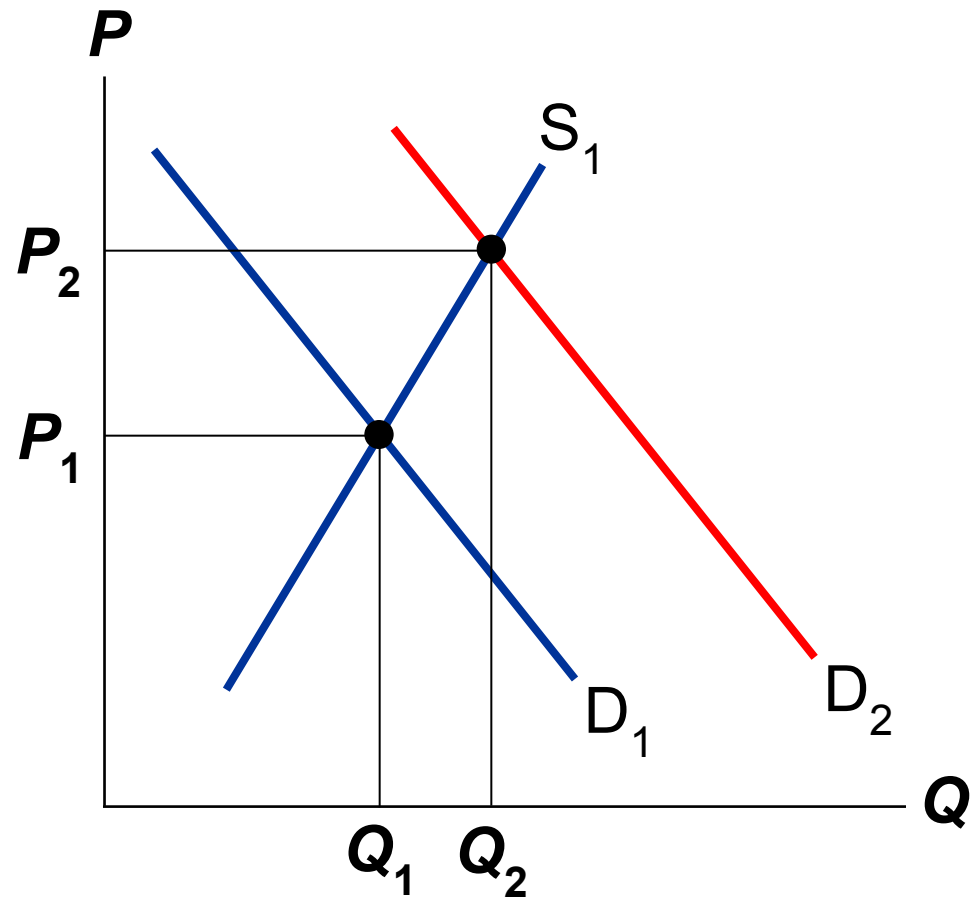


# EXAMPLE 1: A Shift in Demand

Notice:

When  $P$  rises, producers supply a larger quantity of hybrids, even though the  $S$  curve has not shifted.

***Always be careful to distinguish b/w a shift in a curve and a movement along the curve.***



# Terms for Shift vs. Movement Along Curve

- **Change in supply:** a shift in the **S** curve occurs when a non-price determinant of supply changes (like technology or costs)
- **Change in the quantity supplied:** a movement along a fixed **S** curve occurs when **P** changes
- **Change in demand:** a shift in the **D** curve occurs when a non-price determinant of demand changes (like income or # of buyers)
- **Change in the quantity demanded:** a movement along a fixed **D** curve occurs when **P** changes

## EXAMPLE 2: A Shift in Supply

**EVENT:** New technology reduces cost of producing hybrid cars.

**STEP 1:**

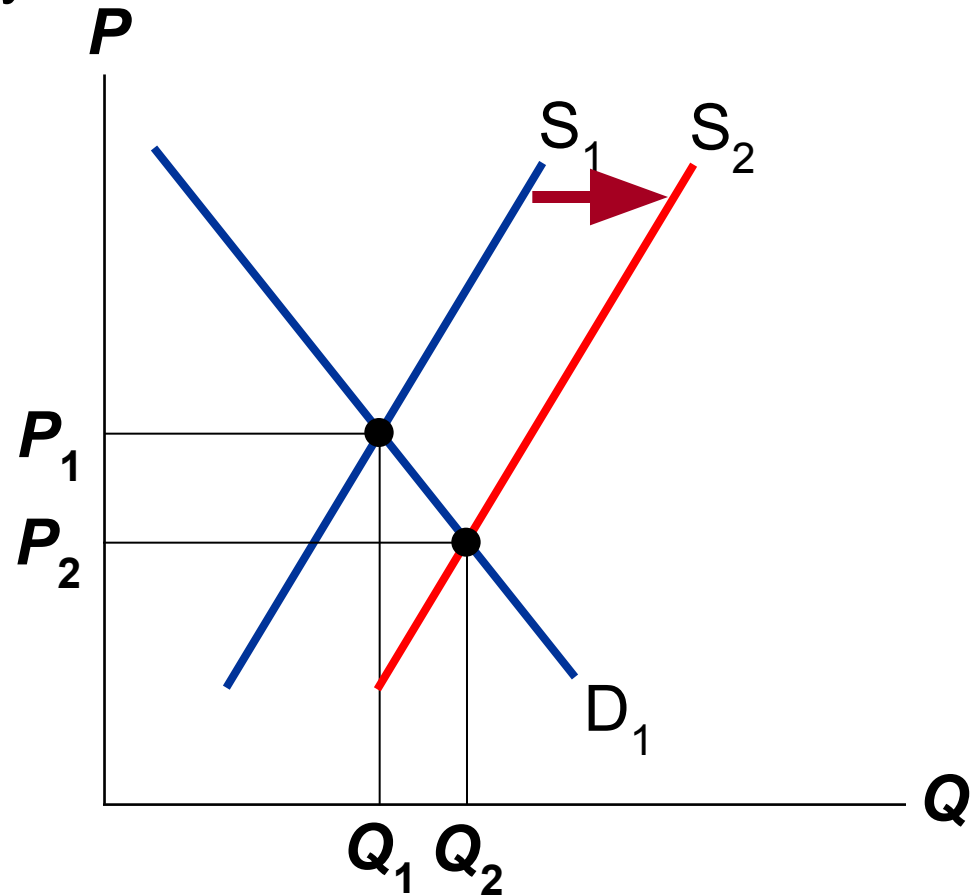
**S** curve shifts

**STEP 2:**

**S** shifts right

**STEP 3:**

The shift causes price to fall and quantity to rise.



# EXAMPLE 3: A Shift in Both Supply and Demand

## EVENTS:

price of gas rises AND  
new technology reduces  
production costs

## STEP 1:

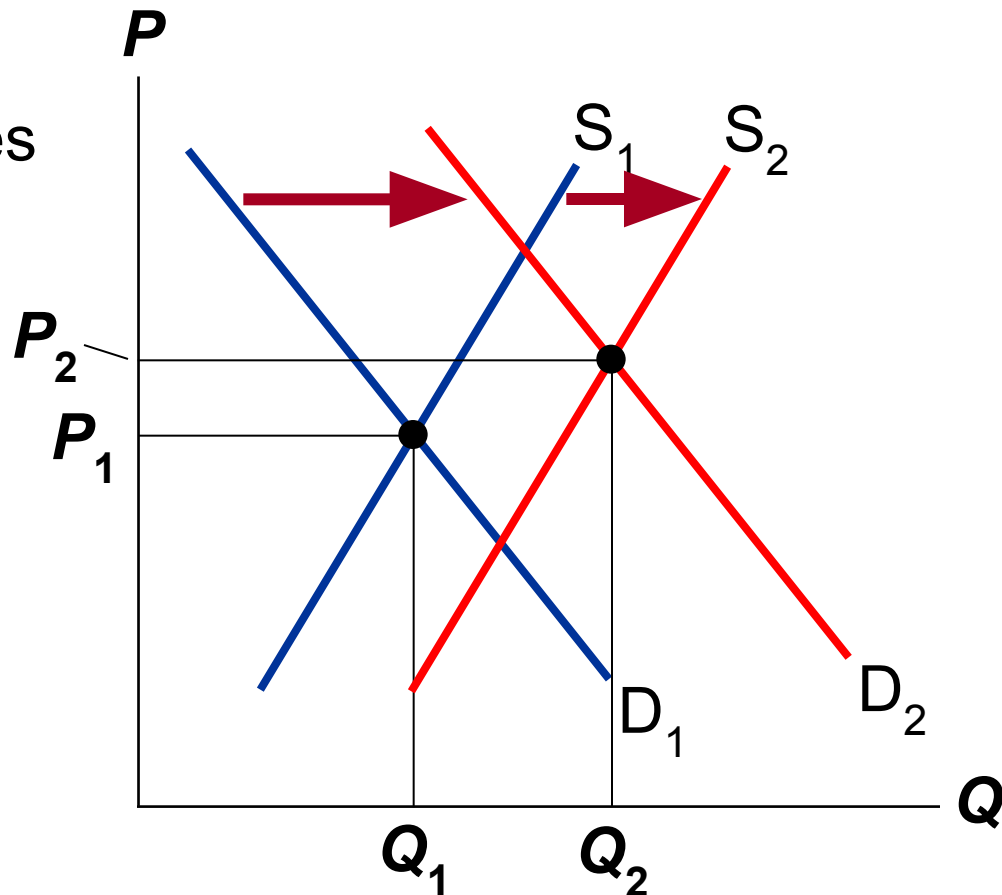
Both curves shift.

## STEP 2:

Both shift to the right.

## STEP 3:

$Q$  rises, but effect  
on  $P$  is ambiguous:  
If demand increases more  
than supply,  $P$  rises.



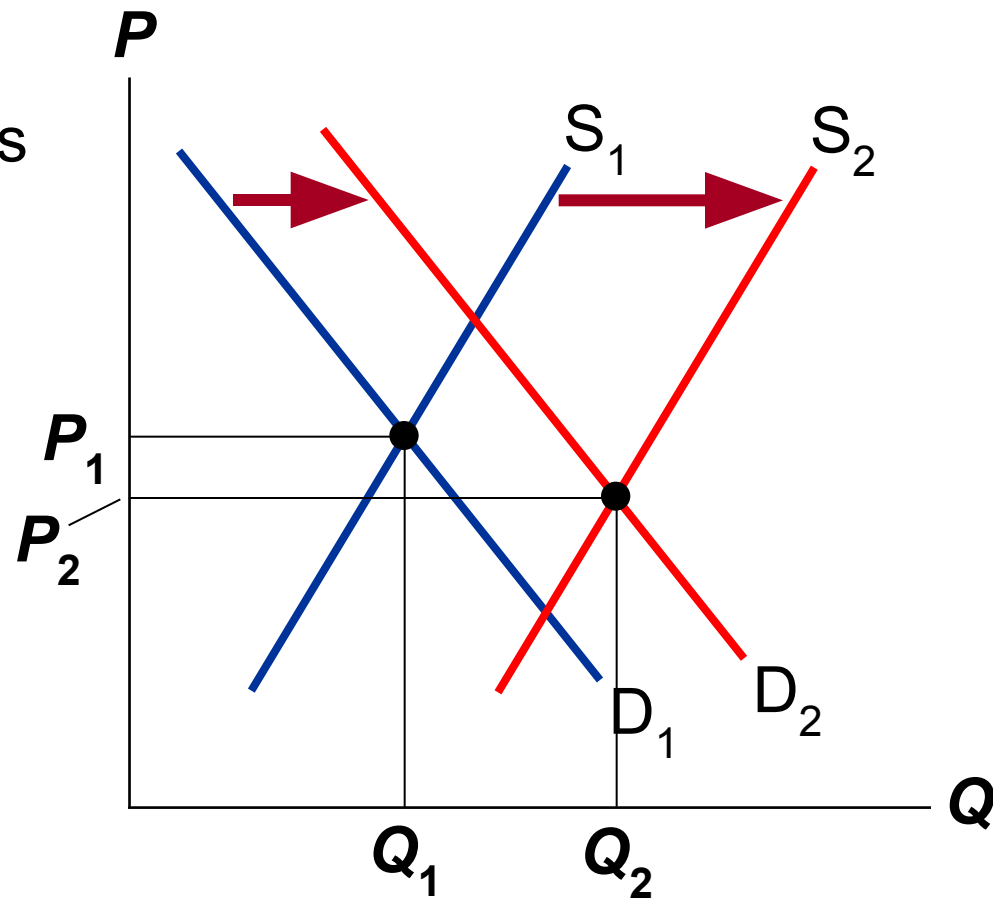
## EXAMPLE 3: A Shift in Both Supply and Demand

### EVENTS:

price of gas rises AND  
new technology reduces  
production costs

### STEP 3, cont.

But if supply  
increases more  
than demand,  
 $P$  falls.



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## ACTIVE LEARNING 3

# Shifts in supply and demand

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Use the three-step method to analyze the effects of each event on the equilibrium price and quantity of music downloads.

Event A: A fall in the price of CDs

Event B: Sellers of music downloads negotiate a reduction in the royalties they must pay for each song they sell.

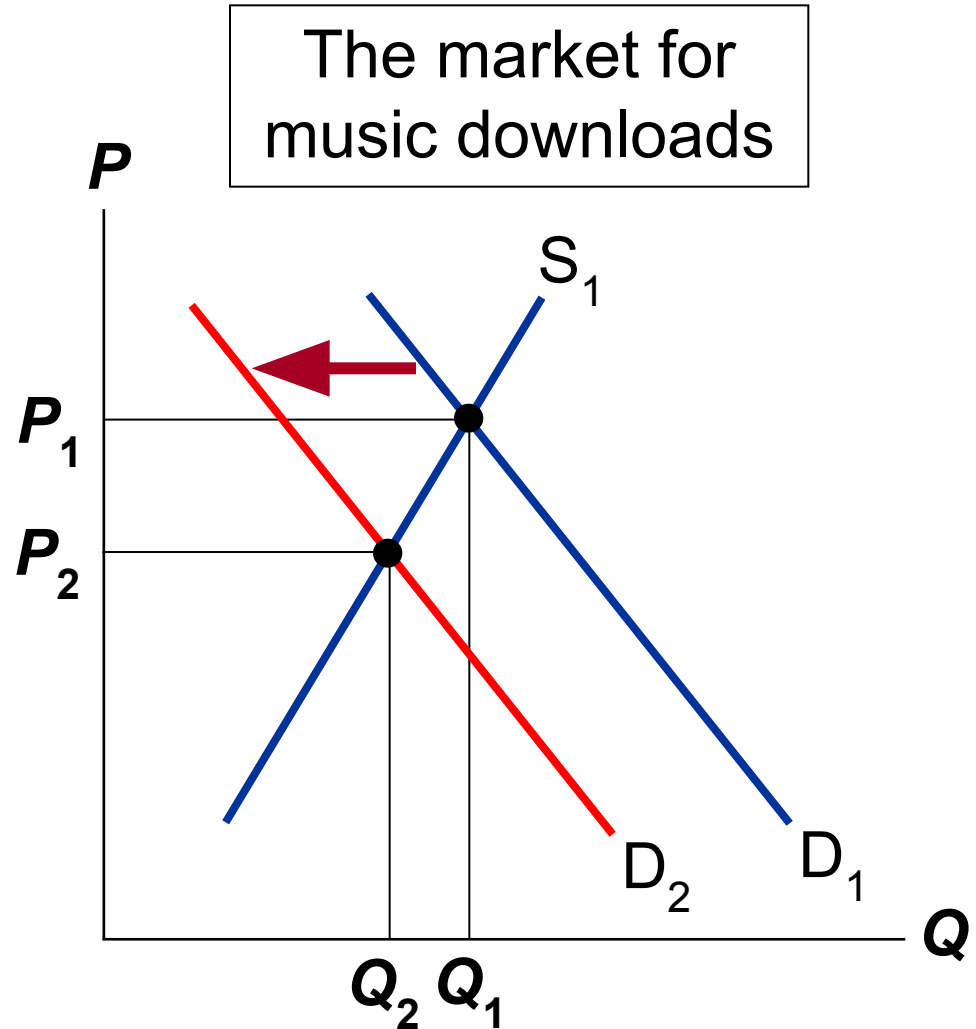
Event C: Events A and B both occur.

# ACTIVE LEARNING 3

## A. Fall in price of CDs

### STEPS

1. ***D*** curve shifts
2. ***D*** shifts left
3. ***P*** and ***Q*** both fall.



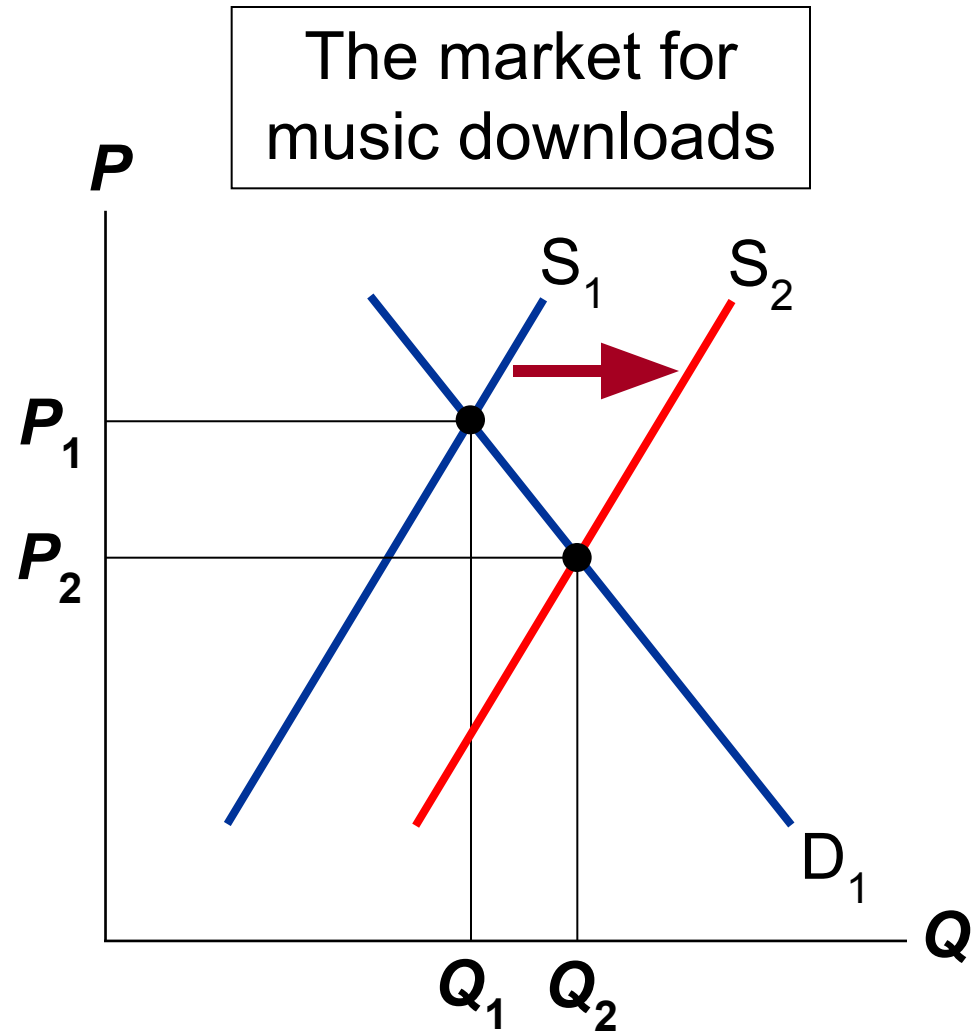


# ACTIVE LEARNING 3

## B. Fall in cost of royalties

### STEPS

1. **S** curve shifts  
(Royalties are part of sellers' costs)
2. **S** shifts right
3. **P** falls,  
**Q** rises.



## ACTIVE LEARNING 3

### C. Fall in price of CDs and fall in cost of royalties

#### **STEPS**

1. Both curves shift (see parts A & B).
2. **D** shifts left, **S** shifts right.
3. **P** unambiguously falls.

Effect on **Q** is ambiguous:

The fall in demand reduces **Q**,  
the increase in supply increases **Q**.

# CONCLUSION:

## How Prices Allocate Resources

- One of the Ten Principles from Chapter 1:  
*Markets are usually a good way to organize economic activity.*
- In market economies, prices adjust to balance supply and demand. These equilibrium prices are the signals that guide economic decisions and thereby allocate scarce resources.

# CHAPTER SUMMARY



- A competitive market has many buyers and sellers, each of whom has little or no influence on the market price.
- Economists use the supply and demand model to analyze competitive markets.
- The downward-sloping demand curve reflects the Law of Demand, which states that the quantity buyers demand of a good depends negatively on the good's price.

# CHAPTER SUMMARY



- Besides price, demand depends on buyers' incomes, tastes, expectations, the prices of substitutes and complements, and number of buyers. If one of these factors changes, the **D** curve shifts.
- The upward-sloping supply curve reflects the Law of Supply, which states that the quantity sellers supply depends positively on the good's price.
- Other determinants of supply include input prices, technology, expectations, and the # of sellers. Changes in these factors shift the **S** curve.

# CHAPTER SUMMARY



- The intersection of **S** and **D** curves determines the market equilibrium. At the equilibrium price, quantity supplied equals quantity demanded.
- If the market price is above equilibrium, a surplus results, which causes the price to fall. If the market price is below equilibrium, a shortage results, causing the price to rise.

# CHAPTER SUMMARY



- We can use the supply-demand diagram to analyze the effects of any event on a market: First, determine whether the event shifts one or both curves. Second, determine the direction of the shifts. Third, compare the new equilibrium to the initial one.
- In market economies, prices are the signals that guide economic decisions and allocate scarce resources.