Economics 1
Principles of Economics

Supply and Demand (Chapter 4)

Dr. Randall R. Rojas

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?

I. Markets and Competition 1 of 2

- Supply and Demand are the forces that make market economies work. They determine the quantity of each good produced and the price at which it is sold.

- Def: Market = A group of buyers and sellers of a particular good or service.
  - Buyers determine the demand for the product.
  - Sellers determine the supply of the product.

I. Markets and Competition 2 of 2

- Def: Competitive Market = A market with many buyers and sellers, where each has a negligible effect on the market price.
- In a perfectly competitive market:
  - All goods are exactly the same
  - Buyers & sellers are so numerous that no one can affect market price—each is a "price taker"
- Note: In these chapters, we assume markets are perfectly competitive*.

*Not all goods and services are sold in perfectly competitive markets (e.g., local cable company).

II. Demand 1 of 4

Demand represents the behavior of buyers.

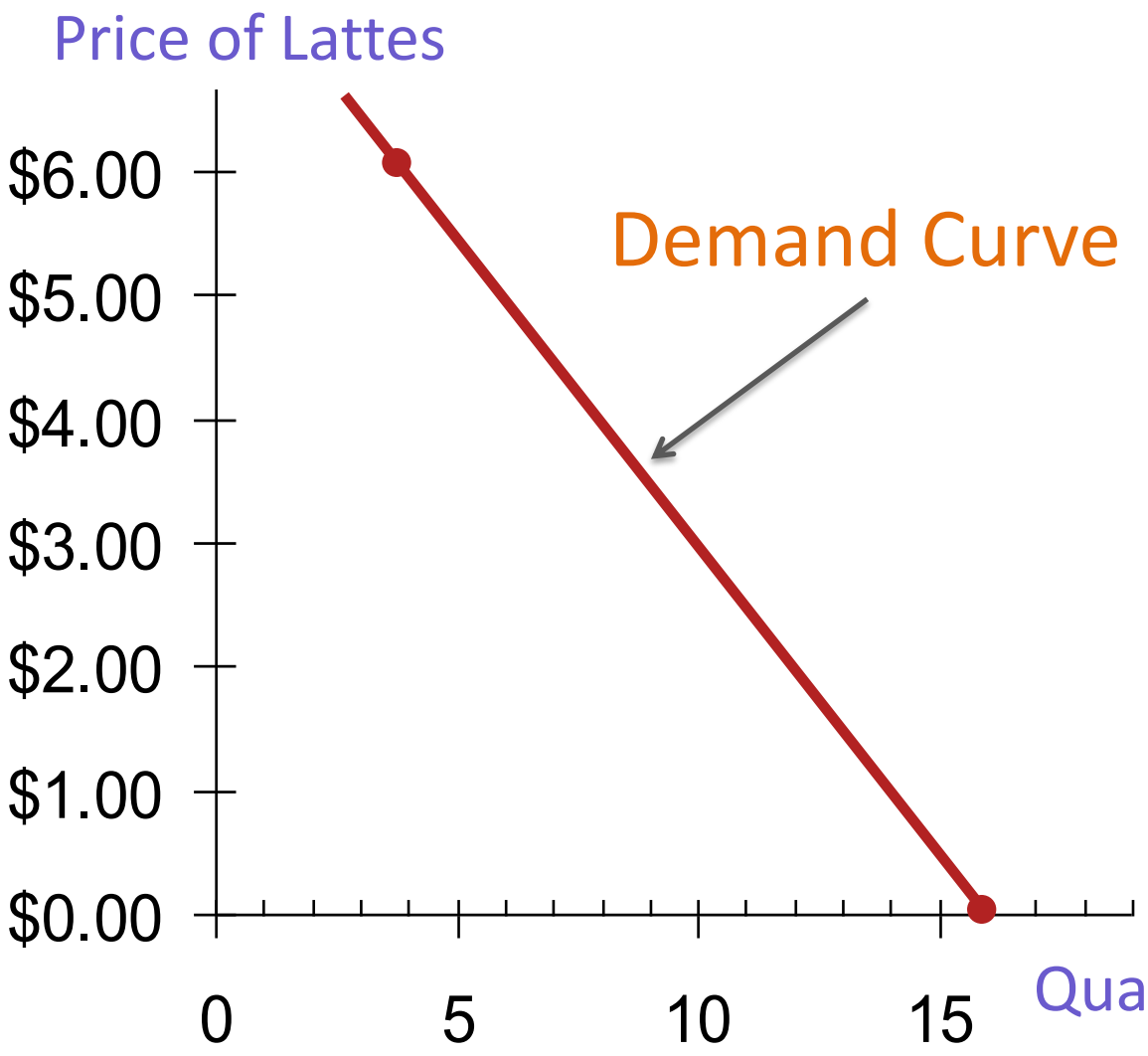
- Def: Quantity Demanded = Amount of a good that buyers are willing and able to purchase.
  - Note: Many things determine the quantity demanded of any good –we will focus on price.
  - Example: If the price of ice-cream rose to $20/scoop, you would most likely buy less ice-cream.
- Def: Law of Demand = The claim that the quantity demanded of a good falls when the price of the good rises, other things equal

II. Demand

- Def: 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



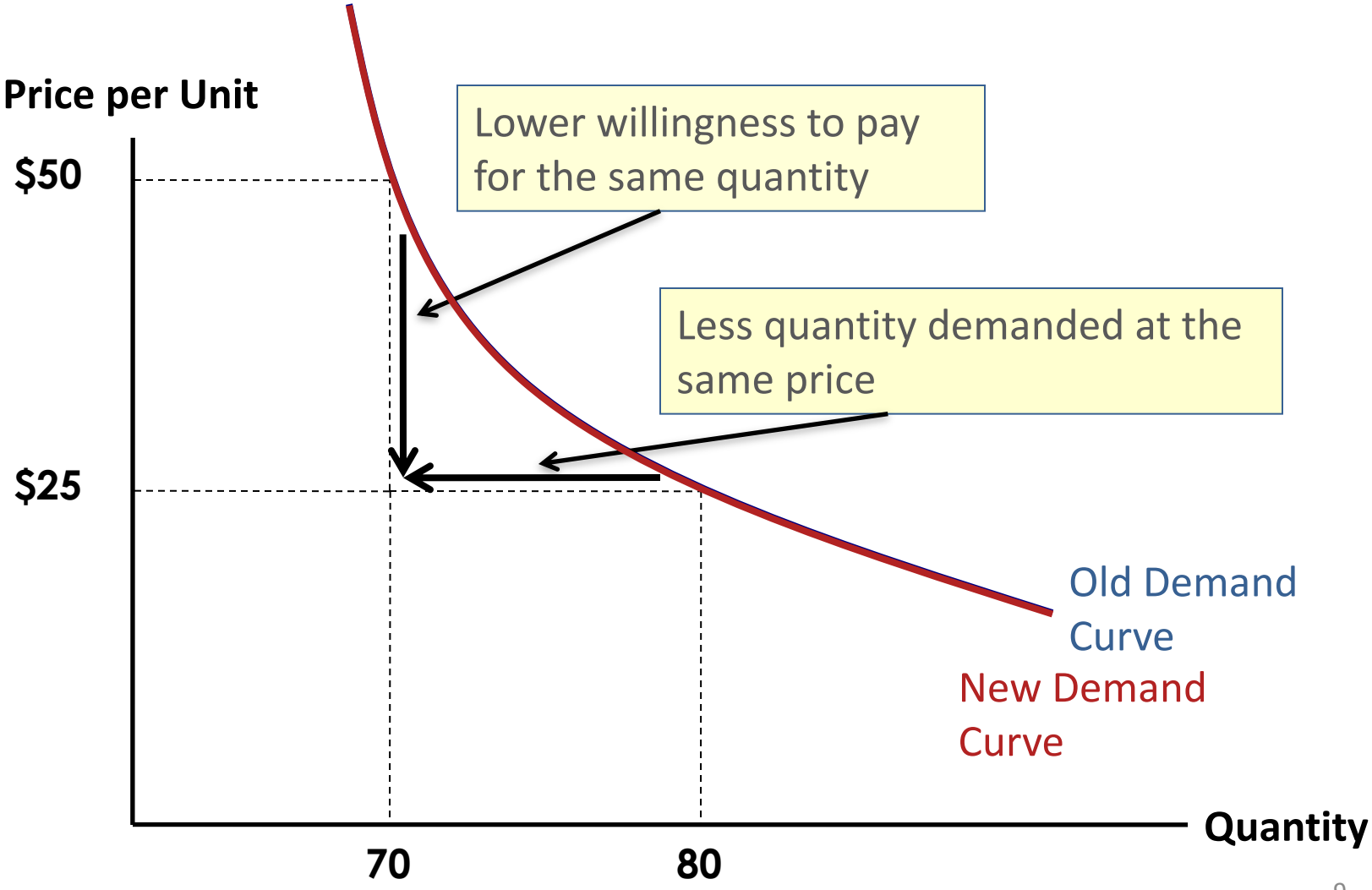
Price of lattes	Quantity of lattes demanded
$0.00	16
1.00	14
2.00	12
3.00	10
4.00	8
5.00	6
6.00	4

II. Demand 3 of 4

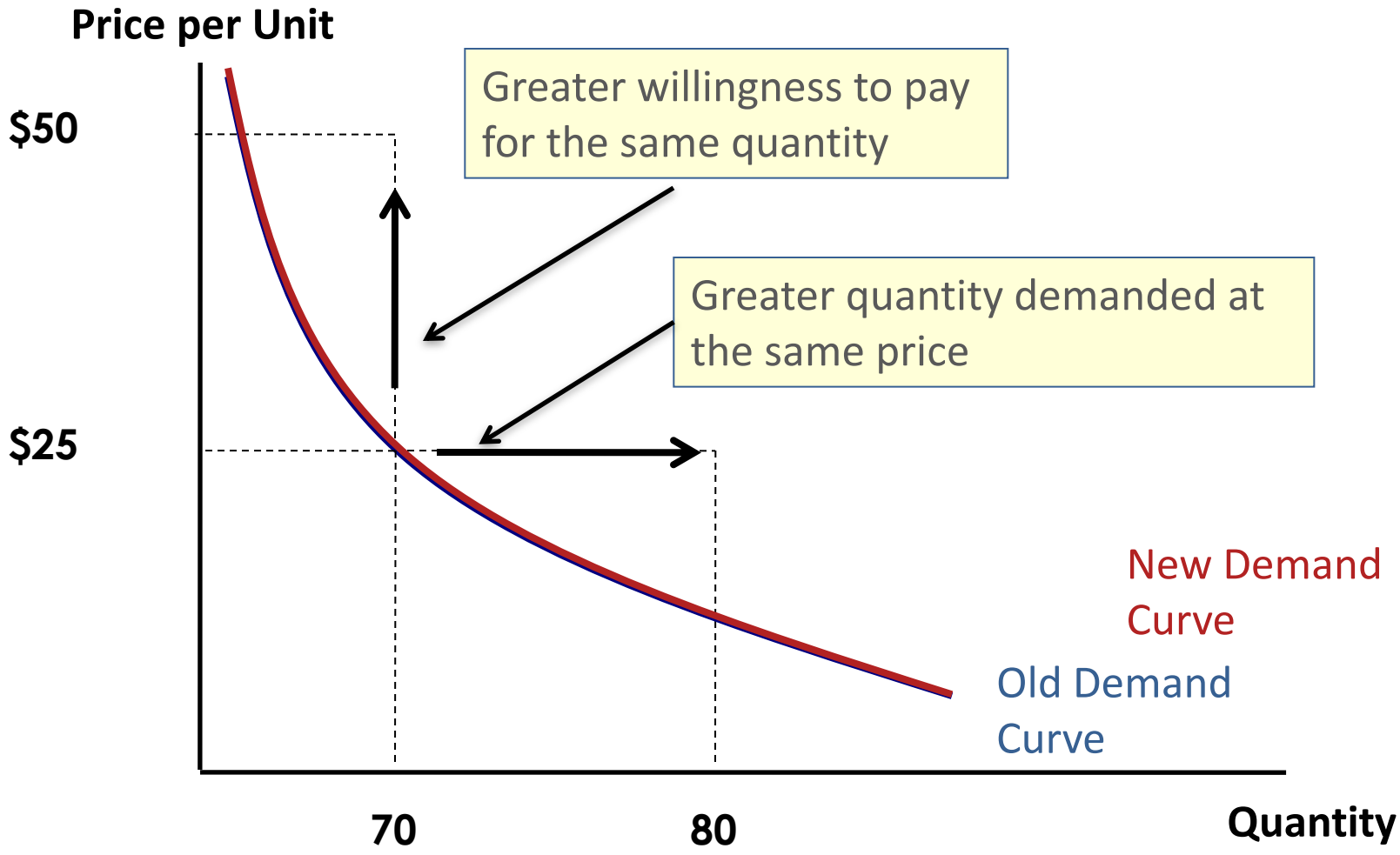
- Def: Demand Curve = A graph of the relationship between the price of a good and the quantity demanded.

- Demand curves can be read in two ways:
  - Horizontally: How much buyers are willing and able to purchase at a certain price.
  - Vertically: The highest price buyers are willing to pay for a certain quantity.

A Decrease in Demand



An Increase in Demand



II. Demand 4 of 4

- Def: Consumer Surplus = The consumer's gain from exchange.
  - the difference between the highest price a consumer will pay at a given quantity and the actual market price.
- Def: Total Consumer Surplus = The sum of consumer surplus of all buyers.

- Example: Assume the ice-cream market price is $1.00/scoop. If Ann I willing to pay $2.50/scoop, she enjoys a $1.50 consumer surplus from a scoop of ice-cream.

III. Important Demand 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).

III. Important Demand Shifters 2 of 8

1. Income
2. Price of Substitutes
3. Price of Complements
4. Expectations
5. Population
6. Tastes

III. Important Demand Shifters 3 of 8

1. Income

What would happen to your demand for ice-cream if you lost your job one summer?

→ Your demand for ice-cream falls

Def: Normal Good = A good for which other things equal, an increase in income leads to an increase in demand (e.g., cars, electronics,…).

Def: Inferior Good = A good for which other things equal, an increase in income leads to a decrease in demand (e.g., bus rides, Ramen noodles,…).

III. Important Demand Shifters 4 of 8

2. Price of Substitutes

If Pizza becomes more expensive, but the prize of hamburgers does not change, what would happen to the quantity of hamburgers demanded?

→ The quantity demand would increase.

Def: Substitutes = Two goods for which an increase in the price of one, leads to an increase in the demand for the other (e.g., Coke and Pepsi, laptops and desktops, CDs and music downloads,…).

III. Important Demand Shifters 5 of 8

3. Price of Complements

Suppose the price of hot fudge falls.

→ According to the Law of Demand you will buy more fudge, but also ice-cream because hot fudge and ice-cream are used together.

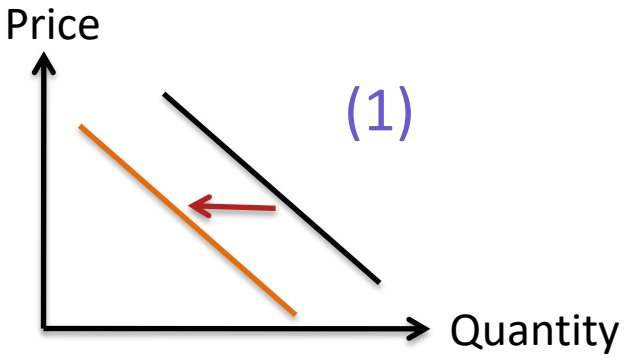
Def: Complements = Two goods for which an increase in the price of one, leads to a decrease in the demand for the other (e.g., computers ad software desktops, gasoline and automobiles).

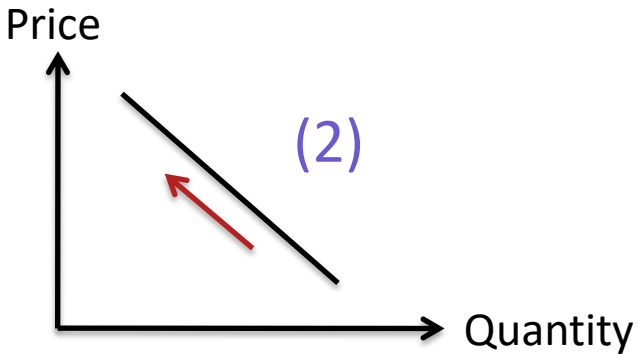
Example (Case Study): How to reduce smoking?

Example (Case Study): How to reduce smoking?

Policy makers can:

1. Shift the demand curve for cigarettes and other tobacco products (e.g., via health warnings, public service announcements, prohibit advertising on TV, etc.) → Shift the demand curve to the left.
2. Raise the price of cigarettes. → Move up along the demand curve.





Example (Case Study): How to reduce smoking?

Result:

- A 10% increase in the price
  →4% reduction in the quantity demanded.

- A 10% increase in the price
  →12% reduction in the quantity demanded for teenagers.

Example (Case Study): How to reduce smoking?

Q: What is the effect this has on the demand for illicit drugs?

Opponents of cigarette taxes argue that e.g., tobacco and marijuana are substitutes.

→ high cigarette prices encourage marijuana use.

Experts on substance abuse view tobacco as a gateway drug leading to experimentation with other drugs.

Finding: Lower cigarette prices (higher demand for cigarettes) are associated with a greater use of marijuana.

→ Tobaco and Marijuana are complements rather than substitutes.

III. Important Demand Shifters

4. Expectations

Your expectations about the future may affect your demand for a good or a service today.

- Example 1: If you expect your income to increase next month, you might spend more now on e.g., eating out, etc.
- Example 2: If you expect the price of a plasma TV to fall next week, you may be less willing to buy it at today's price.

III. Important Demand Shifters

5. Number of Buyers

More people, more demand.

As the population of an economy changes, the number of buyers of a particular good also changes, (thereby changing its demand.)

Summary:
Variables that Influence Buyers

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

III. Important Demand Shifters

6. Tastes

Anything that causes a shift in tastes toward a good will increase demand for that good and shift its Demand (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.

IV. Supply 1 of 5

Supply represents the behavior of sellers.

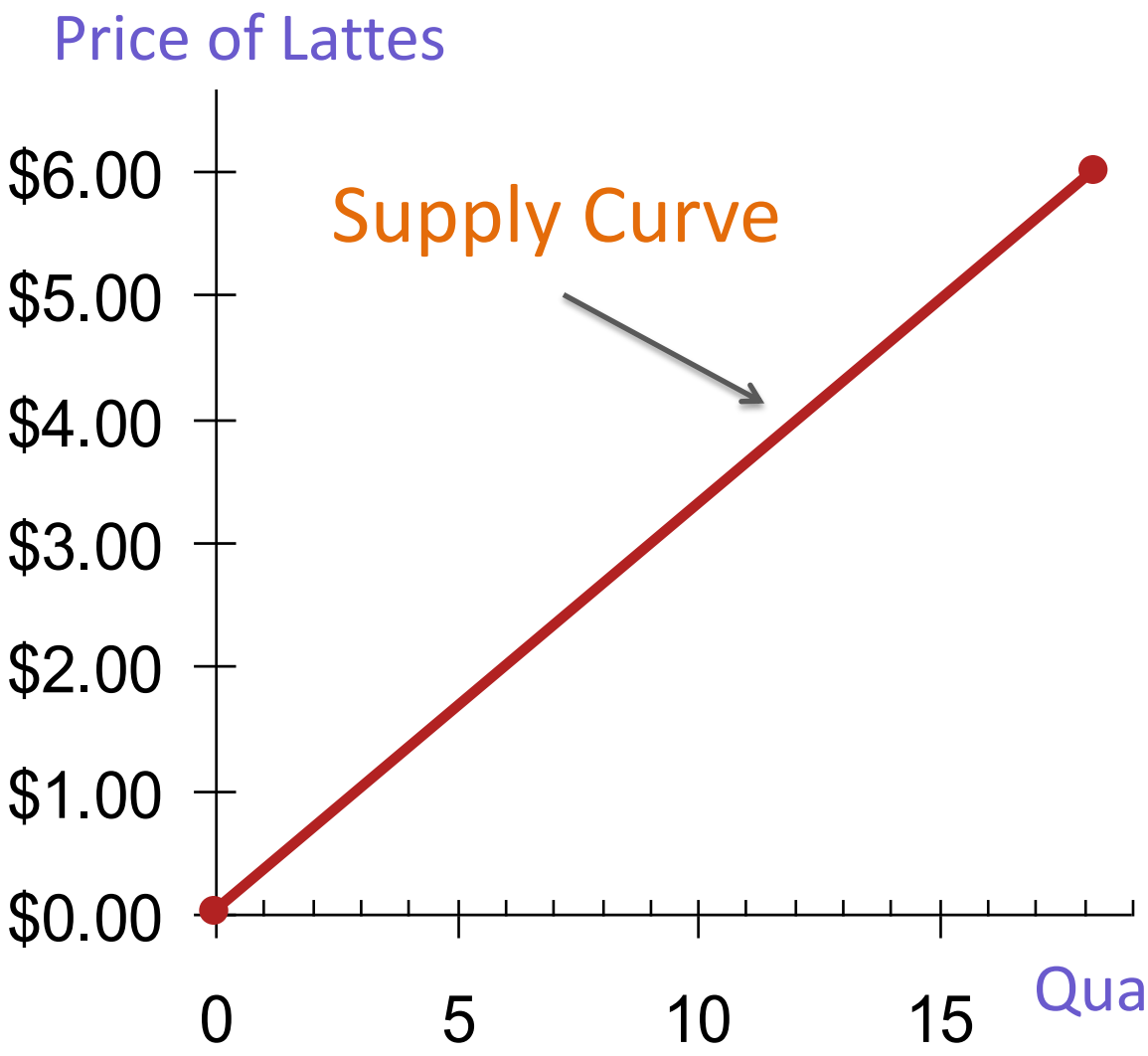
- Def: Quantity Supplied = Amount of a good that sellers are willing and able to sell.
  - Note: Many things determine the quantity supplied of any good –we will focus on price.
  - Example: If the price of ice-cream is low, the business is less profitable than when the price is high → Low supply when the price is low and high supply when the price is high.
- Def: Law of Supply = The claim that the quantity supplied of a good rises when the price of the good rises, other things equal.

IV. Supply

- Def: 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



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

IV. Supply 3 of 5

- Def: Supply Curve = A graph of the relationship between the price of a good and the quantity supplied.

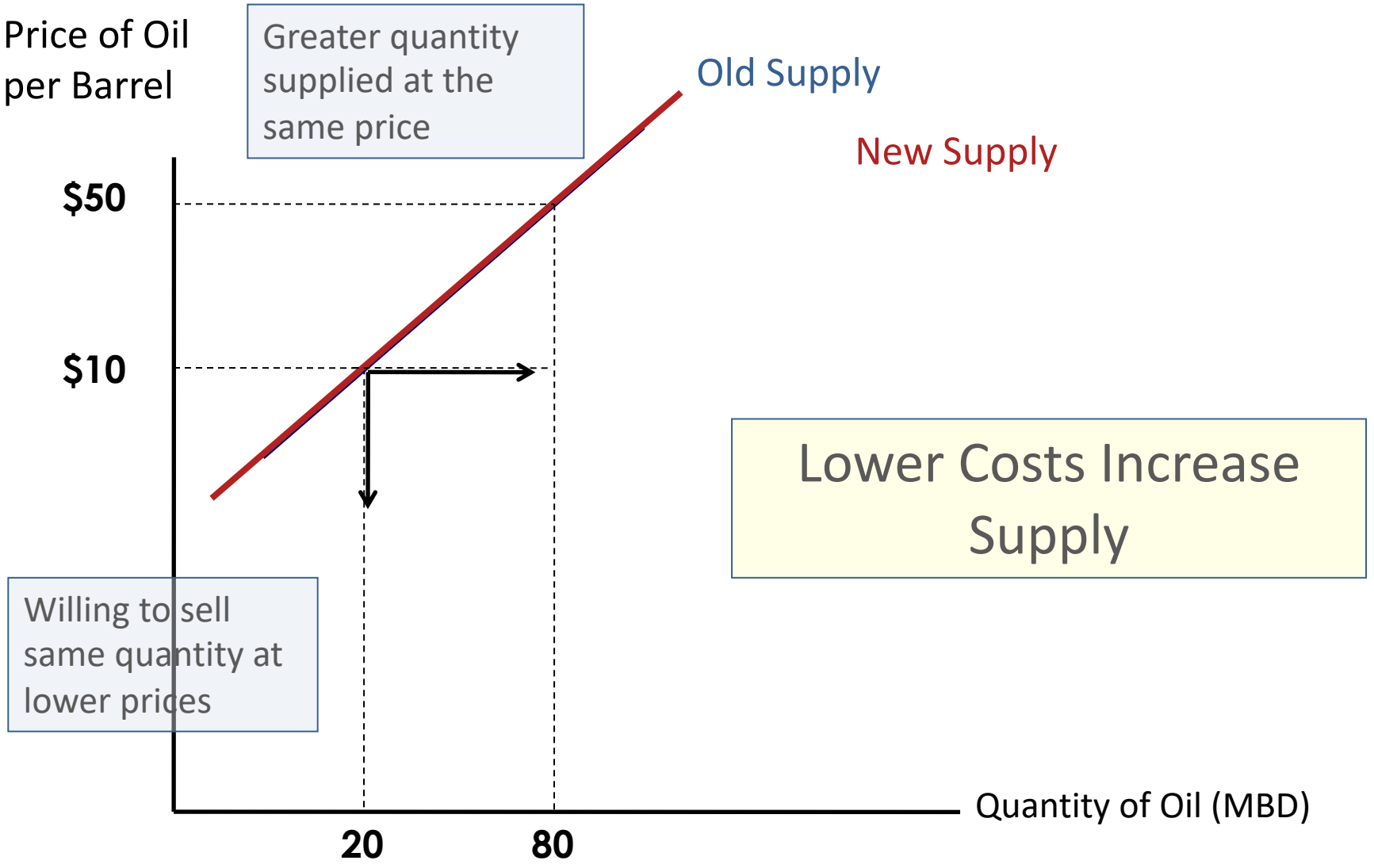
- Supply curves can be read in two ways:
  - Horizontally: How much suppliers are willing and able to sell at a certain price.
  - Vertically: The minimum price for which suppliers are willing to sell a certain quantity.

IV. Supply 4 of 5

- Def: Producer Surplus = The producer's gain from exchange.
  - the difference between the market price and the minimum price at which a producer would be willing to sell a particular quantity.
- Def: Total Producer Surplus = The area above the supply curve and below the price.

- Example: Assume the ice-cream market price is $1.00/scoop. If Ann can produce ice-cream at $0.25/scoop, she earns a $0.75 producer surplus per scoop of ice-cream.

Increase in Supply



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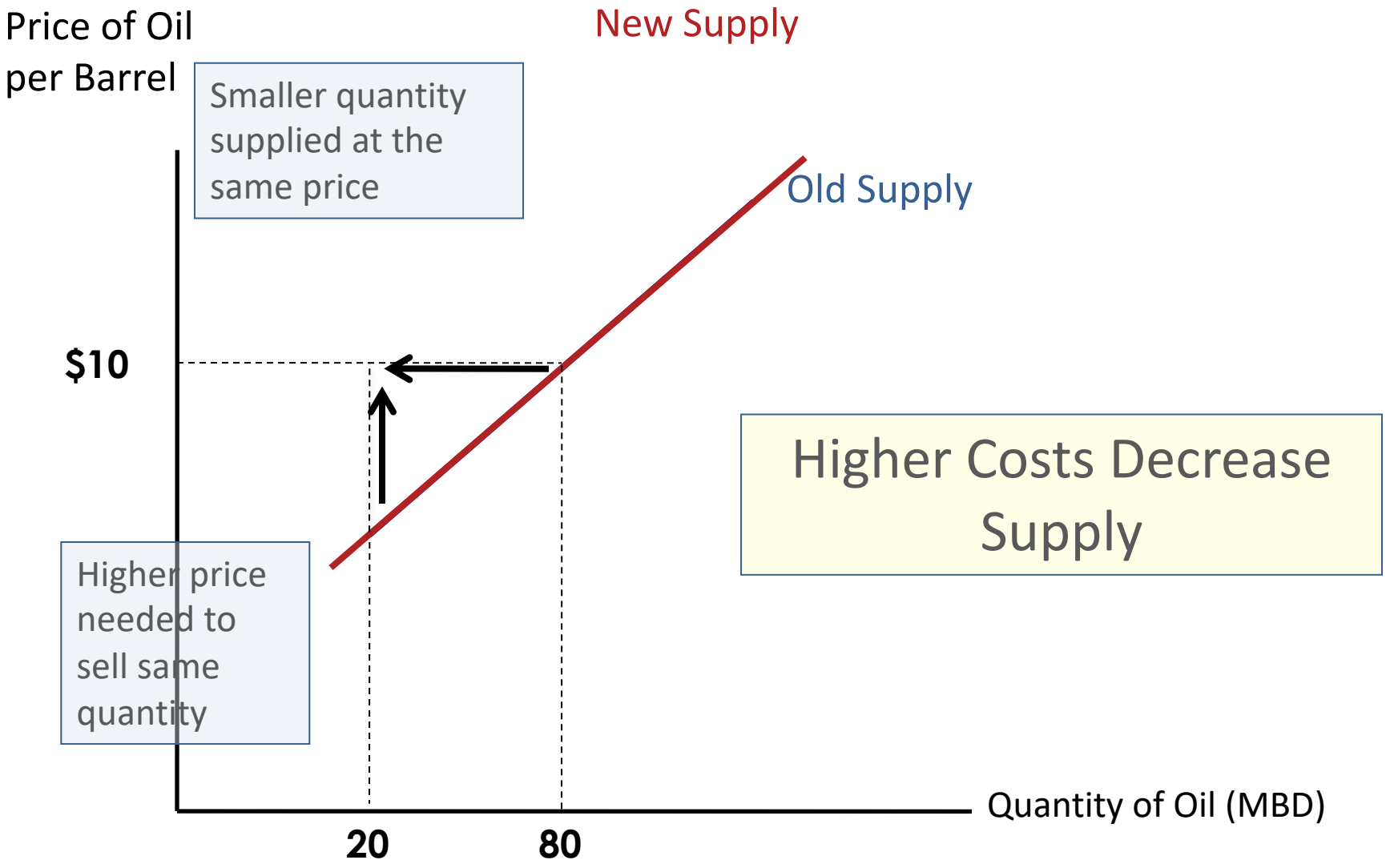
Decrease in Supply



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IV. Supply 5 of 5

Q: Why is the supply curve upward sloping?

A: The cost of producing a good is not equal across all suppliers.

- At a low price, a good is produced and sold only by the lowest cost suppliers.
- At a high price, a good is also produced and sold by higher cost suppliers.

V. Important Supply Shifters 1 of 8

1. Technological Innovations
2. Input Prices
3. Taxes and Subsidies
4. Expectations
5. Entry or Exit of Producers
6. Changes in Opportunity Costs

V. Important Supply Shifters 2 of 8

1. Technological Innovations

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 the supply (S) curve to the right.

Example: Consider the invention of the mechanized ice-cream machine.

→ reduced the amount of labor necessary to make ice-cream

V. Important Supply Shifters

2. Input Prices

The supply of a good is negatively related to the price of the inputs used to make the good. Examples of input prices are wages and price 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 supply (S) curve shifts to the right.

Example: What would happen to sellers of ice-cream if e.g., the price of sugar (an input in making ice-cream) increases?

→ Smaller profit margin. If the price of sugar continues to increase, it may even drive the ice-cream supply down to 0.

V. Important Supply Shifters

3. Taxes and Subsidies

A subsidy on production makes sellers willing to supply a greater quantity at a given price, or the subsidy allows producers to sell a given quantity at a lower price.

Tax to producers = an increase in production costs.

- A subsidy on production lowers costs and increases supply.
- Example: When the U.S. decreases its cotton subsidies, U.S. cotton supply decreases

V. Important Supply Shifters 5 of 8

4. Expectations

A change in producers' expectations about profitability will affect supply curves

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*)

V. Important Supply Shifters 6 of 8

5. Entry or Exit of Producers

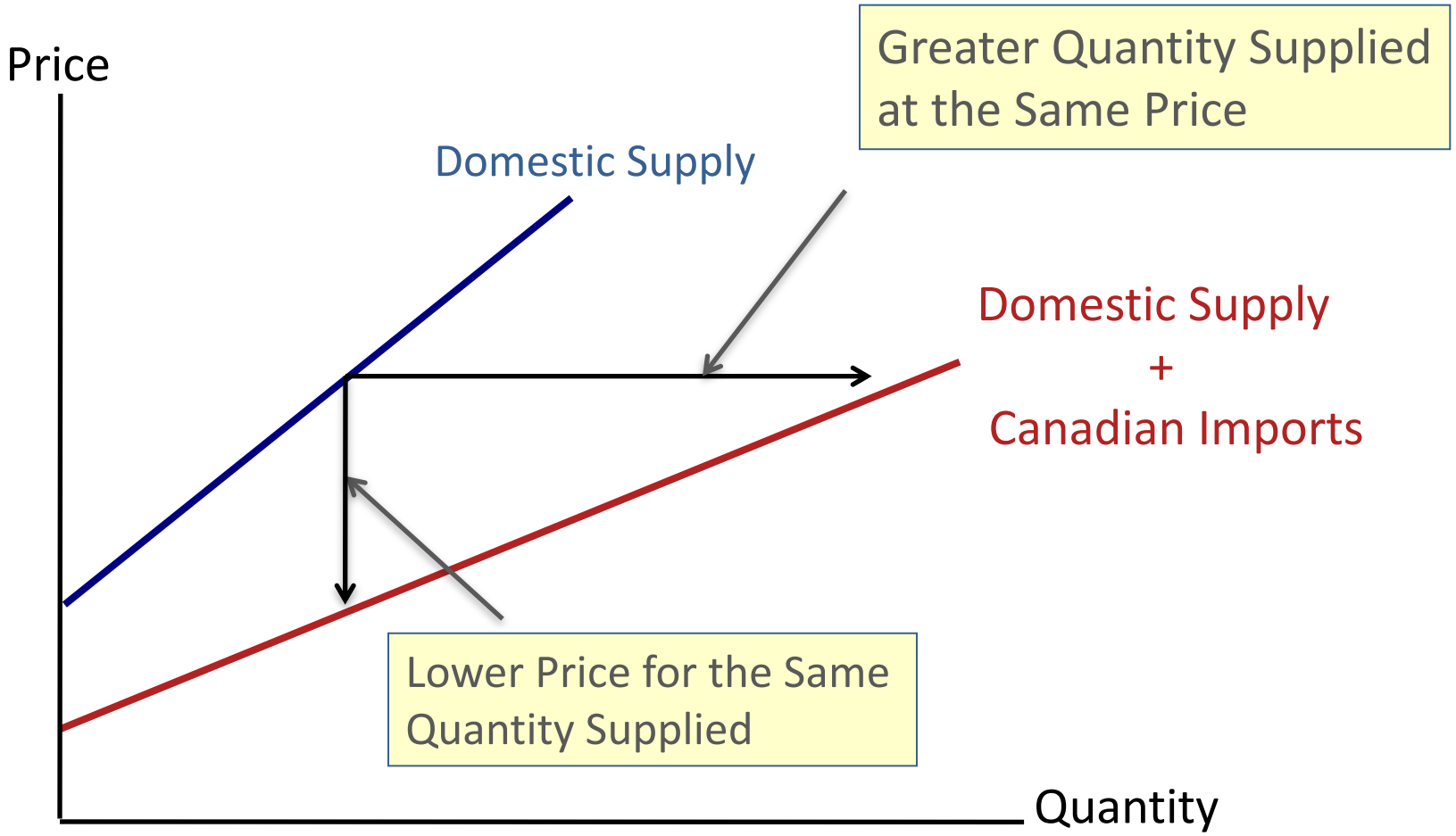
As producers enter and exit the market, the overall supply changes.

- Entry implies more sellers in the market increasing supply.

- Exit implies fewer sellers in the market decreasing supply.

V. Important Supply Shifters

Entry Increases Supply



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V. Important Supply Shifters 8 of 8

6. Change in Opportunity Costs

Inputs used in production have opportunity costs.

Sellers will choose to use those inputs where the profit is the highest.

- Sellers will supply less of a good if the price of an alternate good using the same inputs rises (and vice versa).
- Sellers always chase the highest profit goods.

Producers have the ability to produce other goods

Example: An increase in the profitability of small cars will decrease the supply of SUVs

VI. Equilibrium 1 of 2

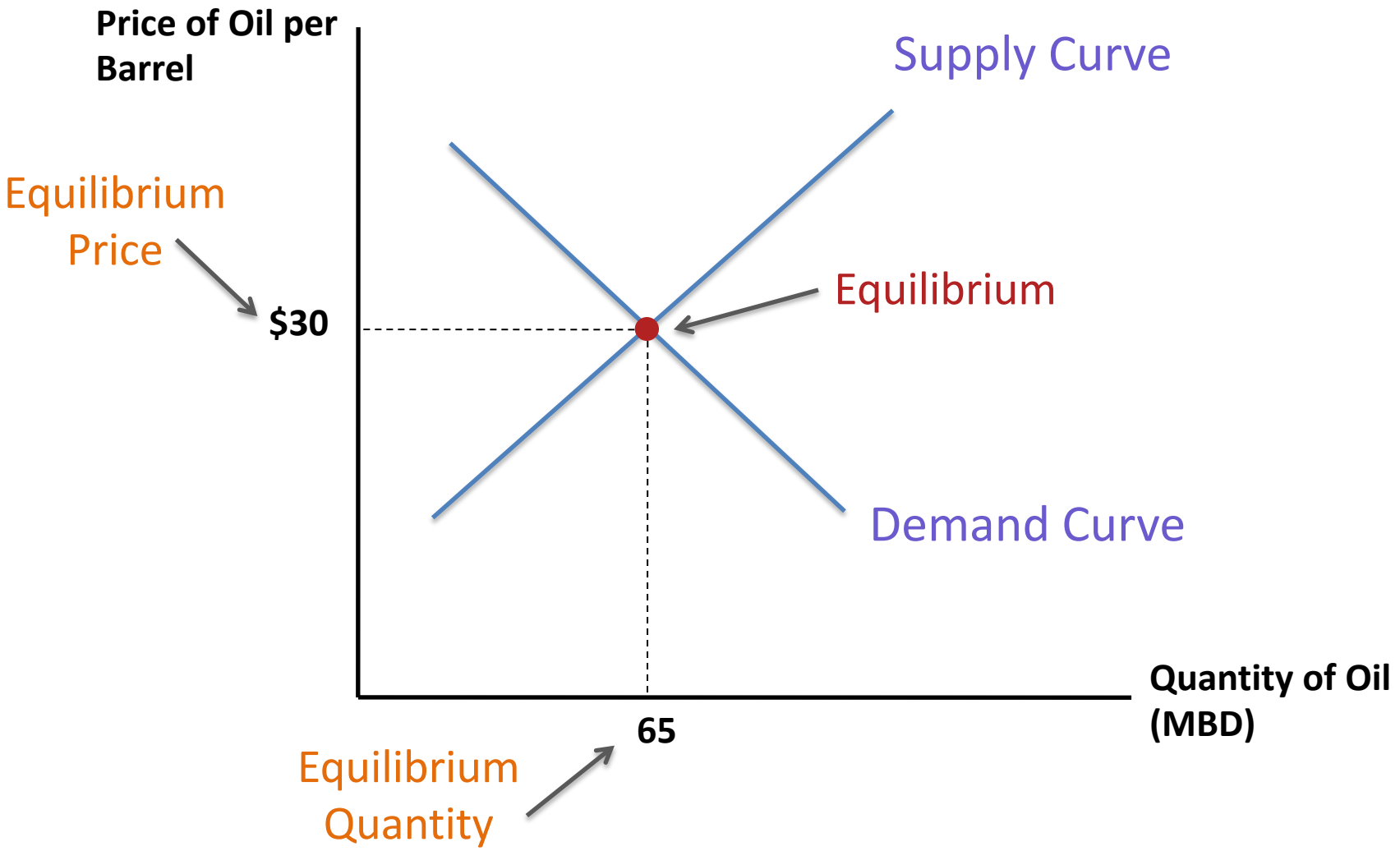
- Def: Equilibrium = A situation in which the market price has reached the level at which quantity supplied equals quantity demanded ($Q_S = Q_D$).
  - The amount consumers would purchase at this price is matched exactly by the amount producers wish to sell.
  - There is only one price where $Q_S = Q_D$.
- Def: Equilibrium Price = The price that balances quantity supplied and quantity demanded.

VI. Equilibrium 2 of 2

- Def: Equilibrium Quantity = The quantity supplied and the quantity demanded at the equilibrium price.
- Def: Surplus = A situation in which quantity supplied is greater than quantity demanded.

- Def: Shortage = A situation in which quantity demanded is greater than quantity supplied.

Price is Determined by Supply and Demand

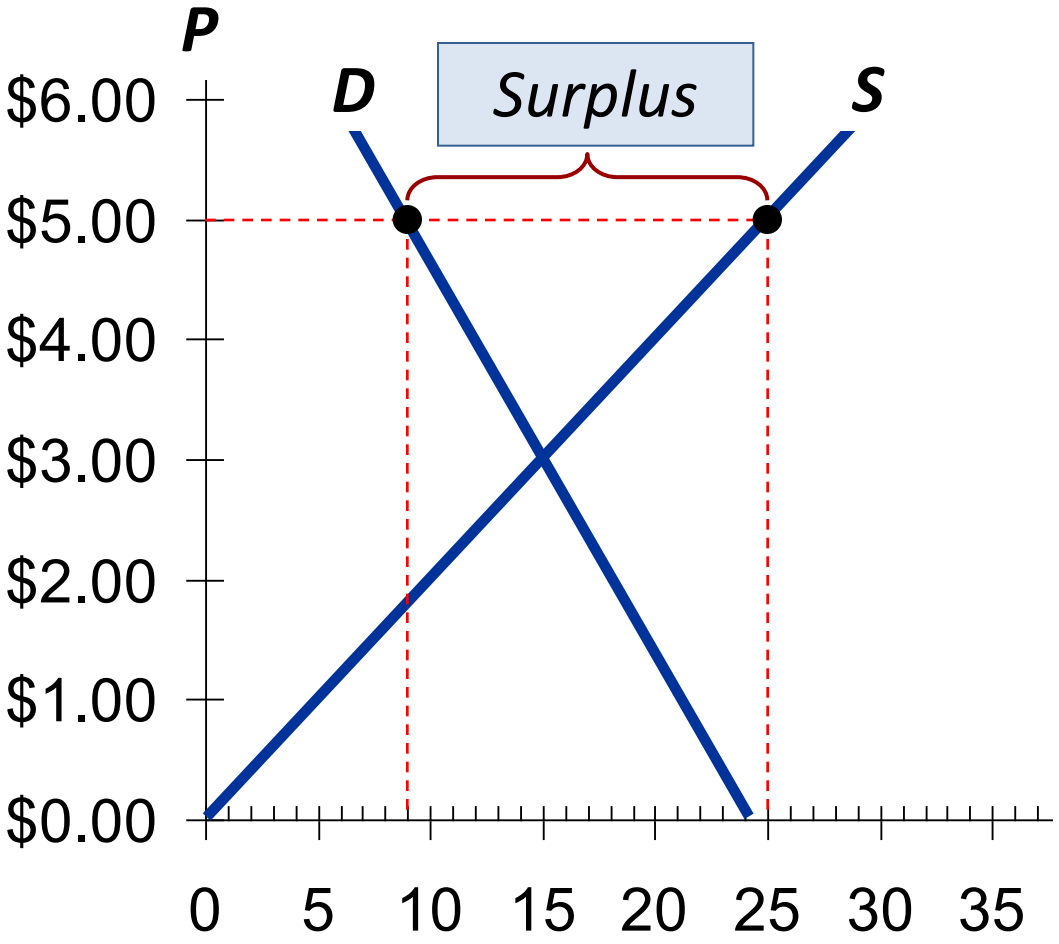


Law of Supply and Demand

The claim that the price of any good adjusts to bring the quantity supplied and the quantity demanded for that good into balance.

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

when quantity supplied is greater than quantity demanded



Example:

If P = \$5,

then

Q_D = 9 lattes

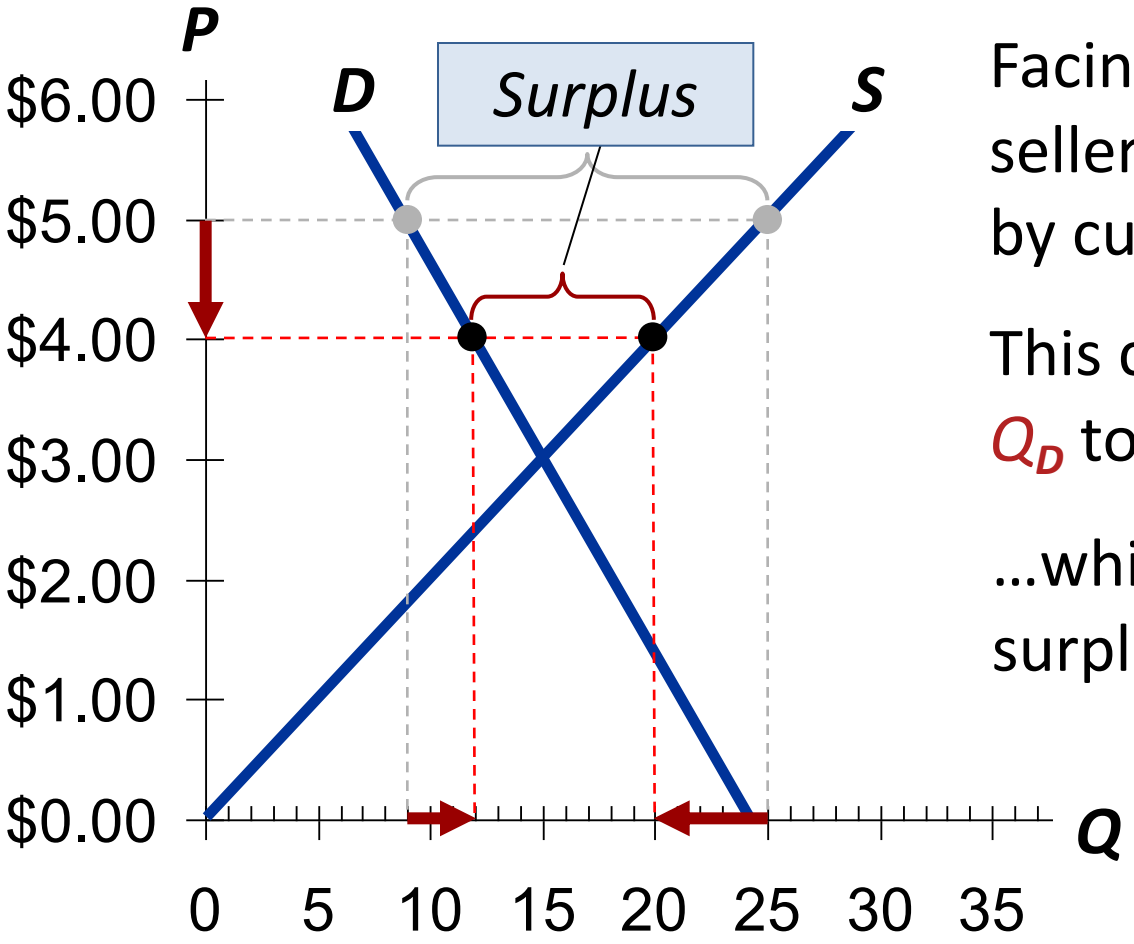
and

Q_S = 25 lattes

resulting in a surplus of 16 lattes

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

when quantity supplied is greater than quantity demanded



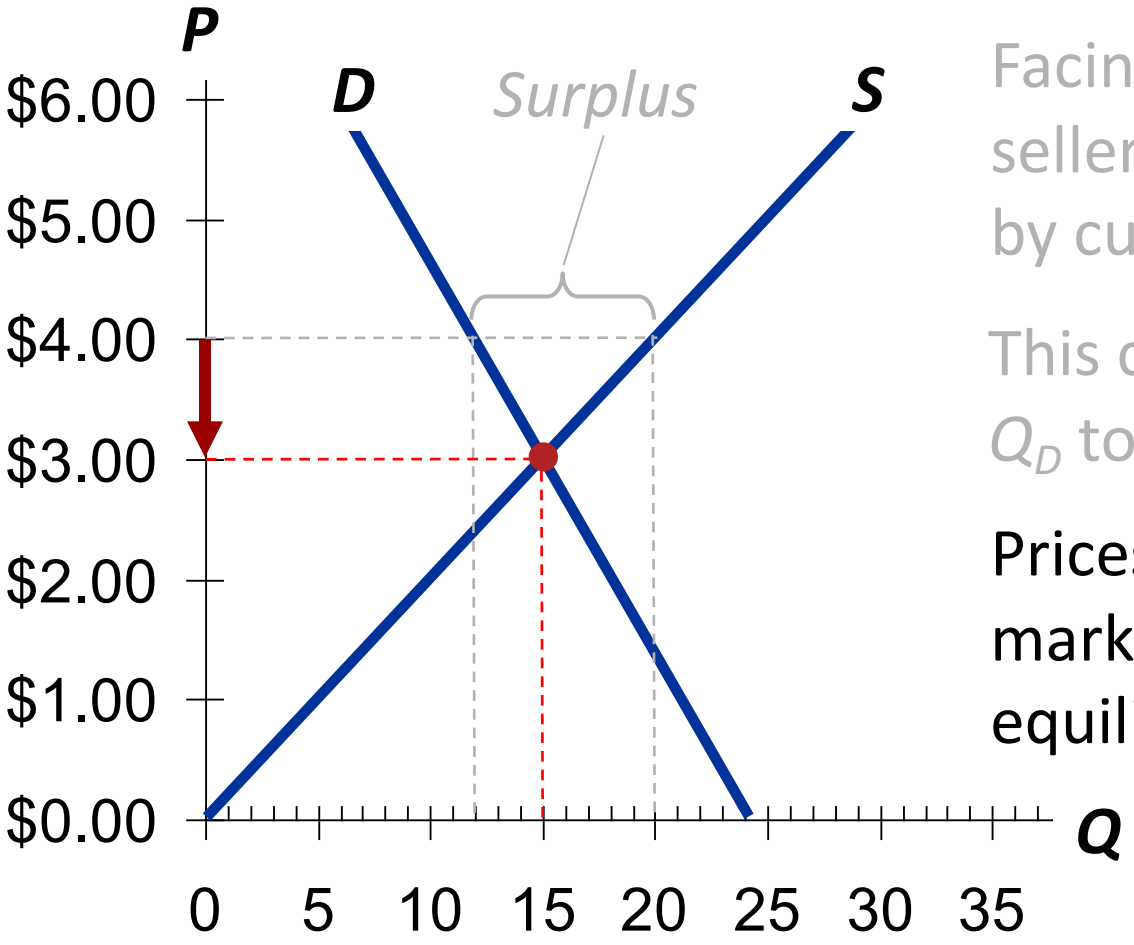
Facing a surplus, sellers try to increase sales by cutting price.

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



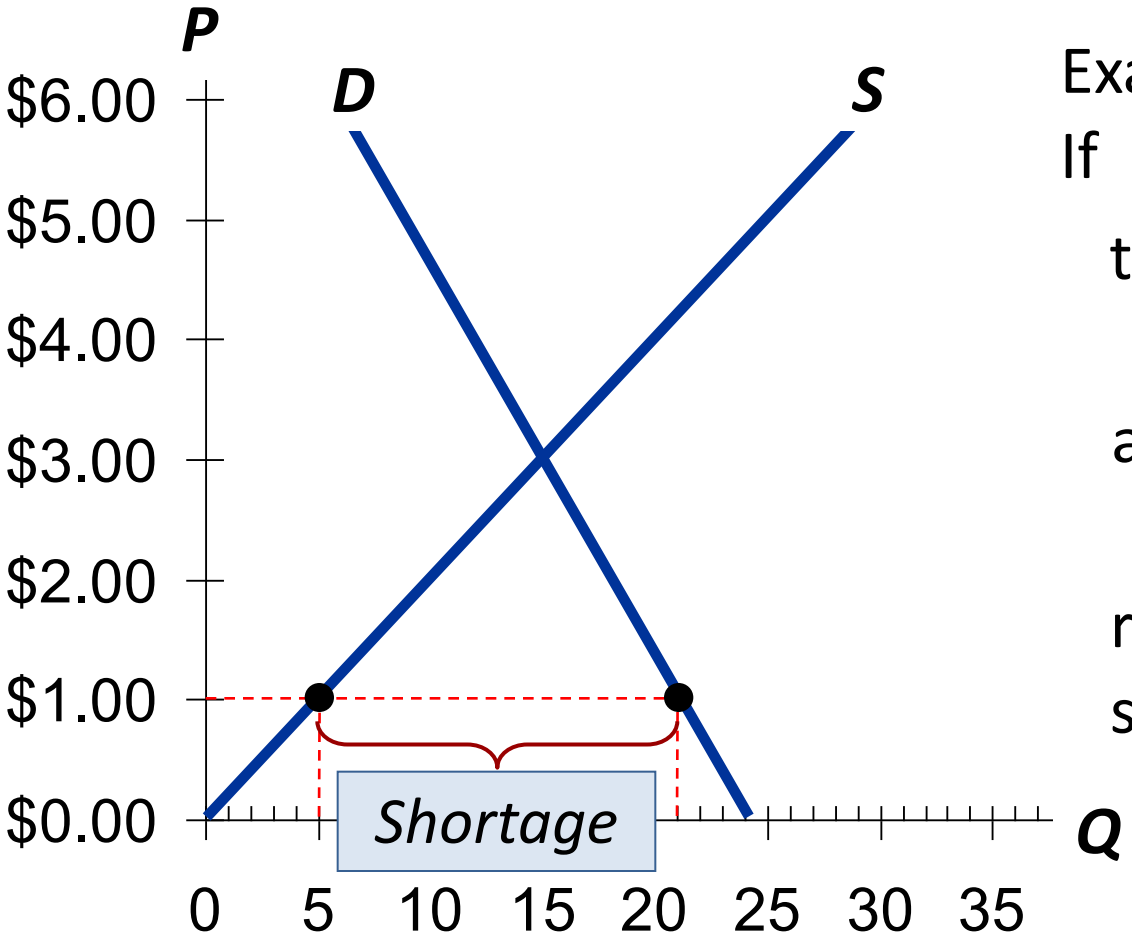
Facing a surplus, sellers try to increase sales by cutting price.

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

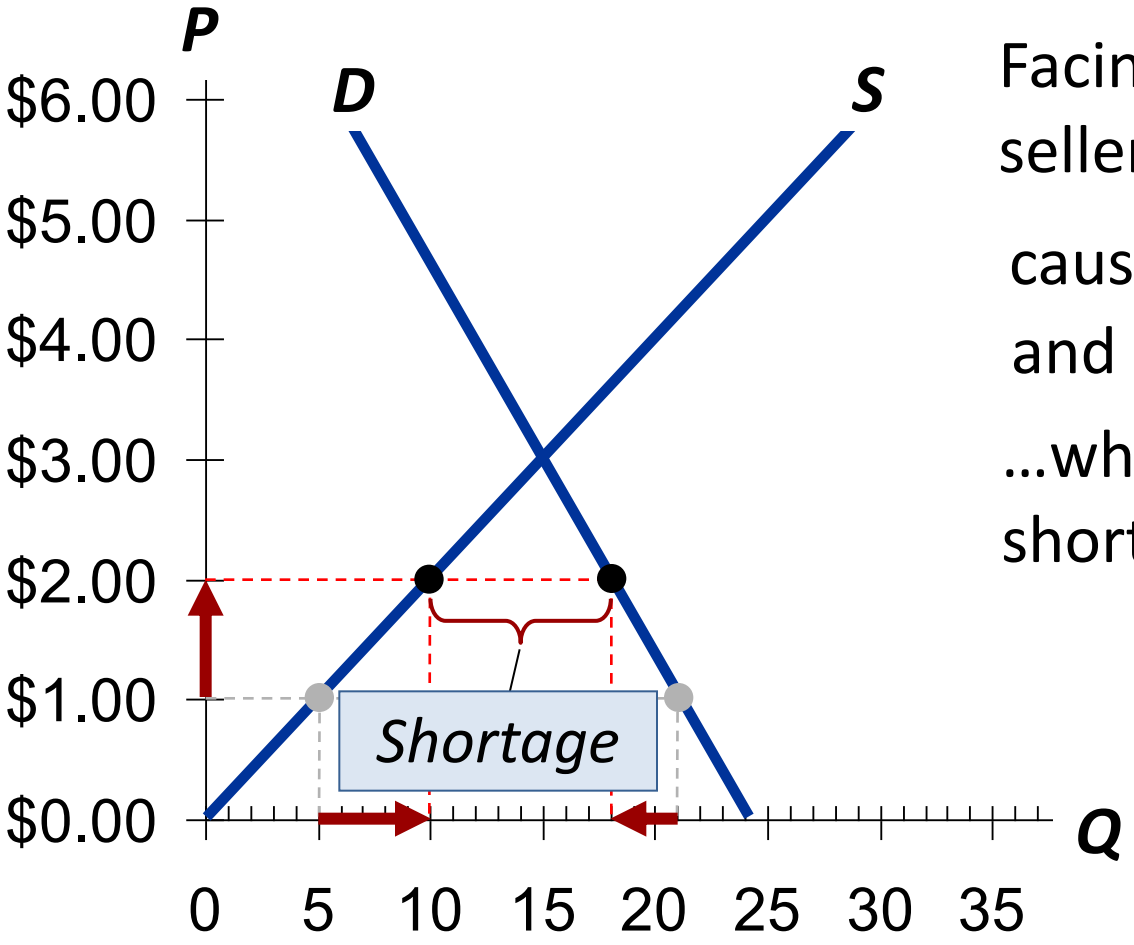
and

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,

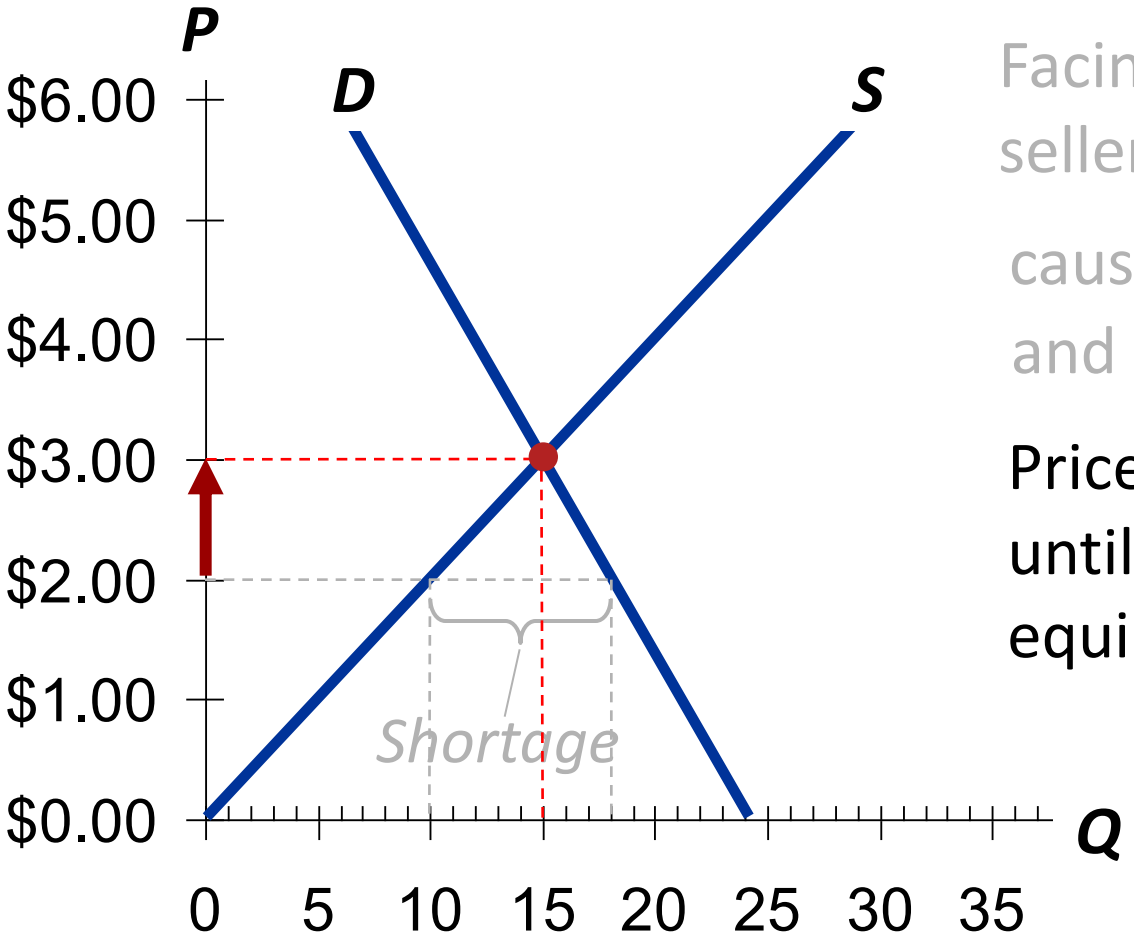
causing Q_D to fall

and Q_S to rise,

…which reduces the shortage.

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

when quantity demanded is greater than quantity supplied



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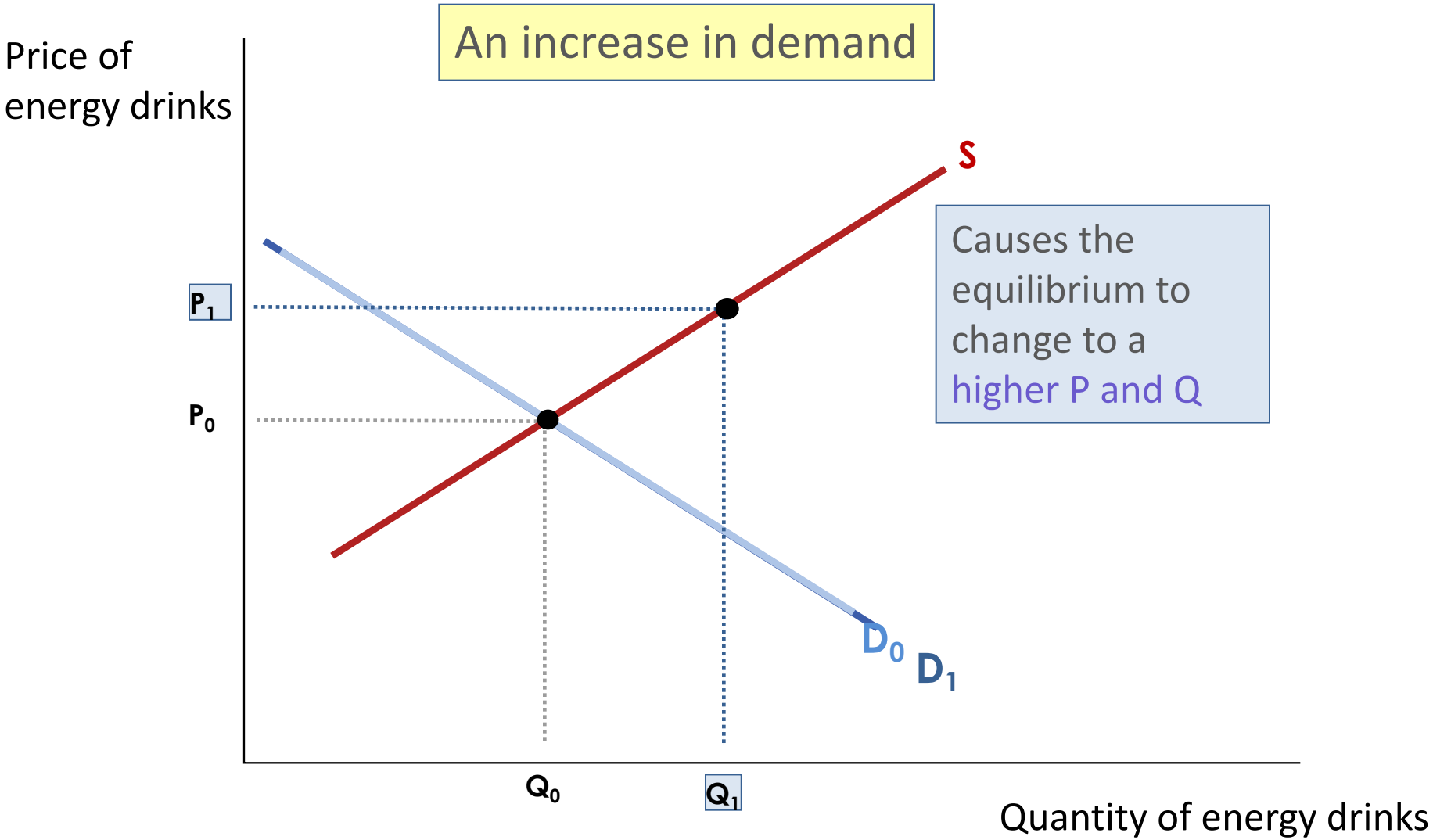
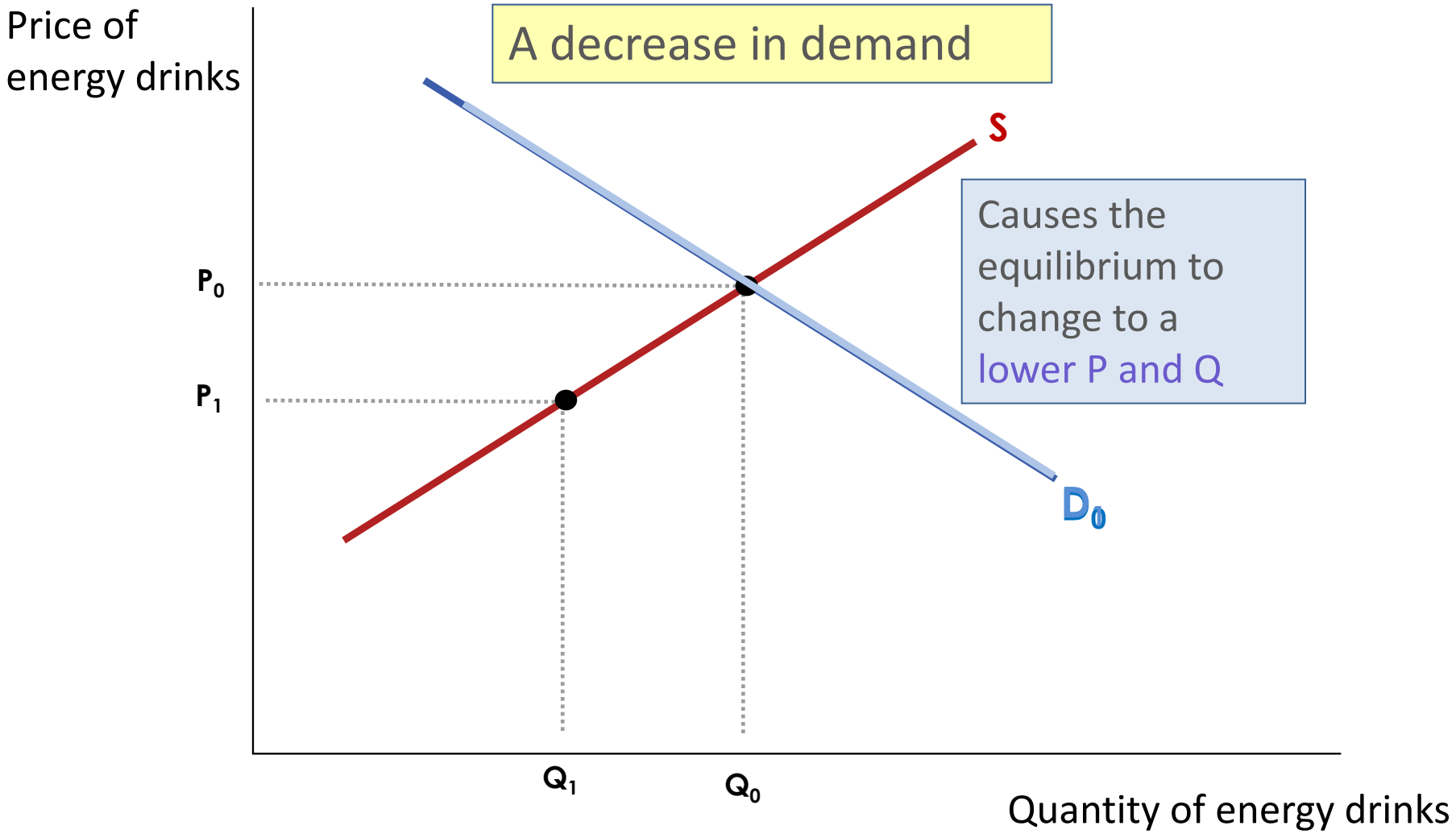
Prices continue to rise until market reaches equilibrium.

Shifting Demand and Supply Curves



Shifting Demand and Supply Curves



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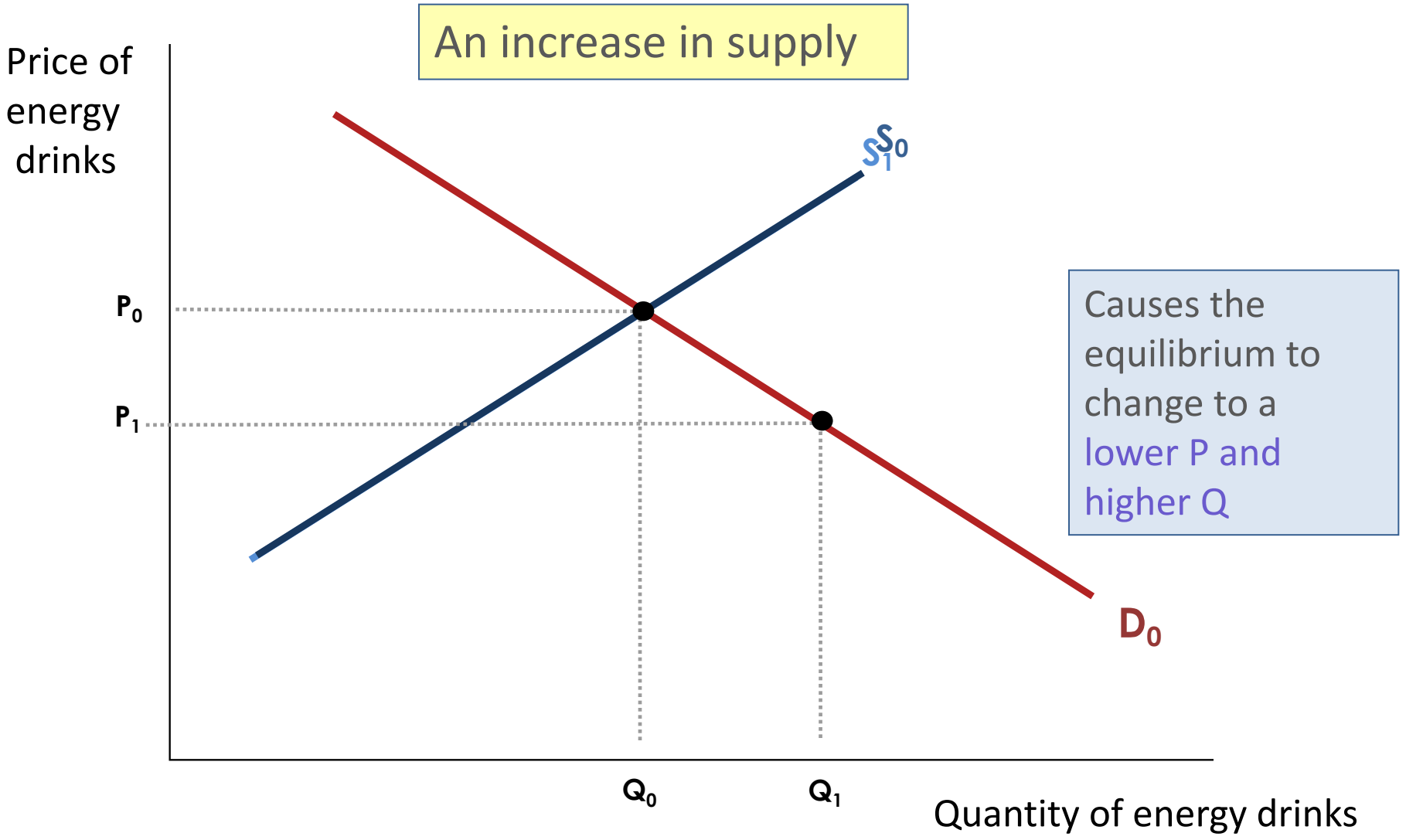
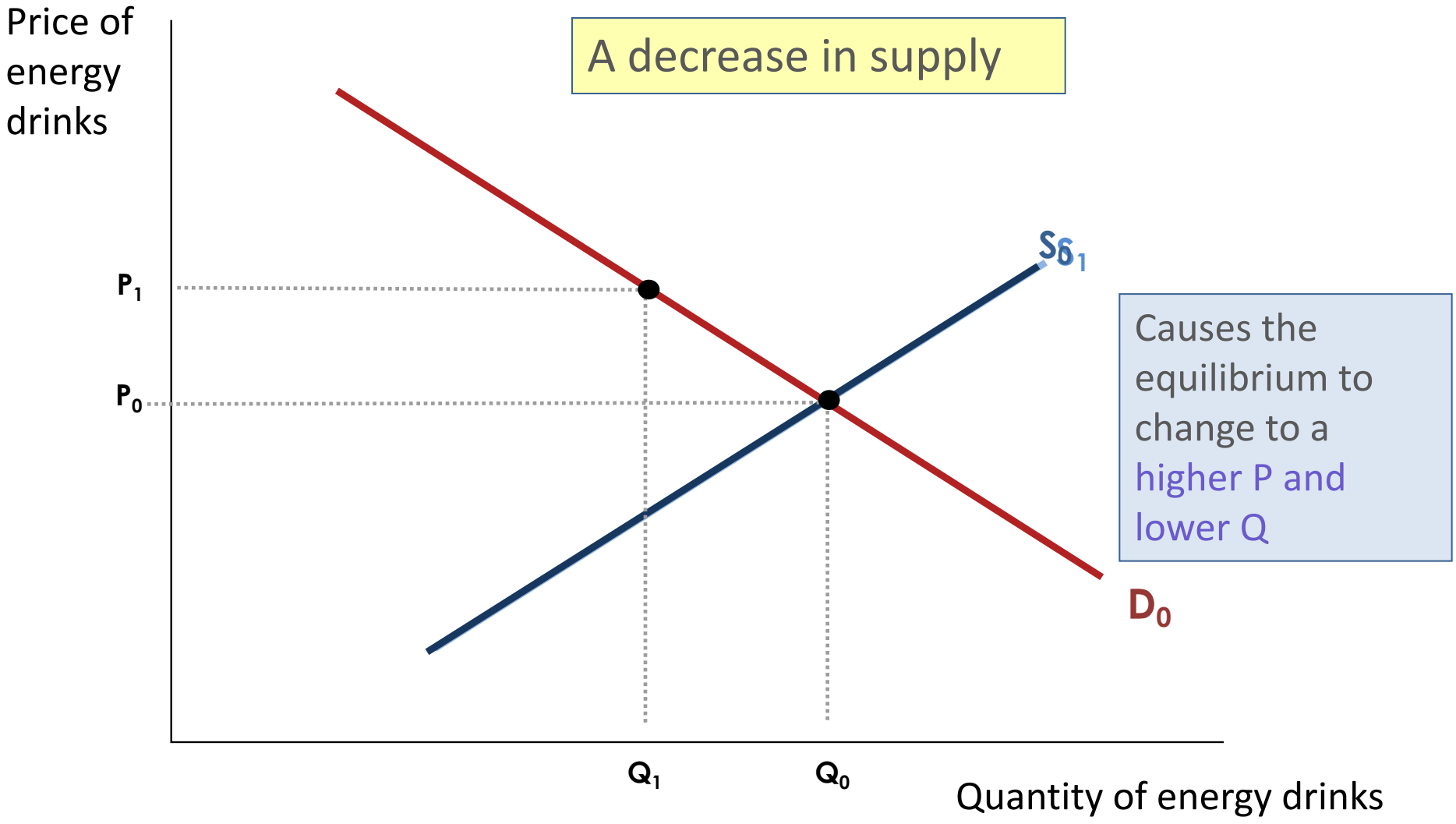


Shifting Demand and Supply Curves



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.

Terminology: Shifts vs. Movement along Supply and Demand curves

- A shift in a demand (supply) curve is called a "Change in Demand (Supply)"

Not to be confused with:

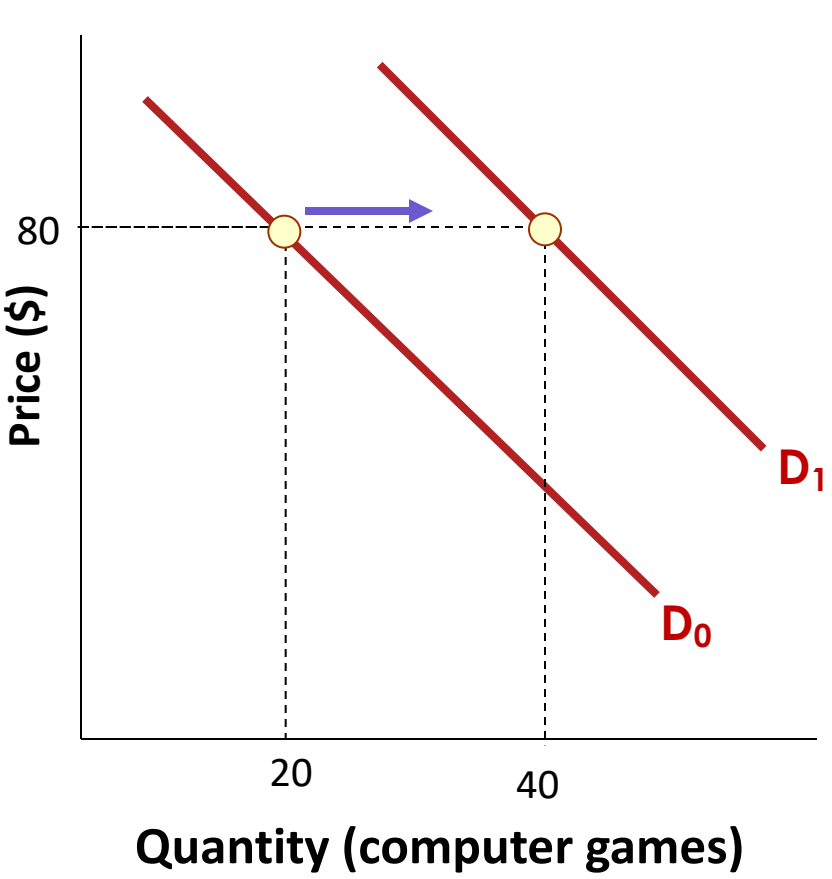
- Movement along a demand (supply) curve is called "Change in Quantity Demanded (Supplied)"

Equilibrium and Total Surplus

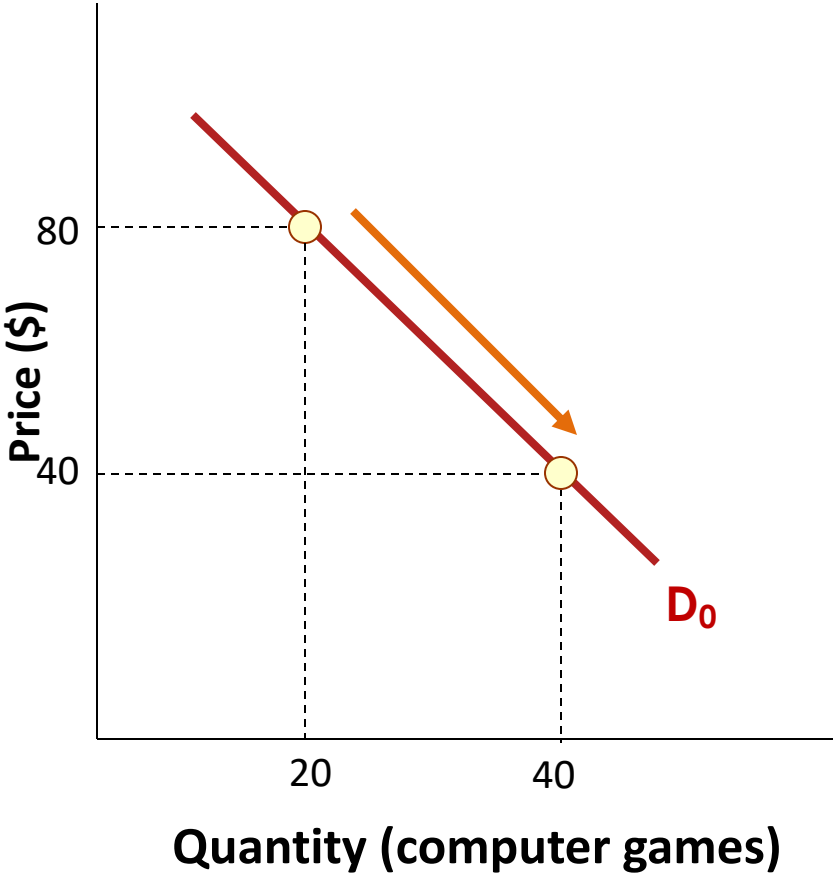
- Equilibrium in a free market yields two important results:
  - Goods must be produced at the lowest possible cost.
  - Goods must satisfy the highest valued demands.
- These results indicate that total surplus (both of the consumer and producer) is maximized in free markets.

Changes in Demand vs. Change in Quantity Demanded

Change in Demand

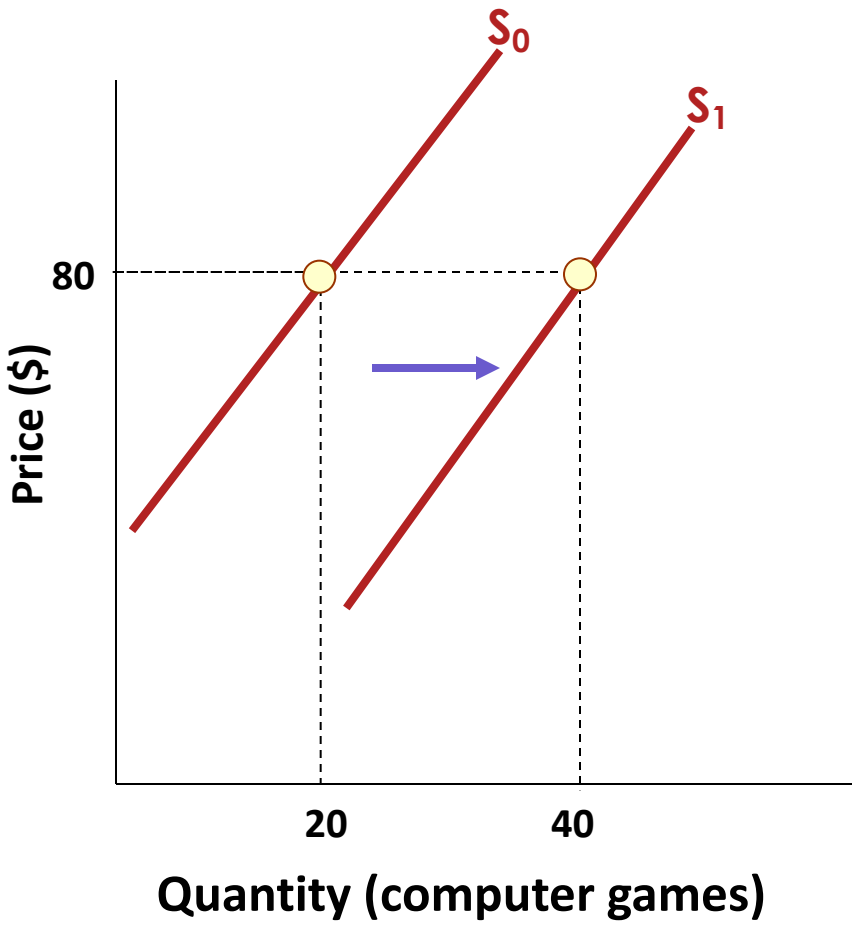


Change in Quantity Demanded

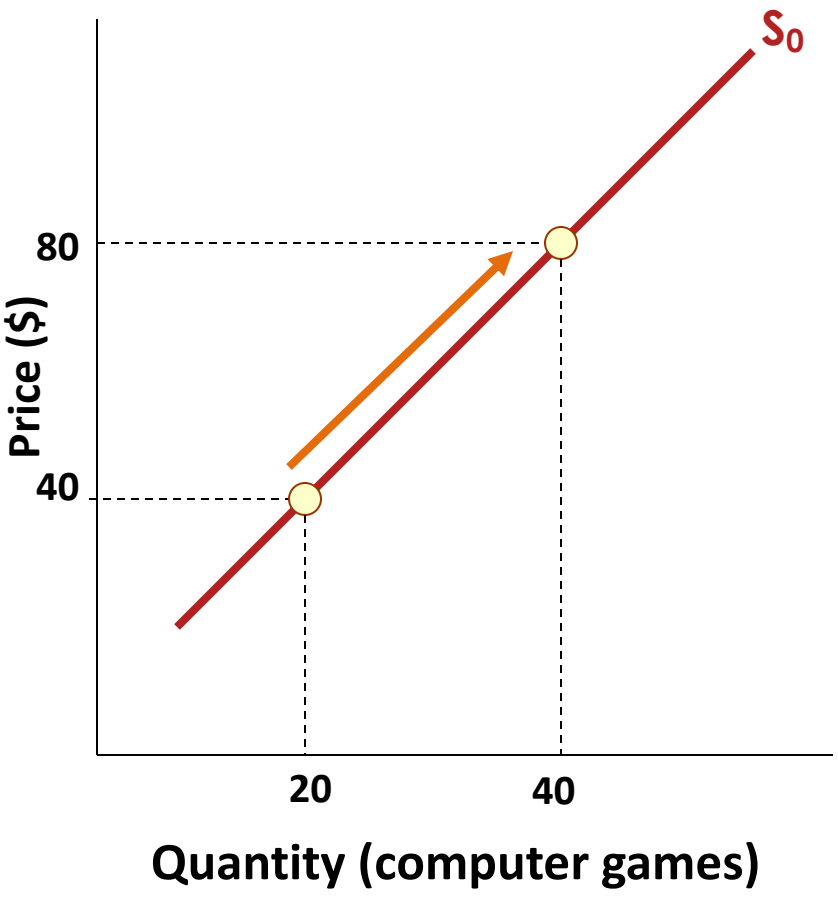


Changes in Supply vs. Change in Quantity Supplied

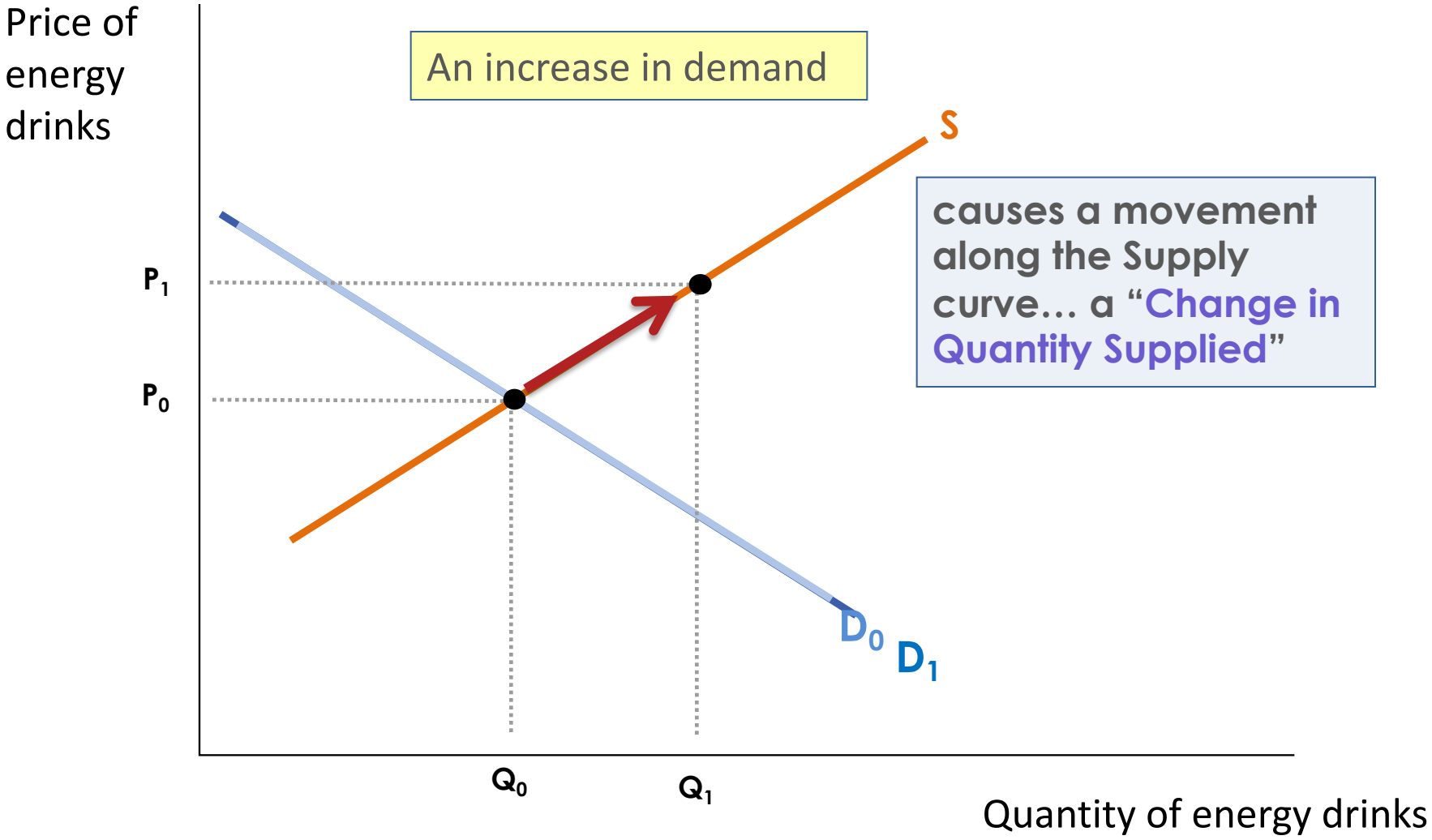
Change in Supply



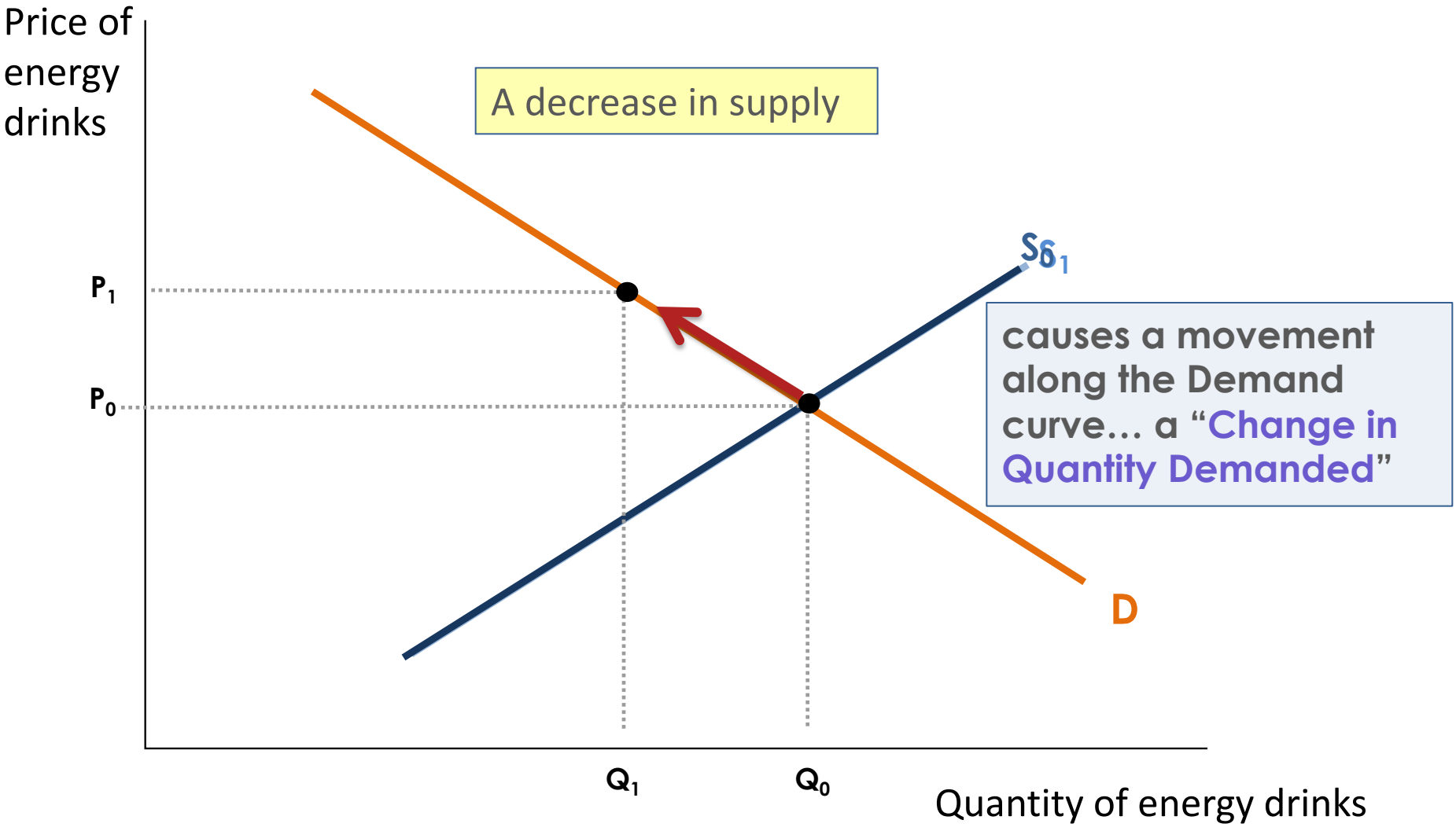
Change in Quantity Supplied



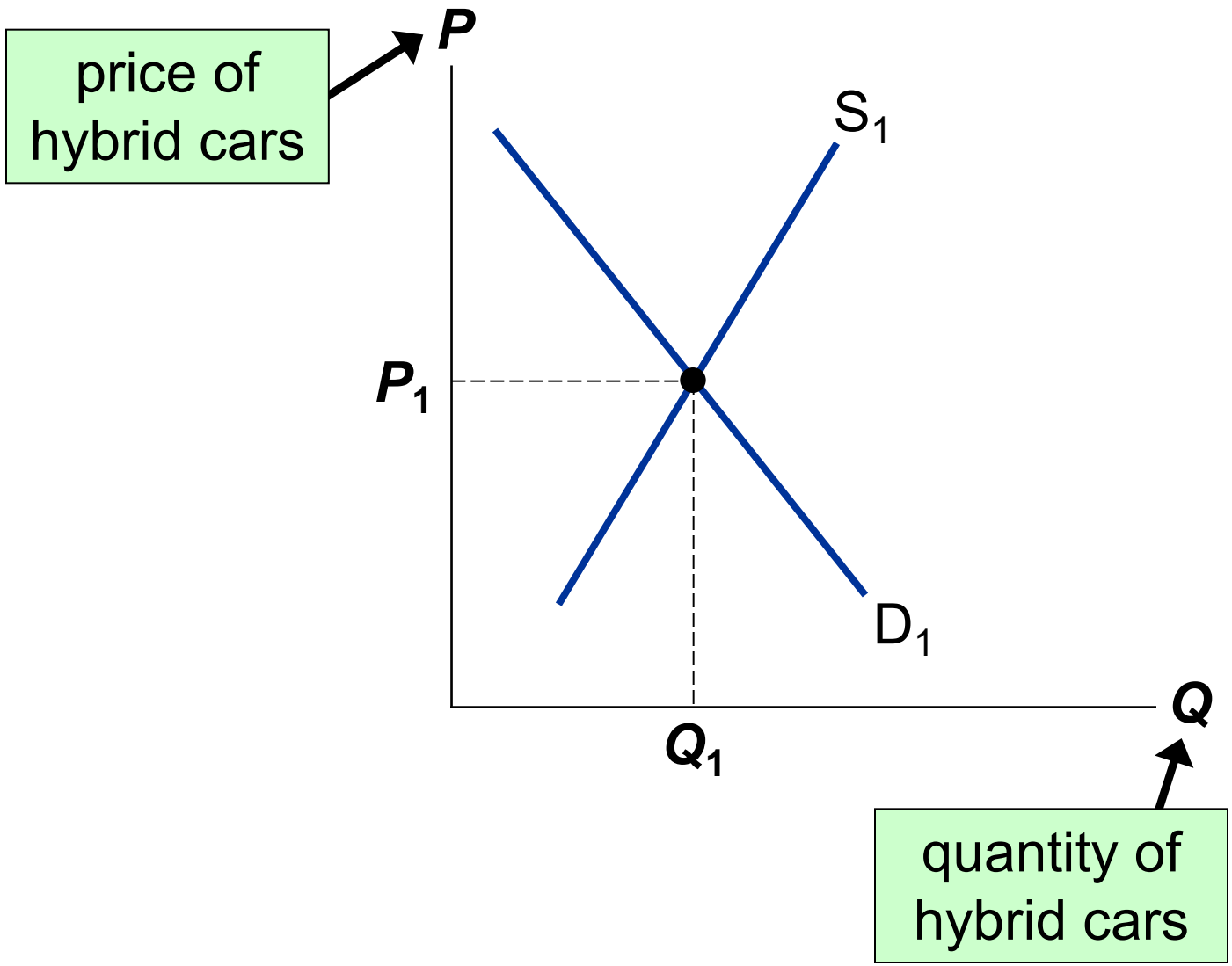
Shifting Demand and Moving along Supply Curve



Shifting Supply and Moving along Demand Curve



Example (1): The Market for Hybrid Cars



Example: The Market for Hybrid Cars

EVENT TO BE ANALYZED:

Increase in price of gas.

STEP 1:

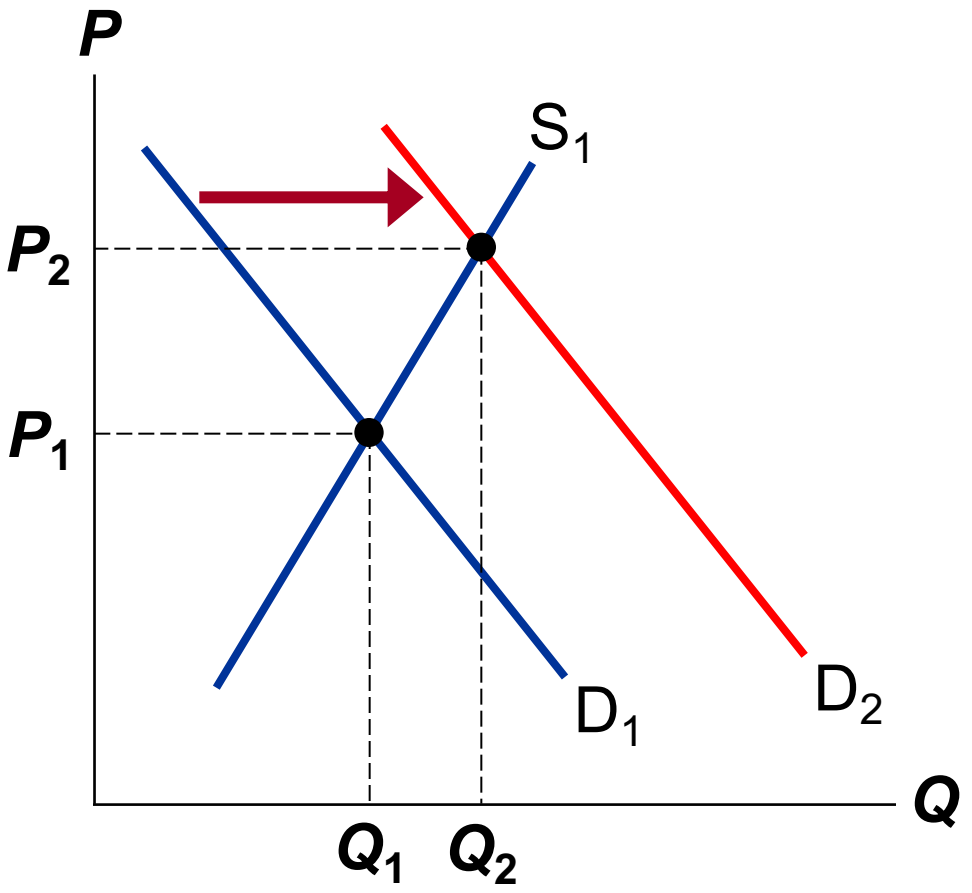
D curve shifts

STEP 2:

D shifts right

STEP 3:

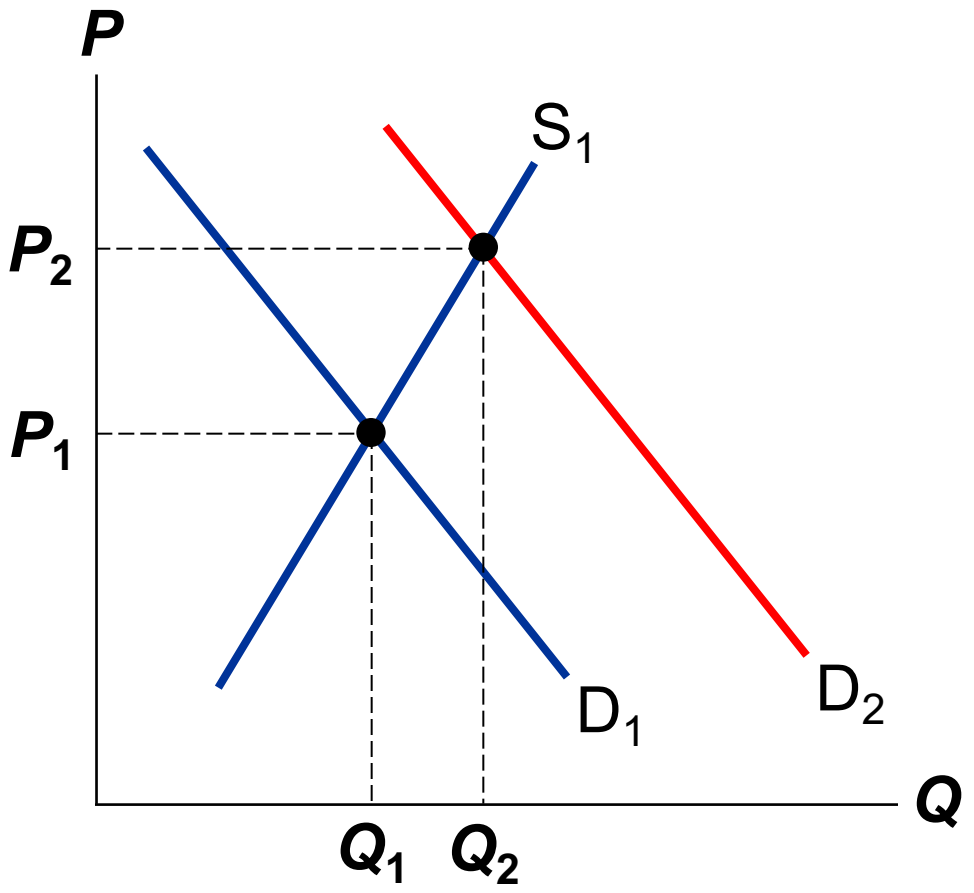
The shift causes an increase in price and quantity of hybrid cars.



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.



Example (2): A Shift in Supply

EVENT: New technology reduces cost of producing hybrid cars.

STEP 1:

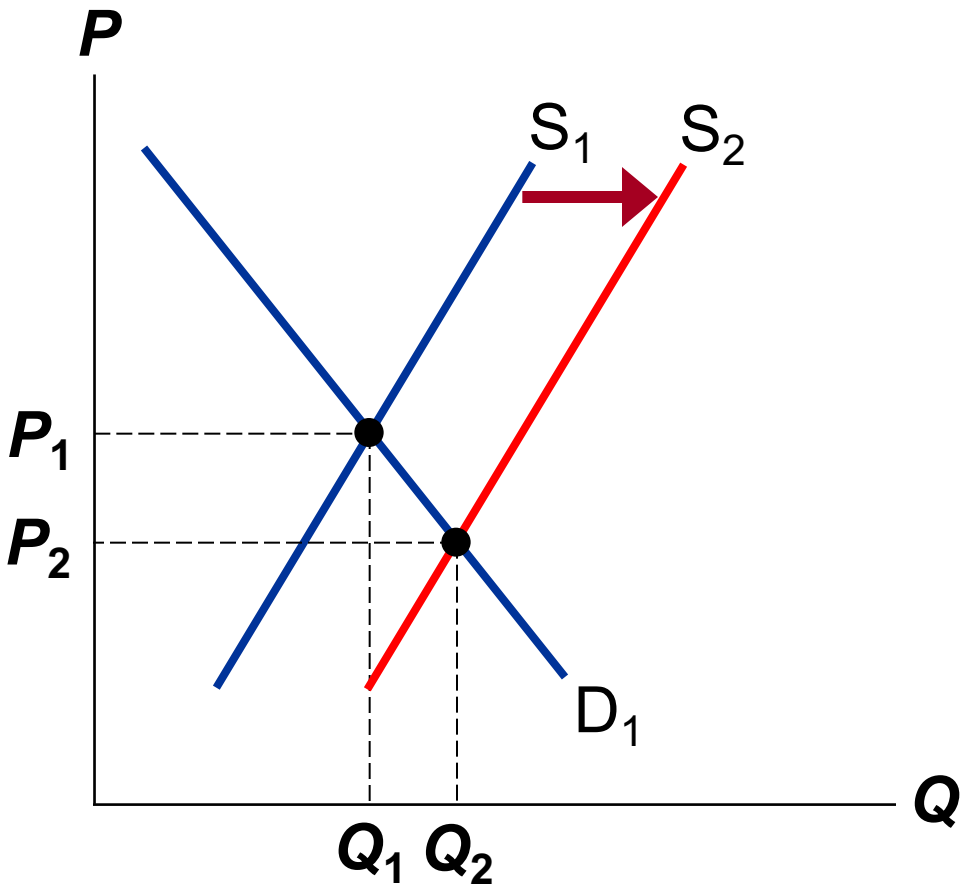
S curve shifts

STEP 2:

S shifts right

STEP 3:

The shift causes price to fall and quantity to rise.



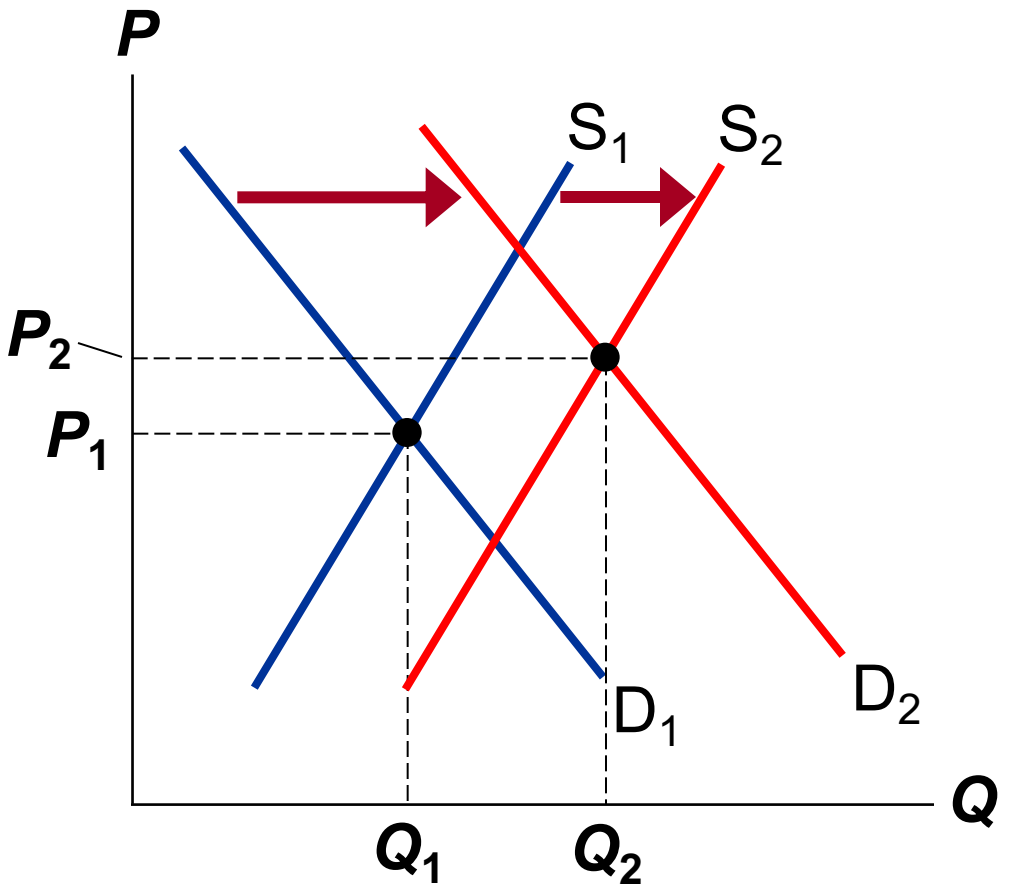
Example (3): A Shift in Both Supply and Demand

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.

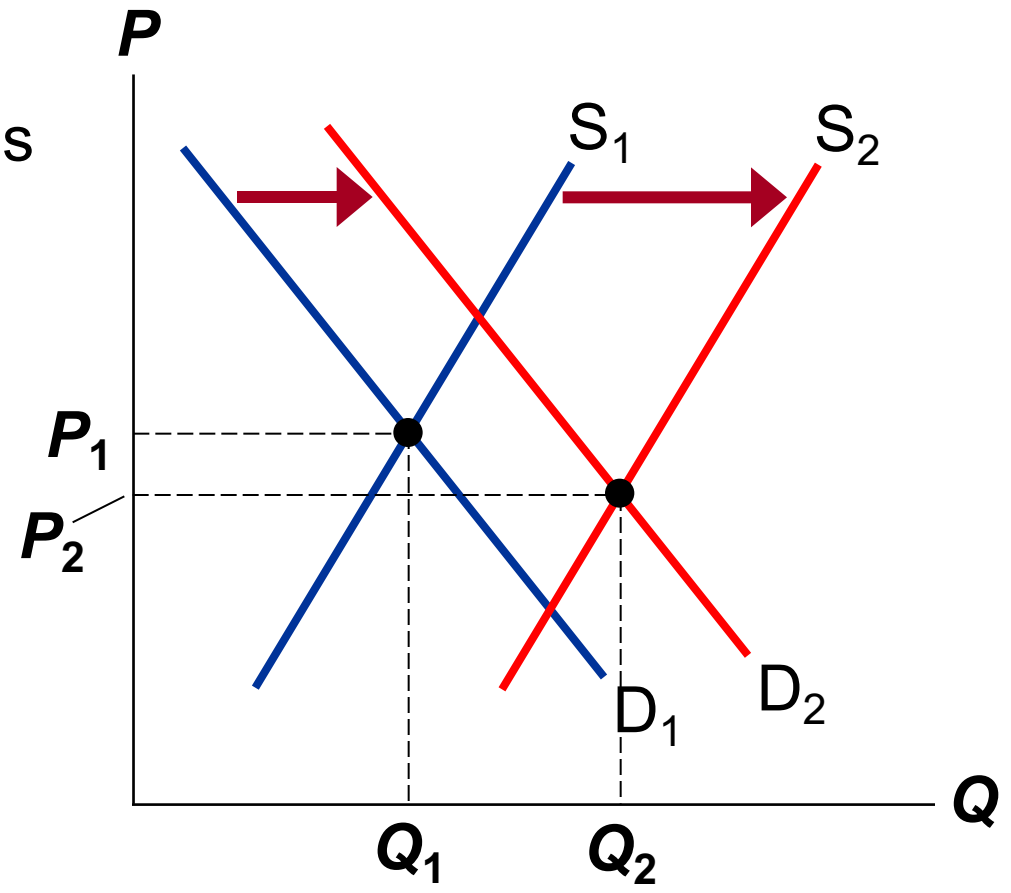


Example (3): A Shift in Both Supply and Demand

EVENTS:
price of gas rises AND
new technology reduces
production costs

STEP 3, cont.

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



Conclusion

- 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.

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.

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.

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.

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.