

THIRD EDITION

ECONOMICS

and

MICROECONOMICS

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Chapter 3

Supply and Demand

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WHAT YOU WILL LEARN IN THIS CHAPTER

- What a **competitive market** is and how it is described by the **supply and demand model**
- What the **demand curve** and **supply curve** are
- The difference between **movements along a curve** and **shifts of a curve**
- How the supply and demand curves determine a market's **equilibrium price** and **equilibrium quantity**
- In the case of a **shortage** or **surplus**, how price moves the market back to equilibrium

Supply and Demand

- A **competitive market**:
 - *Many* buyers and sellers
 - *Same* good or service
- The **supply and demand model** is a model of how a competitive market works.
- Five key elements:
 - Demand curve
 - Supply curve
 - Demand and supply curve shifts
 - Market equilibrium
 - Changes in the market equilibrium

Demand Schedule

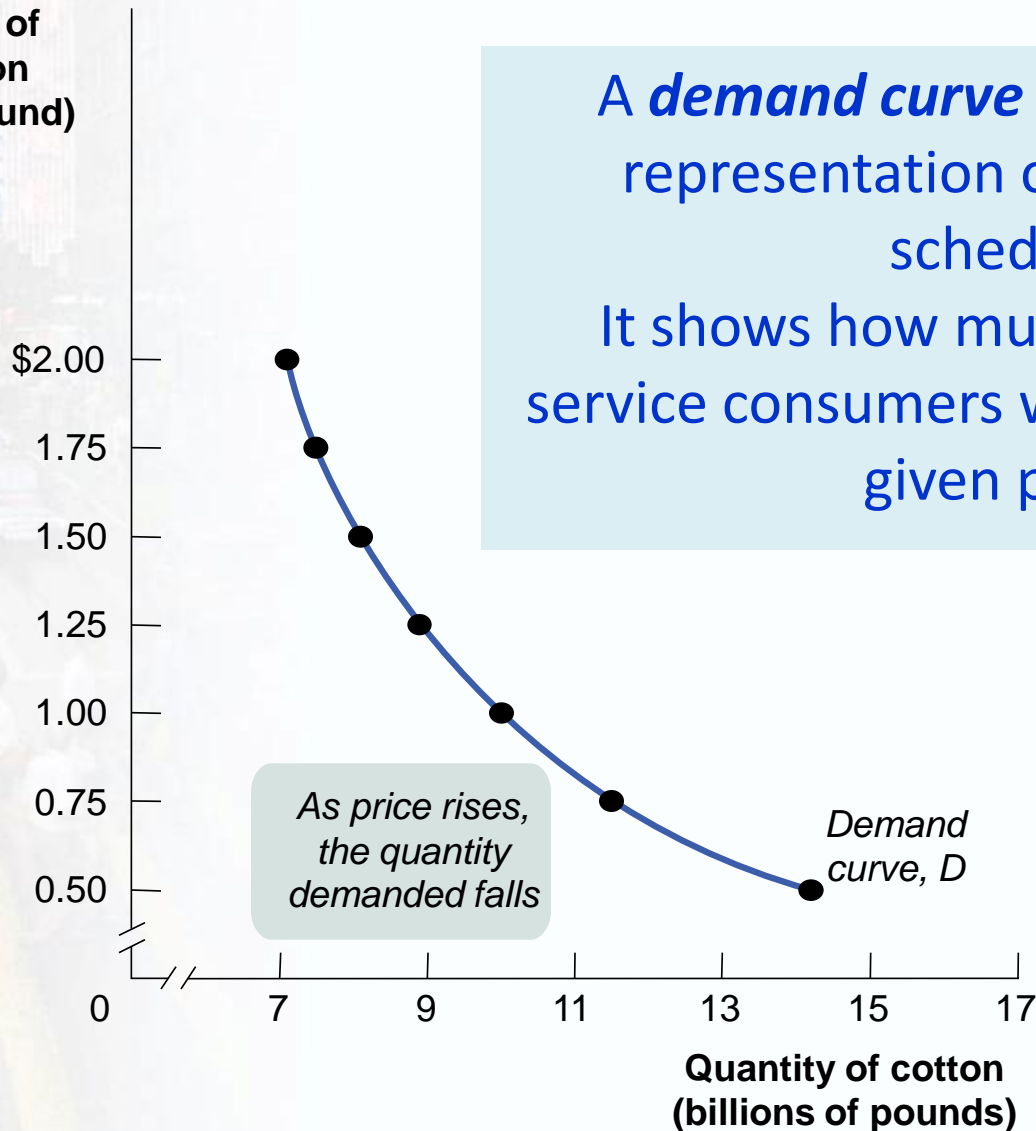
- A demand schedule shows how much of a good or service consumers will want to buy at different prices.

Demand Schedule for Cotton

Price of cotton (per pound)	Quantity of cotton demanded (billions of pounds)
\$2.00	7.1
1.75	7.5
1.50	8.1
1.25	8.9
1.00	10.0
0.75	11.5
0.50	14.2

Demand Curve

Price of cotton
(per pound)

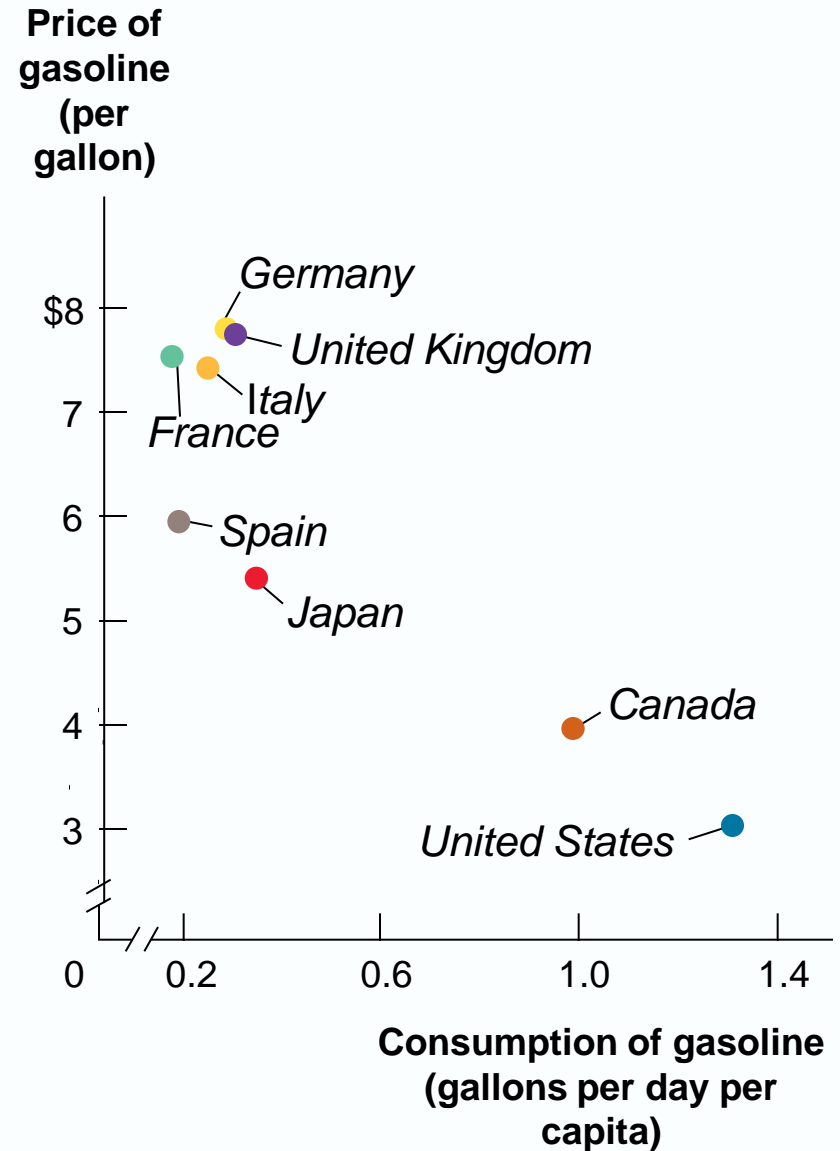


A *demand curve* is the graphical representation of the demand schedule.

It shows how much of a good or service consumers want to buy at any given price.

GLOBAL COMPARISON: Pay More, Pump Less...

- Because of high taxes, gasoline and diesel fuel are more than twice as expensive in most European countries as in the United States.
- According to the law of demand, Europeans should buy less gasoline than Americans, and they do.
- Europeans consume less than half as much fuel as Americans, mainly because they drive smaller cars with better mileage.



An Increase in Demand

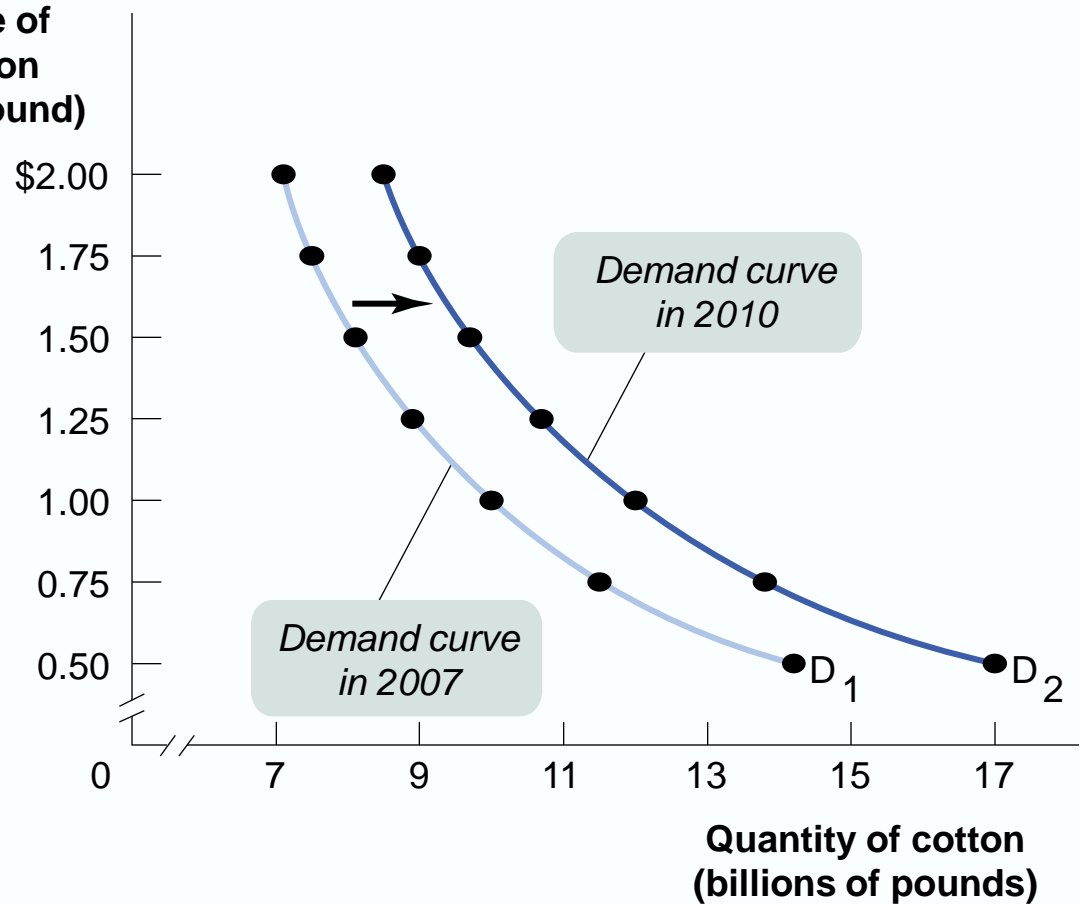
- An increase in population and other factors generate an increase in demand.
 - a rise in the quantity demanded at any given price
- This is represented by the two demand schedules—one showing demand in 2007, before the rise in population, the other showing demand in 2010, after the rise in population.

Demand Schedules for Cotton		
Price of cotton (per pound)	Quantity of cotton demanded (billions of pounds)	
	in 2007	in 2010
\$2.00	7.1	8.5
1.75	7.5	9.0
1.50	8.1	9.7
1.25	8.9	10.7
1.00	10.0	12.0
0.75	11.5	13.8
0.50	14.2	17.0

An Increase in Demand

Increase in population →
more cotton clothing users

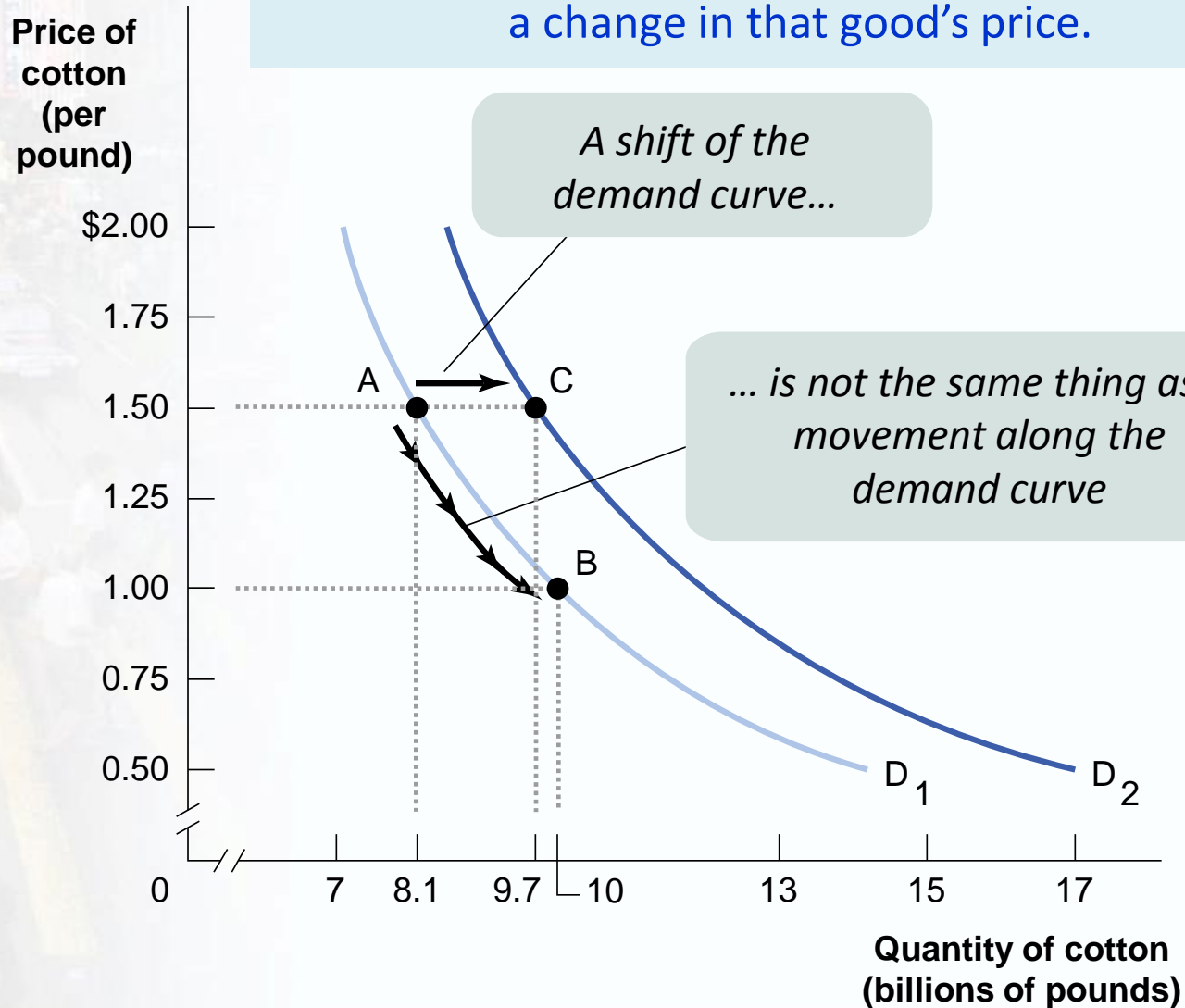
Price of cotton
(per pound)



A **shift of the demand curve** is a change in the quantity demanded at any given price, represented by the change of the original demand curve to a new position, denoted by a new demand curve.

Movement Along the Demand Curve

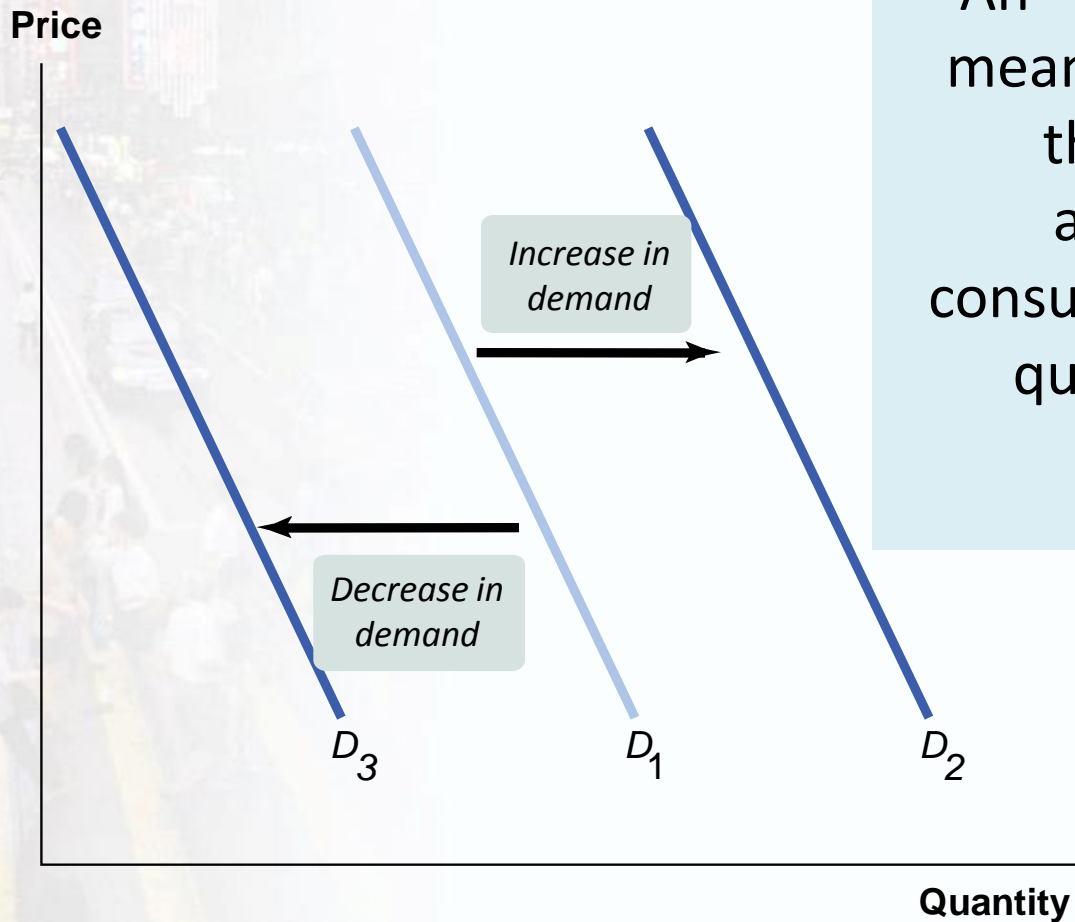
A movement along the demand curve is a change in the quantity demanded of a good that is the result of a change in that good's price.



A shift of the demand curve...

... is not the same thing as a movement along the demand curve

Shifts of the Demand Curve



An “**increase in demand**” means a *rightward* shift of the demand curve: at any given price, consumers demand a larger quantity than before.
 $(D_1 \rightarrow D_2)$

What Causes a Demand Curve to Shift?

Changes in the Prices of Related Goods

- **Substitutes:** Two goods are **substitutes** if a fall in the price of one of the goods makes consumers less willing to buy the other good.
- **Complements:** Two goods are **complements** if a fall in the price of one good makes people more willing to buy the other good.

What Causes a Demand Curve to Shift?

Changes in Income

- **Normal Goods:** When a rise in income increases the demand for a good — the normal case — we say that the good is a **normal good**.
- **Inferior Goods:** When a rise in income decreases the demand for a good, it is an **inferior good**.

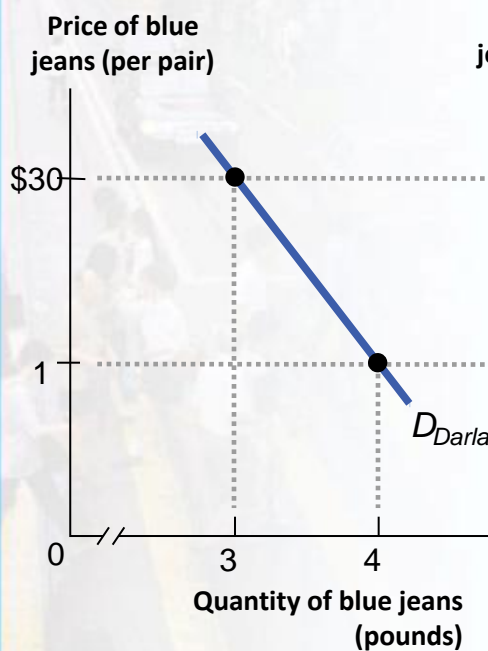
Changes in Tastes

Changes in Expectations

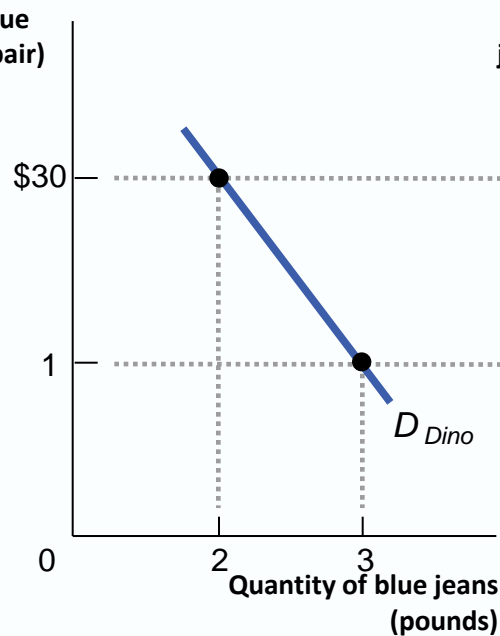
Individual Demand Curve and the Market Demand Curve

The market demand curve is the *horizontal sum* of the individual demand curves of all consumers in that market.

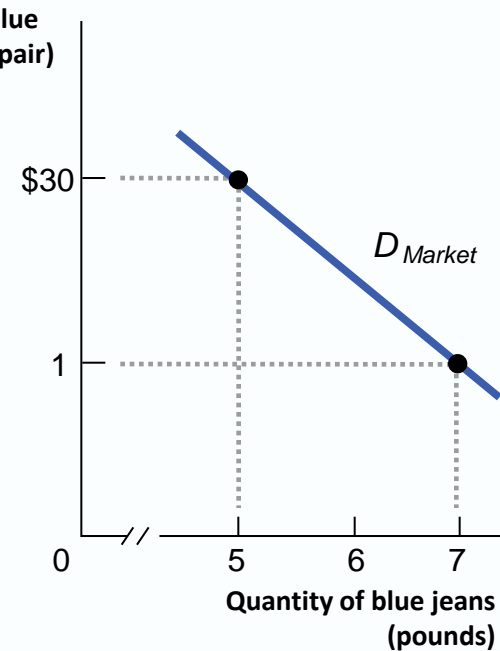
(a)
Darla's Individual
Demand Curve



(b)
Dino's Individual
Demand Curve



(c)
Market Demand Curve



ECONOMICS IN ACTION

Beating the Traffic

- If we think of an auto trip to the city center as a good that people consume, we can use the economics of demand to analyze anti-traffic policies.
- One common strategy is to reduce the demand for auto trips by lowering the prices of substitutes.
 - Many metropolitan areas subsidize bus and rail service, hoping to lure commuters out of their cars.

ECONOMICS IN ACTION

Beating the Traffic

- An alternative is to raise the price of complements: several major U.S. cities impose high taxes on commercial parking garages and impose short time limits on parking meters, both to raise revenue and to discourage people from driving into the city.

ECONOMICS IN ACTION

Beating the Traffic

- A few major cities—including Singapore, London, Oslo, Stockholm, and Milan—have been willing to adopt a direct and politically controversial approach: reducing congestion by raising the price of driving.
 - Under “congestion pricing” (or “congestion charging” in the United Kingdom), a charge is imposed on cars entering the city center during business hours.
- The current daily cost of driving in London ranges from £9 to £12. And drivers who are caught not paying are issued a fine of £120 for each transgression.

ECONOMICS IN ACTION

Beating the Traffic

- Studies have shown that after the implementation of congestion pricing, traffic does indeed decrease.
 - The introduction of its congestion charge in 2003 immediately reduced traffic in the London city center by about 15%, with overall traffic falling by 21% between 2002 and 2006.
 - *And* there was increased use of substitutes, such as public transportation, bicycles, motorbikes, and ride-sharing.

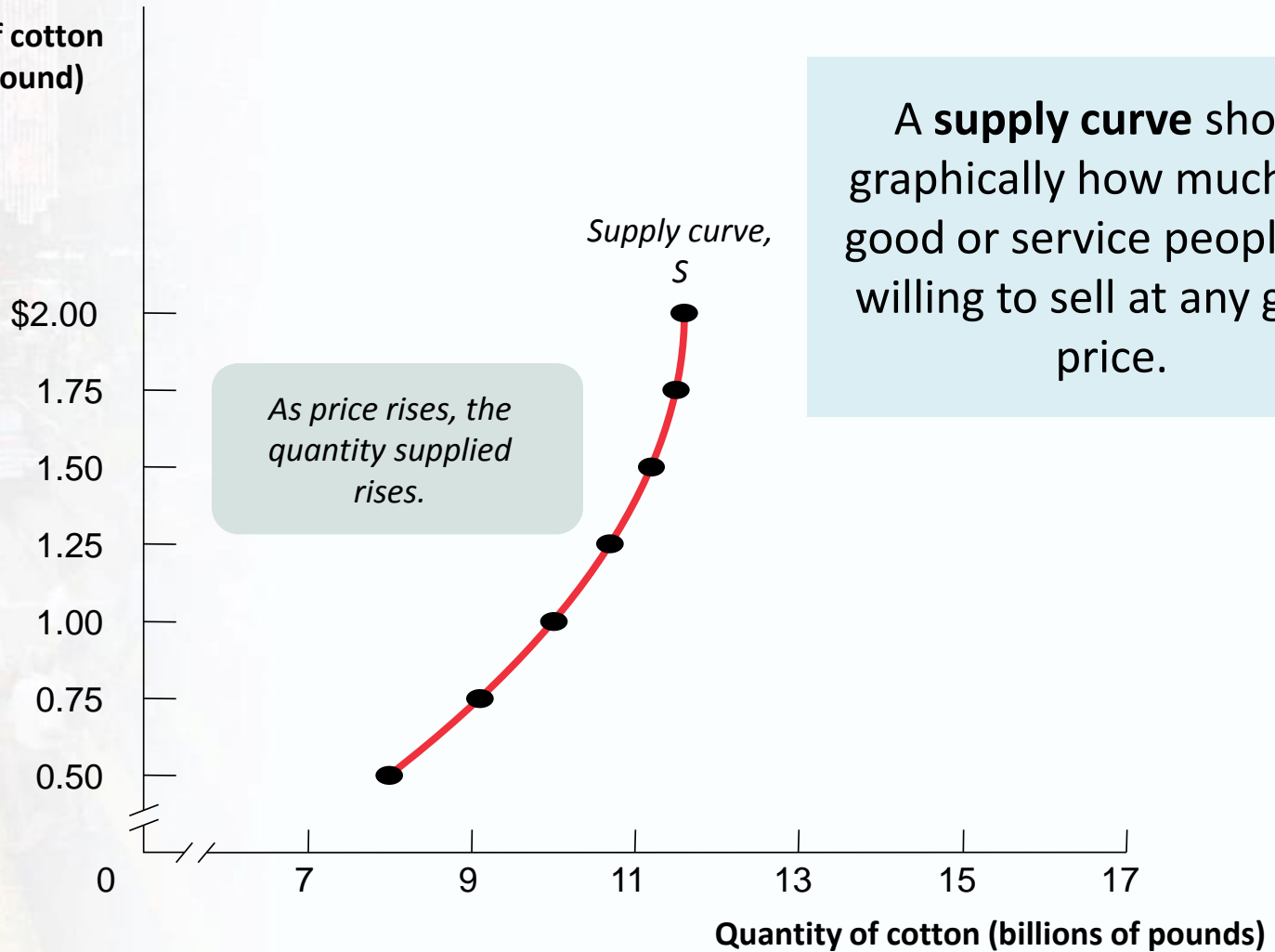
Supply Schedule

- A supply schedule shows how much of a good or service would be supplied at different prices.

Supply Schedule for Cotton	
Price of cotton (per pound)	Quantity of cotton supplied (billions of pounds)
\$2.00	11.6
1.75	11.5
1.50	11.2
1.25	10.7
1.00	10.0
0.75	9.1
0.50	8.0

Supply Curve

Price of cotton
(per pound)



A **supply curve** shows graphically how much of a good or service people are willing to sell at any given price.

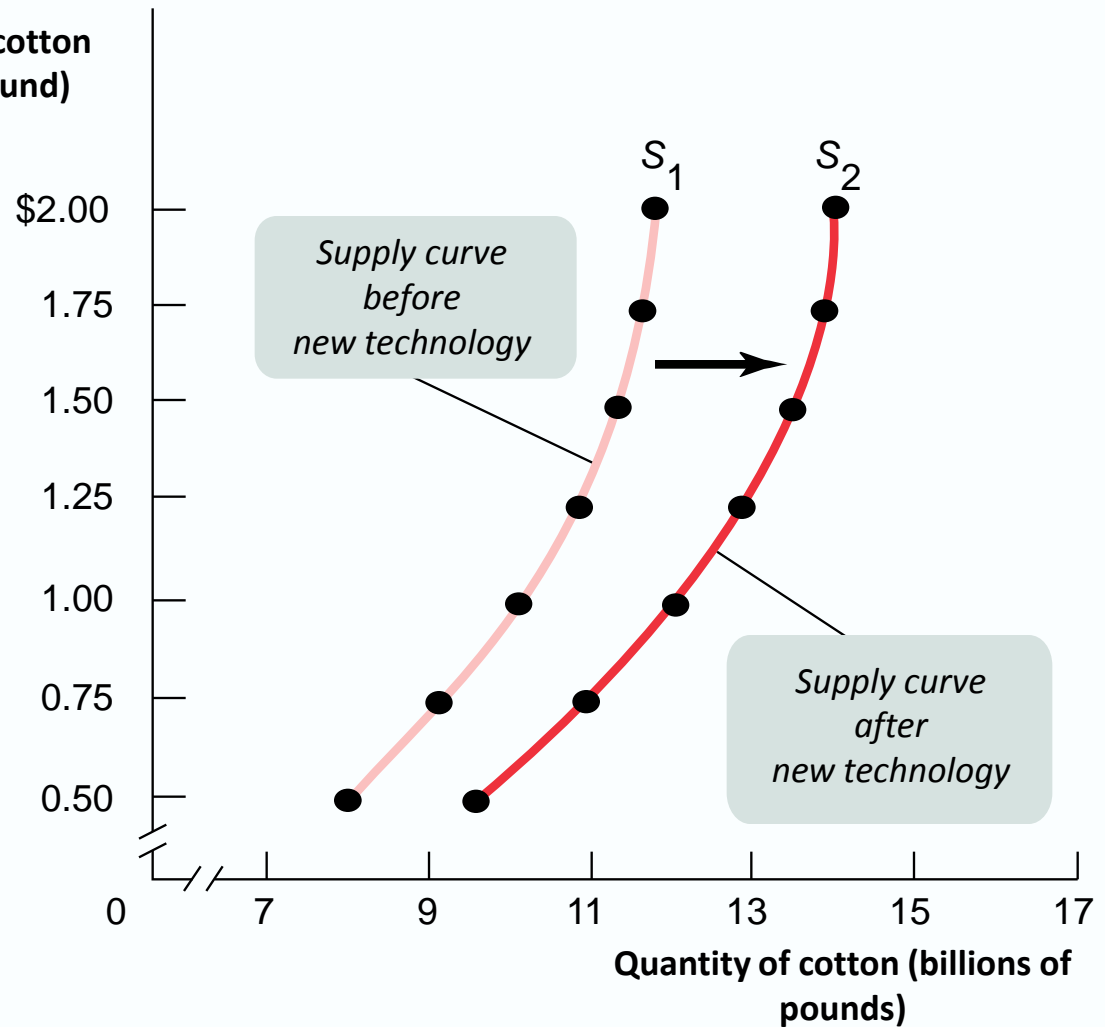
An Increase in Supply

- The adoption of improved cotton-growing technology generated an increase in supply — a rise in the quantity supplied at any given price.
- This event is represented by the two supply schedules — and their corresponding supply curves
 - one showing supply *before* the new technology was adopted
 - the other showing supply *after* the new technology was adopted

Supply Schedule for Cotton		
Price of cotton (per pound)	Quantity of cotton supplied (billions of pounds)	
	Before new technology	After new technology
\$2.00	11.6	13.9
1.75	11.5	13.8
1.50	11.2	13.4
1.25	10.7	12.8
1.00	10.0	12.0
0.75	9.1	10.9
0.50	8.0	9.6

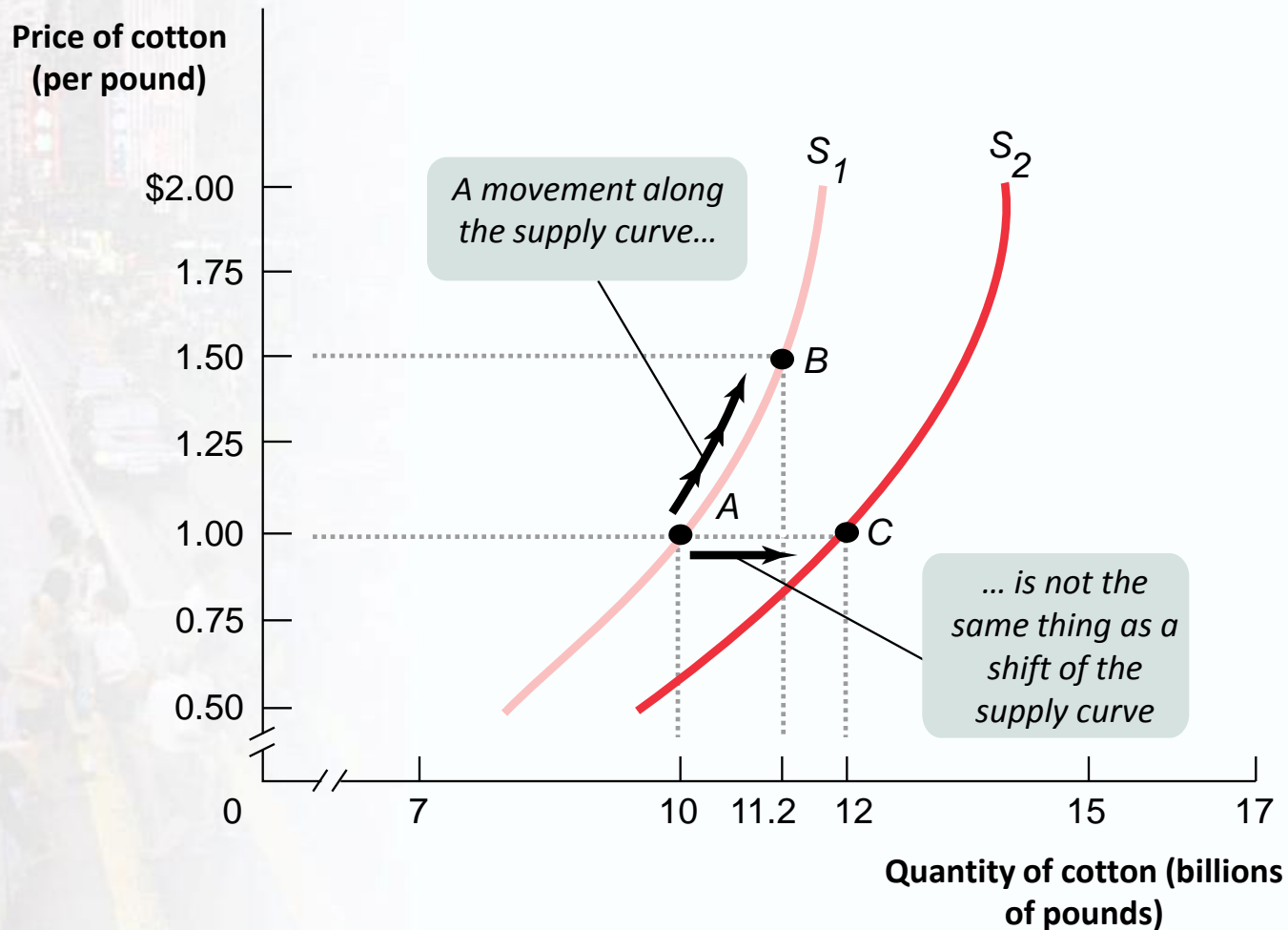
An Increase in Supply

Technology adoption in cotton-growing business → more cotton producers



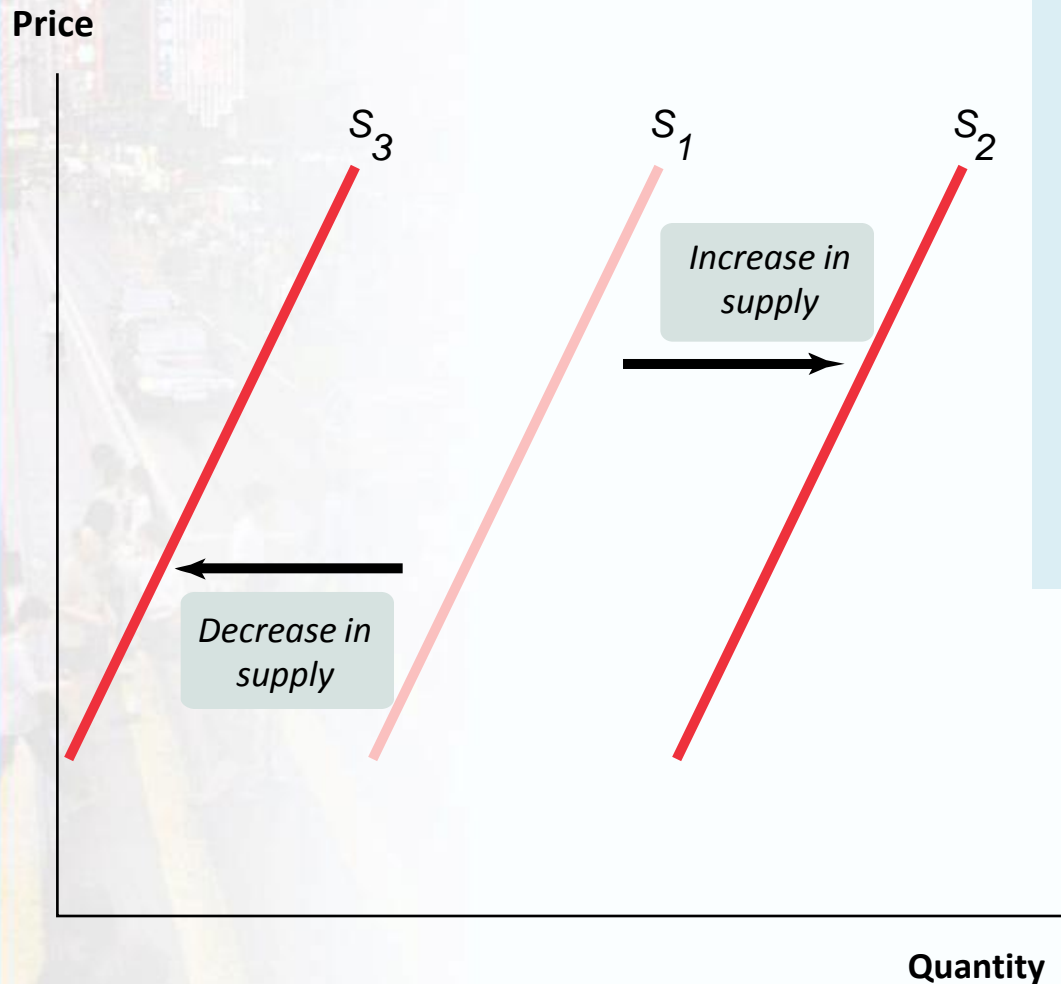
A shift of the supply curve is a change in the quantity supplied of a good at any given price.

Movement Along the Supply Curve



A movement along the supply curve is a change in the quantity supplied of a good that is the result of a change in that good's price.

Shifts of the Supply Curve



Any “**decrease in supply**” means a *leftward* shift of the supply curve:
at any given price, there is a decrease in the quantity supplied.
 $(S_1 \rightarrow S_3)$

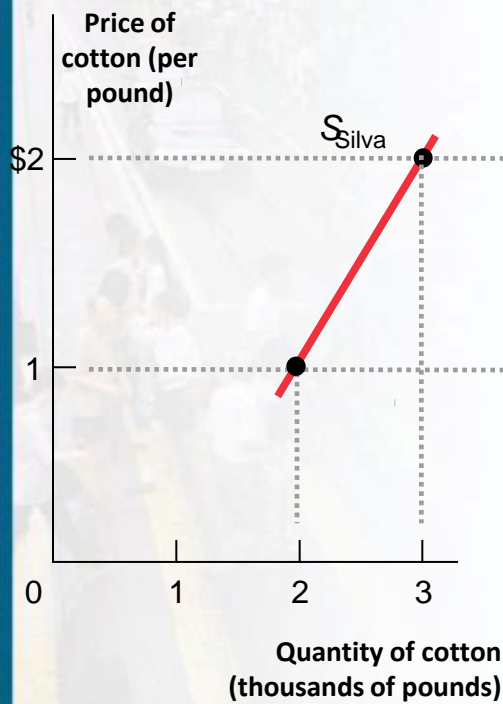
What Causes a Supply Curve to Shift?

- Changes in input prices
 - *An **input** is a good that is used to produce another good.*
- Changes in the prices of related goods and services
- Changes in technology
- Changes in expectations
- Changes in the number of producers

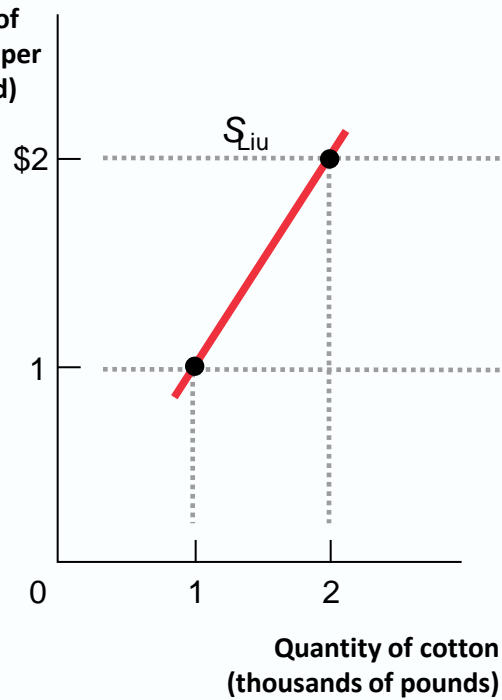
Individual Supply Curve and the Market Supply Curve

The market supply curve is the *horizontal sum* of the individual supply curves of all firms in that market.

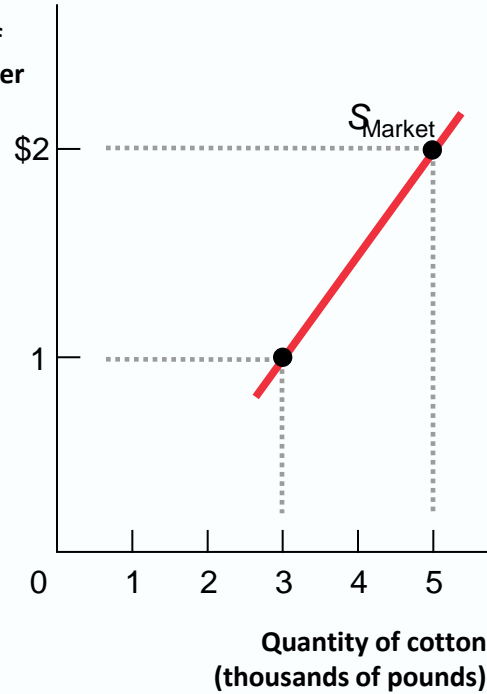
(a)
Mr. Silva's Individual
Supply Curve



(b)
Mr. Liu's Individual Supply
Curve



(c)
Market Supply Curve



ECONOMICS IN ACTION

Only Creatures Small and Pampered

- According to a recent article in the *New York Times*, the United States has experienced a severe decline in the number of farm veterinarians over the past two decades.
 - The source of the problem is competition.
 - Vets are being drawn away from the business of caring for farm animals into the more lucrative business of caring for pets.

ECONOMICS IN ACTION

Only Creatures Small and Pampered

How can we translate this into supply and demand curves?

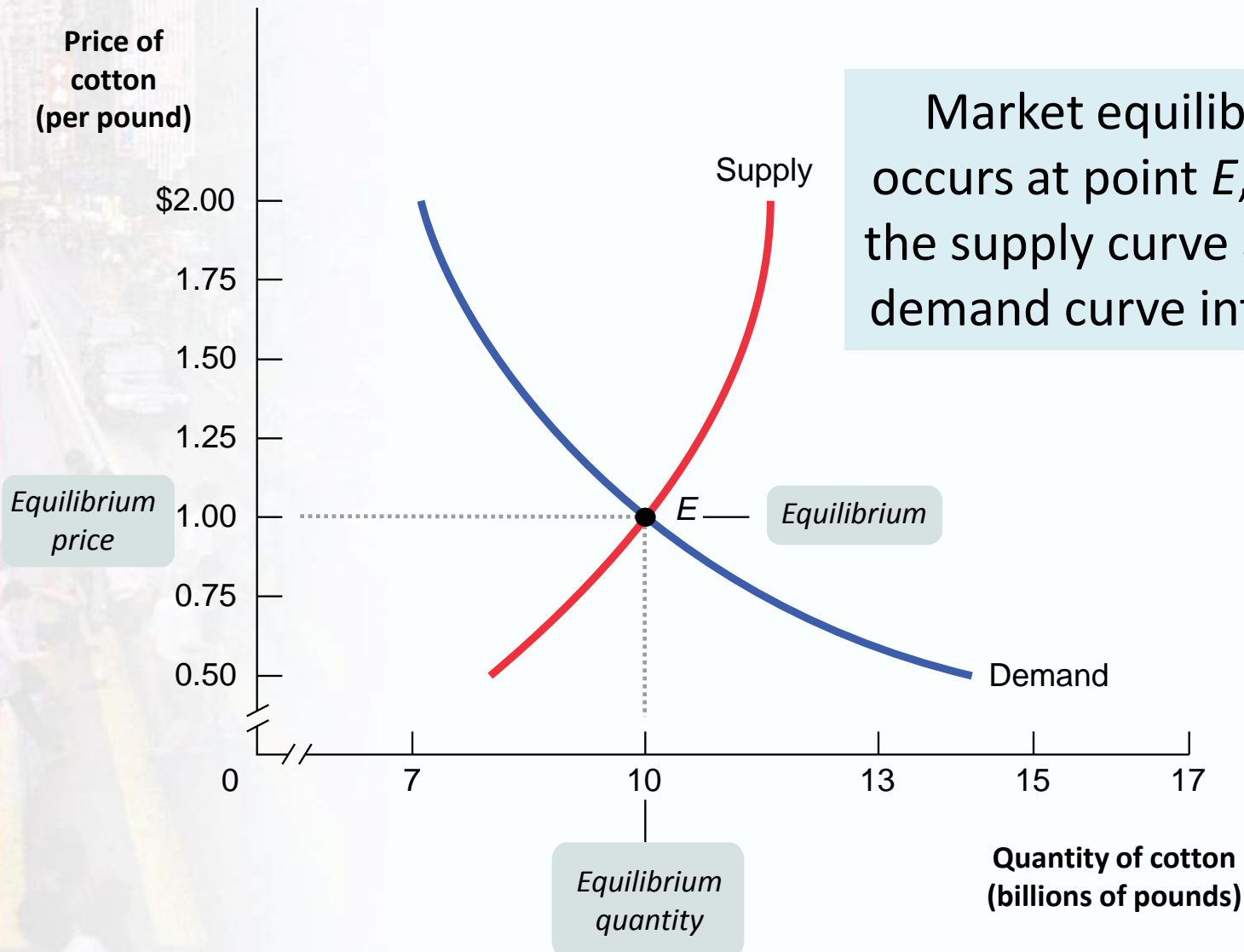
Farm veterinary services and pet veterinary services are related goods that are substitutes in production.

- A veterinarian typically specializes in one type of practice or the other, and that decision often depends on the going price for the service.
- America's growing pet population, combined with the increased willingness of dotting owners to spend money on their companions' care, has driven up the price of pet veterinary services.
- So, the supply curve of farm veterinarians has shifted leftward—fewer farm veterinarians are offering their services at any given price.

Supply, Demand and Equilibrium

- **Equilibrium** in a competitive market: when the quantity demanded of a good equals the quantity supplied of that good
- The price at which this takes place is the **equilibrium price** (or **market-clearing price**)
 - Every buyer finds a seller and vice versa.
 - The quantity of the good bought and sold at that price is the **equilibrium quantity**.

Market Equilibrium



Market equilibrium occurs at point E, where the supply curve and the demand curve intersect.

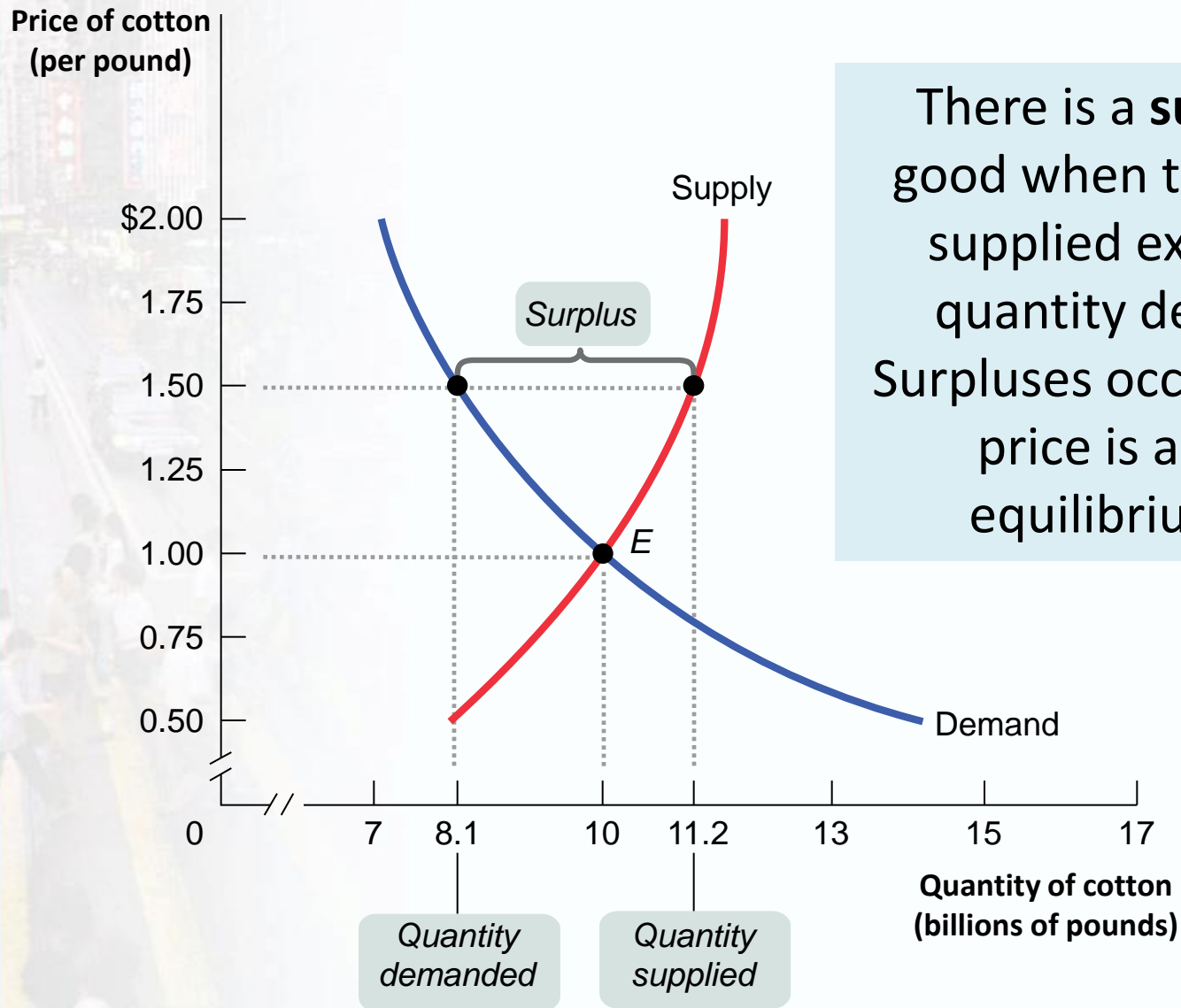
Equilibrium price

Equilibrium

Equilibrium quantity

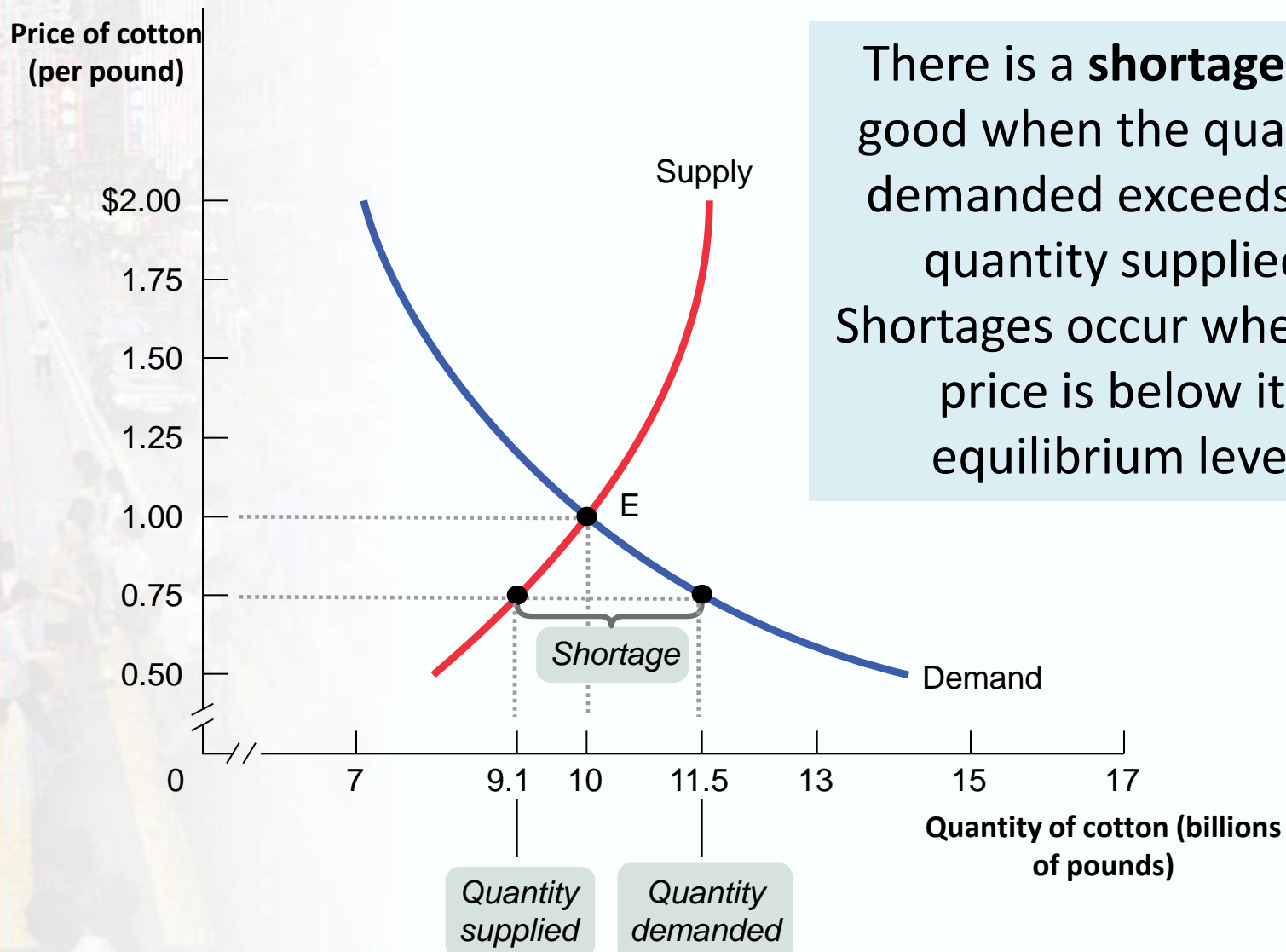
Quantity of cotton (billions of pounds)

Surplus



There is a **surplus** of a good when the quantity supplied exceeds the quantity demanded. Surpluses occur when the price is above its equilibrium level.

Shortage



There is a **shortage** of a good when the quantity demanded exceeds the quantity supplied. Shortages occur when the price is below its equilibrium level.



ECONOMICS IN ACTION

The Price of Admission

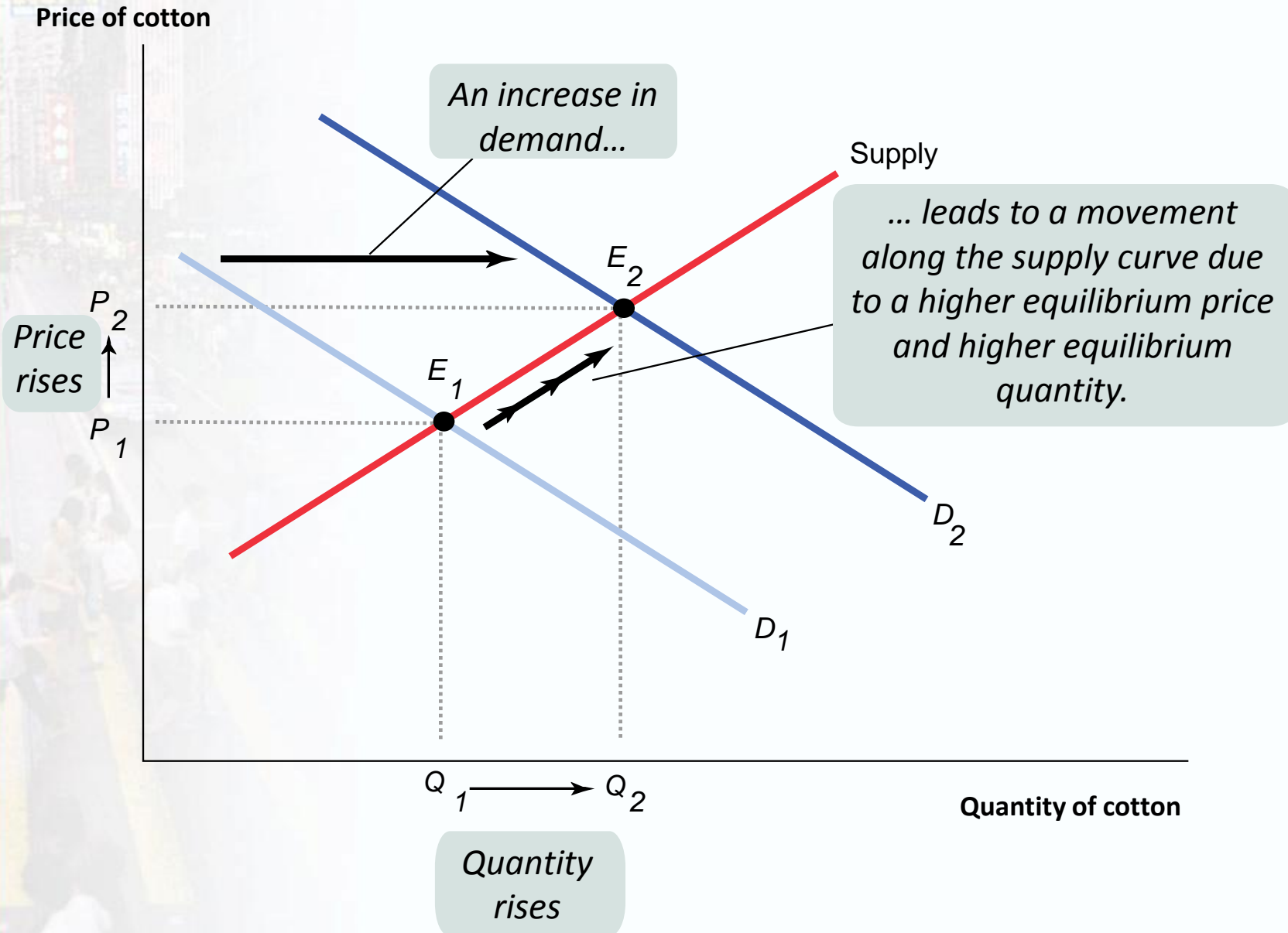
- Compare the box office price for a recent Justin Timberlake concert in Miami, Florida, to the StubHub.com price for seats in the same location: \$88.50 versus \$155.

ECONOMICS IN ACTION

The Price of Admission

- Why is there such a big difference in prices?
 - For major events, buying tickets from the box office means waiting in very long lines.
 - Some ticket buyers who use Internet resellers have decided that the **opportunity cost** of their time is too high to spend waiting in line.
 - For the major events, when box offices sell tickets at face value, tickets often sell out within minutes. In this case, some people who want to go to the concert badly, but missed out on the opportunity to buy cheaper tickets from the box office, are willing to pay the higher Internet reseller price.

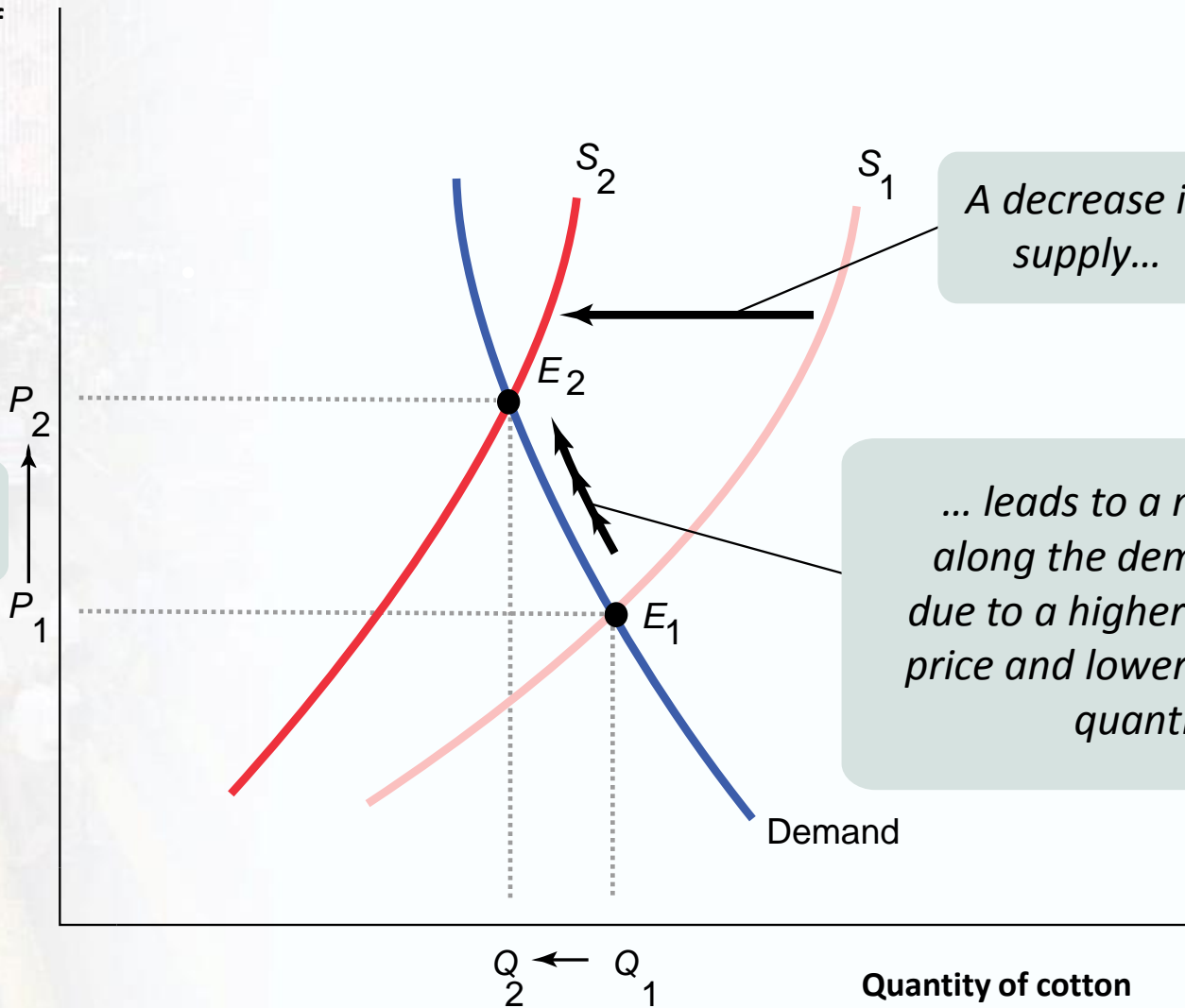
Equilibrium and Shifts of the Demand Curve



Equilibrium and Shifts of the Supply Curve

Price of cotton

Price rises



A decrease in supply...

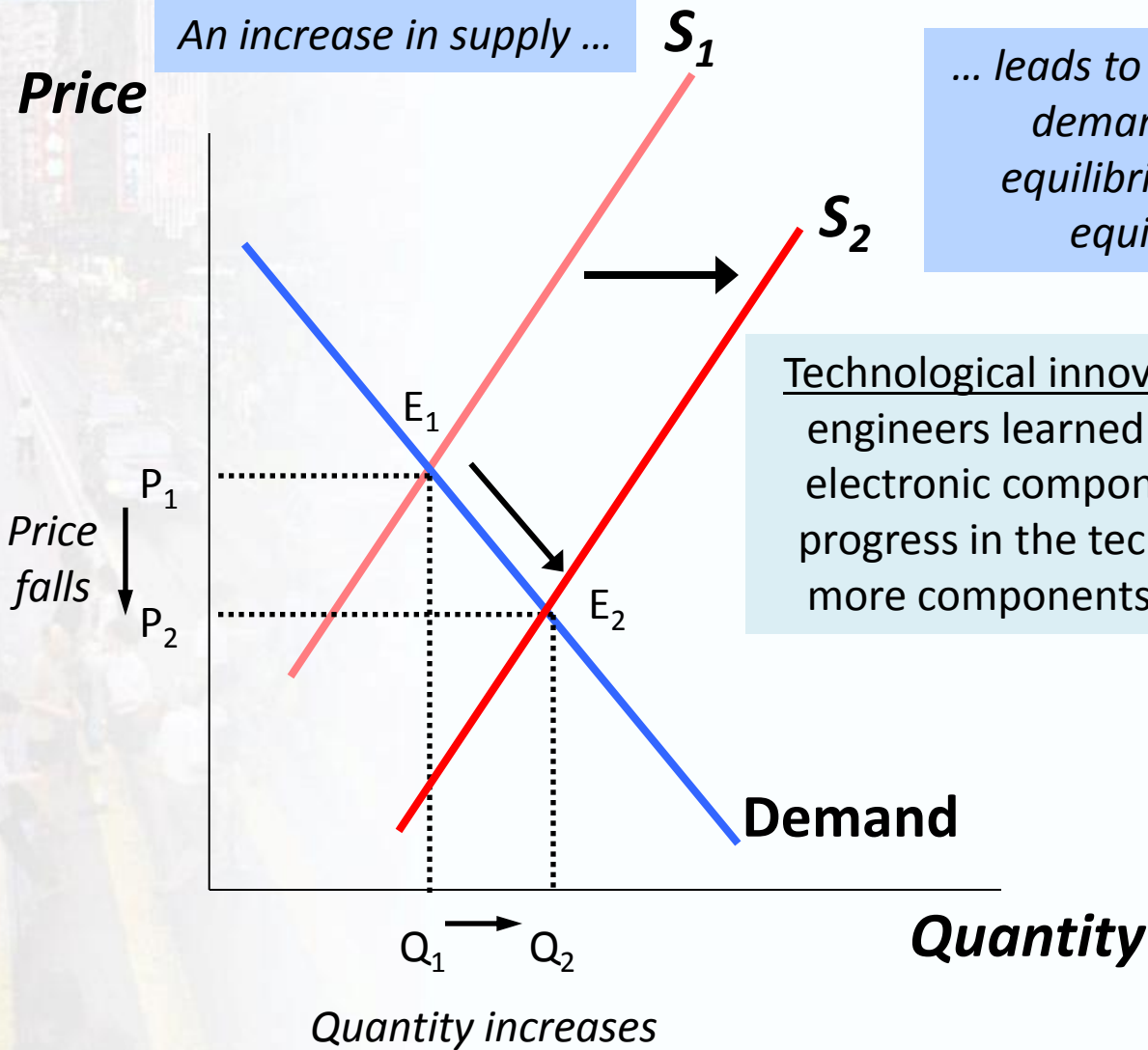
... leads to a movement along the demand curve due to a higher equilibrium price and lower equilibrium quantity.

Quantity falls

Quantity falls

Quantity of cotton

Technology Shifts of the Supply Curve



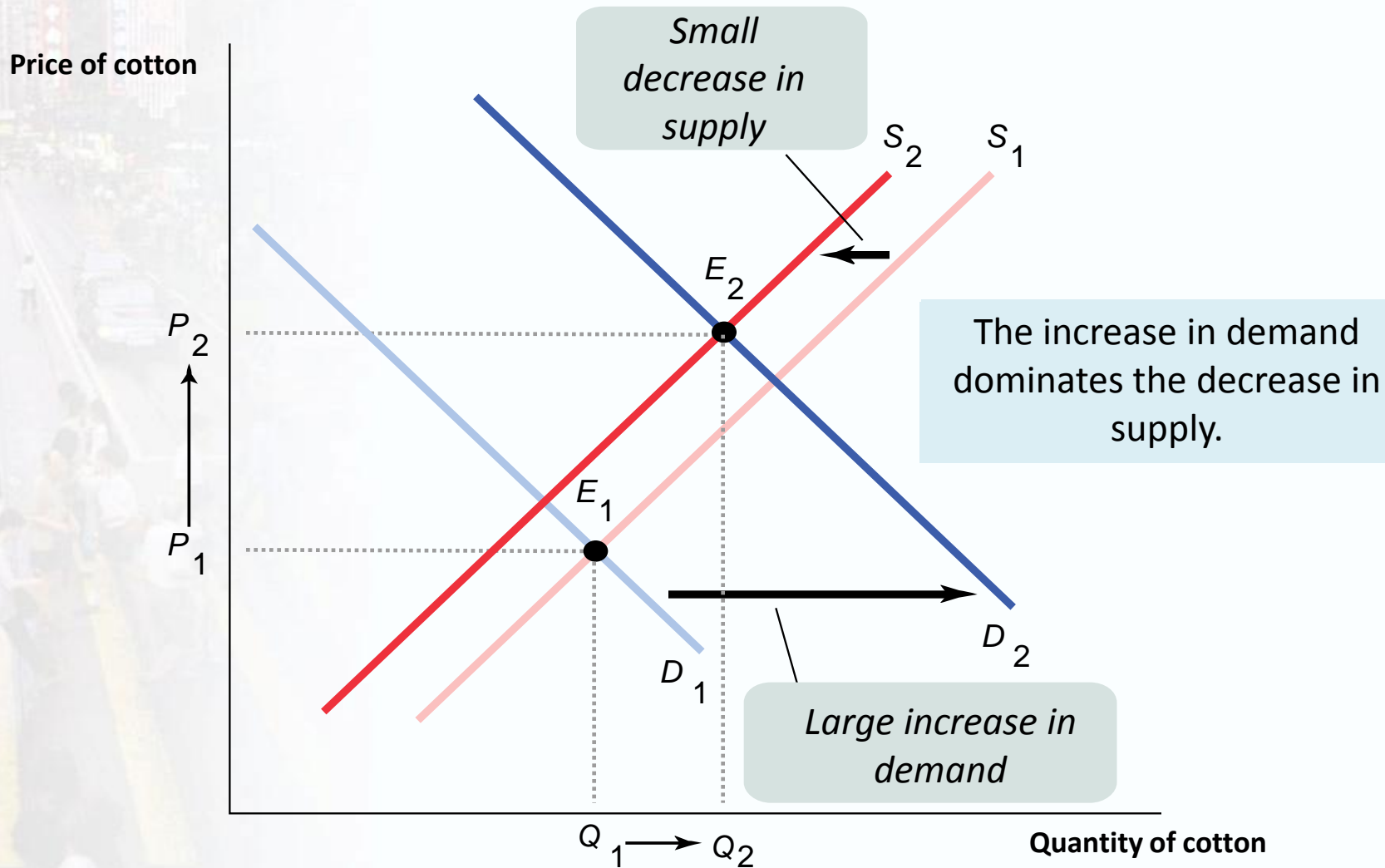
An increase in supply ...

... leads to a movement along the demand curve to a lower equilibrium price and higher equilibrium quantity.

Technological innovation: In the early 1970s, engineers learned how to put microscopic electronic components onto a silicon chip; progress in the technique has allowed ever more components to be put on each chip.

Simultaneous Shifts of Supply and Demand

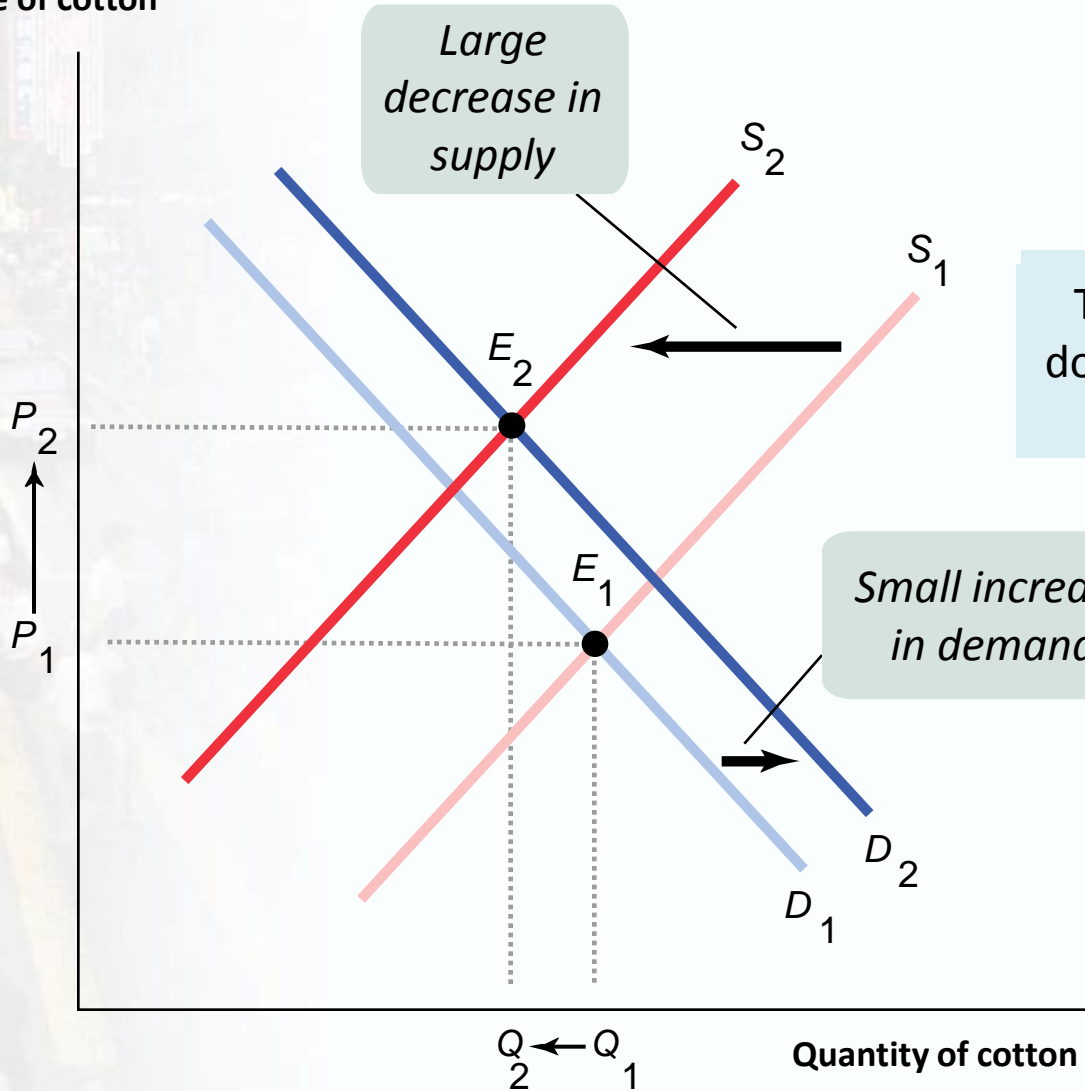
(a) One Possible Outcome: Price Rises, Quantity Rises



Simultaneous Shifts of Supply and Demand

(b) Another Possible Outcome: Price Rises, Quantity Falls

Price of cotton



The decrease in supply dominates the increase in demand.

Simultaneous Shifts of Supply and Demand

We can make the following predictions about the outcome when the supply and demand curves shift simultaneously:

<i>Simultaneous Shifts of Supply and Demand</i>	Supply Increases	Supply Decreases
Demand Increases	<u>Price</u> : ambiguous <u>Quantity</u> : up	<u>Price</u> : up <u>Quantity</u> : ambiguous
Demand Decreases	<u>Price</u> : down <u>Quantity</u> : ambiguous	<u>Price</u> : ambiguous <u>Quantity</u> : down

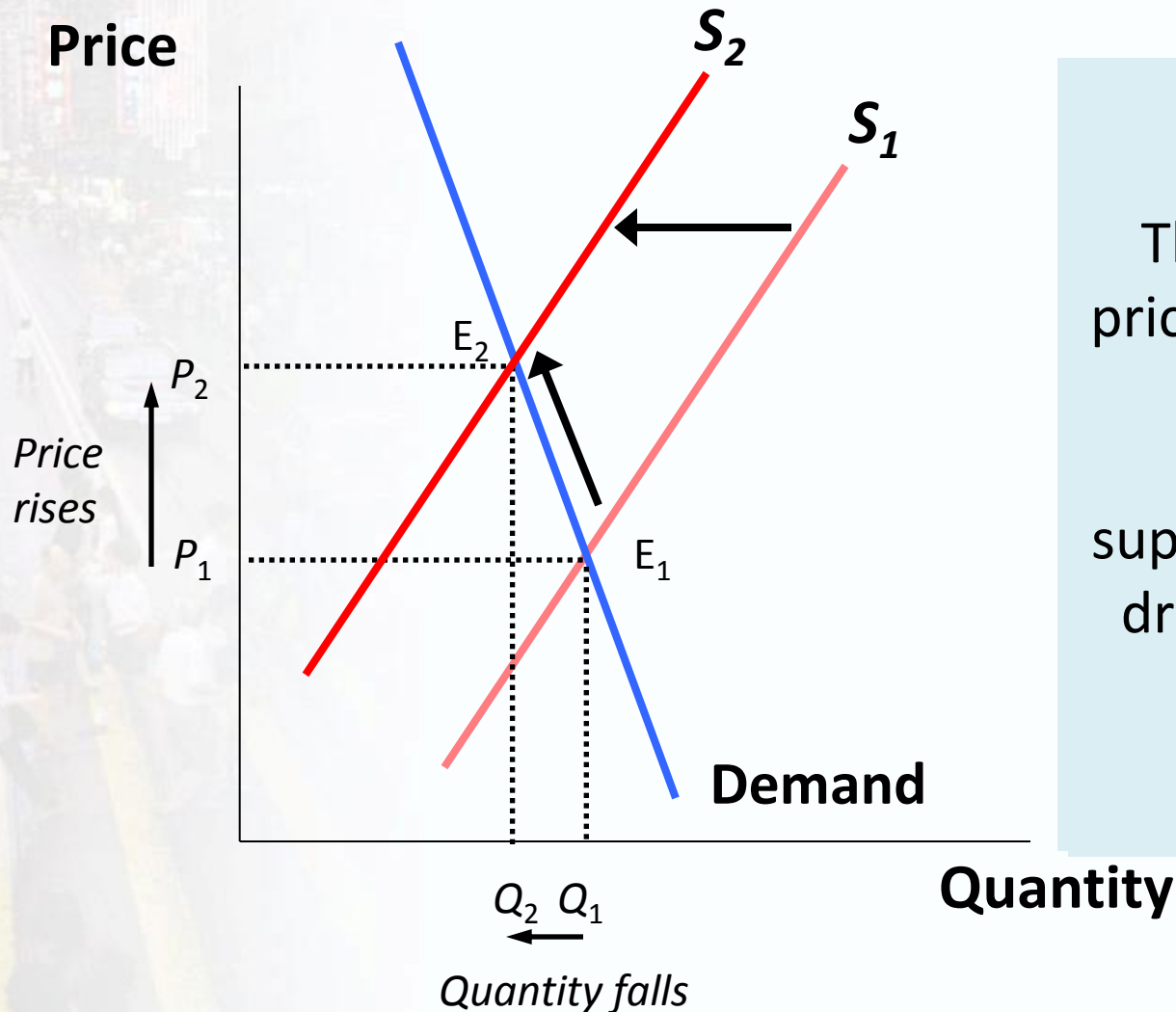
FOR INQUIRING MINDS

Your Turn on the Runway: An Exercise of Supply, Demand, and Supermodels

- The ease of transmitting photos over the Internet and the relatively low cost of international travel → beautiful young women from all over the world, eagerly trying to make it as models = **influx of aspiring models from around the world.**
- In addition, the tastes of many of those who hire models have changed → they prefer celebrities.
- What happened to the equilibrium price of a young (not a celebrity) fashion model?
- Use your supply and demand curves to determine the salaries of “America’s Next Top Models” ...

FOR INQUIRING MINDS

Another Example: *Supply, Demand, and Controlled Substances*



The equilibrium price has risen from P_1 to P_2 ; this induces suppliers to provide drugs despite the risks.

ECONOMICS IN ACTION

The Great Tortilla Crisis

- There was a sharp rise in the price of tortillas, a staple food of Mexico's poor. The price rose from 25 cents a pound to between 35 and 45 cents a pound in just a few months in early 2007.

Why were tortilla prices soaring?

- It was a classic example of what happens to equilibrium prices when supply falls.
 - Tortillas are made from corn, and much of Mexico's corn is imported from the United States, with the price of corn in both countries basically set in the U.S. corn market.
 - And U.S. corn prices were rising rapidly thanks to surging demand in a new market: the market for ethanol.

Demand and Supply Shifts at Work in the Global Economy

- A recent **drought in Australia** reduced the amount of grass on which Australian dairy cows could feed, thus limiting the amount of milk these cows produced for export.
- At the same time, a **new tax levied by the government of Argentina** raised the price of the milk the country exported, thereby decreasing Argentine milk sales worldwide.
- These two developments produced a supply shortage in the world market, which dairy farmers in Europe couldn't fill because of strict production **quotas set by the European Union**.

ECONOMICS IN ACTION

The Rice Run of 2008

- In April 2008, the price of rice exported from Thailand—a global benchmark for the price of rice traded in international markets—reached \$950 per ton, up from \$360 per ton at the beginning of 2008.
 - Within hours, prices for rice at major rice-trading exchanges around the world were breaking record levels.

ECONOMICS IN ACTION

The Rice Run of 2008

- The factors that lay behind the surge in rice prices were both demand-related and supply-related: growing incomes in China and India, traditionally large consumers of rice; drought in Australia; and pest infestation in Vietnam.
 - But it was hoarding by farmers, panic buying by consumers, and an export ban by India, one of the largest exporters of rice, that explained the breathtaking speed of the rise in price.

ECONOMICS IN ACTION

FIGURE 3-17 Rising Rice Prices in the United States, 2003–2011



Source: U.S. Bureau of Labor Statistics.

ECONOMICS IN ACTION

The Rice Run of 2008

- In much of Asia, governments are major buyers of rice.
 - They buy rice from their rice farmers, who are paid a government-set price, and then sell it to the poor at subsidized prices (prices lower than the market equilibrium price).
 - Now, even farmers in rural areas of Asia have access to the Internet and can see the price quotes on global rice exchanges.

ECONOMICS IN ACTION

The Rice Run of 2008

- And as rice prices rose in response to changes in demand and supply, farmers grew dissatisfied with the government price and instead hoarded their rice in the belief that they would eventually get higher prices.
- This was a self-fulfilling belief, as the hoarding shifted the supply curve leftward and raised the price of rice even further.

VIDEO



TED TALK—Shaffi Mather: A new way to fight corruption:
http://www.ted.com/talks/shaffi_mather_a_new_way_to_fight_corruption.html

SUMMARY

1. The **supply and demand model** illustrates how a **competitive market**, one with many buyers and sellers, none of whom can influence the market price, works.
2. The **demand schedule** shows the **quantity demanded** at each price and is represented graphically by a **demand curve**.

The **law of demand** says that demand curves slope downward; that is, a higher price for a good or service leads people to demand a smaller quantity, other things equal.

SUMMARY

3. A **movement along the demand curve** occurs when a price change leads to a change in the quantity demanded.

When economists talk of increasing or decreasing demand, they mean **shifts of the demand curve**—a change in the quantity demanded at any given price.

An increase in demand causes a rightward shift of the demand curve. A decrease in demand causes a leftward shift.

SUMMARY

4. There are five main factors that shift the demand curve:
 - A change in the prices of related goods or services, such as **substitutes** or **complements**
 - A change in income: when income rises, the demand for **normal goods** increases and the demand for **inferior goods** decreases.
 - A change in tastes
 - A change in expectations
 - A change in the number of consumers

SUMMARY

5. The market demand curve for a good or service is the horizontal sum of the **individual demand curves** of all consumers in the market.
6. The **supply schedule** shows the **quantity supplied** at each price and is represented graphically by a **supply curve**. Supply curves usually slope upward.

SUMMARY

7. A **movement along the supply curve** occurs when a price change leads to a change in the quantity supplied.

When economists talk of increasing or decreasing supply, they mean **shifts of the supply curve**—a change in the quantity supplied at any given price.

An increase in supply causes a rightward shift of the supply curve. A decrease in supply causes a leftward shift.

SUMMARY

8. There are five main factors that shift the supply curve:
 - A change in **input** prices
 - A change in the prices of related goods and services
 - A change in technology
 - A change in expectations
 - A change in the number of producers

9. The market supply curve for a good or service is the horizontal sum of the **individual supply curves** of all producers in the market.

SUMMARY

10. The supply and demand model is based on the principle that the price in a market moves to its **equilibrium price**, or **market-clearing price**, the price at which the quantity demanded is equal to the quantity supplied. This quantity is the **equilibrium quantity**.

When the price is above its market-clearing level, there is a **surplus** that pushes the price down.

When the price is below its market-clearing level, there is a **shortage** that pushes the price up

SUMMARY

11. An increase in demand increases both the equilibrium price and the equilibrium quantity; a decrease in demand has the opposite effect.

An increase in supply reduces the equilibrium price and increases the equilibrium quantity; a decrease in supply has the opposite effect.

SUMMARY

12. Shifts of the demand curve and the supply curve can happen simultaneously.

When they shift in opposite directions, the change in equilibrium price is predictable but the change in equilibrium quantity is not.

When they shift in the same direction, the change in equilibrium quantity is predictable but the change in equilibrium price is not.

In general, the curve that shifts the greater distance has a greater effect on the changes in equilibrium price and quantity.

KEY TERMS

- Competitive market
- Supply and demand model
- Demand schedule
- Quantity demanded
- Demand curve
- Law of demand
- Shift of the demand curve
- Movement along the demand curve
- Substitutes
- Complements
- Normal good
- Inferior good
- Individual demand curve
- Quantity supplied
- Supply schedule
- Supply curve
- Shift of the supply curve
- Movement along the supply curve
- Input
- Individual supply curve
- Equilibrium price
- Equilibrium quantity
- Market-clearing price
- Surplus
- Shortage