

Lecture 1

Introduction

The Market Forces of Supply and Demand

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Presentation is based on:

http://www.swlearning.com/economics/mankiw/mankiw3e/powerpoint_micro.html

Introduction

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Introduction

Passing and grades:

1. Presentations: news
2. Essays
3. Two assessments (list with tasks)
4. Presence

Literature:

- ▶ Mankiw, N.G. (2012) Macroeconomics, 8th edition, South-Western Cengage Learning
- ▶ Mankiw, N.G. (2011) Principles of Economics, 7th edition

Introduction

No.	Date	Subject:
1	28.2	Introduction. The market forces of supply and demand
2	07.03	Elasticity and its applications
3	14.03	Supply, demand and government policies
4	21.03	Welfare economics
5	28.03	Cost of production
6	04.04	Market structures (part 1)
7	11.04	Market structures (part 2)
8	25.04	Goods and financial markets + national accounts
9	09.05	Money market (part 1)
10	16.05	Money market (part 2)
11	23.05	International trade
12	30.05	Keynesian cross
13	06.06	Introduction to economic fluctuations – ADAS model
14	13.06	Business cycle: theories and stylized facts; effects of stabilizing policies
15	20.06	Presentations

Key concepts

- ▶ Market
- ▶ Sorts of goods: normal & inferior good
- ▶ Substitutes & complements
- ▶ Quantity demanded
- ▶ Demand schedule & demand curve
- ▶ Law of demand
- ▶ Quantity supplied
- ▶ Supply schedule & curve
- ▶ Law of supply
- ▶ Equilibrium price & quantity
- ▶ Surplus & shortage...

Key concepts

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Markets and competition

- ▶ The terms supply and demand refer to the behavior of people . . . as they interact with one another in markets.

*A **market** is a group of buyers and sellers of a particular good or service.*



Markets and competition

- ▶ Buyers determine *demand*.



- ▶ Sellers determine *supply*.

Markets

- ▶ Markets take many forms:

- Grain market
- Auction house
- Stock-exchange
- Labor market
- Market of second-hand cars
- Amazon.com or ebay.com
- Allegro.pl
- Exchange rates market...

- ▶ Markets can be highly organized
- ▶ Sometimes markets are less organized
- ▶ Sometimes sellers and buyers don't meet face to face at all.
- ▶ Sometimes markets don't describe any specific place.

Competitive Markets

A competitive market is a market in which there are many buyers and sellers so that each has a negligible impact on the market price.

Types of the markets

Characteristics of Different Types of Markets

	Perfect Competition	Monopolistic Competition	Oligopoly	Monopoly
Number of firms	very large	many	few	one
Type of product	standardized	differentiated	std or diff.	unique
Control over price	none	slight	considerable	considerable if not regulated
Entry conditions	no barriers	no barriers	large barriers	large barriers
Examples	wheat soybeans	restaurants retail stores clothing	automobiles air travel breakfast cereal	local phone and electric patented drugs

To study the markets...

- ▶ Let's start with examining the behavior of buyres



What determines the quantity an individual demands?

- ▶ Prices
- ▶ Income
- ▶ Prices of related goods
- ▶ Tastes
- ▶ Expectations...



Ceteris paribus

- ▶ *Ceteris paribus*, is a Latin phrase, translated as „other things being equal”, as a reminder that all variables other than the ones being studied are assumed to be constant!

The Demand Curve:

The Relationship between Price and Quantity Demanded

- ▶ Quantity demanded

Quantity demanded is the amount of a good that buyers are willing and able to purchase.

The Demand Curve:

The Relationship between Price and Quantity Demanded

- ▶ Demand Schedule

The demand schedule is a table that shows the relationship between the price of the good and the quantity demanded.

Catherine's Demand Schedule

Price of Ice-Cream Cone	Quantity of Cones Demanded
\$0.00	12
0.50	10
1.00	8
1.50	6
2.00	4
2.50	2
3.00	0

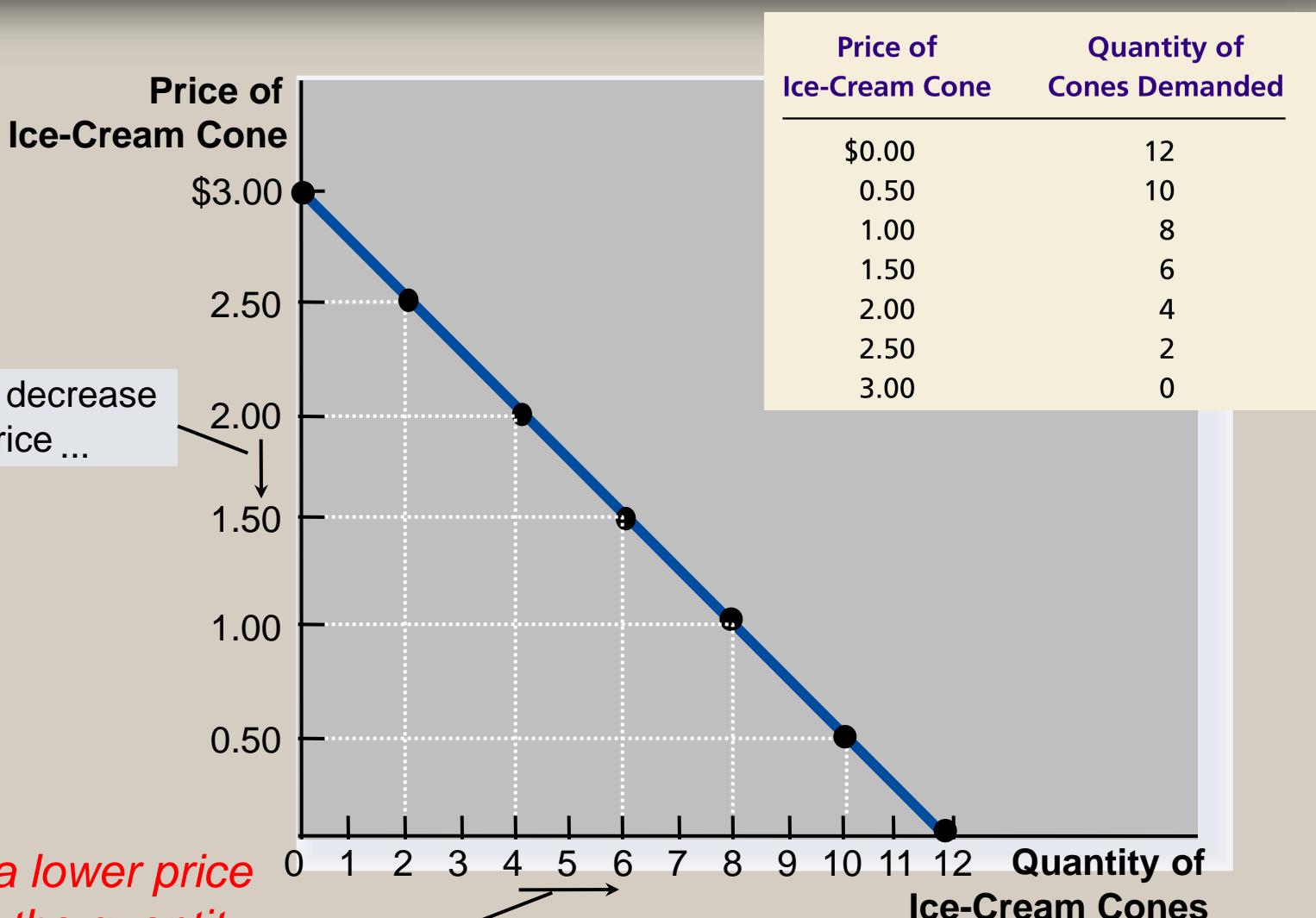


The Demand Curve: The Relationship between Price and Quantity Demanded

► Demand Curve

*The **demand curve** is a graph of the relationship between the price of a good and the quantity demanded.*

Figure 1 Catherine's Demand Schedule and Demand Curve



Because a lower price increases the quantity demanded, the demand curve slopes downward!

2. ... increases quantity of cones demanded.

Why the demand curve slopes downward?

- ▶ **Substitution effect of increased price of the good:** when the price of good increases, consumers try to substitute this good with another, similar product (consumers look for alternatives).
- ▶ **Income effect of a increased price of the good:** When the price of a good rises, ceteris paribus, then a consumer's **real income** will fall (they cannot afford to buy the same quantity of products as before).

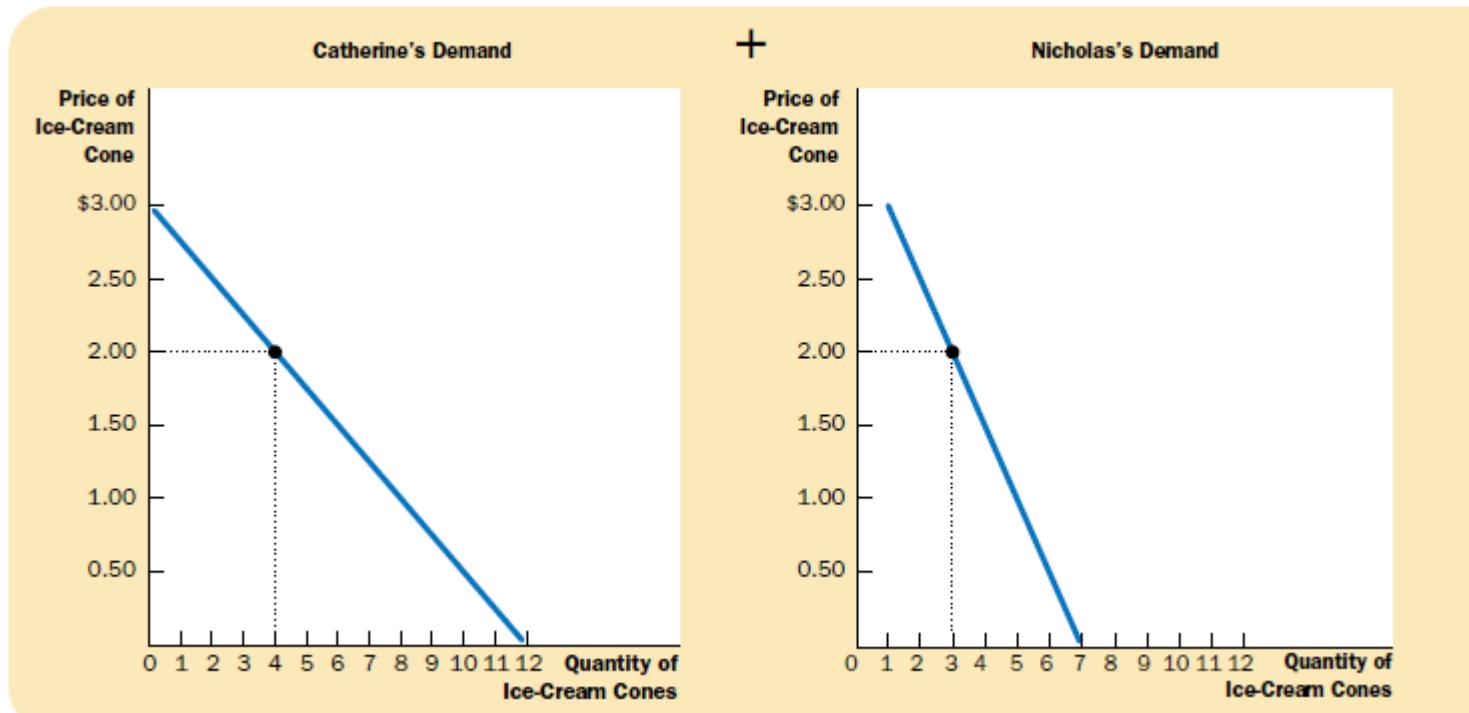
Law of demand

*The **law of demand** states that, other things equal, the quantity demanded of a good falls when the price of the good rises.*

Market Demand versus Individual Demand

- ▶ Market demand refers to the sum of all individual demands for a particular good or service.
- ▶ Graphically, individual demand curves are summed horizontally to obtain the market demand curve.

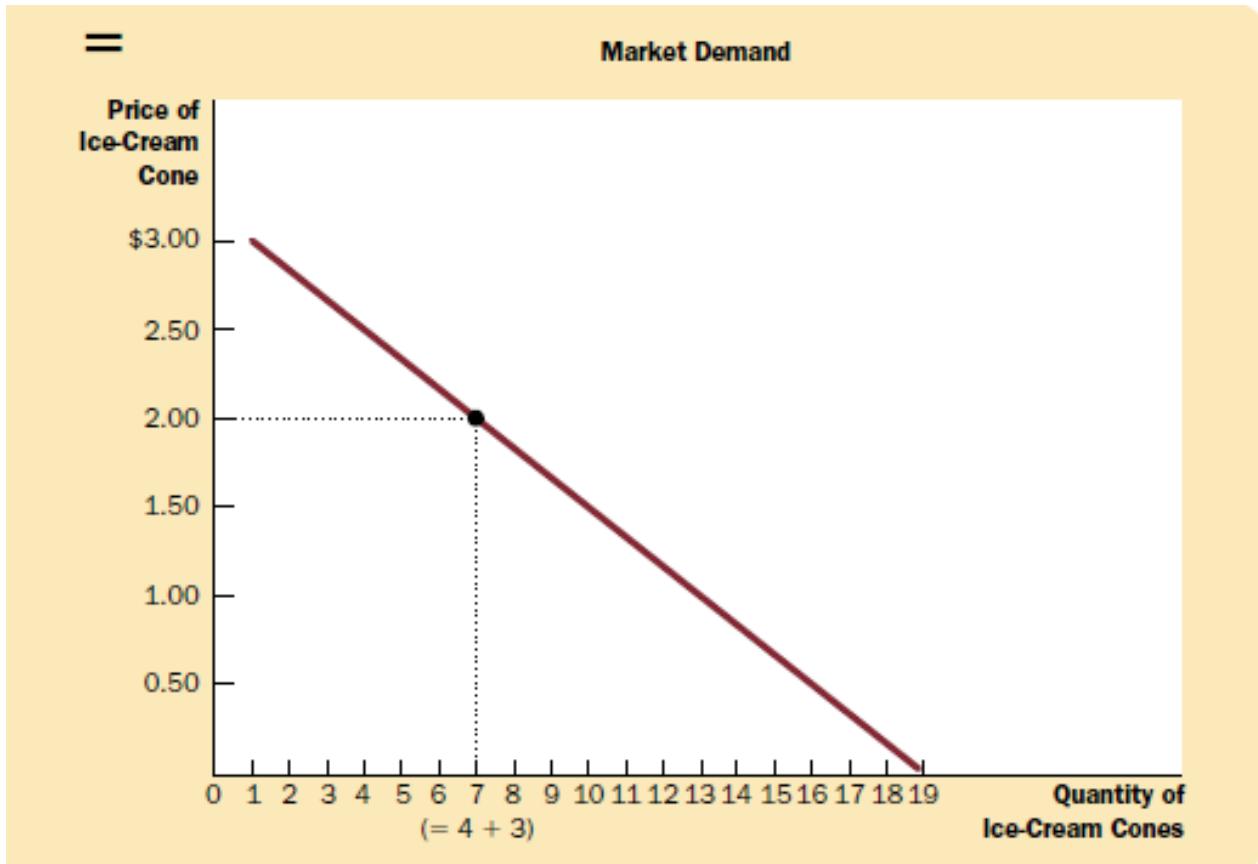
Individual and market demand schedules



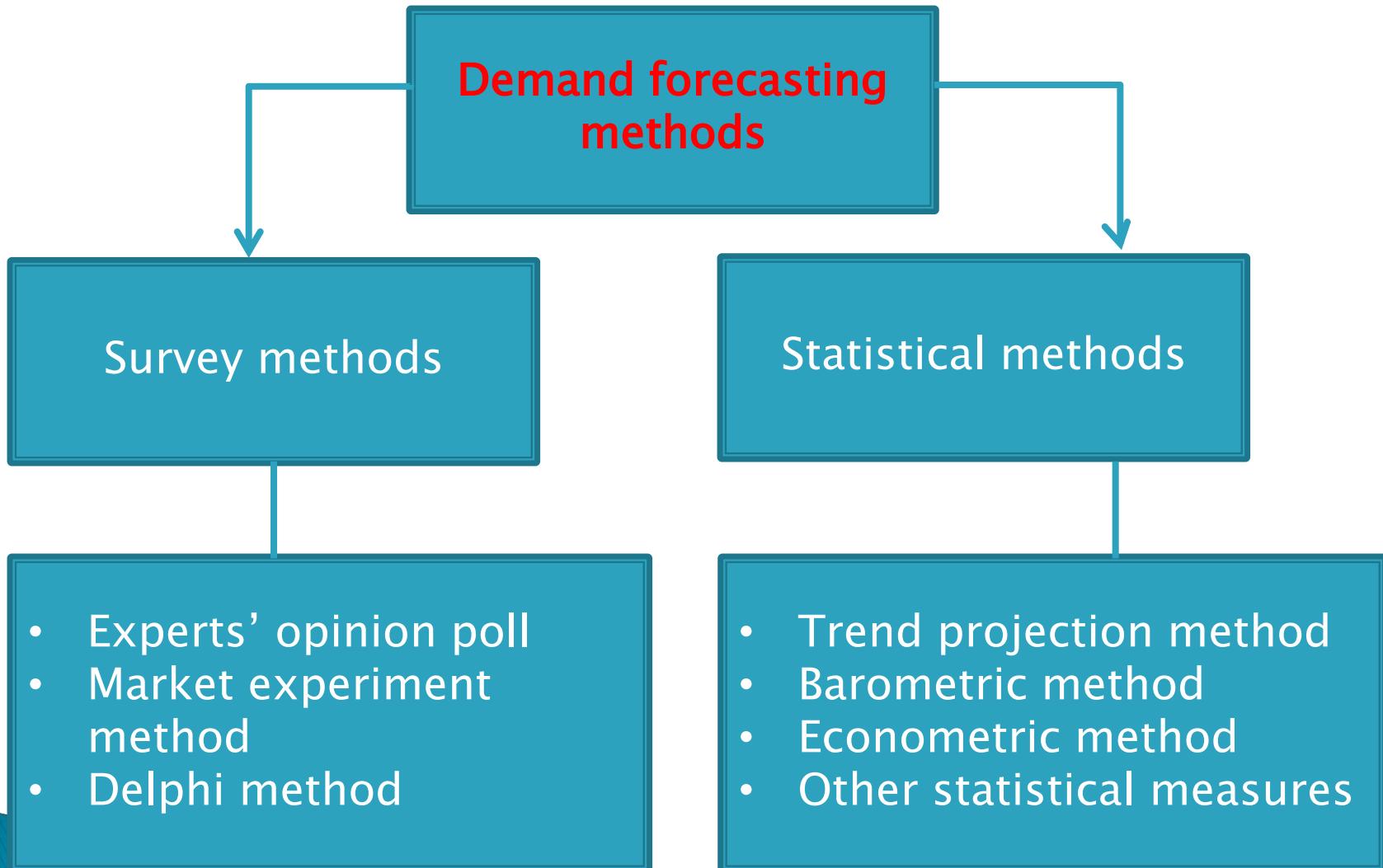
The quantity demanded in a market is the sum of the quantities demanded by all the buyers.

PRICE OF ICE-CREAM CONE	CATHERINE	NICHOLAS	MARKET
\$0.00	12	+	19
0.50	10	6	16
1.00	8	5	13
1.50	6	4	10
2.00	4	3	7
2.50	2	2	4
3.00	0	1	1

Market demand



Demand forecasting techniques



Survey methods

- ▶ Survey method is one of the most common and direct methods of forecasting demand in the short term.
- ▶ This method encompasses the future purchase plans of consumers and their intentions.
- ▶ In this method, an organization conducts surveys with consumers to determine the demand for their existing products and services and anticipate the future demand accordingly.

Statistical methods

- ▶ Statistical methods are complex set of methods of demand forecasting.
- ▶ They are used to forecast demand in the long term.
- ▶ Demand is forecasted on the basis of historical data and cross-sectional data.
- ▶ Statistical methods are cost effective and more objective than survey methods.

What happens when the demand forecast is wrong?

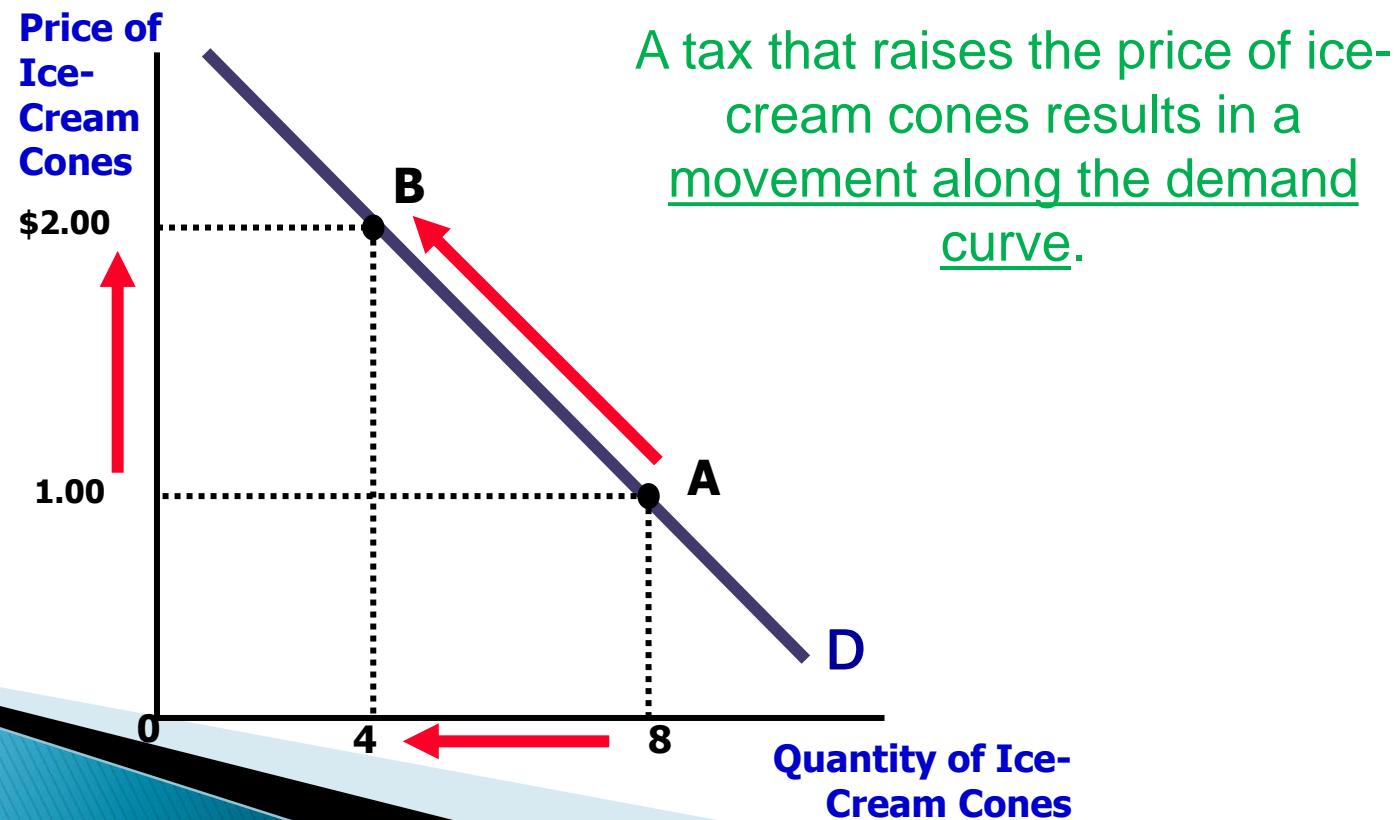
- ▶ Recent history is filled with stories of companies and sometimes even entire industries that have made grave strategic errors because of inaccurate industrywide demand forecasts.
- ▶ ...

Example

- ▶ The petroleum industry invested \$500 billion worldwide in 1980 and 1981 because it expected oil prices to rise 50% by 1985.
- ▶ The estimate was based on forecasts that the market would grow from 52 million barrels of oil a day in 1979 to 60 million barrels in 1985.
- ▶ Instead, demand had fallen to 46 million barrels by 1985.
- ▶ Prices collapsed, creating huge losses in drilling, production, refining, and shipping investments.

Movement along the Demand Curve

- ▶ Change in Quantity Demanded:
 - Movement along the demand curve
 - Caused by a change in the price of the product.



Shifts in the Demand Curve

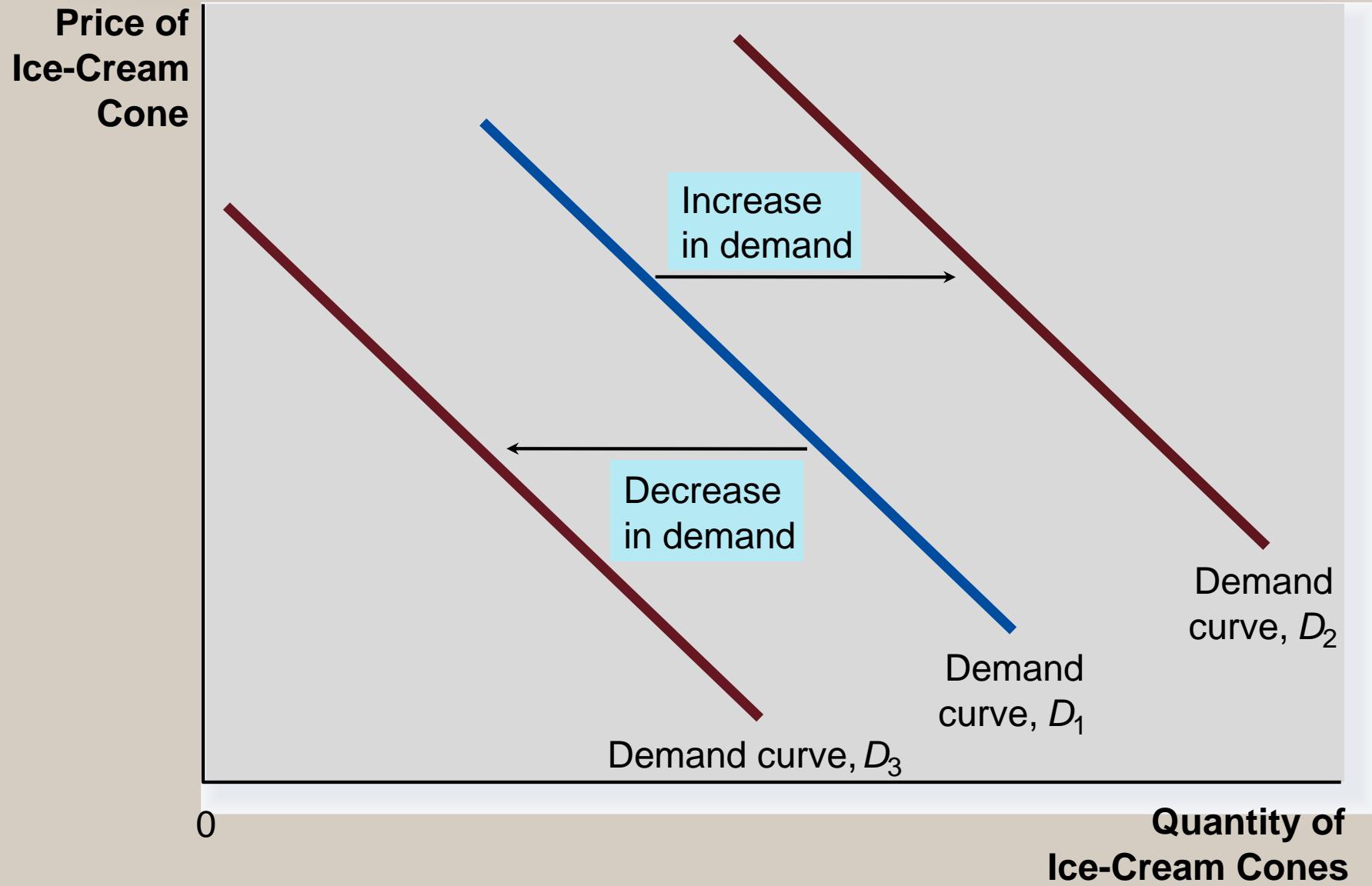
- Consumer income
- Prices of related goods
- Tastes
- Expectations
- Number of buyers



Shifts in the Demand Curve

- ▶ Change in Demand:
 - A shift in the demand curve, either to the left or right.
 - Caused by any change that alters the quantity demanded at every price.

Figure 2. Shifts in the Demand Curve



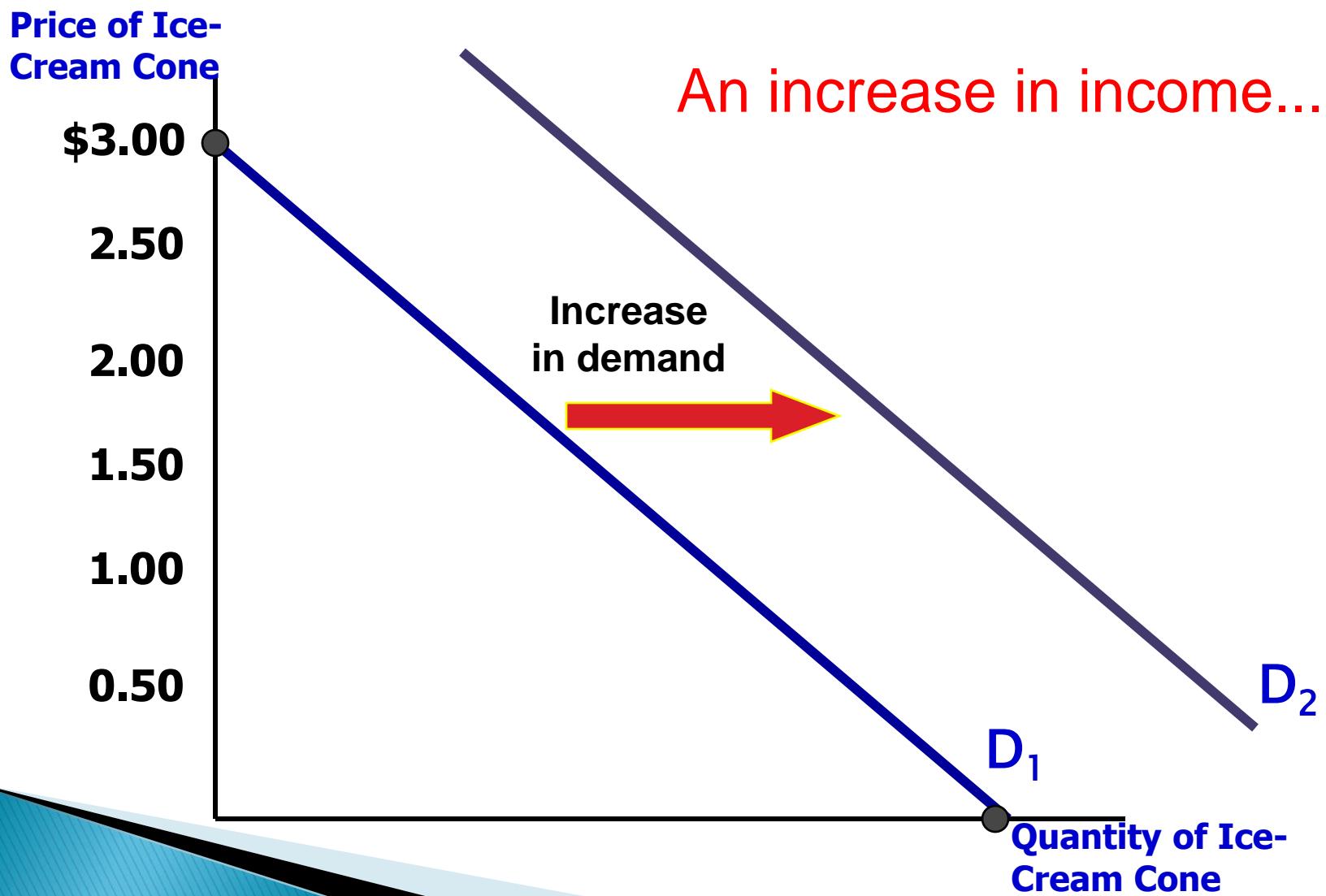
Shifts in the Demand Curve

- ▶ Consumer Income:

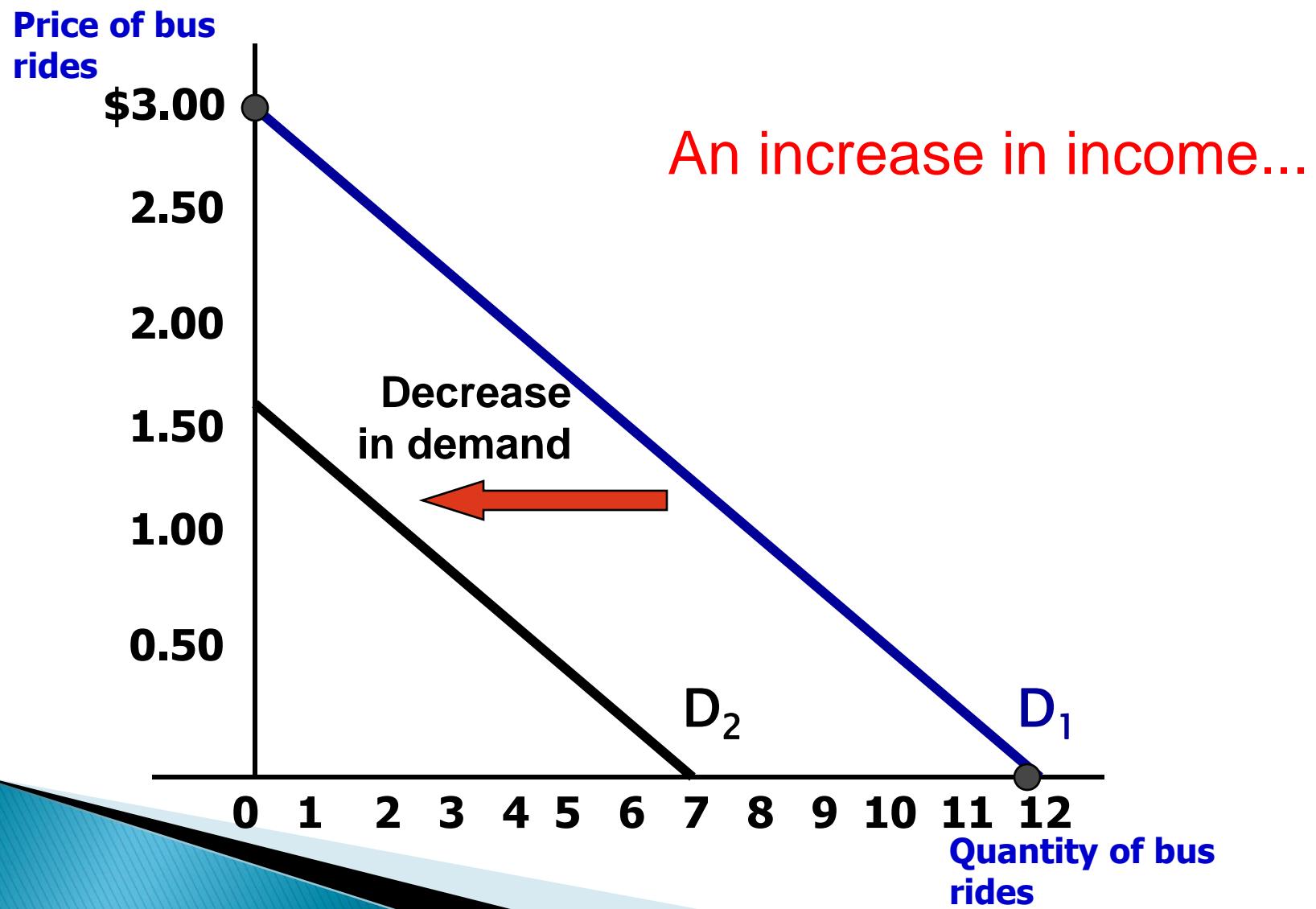
Normal good: a good, for which, other things equal, an increase in income leads to an increase in demand.

Inferior good: a good, for which, other things equal, an increase in income leads to a decrease in demand.

Consumer Income: normal good



Consumer Income: inferior good



Shifts in the Demand Curve

► Prices of Related Goods:

When a fall in the price of one good reduces the demand for another good, the two goods are called substitutes.

When a fall in the price of one good increases the demand for another good, the two goods are called complements.

Examples of substitutes and complements

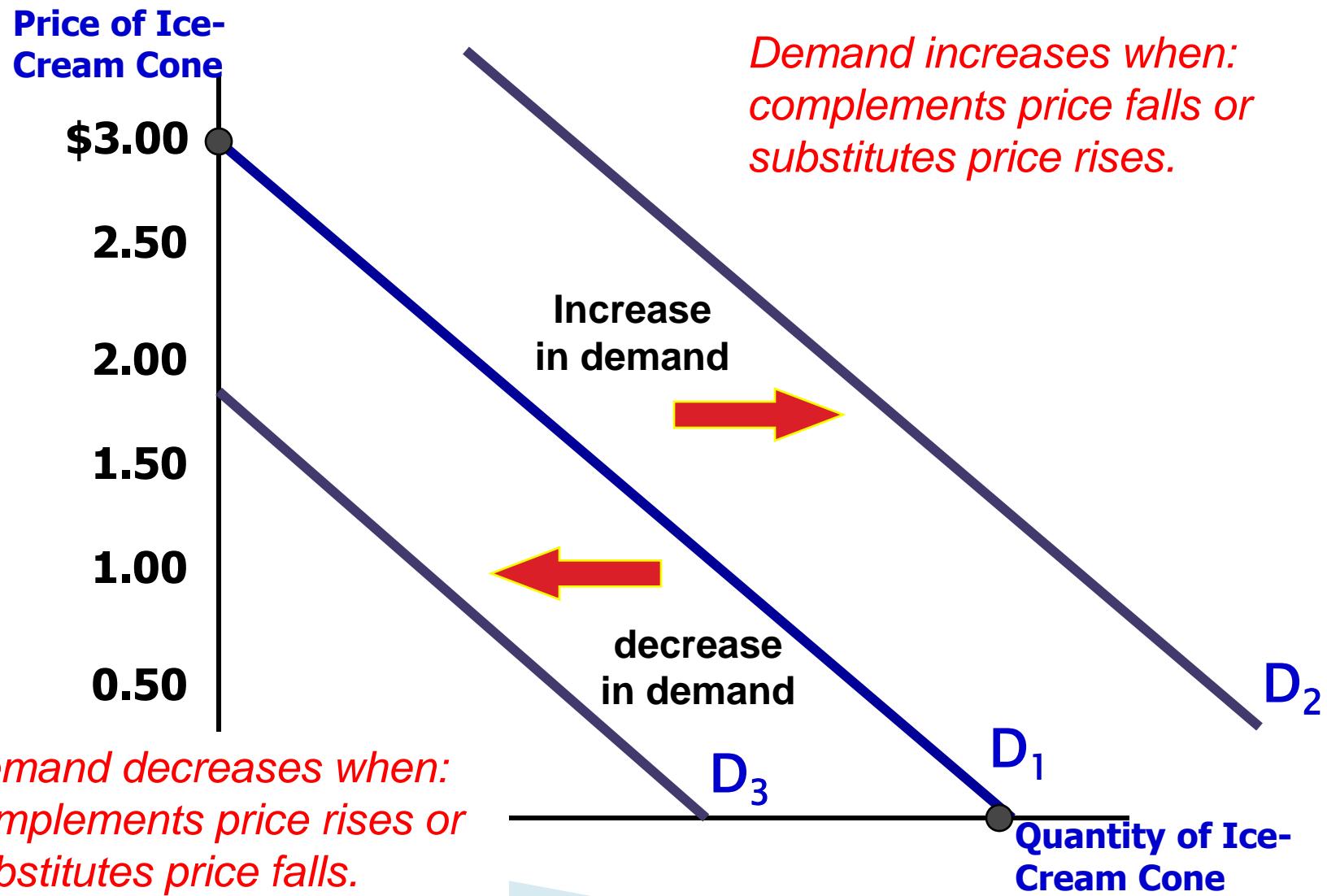
► Complements:

- Computer & monitor
- Mobile phone & charger
- Car & fuel

► Substitutes:

- Apples & pears
- Cinema & TV
- Tea & Coffee

Substitutes v. complements



Combining the income and substitution effects

*If the price of a good rises,
depending on the type of good...*

Type of good	The effect on quantity demanded due to the		The total effect on quantity demanded
	Substitution effect	Income effect	
Normal good	Fall	Fall	Fall
Inferior good	Fall	Rise	Fall (because the substitution effect is thought to be stronger than the income effect)

Other determinants of demand shift

- ▶ Consumer tastes
- ▶ Advertisement and fashion...

The determinants of quantity demanded

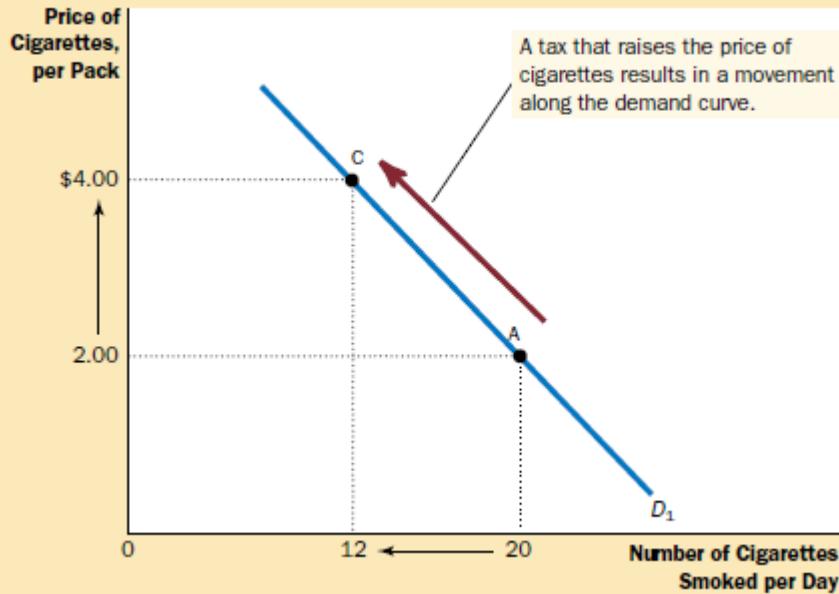
Variable	A Change in This Variable . . .
Price	Represents a movement along the demand curve
Income	Shifts the demand curve
Prices of related goods	Shifts the demand curve
Tastes	Shifts the demand curve
Expectations	Shifts the demand curve
Number of buyers	Shifts the demand curve

The demand curve shows what happens to the quantity demanded of a good when its price varies, holding all other determinants of quantity demanded.

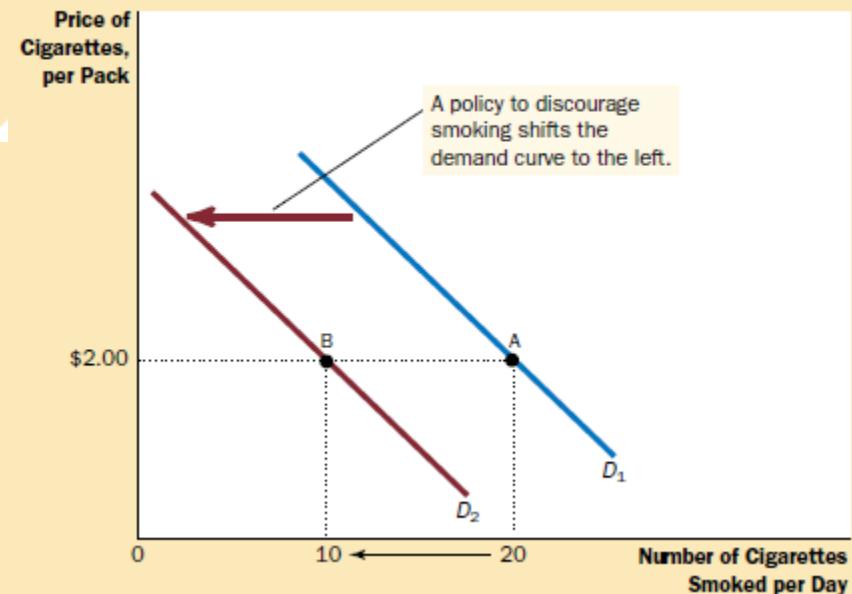
When one of these other determinants changes, the demand curve shifts!

Shifts in the demand curve v. movement along the demand curve

(b) A Movement along the Demand Curve



(a) A Shift in the Demand Curve



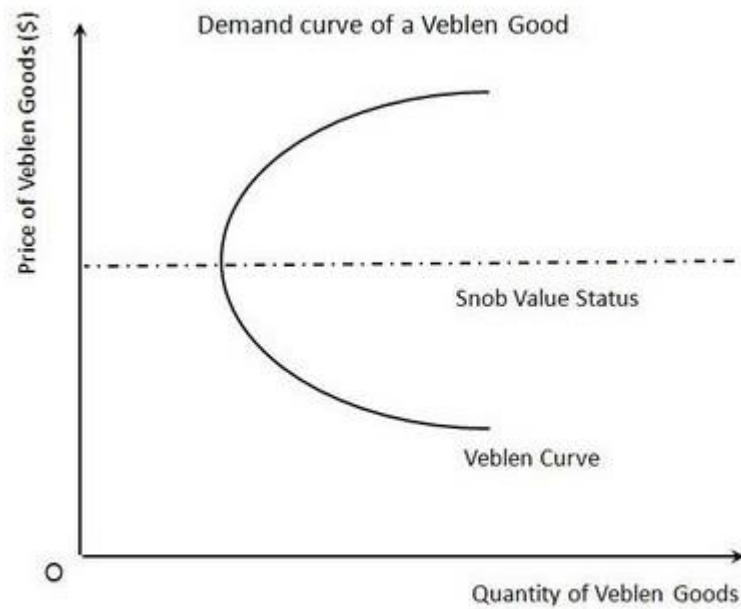
Anomalies in the theory of demand

- ▶ Veblen good
- ▶ Snob effect
- ▶ Bangwagon effect
- ▶ Giffen good...



Veblen good

- ▶ a good, whose demand is proportional to its price (a reversal of the law of demand)
- ▶ examples: luxury goods (luxury cars, designer clothing and products, jewelry)



Snob and Bangwagon effects

▶ Snob effect

- refers to the situation where the demand for a certain good by individuals of a higher income level is inversely related to the demand for the good by individuals of a lower income level.

▶ Bangwagon effect

- people might buy a new electronic item because of its popularity, regardless of whether they need it, can afford it, or even really want it.
- In politics, the bandwagon effect might cause citizens to vote for the person who appears to have more popular support because they want to belong to the majority.

Giffen good



Giffen good: is an unusual type of inferior good; the large increase of price, results in increase of demand

Type of good	The effect on quantity demanded due to the:		The Total effect on quantity demanded
	Substitution effect	Income effect	
Giffen good	Fall	Rise	Rise (because the income effect was much stronger than the substitution effect)

To study the markets...

- ▶ Let's now turn to the other side of the market and examine the behavior of sellers.



What determines the quantity an individual supplies?

- ▶ Prices
- ▶ Input prices
- ▶ Technology
- ▶ Expectations
- ▶ Number of sellers...



The Supply Curve:

The Relationship between Price and Quantity Supplied

- ▶ Quantity supplied:

Quantity supplied is the amount of a good that sellers are willing and able to sell.

The Supply Curve:

The Relationship between Price and Quantity Supplied

- ▶ Supply Schedule:

*The **supply schedule** is a table that shows the relationship between the price of the good and the quantity supplied.*

Ben's Supply Schedule

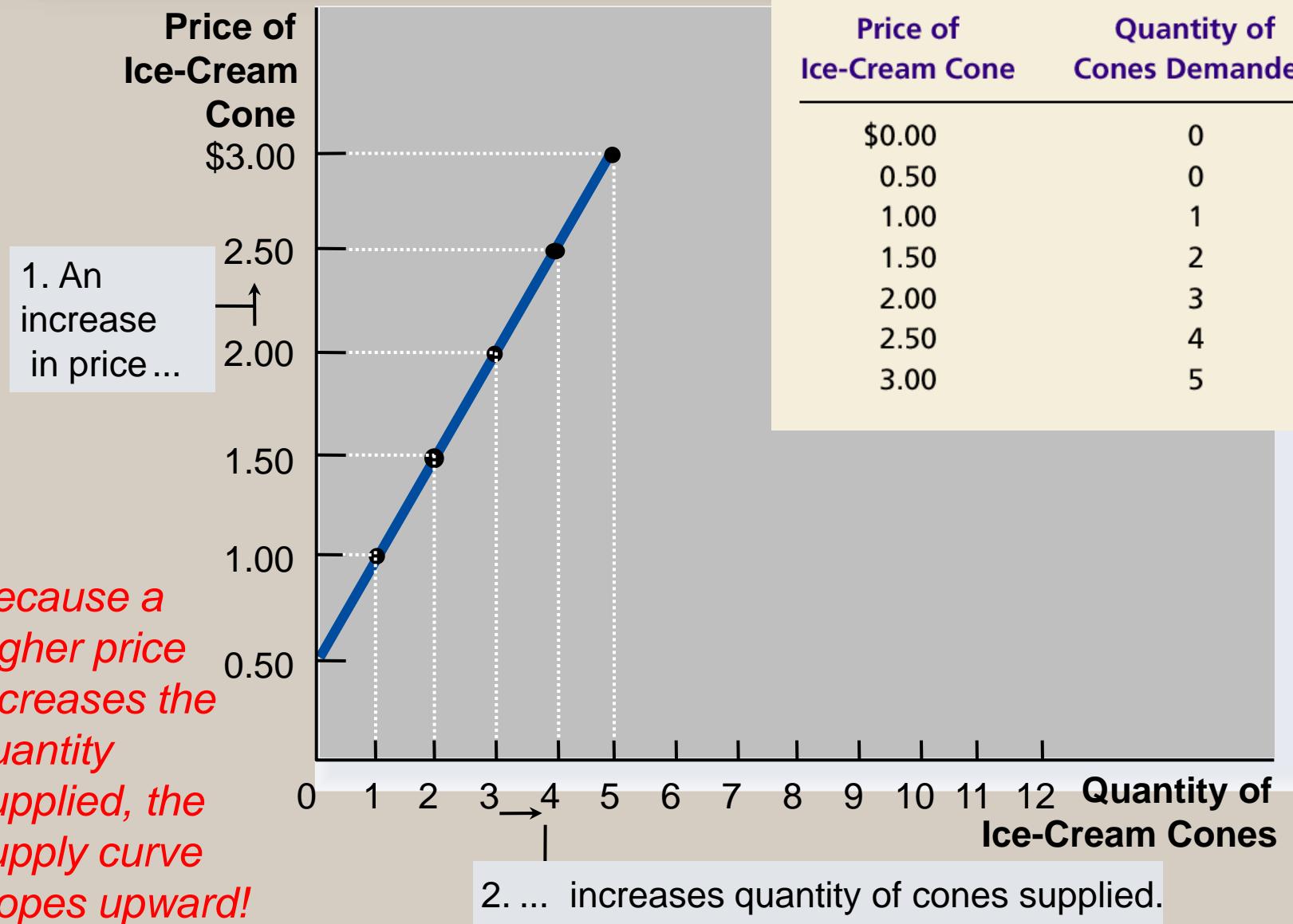
Price of Ice-Cream Cone	Quantity of Cones Demanded
\$0.00	0
0.50	0
1.00	1
1.50	2
2.00	3
2.50	4
3.00	5

The Supply Curve: The Relationship between Price and Quantity Supplied

► Supply Curve

The supply curve is the graph of the relationship between the price of a good and the quantity supplied.

Figure 3. Ben's Supply Schedule and Supply Curve



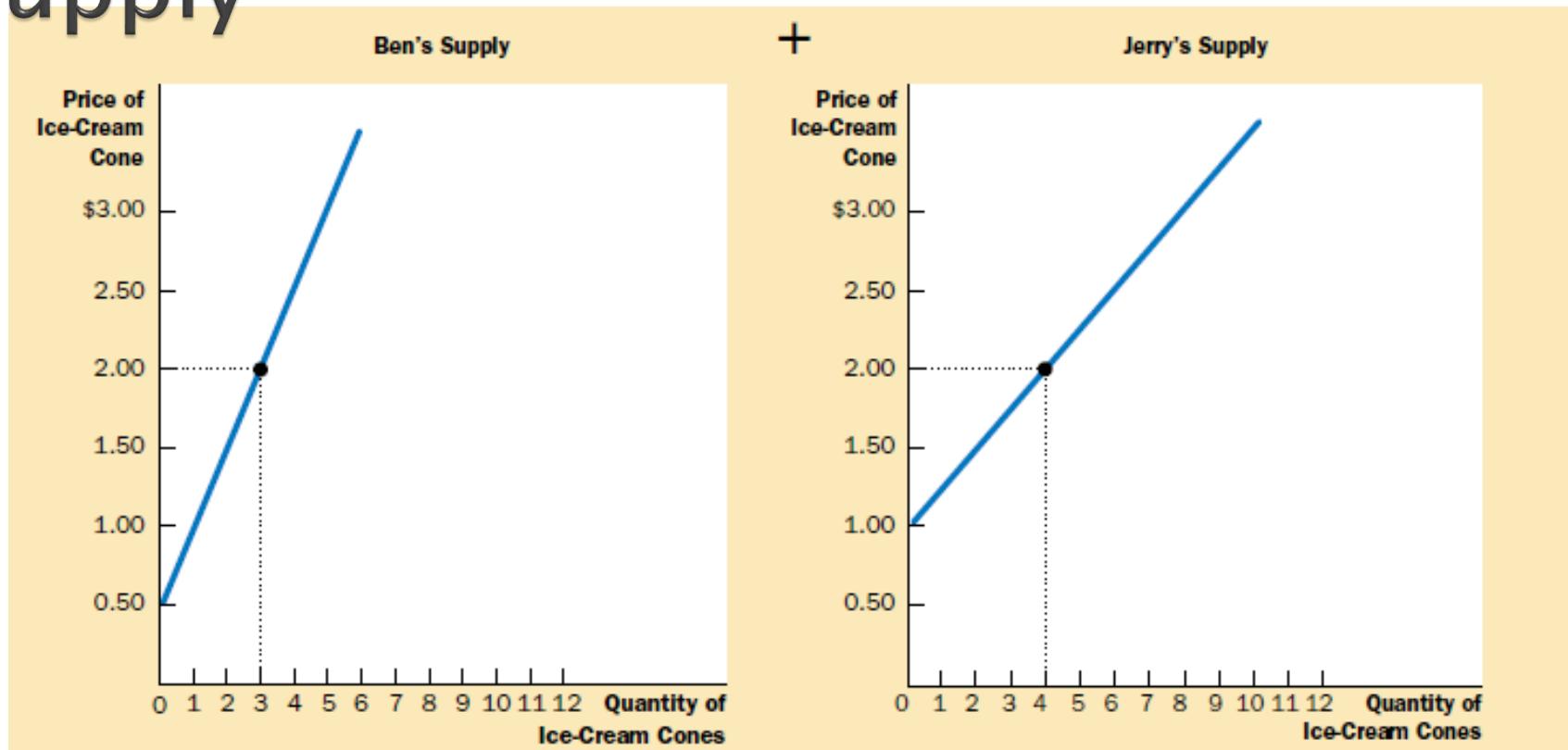
Law of supply

The law of supply states that, other things equal, the quantity supplied of a good rises when the price of the good rises.

Market Supply versus Individual Supply

- ▶ Market supply refers to the sum of all individual supplies for all sellers of a particular good or service.
- ▶ Graphically, individual supply curves are summed horizontally to obtain the market supply curve.

Market supply versus individual supply



The quantity supplied in a market is the sum of the quantities supplied by all the sellers.

PRICE OF ICE-CREAM CONE	BEN	JERRY	MARKET
\$0.00	0	+	0
0.50	0		0
1.00	1		1
1.50	2		2
2.00	3		7
2.50		4	10
3.00		5	13

Market supply

=

Market Supply

Price of
Ice-Cream
Cone

\$3.00

2.50

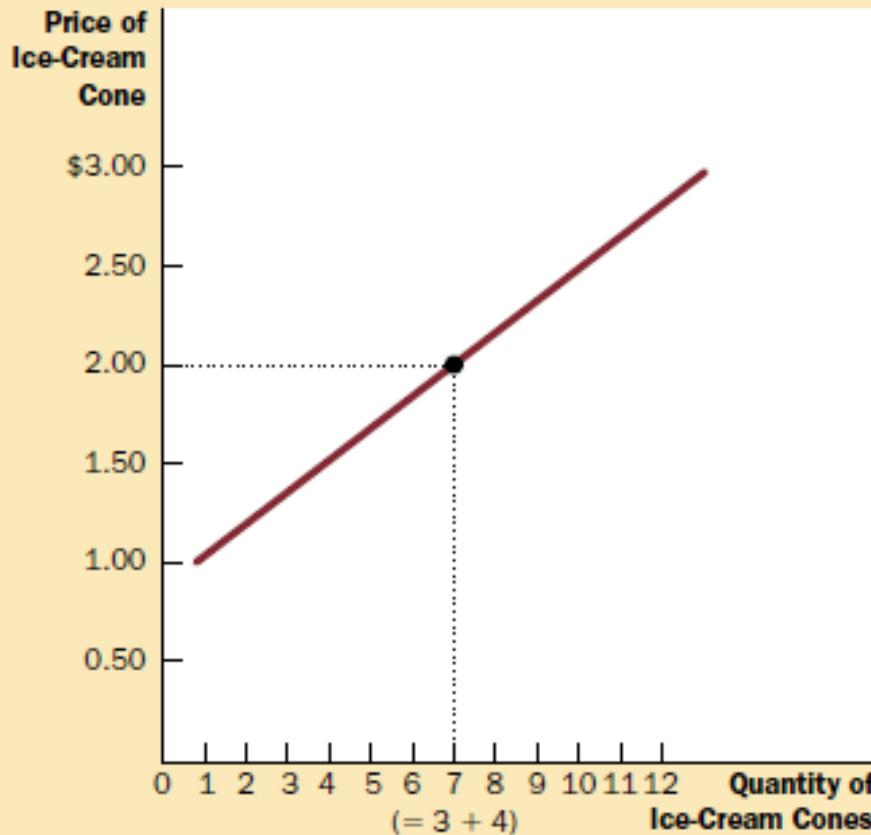
2.00

1.50

1.00

0.50

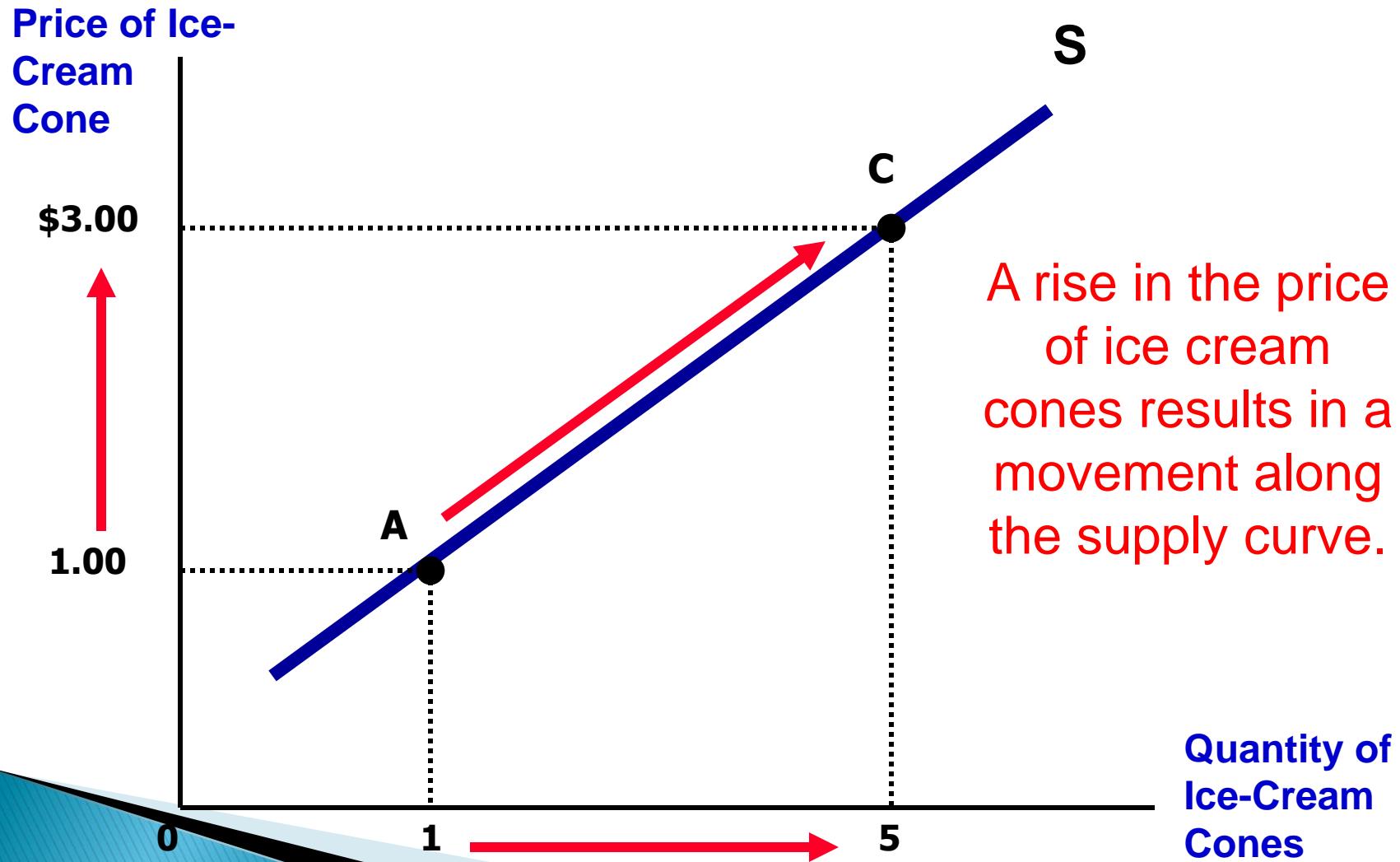
0 1 2 3 4 5 6 7 8 9 10 11 12 Quantity of
Ice-Cream Cones
 $(= 3 + 4)$



Movement along the Supply Curve

- ▶ Change in Quantity Supplied
 - Movement along the supply curve
 - Caused by a change in the price of product.

Change in Quantity Supplied



Shifts in the Supply Curve

▶ Change in Supply

- A shift in the supply curve, either to the left or right.
- Caused by a change in a determinant **other than price**.

Shifts in the Supply Curve

- ▶ Input prices
- ▶ Technology
- ▶ Expectations
- ▶ Number of sellers



Figure 4. Shifts in the Supply Curve

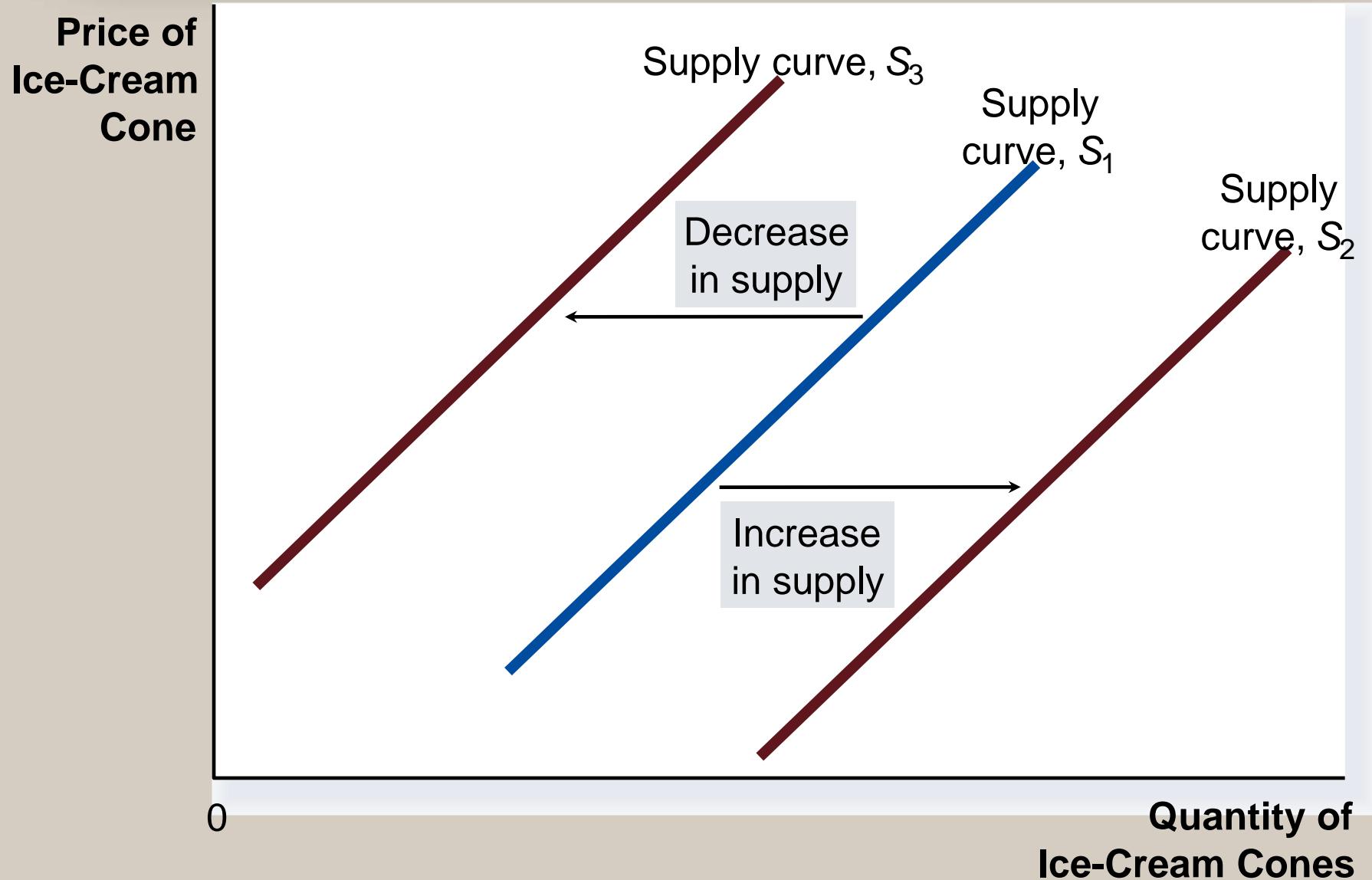


Table 2 Variables That Influence Sellers

Variable	A Change in This Variable ...
Price	Represents a movement along the supply curve
Input prices	Shifts the supply curve
Technology	Shifts the supply curve
Expectations	Shifts the supply curve
Number of sellers	Shifts the supply curve

The supply curve shows what happens to the quantity of a good when its price varies, holding constant all other determinants of quantity supplied.

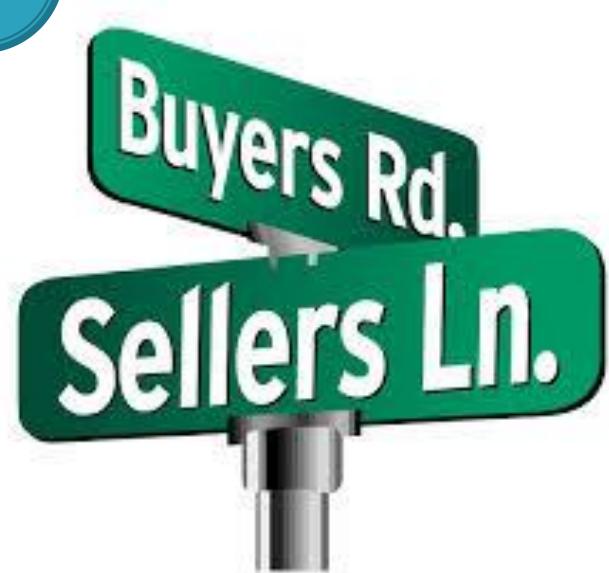
When one of these other determinants changes, the supply curve shifts.

Three Steps to Analyzing Changes in Equilibrium

- ▶ Shifts in Curves versus Movements along Curves
 - A shift in the supply curve is called a **change in supply**.
 - A movement along a fixed supply curve is called a **change in quantity supplied**.
 - A shift in the demand curve is called a **change in demand**.
 - A movement along a fixed demand curve is called a **change in quantity demanded**.

Supply and demand together

Equilibrium refers to a situation in which the price has reached the level where quantity supplied equals quantity demanded.



Supply and demand together

► *Equilibrium Price*

- The price that balances quantity supplied and quantity demanded.
- On a graph, it is the price at which the supply and demand curves intersect.

► *Equilibrium Quantity*

- The quantity supplied and the quantity demanded at the equilibrium price.
- On a graph it is the quantity at which the supply and demand curves intersect.

SUPPLY AND DEMAND TOGETHER

Demand Schedule

Price of Ice-Cream Cone	Market
\$0.00	19
0.50	16
1.00	13
1.50	10
2.00	7
2.50	4
3.00	1

Supply Schedule

Price of Ice-Cream Cone	Market
\$0.00	0
0.50	0
1.00	1
1.50	4
2.00	7
2.50	10
3.00	13

At \$2.00, the quantity demanded
is equal to the quantity supplied!

Figure 4. The Equilibrium of Supply and Demand

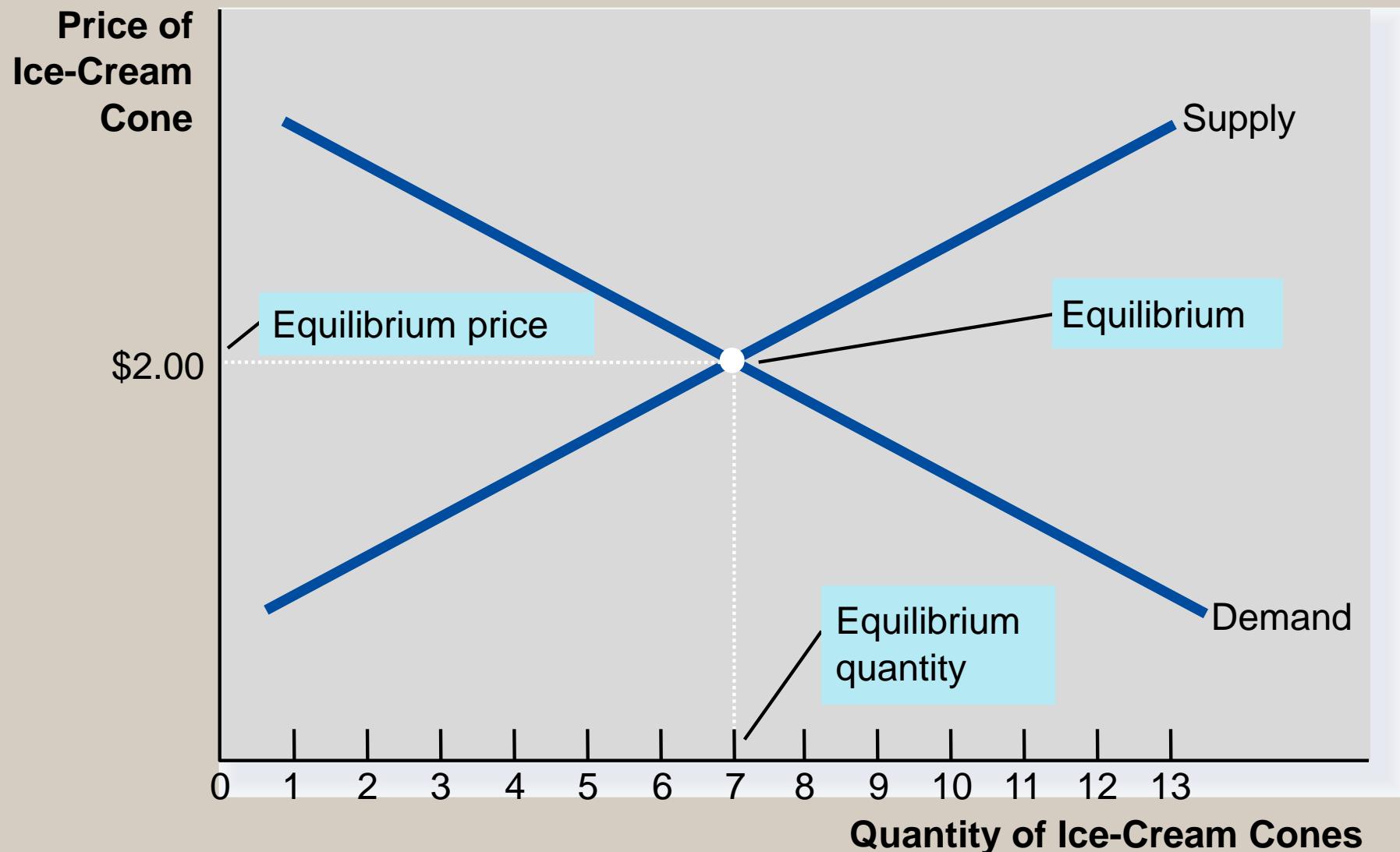
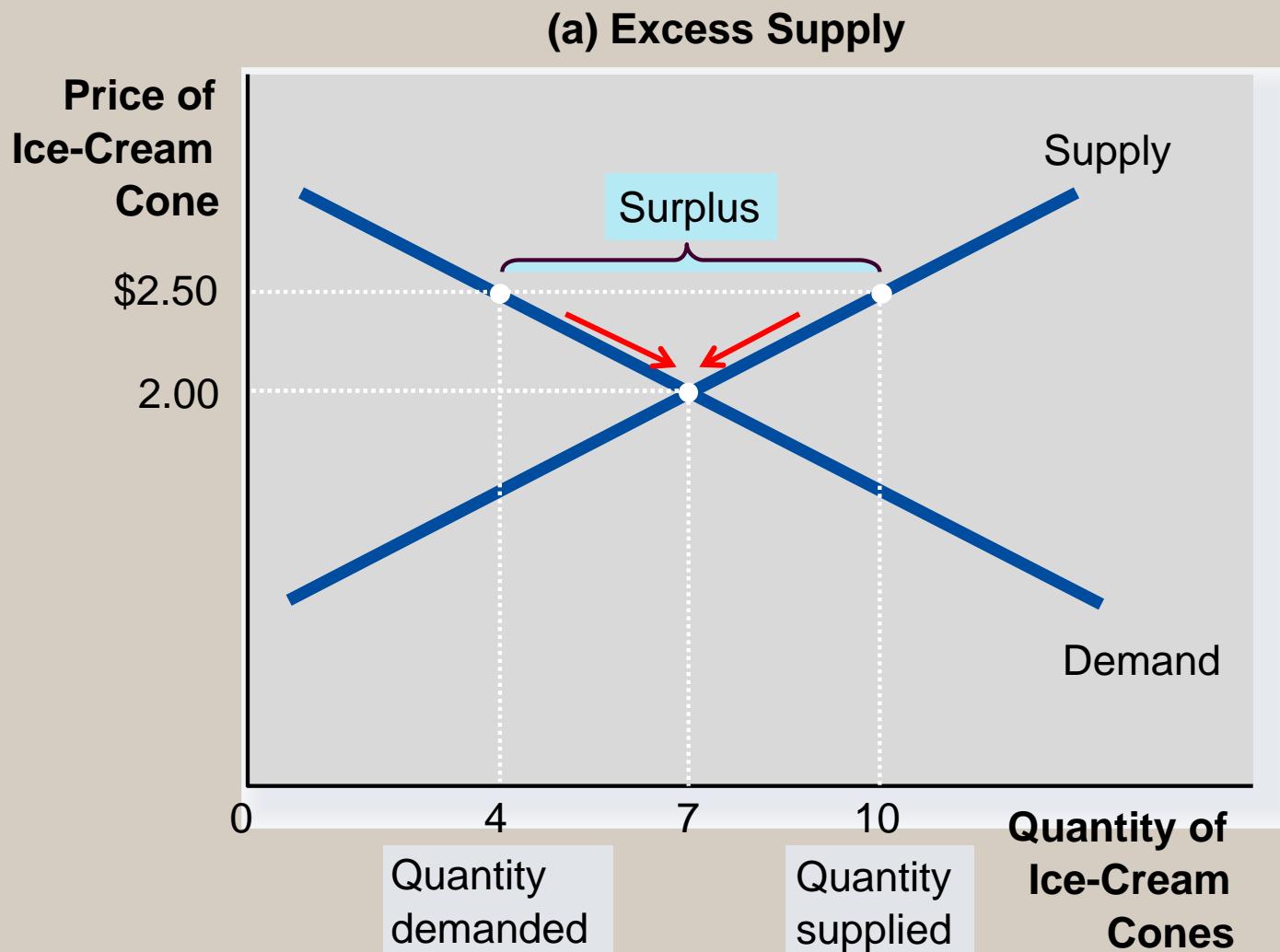


Figure 5. Markets Not in Equilibrium



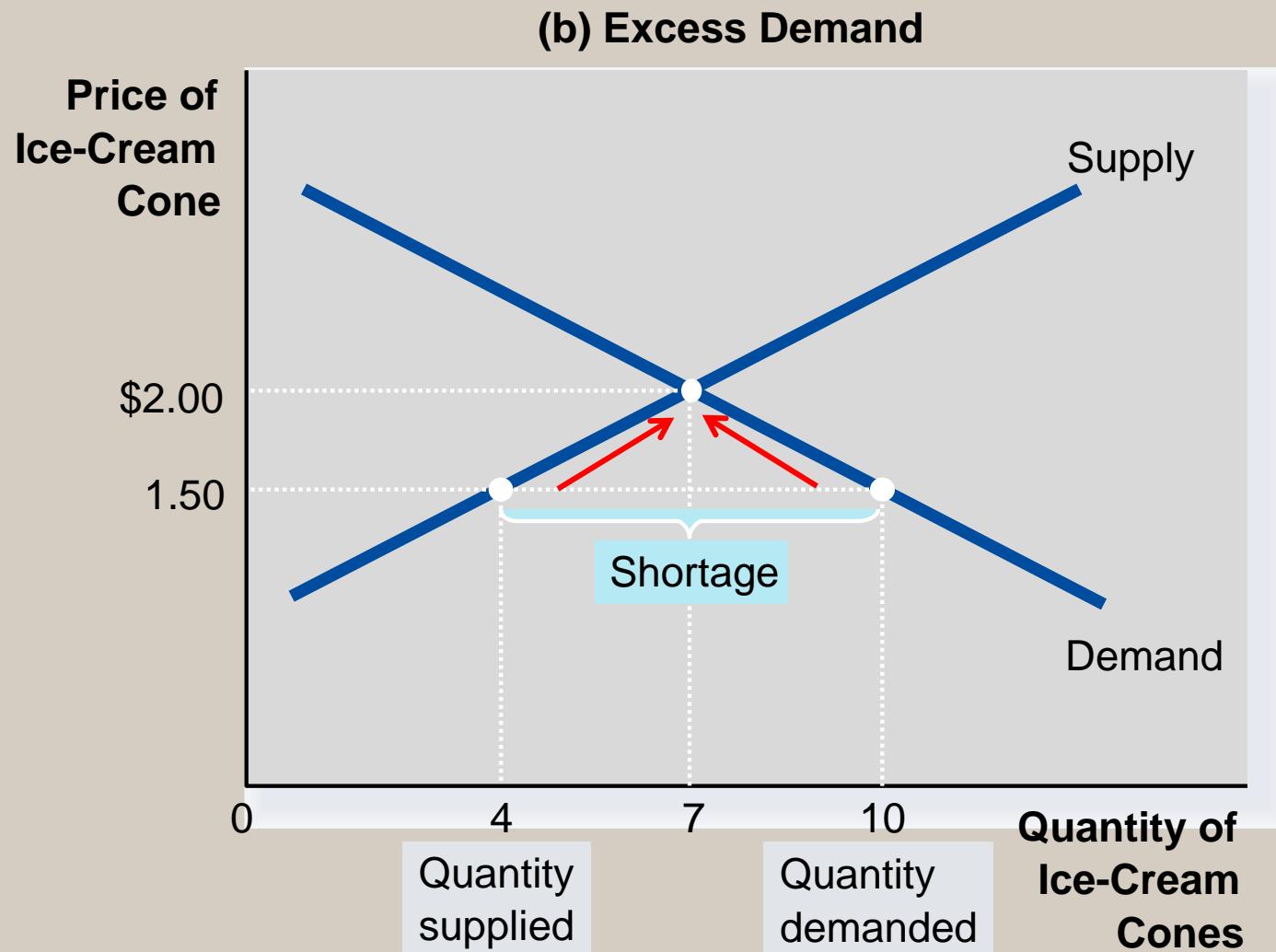
Equilibrium

► *Surplus*

- There is excess supply or a surplus.
- Suppliers will lower the price to increase sales, thereby moving toward equilibrium.

*Surplus: when price > equilibrium price,
then quantity supplied > quantity
demanded.*

Figure 6. Markets Not in Equilibrium



Equilibrium

► *Shortage*

- There is excess demand or a shortage.
- Suppliers will raise the price due to too many buyers chasing too few goods, thereby moving toward equilibrium.

*Shortage: when price < equilibrium price,
then quantity demanded > the quantity supplied.*

Equilibrium

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.

Example of a model:

Supply & demand for new cars

- ▶ shows how various events affect price and quantity of cars
- ▶ assumes the market is **competitive**: each buyer and seller is too small to affect the market price
- ▶ Variables:
 - Q^d = quantity of cars that buyers demand
 - Q^s = quantity that producers supply
 - P = price of new cars
 - Y = aggregate income
 - P_s = price of steel (an input)

The demand for cars

demand equation: $Q^d = D(P, Y)$

- ▶ shows that the quantity of cars consumers demand is related to the price of cars and aggregate income

Digression: functional notation

- ▶ **General functional notation** shows only that the variables are related.

$$Q^d = D(P, Y)$$



A list of the variables that affect Q^d

- ▶ A **specific functional form** shows the precise quantitative relationship.

- Example:

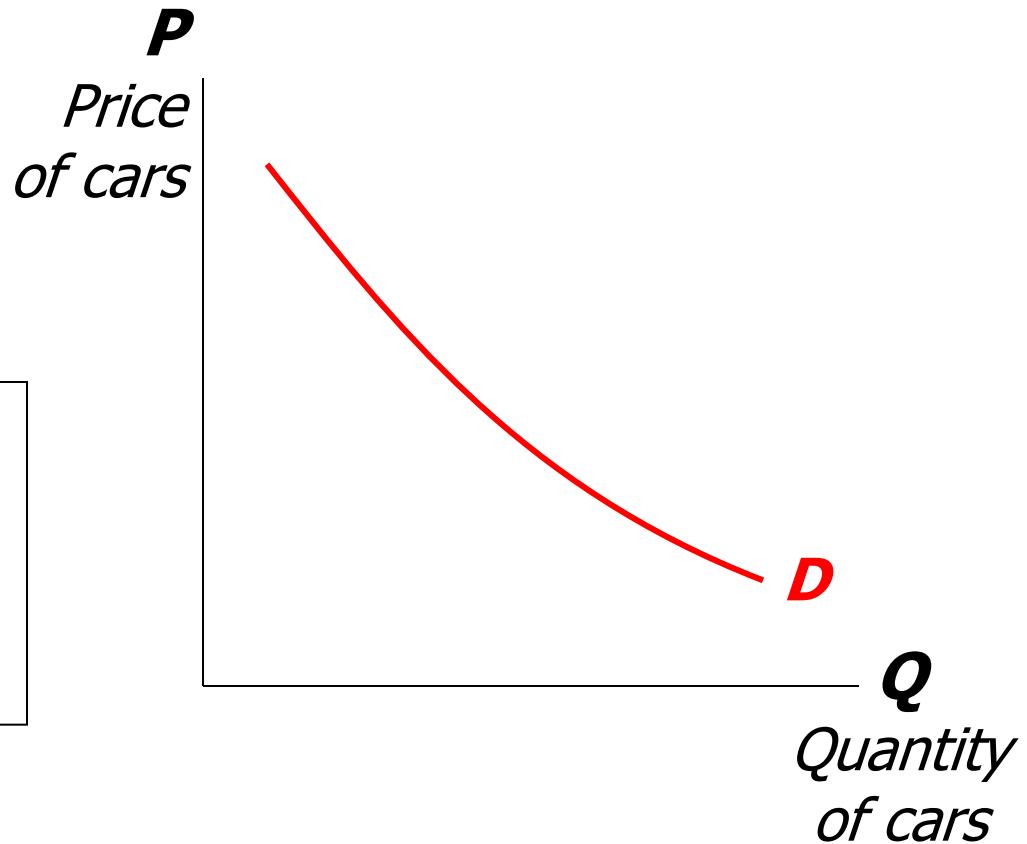
$$D(P, Y) = 60 - 10P + 2Y$$

The market for cars: Demand

demand equation:

$$Q^d = D(P, Y)$$

The **demand curve** shows the relationship between quantity demanded and price, other things equal.

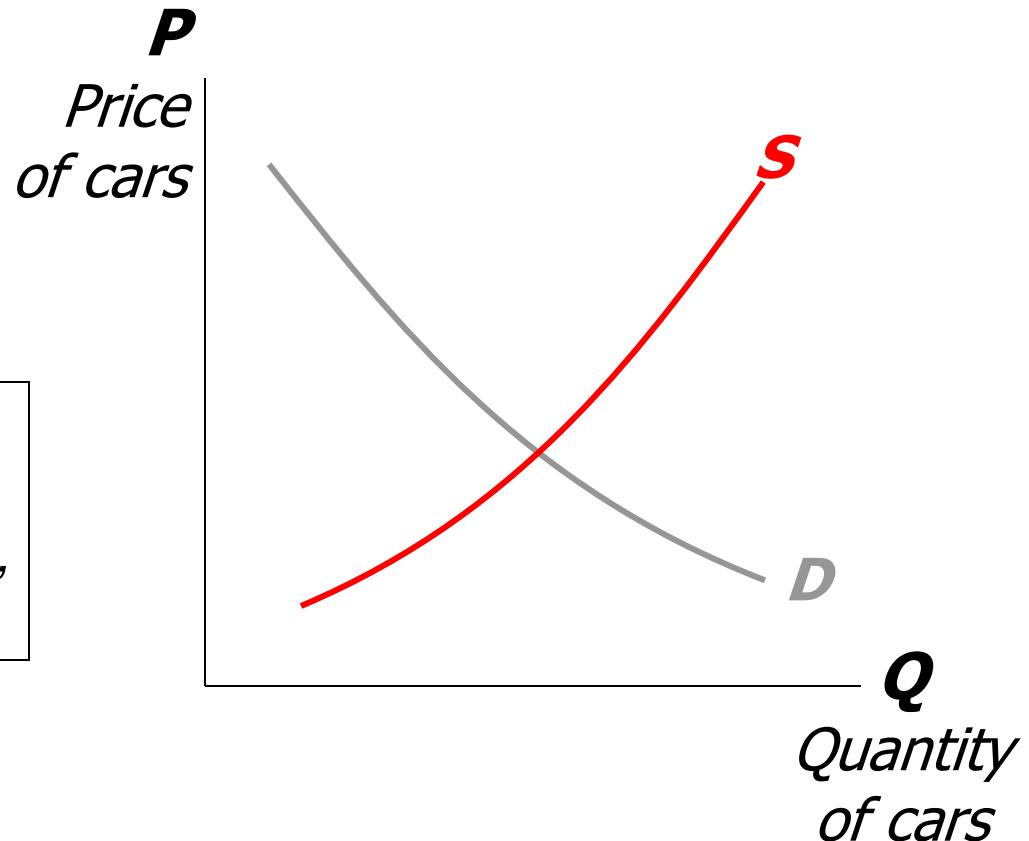


The market for cars: Supply

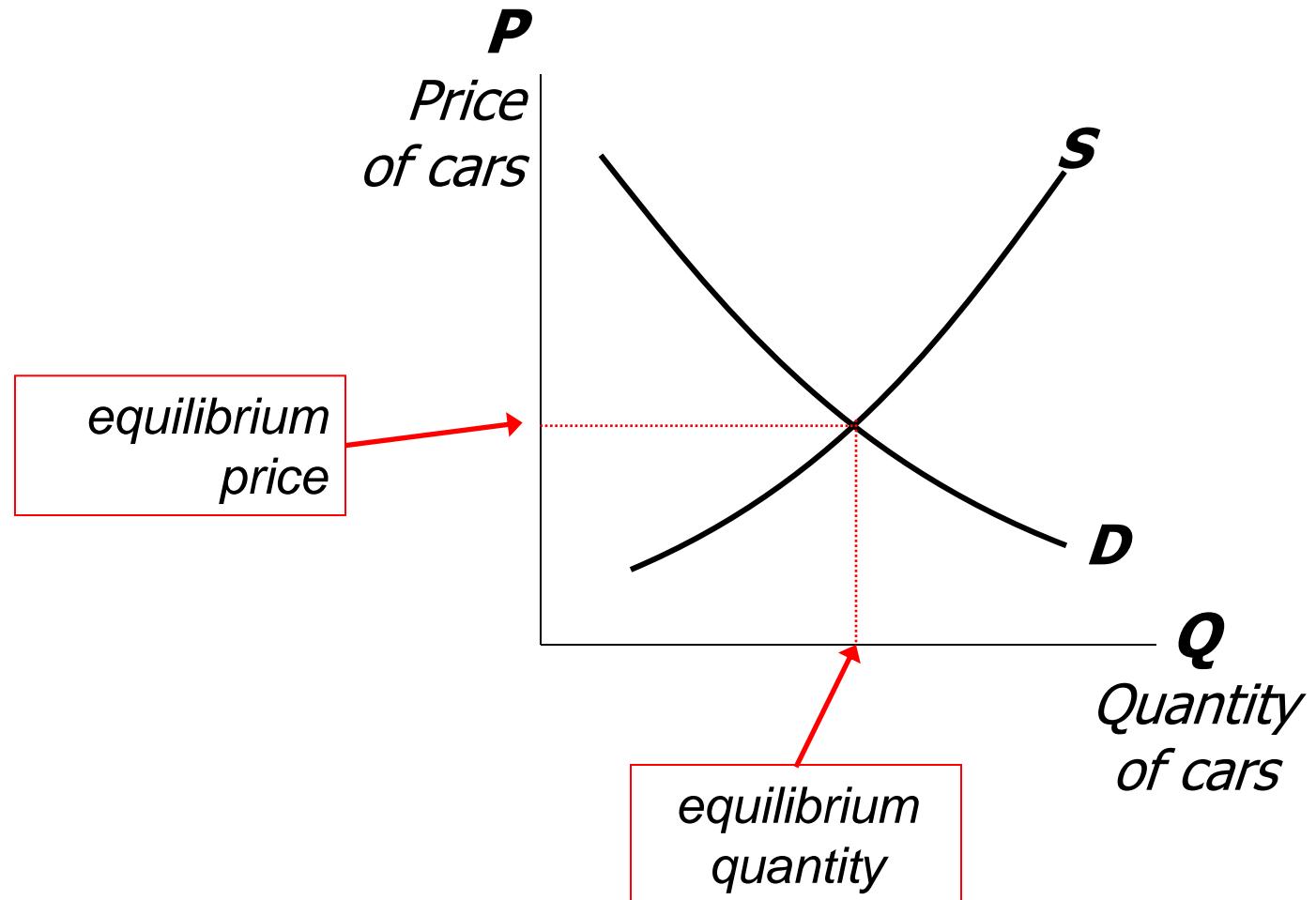
supply equation:

$$Q^s = S(P, P_s)$$

The **supply curve** shows the relationship between quantity supplied and price, other things equal.



The market for cars: Equilibrium



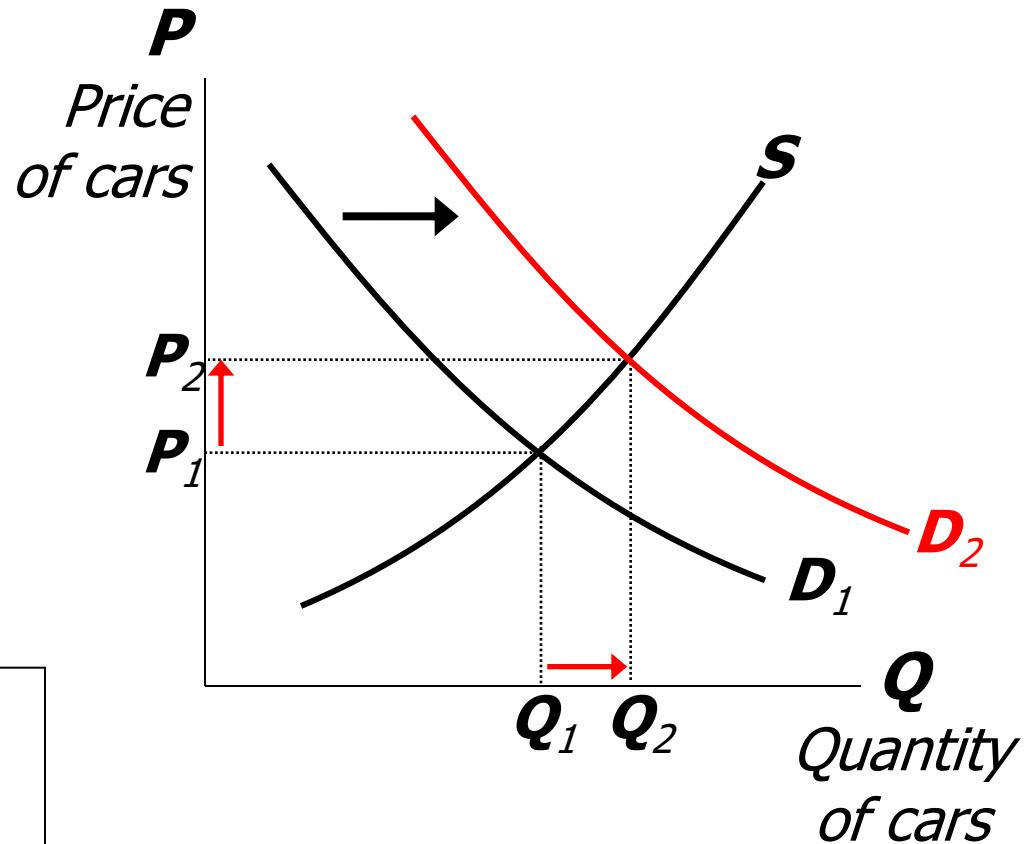
The effects of an increase in income

demand equation:

$$Q^d = D(P, Y)$$

An increase in income increases the quantity of cars consumers demand at each price...

...which increases the equilibrium price and quantity.



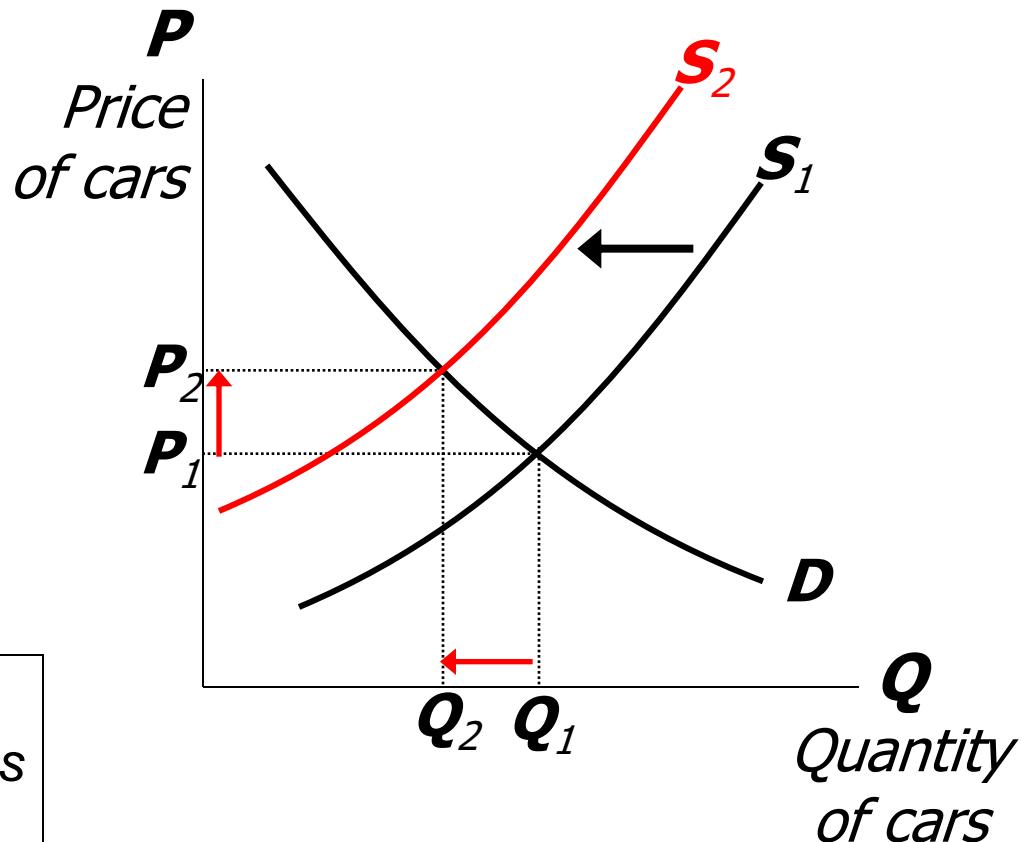
The effects of a steel price increase

supply equation:

$$Q^s = S(P, P_s)$$

An increase in P_s reduces the quantity of cars producers supply at each price...

...which increases the market price and reduces the quantity.



Endogenous vs. exogenous variables

- ▶ The values of **endogenous** variables are determined in the model.
- ▶ The values of **exogenous** variables are determined outside the model: the model takes their values & behavior as given.
- ▶ In the model of supply & demand for cars,

endogenous: P, Q^d, Q^s

exogenous: Y, P_s

A multitude of models

- ▶ No one model can address all the issues we care about.
- ▶ *e.g.*, our supply–demand model of the car market...
 - can tell us **how** a fall in aggregate income affects price & quantity of cars.
 - cannot tell us **why** aggregate income falls.

Task 1

- ▶ Let's analyze the market for bread, where
 $Q_d = D(P, Y) = 10 - 2P - 0.05Y$ and
 $Q_s = S(P, P_f) = 2.5 + 0.5P - P_f$
- ▶ Calculate the market equilibrium P^* and Q^* for $Y=100$ and $P_f=2.5$
- ▶ What happens, if:
 - $Y=60$ and $P_f=2.5$. What kind of good it is?
 - $Y=100$ and $P_f=3$
 - $Y=60$ and $P_f=3$

Three Steps to Analyzing Changes in Equilibrium

1. Decide whether the event shifts the supply or demand curve (or both).
2. Decide whether the curve(s) shift(s) to the left or to the right.
3. Use the supply-and-demand diagram to see how the shift affects equilibrium price and quantity.

Figure 7. How an Increase in Demand Affects the Equilibrium

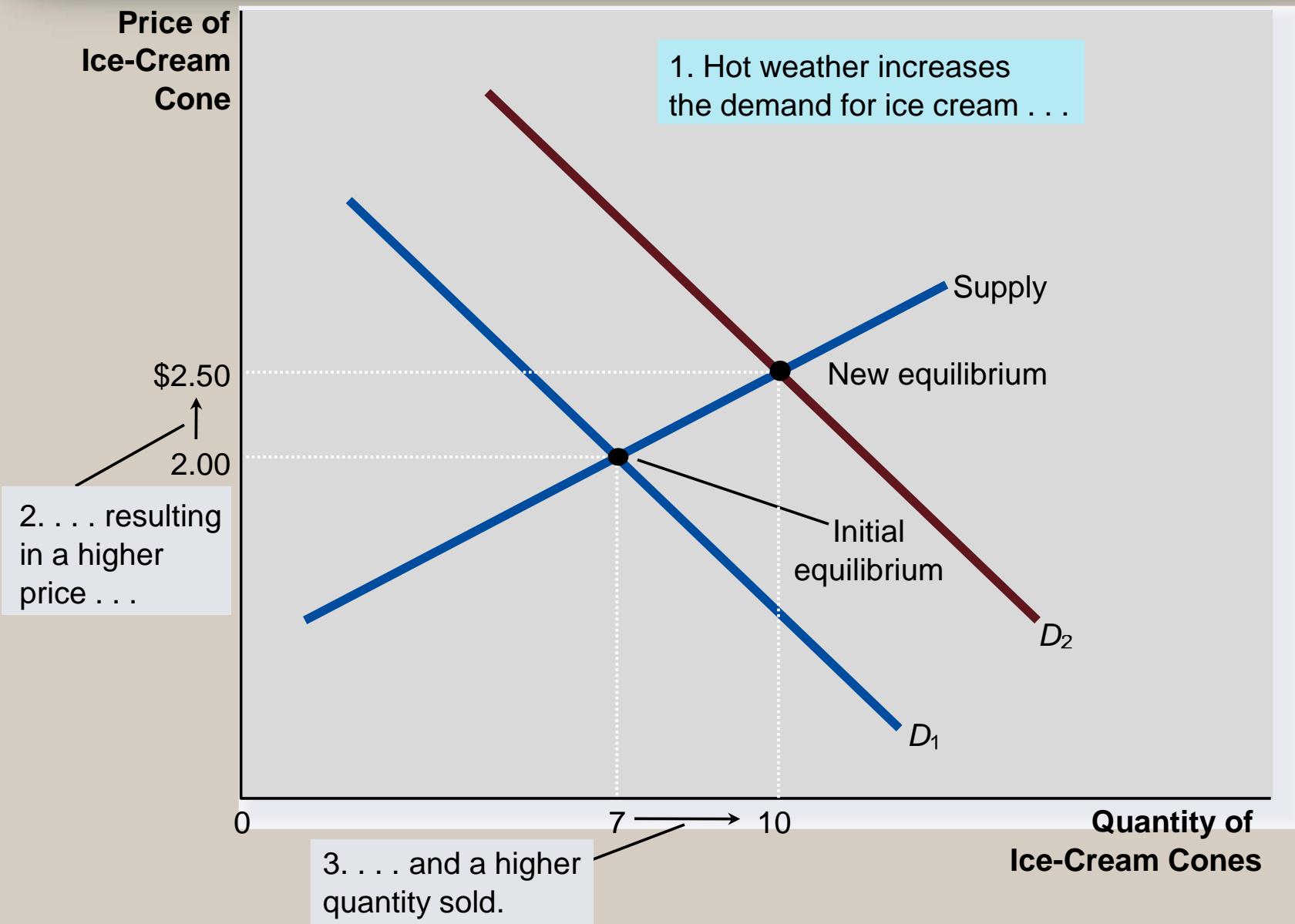


Figure 8. How a Decrease in Supply Affects the Equilibrium

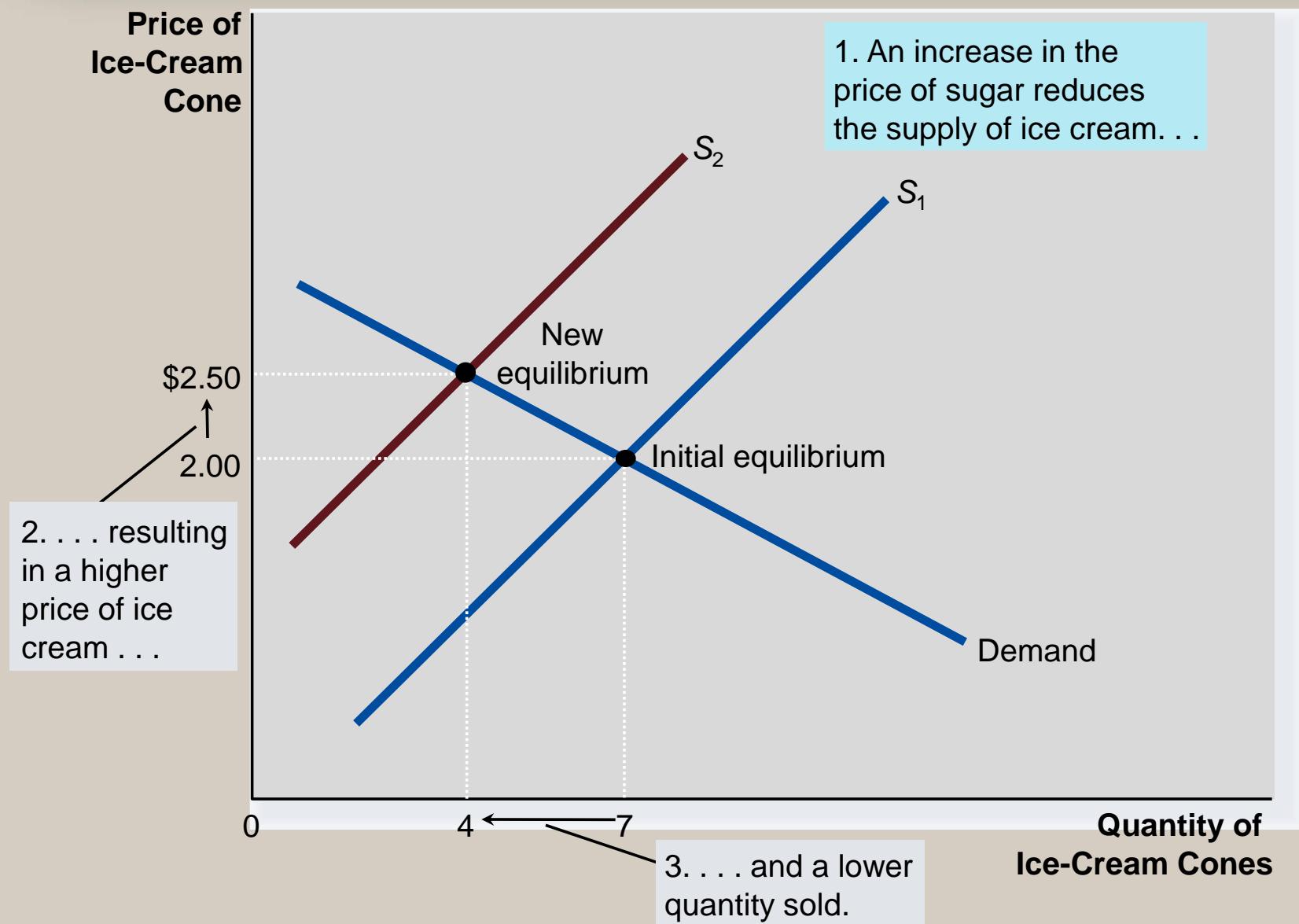


Table 4 What Happens to Price and Quantity When Supply or Demand Shifts?

	No Change in Supply	An Increase in Supply	A Decrease in Supply
No Change in Demand	P same Q same	P down Q up	P up Q down
An Increase in Demand	P up Q up	P ambiguous Q up	P up Q ambiguous
A Decrease in Demand	P down Q down	P down Q ambiguous	P ambiguous Q down

Task 2

Consider the market for minivans. For each of the events listed here, identify which of the determinants of demand or supply are affected. Also indicate whether demand or supply is increased or decreased. Then show the effect on the price and quantity of minivans.

- ▶ People decide to have more children.
- ▶ A strike by steelworkers raises steel prices.
- ▶ Engineers develop new automated machinery for the production of minivans.
- ▶ The price of station wagons rises.
- ▶ A stock-market crash lowers people's wealth.

Summary

- ▶ Thomas Carlyle said:
Teach a parrot the terms "supply and demand" and you've got an economist"...

