

Principles of Economics

Supply and Demand

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Markets

- A **market** is a group of buyers and sellers of a particular good or service.
 - ▶ Buyers as a group determine **demand**.
 - ▶ Sellers as a group determine **supply**.
 - ▶ Examples: fish market, oil market, stock market
- Markets can take many forms.
 - ▶ Some are highly organized, e.g., [NYSE](#), [Christie's](#).
 - ▶ Many are less organized.

Markets and Competition

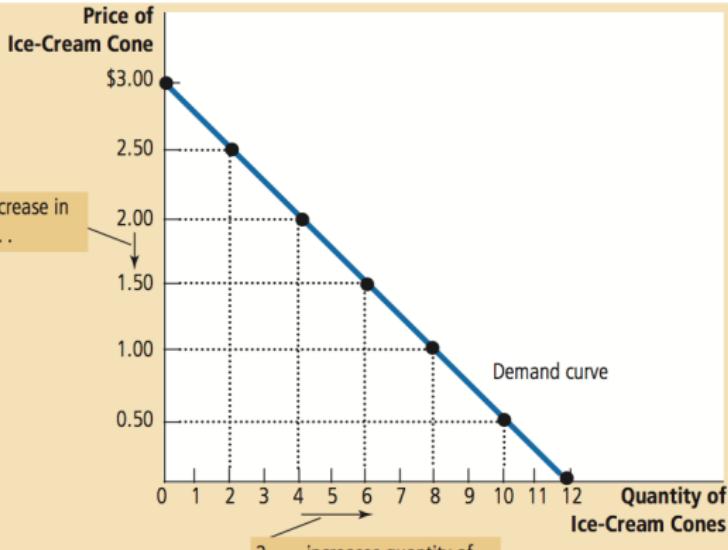
- **Monopoly:** one seller (seller controls price)
- **Oligopoly:** few sellers (not always aggressive competition)
- **Monopolistically competitive market:** a market with many sellers offering similar but not identical products (**product differentiation**).
 - ▶ Sellers in monopolistically competitive markets have some **market power**: each is able to set its own price to a certain degree.
 - ▶ E.g., restaurants, clothing, hair salons
- **Perfectly competitive market**
 - ▶ Homogeneous good
 - ▶ Numerous buyers and sellers so that each has no influence over price.
 - ★ buyers and sellers are **price takers**.
 - ▶ Perfect information
- Most markets fall between monopoly and perfect competition.

Supply and Demand

- Models of supply and demand are used to analyze the equilibrium of competitive markets.

Individual Demand

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

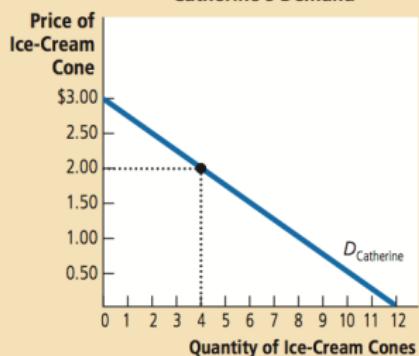


Catherine's demand for ice-cream cones

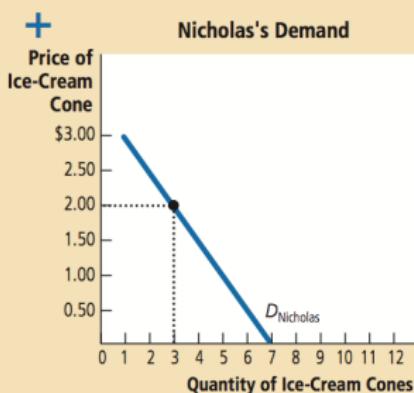
Market Demand

Price of Ice-Cream Cone	Catherine	+	Nicholas	=	Market
\$0.00	12		7		19 cones
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

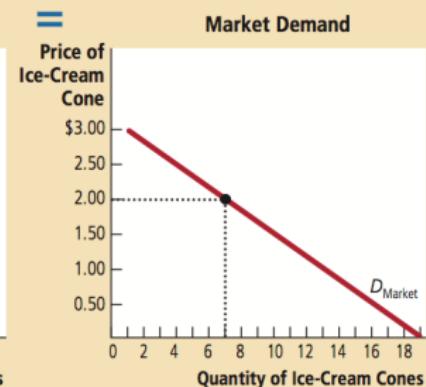
Catherine's Demand



Nicholas's Demand



Market Demand



Demand Shifters

① Number of buyers

- ▶ e.g., population growth, immigration, etc.

Demand Shifters

- ① Number of buyers
- ② Income and wealth

Normal and Inferior Goods

- **Normal good:** other things equal, increase in income/wealth leads to increase in demand.
- **Inferior good:** other things equal, increase in income/wealth leads to decrease in demand.
- *Note:* goods can be normal for some ranges of income/wealth and inferior for other ranges.

Normal Goods



Inferior Goods



Demand Shifters

- ① Number of buyers
- ② Income and wealth
- ③ Price of related goods

Substitutes and Complements

- Suppose that the price of milk increases. What will happen to the demand for soy milk?
- Demand for soy milk should increase, because people will substitute at least part of their consumption of milk by soy milk.
- Milk and Soy milk are substitute goods, or **substitutes**.

Substitutes and Complements

- What if the price of cereal increases?
- Demand for both milk/soy milk should decrease, because cereal is usually consumed together with milk/soy milk.
- They are complementary goods, or **complements**.

Substitutes and Complements

- **Substitutes:** two goods for which the demand for one rises when the price of the other increases.
 - ▶ Coffee and Tea
 - ▶ Pork and Beef
 - ▶ Toyota and Honda
- **Complements:** two goods for which the demand for one falls when the price of the other increases.
 - ▶ Bread and butter
 - ▶ Car and gas
 - ▶ Computers and software

Substitutes and Complements

- “Gas prices knock bicycle sales, repairs into higher gear,” *Associated Press*, 5/11/2008.
- “Camel demand soars in India,” *Financial Times*, 5/2/2008.

Demand Shifters

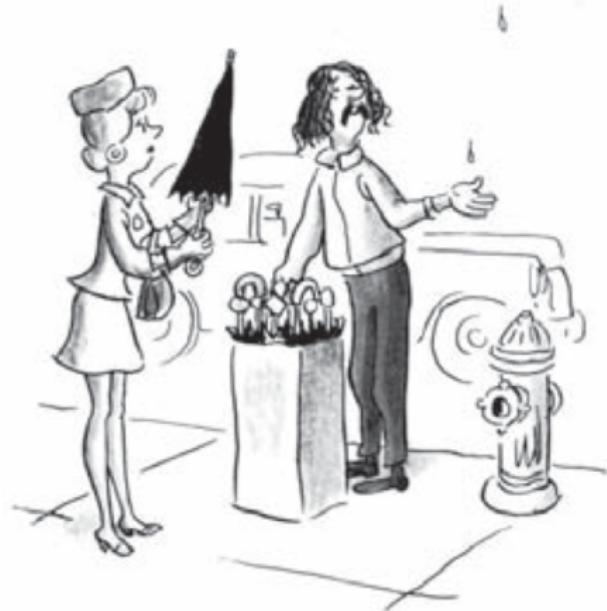
- ① Number of buyers
- ② Income and wealth
- ③ Price of related goods
- ④ Tastes and needs
 - ▶ If medical research shows that drinking coffee has significant health benefits, demand for coffee will increase.
 - ▶ If the weather becomes hotter, demand for air-conditioner will increase.

Surge Pricing



“Two dollars”

Surge Pricing



Surge Pricing



“—and seventy-five cents.”

Demand Shifters

- ① Number of buyers
- ② Income and wealth
- ③ Price of related goods
- ④ Tastes and needs
- ⑤ Expectations
 - ▶ Expectations of future income, wealth, prices of related goods, tastes, needs, etc. can affect demand today.
 - ▶ Expectations of future higher prices can lead to higher demand today.

Demand Shifters

Note

The demand function is a function of many variables, including price, income, prices of related goods, etc. When we focus on the relationship between P and Q_D ^a and draw the demand curve on these two dimensions, variables other than price that affect demand (income, prices of related goods, etc.) become *demand shifters* and are assumed to be *fixed* when we move along a given demand curve.

^a Q_D denotes quantity demanded.

Demand Shifters

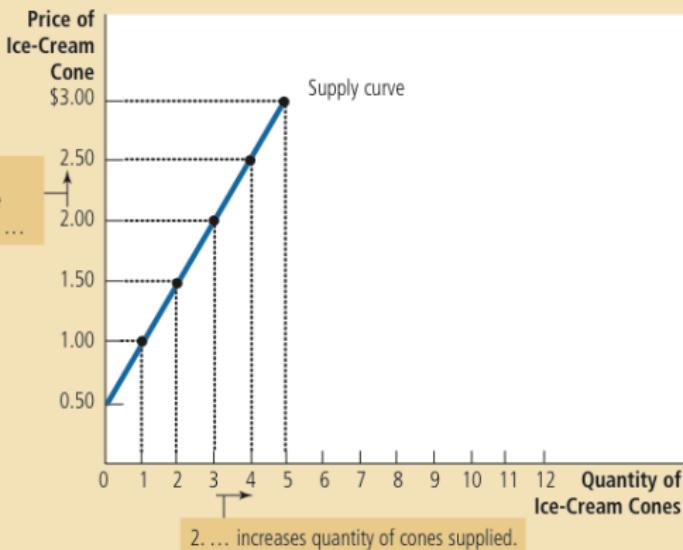
Concept Check

What happens to the demand curve of a good if

- the number of potential buyers ↑
- the prices of substitute goods ↑
- the prices of complementary goods ↓
- expected future income ↑
 - ▶ if the good is a normal good
 - ▶ if the good is an inferior good

Individual Supply

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

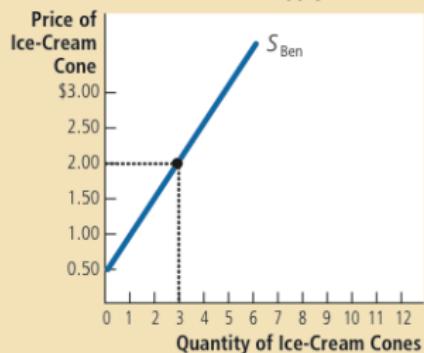


Ben's supply of ice-cream cones

Market Supply

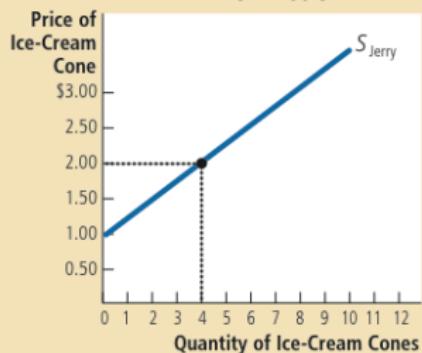
Price of Ice-Cream Cone	Ben	Jerry	Market
\$0.00	0	+	0 cones
0.50	0	0	0
1.00	1	0	1
1.50	2	2	4
2.00	3	4	7
2.50	4	6	10
3.00	5	8	13

Ben's Supply



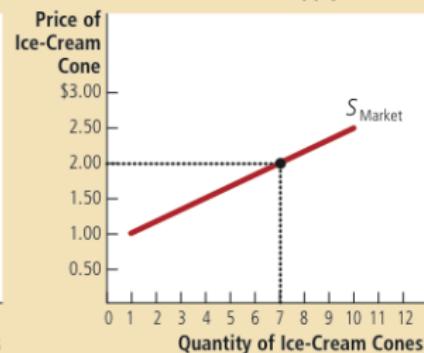
+

Jerry's Supply



=

Market Supply



Supply Shifters

① Number of sellers

- ▶ e.g., trade liberalization → supply ↑

Supply Shifters

① Number of sellers

② Input Prices

- ▶ e.g., milk price ↑ → ice cream supply ↓

Supply Shifters

- ① Number of sellers
- ② Input Prices
- ③ Technology
 - ▶ e.g., invention of the assembly line → manufactured goods supply ↑

Supply Shifters

- ① Number of sellers
- ② Input Prices
- ③ Technology
- ④ Expectations
 - ▶ e.g., expectations of higher corn prices next year → corn supply ↓ this year (store for sale next year)

Supply Shifters

Note

The supply function is a function of many variables, including price, input prices, technology, etc. When we focus on the relationship between P and Q_S ^a and draw the supply curve on these two dimensions, variables other than price that affect supply (input prices, technology, etc.) become *supply shifters* and are assumed to be *fixed* when we move along a given supply curve.

^a Q_S denotes quantity supplied.

Market Equilibrium

- **Market equilibrium** occurs when quantity demanded = quantity supplied.
 - ▶ Equilibrium occurs at the intersection of the supply and demand curves.
 - ▶ The price at which equilibrium occurs is called the **equilibrium price** (also called the **market-clearing price**).
 - ▶ The quantity at which equilibrium occurs is called the **equilibrium quantity**.
- In market economies, prices adjust to balance supply and demand, so that markets will reach equilibrium.

Supply and Demand Together

Demand Schedule

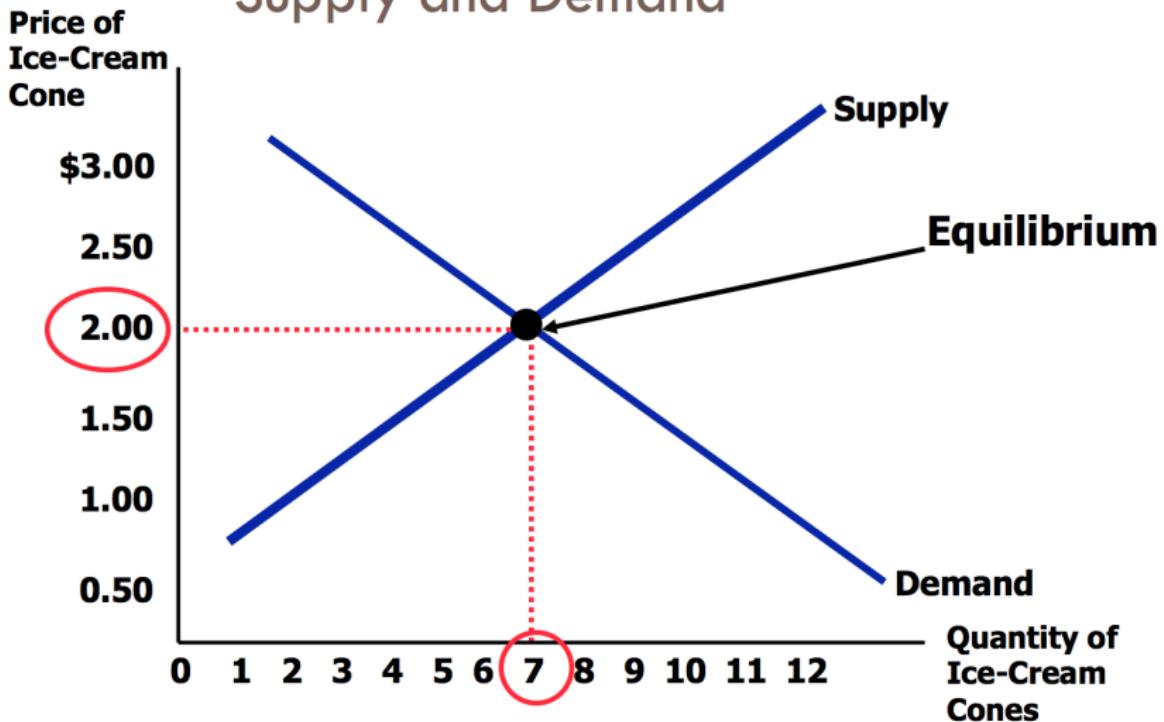
Price	Quantity
\$0.00	19
0.50	16
1.00	13
1.50	10
2.00	7
2.50	4
3.00	1

Supply Schedule

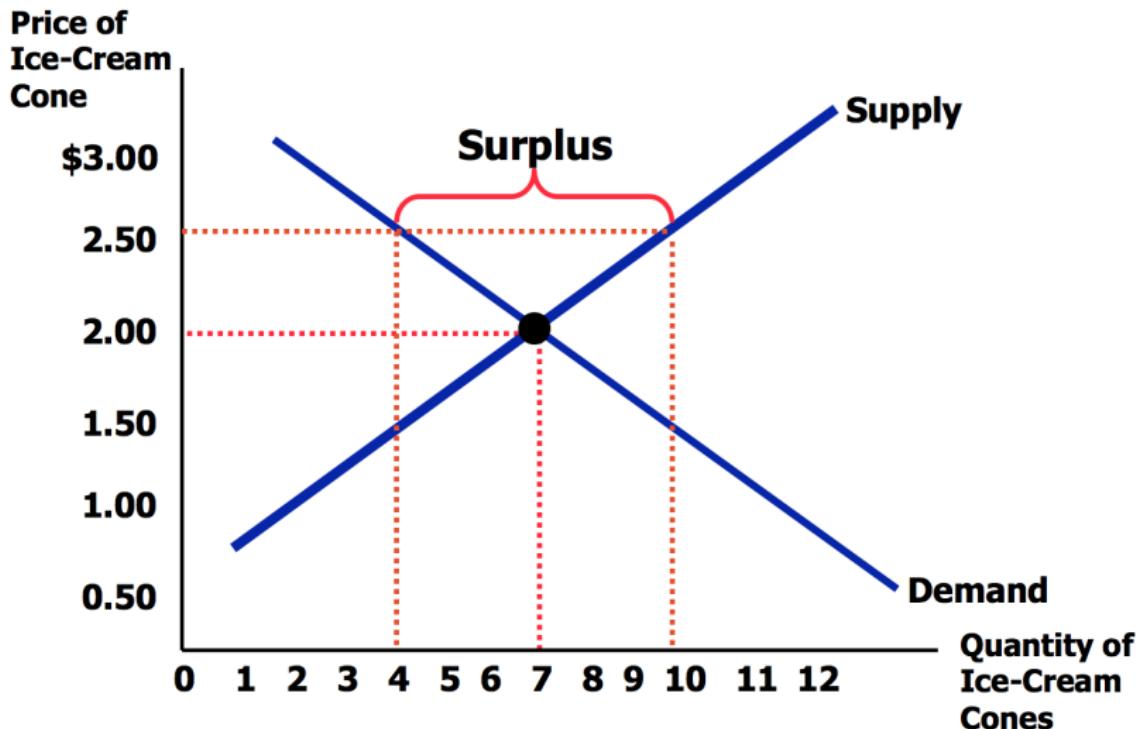
Price	Quantity
\$0.00	0
0.50	0
1.00	1
1.50	4
2.00	7
2.50	10
3.00	13

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

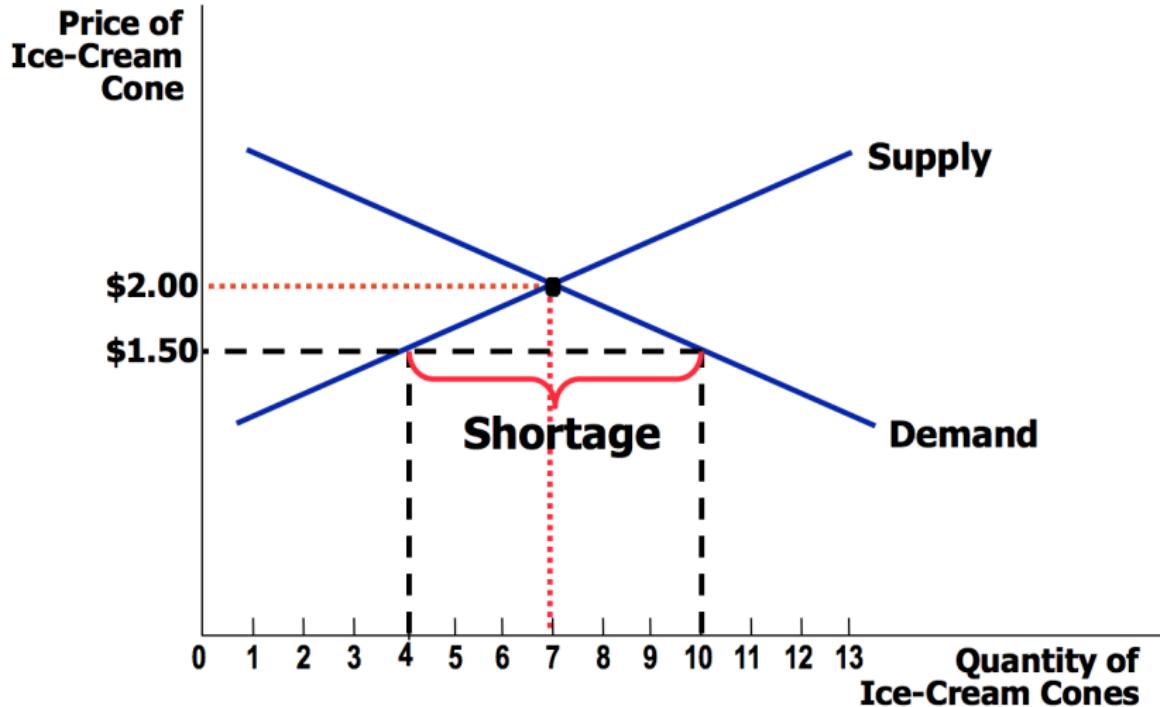
Equilibrium of Supply and Demand



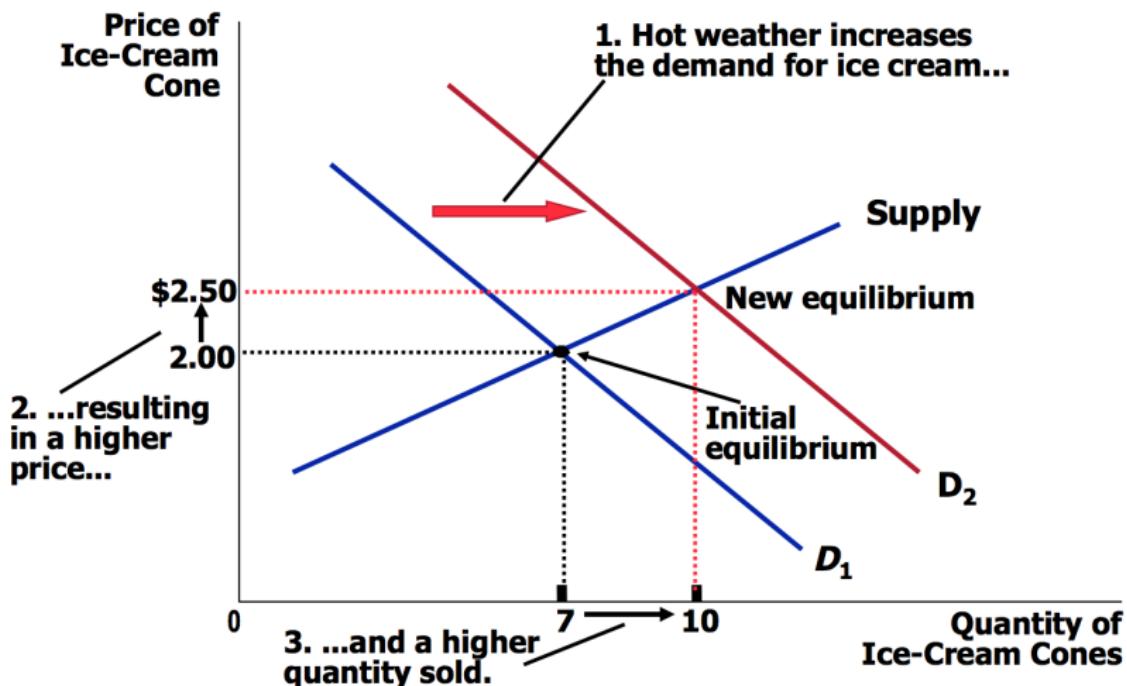
Excess Supply



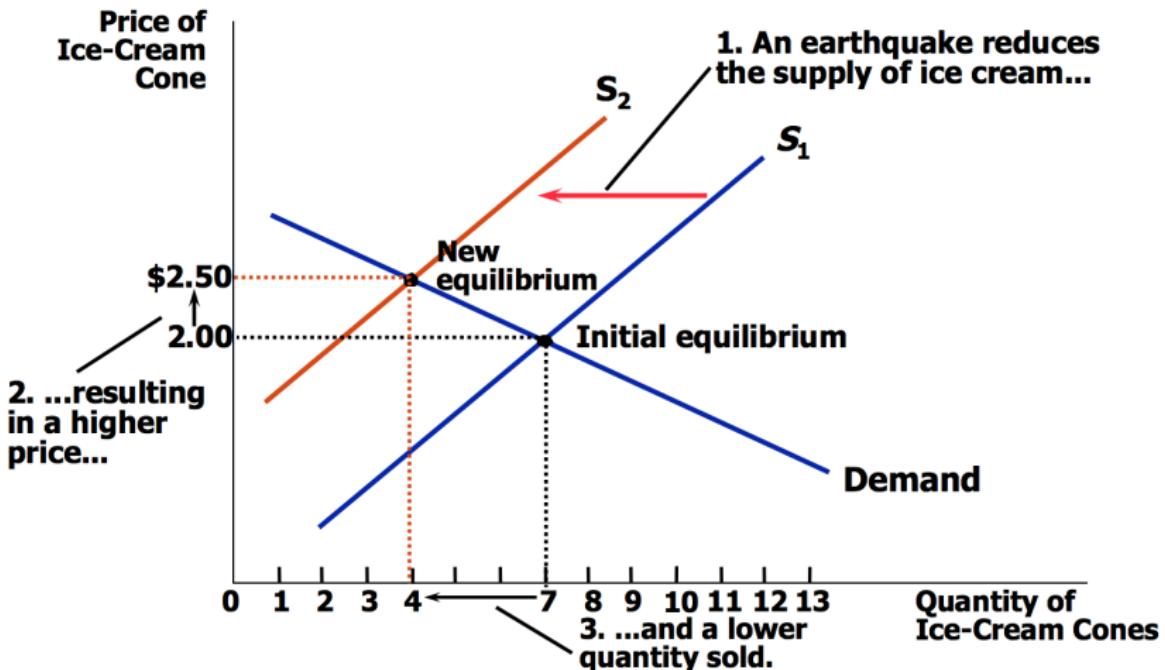
Excess Demand



How an Increase in Demand Affects the Equilibrium



How a Decrease in Supply Affects the Equilibrium



What happens to equilibrium price and quantity when supply or demand shifts

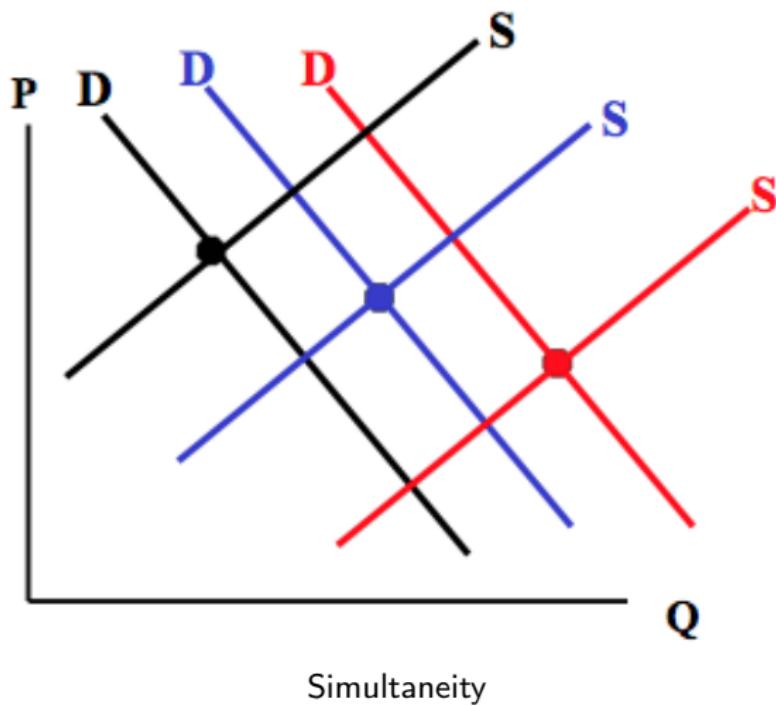
	No Change In Supply	An Increase In Supply	A Decrease In Supply
No Change In Demand	P same Q same	P down Q up	P up Q down
An Increase In Demand	P up Q up	P ambiguous Q up	P up Q ambiguous
A Decrease In Demand	P down Q down	P down Q ambiguous	P ambiguous Q down

Estimating Demand and Supply

- According to the supply and demand model¹, the prices and quantities sold of a good that we observe in a market are equilibrium prices and quantities.
- Changes in equilibrium price and quantity can reflect changes in both demand and supply.
- Therefore, we often cannot directly infer the shape of the demand curve or the shape of the supply curve from observed market prices and quantities. This is called the **simultaneity problem**.
- To estimate the shape of the demand curve, we want the demand curve to stay constant while the supply curve shifts.
- To estimate the shape of the supply curve, we want the supply curve to stay constant while the demand curve shifts.

¹Note: it is important to keep in mind that the supply and demand model is a *theoretical model* and the statement that a market will adjust its price to reach equilibrium is a *prediction* of the model.

Estimating Demand and Supply



Reference

-  Mankiw, N. G. (2017). *Principles of Economics* (8th ed.). Boston, MA: Cengage Learning.