4. The Market Forces of Supply and Demand

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March 17, 2016

What this chapter is about

The first chapter in a three-chapter sequence that deals with **supply and demand** and **how markets work**.

- Chapter 4 shows how supply and demand for a good determines both the **quantity** produced and the **price** at which the good sells.
- Chapter 5 will add precision to the discussion of supply and demand by addressing the concept of **elasticity**—the sensitivity of the quantity supplied and quantity demanded to changes in economic variables
- Chapter 6 will address the impact of **government policies** on prices and quantities in markets.

What this chapter is about

- what a competitive market is.
- what determines the demand for a good in a competitive market.
- what determines the supply of a good in a competitive market.
- how supply and demand together set the price of a good and the quantity sold.
- the key role of prices in allocating scarce resources in market economies.

Market and Competition

- Market: a group of buyers and sellers of a particular good or service.
- Competitive market: there are many buyers and sellers of the same good or service
  - Each seller or buyer has a negligible impact on the market price
- Each market is characterized by a different degree of competition.

Perfect competition 완전경쟁시장

- For now, we will assume that markets are **perfectly competitive**.
  - The goods being offered for sale are exactly the same.
  - Buyers and sellers are so numerous that no single buyer or seller has any influence over the market price.
  - Must accept the market price as given → "price takers." 
- Not all goods are sold in a perfectly competitive market.
  - The other extreme: monopoly 독점
  - Other markets fall between perfect competition and monopoly.
    - oligopoly, duopoly, monopolistic competition 과점

Perfect competition as a benchmark

- We will start by studying perfect competition.
- Easiest to analyze 
- Some degree of competition is present in most markets
  - Many of the lessons that we learn under perfect competition apply in more general environment.
- Useful starting point

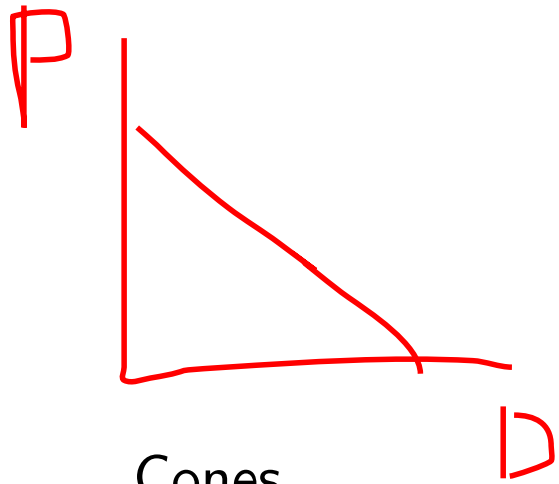
Demand 공급

- **Quantity demanded**: the amount of a good that buyers are willing and able to purchase (at some specific price).

$$Q^D = f\,(P, \underbrace{Other\ things}_{\text{가격, 날씨, 소득, 개인의 기호 등등}})$$

- **Law of demand**: the claim that, *other things being equal*, the quantity demanded of a good falls when the price of the good rises. 
  - The exceptions (Giffen goods) are so rare
- **Demand schedule**: a table that shows the relationship between the price of a good and the quantity demanded.
- **Demand curve**: a graph of the relationship between the price of a good and the quantity demanded.

Demand



- Catherine

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

Market Demand versus Individual Demand

- The market demand is the sum of all of the individual demands for a particular good or service.
- The demand curves are summed horizontally—meaning that the quantities demanded are added up for each level of price.

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

Shifts in the demand curve

예를 들어 날씨가 더워졌을 때에는 같은 가격이라도 아이스크림의 수요량이 증가한다.

- "Other things" need not be constant
- Any changes in these other factors will affect demand *at any given price*.
- Represented by shifts in the demand curve
  - An increase in demand is represented by a shift of the demand curve to the right.
  - A decrease in demand is represented by a shift of the demand curve to the left.

수요량의 변화

- Need to distinguish between "*movement along the demand curve*" and "*shift in the demand curve*"

수요의 변화

$$Q^D = f\left(P, Other\ \ things\right)$$

Other things...

- Income
- Normal good: a good for which, other things equal, an increase in income leads to an increase in demand 정상재 : 소득이 늘면 수요가 증가
- Inferior good: a good for which, other things equal, an increase in income leads to a decrease in demand 열등재 : 소득이 늘면 수요가 감소
  - Fast-food chains
  - Bus rides

Other things...

연관재

- Prices of related goods
- Substitutes: two goods for which an increase in the price of one good leads to an increase in the demand for the other. 대체재 : 다른상품의 가격이 증가했을때 수요가 증가한다.
  - Coffee and Tea
  - Train rides and Air flights
  - Frozen yogurt and Ice cream
- Complements: two goods for which an increase in the price of one good leads to a decrease in the demand for the other. 보완재 : 다른상품의 가격이 증가했을때 수요가 감소한다.
  - Goods that are consumed together
  - Computers and Software
  - Cars and Gasoline
  - Cappuccinos and Croissants

영화보는 것과 팝콘!

Other things...

- Tastes
- Number of Buyers
- Expectations
  - Future income
  - Future prices
    휘발유가 오를 것이라고 예상하면 자동차의 소비가 줄어든다 등

Case Study: Two Ways to Reduce the Quantity of Smoking Demanded

수요곡선을 이동시키기

1. Shift the demand curve for cigarettes and other tobacco products
2. Try to raise the price of cigarettes
   가격을 올려서 수요량을 바꾼다.

Case Study: Two Ways to Reduce the Quantity of Smoking Demanded

- Policies designed to reduce the demand for cigarettes
  - Public service announcements
  - Mandatory health warnings on cigarette packages
  - Prohibition of cigarette advertising on television
- If successful
  - Shift the demand curve to the left

Case Study: Two Ways to Reduce the Quantity of Smoking Demanded

- Raising the price of cigarettes
  - Tobacco taxes $\rightarrow$ higher price $\rightarrow$ lowers the quantity of cigarettes demanded.
  - The demand curve does not shift in this case
  - An increase in the price of cigarettes can be shown by a movement along the original demand curve.
- 10% increase in the price of cigarettes causes a 4% reduction in the quantity of cigarettes demanded.
- For teens, a 10% increase in price leads to a 12% drop in quantity demanded.

Case Study: Two Ways to Reduce the Quantity of Smoking Demanded

- How does the price of cigarettes affects the demand for illicit drugs, such as marijuana
- Opponents of cigarette taxes vs. Proponents
- One can claim that marijuana is a close substitute for smoking cigarettes.
  - In this case, an increase in the price of cigarettes results in much higher marijuana consumption.
- On the other hand, some studies have shown that tobacco as a "gateway drug" that leads people to other harmful drugs.
  - In this case, an increase in the price of cigarettes results in much smaller marijuana consumption.
  - Thus, it appears that tobacco and marijuana are complements.
- Substitutes or complements? It depends.

Supply

- **Quantity supplied**: the amount of a good that sellers are willing and able to sell (at some specific price).

$$Q^S = f\,(P, \mathit{Other\ things})$$

비싸면 많이 판다.

- **Law of supply**: the claim that, *other things being equal*, the quantity supplied of a good rises when the price of the good rises
- **Supply schedule**: a table that shows the relationship between the price of a good and the quantity supplied
- **Supply curve**: a graph of the relationship between the price of a good and the quantity supplied

Supply

- Ben

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

Market Supply versus Individual Supply

- The market supply is the sum of the quantities supplied by all the sellers at each price for a particular good or service.
- The market supply curve is found by adding horizontally the individual supply curves.

Price of Ice-Cream Cone	Ben		Jerry		Market
\$0.00	0	+	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

Shifts in the supply curve

- "Other things" need not be constant
- Any changes in these other factors will affect supply *at any given price*.
- Represented by shifts in the supply curve
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  - A decrease in supply is represented by a shift of the supply curve to the left
- Need to distinguish between "*movement along the supply curve*" and "*shift in the supply curve*"

$$Q^S = f\left(P, Other\ things\right)$$

Other things...

요소 가격 ex) 설탕값이 증가하면 아이스크림의 공급이 줄어든다.

- Input prices
  - Supply is negatively related to prices of inputs
  - Higher input prices: decrease in supply
- Technology
  - Advance in technology: increase in supply
- Expectations about future
  - Affect current supply
  - Expected higher prices
    - Decrease in current supply

ex) 가격이 증가할 것이라고 예측하면,

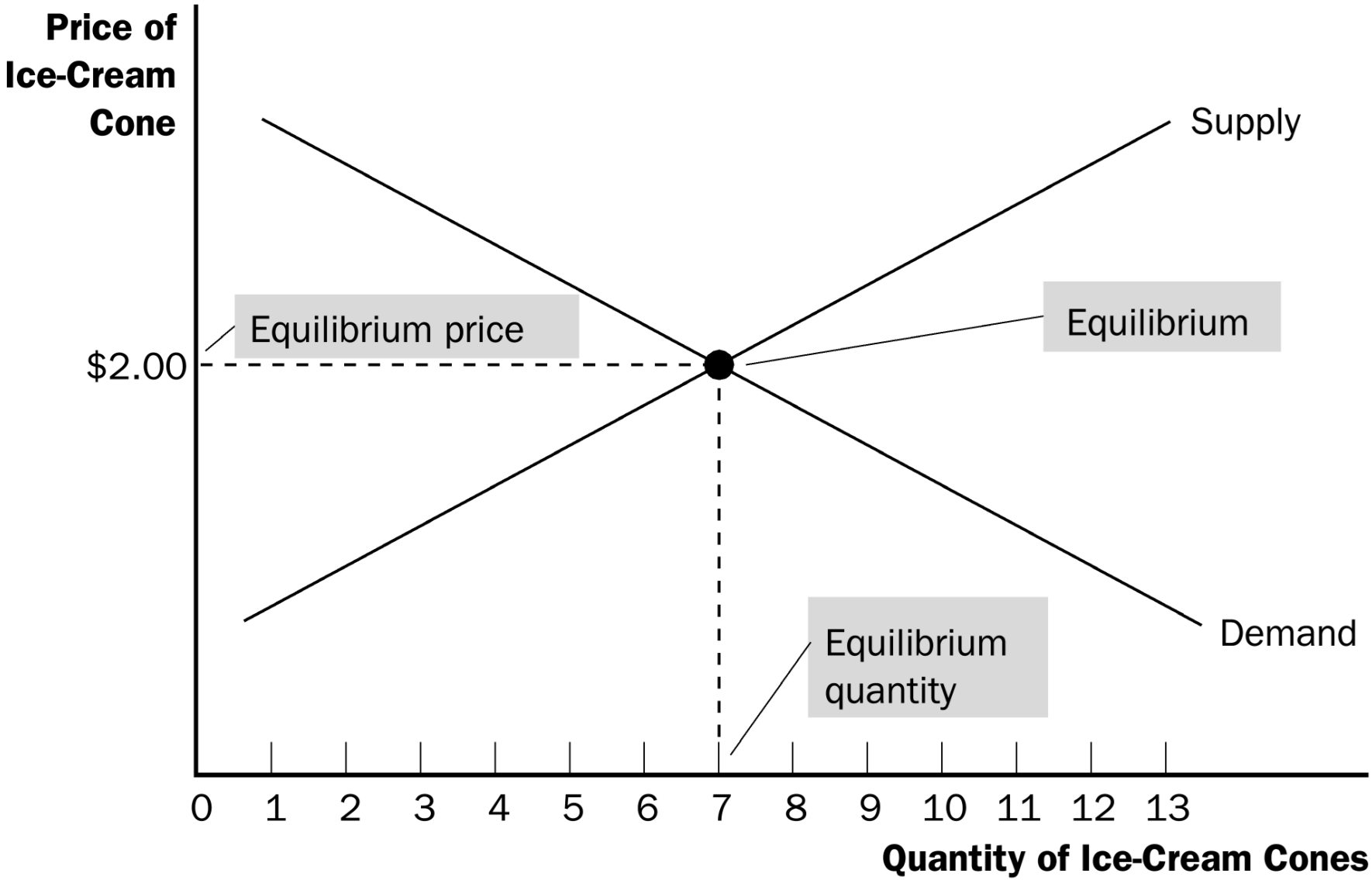
공급을 줄여서 나중에 파려고 할 것이다.

- Number of sellers increases
  - Market supply increases

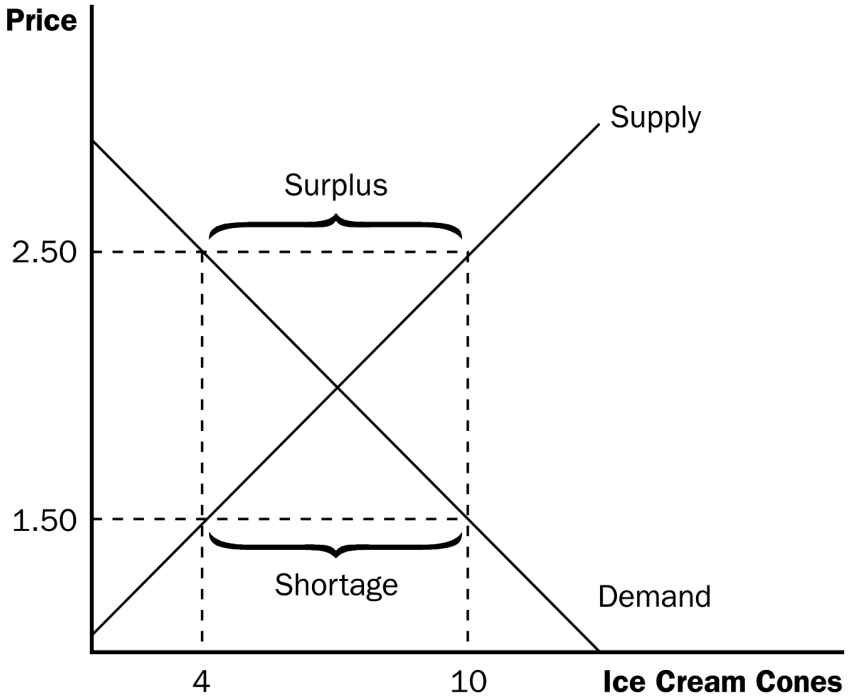
Supply and Demand Together

- Equilibrium (균형)
  - Various forces are in balance
  - A situation in which market price has reached the level where
    - Quantity supplied = Quantity demanded
  - Supply and demand curves intersect
- Equilibrium price 균형가격
  - Balances quantity supplied and quantity demanded
  - Market-clearing price
- Equilibrium quantity 균형거래량
  - Quantity supplied and quantity demanded at the equilibrium price

Supply and Demand Together



Supply and Demand Together



- Surplus
  - Quantity supplied $>$ quantity demanded
  - Excess supply 초과 공급
- Shortage
  - Quantity demanded $>$ quantity supplied
  - Excess demand 초과 수요

Supply and Demand Together

- Markets tend to move toward equilibrium
- Excess supply
  - Downward pressure on price
    - Movements along the demand and supply curves
    - Increase in quantity demanded
    - Decrease in quantity supplied
- Excess demand
  - Upward pressure on price
    - Movements along the demand and supply curves
    - Decrease in quantity demanded
    - Increase in quantity supplied

Supply and Demand Together

- In most free markets
  - Surpluses and shortages are temporary
  - Prices eventually move toward their equilibrium level
  - How quickly equilibrium is reached varies from market to market
    - Depend on how quickly prices adjust.
    - More competitive $\rightarrow$ quicker adjustment
- **Law of supply and demand**
  - The price of any good adjusts
    - To bring the quantity supplied and the quantity demanded for that good into balance

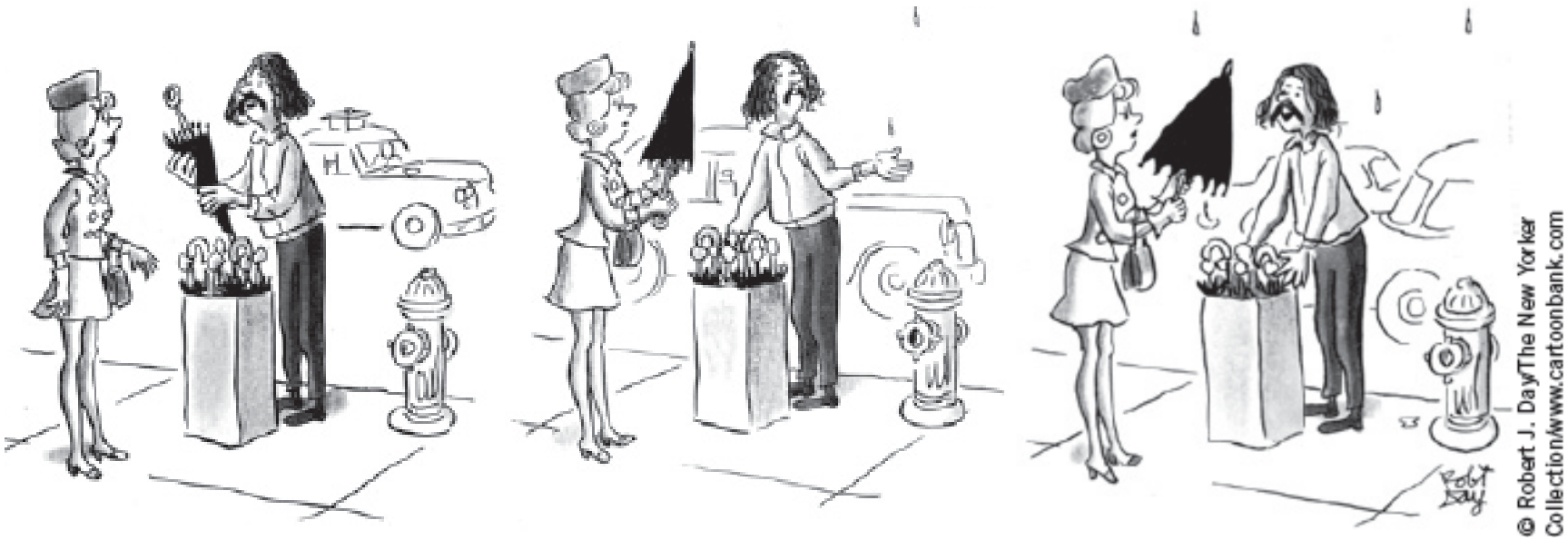
Three Steps for Analyzing Changes in Equilibrium

1. Decide whether the event shifts the supply or demand curve (or perhaps both).
2. Determine the direction in which the curve shifts.
3. Use the supply-and-demand diagram to see how the shift changes the equilibrium price and quantity.

- Often called "*comparative statics*"
- Comparative statics is loosely defined as the comparison of two different economic outcomes, before and after an exogenous change in economic environment.

Simple examples

- A change in market equilibrium due to a shift in demand
  - The effect of hot weather on the market for ice cream
  - The effect of an decrease in the income of consumers



"Two dollars" *"— and seventy-five cents."*

수요곡선이 shift 되어 가격이 증가!

Simple examples

- Remember! : Shifts vs. movements along curves
  - Shift in the supply curve
    - Change in *supply*
  - Movement along a fixed supply curve
    - Change in *the quantity supplied*
  - Shift in the demand curve
    - Change in *demand*
  - Movement along a fixed demand curve
    - Change in *the quantity demanded*

Simple examples

- A change in market equilibrium due to a shift in supply
  - One summer, a hurricane destroys part of the sugarcane crop: higher price of sugar
  - Effect on the market for ice cream? 허리케인이 와서 설탕가격 오름

    아이스크림 공급 감소 (shift)

- Shifts in both supply and demand 허리케인 + 날씨가 더워짐
  - One summer: hurricane and heat wave 아이스크림 수요 증가도 있음(shift)
  - Effect on the market for ice cream?
    - Effect on equilibrium price and quantity?

Conclusion: How Prices Allocate Resources

- The model of supply and demand is a powerful tool for analyzing markets.
- Supply and demand together determine the prices of the economy's goods and services.
  - These prices in turn serve as signals that guide the allocation of scarce resources in the economy.
  - Prices determine who produces each good and how much of each good is produced.