4 The Market Forces of Supply and Demand

PRINCIPLES OF
ECONOMICS
FOURTH EDITION

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Premium PowerPoint® Slides
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In this chapter, 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?

Markets and Competition

- A **market** is a group of buyers and sellers of a particular product.
- A **competitive market** is one with many buyers and sellers, each has a negligible effect on price.
- **In modern economics,**
- A **market** is a group of buyers and sellers of a particular product trading under certain "rules".
- A **competitive market** is one where buyers and sellers have a negligible effect on price because there are substitutes on either side.

Markets and Competition

- A **perfectly competitive** market:
  - all goods exactly the same
  - buyers & sellers so numerous that no one can affect market price – each is a "**price taker**"
- **In modern economics,**
  - There are **perfect substitutes** for both buyers and sellers so you can always "switch"
  - No one can affect market price – each is a "**price taker**" (since others can always "switch")
- In this chapter, we assume markets are perfectly competitive.

Demand

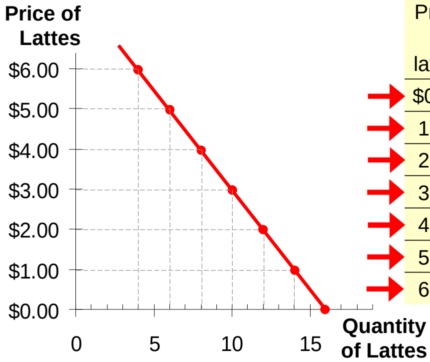
- The **quantity demanded** of any good is the amount of the good that buyers are willing and able to purchase.
- **Law of demand**: the claim that the quantity demanded of a good falls when the price of the good rises, other things equal

The Demand Schedule

- **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



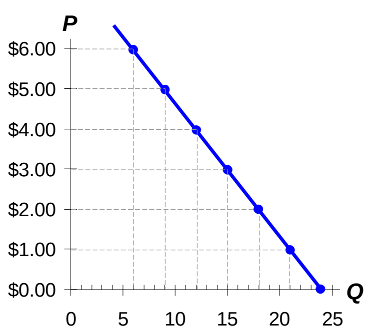
Price of lattes	Quantity of lattes demanded
$0.00	16
1.00	14
2.00	12
3.00	10
4.00	8
5.00	6
6.00	4

Market Demand versus Individual Demand

- The quantity demanded in the market is the sum of the quantities demanded by all buyers at each price.
- Suppose Helen and Ken are the only two buyers in the Latte market. (Q^d = quantity demanded)

Price	Helen's Q^d		Ken's Q^d		Market Q^d
$0.00	16	+	8	=	24
1.00	14	+	7	=	21
2.00	12	+	6	=	18
3.00	10	+	5	=	15
4.00	8	+	4	=	12
5.00	6	+	3	=	9
6.00	4	+	2	=	6

The Market Demand Curve for Lattes



P	Q^d (Market)
$0.00	24
1.00	21
2.00	18
3.00	15
4.00	12
5.00	9
6.00	6

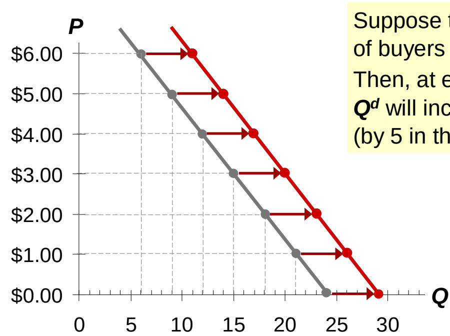
Demand Curve Shifters

- 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).
- Changes in them shift the ***D*** curve…

Demand Curve Shifters: # of buyers

- Increase in # of buyers increases quantity demanded at each price, shifts ***D*** curve to the right.

Demand Curve Shifters: # of buyers



Suppose the number of buyers increases. Then, at each ***P***, Q^d will increase (by 5 in this example).

Demand Curve Shifters: income

- Demand for a **normal good** is positively related to income.
  - Increase in income causes increase in quantity demanded at each price, shifts ***D*** curve to the right.

(Demand for an **inferior good** is negatively related to income. An increase in income shifts ***D*** curves for inferior goods to the left.)

Demand Curve Shifters: prices of related goods

- Two goods are **substitutes** if an increase in the price of one causes an increase in demand for the other.
- Example: pizza and hamburgers. An increase in the price of pizza increases demand for hamburgers, shifting hamburger demand curve to the right.
- Other examples: laptops and desktop computers, compact discs and music downloads,
  - In the news: Fresh and Frozen Vegetables after a typhoon

Demand Curve Shifters: prices of related goods

- Two goods are **complements** if an increase in the price of one causes a fall in demand for the other.
- Example: computers and software. If price of computers rises, people buy fewer computers, and therefore less software. Software demand curve shifts left.
- Other examples: college tuition and textbooks, bagels and cream cheese, eggs and bacon
  - In the news: gasoline and cars

Demand Curve Shifters: tastes

- Anything that causes a shift in tastes *toward* a good will increase demand for that good and shift its ***D*** curve to the right.
- Example: The organic diet became popular recently, caused an increase in demand for organic food, shifted the organic demand curve to the right.

Demand Curve Shifters: expectations

- Expectations affect consumers' buying decisions.
- Examples:
  - If people expect their incomes to rise, their demand for meals at expensive restaurants may increase now.
  - If the economy turns bad and people worry about their future job security, demand for new autos may fall now.

Summary: Variables That Affect Demand

Variable	A change in this variable…
Price	…causes a movement along the ***D*** curve
No. 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

ACTIVE LEARNING 1: Demand curve

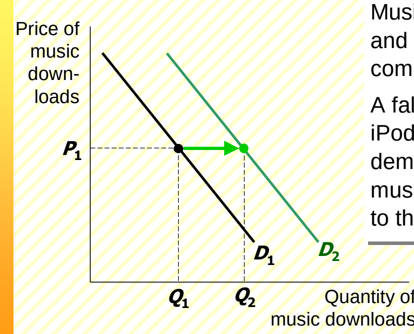
Draw a demand curve for music downloads. What happens to it in each of the following scenarios? Why?

A. The price of iPods falls

B. The price of music downloads falls

C. The price of compact discs falls

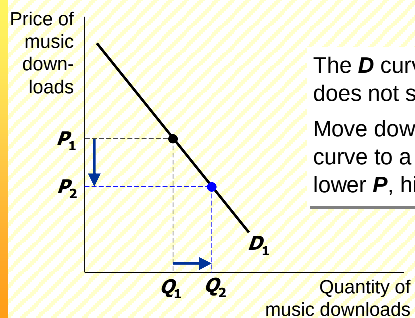
ACTIVE LEARNING 1: A. price of iPods falls



Music downloads and iPods are complements.

A fall in price of iPods shifts the demand curve for music downloads to the right.

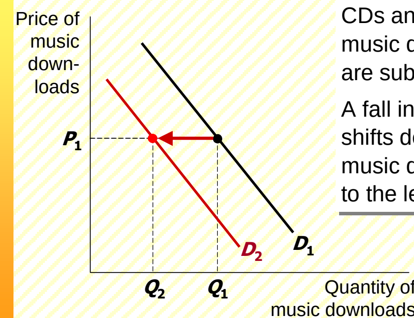
ACTIVE LEARNING 1: B. price of music downloads falls



The ***D*** curve does not shift.

Move down along curve to a point with lower ***P***, higher ***Q***.

ACTIVE LEARNING 1: C. price of CDs falls



CDs and music downloads are substitutes.

A fall in price of CDs shifts demand for music downloads to the left.

Supply

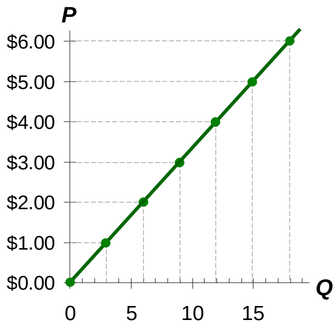
- The **quantity supplied** of any good is the amount that sellers are willing and able to sell.
- **Law of supply**: the claim that the quantity supplied of a good rises when the price of the good rises, other things equal

The Supply Schedule

- **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



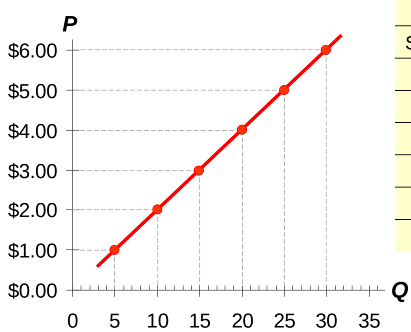
Price of lattes	Quantity of lattes supplied
$0.00	0
1.00	3
2.00	6
3.00	9
4.00	12
5.00	15
6.00	18

Market Supply versus Individual Supply

- The quantity supplied in the market is the sum of the quantities supplied by all sellers at each price.
- Suppose Starbucks and Jitters are the only two sellers in this market. (*Q*^{s} = quantity supplied)

Price	Starbucks		Jitters		Market *Q*^{s}
$0.00	0	+	0	=	0
1.00	3	+	2	=	5
2.00	6	+	4	=	10
3.00	9	+	6	=	15
4.00	12	+	8	=	20
5.00	15	+	10	=	25
6.00	18	+	12	=	30

The Market Supply Curve



P	*Q*^{s} (Market)
$0.00	0
1.00	5
2.00	10
3.00	15
4.00	20
5.00	25
6.00	30

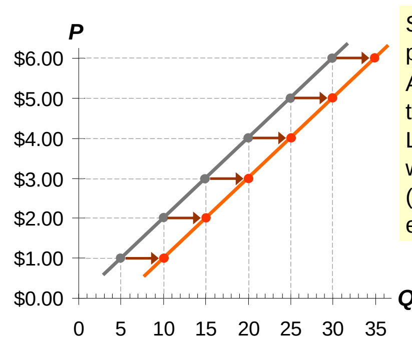
Supply Curve Shifters

- The supply curve shows how price affects quantity supplied, *other things being equal*.
- These "other things" are non-price determinants of supply.
- Changes in them shift the ***S*** curve…

Supply Curve Shifters: input prices

- Examples of input prices:
  wages, prices 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 ***S*** curve shifts to the right.

Supply Curve Shifters: input prices



Suppose the price of milk falls. At each price, the quantity of Lattes supplied will increase (by 5 in this example).

Supply Curve Shifters: technology

- 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 ***S*** curve to the right.

Supply Curve Shifters: # of sellers

- An increase in the number of sellers increases the quantity supplied at each price, shifts ***S*** curve to the right.

Supply Curve Shifters: expectations

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.

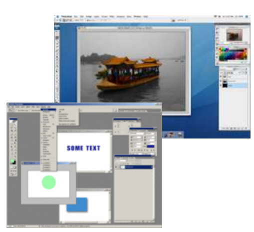
In general, sellers may adjust supply* when their expectations of future prices change.
(**If good not perishable*.)

Summary: Variables That Affect Supply

Variable	A change in this variable…
Price	…causes a movement along the ***S*** curve
Input prices	…shifts the ***S*** curve
Technology	…shifts the ***S*** curve
No. of sellers	…shifts the ***S*** curve
Expectations	…shifts the ***S*** curve

ACTIVE LEARNING 2:
Supply curve

Draw a supply curve for photo imaging software. What happens to it in each of the following scenarios?



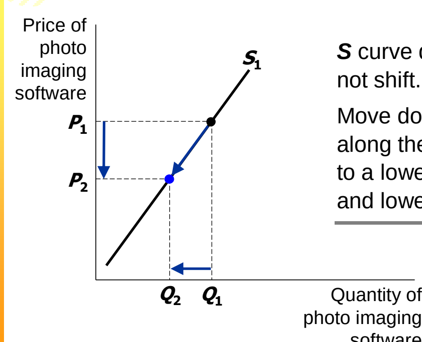
Picture source: Wikipedia

A. Retailers cut the price of the software.

B. A technological advance allows the software to be produced at lower cost.

C. Professional photoshops raise the price of the services they provide.

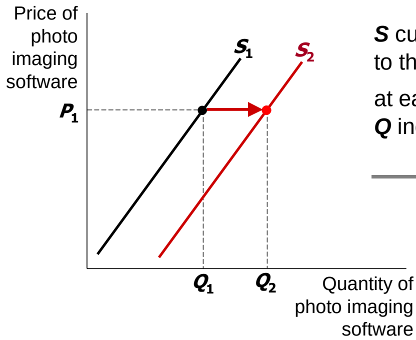
ACTIVE LEARNING 2:
A. fall in price of photo imaging software



S curve does not shift.

Move down along the curve to a lower ***P*** and lower ***Q***.

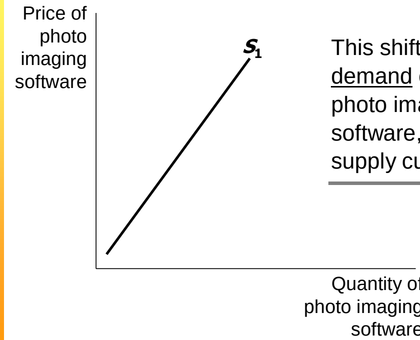
ACTIVE LEARNING 2:
B. fall in cost of producing the software



S curve shifts to the right:

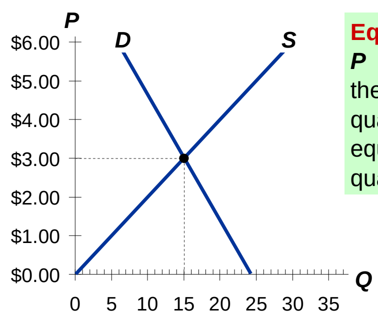
at each price, ***Q*** increases.

ACTIVE LEARNING 2:
C. professional photoshops raise their price



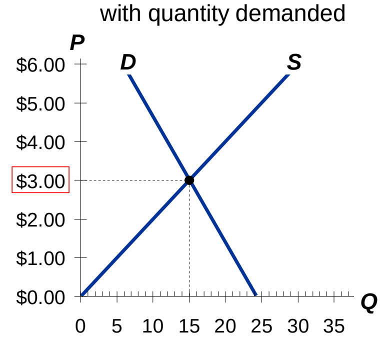
This shifts the demand curve for photo imaging software, not the supply curve.

Supply and Demand Together



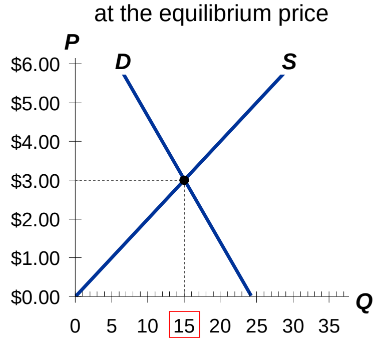
Equilibrium:
P has reached the level where quantity supplied equals quantity demanded

Equilibrium price:
The price that equates quantity supplied with quantity demanded



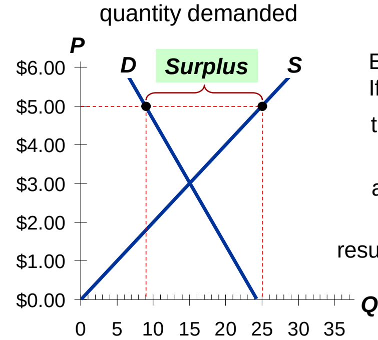
P	Q^D	Q^S
$0	24	0
1	21	5
2	18	10
3	15	15
4	12	20
5	9	25
6	6	30

Equilibrium quantity:
The quantity supplied and quantity demanded at the equilibrium price



P	Q^D	Q^S
$0	24	0
1	21	5
2	18	10
3	15	15
4	12	20
5	9	25
6	6	30

Surplus:
when quantity supplied is greater than quantity demanded



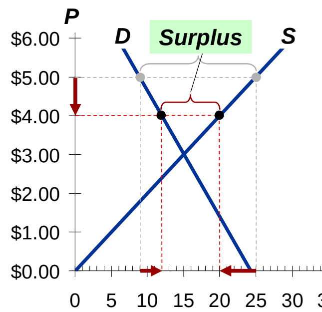
Example:
If ***P*** = $5,

then
Q^D = 9 lattes

and
Q^S = 25 lattes

resulting in a surplus of 16 lattes

Surplus:
when quantity supplied is greater than quantity demanded

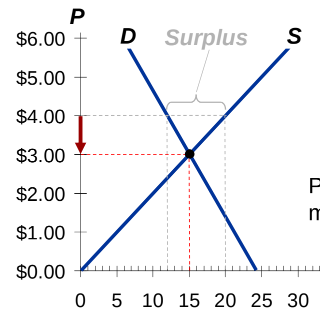


Facing a surplus, sellers try to increase sales by cutting price.

This causes Q^D to rise and Q^S to fall…

…which reduces the surplus.

Surplus:
when quantity supplied is greater than quantity demanded

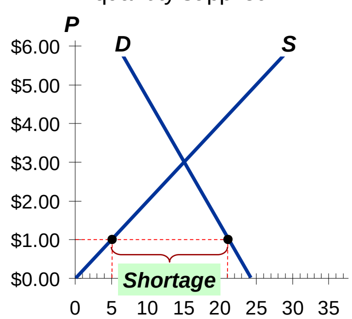


Facing a surplus, sellers try to increase sales by cutting price.

This causes Q^D to rise and Q^S to fall.

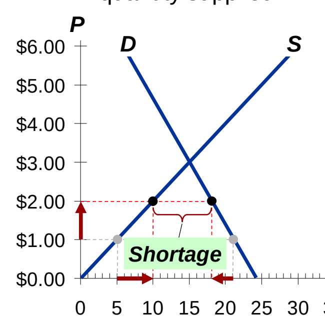
Prices continue to fall until market reaches equilibrium.

Shortage:
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:
when quantity demanded is greater than quantity supplied

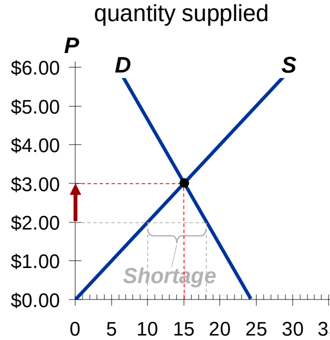


Facing a shortage, sellers raise the price,

causing Q^D to fall and Q^S to rise,

…which reduces the shortage.

Shortage:
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.

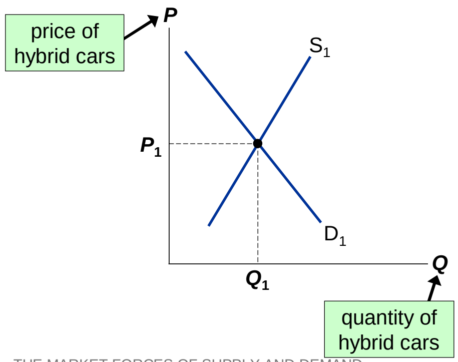
Prices continue to rise until market reaches equilibrium.

Three Steps to Analyzing Changes in Eq'm

To determine the effects of any event,

1. Decide whether event shifts S curve, D curve, or both.
2. Decide in which direction curve shifts.
3. Use supply-demand diagram to see how the shift changes eq'm P and Q.

EXAMPLE: The Market for Hybrid Cars



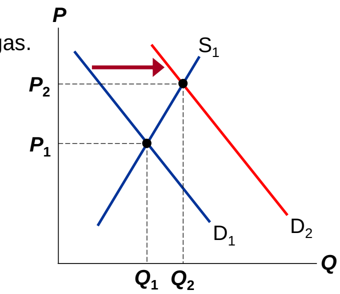
EXAMPLE 1: A Change in Demand

EVENT TO BE ANALYZED:
Increase in price of gas.

STEP 1:
D curve shifts

STEP 2:
D shifts right

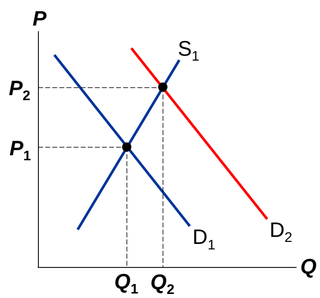
STEP 3:
The shift causes an increase in price and quantity of hybrid cars.



EXAMPLE 1: A Change 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.



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

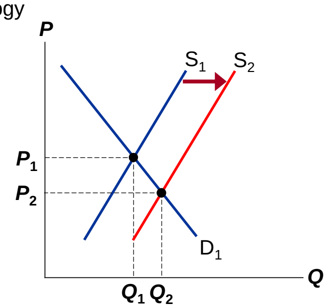
EXAMPLE 2: A Change in Supply

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.



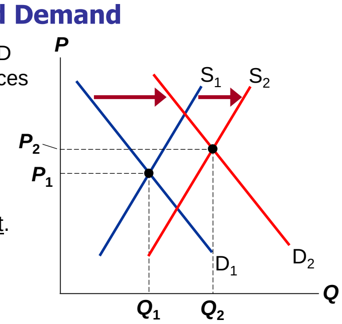
EXAMPLE 3: A Change in Both Supply and Demand

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

STEP 1:
Both curves shift.

STEP 2:
Both shift to the right.

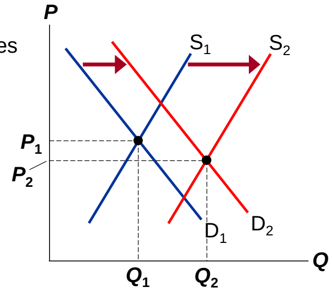
STEP 3:
Q rises, but effect on ***P*** is ambiguous:
If demand increases more than supply, ***P*** rises.



EXAMPLE 3: A Change 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.



ACTIVE LEARNING 3:
Changes in supply and demand

Use the three-step method to analyze the effects of each event on the equilibrium price and quantity of music downloads.

Event A: A fall in the price of compact discs

Event B: Sellers of music downloads negotiate a reduction in the royalties they must pay for each song they sell.

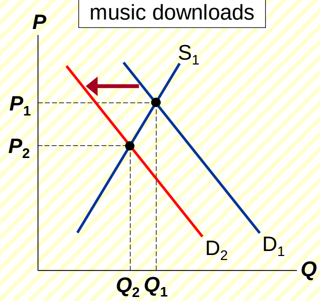
Event C: Events A and B both occur.

ACTIVE LEARNING 3:
A. fall in price of CDs

The market for music downloads

STEPS

1. ***D*** curve shifts
2. ***D*** shifts left
3. ***P*** and ***Q*** both fall.

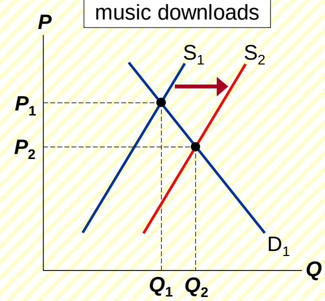


ACTIVE LEARNING 3:
B. fall in cost of royalties

The market for music downloads

STEPS

1. ***S*** curve shifts (royalties are part of sellers' costs)
2. ***S*** shifts right
3. ***P*** falls, ***Q*** rises.



ACTIVE LEARNING 3:
C. fall in price of CDs AND fall in cost of royalties

STEPS

1. Both curves shift (see parts A & B).
2. ***D*** shifts left, ***S*** shifts right.
3. ***P*** unambiguously falls.
   Effect on ***Q*** is ambiguous:
   The fall in demand reduces ***Q***,
   the increase in supply increases ***Q***.

CONCLUSION: How Prices Allocate Resources

- 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.

CHAPTER 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.

CHAPTER SUMMARY

- Besides price, demand depends on buyers' incomes, tastes, expectations, the prices of substitutes and complements, and # 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.

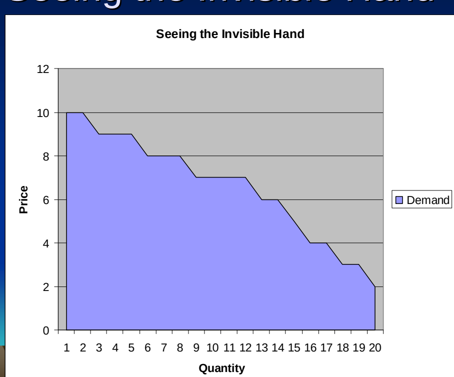
CHAPTER SUMMARY

- The intersection of ***S*** and ***D*** curves determine 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.

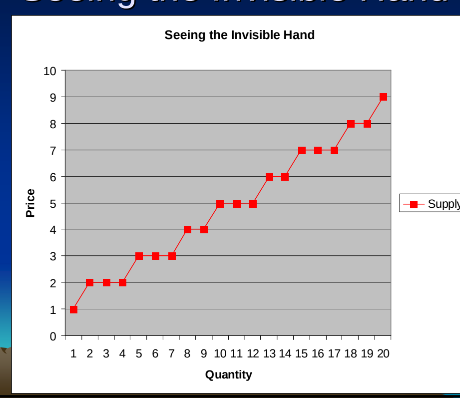
CHAPTER SUMMARY

- 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.

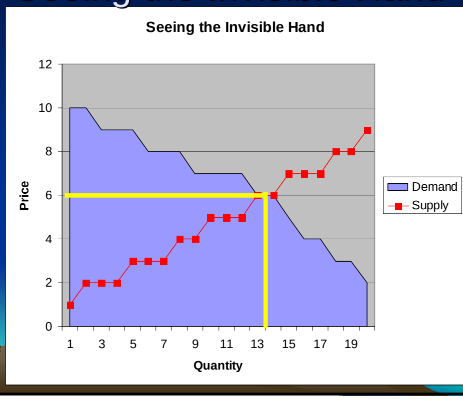
Seeing the Invisible Hand



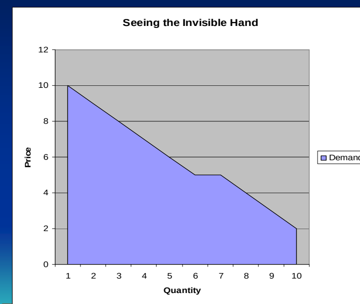
Seeing the Invisible Hand



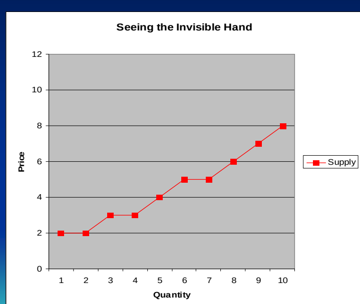
Seeing the Invisible Hand



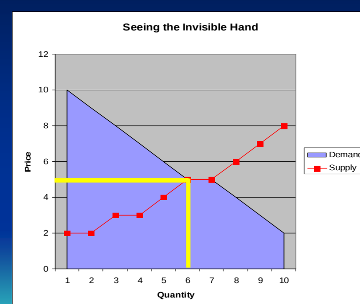
Seeing the Invisible Hand



Seeing the Invisible Hand



Seeing the Invisible Hand



Summary

- Supply, Demand, and Equilibrium

- Step 1: Identify which curve shifts (or both)
- Step 2: Identify what direction did it shift
- Step 3: Use the S/D graph to find how equilibrium price and quantity change
- Homework: Mankiw, p. 85-87, Problem 4, 7, 8, 12, 13