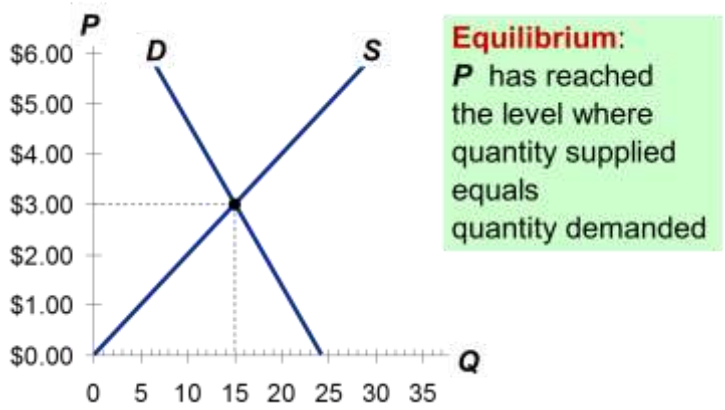
Equilibrium:
Supply and Demand Together

Let's assume that the market is a perfect competitive market, and that the supply curve is upward sloping as shown in the following diagrams.



I. Equilibrium

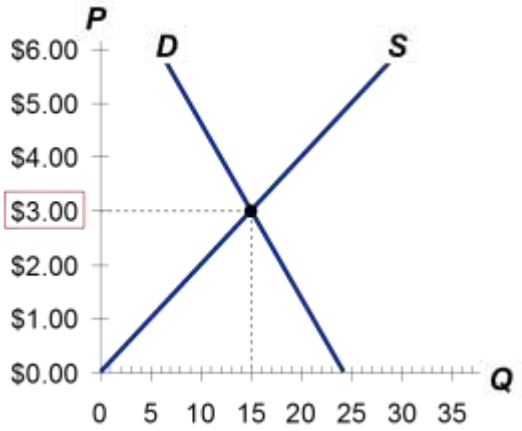
1. Equilibrium

- ❖ Equilibrium is the fundamental concept in game theory. It refers to a state in which no players would change his strategy.

- ❖ In our context the market equilibrium is reached at the point where the supply and demand curves intersect, because at this point neither the consumer nor the firm would change their strategies: how much to buy or how much to produce.

a) Market price is the price reached in the market Equilibrium, which is determined by the demand and supply.

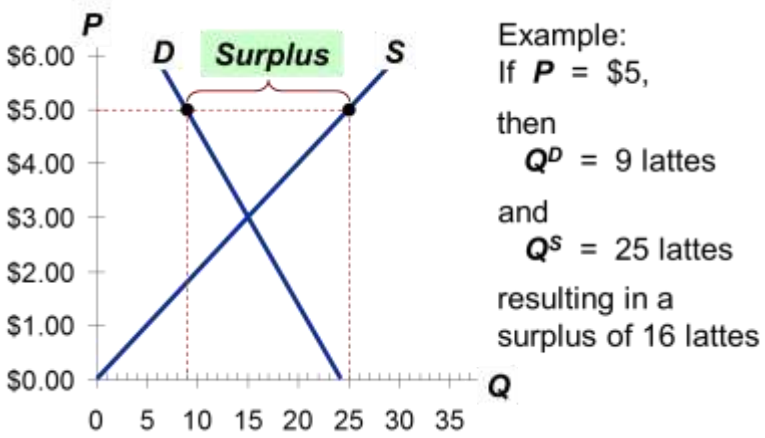
- The equilibrium price is often called the "market-clearing" price because both buyers and sellers are satisfied at this price.



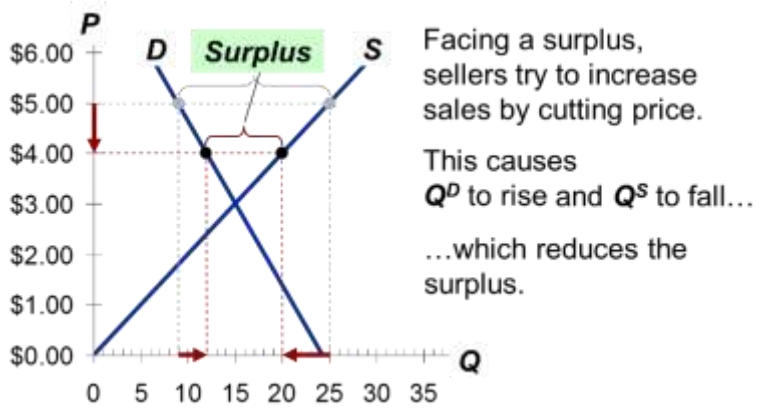
P	Q^D	Q^S
$0	24	0
1	21	5
2	18	10
3	15	15
4	12	20
5	9	25
6	6	30

2. Surplus (a.k.a. Excess Supply)

❖ If the actual market price is higher than the equilibrium price, there will be a surplus of the good.



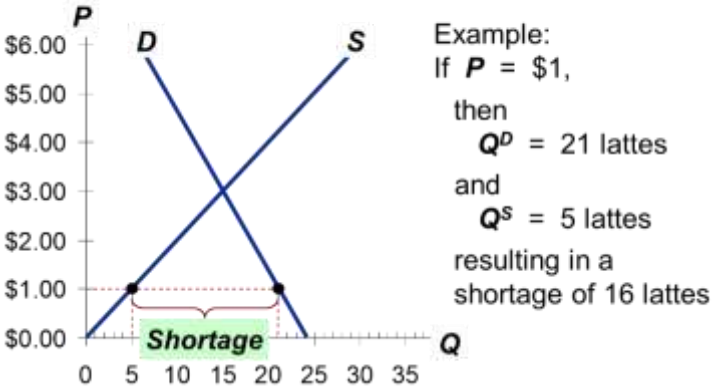
❖ To eliminate the surplus, producers will lower the price until the market reaches equilibrium.



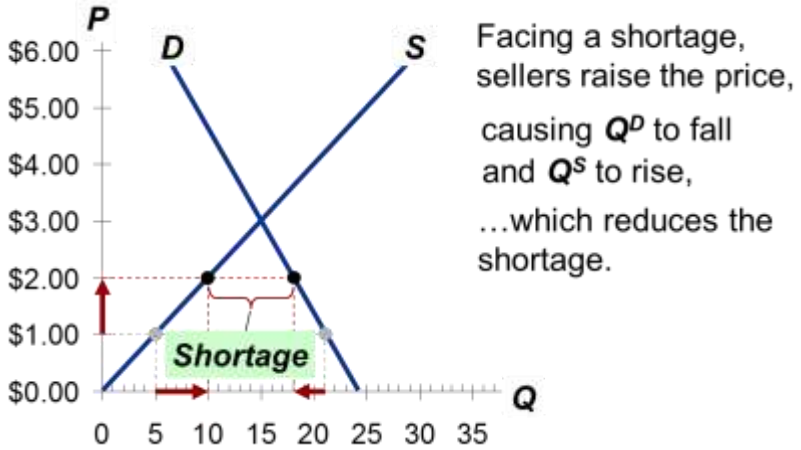
3. Shortage (a.k.a. Excess Demand)

❖ If the actual price is lower than the equilibrium price, there will be a shortage of the good.

when quantity demanded is greater than quantity supplied



- Sellers will respond to the shortage by raising the price of the good until the market reaches equilibrium.



II. Three Steps to Analyzing Changes in Equilibrium

To determine the effects of any event,

1) Decide whether event shifts S curve, D curve, or both or just move along curve.

2) Decide in which direction the curve shifts.

3) Use supply-demand diagram to see how the shift changes the equilibrium P and Q.

Recall: 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 1: The Market for Ice Cream Cones

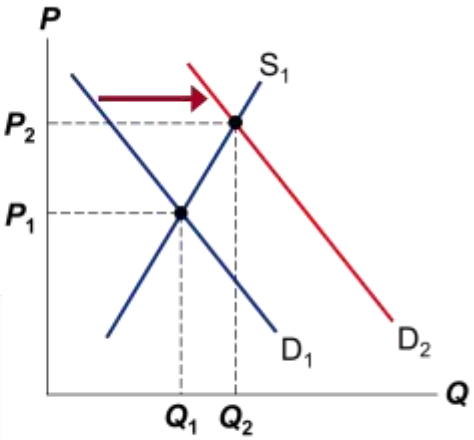
a) A Shift in Demand

EVENT TO BE ANALYZED:
hot weather

STEP 1:
D curve shifts

STEP 2:
D shifts right

STEP 3:
The shift causes an increase in price and quantity of ice cream cones.



When P rises, producers supply a larger quantity of ice cream cones, even though the S curve has not shifted.

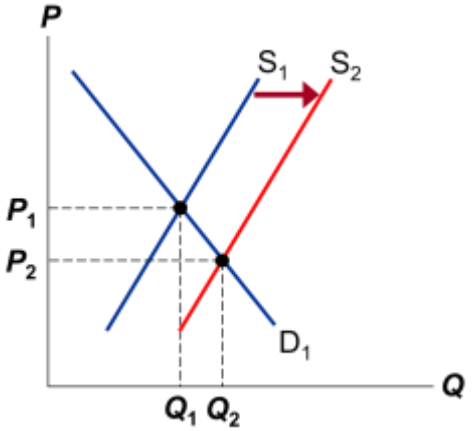
b) A Shift in Supply

Event: A decrease in milk price

STEP 1:
S curve shifts
because the cost of producing every unit is lower.
D curve does not shift.

STEP 2:
S shifts right
because event reduces cost, makes production more profitable at any given price.

STEP 3:
The shift causes price to fall
and quantity to rise.



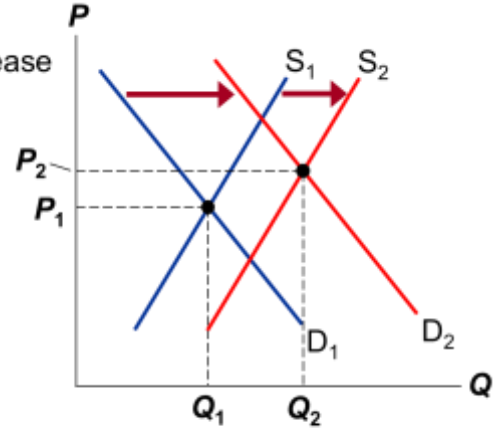
c) Shifts in Supply and Demand

EVENTS:
hot weather and decrease in milk price

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.



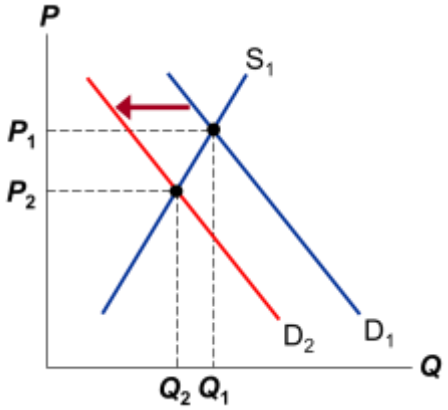
If supply increases more than demand, then P falls.

Example 2: Music Downloads

Event A: A fall in the price of CDs

STEPS

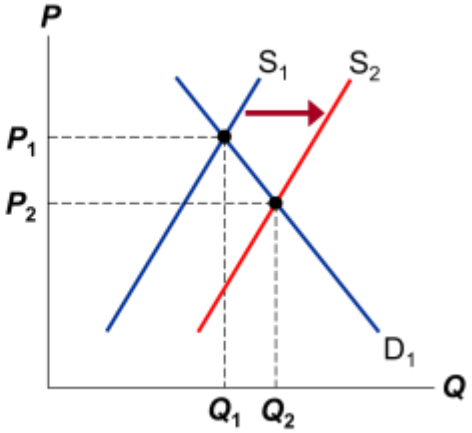
1. ***D*** curve shifts
2. ***D*** shifts left
3. ***P*** and ***Q*** both fall.



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

STEPS

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



Event C: Events A and B both occur.

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.

Note:

In market economies, prices are the signals that guide economic decisions and thereby allocate scarce resources. For every good in the economy, the price ensures that supply and demand are in balance.

III. Using Math to Determine the Equilibrium

Example question: Suppose in a market of beef, we have the following demand and supply function:
Demand function: $Q_d = 286 - 20p$
Supply function: $Q_s = 88 + 40p$
Calculate the Equilibrium price and quantity.
Answer: In equilibrium we have $Q_d = Q_s$.
So $286 - 20p = 88 + 40p \Rightarrow p = 3.3$.
Then use demand function (or supply function) to get $Q_d = Q_s = 220$.
So in equilibrium price is $3.3, and quantity is 220.