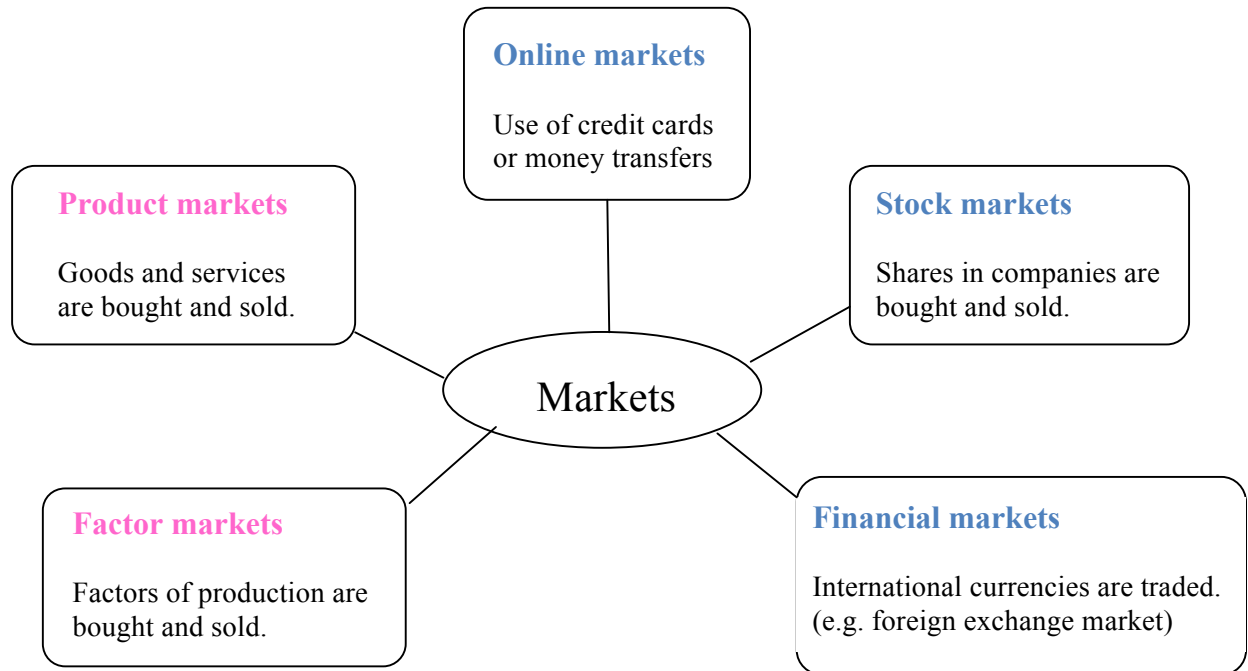


Section 1: Microeconomics

1.1 Competitive Markets: Demand and Supply

Markets

1. The Nature of Markets



Markets

- ✧ A market is where buyers and sellers come together to carry out an economic transaction. Nowadays, a market can exist without shops or malls.

IB Question

Outline the meaning of the term market.

Key terms

- ✧ Demand
- ✧ Supply
- ✧ Buyers → Demand side
- ✧ Sellers → Supply side

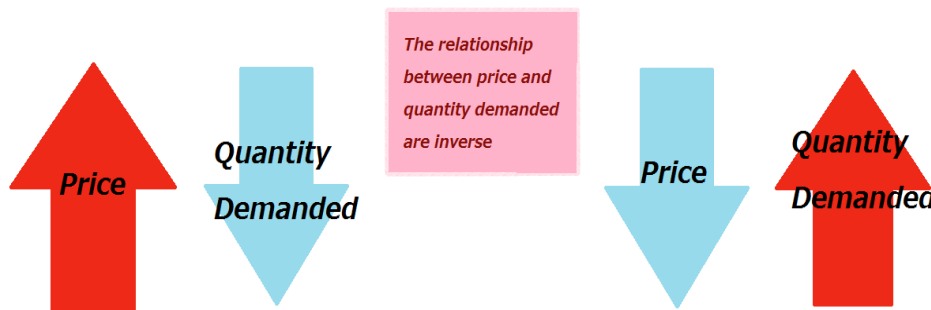
Demand

2. *The Law of Demand*

Demand

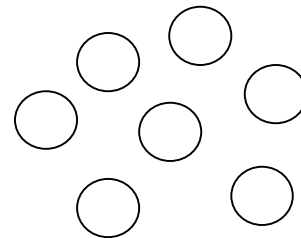
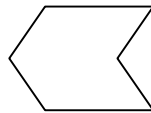
- ✧ The **willingness** and **ability** of a consumer to purchase a quantity of a good or service at a certain price (in a given time period).

Negative causal relationship between price and quantity demanded



- An **inverse relationship** between **price** and **quantity demanded**.

Relationship between an individual consumer's demand and market demand



Individual consumer's demand

Market demand

IB Question

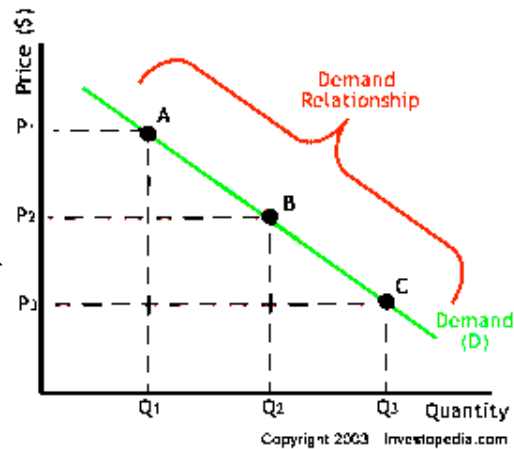
- Explain the negative causal relationship between price and quantity demanded.
- Describe the relationship between an individual consumer's demand and market demand.

Sum of individual consumer's demand

3. The Demand Curve

The Demand Curve

- ✧ It represents the relationship between the price and the quantity demanded
- ✧ It has a negative slope.



This only works when “all other things are being equal”
→ Ceteris paribus

- Points A, B and C are on the demand curve.
- Each point on the curve reflects a direct correlation between quantity demanded (Q) and price (P)

Key points

- ✧ As the price **increases** ($P_2 - P_1$), the quantity demanded will **decrease**. ($Q_2 - Q_1$)
- ✧ As the price **decreases** ($P_2 - P_3$), the quantity demanded will **increase**. ($Q_2 - Q_3$)

IB Question

- Explain that a demand curve represents the relationship between the price and the quantity demanded of a product, *ceteris paribus*.
- Draw a demand curve.

Key terms

- ✧ Demand curve
- ✧ Ceteris paribus
- ✧ A change in the price of the product → A change in the quantity demanded

4. The Non-price Determinants of Demand

The Non-price Determinants of Demand

✧ Factors which determine demand and lead to an actual shift of the demand curve to either the right or the left. (***Ceteris paribus assumption**)

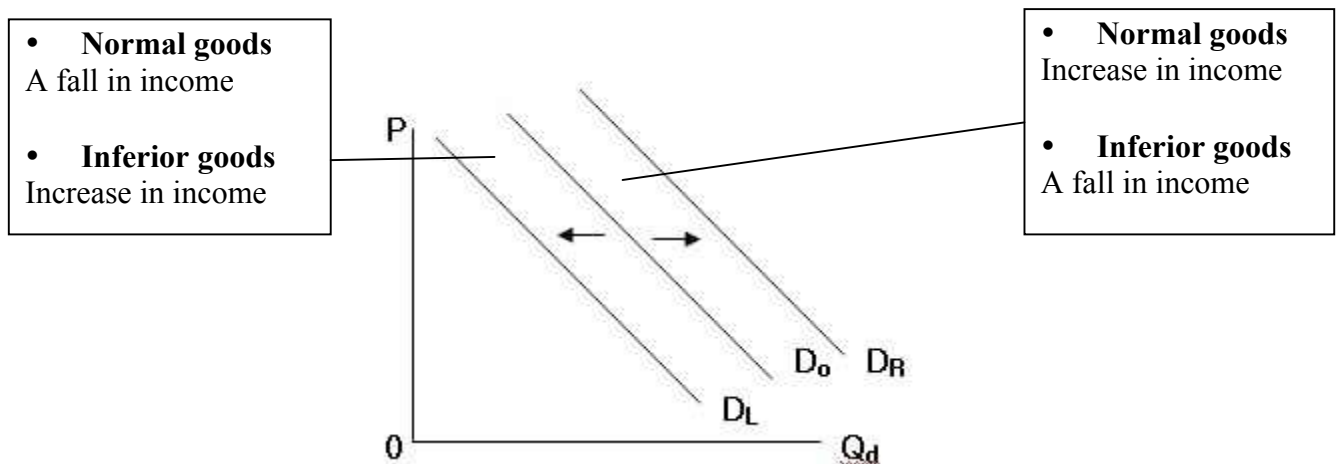
The major non-price determinants are:

- **Income:**
 - Normal goods.
 - Inferior goods
- **Tastes and preferences**
- **Prices of related goods**
 - Substitutes
 - Complements
- **Demographic changes**

Etc.

1. Income

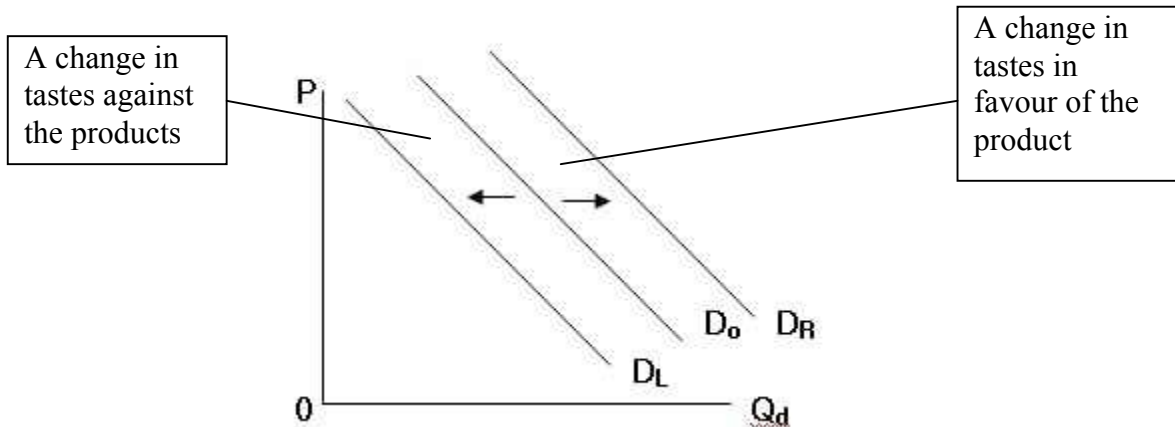
➔ If wages and salaries rise in the economy people may decide to spend more money.



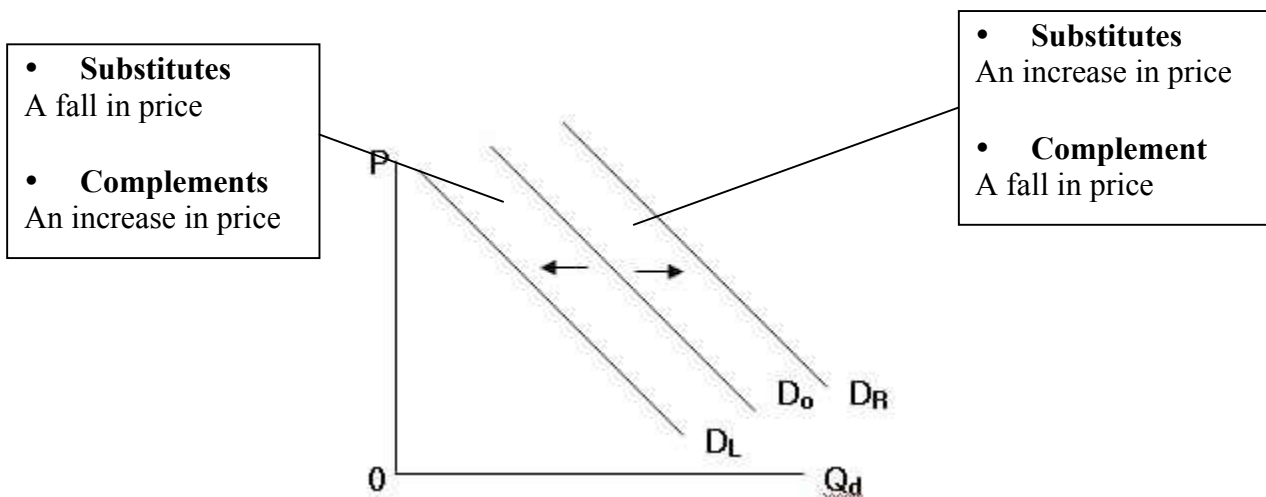
- **Normal goods:** These are products that one would buy in larger amounts if one had more money. (e.g. majority of products for sales)
- **Inferior goods:** These are products that if you had more money, you would use the extra cash NOT to buy, and could avoid buying. Demand for the inferior good **can be zero** which result in **demand curve to disappear**. (e.g. Cheap wine or “own brand” supermarket detergents and public transportation)

2. Tastes and preferences

→ When consumers' tastes change, the demand will shift in accordance to that change.



3. Prices of related goods



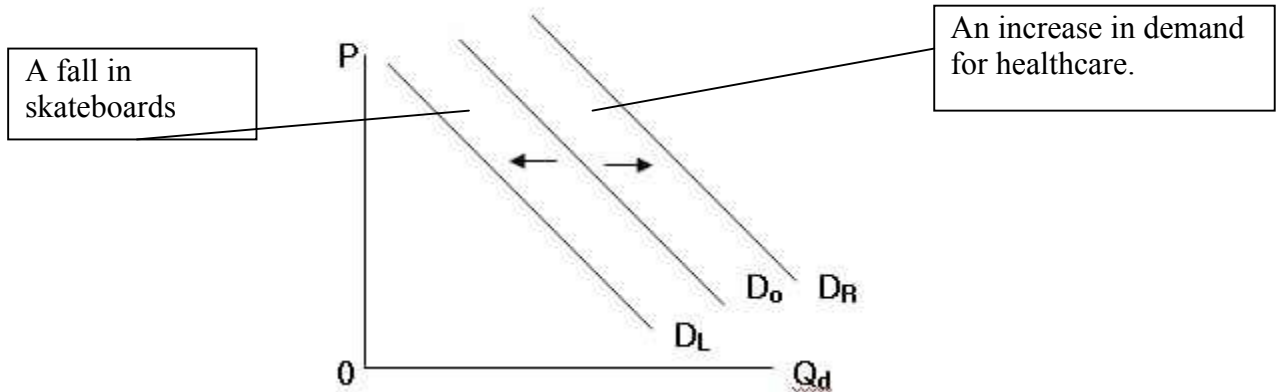
- **Substitutes:** Goods that can be used in place of one another. If the price goes up on one, the demand for that product will **decrease** while the demand for the other **increases**.
(e.g. chicken and beef)
- **Complements:** Goods that go with another good.
(e.g. printers and ink cartridges/ DVDs and DVD players)

4. Demographic changes

→ Changes in age structure and the size of population also influences demand.

Example

If there is a population increase in **elderlies**...



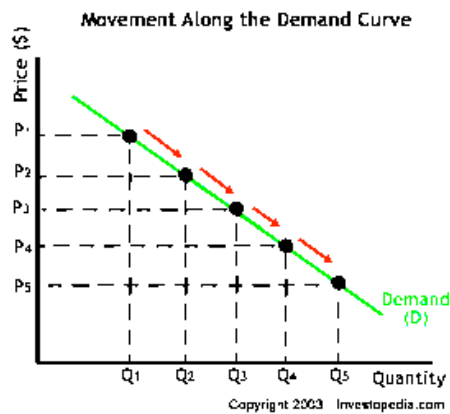
- The demand for healthcare outweighs the demand for skateboards.

IB Question

- Explain how factors including changes in income (in the cases of normal and inferior goods), preferences, prices of related goods (in the cases of substitutes and complements) and demographic changes may change demand.

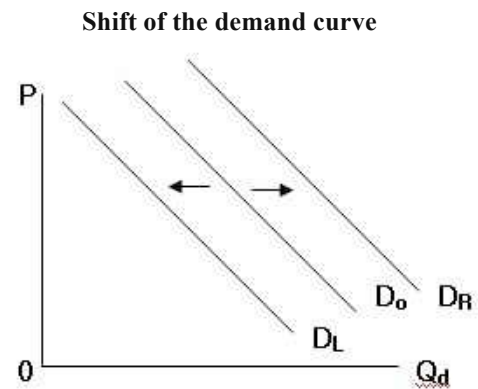
5. Movements along and shifts of the demand curve

- If there is a change in **price**...



- The point moving upwards means increase in price and decrease in quantity demanded, whereas the point moving downwards suggests a fall in price and a rise in quantity demanded
- A change in both **price** and **quantity demanded**

- If there is a change in any other **determinants**...



- Increase in quantity demanded when shifted right and decrease in quantity demanded when shifted left.
- Only a change in **quantity demanded**

IB Question

- Distinguish between movements along the demand curve and shifts of the demand curve.
- Draw diagrams to show the difference between movements along the demand curve and shifts of the demand curve.

6. Linear Functions

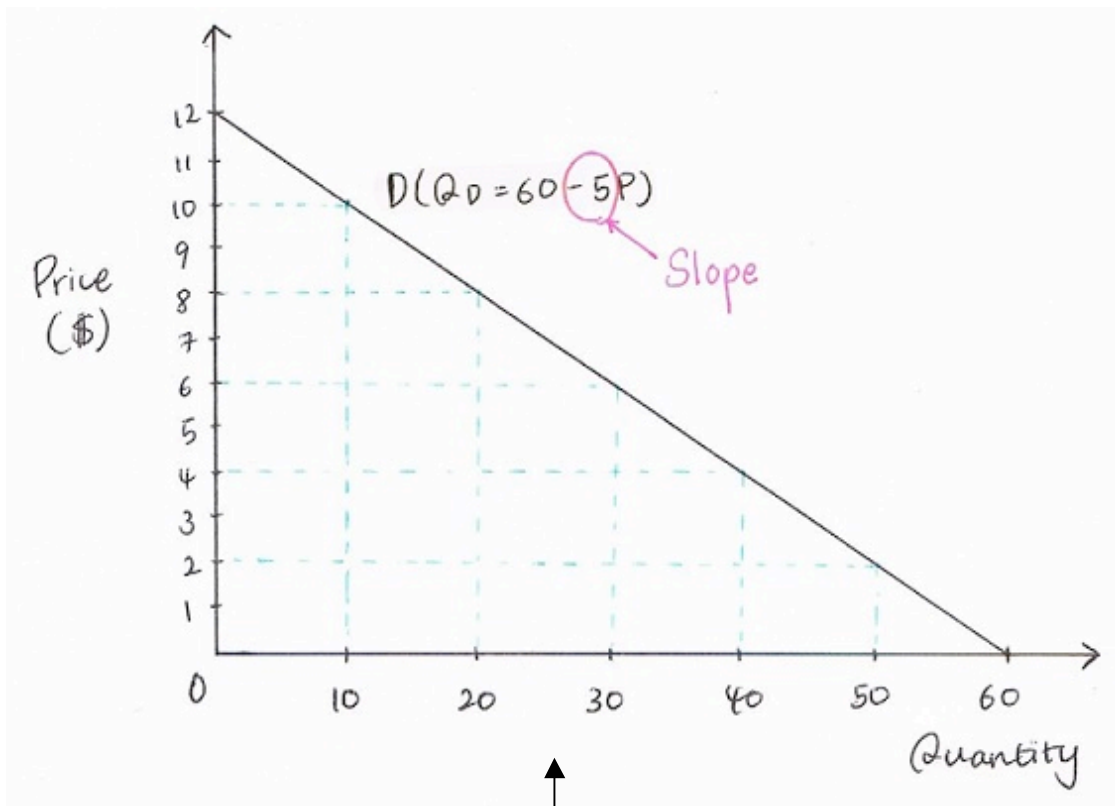
Linear Demand Functions

- ✧ Describes the relationship between the demand for a product and individual determinants of demand

$$Q_d = a - bP$$

Qd: **Quantity demanded**
a: **Quantity demanded if the price was 0**
b: **Slope of the curve**
P: **Price**

Example: $Q_d = 60 - 5P$



Procedures

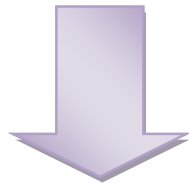
1. Set up a demand schedule.
2. Plot the demand curve using the demand schedule.

Change in 'a' term

- A **shift of demand curve**
- Because 'a' **determines the x value** at price 0.
- The bigger the 'a' value, there would be a shift in right.
- The smaller the 'a' value, there would be a shift in left.

Change in 'b' term

- Affects the **steepness** of the slope
- Because it determines the **fall of demand**.
- The bigger the value of 'b', the steeper the slope.
- The smaller the value of 'b', the flatter the slope.



Value of 'a' and 'b' are influenced by changes in **non-price determinants of demand**.

IB Question

- Explain a demand function (equation) of the form $Q_d = a - bP$.
- Plot a demand curve from a linear function (eg. $Q_d = 60 - 5P$).
- Identify the slope of the demand curve as the slope of the demand function $Q_d = a - bP$, that is $-b$ (the coefficient of P).
- Outline why, if the "a" term changes, there will be a shift of the demand curve.
- Outline how a change in "b" affects the steepness of the demand curve.

Supply

7. The Law of Supply

Supply

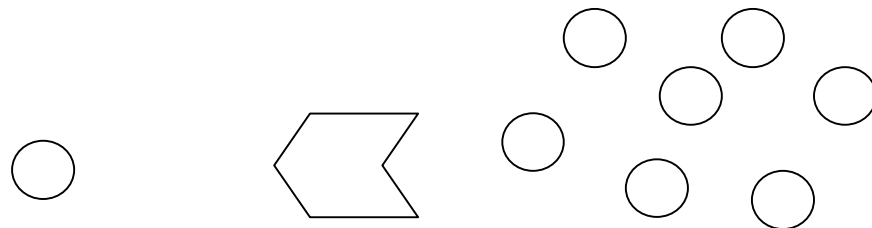
- ✧ The **willingness** and **ability** of a producer to produce a quantity of a good or service at a certain price (in a given time period).

Positive causal relationship between price and quantity demanded



- A **parallel relationship** between price and quantity demanded.

Relationship between an individual consumer's supply and market supply



Individual consumer's supply

Market supply

IB Question

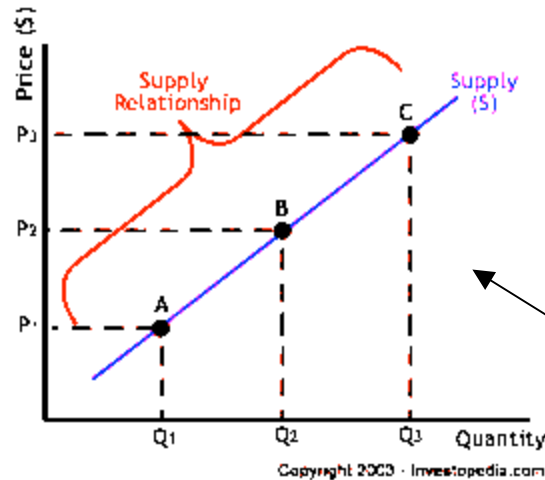
- Explain the positive causal relationship between price and quantity supplied.
- Describe the relationship between an individual producer's supply and market supply.

Sum of individual consumer's supply

8. The Supply Curve

The Supply Curve

- ✧ It represents the relationship between the price and the quantity supplied
- ✧ It has a positive slope.



Ceteris paribus assumption

This occurs because as the price of a good increases, suppliers will attempt to maximize profits by increasing the quantity of the product sold.

- Points A, B and C are on the supply curve.
- Each point on the curve reflects a direct correlation between quantity supplied (Q) and price (P)

Key points

- ✧ As the price **increases** (P2-P3), the quantity demanded will also **increase**. (Q2-Q3)
- ✧ As the price **decreases** (P2-P1), the quantity demanded will also **decrease**. (Q2-Q1)

IB Question

- Explain that a supply curve represents the relationship between the price and the quantity supplied of a product, *ceteris paribus*.
- Draw a supply curve

9. The Non-Price Determinants of Supply

The Non-price Determinants of Supply

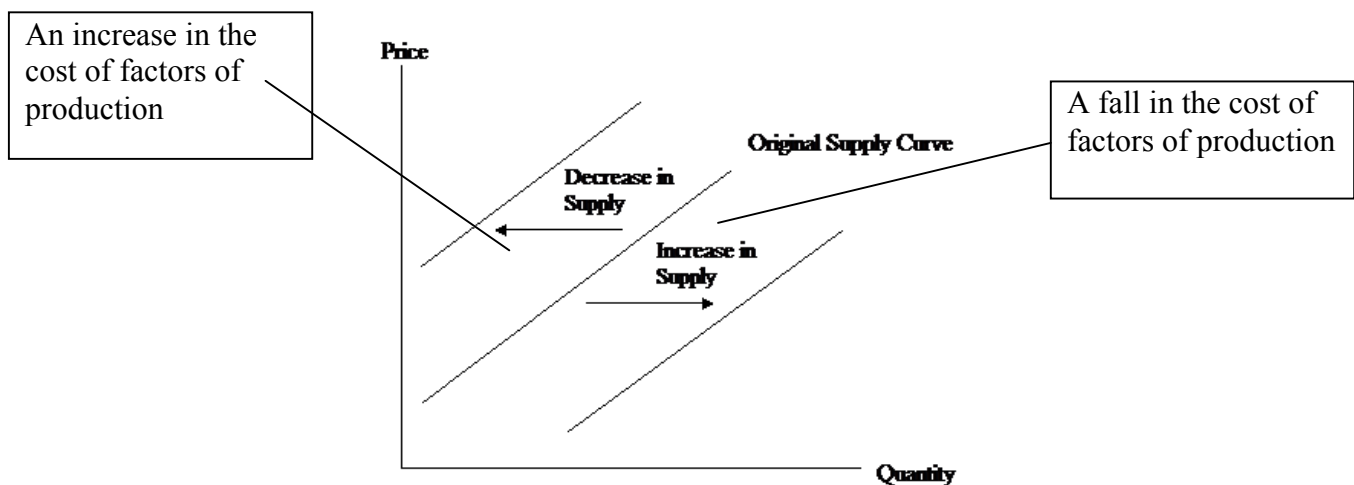
✧ Factors which determine supply and lead to an actual shift of the supply curve to either the right or the left. (**Ceteris paribus assumption*)

The major non-price determinants are:

- **Costs of factors of production** (land, labour, capital and entrepreneurship)
- **Technology**
- **Prices of related goods** (joint/competitive supply)
- **Expectations**
- **Indirect taxes and subsidies**
- **Number of firms in the market**

1. Costs of factors of production

➔ Land, labour, capital and entrepreneurship.



Factors of production

✧ They are the resources to produce goods and services.

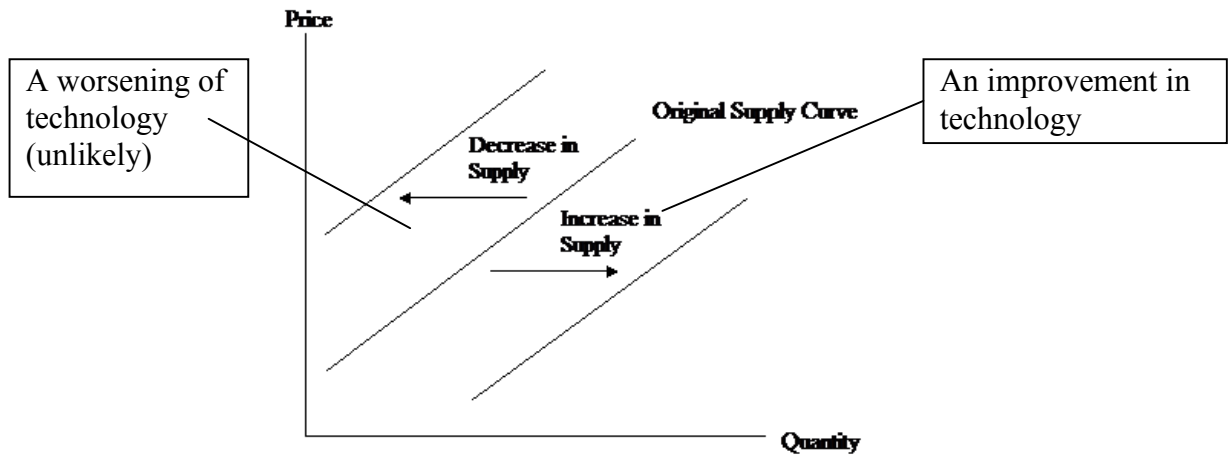
Land: All natural resources on the planet.

Labour: The human input into the production process.

Capital: Man made physical goods used to produce other goods and services.

Entrepreneurship: They provide the initial ideas. They risk their resources in business ventures.

2. Technology



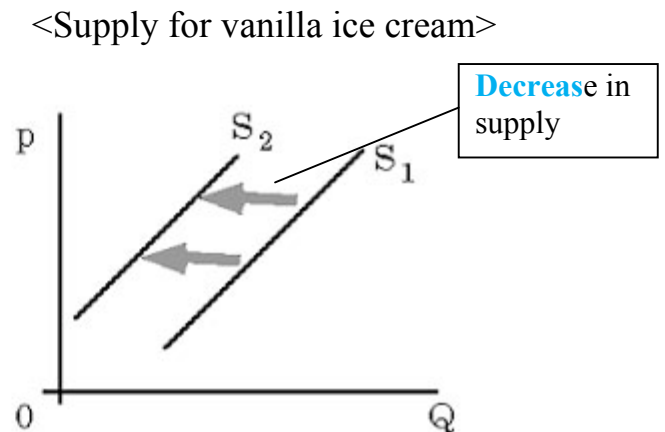
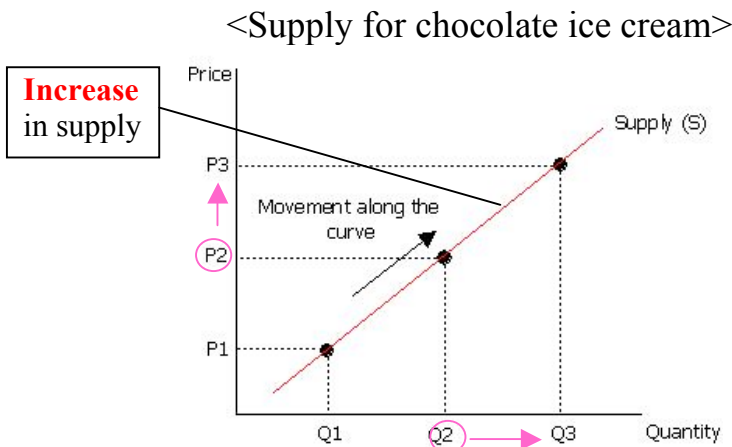
3. Prices of related goods

Competitive supply

- ➔ If a producer switches from producing A to producing B, the price of A will fall and hence the supply will fall because it's less profitable to make A.

Example

If the firms find that prices of chocolate ice creams are increasing...



◇ If the firm finds that prices of other products are rising, then it is likely that they will want to **increase the supply** of those products → the **supply of others will decrease**.

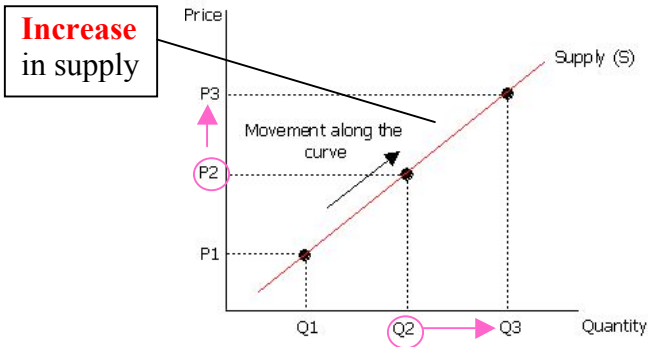
Joint supply

→ A rise in one product may cause a rise in another

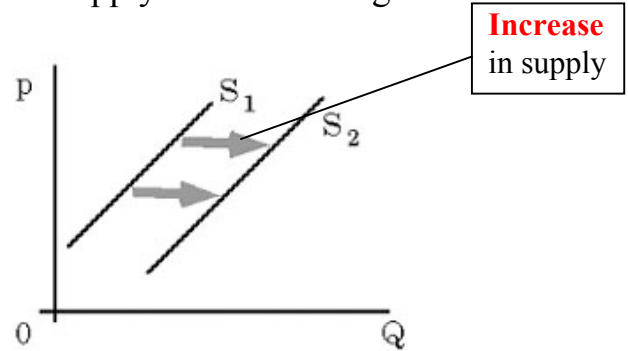
Example

If there is an increase in price for chicken breasts...

<Supply for chicken breasts>



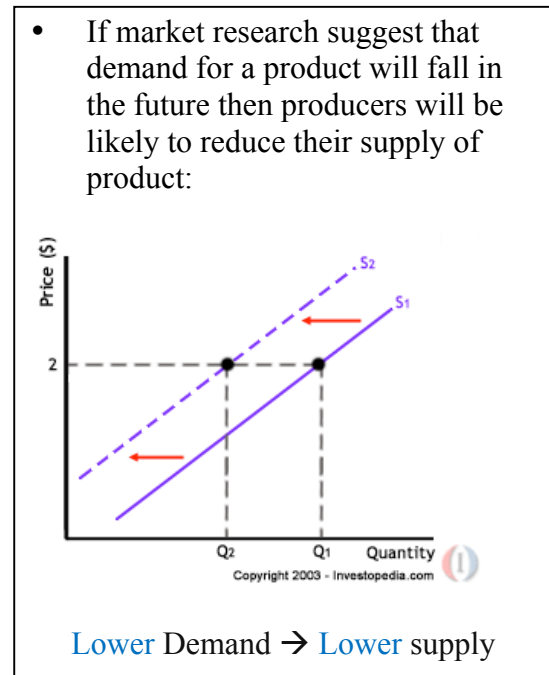
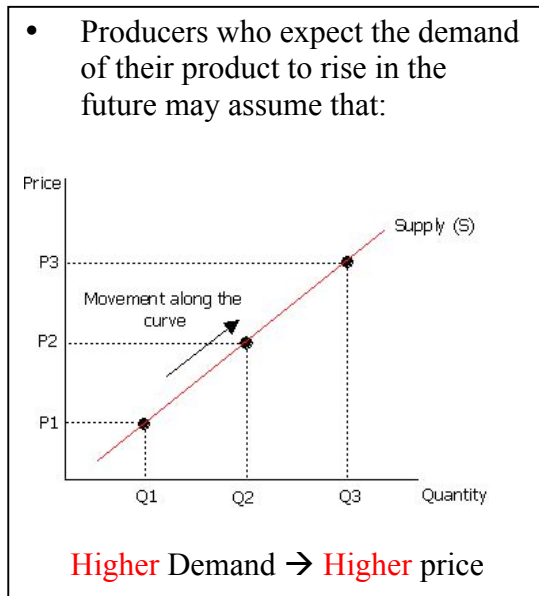
<Supply for chicken legs>



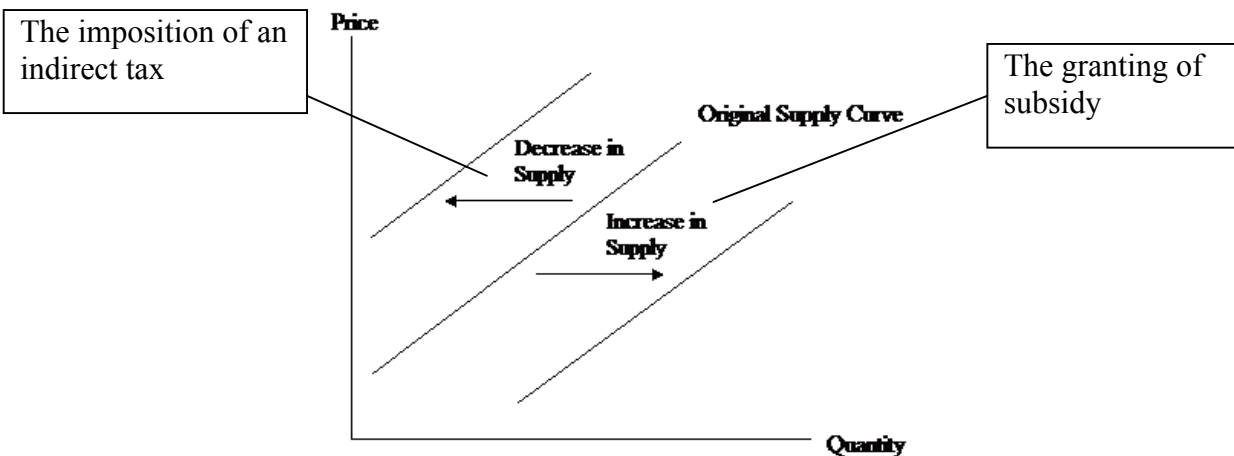
✧ Increase in supply for one, increase in supply for the other.

4. Expectations

- Producers make decisions about what to supply based on their expectations of future prices. However, the effect that expectations might have on production decisions might vary.



5. Government intervention



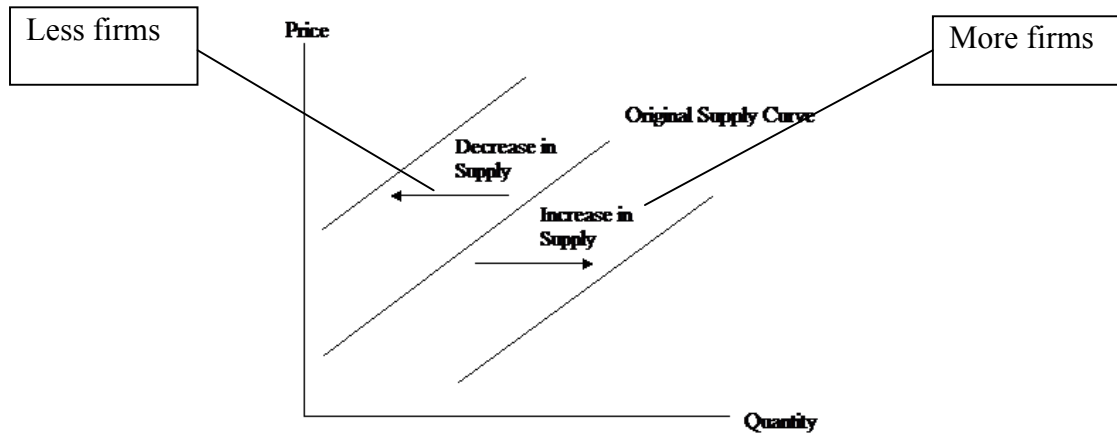
Indirect taxes (expenditure taxes)

- Taxes on goods and services that are added to the price of a product. These taxes force up the price of the product.

Subsidies

- Payments made by government to firms that will reduce their costs.

6. The number of firms in the market



- If there are many firms, there would be more supplies.

IB Question

- Explain how factors including changes in costs of factors of production (land, labour, capital and entrepreneurship), technology, prices of related goods (joint/competitive supply), expectations, indirect taxes and subsidies and the number of firms in the market can change supply.

10. *Movements along and shifts of the supply curve*

- If there is a change in **price**...



- ➔ Movement along the supply curve
- ➔ A change in both **price** and **quantity demanded**

- If there is a change in any other **determinants**...



- ➔ Shifts either left or right depending on the circumstances
- ➔ Only a change in **quantity demanded**

IB Question

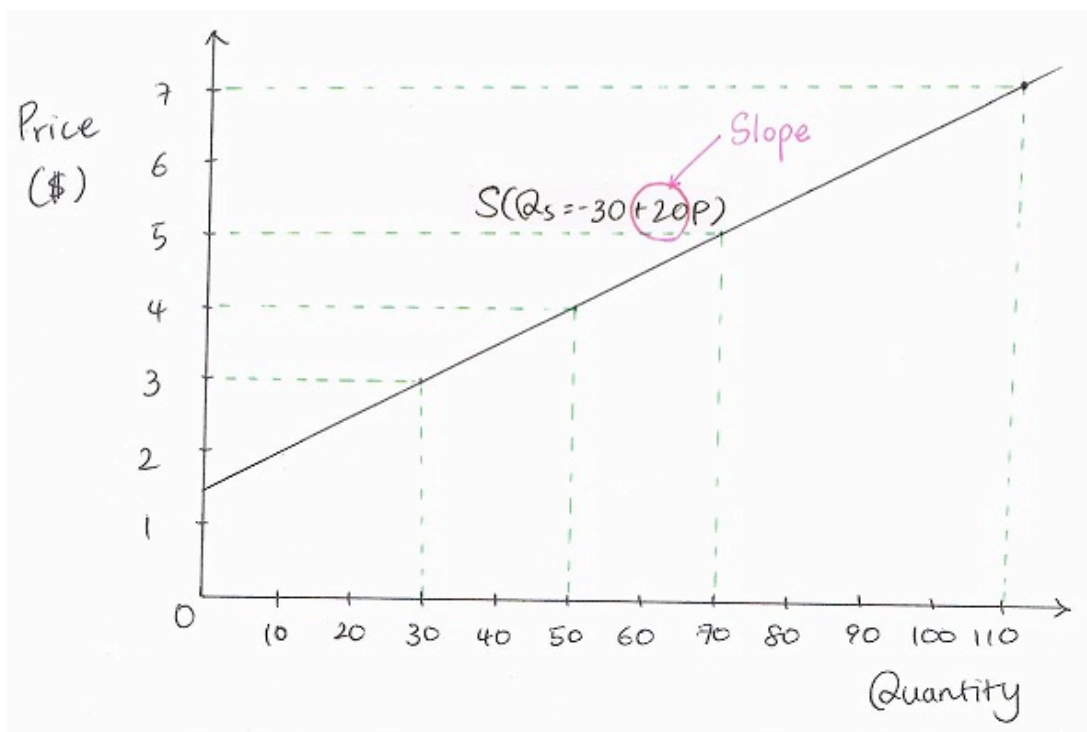
- Distinguish between movements along the supply curve and shifts of the supply curve.
- Construct diagrams to show the difference between movements along the supply curve and shifts of the supply curve.

11. Linear supply functions

$$Q_s = c + dP$$

Q_s : Quantity supplied
 c : Quantity supplied if the price was 0
 d : Slope of the curve
 P : Price

Example: $Q_s = -30 + 20P$



Procedures

1. Set up a supply schedule.
2. Plot the supply curve using the demand schedule.

Change in 'c' term

- **A shift of demand curve**
- Because 'c' **determines the x value** at price 0.
- The bigger the 'c' value, there would be a shift in right.
- The smaller the 'c' value, there would be a shift in left.

Change in 'd' term

- Affects the **steepness** of the slope
- Because it determines the **fall of demand**.
- The bigger the value of 'd', the steeper the slope.
- The smaller the value of 'd', the flatter the slope.



Values of 'c' and 'd' are influenced by changes in **non-price determinants of supply**.

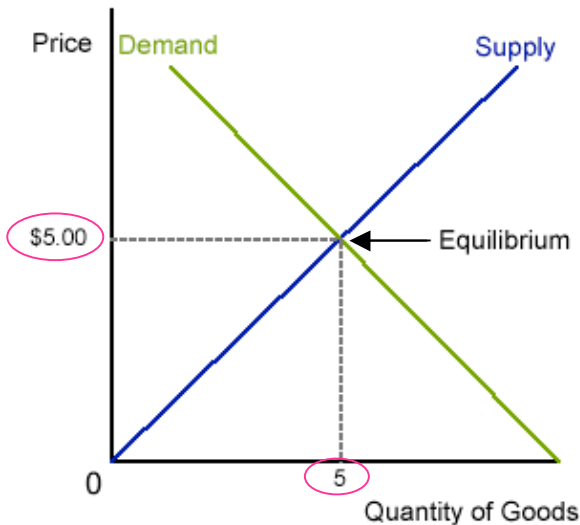
IB Question

- Explain a supply function (equation) of the form $Q_s = c + dP$.
- Plot a supply curve from a linear function (eg, $Q_s = -30 + 20P$).
- Identify the slope of the supply curve as the slope of the supply function $Q_s = c + dP$, that is d (the coefficient of P).
- Outline why, if the "c" term changes, there will be a shift of the supply curve.
- Outline how a change in "d" affects the steepness of the supply curve.

Market Equilibrium

12. *Equilibrium and Changes to Equilibrium*

→ “A state of rest, self-perpetuating in the absence of any outside disturbance”



Quantity demanded = Quantity supplied

(5 \$ → 5 units)

Market Equilibrium

- ✧ Where **demand** curve and **supply** curve intersect.
- ✧ Unless interfered with, the market will settle at this price and quantity.

→ Why?

- ✧ Because at this point of intersection, **buyers and sellers agree on both price and quantity**.
 - ✧ In the graph on the left, at the equilibrium price (5 \$), buyers want to buy exactly the same amount (5 units) that sellers want to sell.
- Also called the **market clearing price**.



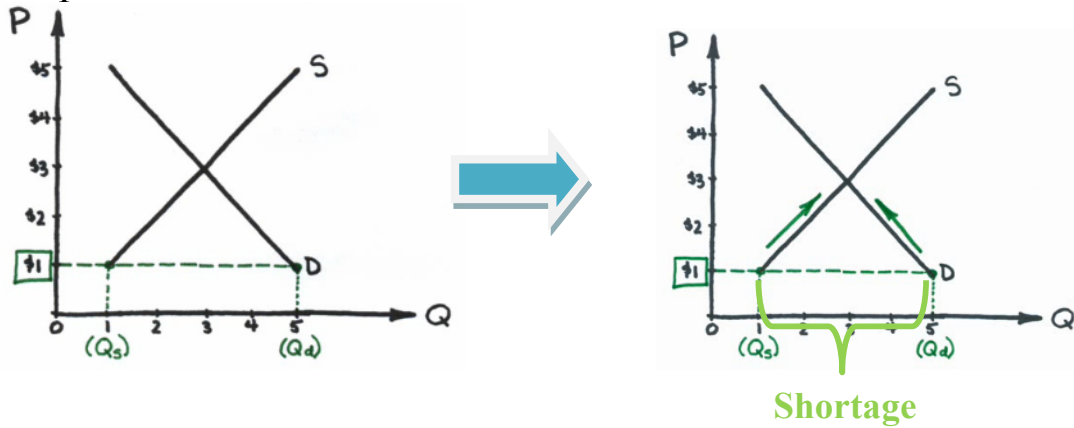
Excess Demand



Excess Supply

Excess Demand

Example



If the seller tries to lower the price to 1 \$...

(Q_s) : 1 (Q_d) : 5

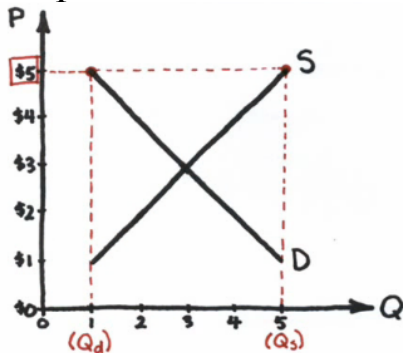
This means that there is only **1 unit** available to **5 people**

→ **Shortage (Excess Demand)**

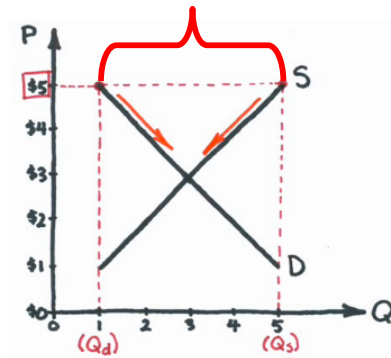
*This makes the price to rise and consequently quantity demanded drops while quantity supplied rises until there is equilibrium.

Excess Supply

Example



Surplus



If the seller tries to higher the price to 5 \$...

$(Q_s): 5$ $(Q_d): 1$

This means that there are only 5 units available to 1 person.

→ **Surplus (Excess Supply)**

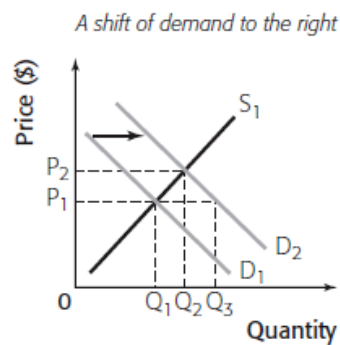
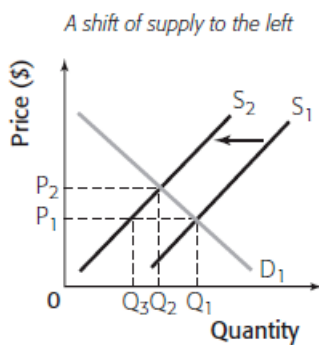
*This makes the price to go down and consequently quantity demanded rises while quantity supplied falls until there is an equilibrium.



Price and quantity **MUST** be the
market equilibrium

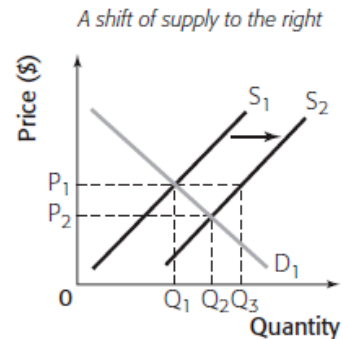
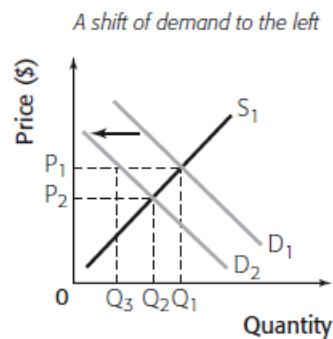
The effect of changes in demand and supply upon the equilibrium

- A change in any of the **determinants** of demand and/or supply **with the exception of a change in the price of good itself**, shifts the supply/demand curve to the left or to the right causing either an upward or a downward pressure on price.



◇ *When either a supply curve shifts to the left or a demand curve shifts to the right, there would be an **increase in price**.*

◇ *When either a supply curve shifts to the right or a demand curve shifts to the left, there would be a **decrease in price**.*



IB Question

- Explain, using diagrams, how demand and supply interact to produce market equilibrium.
- Analyse, using diagrams and with reference to excess demand or excess supply, how changes in the determinants of demand and/or supply result in a new market equilibrium.

13. Calculating and illustrating equilibrium using linear equations

Example

$$Q_d = 900 - 100P \rightarrow \text{Demand function}$$

$$Q_s = 200P \rightarrow \text{Supply function}$$

Using these functions, it is possible to work out the equilibrium price and quantity demanded and supplied. Since equilibrium is found where demand equals supply, we simply need to set our two functions opposite each other.

$$900 - 100P = 200P$$

$$300P = 900$$

$$P = 3 \$$$

Once we have the equilibrium price the equilibrium quantity can be found by substituting the price into either the demand function or supply function.

$$Q_d = 900 - 100P$$

$$= 900 - 100 \times 3$$

$$= 900 - 300$$

$$= 600 \text{ units}$$

or

$$Q_s = 200 \times 3$$

$$= 600 \text{ units}$$

Answer:

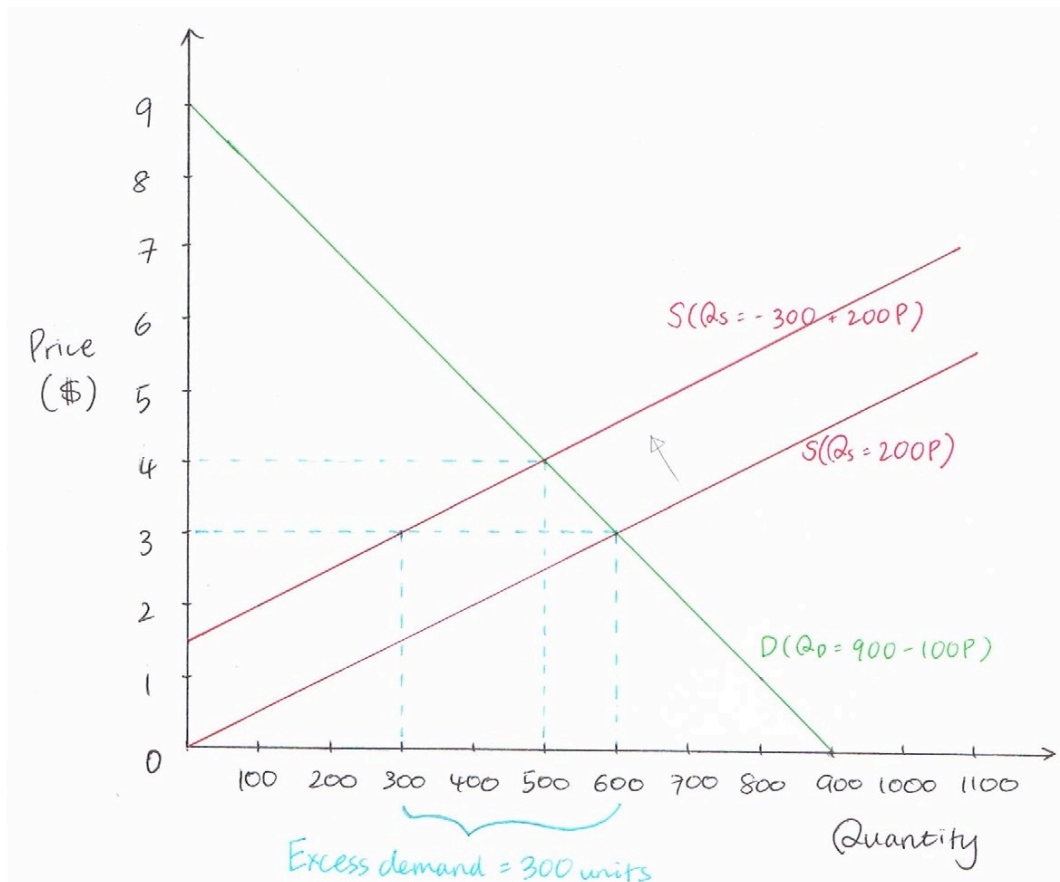
Hence, the equilibrium price is 3 \$ per unit and the equilibrium quantity demanded and supplied is 600 units.

Example

If we assume the supply function for the product changes:

$$Q_s = 200P \rightarrow Q_s = -300 + 200P$$

The graph would look like this:



The new supply function ($-300 + 200P$) shifted to the left from the original one ($200P$).

This would mean that now, at the original equilibrium price of 3 \$, 600 units are still demanded but only 300 units are supplied. There is an excess demand of 300 units and so the price will start to rise in order to eliminate the excess demand.

Answer

Therefore, the new equilibrium price is 4 \$ per unit and the equilibrium quantity demanded and supplied are 500 units.

IB Question

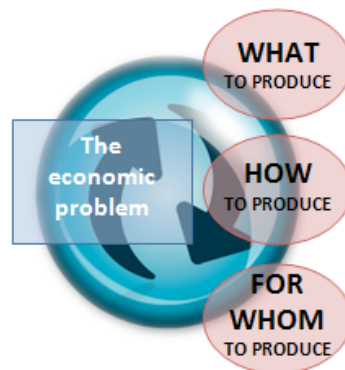
- Calculate the equilibrium price and equilibrium quantity from linear demand and supply functions.
- Plot demand and supply curves from linear functions, and identify the equilibrium price and equilibrium quantity.
- State the quantity of excess demand or excess supply in the above diagrams.

The role of the price mechanism

14. Resource allocation

Price mechanism (Price system)

- ✧ The means by which the many millions of decisions taken each day by **consumers** and **businesses** interact to **determine the allocation of scarce resources** between competing uses.
- ✧ Scarcity is the basic economic problem. **The world's resources are limited but human wants and needs are unlimited.** Therefore, it is significant to be able to answer the question, “What to produce?” question to effectively allocate scarce resources.



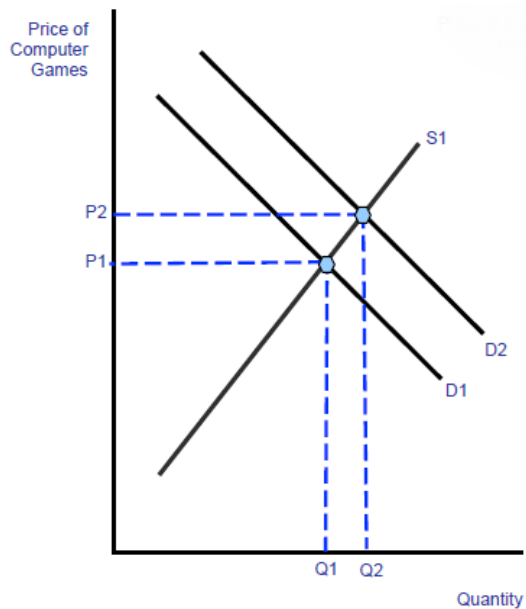
- ✧ When a **choice** is made, there is an **opportunity cost** because people have finite incomes. We have to decide how to allocate our limited financial resources and so sacrifice has to be made when making a choice.

Functions of price mechanism

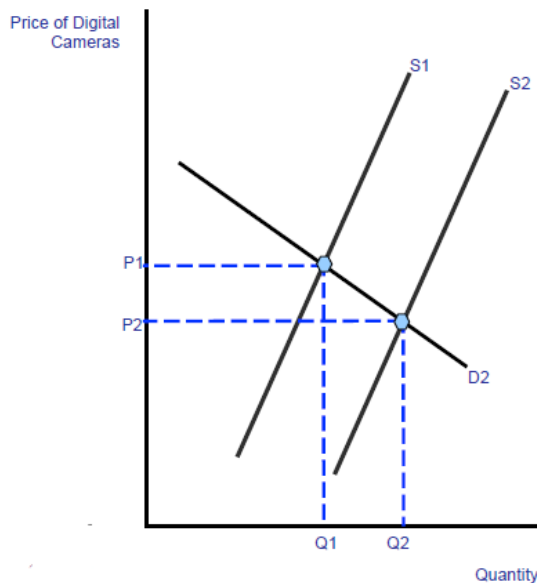
1. Signaling function

- ✧ They adjust to demonstrate where resources are required, and where they are not. Prices rise and fall to reflect scarcities and surpluses.

Example



Higher demand signals to producers to step up production – if they are driven by the profit motive. Total revenue is higher at price P_2 and output Q_2 .



In this diagram, an increase in supply leads to lower market prices – a signal to consumers that their real income has increased – they can afford to buy more.

2. Incentive function

- ✧ Something that **motivates** a **producer or consumer** to follow a course of action or to change behavior.
- ✧ For competitive markets to work efficiently all ‘economic agents’ (i.e. consumers and producers) must respond to **appropriate price signals** in the market.

IB Question

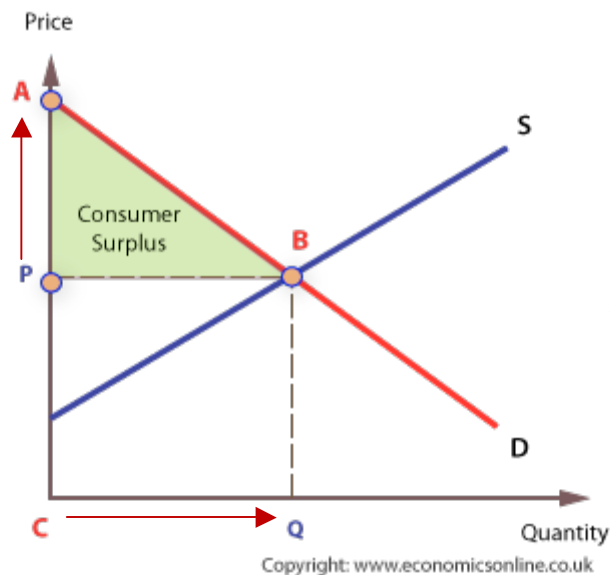
- Explain why scarcity necessitates choices that answer the “What to produce?” question.
- Explain why choice results in an opportunity cost.
- Explain, using diagrams, that price has a signaling function and an incentive function, which result in a reallocation of resources when prices change as a result of a change in demand or supply conditions.

Market efficiency

15. Consumer surplus

Consumer surplus

- ✧ The **extra benefit** gained by a **consumer** when the price they are prepared to pay for a good is higher than the actual market price.



Graphically, it is the **area** from the **price line** up to the **demand curve**

- Point **B** is the actual price. (P-Q)
- If the consumers were willing to buy more than **P** below **A** then there is a consumer surplus. Meaning that the price they were prepared for was bigger than the actual price.

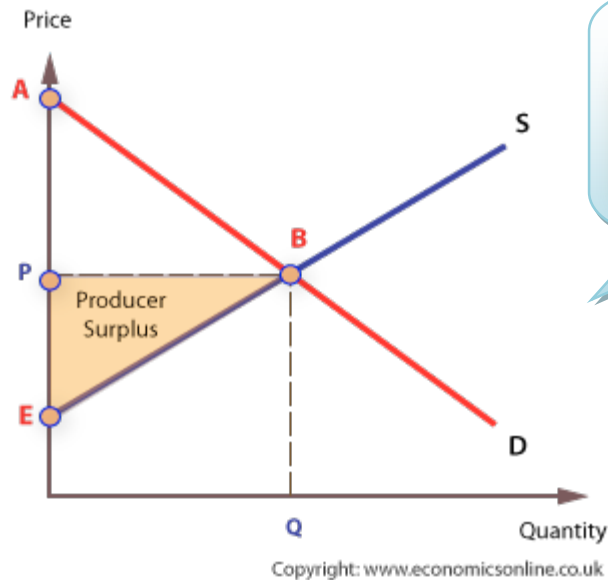
IB Question

- Explain the concept of consumer surplus.
- Identify consumer surplus on a demand and supply diagram.

16. Producer surplus

Producer surplus

- ✧ The **extra benefit**, in terms of profits, gained by **producers** when the price they are prepared to accept for a unit is less than the actual market price.



- Point **B** is the actual price.(P-Q)
- If the producer were to produce a product below **P** and above **E**, there is a producer surplus. Meaning that the price they set up for the product was less than the actual price.

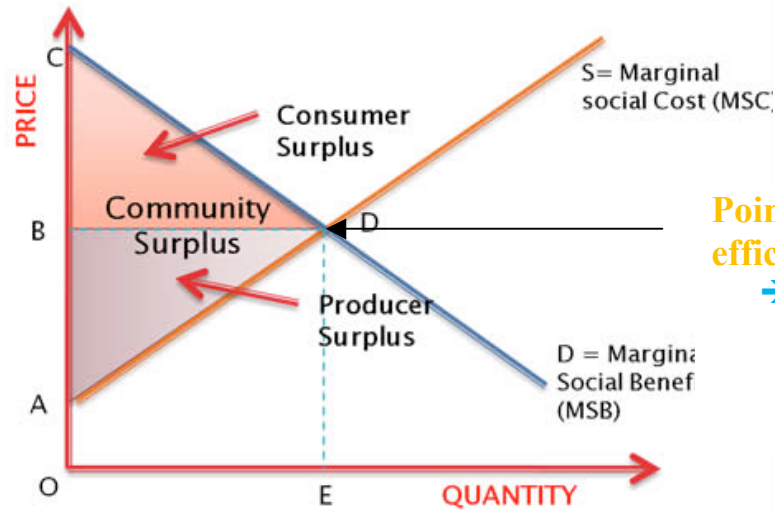
IB Question

- Explain the concept of producer surplus.
- Identify producer surplus on a demand and supply diagram.

17. *Allocative efficiency*

✧ It is when a market is **in equilibrium**, with no external influences and external effects.

→ Meaning that resources are allocated in **the most efficient way** from *society's point of view*.



Point of allocative efficiency

→ This is where **community surplus is maximized**.

This means that there is **no other combination of price and quantity** on the diagram that could give a greater community surplus.

→ This is why it is the **optimum** allocation of resources from *society point of view*.

Market efficiency occurs when:

$$\text{Demand} = \text{Supply}$$

In other words:

$$\underline{\text{Marginal benefits (demand)}} = \underline{\text{Marginal social cost (supply)}}$$

IB Question

- Explain that the best allocation of resources from society's point of view is at competitive market equilibrium, where social (community) surplus (consumer surplus and producer surplus) is maximized (marginal benefit = marginal cost).