1. Understanding Market Equilibrium

Market equilibrium is defined as a situation where the plans of all consumers and firms in the market match exactly, allowing the market to clear.

In a perfectly competitive market, consumers aim to maximise their utility, while firms aim to maximise their profits. Equilibrium occurs when the **aggregate quantity that all firms wish to sell equals the quantity that all consumers wish to buy**; in other words, market supply equals market demand.

- **Equilibrium Price ($p*$):** The specific price at which market demand and market supply are equal.
- **Equilibrium Quantity ($q*$):** The total amount of a commodity bought and sold at the equilibrium price.
- **Mathematical Condition:** An equilibrium $(p*,q*)$ is reached when $qD(p*)=qS(p*)$.

Graphically, equilibrium is the point where the **market supply curve (SS) intersects the market demand curve (DD)**. At any other price level, the market is in a state of imbalance, categorized as either excess demand or excess supply.

2. Dynamics of Excess Demand and Excess Supply

Whenever market supply does not equal market demand, the market is not in equilibrium, and forces are triggered to change the price. This is often described through the concept of the **"Invisible Hand,"** a mechanism that adjusts prices to eliminate imbalances and drive the market back toward equilibrium.

- **Excess Demand:** This occurs if, at a given price, **market demand exceeds market supply**. In this scenario, some consumers are unable to obtain the commodity or obtain it in insufficient quantities. These dissatisfied consumers will be willing to pay a higher price, causing the market price to rise. As the price increases, quantity demanded falls and quantity supplied increases until the market reaches $p*$.

- **Excess Supply:** This occurs if, at a given price, **market supply is greater than market demand**. Some firms will be unable to sell the quantity they intended to provide. To clear their stock, firms will lower their prices. As the price falls, quantity demanded rises and quantity supplied falls until they match at the equilibrium point.

Algebraically, for a price p, **Excess Demand (ED)** is expressed as $ED(p)=qD(p)-qS(p)$, and **Excess Supply (ES)** is $ES(p)=qS(p)-qD(p)$.

3. Market Equilibrium with a Fixed Number of Firms

Under the assumption that the number of firms in the market is fixed, the intersection of the market demand and supply curves determines the equilibrium. In this environment, any change in external factors (like consumer income or input prices) shifts the curves and alters the equilibrium.

Impact of Demand Shifts:

- **Rightward Shift in Demand:** If demand increases (e.g., due to an increase in consumer income for a normal good), a state of **excess demand** is created at the initial price. This causes the equilibrium price to rise and the equilibrium quantity to increase.

- **Leftward Shift in Demand:** If demand decreases, **excess supply** emerges at the old price, leading to a decrease in both equilibrium price and equilibrium quantity.

Impact of Supply Shifts:

- **Leftward Shift in Supply:** If supply decreases (e.g., due to a rise in input prices like wages), **excess demand** occurs at the initial price. This leads to an increase in the equilibrium price but a decrease in the equilibrium quantity.

- **Rightward Shift in Supply:** If supply increases (e.g., due to technological progress or an increase in the number of firms), **excess supply** occurs at the old price, leading to a decrease in equilibrium price and an increase in equilibrium quantity.

Simultaneous Shifts: When both curves shift at once, the final impact depends on the direction and magnitude of the shifts.

- If both shift in the same direction, the change in **quantity is unambiguous**, but the effect on price depends on the magnitude of the shifts.

- If they shift in opposite directions, the change in **price is unambiguous**, while the effect on quantity depends on magnitude.

4. Market Equilibrium with Free Entry and Exit

In the long run, if firms are identical and can enter or exit the market freely, the equilibrium mechanism changes significantly.

- **Zero Profit Condition:** Free entry and exit imply that in equilibrium, no firm earns supernormal profit or incurs a loss; every firm earns exactly **normal profit**.

- **Price Determination:** Firms will enter if there are supernormal profits (price > minimum Average Cost) and exit if there are losses (price < minimum Average Cost). Consequently, the **equilibrium price must always equal the minimum Average Cost (min AC)**.

- **Effect of Demand Shifts:** Unlike the fixed-firm case, a shift in the demand curve under free entry/exit **has no impact on the equilibrium price**. Instead, it only changes the equilibrium quantity and the number of firms in the same direction as the demand shift. The impact on quantity is more pronounced here than in a market with a fixed number of firms.

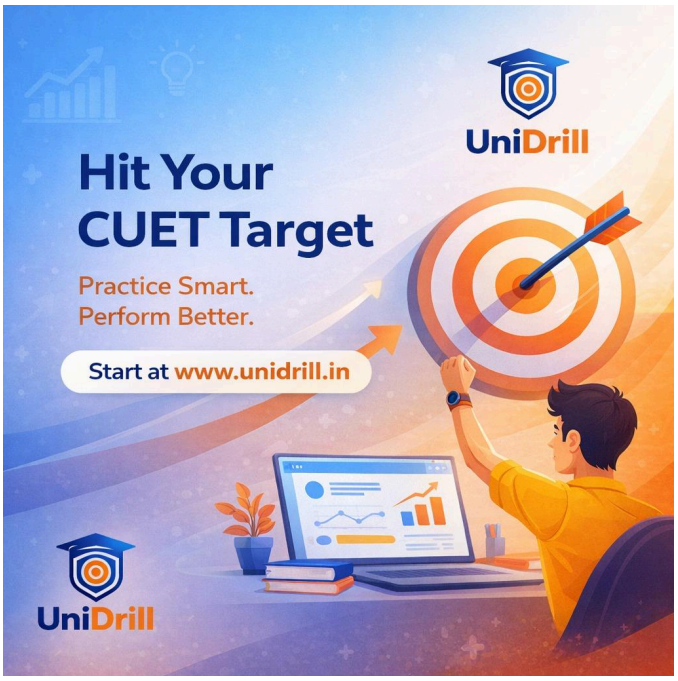
5. Wage Determination in the Labour Market

The theory of equilibrium also applies to the **labour market**, where households are the suppliers and firms are the demanders.

- **Demand for Labour:** A profit-maximising firm hires labour up to the point where the **wage rate (w) equals the Marginal Revenue Product of Labour (MRPL)**. In perfect competition, this is equivalent to the wage matching the **Value of Marginal Product of Labour (VMPL)**.

- **Supply of Labour:** Households decide how much labour to provide based on a choice between **income and leisure**.

- **Equilibrium:** The equilibrium wage rate is determined at the intersection of the labour demand and supply curves.



6. Application: Price Ceiling

A **price ceiling** is a government-imposed **upper limit** on the price of a good or service. It is typically applied to essential items (e.g., wheat, kerosene, sugar) and is set **below the market-determined equilibrium price** to make these goods affordable for the poor.

Consequences of a Price Ceiling:

- **Excess Demand (Shortage):** Because the price is artificially low, the quantity demanded by consumers exceeds the quantity supplied by firms ($qc > qc'$).
- **Rationing:** To manage the shortage, the government often introduces **rationing**, where ration coupons limit the amount each individual can buy through "fair price shops".
- **Adverse Effects:** Consumers may face long queues at ration shops. Furthermore, some consumers may be willing to pay more for the scarce good, leading to the creation of **black markets**.

7. Application: Price Floor

A **price floor** is a government-imposed **lower limit** on the price that may be charged for a good or service. It is set **above the market equilibrium price**. Common examples include agricultural price support programmes and minimum wage legislation.

Consequences of a Price Floor:

- **Excess Supply (Surplus):** Because the price is artificially high, the quantity firms want to supply exceeds the quantity consumers want to buy ($qf' > qf$).
- **Buffer Stocks:** In agriculture, to prevent the price from falling due to the surplus, the government must purchase the excess supply at the predetermined floor price.
- **Labour Market Impact:** In the context of minimum wage legislation, a price floor set above the equilibrium wage can lead to excess supply of labour, potentially resulting in unemployment.