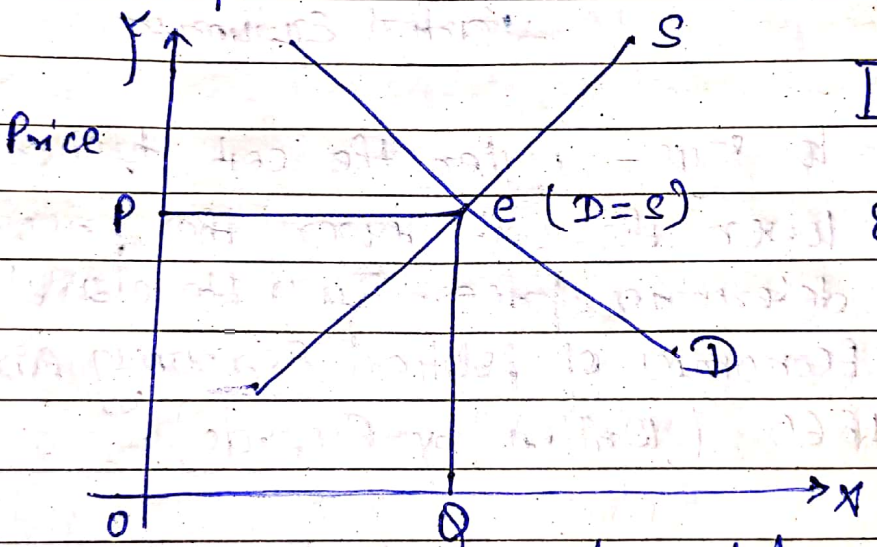
Jevon, Ricardo — British Economist

# General Equilibrium

## Marshall's partial Equilibrium :

In 1890 (Principle of Economics) Alfred Marshall had given the concept of partial Equilibrium. According to his theory, demand and supply plays the significant role in the determination of equilibrium.

## Partial Equilibrium :




D - S = 0

D = S

↓

Equilibrium

Price equilibrium is generally associated with Marshall. He wrote his book 1890. In this book he had synthesed "cost theory of pricing" and "utility Theory of pricing" into one "demand and supply Theory of pricing"

1776 - Adam Smith

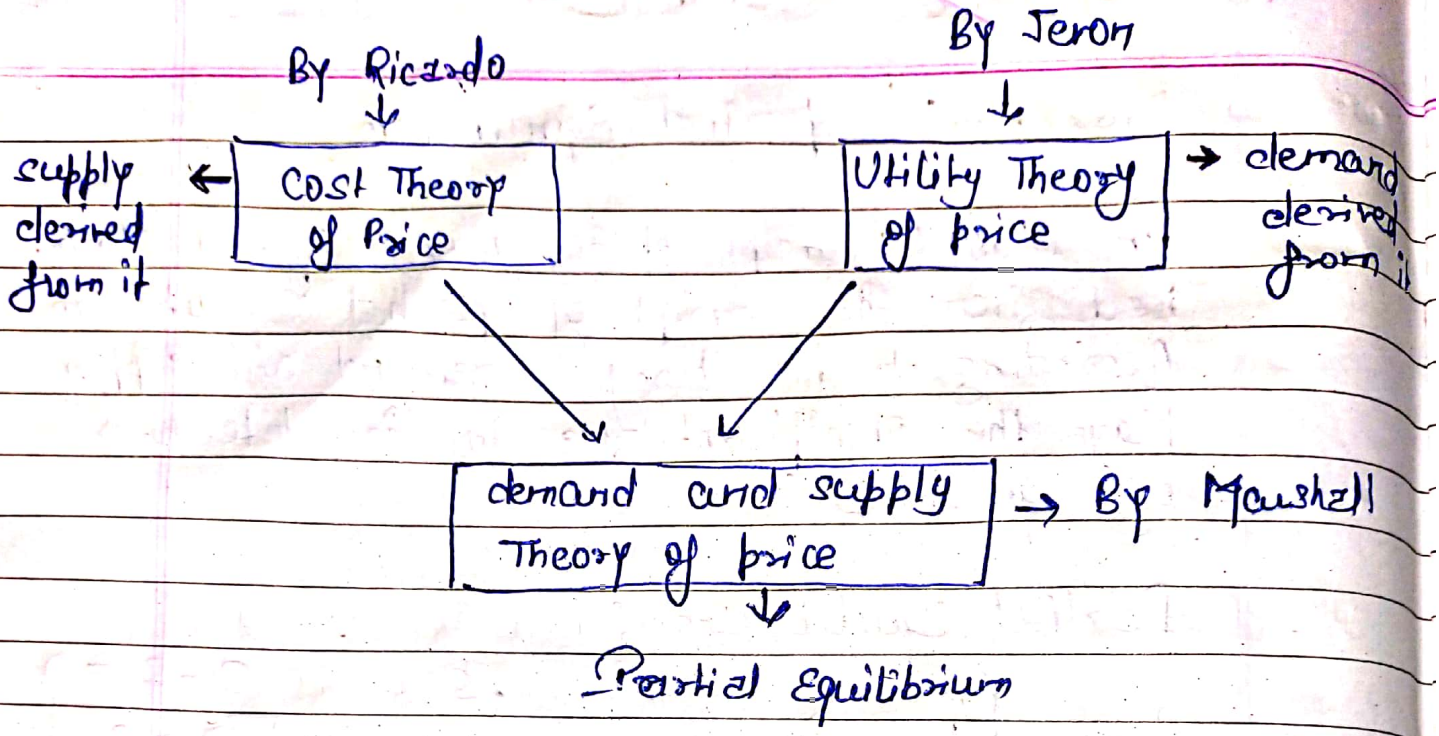
1871 - Jevon's utility Theory of pricing (~~Austrian~~ ~~Economist~~)

1816 - Ricardian's cost Theory of pricing (British)

1890 → Marshall had integrated both the Theory of Jevon and Ricardo and developed his D-S Theory of pricing

C↑ → S↓
C↓ → S↑

D↑ → y↑




Ricardo says - higher the cost higher the price and lower the cost lower the price. it means cost determines price. This is the classical theory of price determination. Economics of political Economy and Taxation in 1860 (Written by Ricardo).

But in 1871, Jeron's told that Ricardian Theory of price determination is not appropriate. He added that cost is not an important factor for the determination of price of the commodity. He said that it is utility which is important factor for the determination of price.

Jeron said "Higher the utility Higher then price and vice versa".

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## Adam Smith

→ Water-diamond Paradox :- (1700s)

It states the water provides max^m utility but its price is low whereas diamond does not possess any utility but its price is highest. This paradox contradicted the Jevon's utility analysis of price.

Marshall used supply in the place of cost and demand (derived from utility) and integrated both D and S in order to determine price. He held that cost and utility worked only under the curtain.

→ **Cost and supply** → lower

Higher cost means ~~higher~~ supply and lower the cost higher the supply when other things ~~der~~ remain constant.

cost ↑ → supply ↓ and cost ↓ → S ↑

→ **Utility and demand** →

Utility ↑ → demand ↑ and Utility ↓ → demand ↓ when other things remaining the same.

According to Marshall the equilibrium price in the commodity market is determined at the point where the commodity demand is equal to the ~~commodity~~ ~~price~~ supply.

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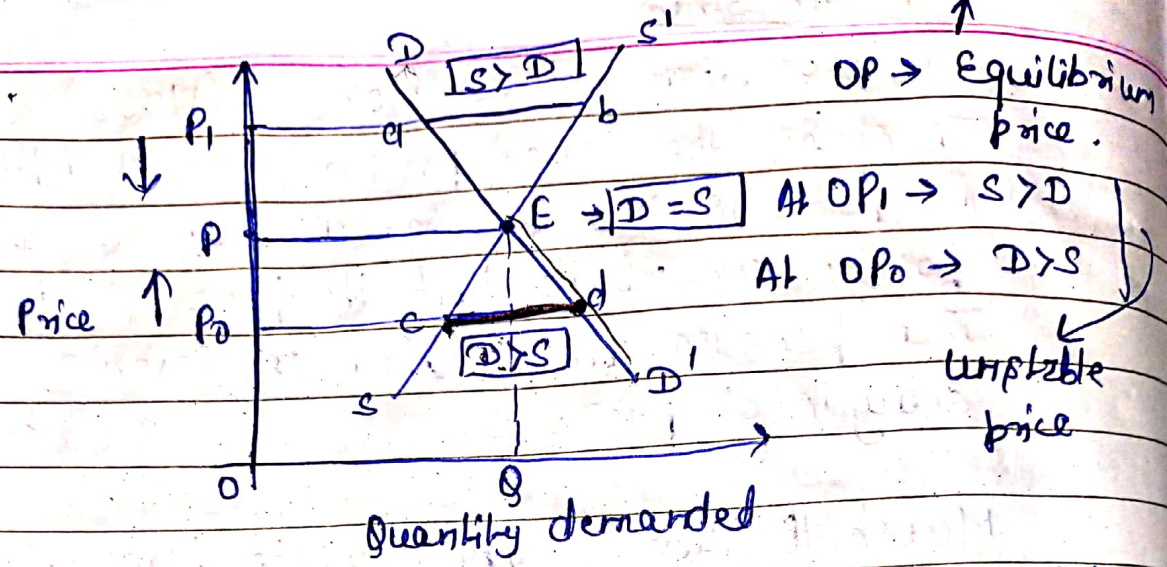
## determination of price under Partial Equilibrium :→



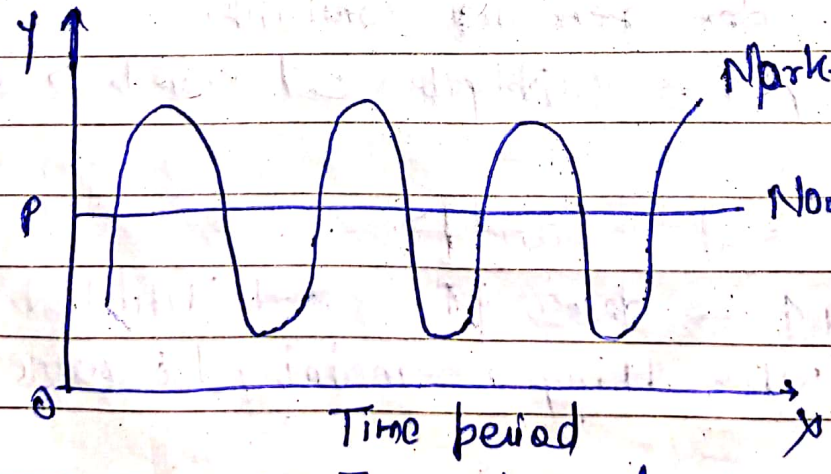

P1 and P0 is not stable price. P is a stable price.

Three types of time element according to Marshall :

(i). Market period → very very short period of time.

(ii) Normal period → both the short & long period.

(iii) Secular period → It means long period.



D = S

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- **Walras General Equilibrium (1889) :-**

Walras' Law states "that the total value of goods and money supplied equal that of goods and money demand."

Walras' Law is an economic theory that the existence of excess supply in one market must be matched the excess demand in another market so that it balances out.

Leon Walras (1834-1910) – Elements of Pure Economic (1874)

**Commodity Market :**

$x_i P_i$ = Demand .. Excess [because quantity demand & price]

$x_i P_i = D - S > 0$ Excess demand in Commodity market

$i = 1, 2, 3, \ldots n$ – Commodity

- $\sum_{i=1}^{n} x_i P_i > 0$ Excess demand

- $\sum_{i=1}^{n} x_i P_i < 0$ Excess supply

**Money Market :**

supply of money = M

demand for money = k

- if $M < k$ Excess demand in money Market

- if $k < M$ Excess supply in the money market

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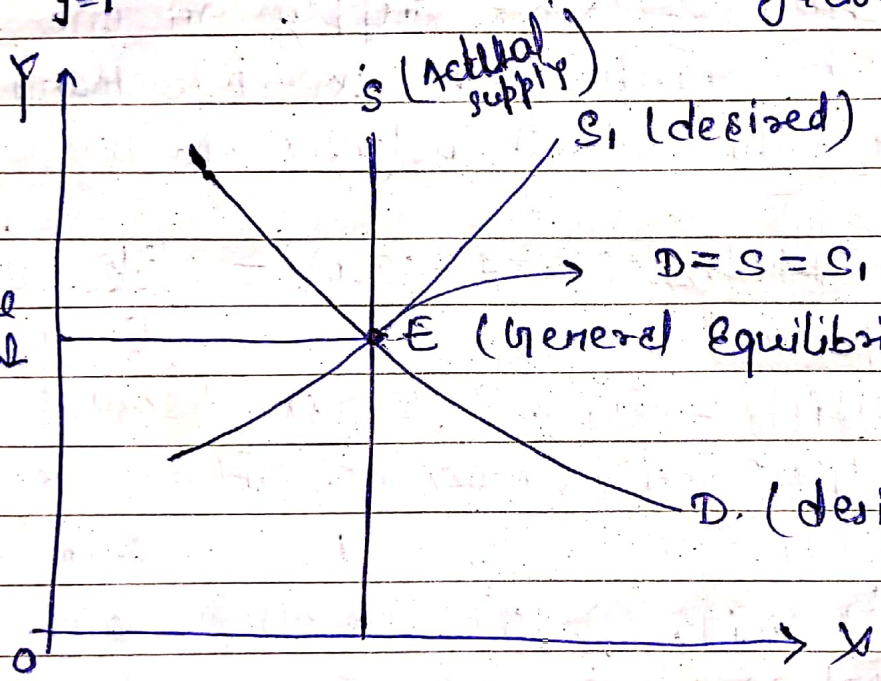
$\sum_{j=1}^{n} X_j P_j > 0$ ⟹ D-S > 0

**Factor Market :-**

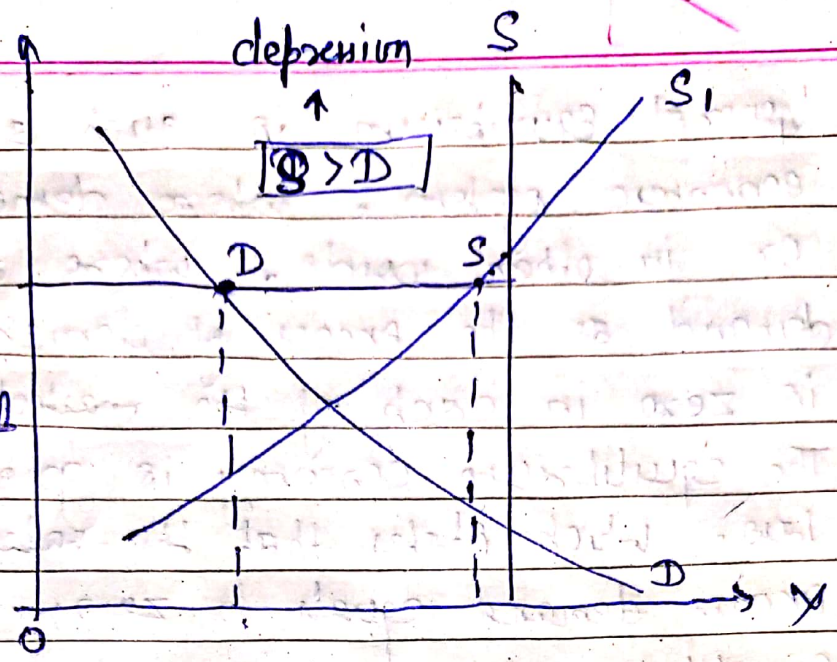
- $\sum_{j=1}^{n} X_j P_j = D - S > 0$ — Excess demand in factor Market
- $\sum_{j=1}^{n} X_j P_j = D - S < 0$ — Excess supply in factor Market

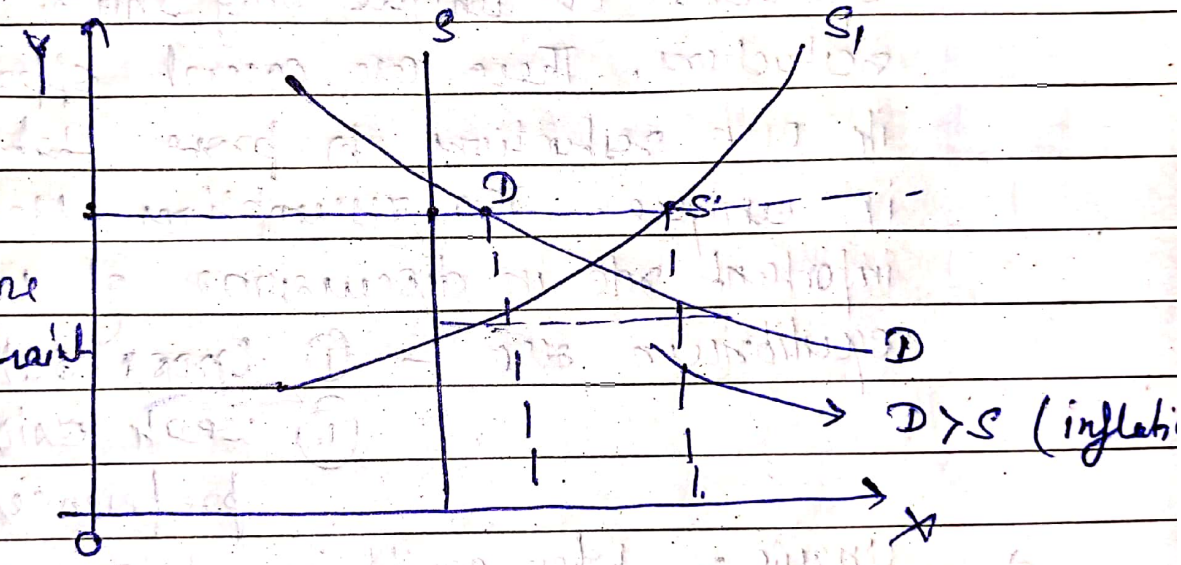



S = Actual total production at full employment. S represents that the resources are fixed at a particular period of time so, S (supply curve) is vertical / perfectly inelastic in nature.

if $D = S = S_1$ — General Equilibrium

↳ Desired demand = Desired supply = Actual supply




In the capitalist economy if excess demand or excess supply created then it can be corrected by the revision of ROI.

General Equilibrium = $D = S = S_1 = 0$

"Walras told that all the markets must be cleared for any Excess demand or Excess supply to be at equilibrium"

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→ General equilibrium is such a state of the economic system, where demand equal supply. Or in other words, where aggregate excess demand is the excess of demand over supply is zero in each of the market.

→ The equilibrium economy is governed by Walras law, which states that the value of aggregated excess demand equals to zero.

→ Equilibria are unique only under very strong restrictions. There are several approaches with its own restrictions to prove that ~~uni~~ equilibrium is unique. Two assumptions that play an important role in discussions of uniqueness of equilibrium are :- (i) Gross substitutability
(ii) weak axiom of revealed preferences.

→ Unqie = when equilibrium price must be positive ($P^* > 0$) and aggregate demand function must be continuous differenti

# Walras General Equilibrium Analysis

→ General equilibrium model was developed by the French economist Leon Walras (1834-1910).

→ In his Elements of Pure Economics Walras argued that all prices and quantities in all markets are determined simultaneously through their interaction with one another.

→ Walras used a system of simultaneous equations to describe the interaction of individual sellers and buyers in all markets.

→ In the Walrasian model the behaviour of each individual decision maker is presented by a set of equations.

→ For ex :- each consumer has a double role: he buys commodities and sells services of factors to firms.

Thus for each consumer we have a set of equations consisting of two subsets:

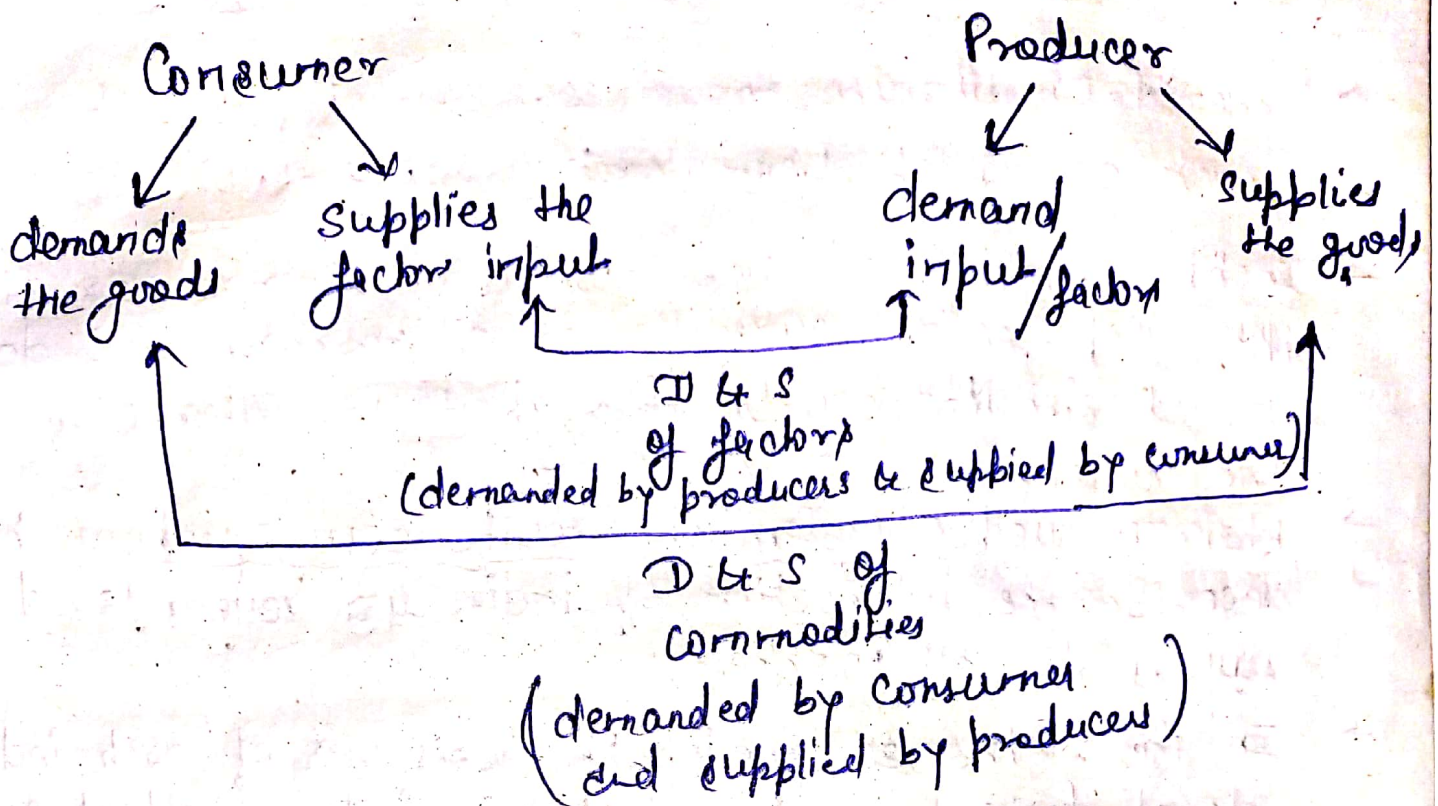
(i). One describing his demands of the different commodities.

(ii). The other his supplies of factor inputs.

Similarly, the behaviour of each firm is presented by a set of equations with two subsets.

(i). One for the quantities of commodities that it produces

(ii). and the other for the demand for factor inputs for each commodity produced.




Here, we see that both the consumer and producer (demands and supply of goods & factors). They work simultaneously and they are interdependent.

* The important characteristics of these equations in their simultaneously or interdependence

→ Existence, Uniqueness and Stability of an Equilibrium :

i) Does a general equilibrium solution exist? (Existence problem)
ii) If an equilibrium solution exists, is it unique?
iii). If an equilibrium solution exists, is it stable? (Stability problem)

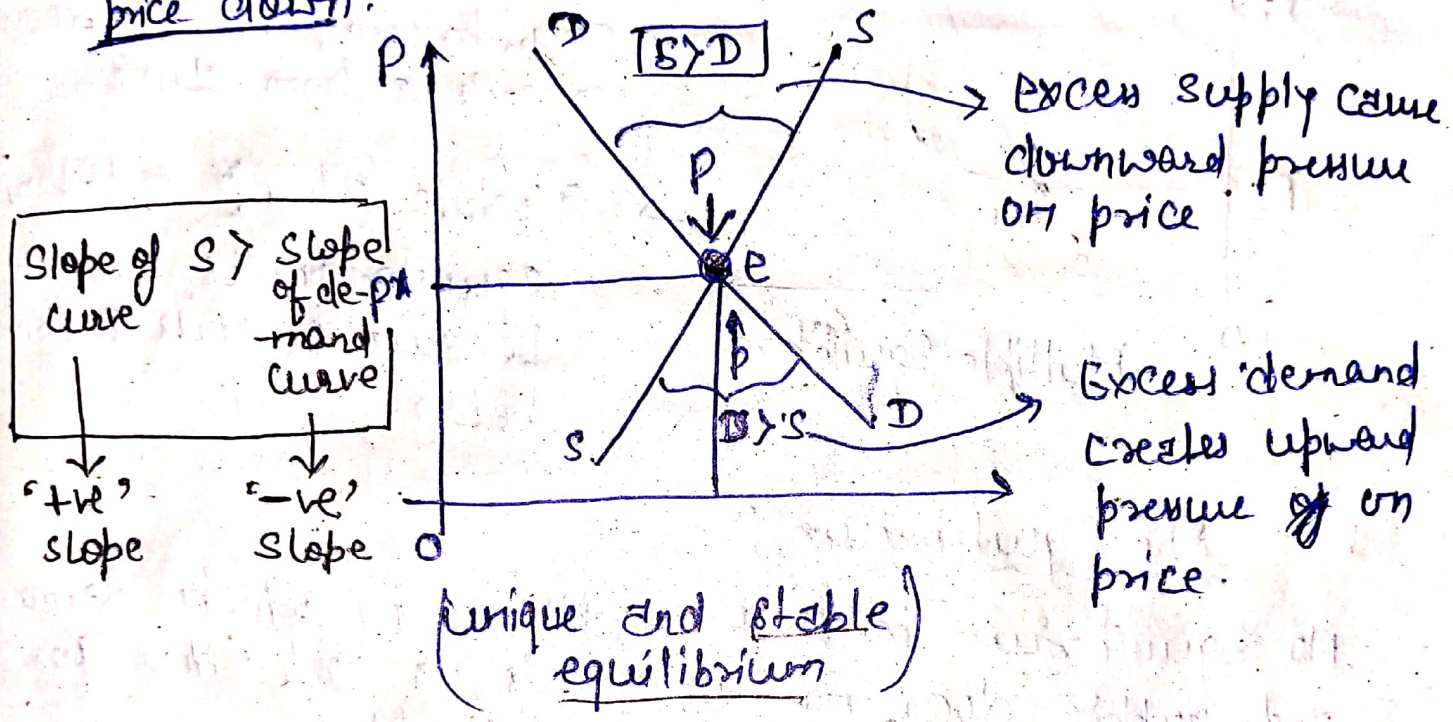
At such a price there is neither excess demand nor excess supply.

## * Stable Equilibrium :

** or The stability of equilibrium depends on the relationship b/w the slopes of Demand & Supply curve.

The equilibrium is stable if the demand function cuts the supply function from above.

In this case an excess demand drives price up, while an excess supply (excess negative demand) drives the price down.

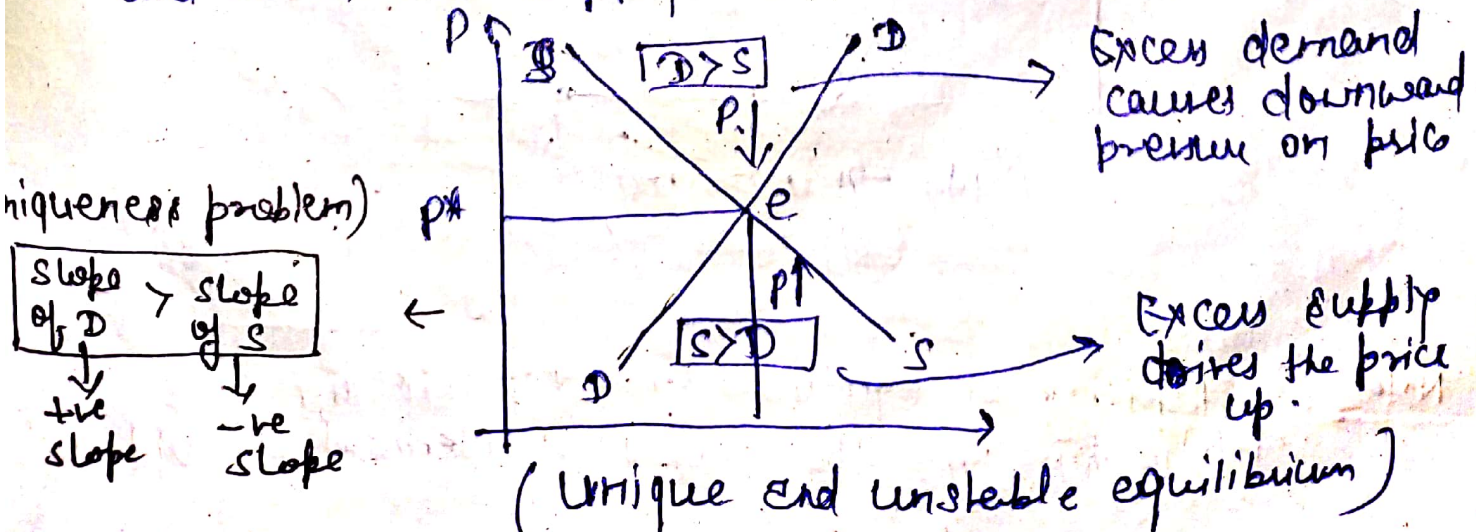



(unique and stable equilibrium)

## * Unstable Equilibrium :

The equilibrium is unstable if the demand function cuts the supply function from below.

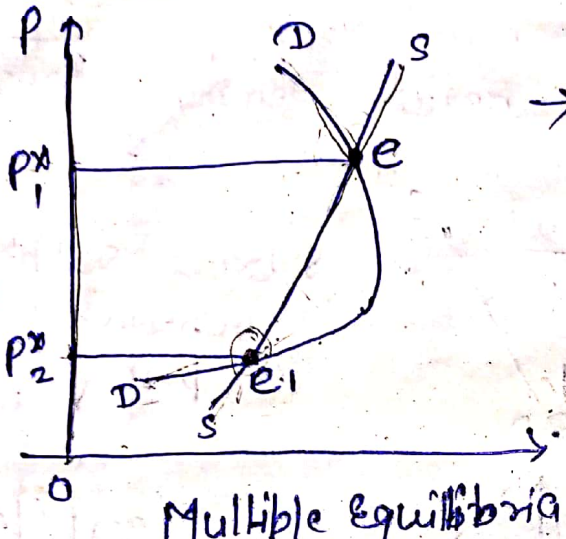
In this case an excess demand drives the price down, and an excess supply drives the price up.




(unique and unstable equilibrium)

## * Multiple Equilibrium :

In Multiple equilibrium, demand curve cuts supply curve at various points.



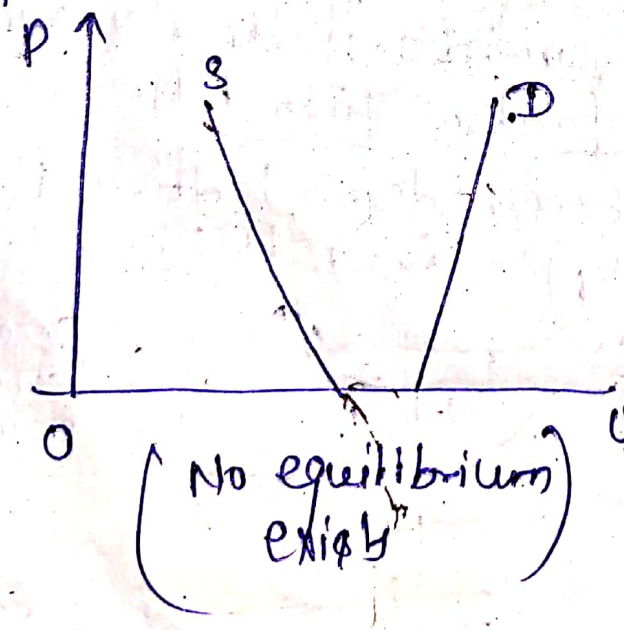

Multiple Equilibria

→ It is obious that at $P_1^*$ there is a stable equilibrium (AT e). because D cuts S from above.

→ while at $P_2^*$ or (At $e_1$) equilibrium is unstable because D cuts S from below.

## * No Equilibrium :

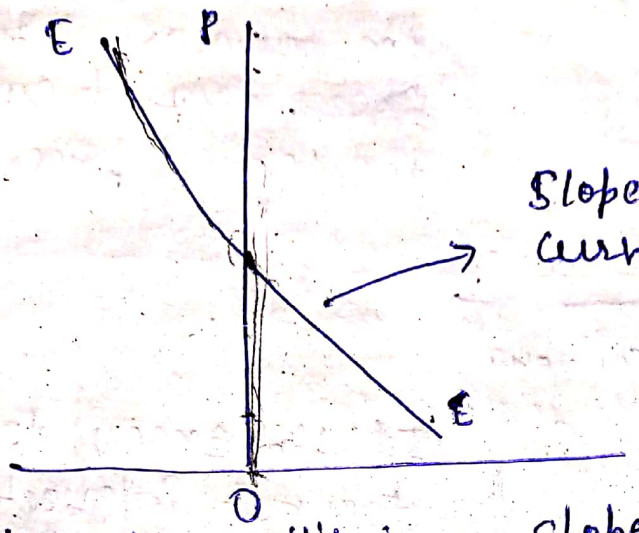
No Equilibrium is that condition in which demand and supply does not intersects to each other so, here equilibrium can not be take place.




equilibrium (at a positive price) does not exist.

Note : Stability of equilibrium depends on the Relationship b/w the slopes of demand & supply

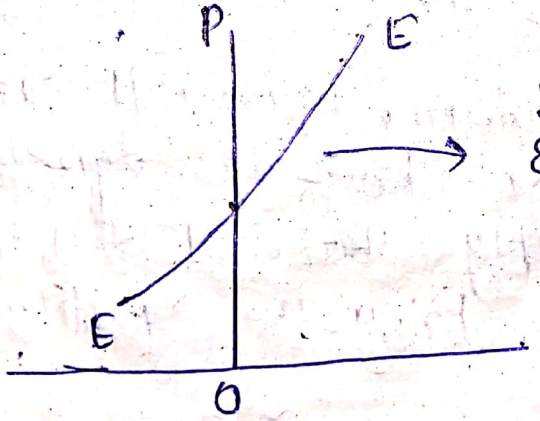
## ✱ What are the conditions for the stable equilibrium? How stable equilibrium can be formed?




Stable equilibrium, slope of Excess demand '-ve'
i.e., $\frac{\Delta Ed}{\Delta P} < 0$

The equilibrium is stable if the slope of the excess demand curve is negative at the point of its intersection with the price-axis.

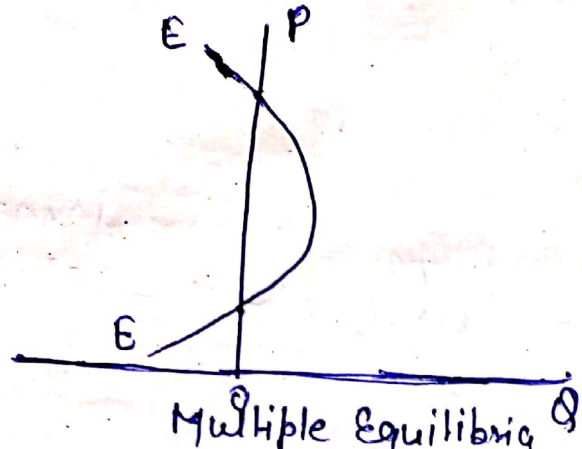
## ✱ Condition for Unstable Equilibrium




Unstable equilibrium
and slope of demand curve is '+ve' $\frac{\Delta Ed}{\Delta P} > 0$

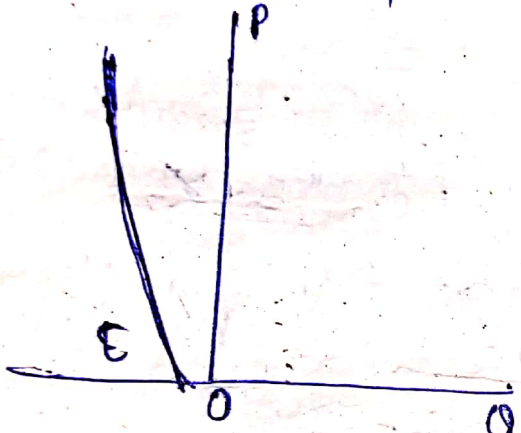
The equilibrium is unstable if the slope of the excess demand curve is positive at the point of its intersection with the price axis.

## Condition for Multiple Equilibria and No Equilibrium




Multiple Equilibria

There are as many equilibria as the number of times that the excess demand curve (P) intersects the vertical price axis.




No Equilibrium

If the excess demand function does not intersect the vertical axis at any one price, an equilibrium does not exist

## Walrasian Price adjustment

In the Partial Equilibrium, Marshall emphasised that the quantity adjustment bring the equality between the demand and supply. But, Walras told that the price adjustment bring the equality b/w Demand and supply

## Lerner degree of Monopoly Power :→

That is, the degree of monopoly power depends upon the numerical coefficient (e) of the "price-elasticity of demand" for the monopolist's product.

- Existence problem : The existence of equilibrium is related to the problem of whether the consumer's and producer's behaviour ensures that the demand and supply curves intersects (at a positive price).
- Stability Problem : The stability of equilibrium depends on the relationship b/w the slopes of demand & supply curves.
- Uniqueness Problem : The uniqueness of equilibriu is related to the slope of the excess demand function i.e., the curve which shows the difference b/w $Q_D$ and $Q_S$ at any one point.

Elements of Pure Economics (1954)

- **Conclusions of General Equilibrium:**

The analysis of stability and uniqueness in terms of Excess demand

i) The excess demand function, $E(p)$, intersects the vertical (Price) axis when there is an equilibrium, i.e., when the excess demand is zero. If $\boxed{Q_D = Q_S}$ then, $\boxed{E(p) = 0} \rightarrow$ Excess demand $= 0$

ii). There are as many equilibria as the number of times that the excess demand curve $E(p)$ intersects the vertical price axis.

iii). The equilibrium is stable if the slope of the excess demand curve is '-ve' at the point of its intersection with the price axis.

iv). The equilibrium is unstable if the slope of the Excess demand curve is '+ve' at the point of intersection with the price axis.

v). If the excess demand function does not intersect the vertical axis at any one price, an equilibrium does not exist (no equilibrium).

The market is like a lake agitated by the wind, where the water is incessantly seeking its level without ever reaching it.

बाजार हवा से उत्तेजित झील की तरह है, जहाँ पानी लगातार बिना रुके लगातार अपने स्तर पर पहुँच रहा है।

→ General Equilibrium Meaning:

An economy is only in general equilibrium when every consumer, every company, every industry and every factor-service is in equilibrium at the same time.

Assumptions:

1). Perfect competition exists in the goods, services, and factor markets.
2). Consumers incomes are given and constant.
3). Factors of production are prefectly mobile between different places and occupations.
4). Returns to scale are constant
5). All companies do business under the same cost conditions.
6). All units of a productive service are the same.
7). Techniques of production do not change.
8). There is full employment of all resources, including labor.