



INTRODUCTORY MICRO ECONOMICS

Chapter number:4(4.2)

Chapter Name:THEORY OF FIRM UNDER PERFECT COMPETITION(Supply)

CHANGING YOUR TOMORROW

What is supply?

‘Supply refers to the quantity of a commodity which producers or sellers are willing to produce and offer for sale at a particular price’, in a given market, at a particular period of time



The three important aspects of supply are....

- Supply is a desired quantity
- Supply is always explained with reference to price
- Time during which it is offered for sale

Supply Schedule and Supply Curve

Supply schedule shows a tabular representation of law of supply. It presents the different quantities of a product that a seller is willing to sell at different price levels of that product.

The graphical representation of supply schedule is called supply curve.

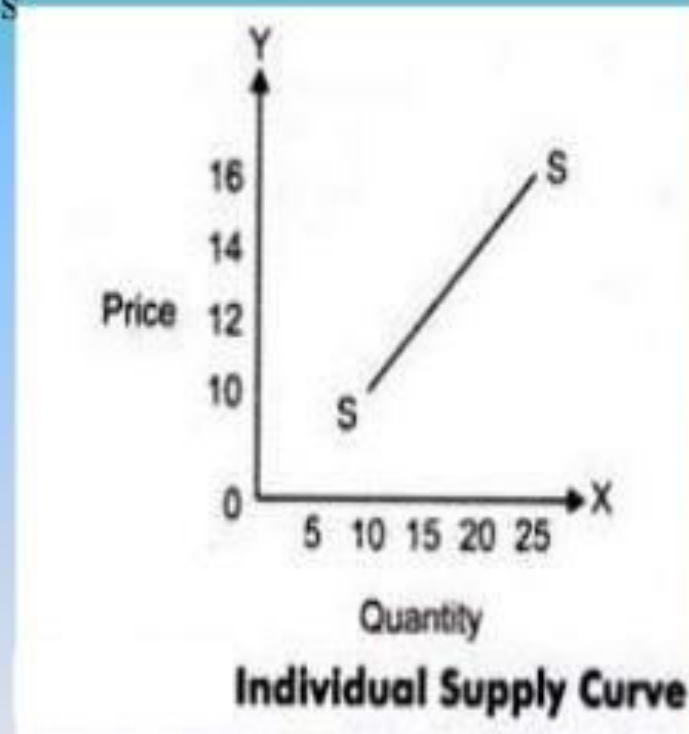
Supply Schedule and Supply Curve are of two types

- 1) Individual Supply Schedule & Individual Supply Curve**
- 2) Market Supply Schedule & Market Supply Curve**

Individual supply schedule & Individual Supply Curve

Refers to a supply schedule that represents the different quantities of a product supplied by an individual seller at different prices

Price of Milk (Per liter in Rs)	Quantity Supplied (1000 per day in liters)
10	10
12	15
14	20
16	25

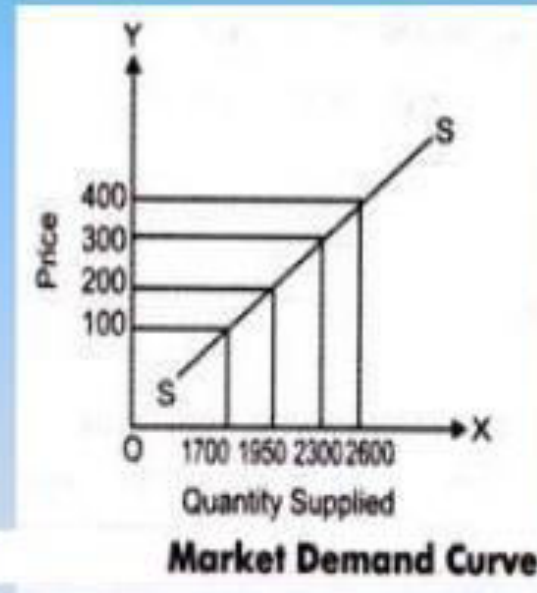


The supply curve is showing a straight line and an upward slope. This implies that the supply of a product increases with increase in the price of a product.

Market Supply schedule & Market Supply Curve

Refers to a supply schedule that represents the different quantities of a product that all the suppliers in the market are willing to supply at different prices.

Price of Product X	Individual Supply			Market Supply
	A	B	C	
100	750	500	450	1700
200	800	650	500	1950
300	900	750	650	2300
400	1000	900	700	2600



Market supply curve also represents the direct relationship between the quantity supplied and price of a product.

Supply Function or Determinants of Supply

Supply function studies the functional relationship between supply of a commodity and its various determinants.

$$S_x = f (P_x, P_R, N_F, G, P_F, T, E_x, G_P)$$

Where,

S_x = Supply of a Commodity

P_x = Price of the Commodity

P_R = Price of the Related Goods

N_F = Number of Firms

G = Goal of the Firm

P_F = Price of factors of Production

T = Technology

E_x = Expected Future Price

G_P = Government Policy

Price of Related Goods

Producers always have the tendency of shifting from the production of one commodity to another commodity. If the prices of another commodity increases, especially substitute goods, producers will find it more profitable to produce that commodity by reducing the production of the existing commodity.

For Example: Suppose the seller of tea notice that the price of coffee increases . They may reduce the amount of resources devoted to the selling of tea in favour of coffee.

Number of Firms

Market supply of a commodity depends upon number of firms in the market.

Increase in the number of firms implies increase in the market supply, and decrease in the number of firms implies decrease in the market supply of a commodity.

Goal of the Firm

If goal of the firm is to maximise profits, more quantity of the commodity will be offered at a higher price.

On the other hand, if goal of the firm is to maximise sale more will be supplied even at the same price.

Price of the Factor of Production

Supply of a commodity is also affected by the price of factors used for the production of the commodity.

If the factor price decreases, cost of production also reduces. Accordingly, more of the commodity is supplied at its existing price.

Conversely, if the factor price increases cost of production also increases. In such a situation less of the commodity is supplied at its existing price.

Change in Technology

Change in technology also affects supply of the commodity.

Improvement in the technique of production reduce cost of production. Consequently, more of the commodity is supplied at its existing price.



Expected Future Price

If the producer expects price of the commodity to rise in the near future, current supply of the commodity will reduce.

If, on the other hand, fall in the price is expected, current supply will increase.



Government Policy

'Taxation and Subsidy' policy of the government affects market supply of the commodity.

Increase in taxation tends to reduce supply. On the other hand, subsidies tend to increase supply of the commodity.



Law of Supply

THE LAW OF SUPPLY

'Law of supply states that other things remaining the same, the quantity of any commodity that firms will produce and offer for sale rises with rise in price and falls with fall in price.'

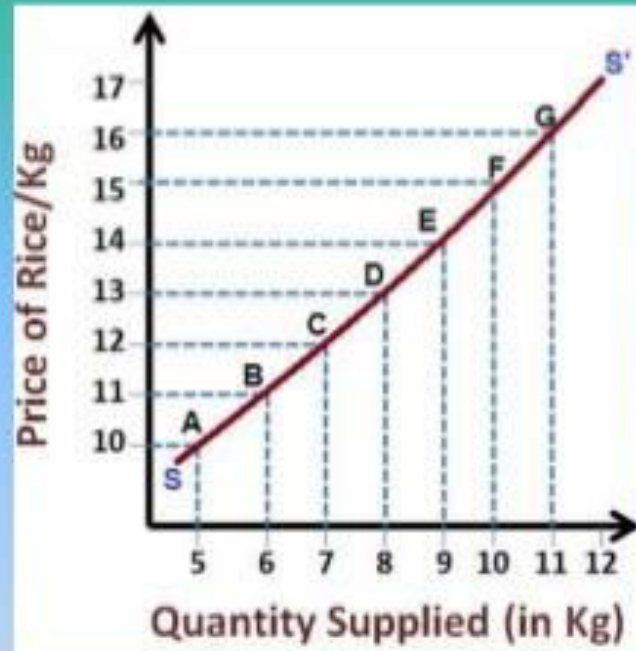
i.e. Higher the price, higher will be quantity supplied and lower the price smaller will be quantity supplied.

'Other things remaining the same' means determinants other than own price such as technology, goals of the firm, government policy, price of related goods etc. should not change.



THE LAW OF SUPPLY

Price of Rice (Rs)	Quantity Supplied (kg)
10	5
11	6
12	7
13	8
14	9
15	10
16	11



SS Slopes upward from left to right.

It shows positive relationship between price of the commodity and its quantity supplied.

As price rises quantity supplied also rises.

Assumptions of the Law of Supply



- There is no change in the prices of the factors of production.
- There is no change in the technique of production.
- There is no change in the goal of firm.
- There is no change in the prices of related goods.
- Producers do not expect change in the price of the commodity in the near future.

Exceptions to the Law of Supply

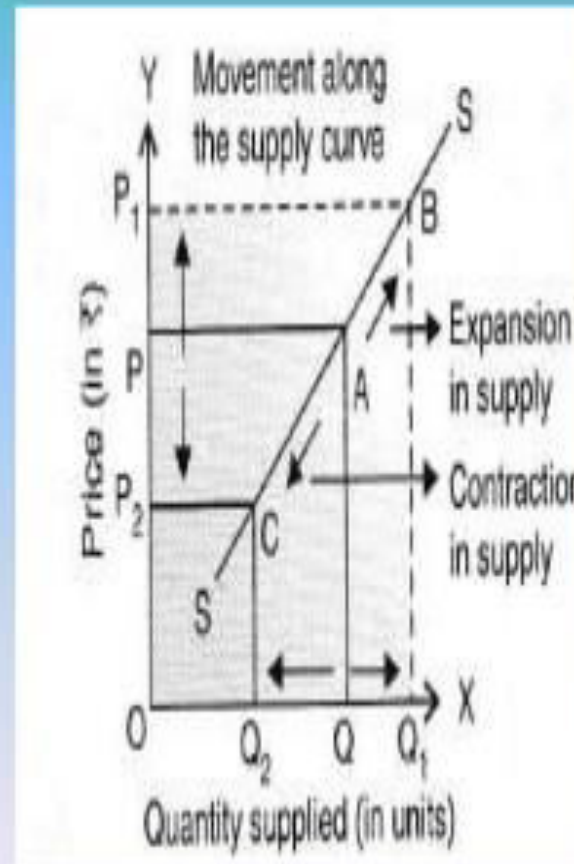
- The law of supply does not apply strictly to agricultural products whose supply is governed by natural factors. If due to natural calamities, there is fall in the production of wheat, then its supply will not increase, however high the price may be.
- Supply of goods having social distinction will remain limited even if their price tends to rise.
- Seller may be willing to sell more units of a perishable commodity at a lower price.

Why Does Demand Curve Slope Upwards?

- The level of price determines profit. i.e. higher the price, higher the profit and vice versa. So higher the price, the greater is the incentive for the producer to produce and supply more in the market, other things remain the same.
- Positive slope of supply curve is also caused by the rise in the cost of production. Usually cost of production increases with increase in production. In this situation a producer will produce and sell more units only at a higher price.
- The rise in price also motivates other producers to produce this commodity so as to earn higher profit.

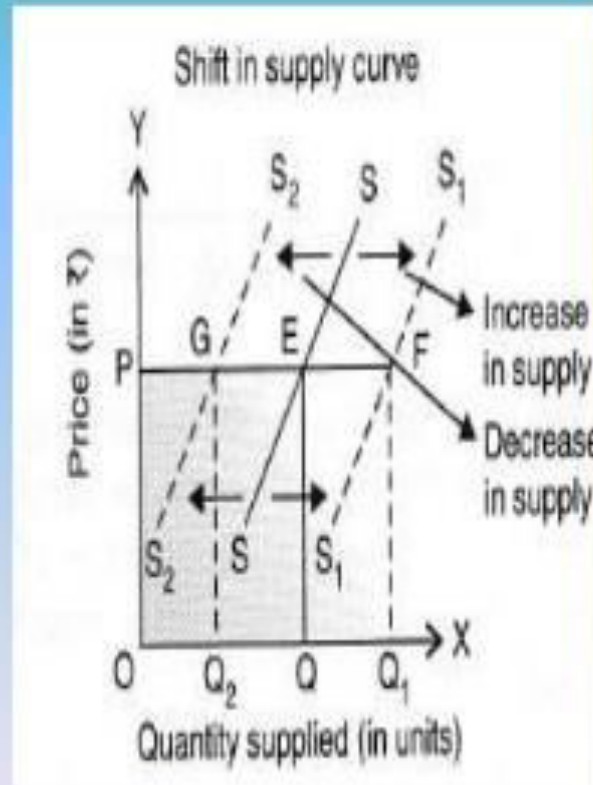
Change in Quantity Supplied or Extension and Contraction of Supply or Movements Along the Supply Curve

Increase in quantity supplied of a commodity **due to rise in its price** is called Extension of Supply and decrease in quantity supplied due to fall in its price is called Contraction of Supply.



Change in Supply or Increase and Decrease in Supply or Shift in Supply Curve

Increase in Supply occurs when more is supplied at the existing price, while decrease in supply occurs when less is supplied at the existing price. While increase in supply cause a forward shift in supply curve, decrease in supply cause a backward shift in supply curve.



Elasticity of Supply

The law of supply indicates the direction of change—if price goes up, supply will increase. But how much supply will rise in response to an increase in price cannot be known from the law of supply.

To quantify such change we require the concept of elasticity of supply that measures the extent of quantities supplied in response to a change in price.

Elasticity of Supply



Elasticity of supply **measures the degree of responsiveness of quantity supplied to a change in own price of the commodity.** It is also defined as the percentage change in quantity supplied divided by percentage change in price.

It can be calculated by using the following formula:

$E_s = \% \text{ change in quantity supplied} / \% \text{ change in price}$

Symbolically,

$$E_s = \Delta Q / Q \div \Delta P / P = \Delta Q / \Delta P \times P / Q$$

Types of Elasticity of Supply

Like elasticity of demand, there are five cases of E_s :

(a) Elastic Supply ($E_s > 1$):

(b) Inelastic Supply ($E_s < 1$):

(c) Unit Elasticity of Supply ($E_s = 1$):

(d) Perfectly Elastic Supply ($E_s = \infty$):

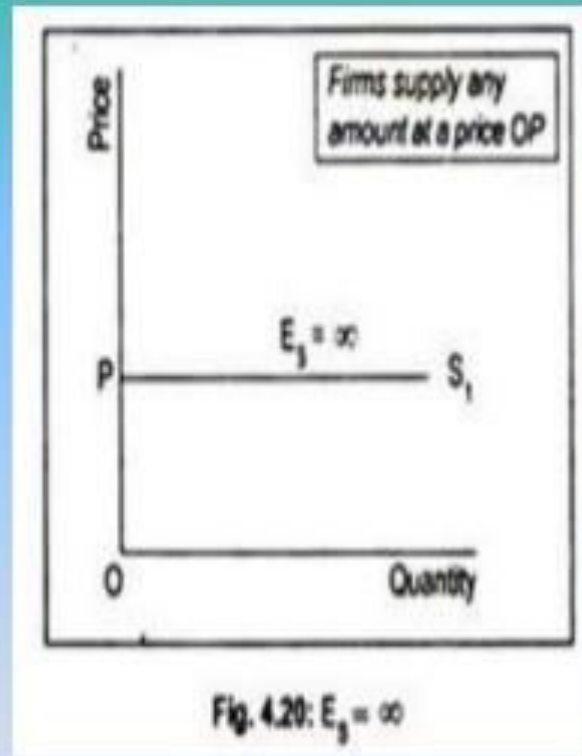
(e) Perfectly Inelastic Supply ($E_s = 0$):



Perfectly Elastic Supply ($E_s = \infty$)

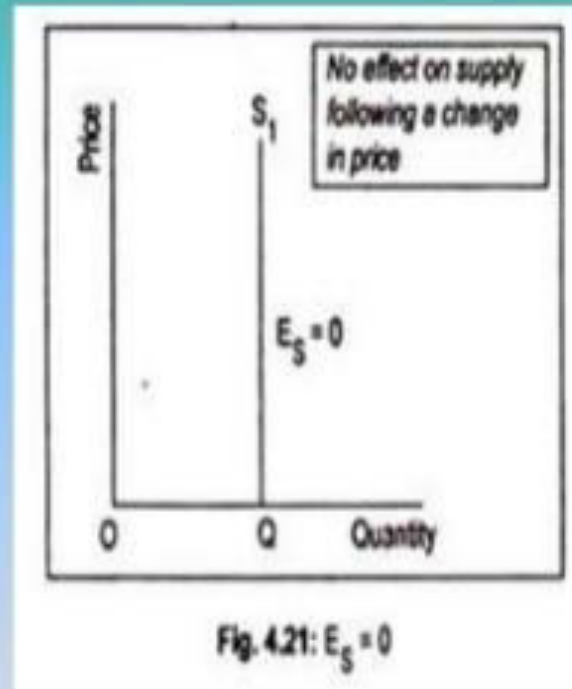
The economic interpretation of this supply curve is that an unlimited quantity will be offered for sale at the price OP. If price slightly drops down below OP, nothing will be supplied.

The supply curve PS1 drawn in Figure has an elasticity of supply equal to infinity. Here the supply curve has been drawn parallel to the horizontal axis.



Perfectly Inelastic Supply ($E_s = 0$)

This curve describes that whatever the price of the commodity, it may even be zero, quantity supplied remains unchanged at OQ . This sort of supply curve is conceived when we consider the supply curve of land from the viewpoint of a country, or the world as a whole.



Unitary Elasticity of Supply ($E_s = 1$)

If price and quantity supplied change by the same magnitude, then we have unit elasticity of supply.

Any straight line supply Curve passing through the origin, such as the one shown in Figure, has an elasticity of supply equal to 1. This can be verified in this way.

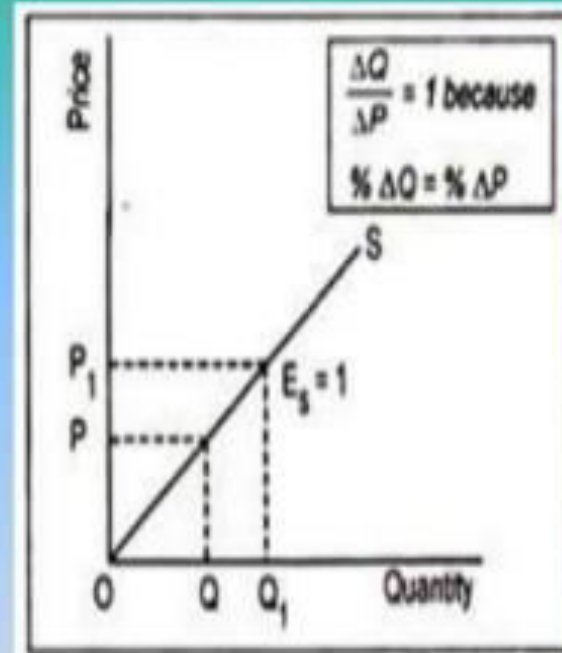
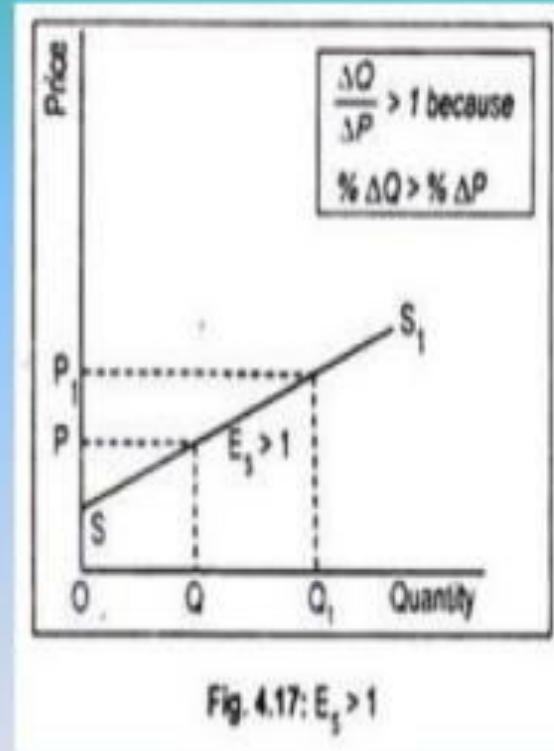


Fig. 4.19: $E_s = 1$

Relatively Elastic Supply ($E_s > 1$)

Supply is said to be elastic when a given percentage change in price leads to a larger change in quantity supplied. Under this situation, the numerical value of E_s will be greater than one but less than infinity.

Here quantity supplied changes by a larger magnitude than does price.



Relatively Inelastic Supply ($E_s < 1$)

Supply is said to be inelastic when a given percentage change in price causes a smaller change in quantity supplied.

Figure depicts inelastic supply curve where quantity supplied changes by a smaller percentage than does price.

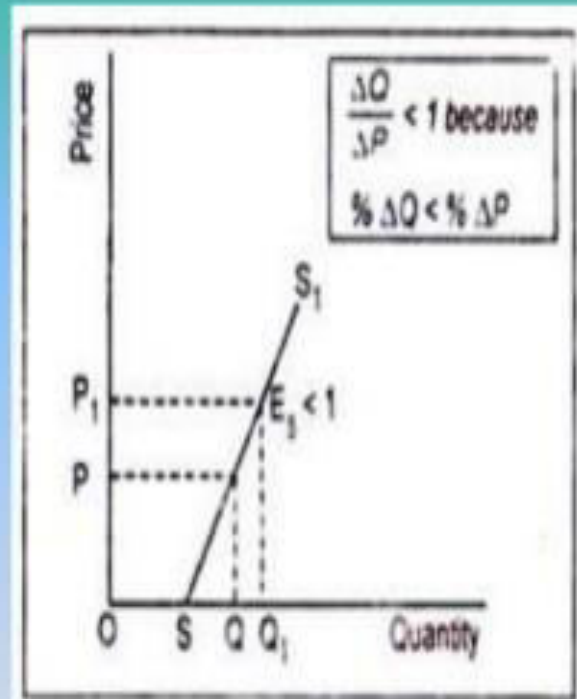


Fig. 4.18: $E_s < 1$

Measurement of Price Elasticity of Supply

This concept is parallel to the concept of price elasticity of demand.

It points out the reaction of the sellers to a particular change in the price of the commodity. It explains the quantitative changes in supply of a commodity, due to a given change in the price of the commodity.

Methods for Measuring Price Elasticity of Supply:

Price elasticity of supply can be measured by the following methods:

1. Percentage Method
2. Geometric method



1. Percentage Method

Like elasticity of demand, the most common method for measuring price elasticity of supply (Es) is percentage method. This method is also known as 'Proportionate Method'.

According to this method, elasticity is measured as the ratio of percentage change in the quantity supplied to percentage change in the price.

$$\begin{aligned}
 PES &= \frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}} \\
 &= \frac{\frac{\text{change in quantity supplied}}{\text{initial quantity supplied}} \times 100\%}{\frac{\text{change in price}}{\text{initial price}} \times 100\%} \\
 &= \frac{\frac{\text{new quantity (Q2)} - \text{initial quantity (Q1)}}{\text{initial quantity (Q1)}} \times 100}{\frac{\text{new price (P2)} - \text{initial price (P1)}}{\text{initial price (P1)}} \times 100} \\
 &= \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}
 \end{aligned}$$

1. Percentage Method

For Example: A producer offers to sell 400 units of a commodity when its price is Rs. 10 per unit, while only 200 units are offered if the price reduces to Rs. 5 per unit. Find elasticity of supply.

Solution:

$$E_s = \frac{\text{Percentage Change in quantity supplied}}{\text{Percentage change in Price}}$$

$$= \frac{200}{5} \times \frac{10}{400}$$

$$E_s = 1$$

2. Geometric Method

This method studies five different situations of
`elasticity of supply as under:

- (i) $E_s = 1$, **unitary elasticity**: when a straight line upward sloping supply curve starts from the point of origin. in this case percentage change in quantity supplied is equal to the percentage change in price



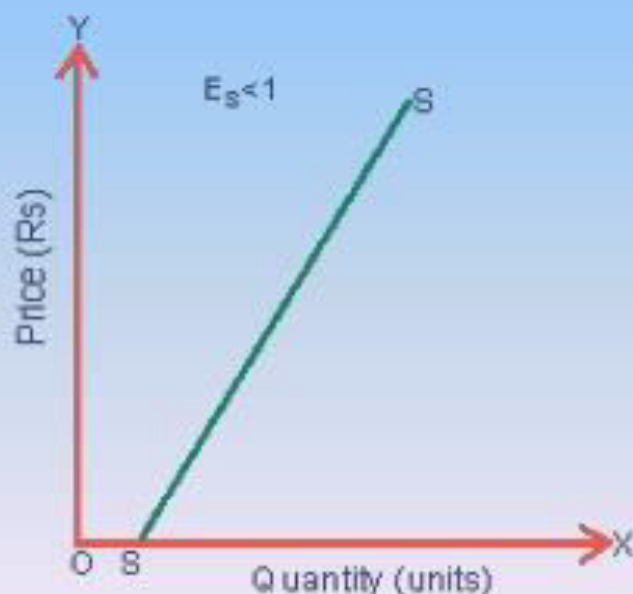
(ii) $E_s > 1$, or Greater unitary Elasticity:

When a straight line upward sloping supply curve starts from the percentage change in price . than Y-axis. In this case , percentage change in quantity supplied is greater than percentage change in price.



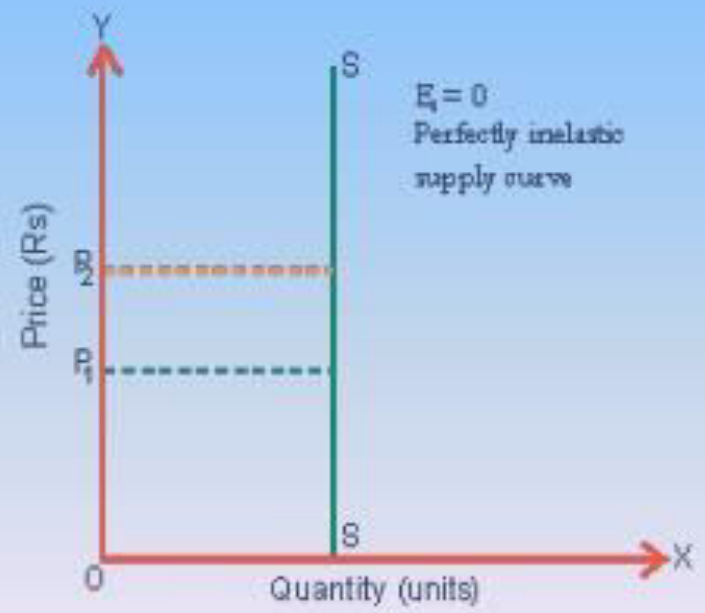
(iii) $E_s < 1$, or Less than Unitary Elasticity:

When a straight line upward sloping curve starts from the X-axis. In this case, percentage change in quantity supplied is less than percentage change in price.



(iv) $E_s = 0$, or Perfectly Inelastic Supply:

It refers to a situation in which there is no change in supply remains unchanged it is a situation in which price has no influence on supply. In this case, supply curve is a vertical straight line as given fig.



(V) $E_s = \infty$ or perfectly elastic supply :

It refers to a situation in which supply is infinite corresponding to a particular price of the commodity . Accordingly, a slightest fall in price causes an infinite change in supply , reducing it to zero .

In this case , supply curve is a horizontal straight line .





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