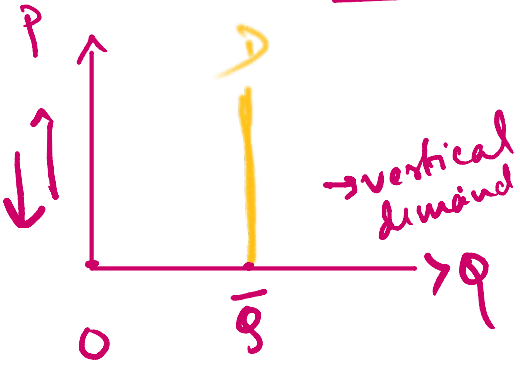
09 November 2023 07:34 PM

Elasticity of demand

(1) Own price elasticity of demand.

$$e_p = \left| \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} \right|$$

Case 1. perfectly inelastic $|e_p| \to 0$



$$\frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} \to 0$$

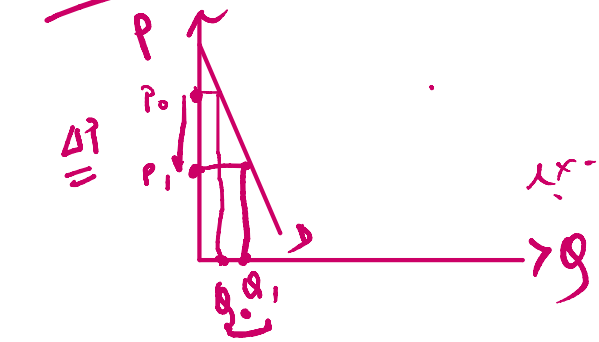
$P, Q \neq 0$ $\therefore \frac{\Delta Q}{\Delta P} \to 0$

$\to \boxed{\Delta Q \to 0}$

ex: Life saving drugs.

it means that for any change in price, quantity demand remains unchanged.

Case 2: inelastic demand $0 < |e_p| < 1$



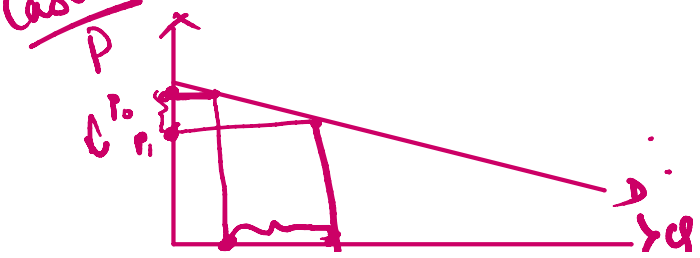
ex - petroleum.

$$\frac{\% \text{ change in } Q}{\% \text{ change in } P} < 1$$

(% change in Q) < (% change in P)

demand curve is steeper.

Case 3: elastic demand $|e_p| > 1$



$$\frac{\% \text{ change in } Q}{\% \text{ change in } P} > 1$$

(% change in Q) > (% change in P)

demand curve is flatter.

% change in q

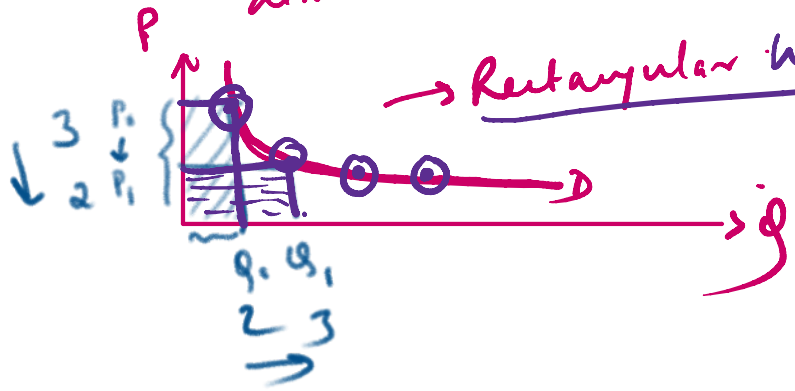
demand curve is flatter.

Case 4: Unit elastic demand

$|ep| = 1$

% change in q = % change in P

demand curve is rectangular hyperbola.



→ Rectangular hyperbola

Case 5: Perfectly elastic $|ep| \to \infty$

$\Delta P \to 0$

(negligible change in price)

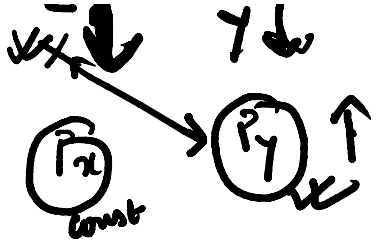
horizontal.

② Cross price elasticity.

defined as ratio of % change in quantity demand for (X) to the % change in price of another good (Y)

$$e_c^{x,y} = \frac{\% \text{ change in } X}{\% \text{ change in } P_y}$$

$$= \frac{\Delta X}{X} \cdot \frac{P_y}{\Delta P_y}$$



$= \frac{\Delta X}{\Delta P_y} \times \frac{P_y}{X}$

(i) Substitute goods $\Rightarrow \frac{\Delta X}{\Delta P_y} > 0 \Rightarrow e_c^{x,y} > 0$ ✓

(ii) complimentary goods $\Rightarrow \frac{\Delta X}{\Delta P_y} < 0 \Rightarrow e_c^{x,y} < 0$ ✓

(iii) unrelated goods $\Rightarrow \frac{\Delta X}{\Delta P_y} = 0 \Rightarrow e_c^{x,y} = 0$ ✓

(3) Income elasticity of demand.

defined as % change in demand for X w.r.t to % change in income of consumer (M).

i.e., $e_m^x = \frac{\% \text{ change in } X}{\% \text{ change in } M} = \frac{\frac{\Delta X}{X} \times 100}{\frac{\Delta M}{M} \times 100}$

$\therefore \boxed{e_m^x = \frac{\Delta X}{\Delta M} \times \frac{M}{X}}$ ✓

Classification of goods.

(1) inferior goods, ($X \downarrow$ with $M \uparrow$)

$\frac{\Delta X}{\Delta M}_{+} < 0 \Rightarrow e_m^x < 0$

(2) Normal goods $\Rightarrow$ ($X \uparrow$ with $M \uparrow$)

$\frac{\Delta X}{\Delta M} > 0 \Rightarrow e_m^x > 0$

$\frac{\Delta x}{\Delta M} > 0 \Rightarrow e_m > 0$

(a) Necessary goods $\Rightarrow 0 < e_m^x < 1$

$\Delta x < \Delta M$

(ex food, cloth).

(b) Luxury goods $\Rightarrow e_m^x > 1$

(ex, Jewellery, cars etc).

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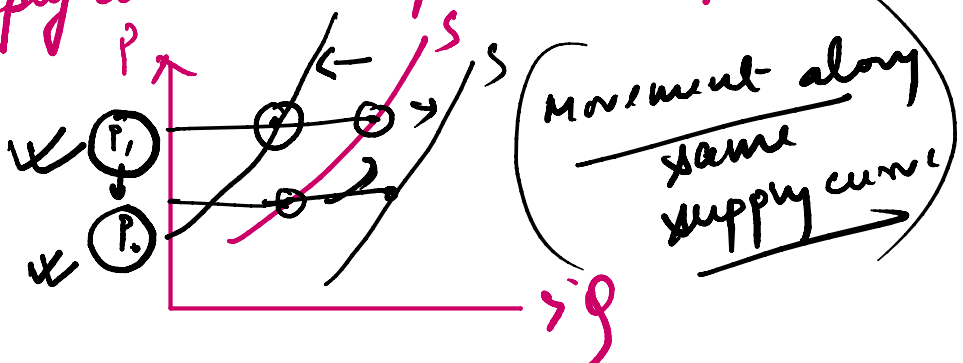
Supply: +ve relation b/w P and Q.

Supply curve is upward sloping.



Factors:

1. price of commodity supplied. (P).
2. price of inputs $\Rightarrow$ cost of production.

price of inputs -vely to Q_s.

3. Technological advancement.

③ Technology advancement.

④ Climate / Natural disaster.

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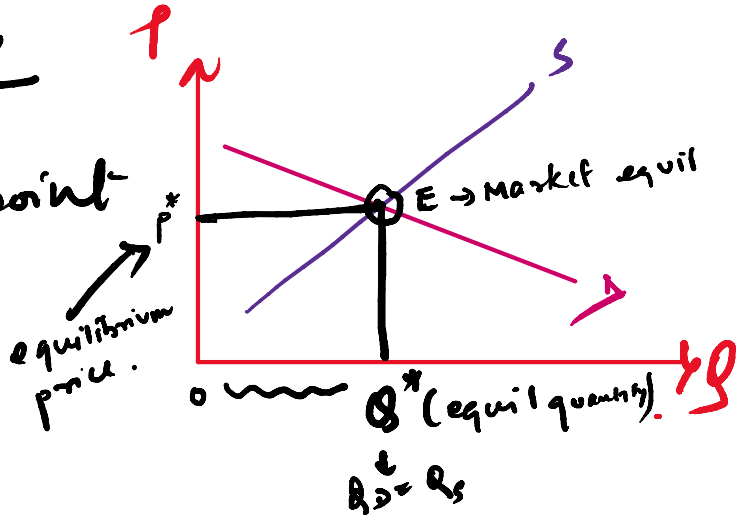
Market Equilibrium

↓

market clearing point

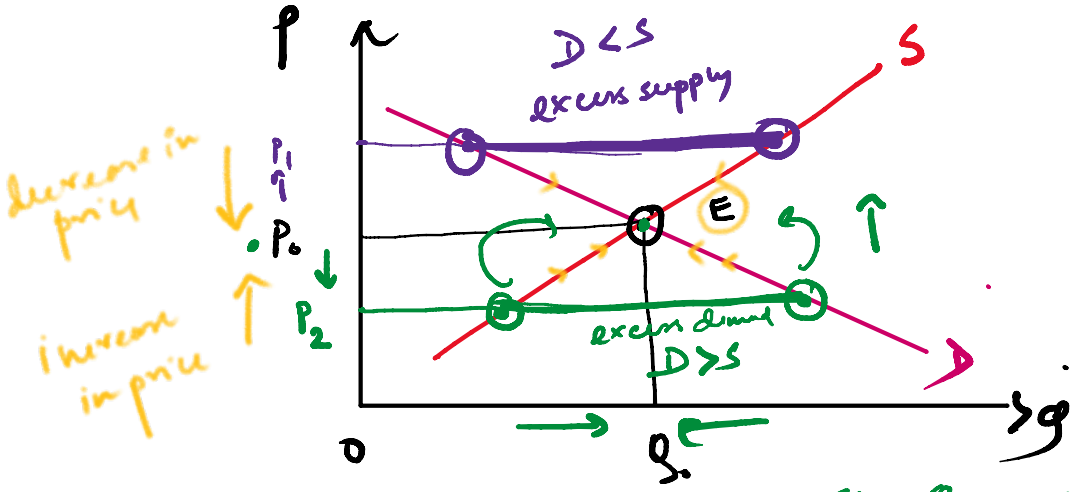
↓

$D = S$ ✓



Market adjustments

(mechanism of market equilibrium)



Stability condition for market equilibrium is that with increase in price, excess demand in the market will decrease.

∴ pt E is a stable market equilibrium

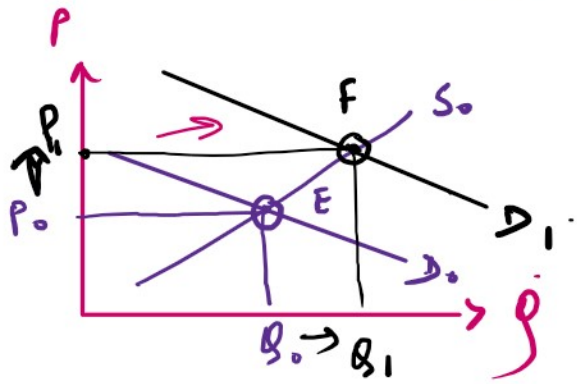
... pt E is a ...

— * —

I (Change in Market equilibrium) due to change in demand when supply is same.

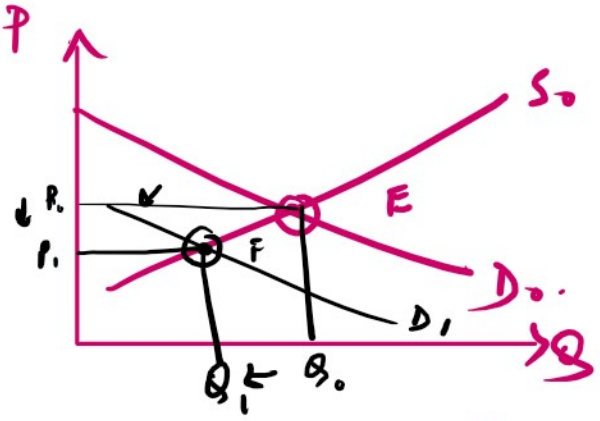
(a) increase in demand

D_0 shifts right to D_1

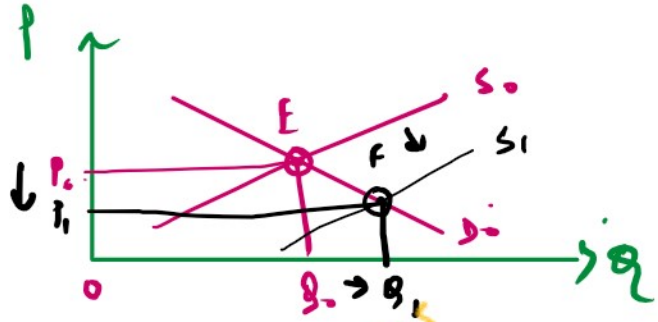


Conclusion: equil Q as well as equil P will increase.

(b) decrease in demand :



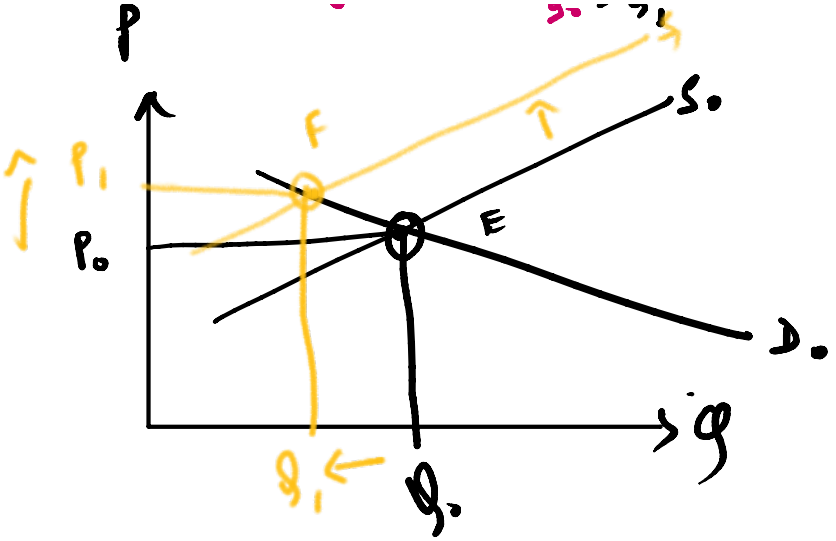
Case 2 : Supply changes keeping demand constant :



(a) increase supply.

equil quant ↑ as
but equil price ↓ as.

P



→ equil quan decreases but equil price increases.

Next class : Production and cost

[① problems on elasticity & equilibrium]

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