Eco - 101 Lecture - 01

opportunity cost → next best option

Factors / Resources of Production

① Labor ⇝ for a student, labor is how many hours he's studying.
② Capital ⇝ hours working
③ Land
④ Entrepreneurs

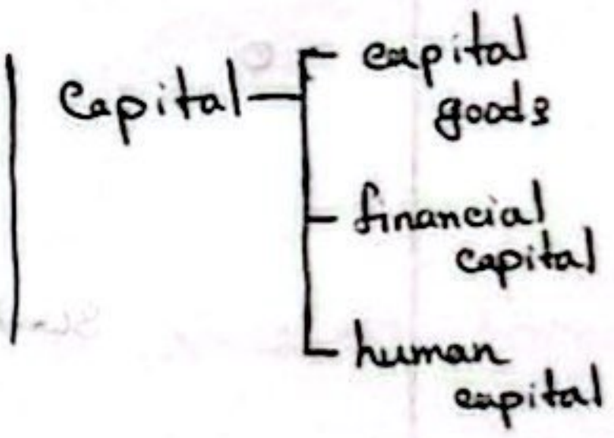
tradeoff of labor → wages

Salary ⇝ job based

income ⇝ depends on source

Capital

⇝ money tal that's being used for
↳ capital goods (tools, machinary)



The return of capital is Interest

The purpose of capital is to increase efficiency

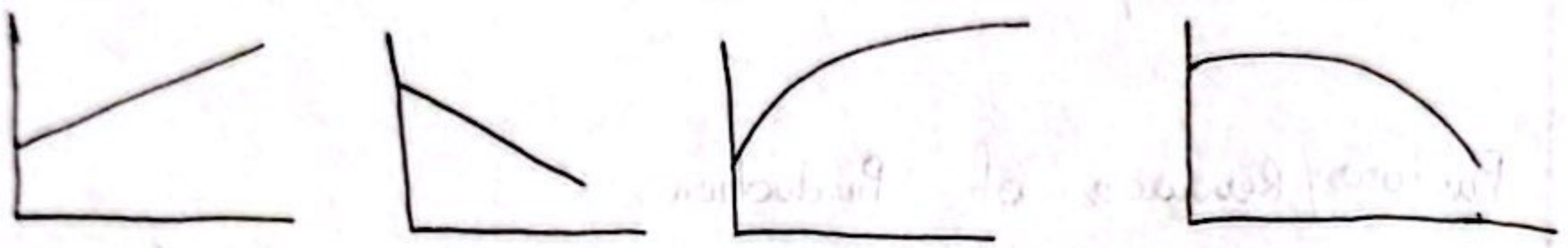
Land

↳ place for facility

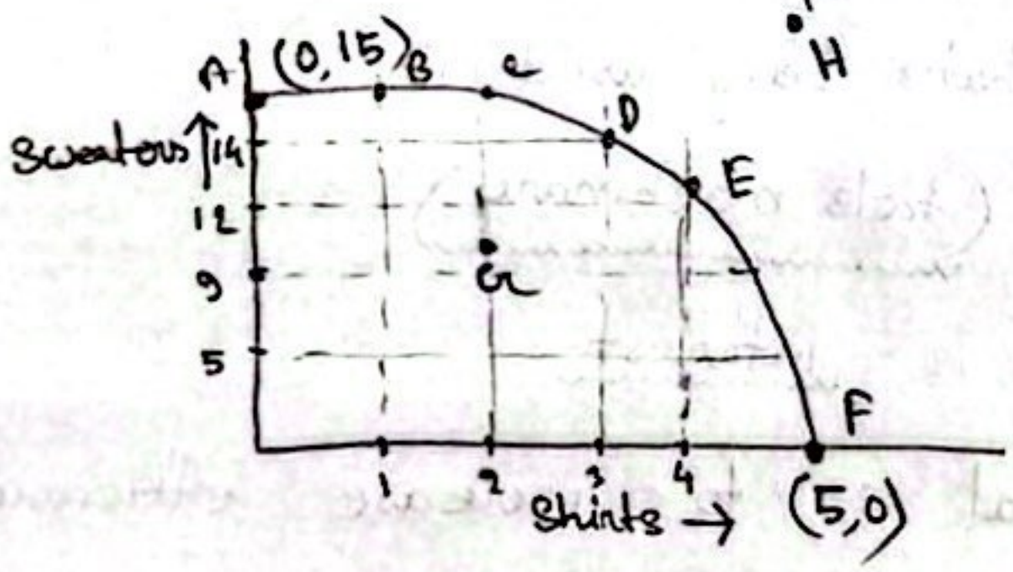
Entrepreneurs

↳ owners | who get profit

Production Possibilities Frontier (PPF)



Sweaters	Shirts
15	0
14	1
12	2
9	3
5	4
0	5



G point is inefficient

Allocative Efficiency

↳ Curve এর কোন combination বা bundle best হবে আমার জন্য.

it depends on cost, demand, time

opportunity cost → increasing : graph bend outward

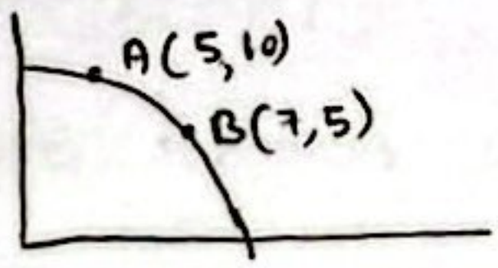
opportunity cost

$$B \to C = \frac{\text{decreasing}}{\text{increasing}}$$

$$= \frac{14-12}{2-1}$$

$$= €2$$

For 1 unit of shirt I'm sacrificing 2 unit of sweaters from point B to C.



$$A \to B = \frac{10-5}{7-5}$$

- $\frac{5}{2}$ for 2 additional units of shirts
- ~~2=5~~ I've to sacrifice 5 units of sweaters

Sw : Sh = 5 : 2

8w : Sh = 10 : 4

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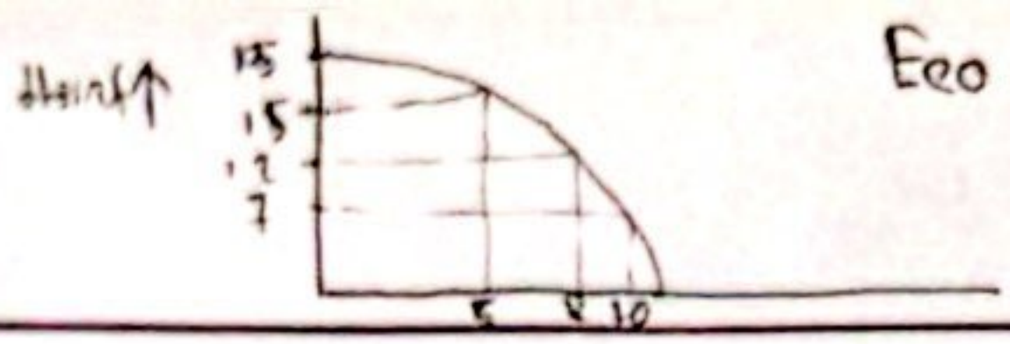


O.C = $\frac{\text{decreasing}}{\text{increasing}}$

$= \frac{15-12}{8-5}$

$= \frac{3}{3}$

$= \frac{1}{1}$

for 1 unit of extra shoe I've to decrease 1 unit of tshirts

O.C

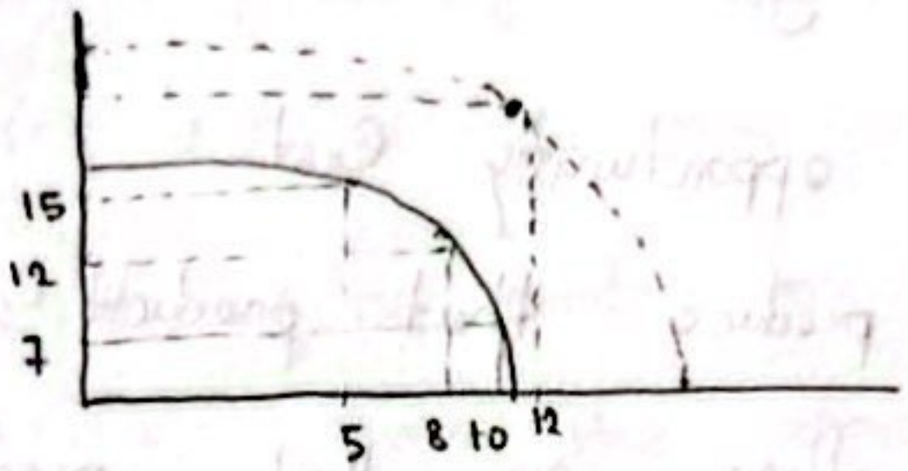
$B \to C = \frac{12-7}{10-8}$

$= \frac{5}{2}$

for 2 unit of extra shoes, I've to decrease 5 units of tshirts.

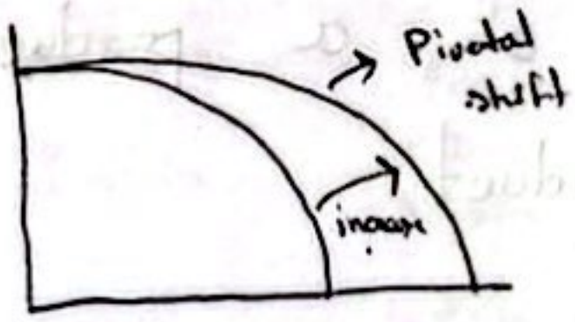
ECO-101 Lecture - 02

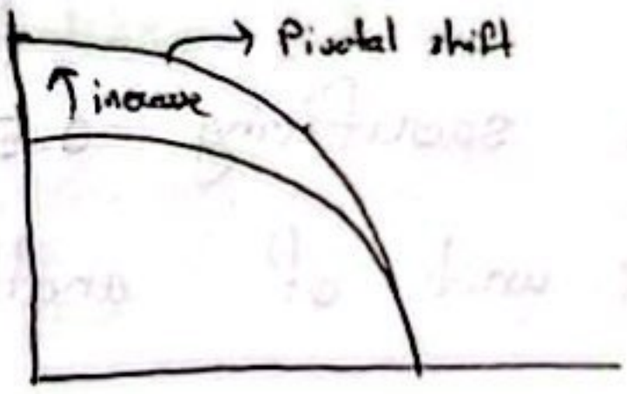
Parallel effect



other factors (resorce) - যাদের কারণে যখন Production বাড়ে যায়।

- Factors - যার কারণে Production বাড়তে বা কমতে ও পারবে





Trade

Absdute Advantage

↳ Proposed by Adam smith

With the same resources, who produces the same product more has Absolute Advantage on that product.

↳ It depends on the volume of the product

- But it doesn't allow to trade.

Comparative Advantage

↳ Focuses on opportunity Cost

- Country should produce that product which has lesser O.C than other on that product

China — 0.8 O.C
India — 0.5 O.C ; means India has to sacrifice less compared to China.

India is sacrificing 0.5 unit of a product to produce 1 unit of another product.

	Shirt	Shoes
Japan	200	100
BD	80	100

(100,0)
(0,200)

O.C of Japan for producing Shirt = $\frac{100}{200} = \frac{\text{sacrifice}}{\text{increase}} = \frac{1}{2} = 0.5$

O.C of " " " Shoes = $\frac{200}{100} = 2$

O.C " BD " " Shirt = $\frac{100}{80} = 1.25$

O.C " " " " Shoes = $\frac{80}{100} = 0.8$

Shirt absolut advantage — Japan

Shoe " " — Same

Shirt Comparative Advantage — Japan

Shoe " " — B.D

if both are same: no country has comparative advantage over the other.

- As Japan has comparative advantage on shirt production, Japan should only produce shirt

lower O.P = Comparative Advantage

	Pen	Pencil
India	5 P in 5 mins	8 Pencils in 10 min
USA	4 P in 6 min	10 Pencils in 14 min

(i) Absolut advantage in Pencil?

(ii) Comparative advantage in Pen?

=> India

5 min — 5 Pen , 10 min — 8 Pencil

1 min — 1 Pen , 1 min — $\frac{8}{10}$ Pencil

= 1 Pen = 0.8 Pencil

USA

6 min — 4 Pen , 14 min — 10 Pencil

1 min — $\frac{4}{6}$ Pen , 1 min — $\frac{10}{14}$ Pencil

= 0.67 Pen = 0.714 Pencil

= absolut = India

- absolut advantage trade এর ব্যাপারে বলে না

O.C of Pen of ~~USA~~ India ~~of for~~ Pencil = $\frac{0.8}{1}$ = 0.8

O.C " Pencil of " = $\frac{1}{0.8}$ = 1.25

O.C of Pen of ~~India~~ USA = ① $\frac{0.714}{0.67}$ = 1.06

O.C " Pencil " " = $\frac{0.67}{0.714}$ = 0.938

Comparatie advantage of Pen = India

Comparative advantage of Pencil = USA

ECO-101 ; Lecture-03

01. Company x Produces 5 PCs in 1.5 min or 10 tabs in 2 min

Company y " 7 PCs in 3 min or 10 tabs in 3.5 min

①

x	y
1.5 min = 5 PC	3 min = 7 PC
1 min = $\frac{5}{1.5}$ = 3.33 PC	1 min = $\frac{7}{3}$ = 2.33 P.C
2 min = 10 tab	3.5 min = 10 tab
1 min = $\frac{10}{2}$ = 5	1 min = $\frac{10}{3.5}$ = 2.857 tab

so, absolut advantage in PC = y x

now,

O.C of tab for x = $\frac{3.33}{5}$ = 0.666

O.C of tab for y = $\frac{2.33}{2.857}$ = 0.815

O.C of x is lower than y. means Company x has to sacrifice lower amount of PC for extra units of tab production. So, Comparative advantage of X for tab is better. as x has to sacrifice 0.666 units of PC for 1 unit of extra tab and y has to sacrifice 0.815 unit of P.C for 1 unit of extra tab

ECO- 101 : Lecture - 03

3. Company x Produces 5 PCs in 1.5 min or 10 tabs in 2 min

Company y " 7 PCs in 3 min or 10 tabs in 35 min

④

x	y
1.5 min = 5 PC	3 min = 7 PC
1 min = $\frac{5}{1.5}$ = 3.33 PC	1 min = $\frac{7}{3}$ = 2.33 PC
2 min = 10 tab	35 min = 10 tab
1 min = $\frac{10}{2}$ = 5	1 min = $\frac{10}{35}$ = 2.857 tab

So, absolut advantage in PC = y x

now,

O.C of tab for x = $\frac{3.33}{5}$ = 0.666

O.C of tab for y = $\frac{2.33}{2.857}$ = 0.815

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Demand and Supply

Demand

↳ want or desire in general

↳ Based of want

Feature:

① Willingness to pay

② It must be affordable. ⇝ Affordability

both affordability and will to pay is necessary.

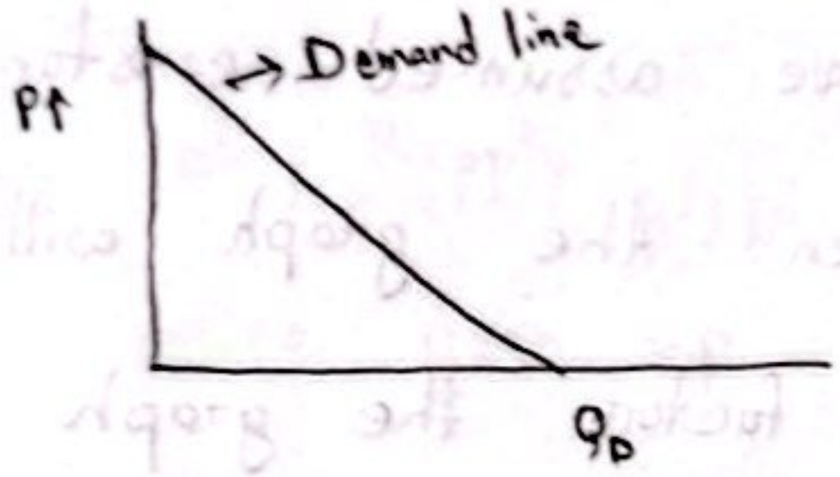
③ Time : over time demand changes

Laws of demand

If the price of a product goes up Quantity demand decreases

If the price of a product goes down Quantity demand increases

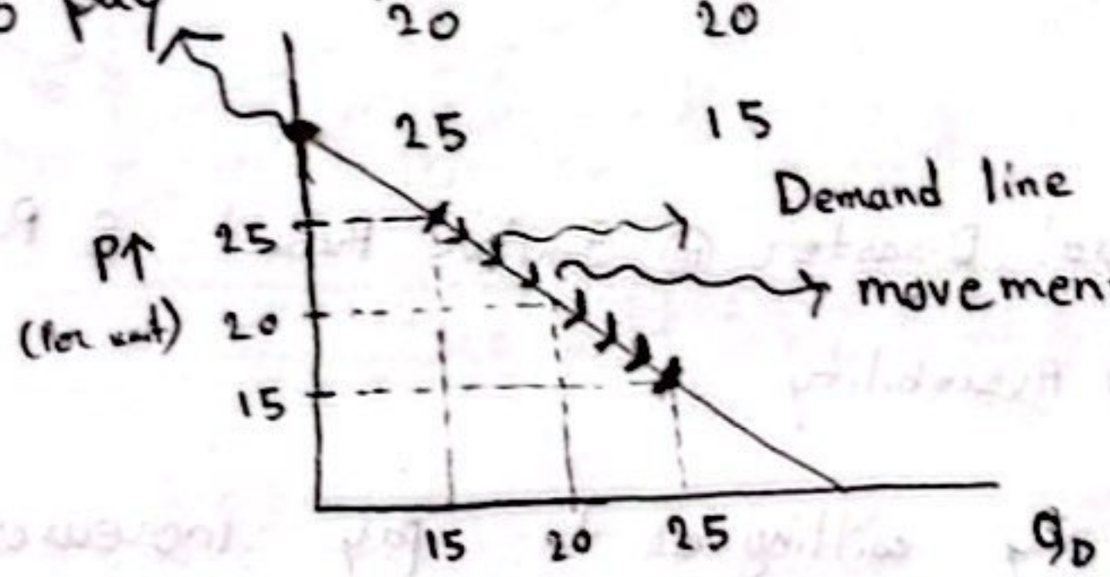
- Ceteris Paribus " Having all other factor constant"



• Price is price per unit

P	q_D
15	25
20	20
25	15

{Maximum willingness to pay



If price per unit increase from 15 to 20, the quantity demand will decrease 5 units

when Price per unit is 25; I'm spending = (15 × 25) = 375

when " " " " 20; " " = (20 × 20) = 400

when " " " " 15; " " = (15 × 25) = 375

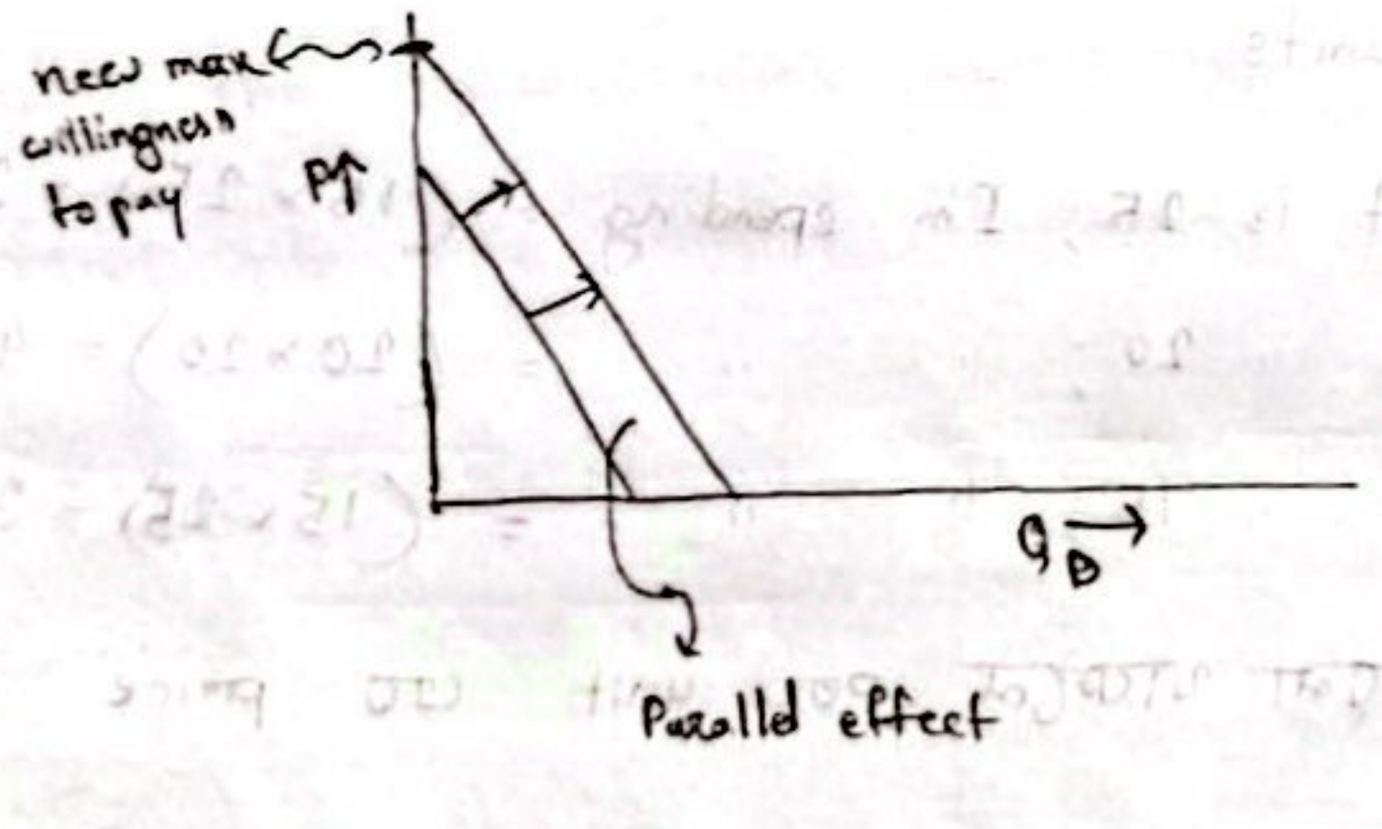
• Find the price যেখানে সর্বোচ্চ per unit এত price

- If any factors that we assumed constant previously is changed then the graph will be affected. For that changed factor, the graph will be shifted. It can be either positive shift or negative shift.

Different factors:

① Population ; ⑪ Natural Disaster ⑪ Similar Product ⑫ Preference
⑤ Weather ⑥ Income ⑦ Availability

If I earn more my willingness to pay increases. That takes the graph up

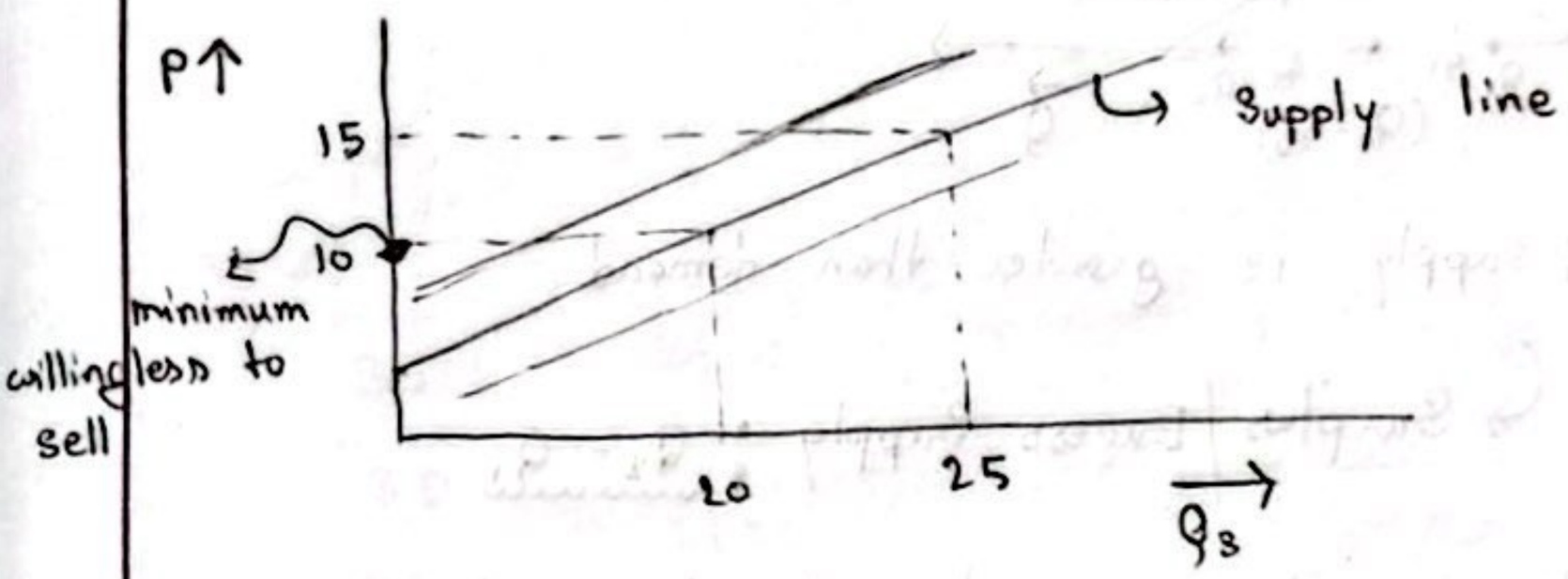


Supply

Law of Supply

If price goes up Quantity Supply goes up

If price goes down Quantity Supply goes down



Factors/Determinants :

(i) ataa availability of raw material (ii) labor cost (iii) Cost production

(iv) Tax/Subsidy

if cost production increases; su Q_s decreases

if subsidy increases Q_s increases

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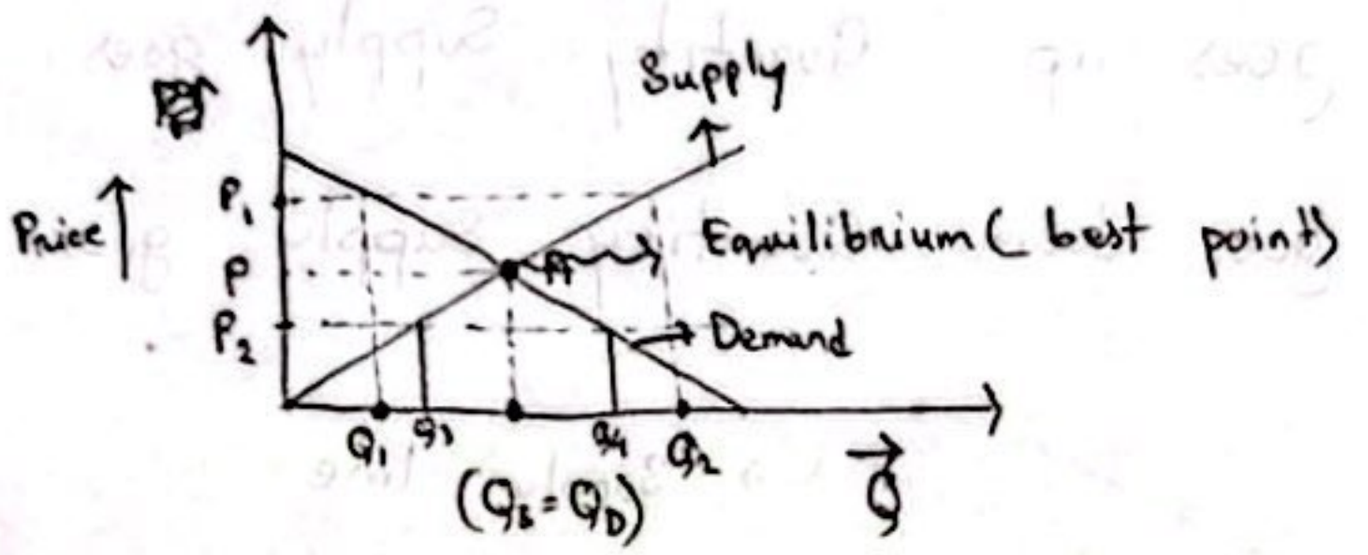
Sy: Opportunity cost, PPE, Absolut, Comparative advantage, Demand & supply. Market

Market

↳ in market demand and supply interacts



at P_1 Point: supply is greater than demand

↳ Surplus / Excess Supply : $Q_2 - Q_1$

at P_2 Point: demand is greater than supply.

↳ Shortage / Deficit : $Q_4 - Q_3$

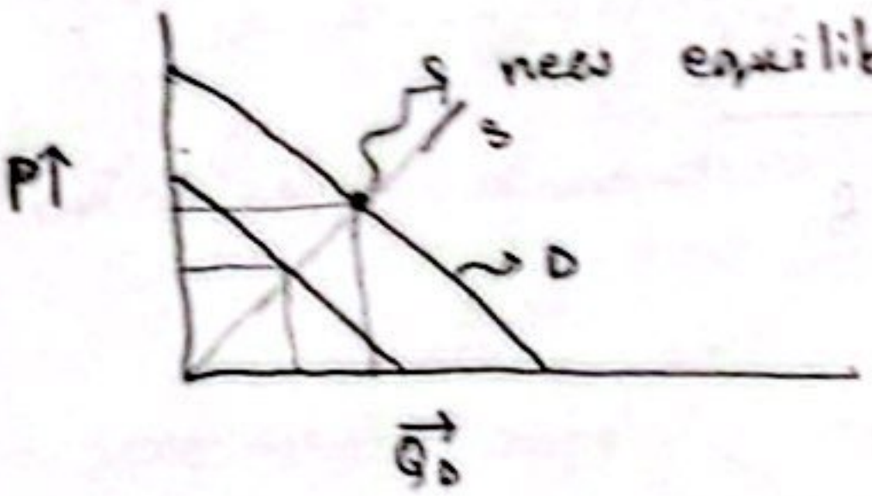
If the price goes up the quantity supply increase and quantity demand decreases.

- Price কমলে Revenue আয়তে কম। ফলত Quantity Supply কমে যাবে। 

- Market eventually reaches to equalibrium point. Because at this point there is no shortage or no surplus. The supply quantity and demand quantity difference is zero.

- change of factors will cause shifting in graph

Let, if ~~prices~~ income goes up, demand goes up



now:

S D↓ S↑ D↑

S↓ D↑

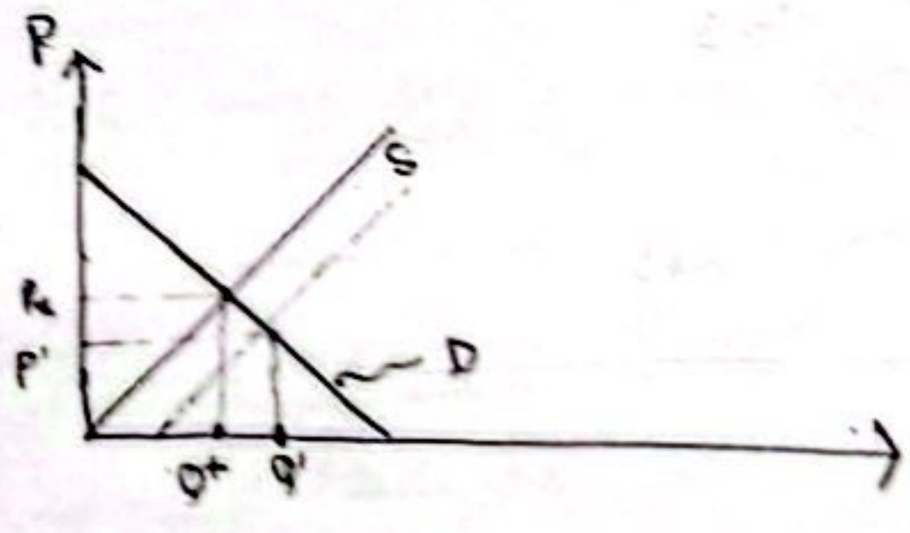
S D↑ S↓ D↓

S↑ D

S↑ D↓

S↓ D

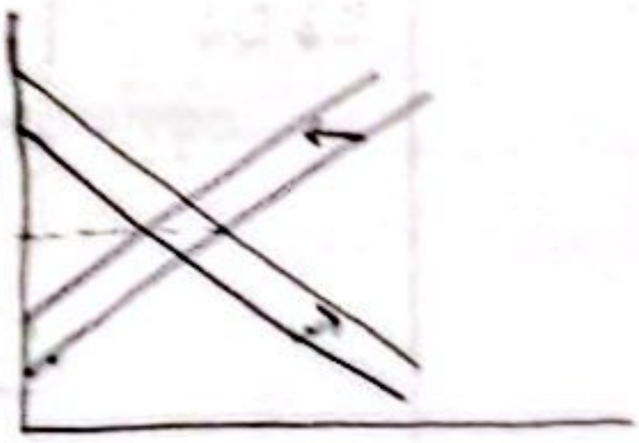
S↑ D:



P < P'

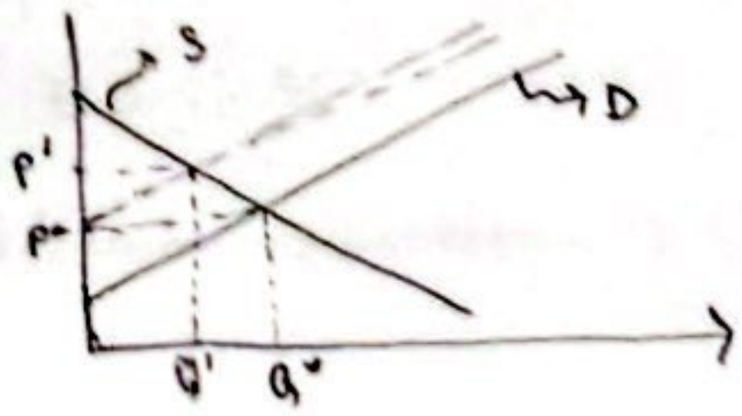
Q' > Q+

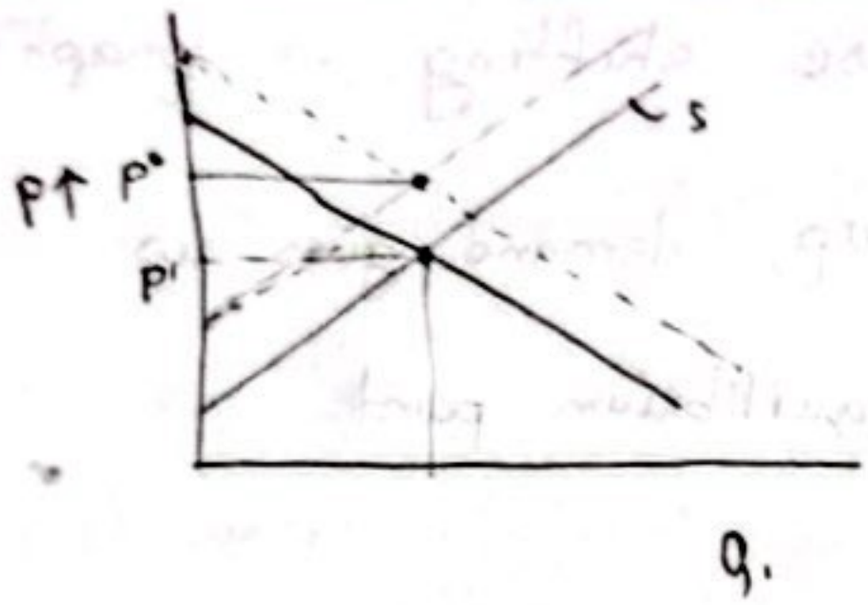
S↓ D↑ :



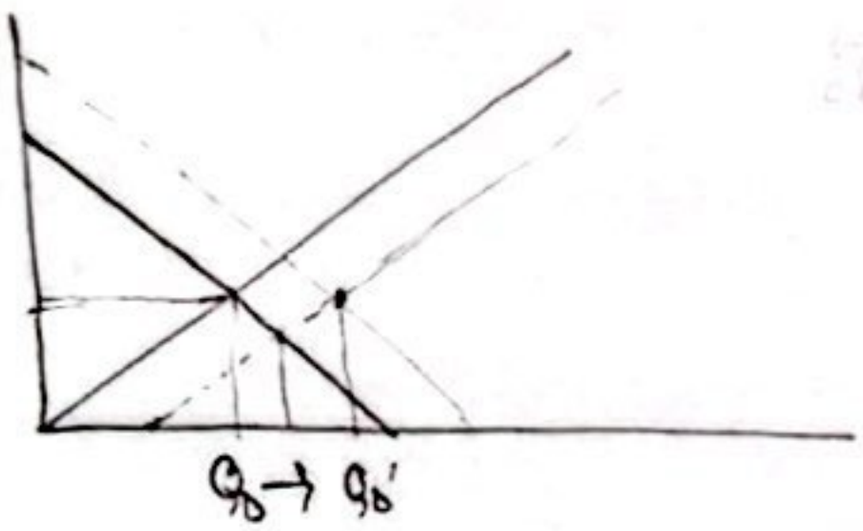
Price will always increase but quantity & may or may not change.

S↓ D:

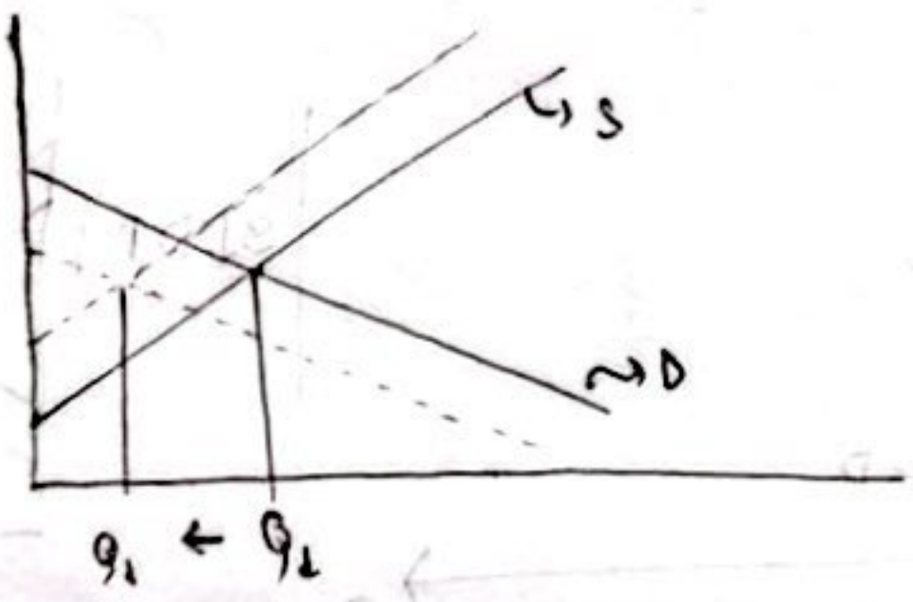




S↑ D↑



S↓ D↓



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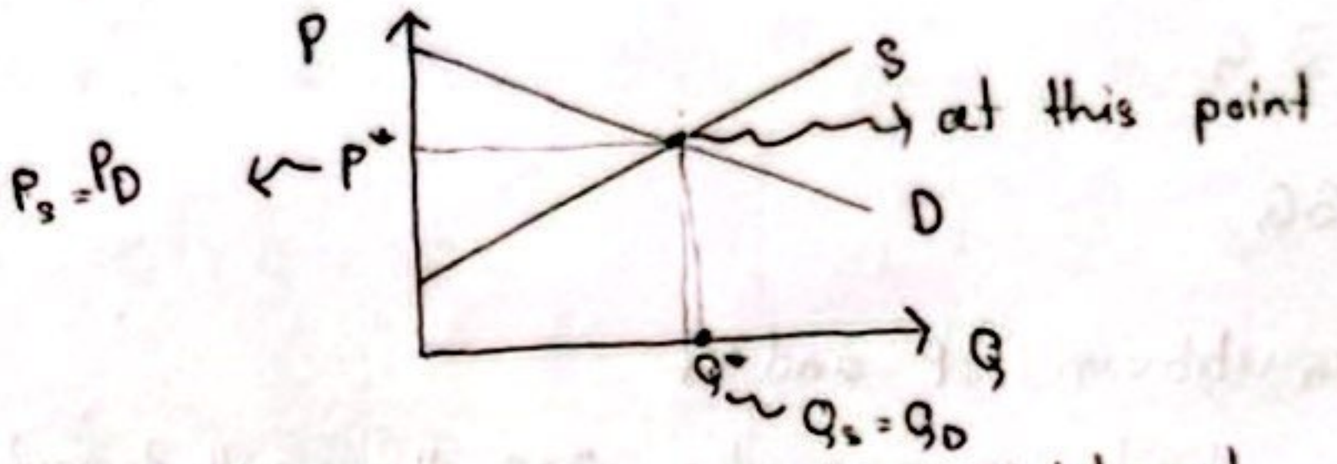


S, D line based on: $y = mx + c$ → y-intercept

slope

$m \rightarrow (+)$: it represents supply :

$m \rightarrow (-)$: it rerperesents demand :

$P = f(Q)$

$Q = f(P)$

\# $P = 100 - 4Q$ ⇝ demand function as negative slope.

$P = 20 + 2Q$ ⇝ supply function as positive slope.

$\Rightarrow$

at equilbrium; **Supply = Demand**

$\therefore P_D = P_S$

$\therefore 100 - 4Q = 20 + 2Q$

$\Rightarrow 6Q = 80$

$Q = 13.367$

Equilibrium quantity = 13.367

$P = 100 - 4 \times (13.367)$

$= 100 - 26.$

$= 46.73$ Tk/unit.

4 $P = 60 - 3q$

$P = 6 + 3q$

① Find the equilibrium P and q

② If the income level increases by 30%, the overall demand is positively affected by 10%. assume a parallel effect.

① now find P when, $q_D = q^*$ from (1)

② find the equilibrium P and q after change in that income.

⇒

at equilibrium, $P_D = P_S$

$60 - 3q = 6 + 3q$

$\Rightarrow 6q = 54$

$q = 9$

$P = 60 - 27$

$= 33$

$P = 33$ unit ; $q = 9$ unit

6.01 10% = $60 \times \frac{1}{10}$ = 6

2. ① ans

$P = 6 + 3.1\, q$ ⇝ supply

$P = 60 - 3.1q$ ⇝ demand

now,

$60 - 3.1q = 9$

$\Rightarrow 3.1q = 16.45$

$P = 60 - 3.1 \times 16.45$

$= 9$

$P = \sout{66 - 3q + 0.1}$ $66 - 3q$

$= 60.1 - 3q$

$60.1 - 3q = 9$

$\Rightarrow 3q = 60.1 - 9$

$q = 17.03$

$P = 7.207$

$P = 66 - 3q = 0$

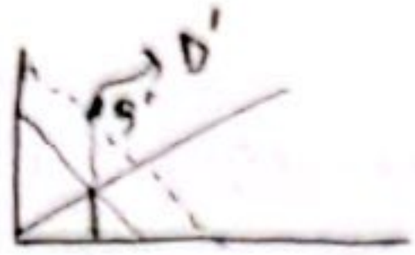
$\Rightarrow 3q = 56$

$q = 18.67$

$P = 66 - 3 \times 9.9$

$\Rightarrow P = 66 - 27.0$

$= -39$



(11) $6 + 3.1Q = 60 - 3.1Q$

$\Rightarrow 6.2Q = 54$

$Q = 8.709$

$P = 33.0021$

$60.1 - 3Q = 6 + 3.1Q$

$\Rightarrow 6.1Q = 54$

$Q = 8.85$

$P = 33.55$

(12) $S = D$

$Q = 10$

$P = 36$

$P = 70 - 2Q$ or, just $70 - 2 \cdot 35 \neq 20 + 3 \cdot 35$

$P = 20 + 3Q$

(a) If the market price is at 35 tk/unit

→ ① is the market at equilibrium

② If not, what problem could arise in market

⇒

① $P = 70 - 2Q = 20 + 3Q$

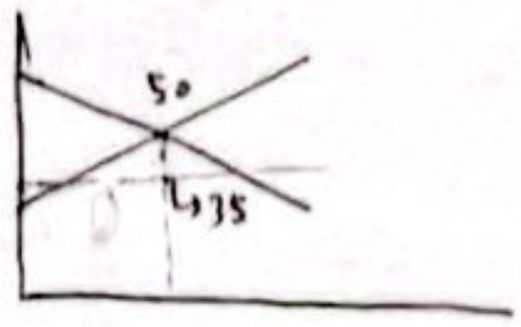
$\Rightarrow 5Q = 50$

$\Rightarrow 5Q = 50$

$Q = 10$

$\therefore P = 70 - 20$

$= 50$



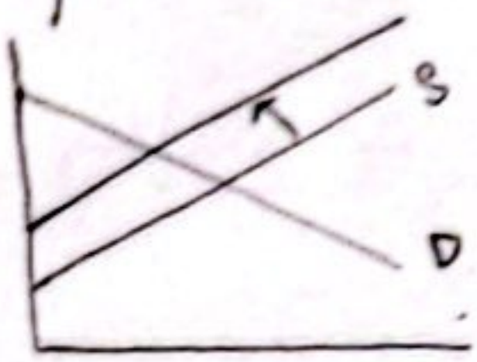
$P_1 = P_2 = 50$ tk/unit ; Q_1

not at equilibrium

$Q_2 = 17.25$; $Q_1 = 5$

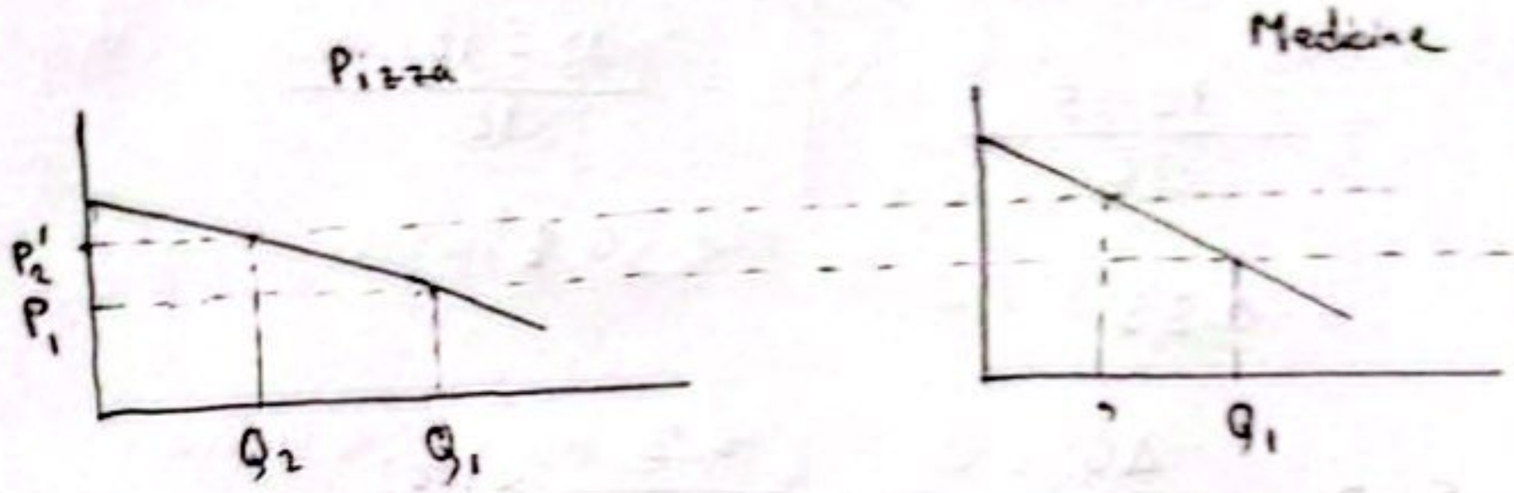
② $Q_2 > Q_1$: Quantity demand is greater than quantity supply. So, there's a shortage problem of $(17.25 - 5) = 12.25$ unit.

Elasticity



the impact of change in one sector on another sector is

elasticity
↓
slope/gradient



Elasticity ⇝ Responde of price change

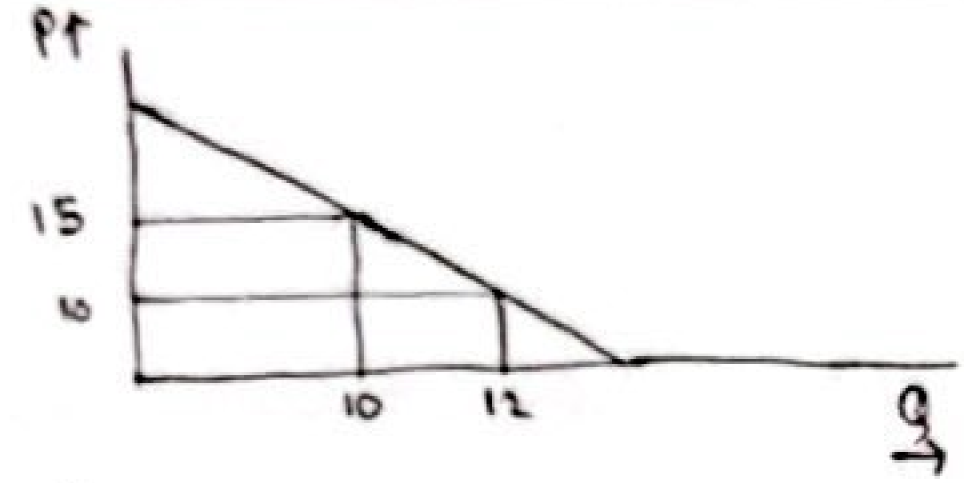
Price Elasticity of Demand (PED)

↳ how any change in price effects the quantity level

$$PED = \frac{\Delta Q\ \%}{\Delta P}$$ ⇝ effect of price change on quantity

$$\Delta Q = \frac{Q_2 - Q_1}{Q_1}$$

$$\Delta P = \frac{P_2 - P_1}{P_1}$$



$P_1 = 15$, $Q_1 = 10$

$$\Delta P = \frac{P_2 - P_1}{P_1} = \frac{10-15}{15} = -0.33$$

$$\Delta Q = \frac{Q_2 - Q_1}{Q_1} = \frac{12-10}{10} = 0.2$$

$$PED = \frac{\Delta Q}{\Delta P} = \frac{0.2}{-0.33} \times 100\% = -60.7\%$$

PED is always negative.

So, we ignore the sign. that's just direction. ~~উল্টা থাকলে আবর্তিত করে।~~

• Here PED has two values. But PED on slope will be same. Having two different value is inconsistancy.

The problem happens because of P_1 and Q_1 as P_1, Q_1 has different values.

absolut will be taken just for PED

Midpoint Average Method

$$PED = \frac{\Delta Q}{\Delta P} = \frac{\frac{Q_2 - Q_1}{\frac{Q_2 + Q_1}{2}}}{\frac{P_2 - P_1}{\frac{P_2 + P_1}{2}}}$$

$$\Delta Q = \frac{Q_2 - Q_1}{Q_2 + Q_1/2} = \frac{12 - 10}{(12+10)/2} = 0.182$$

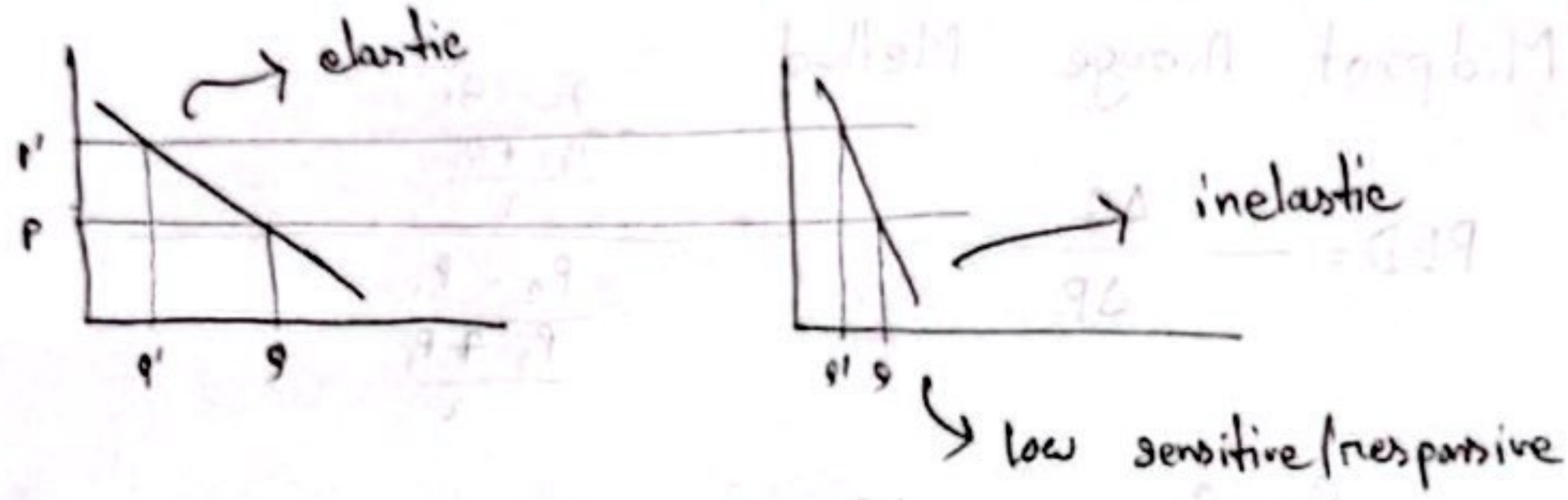
$$\Delta P = \frac{P_2 - P_1}{P_2 + P_1/2} = \frac{10 - 15}{(10+15)/2} = -0.4$$

$$PED = \frac{\Delta Q}{\Delta P} = \frac{0.18}{-0.4} = -0.45$$

$$|PED| = 0.45$$

If I increase the price 1 tk Quantity demand will fall by 0.45 unit.

If $|PED| < 1$ ⇝ less sensitive : inelastic



if $0 < |PED| < 1 \rightsquigarrow$ inelastic demand

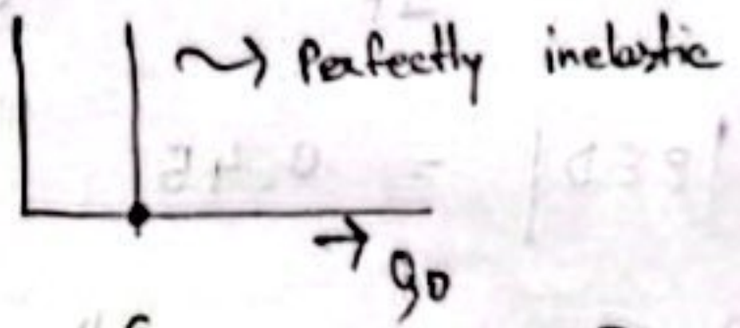
$|PED| > 1 \rightsquigarrow$ elastic

$|PED| = 1 \rightsquigarrow$ unit elastic

↳ one to one change

↳ যতটুকু দাম তত্টুকু কমে

$|PED| = 0 \rightsquigarrow$

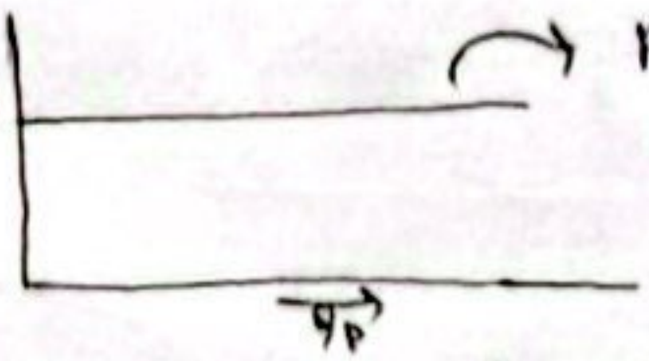


↳ Perfectly inelastic

↳ Price যতই change করি না কেন quantity demand same.

or, price যত পরিবর্তন হোক demand থাকবে

$|PED| = \infty$



↳ Perfectly elastic

P দামে কোন quantity demand করা হবে না

there is no demand.

* Producer can sell based on,

P = 100

Q = 100

Total Revenue = 100×100 = 10000

① P ↑ 20% ; Q_D ↓ 10%.

$P = 100 + 100 \times \frac{20}{100}$

$= 120$

$Q = 100 - 100 \times \frac{10}{100}$

$= 90$

total revenue = 120×90 = 10,800 ⇝ inelastic

↳ if the demand is inelastic the revenue will be more.

② P ↑ 10% ; Q_D ↓ 20%.

$P = 100 + 10$

$= 110$

$Q = 100 - 100 \times \frac{20}{100}$

$= 80$

total revenue = 110×80

= 8800