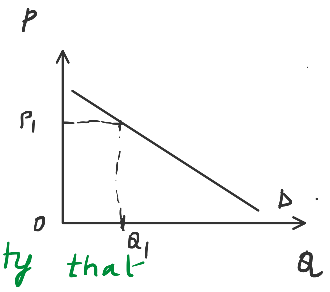
19 August 2023 20:08

Markets

i) Perfect competition
ii) Monopoly
iii) Oligopoly
iv) Monopolistic competition

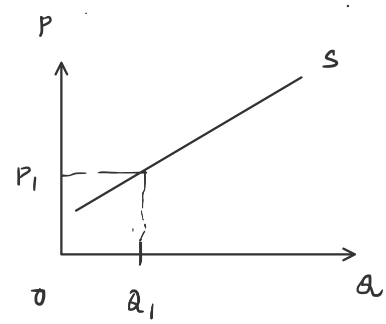
} Features of the product market.

(Product) Market → Demand side [Consumers, decide based on utility max] → Demand curve.
→ Supply side [Producers, decide based on π-max] → Supply curve.



Mkt Demand Curve: $Q_d = \alpha - \beta P$, $\alpha, \beta > 0$.

[Given a price level, what is the max quantity that the consumers are willing to buy]



Mkt supply Curve: $Q_s = -\gamma + \delta P$; $\gamma, \delta > 0$.

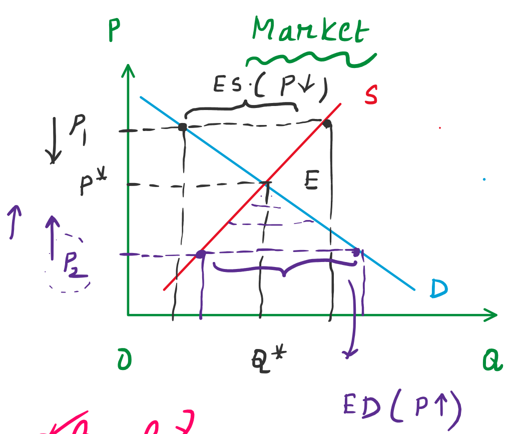
[Given a price level, what is the output level that all the firms together are willing to produce].

Finding the market equillibrium: condition $\boxed{Q_d = Q_s}$

D: $Q_d = \alpha - \beta P$, $\alpha, \beta > 0$.

S: $Q_s = -\gamma + \delta P$, $\gamma, \delta > 0$.

$$Q^* = \frac{(\alpha\delta - \beta\gamma)}{\beta + \delta} \qquad P^* = \left(\frac{\alpha + \gamma}{\beta + \delta}\right).$$



D: $Q^* = \alpha - \beta\left(\frac{\alpha + \gamma}{\beta + \delta}\right)$

$$= \frac{\alpha(\beta + \delta) - \beta(\alpha + \gamma)}{\beta + \delta} = \frac{\cancel{\alpha\beta} + \alpha\delta - \cancel{\alpha\beta} - \beta\gamma}{\beta + \delta}$$

$ED(P^*)$

$$= \frac{\alpha(\beta+\delta) - \beta(\alpha+\gamma)}{\beta+\delta} = \frac{\cancel{\alpha\beta} + \alpha\delta - \cancel{\alpha\beta} - \beta\gamma}{\beta+\delta}$$

$$= \frac{\alpha\delta - \beta\gamma}{\beta+\delta}$$

To ensure economic feasibility of the equillibrium, we need to ensure:

(i) $(P^*, Q^*) > 0$.

$$P^* = \frac{\alpha+\gamma}{\beta+\delta} > 0 \quad , \quad Q^* = \frac{\overbrace{\alpha\delta}^{>0} - \overbrace{\beta\gamma}^{>0}}{\beta+\delta} > 0 \text{ iff } \alpha\delta > \beta\gamma$$

(ii) Equillibrium should be stable in order to meaningful.

Stability means the market forces are acting is such a way such that the convergence is at the equillibrium pt.

To check for stability: $ED \downarrow$ as $P \uparrow$ i.e: $\frac{dED}{dP} < 0$.

D: $Q_d = \alpha - \beta P$, $\alpha, \beta > 0$.

S: $Q_s = -\gamma + \delta P$, $\gamma, \delta > 0$.

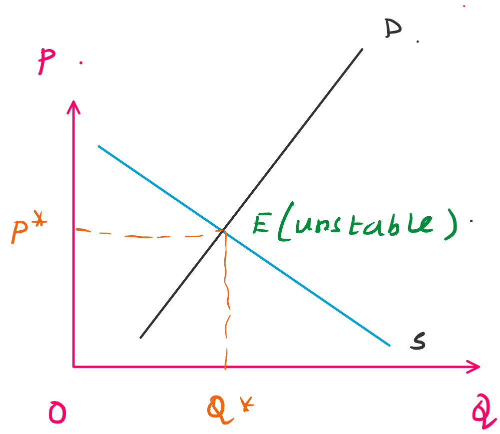
$$ED = D - S = \alpha - \beta P - (-\gamma + \delta P) = (\alpha+\gamma) - (\beta+\delta)P$$

$$\frac{dED}{dP} = -(\beta+\delta) < 0.$$

$\therefore$ Equillibrium is stable.

Q. D: $Q_d = -\gamma + \delta P$; $\gamma, \delta > 0$

S: $Q_s = \alpha - \beta P$; $\alpha, \beta > 0$



$$P^* = \frac{\alpha+\gamma}{\beta+\delta} \quad , \quad Q^* = \frac{\alpha\delta - \beta\gamma}{\beta+\delta}$$

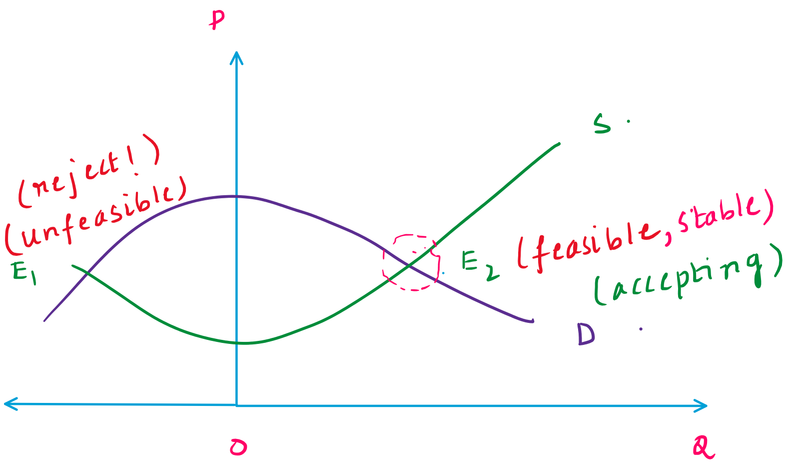
Stability: $ED = Q_d - Q_s$

$$= -\gamma + \delta P - (\alpha - \beta P) = -\gamma - \alpha + (\beta+\delta)P$$

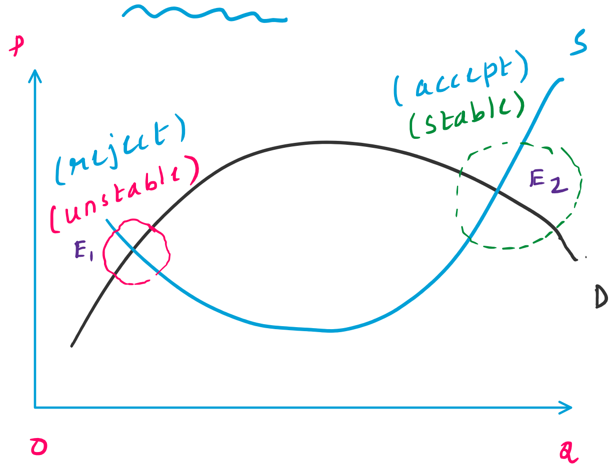
$$= -\gamma + \delta P - (\alpha - \beta P) = -\gamma - \alpha + (\beta + \delta) P.$$

$$\frac{dED}{dP} = (\beta + \delta) > 0 \Rightarrow \text{Not stable.}$$

Case II:



Case III



Q. D: $Q_d = 4 - P^2$

S: $Q_s = 4P - 1$

HW Draw the eqns graphically.

At equillibrium: $Q_d = Q_s$

$$4 - P^2 = 4P - 1$$

$$0 = P^2 + 4P - 5$$

$$P^2 + 4P - 5 = 0 \Rightarrow \text{Quadratic in } P.$$

$$P^2 + 5P - P - 5 = 0$$

$$P(P+5) - 1(P+5) = 0.$$

$$(P+5)(P-1) = 0$$

$$P = -5 / 1 \Rightarrow P^* = 1$$

D: $Q^* = 4 - P^{*2} = 4 - (1)^2 = 3$.

$\therefore$ Feasible Equilibrium $(P^*, Q^*) = (1, 3)$

For stability: $ED = Q_d - Q_s = (4 - P^2) - (4P - 1)$

$$= 4 - P^2 - 4P + 1$$

$$= 5 - 4P - P^2$$

$$\frac{dED}{dP} = -4 - 2P.$$

$$\left.\frac{dED}{dP}\right|_E = -4 - 2P^* = -4 - 2 = -6 < 0. \text{ [stable]}$$

HW Q. D: $Q_d = 8 - P^2$

S: $Q_s = P^2 - 2$