Short-run and Long-run aspects of Comp Market:

In production: short run ⇒ time period when one or more factors of production are fixed (capital)

Short run production fn: $q = f(L, \bar{k})$

long run ⇒ all the factors of production are flexible.

Long run production fn: $q = f(L, k)$

In comp mkt: short run ⇒ time period when no. of firms are unchanged (n = is fixed)

Long run ⇒ time span when no. of firms become flexible.

A firm in a competitive mkt :

A firm is a price taker in the competitive mkt.

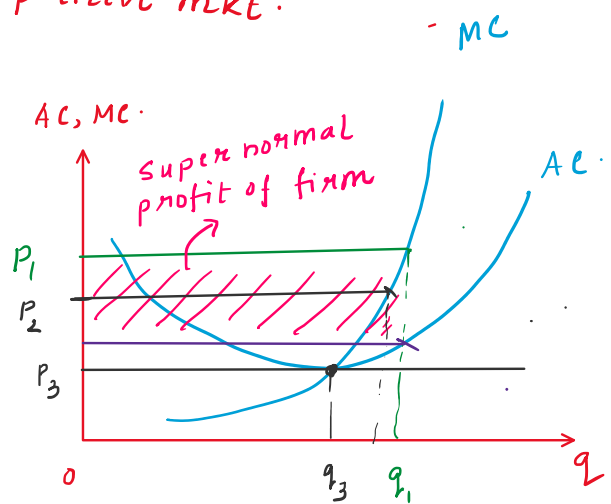Opt decision is : $P = MC$

Given mkt price $P = P_1$, opt output $q = q_1$

$P_1 q_1$ = total revenue of firm $(q = q_1)$

$(AC) q_1$ = total cost for producing q_1 units.

$(P_1 q_1) - (AC) q_1 = \pi$ of firm $(q = q_1)$

MC

AC, MC.

super normal profit of firm

AC.

P_1

P_2

P_3

O q_3 q_1 q

Long run aspect: As the firm is earning super-normal profit ⇒ industry is overall profitable ⇒ more firms will enter the mkt (n↑) ⇒

mkt supply increase ($Q\uparrow$) $\Rightarrow$ mkt supply curve curve will shift to right $\Rightarrow$ equillibrium price in mkt will fall ($P\downarrow$) $\Rightarrow$ $\pi\downarrow$.

In this way as price keeps on falling, a point will come when the supernormal π earned $= 0$. Then there will no more incentive for more firms to enter the mkt.

$\Rightarrow$ Long run equillibrium: $\pi = 0$.

$$\Rightarrow R = C.$$
$$\Rightarrow P \cdot q = C(q)$$
$$\Rightarrow P = \frac{C(q)}{q}$$
$$or \Rightarrow \boxed{P = AC}$$

Diagrammatically, $P = AC$ condition occurs at pt of min AC.

Long run equillibrium condition: $\boxed{P = min\ AC = MC}$

$\quad\quad\quad\quad\quad\quad \hookrightarrow AC = \frac{C}{q} = \frac{VC + FC}{q} = AVC + AFC$

Effect of Taxes in the Long Run:

Suppose per unit tax of Rs.'t' is changed to the producers by the govt.
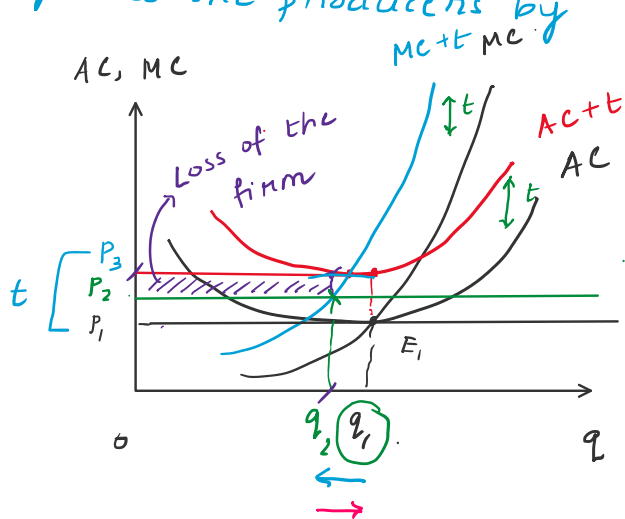
Pre-tax cost : $C(q)$.

Post-tax cost : $C(q) + t \cdot q$.

Post tax AC $= AC + t$.

Post tax MC $= MC + t$.

Pre-tax Long run equi pt $= E_1(P_1, q_1)$

Now after introduction of taxes, the eq price increases, but by an amt $< t$ (say P_2). Equilibrium for all the firms present in the mkt is

- per unit < t (say P_2). Equillibrium for all the firms present in the mkt is given by [$P_2 = MC + t$] $\Rightarrow$ opt output $q_2 < q_1$.

At output $q = q_2$, firms incur a loss $\Rightarrow$ firms will exit the market $\Rightarrow$ mkt supply will fall ($Q \downarrow$) $\Rightarrow$ supply curve will shift more to the left $\Rightarrow$ $P \uparrow$. Hence price will increase from P_2. This adj will continue till the losses made by the firms are not eliminated (in the post-tax scenario).

This pt occurs when: [$P = AC + t$]

or diagrammatically, [$P = \min AC + t$] $\Rightarrow$ This occurs at output level $q = q_1$ (pre-tax output level)

$\therefore$ Long run- implication of taxes:

(i) Price rises by the full-extent of tax.

(ii) All the existing firms produce pre-tax level of output.

HW.

Q. Mkt demand curve: $Q = 100 - 10P$. There are 10 identical firms in the mkt will the cost fn: $c_i(q_i) = \dfrac{q_i^2}{2}$, $i = 1, 2, \cdots, 10$

(i) Find the pre-tax and post-tax firm and industry output if a per unit tax of 2 is imposed on the producers.

(ii) Find the long-run impact of this per-unit tax.