

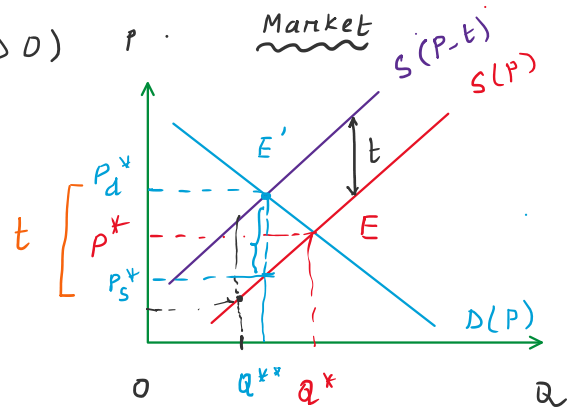
Effects of Taxes on Competitive Markets:

Compare b/w Pre-tax ($t=0$) and Post-tax ($t>0$)

Define: Pre-tax scenario: ($t=0$)

∴ Demand: $D = D(P)$, $D' < 0$

Supply: $S = S(P)$, $S' > 0$



Define: Post-tax scenario ($t>0$)

Per unit tax: a tax of Rs. 't' is imposed on every unit sold.

$$P \rightarrow (P+t)$$

Ad-valorem tax: a tax @ t% is imposed.

$$P \rightarrow P(1+t)$$

Consider a setup where producers are tax at per unit tax level 't'.

Introduction of taxes causes a gap b/w price paid by buyers (Demand price: P_d) and the price received by the sellers (Supply Price: P_s). Then: $P_d - P_s = t \Rightarrow P_s = P_d - t = (P-t)$

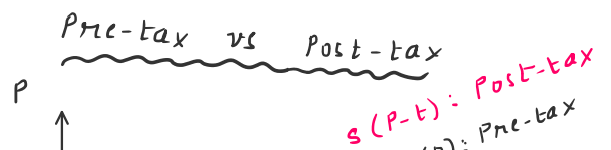
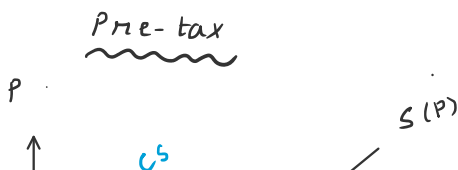
Demand: $D = D(P_d)$, $D' < 0$

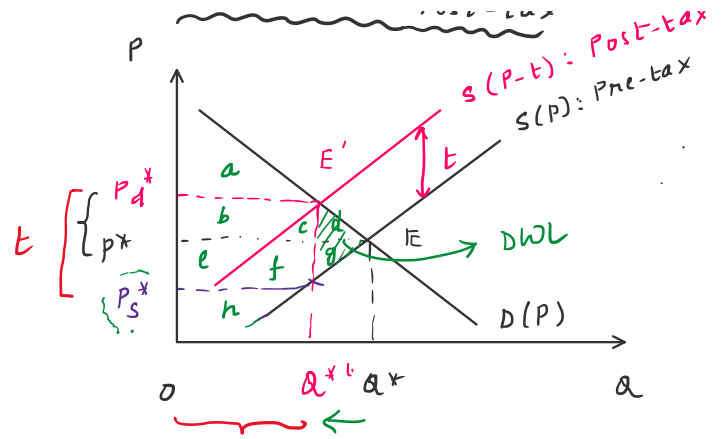
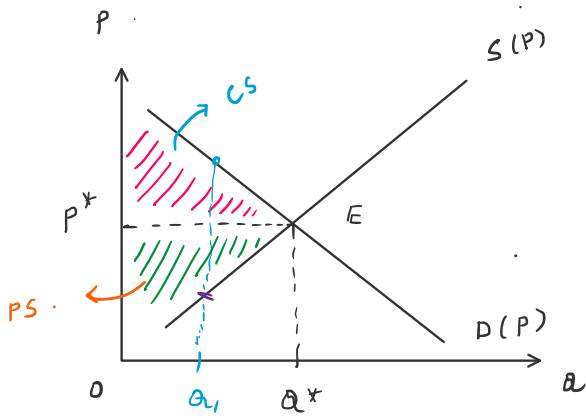
Supply: $S = S(P_s)$, $S' > 0$

Demand price = $P_d =$ market price = P .

∴ Demand: $D = D(P)$ and Supply: $S = S(P-t)$

Comparison of Efficiency: (Pre-tax vs Post-tax).





Welfare = CS + PS

Result: Imposition of tax reduces social welfare for both producers and consumers

CS = a

PS = h

Govt tax revenue = b + c + e + f

Welfare = a + (b + c + e + f) + h

DWL = (d + g)

welfare loss to consumers (c) and welfare loss to producers (e)

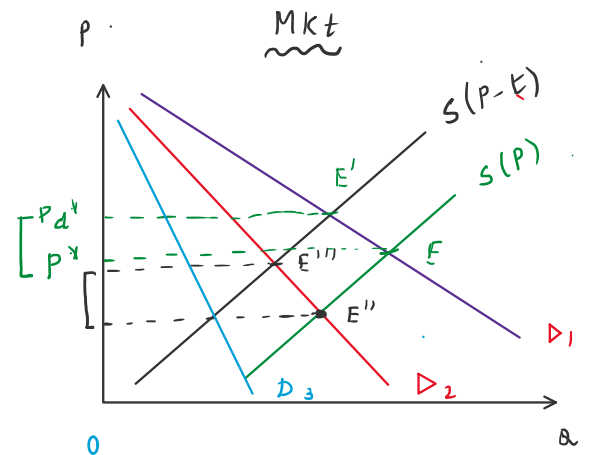
Burden of tax on consumers = $(P_d^* - P^*)$

Burden of tax on producers = $(P^* - P_s^*)$

- (i) If $|P_d^* - P^*| > |P^* - P_s^*| \Rightarrow$ burden of tax higher on consumers.
- (ii) If $|P_d^* - P^*| < |P^* - P_s^*| \Rightarrow$ burden of tax is higher on producers.

∴ More inelastic the demand curve, greater will be the burden of tax on consumers.

& Similarly, more inelastic the supply curve, greater will be the burden of tax on producers.



Q: A representative firm in a competitive mkt is having cost fn: $C_i(q_i) = 0.1 q_i^2 + a$

- Q: A representative firm in a competitive mkt is having cost fn:
 $C_i(q_i) = 0.1q_i^2 + q_i + 10$ and there are 100 firms in the mkt.
- (i) Find the firm's supply curve & mkt supply curve.
- (ii) If the mkt demand curve is $D = -400P + 4000$. Find the equilibrium price in the mkt.