EE375: Applied Economics for Natural Resources and Environment
Assignment 2 (Group)
Due on Friday August 27, 2021

Question 1:

Suppose that the demand curve derived from marginal benefit associated with a consumption of chocolate is 360 – 4Q and the marginal cost of chocolate production is 6Q. The marginal damage from pollutions generated by chocolate production is 2Q

a) Find the social optimum or efficient production level (P*, Q*)
b) Find the private equilibrium price and quantity when external costs could be ignored by firms
c) What tax level should be set to achieve the efficient/social optimal
d) Calculate deadweight loss from externalities in this case
e) Drawing a graph to illustrate the result from a) to d)

Question 2:

The production of cigarettes increases water pollutions while the consumption of cigarettes can put their neighbors at health risks (Hint: Impact on social marginal benefits as a whole)

a) Explain how externalities in this case create inefficiencies in the cigarette market and draw a graph to illustrate your explanation, including the market equilibrium for cigarettes at i) socially optimal level, P* and Q*; ii) private optimal level (P_p and Q_p) when externalities are not internalized by both firms and consumers and; iii) the deadweight loss area.
b) What policies could be considered to reduce deadweight loss in this case and describe the effects of such policies in the cigarette market.

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Demand : $P = 360 - 4Q$

Supply $MC = 6Q$, pollution cost $= 2Q$

a) Find the social optimum or efficient production level (P*, Q*)

2.)

$P^* = MC_S$

$360 - 4Q = 6Q + 2Q$

$360 = 12Q$

$30 = Q^*$

$P^* = 360 - 4(Q)$

$= 360 - 4(30)$

$= 360 - 120$

$= 240$

b) Find the private equilibrium price and quantity when external costs could be ignored by firms

$P = MC$

$360 - 4Q = 6Q$

$360 = 10Q$

$36 = Q_m$

$P_m = 360 - 4Q$: $Q = 36$

$360 - 4(36)$

$= 360 - 144$

$= 216$.

c) What tax level should be set to achieve the efficient/social optimal

tax level $= 2Q$

$2(30)$

$= 60$

tax = external cost

d) Calculate deadweight loss from externalities in this case

calculate DWL

$\Delta = \frac{1}{2} \times base \times height$

$= \frac{1}{2} \times 6 \times 60$

$= 180$

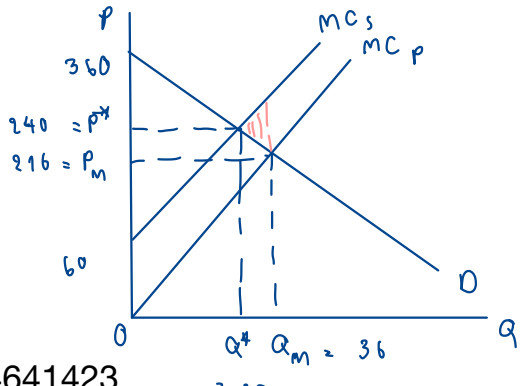
$Q_m - Q^*$ = base

6 =

high = external cost

= 60

e) Drawing a graph to illustrate the result from a) to d)



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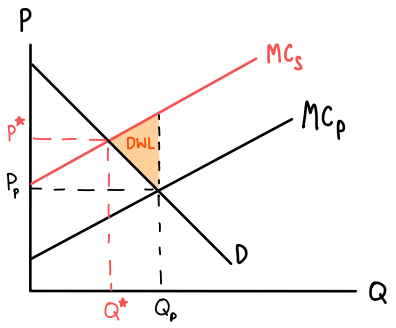
a)



- To reduce deadweight loss firm should produce at (Q^*, P^*). Even though, at (Q_p, P_p) can maximize profit but it can be cause of pollution and it will impact society.

b) - Set up the rule : By specific zone for smoking The buyer will by less if the place are not allowed to smoke.

- Increase tax : Increasing tax by shift the marginal cost up to optimal price.

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