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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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

D: $P = 360 - 4Q$
S: $MC = 6Q$
Pollution cost $= 2Q$

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

$P = MC_s$
$360 - 4Q = 6Q + 2Q$
$360 = 12Q$
$Q^* = 30$ #

$P = 360 - 4(30)$
$P^* = 360 - 120$
$P^* = 240$ #

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

$360 - 4Q = 6Q$
$360 = 10Q$
$Q_m = 36$ #

$P_m = 360 - 4(36)$
$P_m = 360 - 144$
$P_m = 216$ #

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

Tax level = externality cost (Pollution cost)
= different between social marginal cost curve and firm marginal cost curve

Pollution cost = $2(30)$
= 60 #

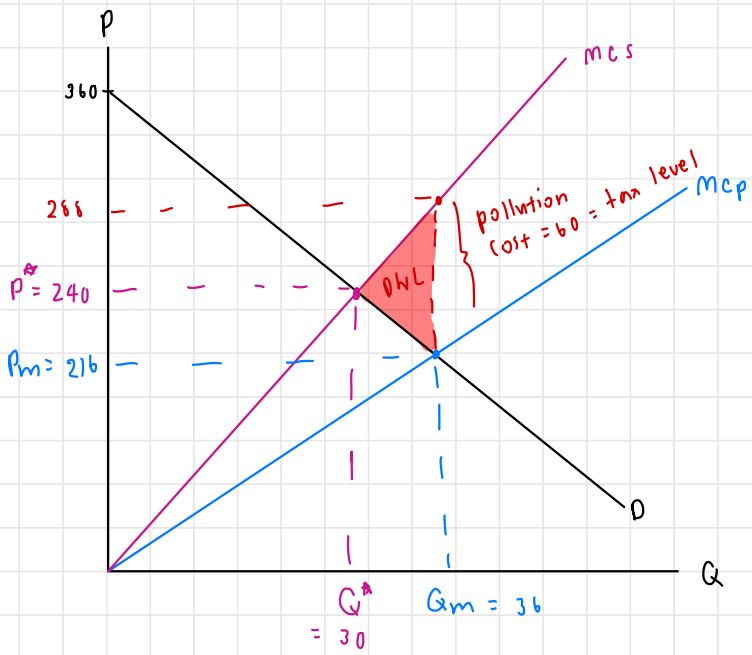
d) Calculate deadweight loss from externalities in this case

DWL = $\frac{1}{2} \times$ base $\times$ high

= $\frac{1}{2} \times (36 - 30) \times (240 - 216)$

= 216 #

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



$6Q + 2Q = 8Q$

$= 8 \times 36$

$= 288$

Question 2:

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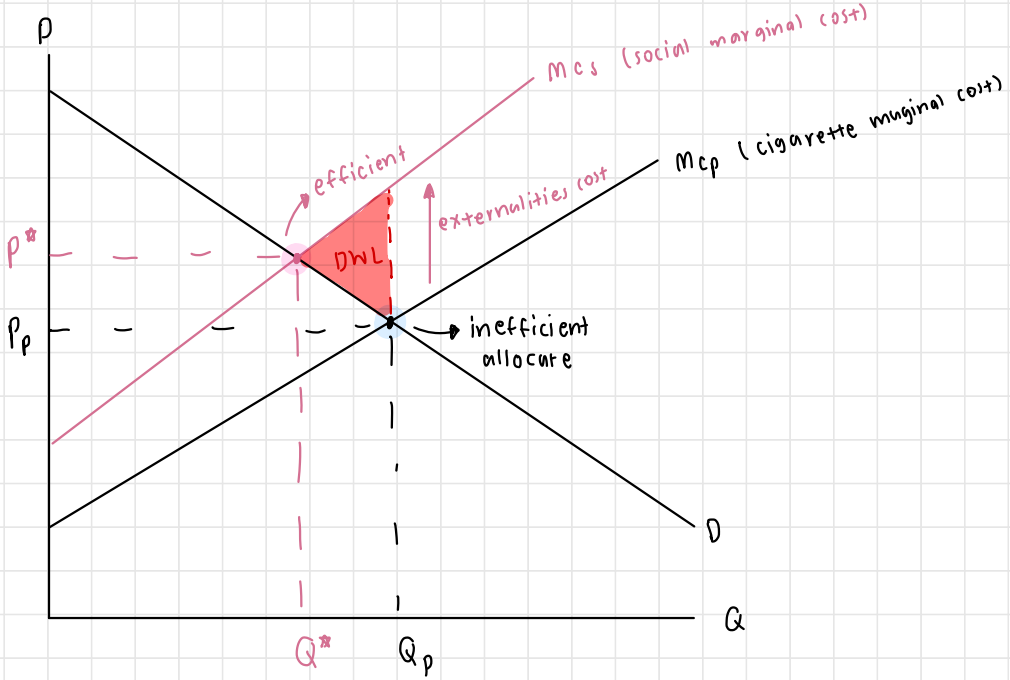
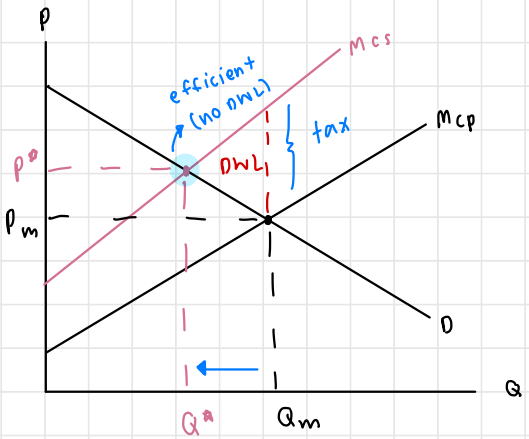


when cigeraftes company increase the production, it creates waste in to the water and also affects people health risks.
As we can see in the graph, at Q* and P* (social marginal cost) is the efficient level of production, meaning that if firm produce at this level, it will not affect and create the externalities cost to the society. However, in reality, firm only thinks to maximize profit, so it choose to produce more at Qp and Pp. It means that when firm increase the production, it will contribute to make more pollution to the society, which create externalities cost and also make deadweight loss to the society in red 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.

* Putting a price → impose a tax on steel production, so it will make deadweight gone and afficient maket allocation

ex. graph!



Before the policy is announced, firm produce at Qm, which make social cost and pollution to the society and also make deadweight loss to the society as well.
When putting a price policy is announced to cigarette market, firms need to pay for tax in order to produce cigarette, so that firm will reduce their production from Qm to Q*, which is efficient market allocation and no deadweight loss.

* Putting a cap → this policy will restrict the production of cigarette, so Qm will be back at Q* with sufficient punishment for example, jail rentences or fines.

* Establishing rules → this policy will permit the cigarette production to produce in separate area or zones.