

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:

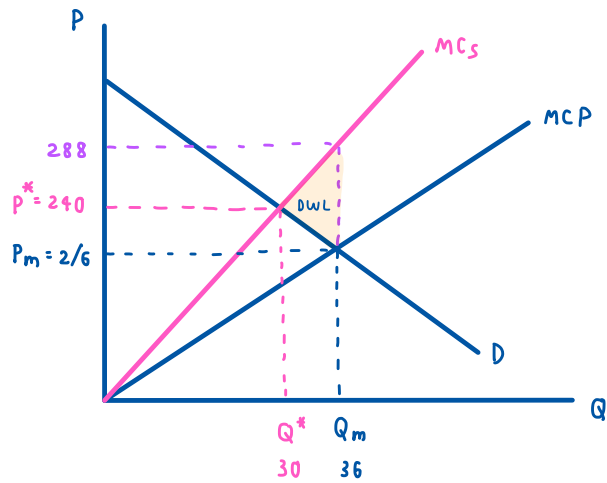
The production of cigarettes increases water pollutions while the consumption of cigarettes can put their neighbors at health risks (Hint: Impact on social marginal benefits as a whole)

- 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.

Group Member


Apicha Isarawanichkul	6304640045
Chananya Leelaphannawut	6304640169
Chonchanok Keardjam	6304640235
Pornpisuth Pongtanya	6304641217
Theeruj Piromrat	6304641647

1.) Demand : $P = 360 - 4Q$, Supply : $MC = 6Q$, pollution cost = $2Q$



a.) $P = MCS$

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

$$12Q = 360$$

$$\therefore P^* = 360 - 4(30)$$

$$= 360 - 120$$

$$P^* = 240$$

c.) tax level is the external cost which is the pollution cost :

$$\begin{aligned} \text{pollution cost} &= 2Q \\ &= 2(30) \\ &= 60 \end{aligned}$$

b.) $P = MCP$

$$360 - 4Q = 6Q$$

$$10Q = 360$$

$$Q_m = 36$$

$$\therefore P_m = 360 - 4(36)$$

$$= 360 - 144$$

$$P_m = 216$$

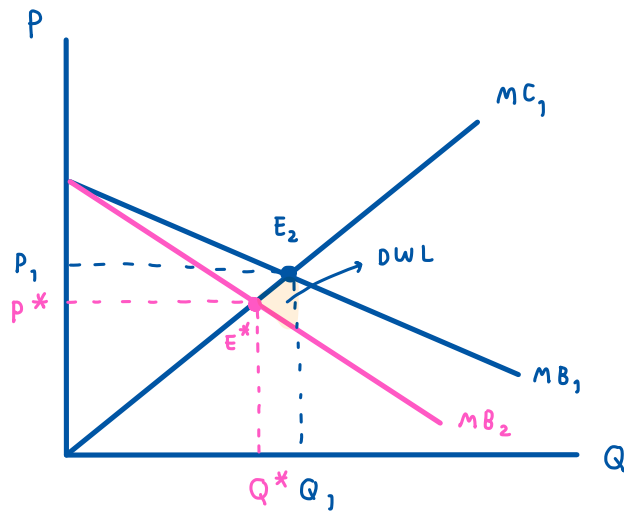
d.) $DWL = \frac{1}{2} \times \text{base} \times \text{height}$

$$= \frac{1}{2} \times (36 - 30) \times (288 - 216)$$

$$= 216$$

2.)

a.



At point E_2 which $MC_1 = MB_1$ is private optimum level. However, smoking cigarettes will decrease in social marginal benefits from MB_1 to MB_2 and from Q_1 to Q^* . As a private benefits, the deadweight loss from MB_1 shift downward. Focusing more on marginal benefit, DWL will be cut off.

b.

To reduce deadweight loss, government should put more tax on customer. From reducing DWL, less customer consume but price will increase.