

EE375: Applied Economics for Natural Resources and Environment
Assignment 2 (Group)
Due on Tuesday August 30, 2022

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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Group 8

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There is another member that we could not find any contact (I did not see his contact in the EE375 group line chat), so I did not put his name in na ka ajarn. My personal guess is I think he is a 3rd year student but others are in 2nd year. I did ask my friends, but none of my friends know him.

Question 1:

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$$\text{Demand : } P = 360 - 4Q$$

$$\text{Supply : } MC = 6Q, \text{ Pollution cost} = 2Q$$

$$a) P = MC_s$$

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

$$360 = 12Q$$

$$Q^* = 30$$

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

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

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

$$\text{DWL} = 180$$

$$b) P = MC_p$$

$$360 - 4Q = 6Q$$

$$360 = 10Q$$

$$Q_p = 36$$

$$P_p = 360 - 4(36) = 216$$

$$c) MC_p = MC_s$$

$$360 - 4Q^* = 6Q^* + t$$

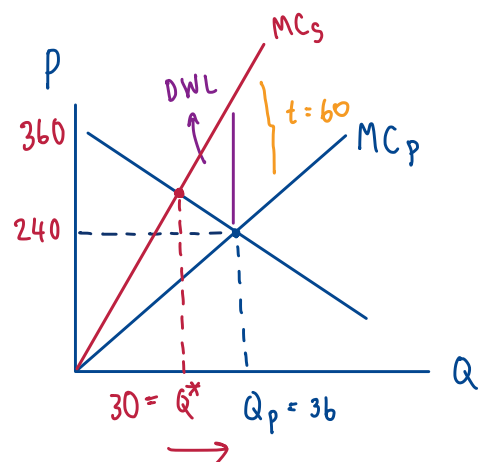
$$360 = 10Q^* + t$$

$$360 = 10(30) + t$$

$$360 - 300 = t$$

$$t = 60$$

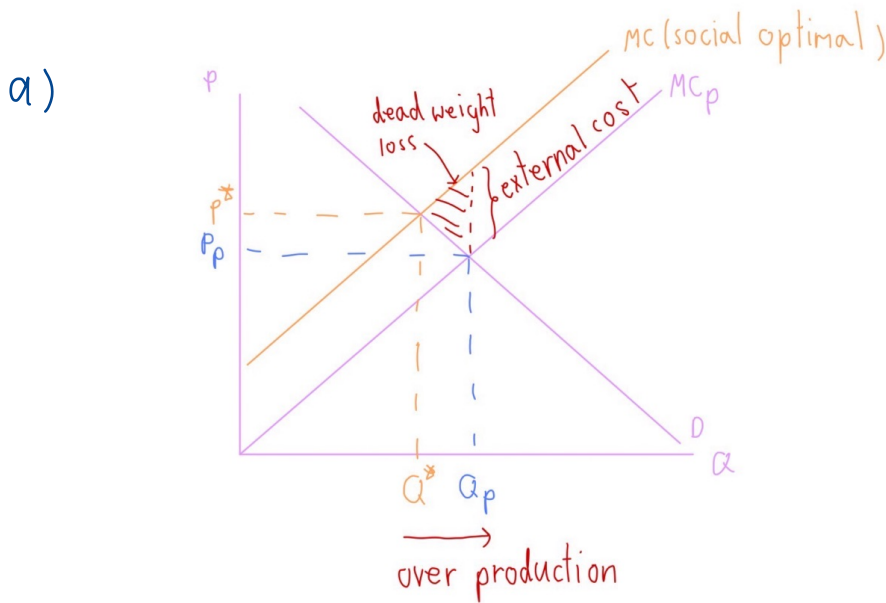
e)



Question 2:

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- What policies could be considered to reduce deadweight loss in this case and describe the effects of such policies in the cigarette market.



- By imposing tax to the producer. This make MC_p shift to the left. So the deadweight loss decreases.
 - By controlling releasing waste into water from factory. So Q_p will decrease and there is less over production.