

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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a.) $P = MC$

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

$$358 = 10Q$$

$$Q = 35.8$$

$$P = 360 - 4Q$$

$$= 360 - 4(35.8)$$

$$= 216.8$$

b.) P_m, Q_m

$$P : 360 - 4Q = 6Q$$

$$360 = 10Q$$

$$Q = 36$$

$$P_m = 360 - 4(Q)$$

$$= 360 - 4(36)$$

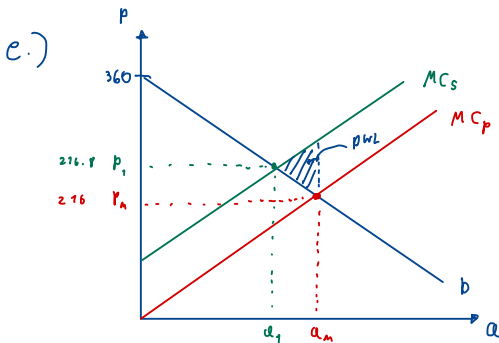
$$= 216$$

c.) Tax level should be $q + 2q$

to achieve the efficient and social optimal.

d.) $PWL = \frac{1}{2} \times \frac{2}{10} \times 2$

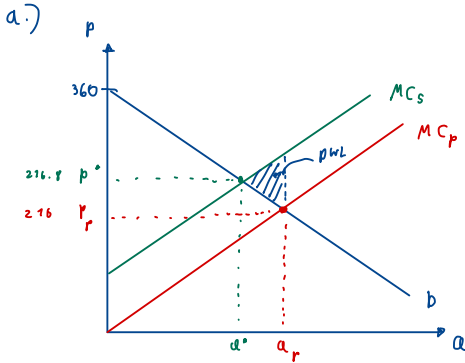
$$= 0.2$$



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The change in production level from equilibrium or private level means that production of cigarettes is above social demand create the gap of DWL.

b.) Using fiscal policies, this policies make government raise tax in addition to reduce gap of DWL from excess demand of production

August 12, 2023 6204640525