

Instructions

- (1) Please read the instruction carefully. Also take this habit with you into the exam room.
- (2) Please read each question carefully and answer the questions straightforwardly. Always provide economic reasons at least a paragraph for your analysis, or a graph when necessary, even when the question does not indicate so.
- (3) Handing and submitting assignments are only available via BE Moodle.

Answering the questions and preparing answer sheets

- (1) Answers are to be handwritten, in either digital or analog form, in a blank canvas or any clean paper. Make sure that your handwriting is clearly visible and readable.
- (2) There is no need to rewrite the question. Just indicate the question number clearly for each of the answer, such as 1.a).
- (3) When done, for the digital case, collage all the pages into a single PDF file. For those who write on sheets of paper, take photo of all pages then convert all of them into a single PDF file as well.
- (4) **Name your PDF file as StudentID_YourNickname, such as 640123456_Bo.**

Submitting your answers

- (1) Make sure your file does not exceed 10MB. This is the maximum file size for BE Moodle upload.
- (2) Login to BE Moodle, head into the course, then the assignment topic.
- (3) Choose your file to submit. Done. There will be timestamp for your upload date and time, so please make sure to not submit later than that.

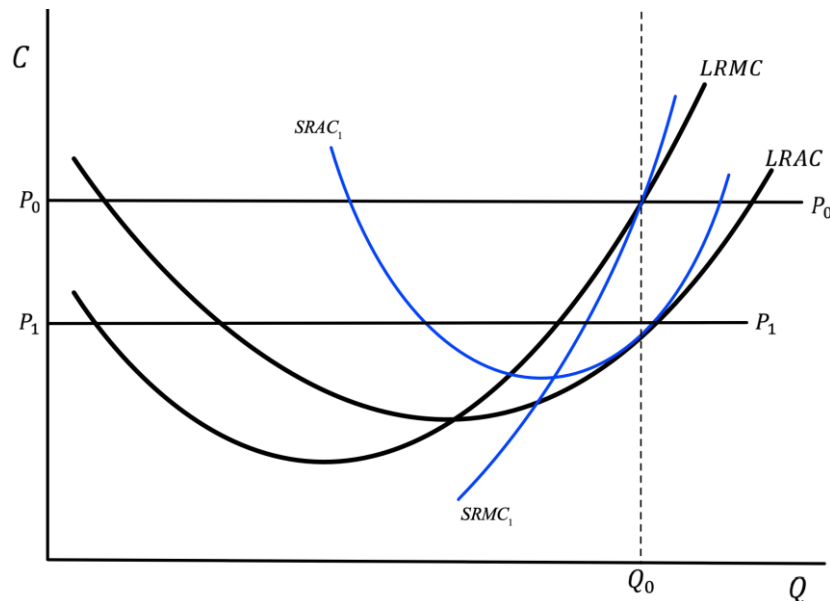
1. Two COVID-19 vaccines are available in Thailand, Sinovac and Pfizer priced at \$20 and \$40 respectively. Assumed that both vaccines are substitutes, answer the following questions clearly.

1.a) Draw a budget line for these two when a consumer has \$40 and indicate all the essential information on the graph, given that Sinovac is displayed on the horizontal axis while Pfizer is on the vertical axis.

↑ ↑ ↓ ↓

1.b) If a consumer sees that Sinovac is an inferior good while Pfizer is a normal good and Sinovac price is slashed by a half, analyze how consumer's equilibrium changes disaggregating price effect into substitution effect and income effect and explain.

2. In a perfectly competitive market, suppose that every firm is in a long-run equilibrium where each firm receives an excess profit at a market equilibrium price P_0 and produces Q_0 as shown in the graph below.



2.a) If the market equilibrium price decreases to P_1 , in the short run according to the given Short-Run cost curves $SRAC_1$ and $SRMC_1$, find the new Short-Run equilibrium quantity Q_1 and profit of the firm. State the equilibrium conditions.

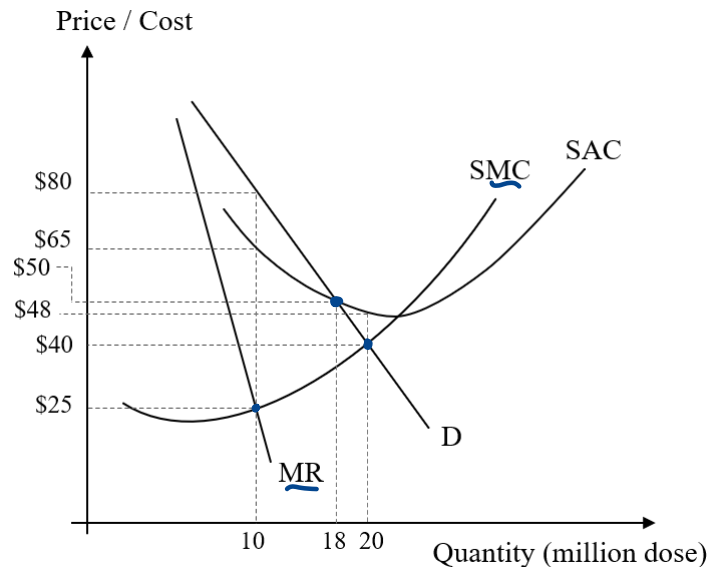
2.b) Show that at the new Short-Run equilibrium quantity Q_1 , the profit earned according to the Long-Run cost curves $LRAC$ at Q_1 and price P_1 is higher than the profit in Short-Run found in 2.a).

2.c) According to the Long-Run cost curves $LRAC$ and $LRMC$, find the equilibrium quantity the firm wants to produce at the new lower price P_1 , when there is no new seller entering the market. State the equilibrium conditions.

Assignment 3

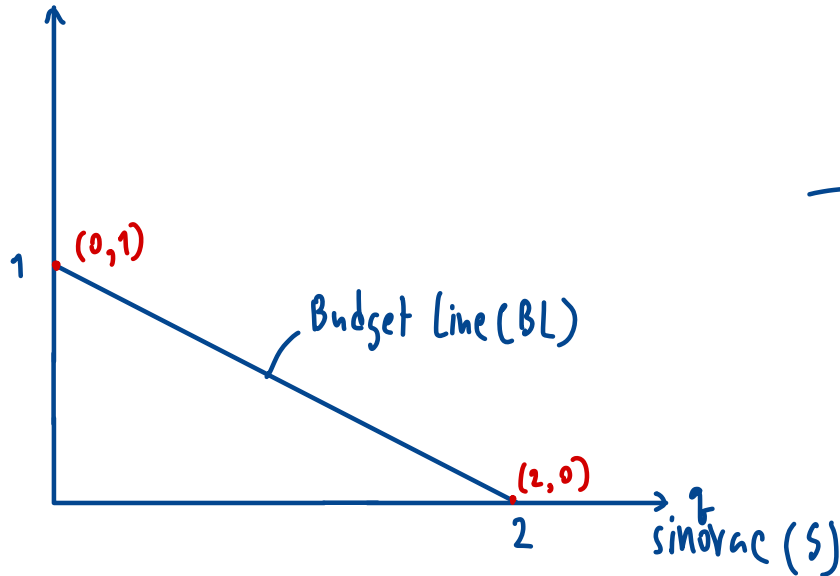
Assigned on Nov 9th, 2021. To be submitted on Nov 18th, 2021 before midnight.

3. Thai government decides to import vaccines from J&J through the Government Pharmaceutical Organization (GPO). Supposed that GPO can act as a private monopoly firm, demand, revenue and cost of importing are displayed in the following graph in USD. Note that a single dose of J&J vaccine is sufficient to immunize COVID-19. Answer the following questions clearly.



- 3.a) If GPO wants to maximize profit, how many million doses should they import and at which price can be sold for each dose?
- 3.b) According to 3.a), how much is the total profit that GPO receives in million USD?
- 3.c) If the government decides to intervene and set a fair price, how many million doses GPO needs to import and how much the price to be set?
- 3.d) To achieve herd immunity with a new strategy, the target number of people privately vaccinated is 20 million people. How much **for a dose** that each person pays for the vaccine and how much does the government should subsidize **in total**?

① 1.a) $q_{\text{Phizer}}(z)$



$$TC = P_z \cdot z + P_s \cdot s$$

$$40 = 40z + 20s$$

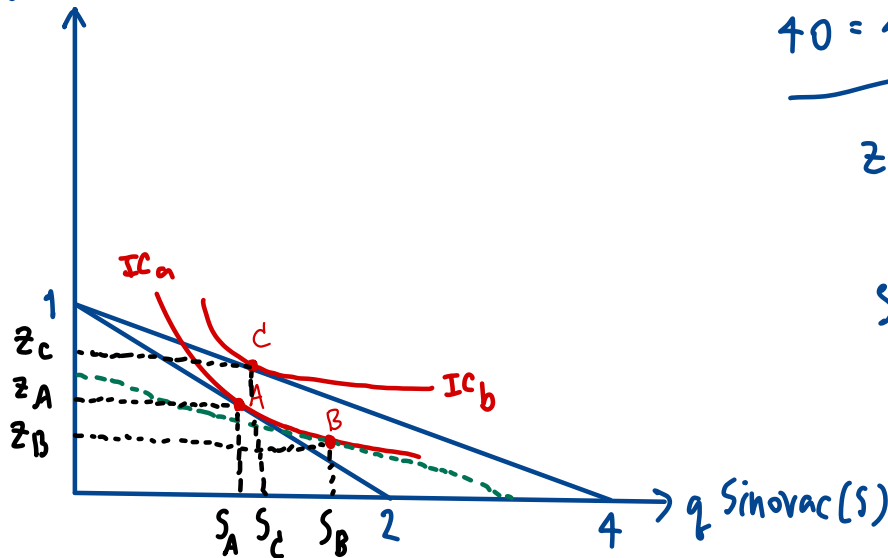
$$z = \frac{TC}{P_z} = \frac{40}{40} = 1$$

$$s = \frac{TC}{P_s} = \frac{40}{20} = 2$$

slope = $\frac{P_s}{P_z} = \frac{20}{40} = \frac{1}{2} \therefore$ Sinovac is half cheaper compared to Phizer.

1.b) Sinovac price (P_s) = $\frac{1}{2} \times 20 = 10 \Rightarrow P_s = 10$

$q_{\text{Phizer}}(z)$



$$TC = P_z \cdot z + P_s \cdot s$$

$$40 = 40z + 10s$$

$$z = \frac{40}{40} = 1$$

$$s = \frac{40}{10} = 4$$

Sinovac (s) Phizer (z)

SE $s_A \rightarrow s_B (+)$ $z_A \rightarrow z_B (-)$

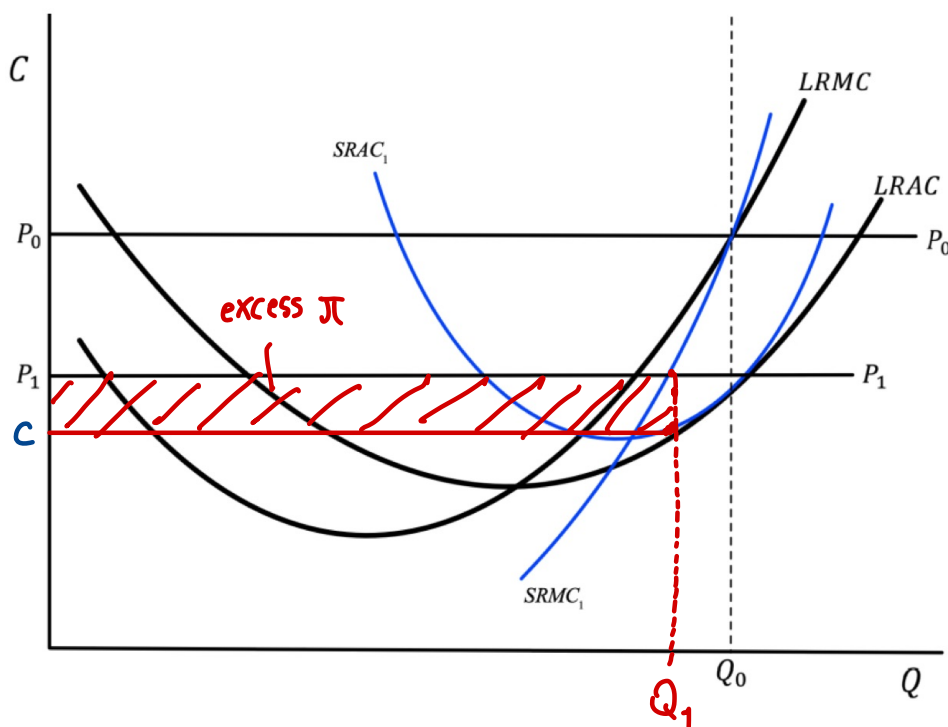
IE $s_B \rightarrow s_C (-)$ $z_B \rightarrow z_C (+)$

PE $s_A \rightarrow s_C (+)$ $z_A \rightarrow z_C (+)$

∴ According to the graphs, it shows that Sinovac is an inferior goods due to the IE of Sinovac is negative ($S_B \rightarrow S_d$) and the SE of Sinovac is also more than its IE.

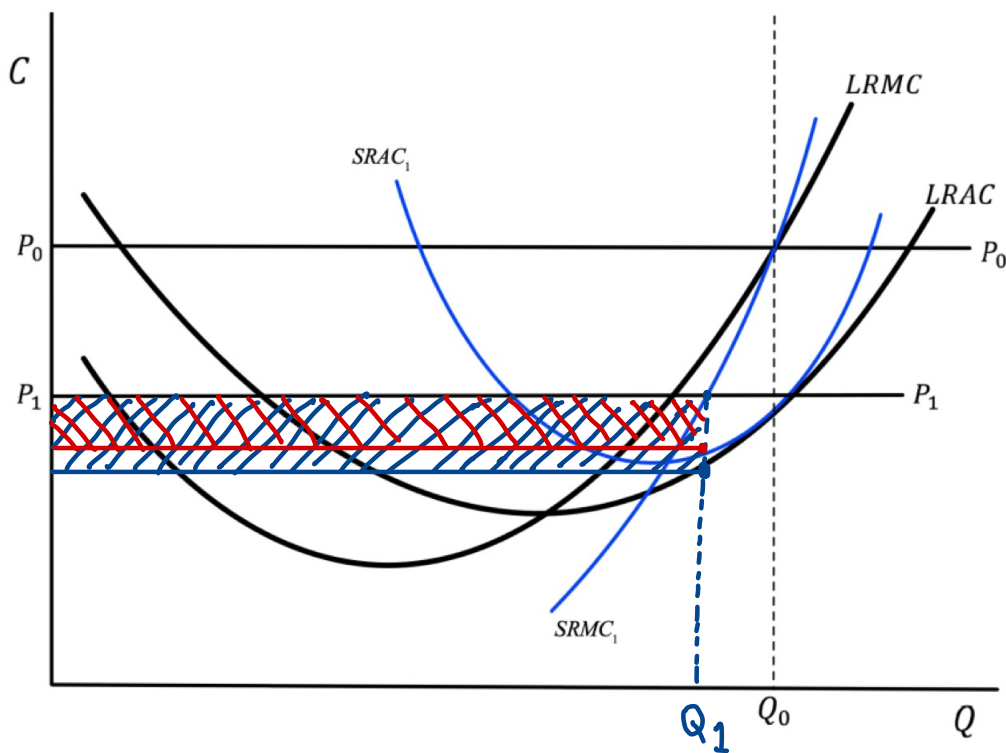
∴ The equilibrium point moves from point A to point c as the Sinovac price drops by half.

(2) 2.a)



∴ As the the equilibrium price decreases from P_0 to P_1 , the equilibrium quantity also decreases from Q_0 to Q_1 , making the equilibrium point changes. Furthermore, there is an excess profit, which is the red shaded area as shown in the graph above.

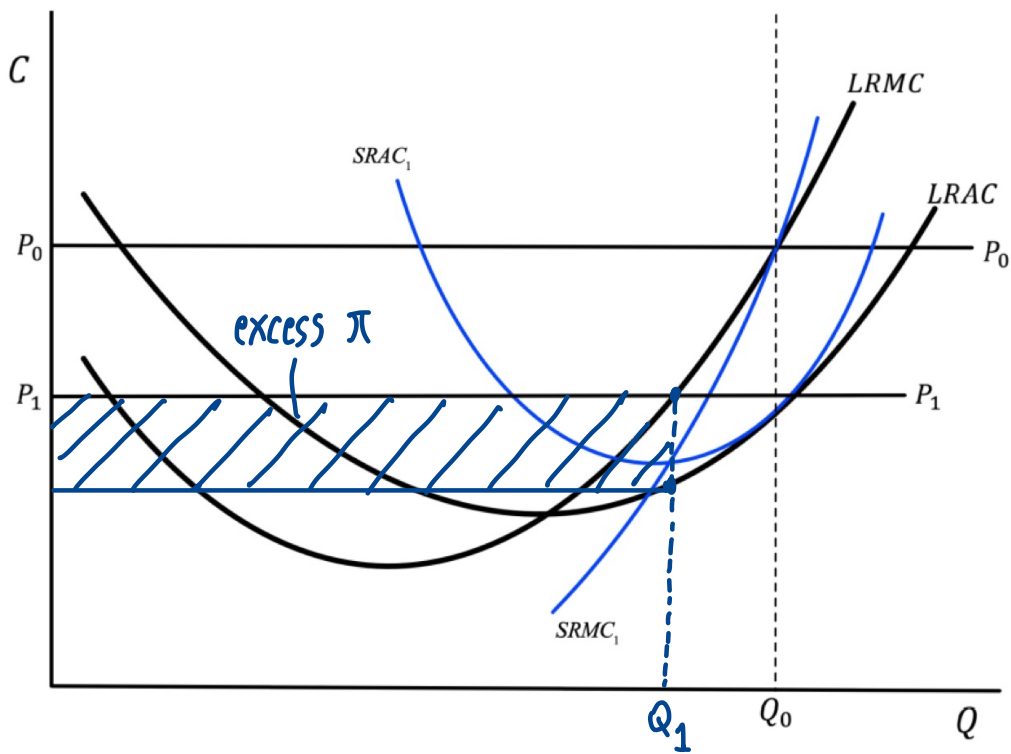
2.b)



- As shown in the graph, the blue shaded area represents for the profit earned according to LRAC at Q_1 and P_1 , on the other hand, the red shaded area represents for the profit earned according to SRAC at Q_1 and P_1 .

∴ It is clear that the blue shaded area is bigger than the red shaded area, meaning there is a higher profit in the Long-Run compared to the Short-Run.

2.c)



∴ According to the Long-Run cost curves LRAC and LRMC, at the new lower price P_1 , the equilibrium quantity drops from Q_0 to the new equilibrium quantity Q_1 .

Moreover, there is an excess profit at the equilibrium price P_1 and the equilibrium quantity Q_1 , which is represented by the blue shaded area as shown in the graph above.

③ 3.a) If GPO wants to maximize profit, where MR equals to SMC, they should import 10 million doses and set price at \$80 for each dose.

$$\begin{aligned} 3.b) \text{ The total profit} &= TR - TC \\ &= 80 \cdot (10) - 65(10) \\ &= 800 - 650 \end{aligned}$$

$$\therefore \pi = 150 \text{ million USD}$$

3.c) To set a fair price, where $SAC = D$, GPO needs to import 18 million doses at price \$50 for each dose.

3.d) - At 20 million doses imported, the price will be set at \$40 for each dose,

- At 20 million doses imported, it costs GPO \$48 for each dose.

$\therefore$ To get a dose, a person needs to pay \$40. Moreover, the loss that the government needs to subsidize for each dose is $\$48 - \$40 = \$8$. So, the total that the government should subsidize is $20 \times 8 = 160$ million USD.