Assignment 3
Assigned on Nov 9th, 2021. To be submitted on Nov 18th, 2021 before midnight.

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 lease 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.

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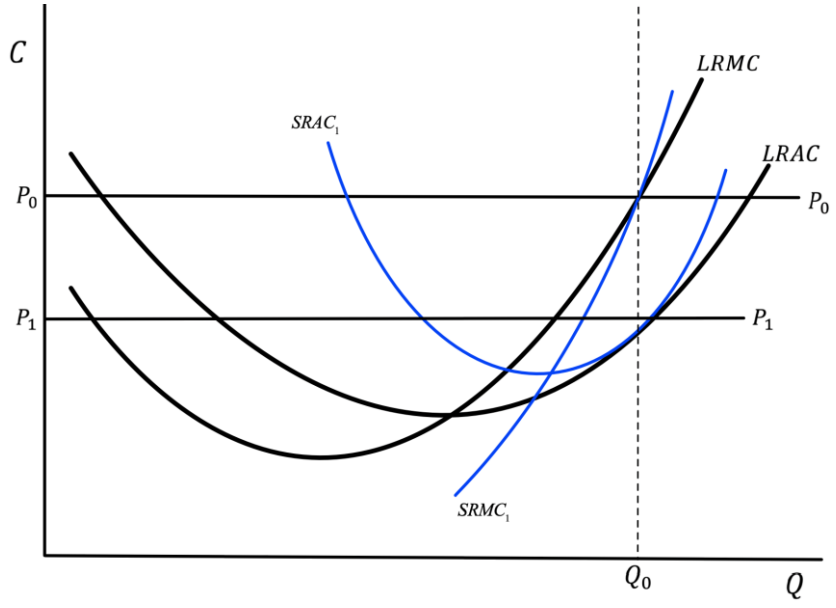
1. Two COVID-19 vaccines are available in Thailand, Sinovac and Pfizer priced at \$20 and \$40 respectively. Assumed that both vaccines are substitutes, answer the following questions clearly.

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.

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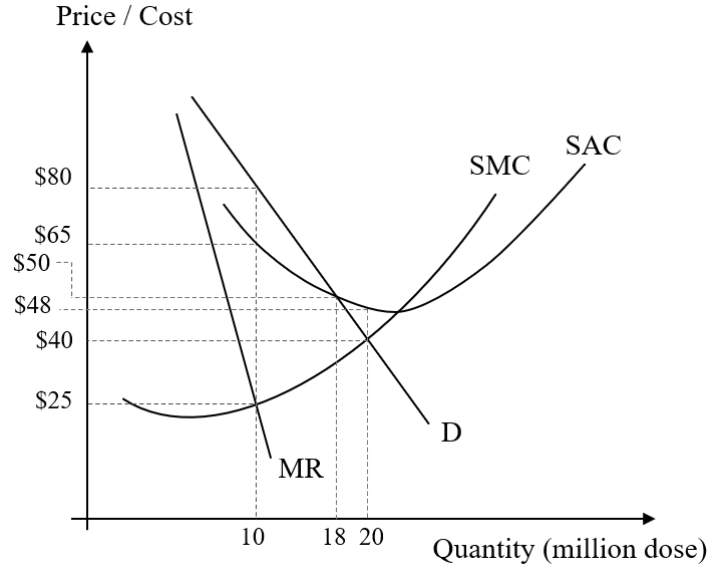
3. Thai government decides to import vaccines from J&J through the Government Pharmaceutical Organization (GPO). Supposed that GPO can act as a private monopoly firm, demand, revenue and cost of importing are displayed in the following graph in USD. Note that a single dose of J&J vaccine is sufficient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

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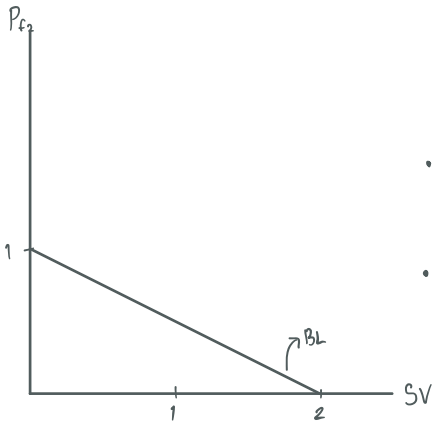


- so the consumer who has the budget of $40 can either get a shot of pfizer or two shots of sinovac
- note: if these aren't perfect sub, IC curve would be convex.

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.

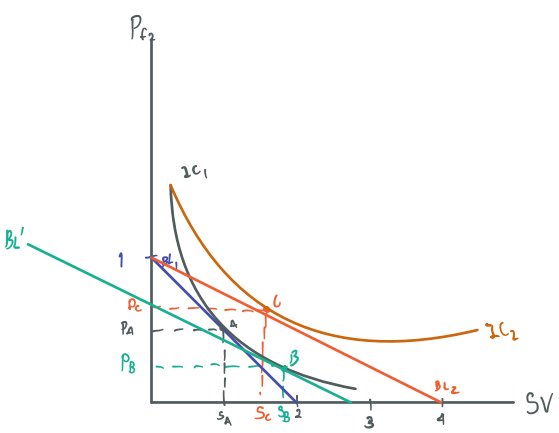
Sinovac → Inferior : 20 → 10 Pfizer → Normal Goods

$40 = 10x + 40y$

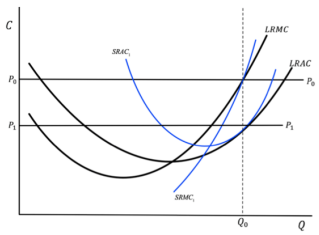
PE situation : Sinovac price ↓, causing demand for it to ↑

SE situation : When a substitute ↓ in price (sinovac), this will cause the demand for Sinovac to ↑ and on the contrary ↓ demand for Pfizer vaccines for maximum utility.

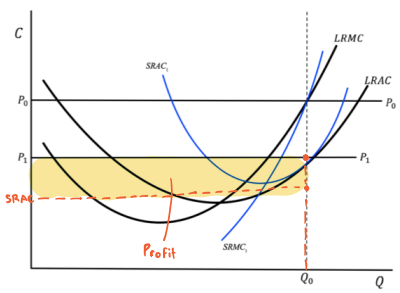
IE situation : Consumers have more purchasing power from $BL_1 \rightarrow BL_2$, with IE consumers would want less inferior goods (sinovac) and want more normal goods (P_{Pfizer})



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 $SRAC_0$ and $SRMC_0$, find the new Short-Run equilibrium quantity Q_1 and profit of the firm. State the equilibrium conditions.

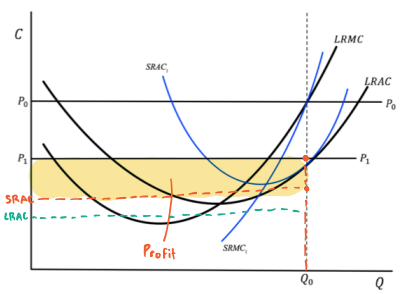


Max π : MR = MC

$P_1 = SRMC_1$

$\therefore \pi_{SR} = (P_1 - SRAC_1) \cdot Q^*_1$

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).



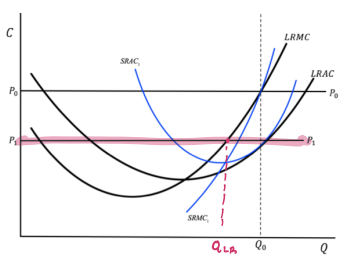
$\pi_{SR} = (P_1 - SRAC) \cdot Q_1$

$\pi_{LR} = (P_1 - LRAC) \cdot Q_1$

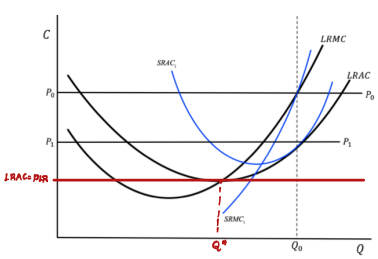
$LRAC < SRAC$

$\therefore \pi_{LR} > \pi_{SR}$

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.



Q_{LR} is Q^* in the long-run P_1



Q^* when there is no new sellers

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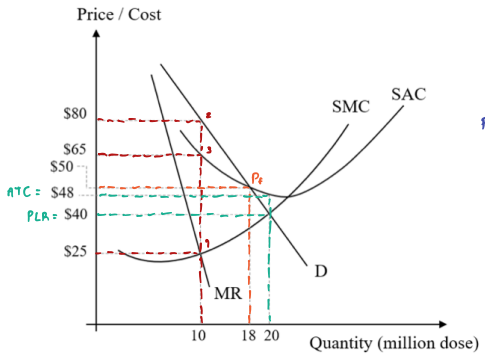

3a) Q^*_m = 10 M doses P^*_m = $80 per doses

3b) $\pi = (80-65) \cdot 10 = \$150$ M

3c) Q^*_M = 18 M doses P^*_F = $50 per dose

3d) The monopoly bears the burden because now ATC > p^*_1

Solution: the government subsidize the burden to compensate which is $(ATC-P) \cdot Q^* = (48-40) \cdot 20 = \$160$ M.