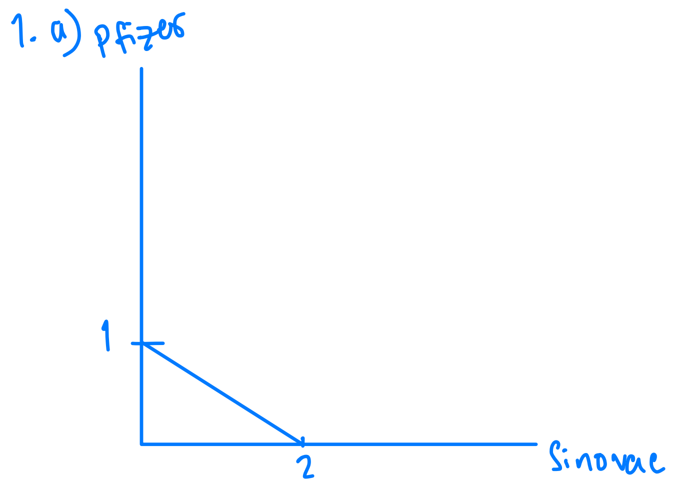
1\. a)

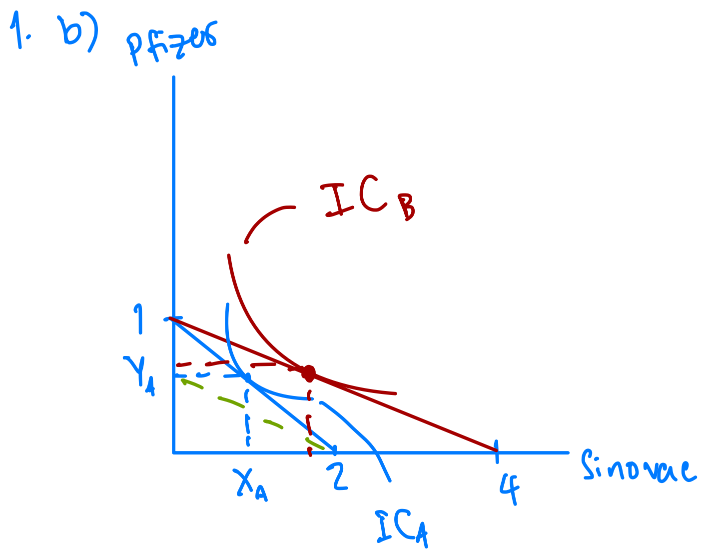


The price of sinovac = \$20
The price of Pfizer = \$40
The budget is \$40

∴ The equation is $20x + 40y = 40$ where x is Sinovac and y is Pfizer.

From the graph, the consumer can buy 2 doses of Sinovac or 1 dose of Pfizer.

1\. b)



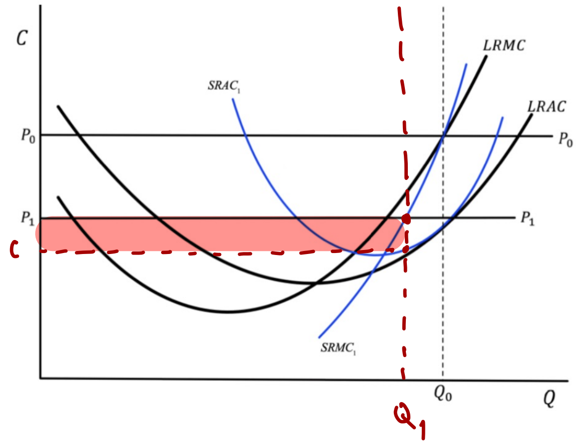
The substitution effect

- The consumer will still consume more Sinovac eventhough it is an inferior good.

The income effect

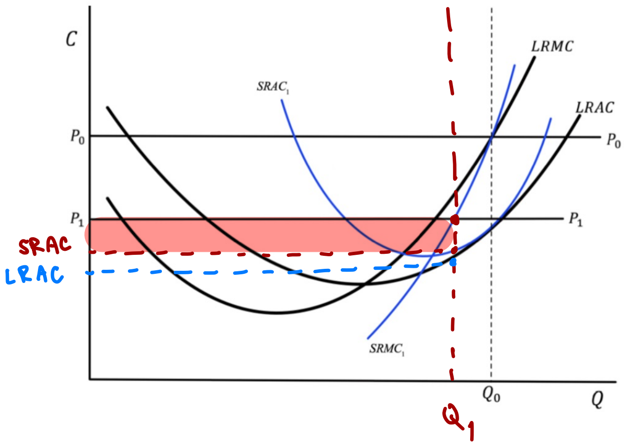
- In this case, the budget hasn't changed so there is no income effect. But if the budget increases demand for Sinovac will goes down and vice versa.

2. a)



The new equilibrium will shift to (P_1, Q_1). The firm will still have excess profit because $P_1 > SRAC$ at Q_1. The profit will be calculated by $TR - TC = (P_1 - c)q$. The profit is the red highlighted part.

2. b)



In the graph, we can see that the cost in the long run is lower than the cost in the short run. Since the cost is lower but the price stays the same, we can conclude that profit in the long run is higher.

3. a) To maximize profit, the GPO should import \$10 million doses and sell them at \$80 because the difference between the price and average cost is highest at this point according to the graph in the question.

3. b) $\pi = TR - TC$

$= (p - c)q$

$= (\underbrace{\$80 - \$65}_{15})\ 10$ million

$=$ \$ 150 million will be the total profit.

3. c) For a fair price, GPO have to get a normal profit. The amount of vaccines that would make normal profit would be at 18 million doses because the demand line intersects with SAC at that point. The price have to be set at $50 per dose for a normal profit.

3. d) Since the target is 20 million people and each person needs a dose of J & J, GPO needs to import 20 million dose. For a dose, each person will have to pay $40 where the demand line intersects with SMC. To cover the loss, the government have to subsidize for $ 144 million in total

$$\pi = TR - TC$$

$$= (P - C)q$$

$$= (40 - 48)\ 18 \text{ million}$$

$$= (-8)\ 18 \text{ million}$$

Loss = $144 million