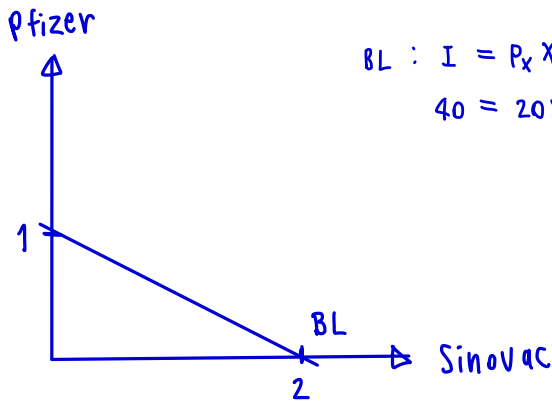
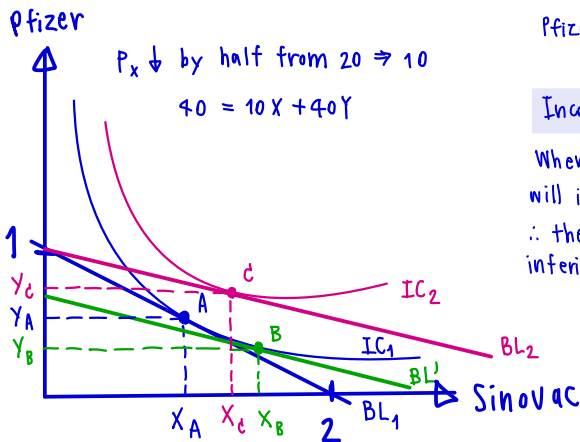


1. a)



1. b)



Substitution Effect

When P_{sinovac} decrease, consumer will increase sinovac and substitute by decrease Pfizer in order to maintain his content utility ($A \rightarrow B$)

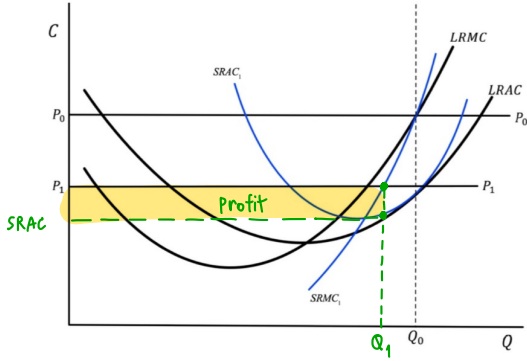
Income Effect

When P_{sinovac} decrease, purchasing power will increase from BL' to BL_2
 \therefore the consumer will decrease Sinovac as an inferior good and increase Pfizer as a normal good ($B \rightarrow C$)

Price Effect

When P_{sinovac} decrease, consumer will increase sinovac as an ordinary good ($A \rightarrow C$)

2.a)

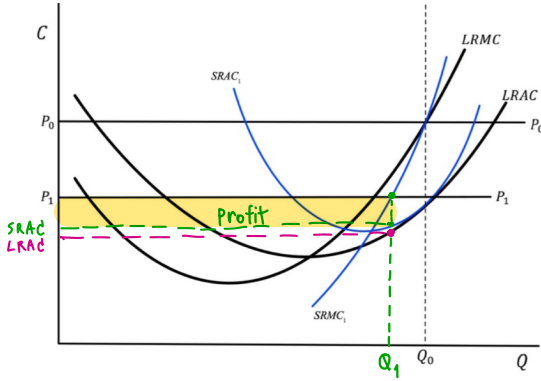


$$\text{Max } \pi \Rightarrow \text{MR} = \text{MC}$$

$$P_1 = \text{SRMC}$$

$$\therefore \pi_{SR} = (P_1 - \text{SRAC}) \times Q_1$$

2.b)

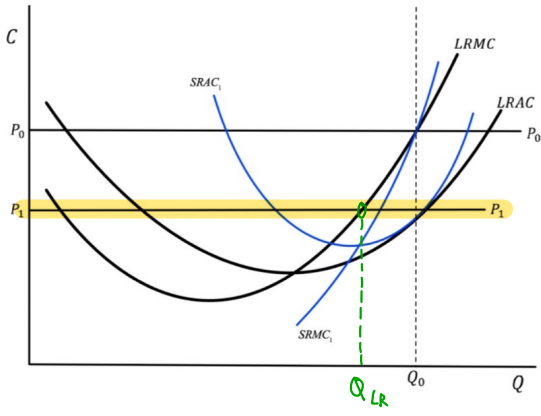


$$\pi_{SR} = (P_1 - \text{SRAC}) \times Q_1$$

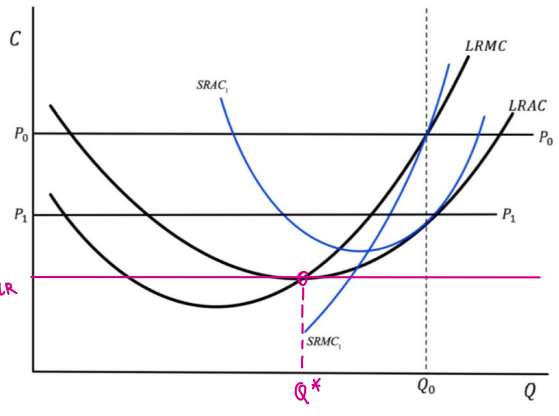
$$\pi_{LR} = (P_1 - \text{LRAC}) \times Q_1$$

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

2.c)



Q_{LR} is Q^* at Long run P_1



$LRAC = P_{LR}$

Q^* when no new seller enter

3.a) $Q_m^* = 10$ million doses

$P_m^* = \$80$ per doses

3.b) $\pi = (80 - 65) \times 10$

$= \$150$ million

3.c) $Q_m^* = 18$ million doses

$P_f^* = \$50$ per doses

3.d) When government need $Q^* = 20$ million doses,
monopoly faces loss since $ATC > P_I^*$

\therefore Government must subsidize that loss in order to
create incentive for monopoly to produce.

\therefore Subsidize $= (ATC - P) \times Q^*$

$= (48 - 40) \times 20$

$= \$160$ million

\therefore each person will pay at \$40