

Patcharapan korsuwat

HW#11, Due May 6, 2021 Analyze the case the firm receives subsidy for the following two different cases to find out how the firm's quantity and profit change.

- a) The government gives a lump sum subsidy of 20,000 bahts to each firm.
- b) Suppose that the firm was producing 1,000 units and the government gives a subsidy of 20 bahts/unit so the total subsidy is also 20,000 bahts if the firm does not change its production of 1,000 units. Do you think, to maximize its profit with the subsidy of 20 bahts/unit, the firm will increase/decrease its production from 1,000 units? Does the firm receive higher profit? Does the firm receive more/less subsidy than 20,000 bahts?

a) The firm receives a lump sum subsidy of 20,000 baht

$$TC(Q) = TFC(Q) + TVC(Q) \rightarrow \text{unchanged} \rightarrow MC \text{ unchanged}$$

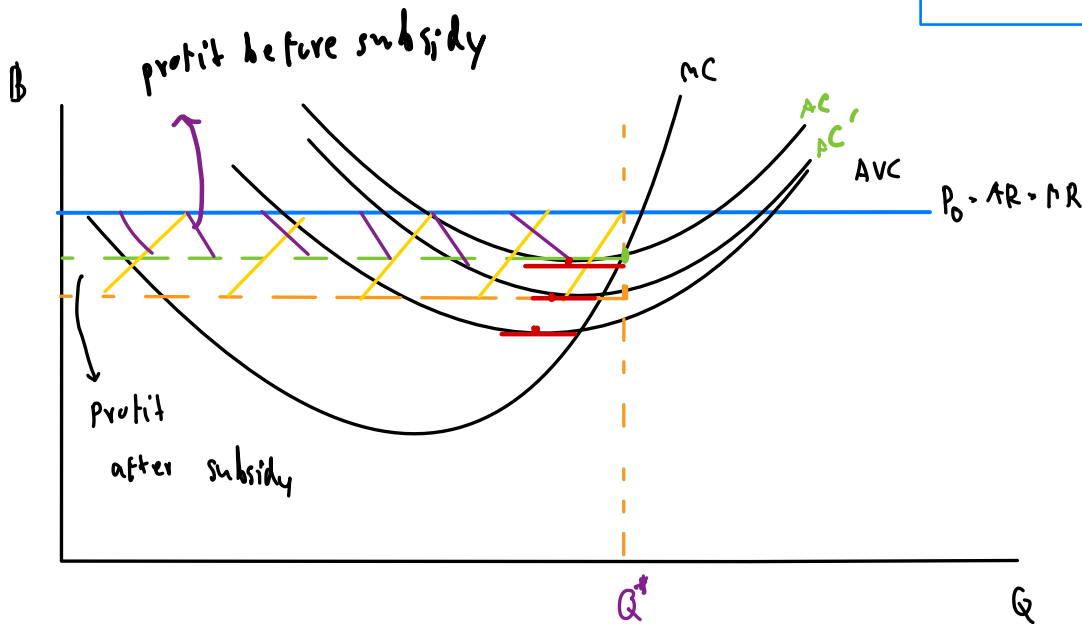
$$TC'(Q) = TFC'(Q) + TVC'(Q)$$

$$\frac{d}{dQ} TC'(Q) = \frac{d}{dQ} (TFC'(Q) + TVC'(Q))$$

$$\frac{d}{dQ} TC'(Q) = \frac{d}{dQ} (TFC(Q) - 20000 + TVC(Q))$$

$$\frac{TFC'(Q)}{Q} = \frac{TFC(Q)}{Q} - \frac{20000}{Q}$$

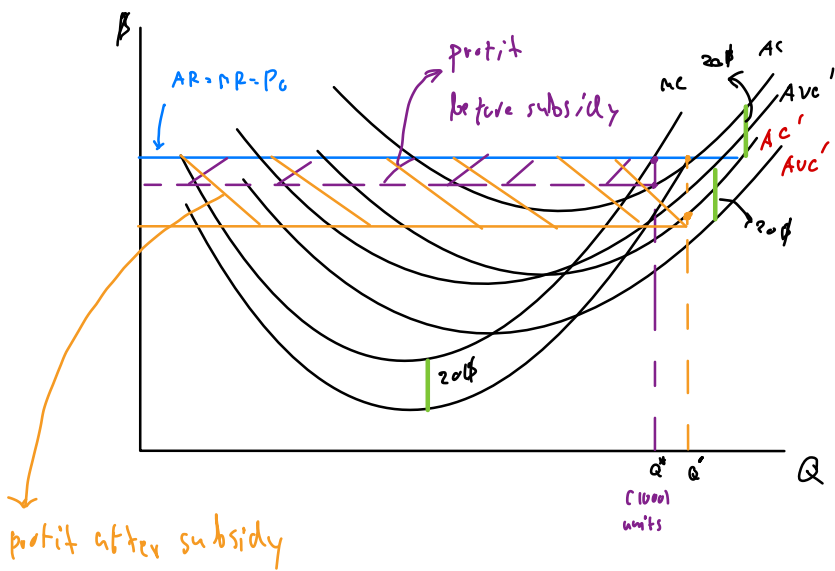
$$AFC'(Q) = AFC(Q) - \frac{20000}{Q}$$



∴ • MC & MR do not change → Eq. Q is still the same = Q^*

• the amount of increasing profit = $\frac{20,000}{Q^*}$ = the amount of lower fixed cost

b)



Eq. Q ↑
 profit ↑

Before subsidy: $MR(Q^*) = MC(Q^*)$

slope $MR(Q^*) = 0 < \text{slope } MC(Q^*)$

} $\rightarrow \text{Eq. } Q = Q^*$

after subsidy: $MR'(Q') = MC(Q')$

slope $MR'(Q') = 0 < \text{slope } MC(Q')$

} $\text{Eq. } Q = Q'$

\therefore The firm will increase its production from 1000 units in order to maximize its profit, ending up setting more profit; and receive more subsidy more than 20000 baht depending on how much products it produce more than Q^*

$Q^* - Q'$

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