

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.

- The government gives a lump sum subsidy of 20,000 bahts to each firm.
- 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) Firm receives a lump sum subsidy of 20,000 baht.

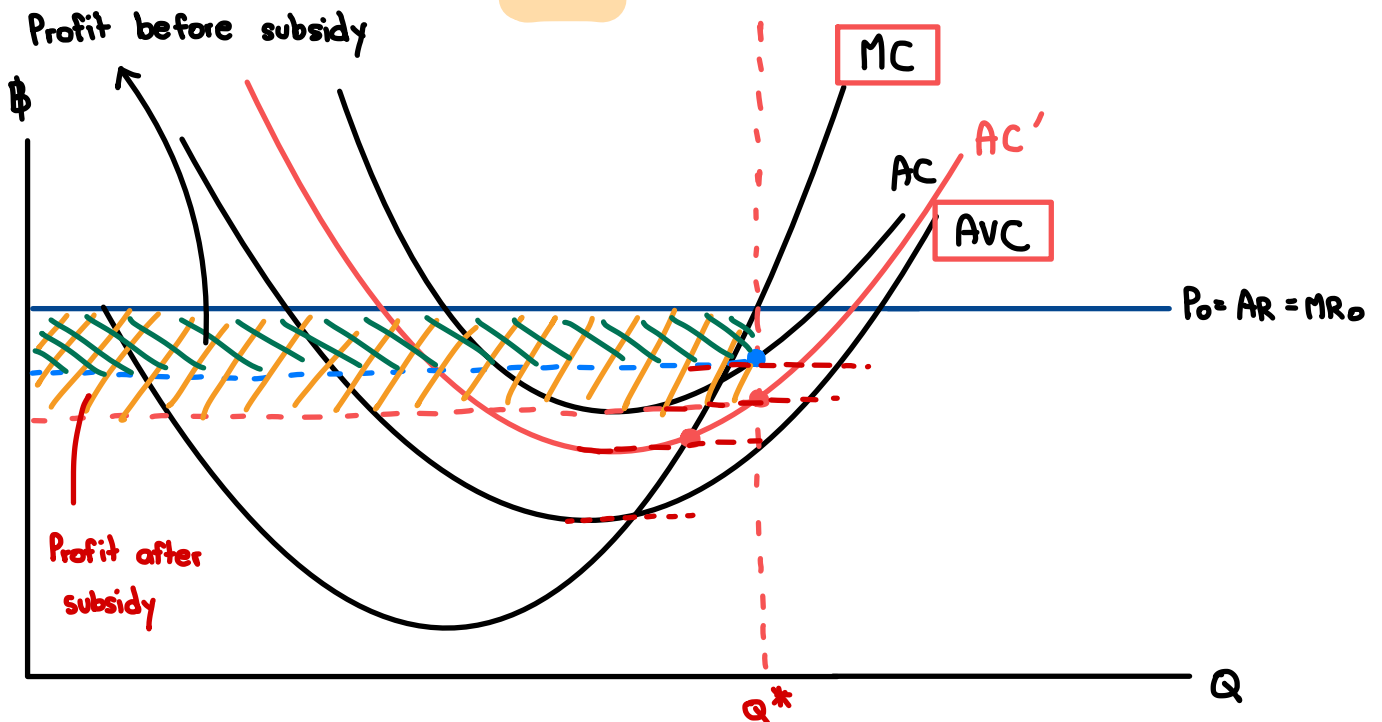
$$TC(Q) = TFC(Q) + TVC(Q) \quad \text{unchanged} = MC \text{ unchanged}$$

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

$$\frac{d}{dQ} (TFC(Q) - 20,000 + TVC(Q))$$

$$\frac{TFC'(Q)}{Q} = \frac{TFC(Q)}{Q} - \frac{20,000}{Q}$$

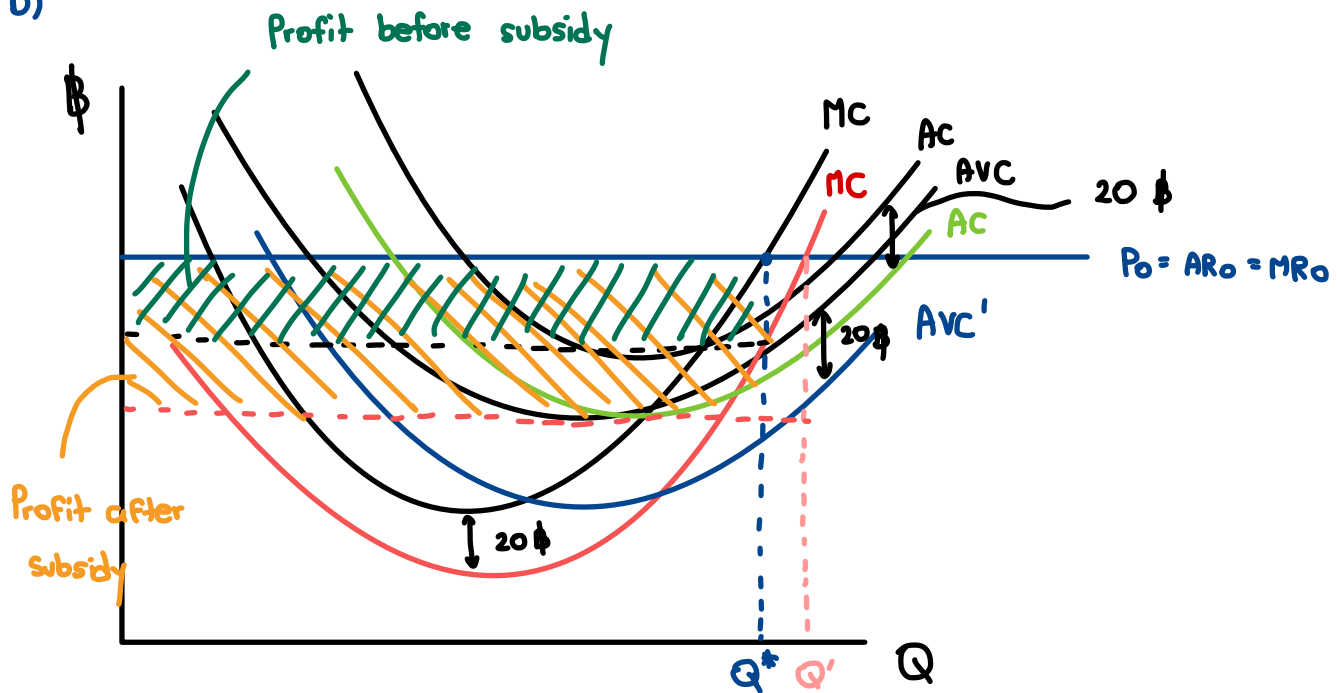
$$AFC'(Q) = AFC(Q) - \frac{20,000}{Q}$$



- Eq. quantity does not change $\rightarrow$ MC & MR do not.
- Increasing profit = 20,000 (the amount of lower fixed cost).

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?

b)



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

Eq Q^*

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

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

Eq Q'

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

$$MC'(Q) = MC(Q) - 20$$

The firm need to increase its production 1,000 units to gain and maximize its profit . Also receive subsidy more than 20,000 baht . However, depend on the quantity .