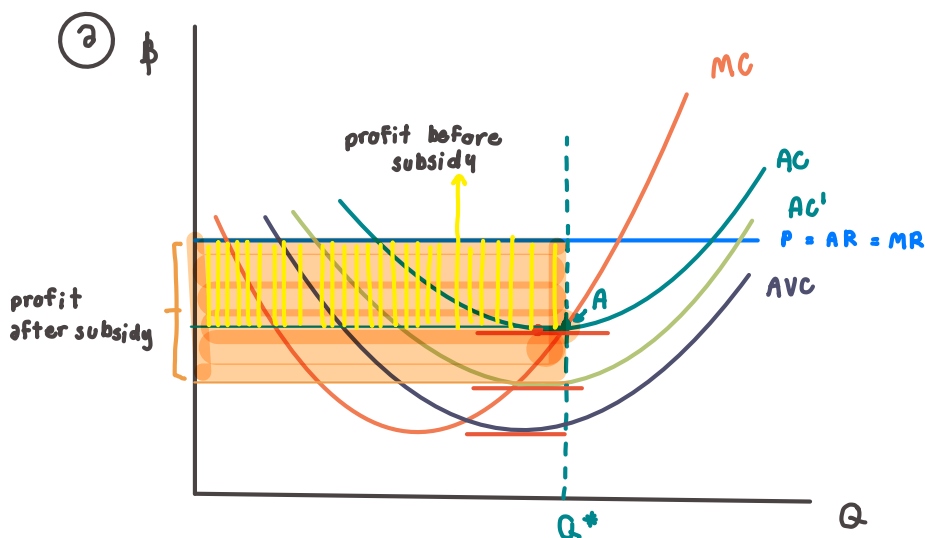


HW#11, Due May 6, 2021 Analyze the case the firm receives subsidy for the following two different cases to find out how the firm's quantity and profit change.

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?



Before the government gives subsidy eq. is at point A.

After the government give subsidy 20,000 bahts.

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

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

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

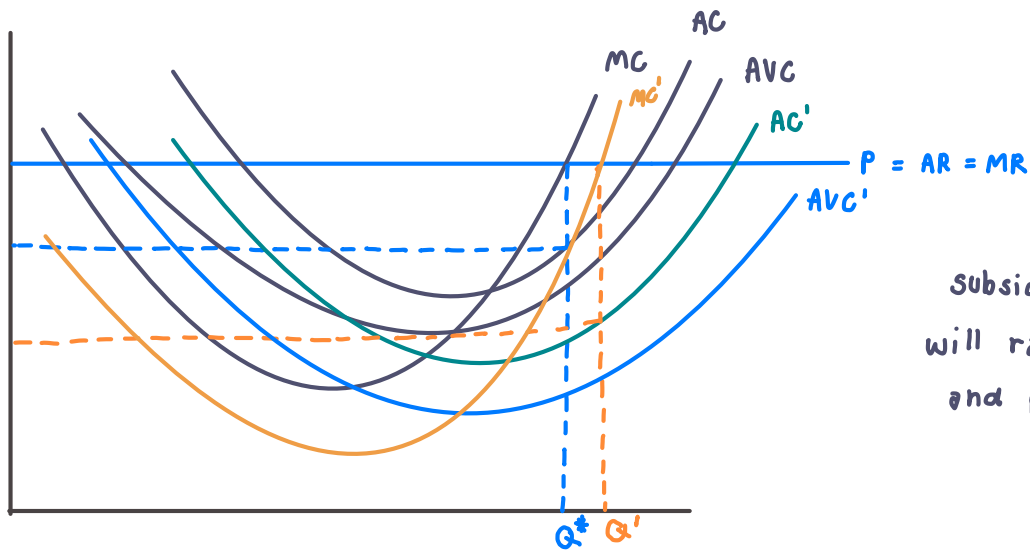
$$\frac{d}{dx} TC'(Q) = \frac{d}{dx} (TFC(Q) - 20000 + TVC(Q))$$

MC and MR do not change so $E_q Q$ is still at Q^*

$$\rightarrow \text{the profit increases } \frac{TFC'(Q)}{Q} = \frac{TFC(Q)}{Q} - \frac{20000}{Q}$$

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

(b)



Subsidy 20฿/unit
will raise the quantity
and profit.

MC & MC'
AC & AC'
AVC & AVC' } decrease 20

before subsidy : Eq is at Q^*

$$\rightarrow MR(Q^*) = MC(Q^*)$$

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

after subsidy : Eq. is at Q'

$$\rightarrow MR(Q') = MC(Q')$$

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

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

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

$$= TFC(Q) + TVC(Q) - 20Q$$

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

$$AC'(Q) = AFC(Q) + AVC(Q) - 20 = AC$$

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

∴ To maximize its profit, the firm will increase its production to Q' ($> 1,000$ units) and gain higher profit. The firm will also receive subsidy more than 20,000 baht according to the quantity it produces. However, if the firm produces more than Q' the cost will be higher and gain less revenue.