

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) The firm receives a lump sum subsidy for 20,000 B

TFC decreases

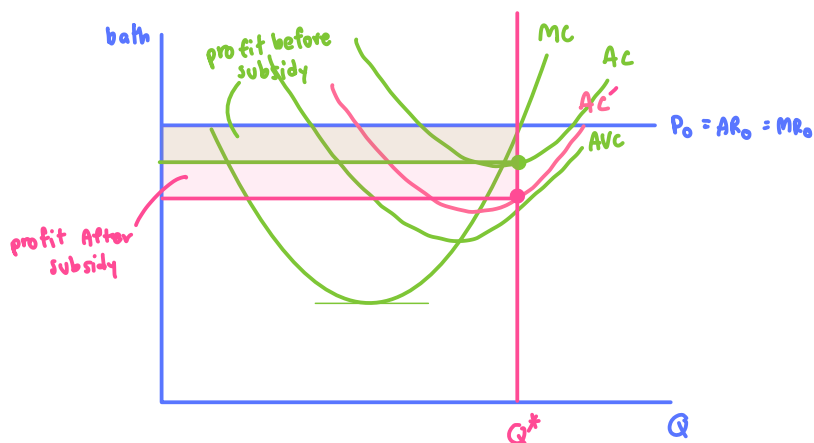
$$TC(Q) = TFC(Q) + TVC(Q)$$

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

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

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

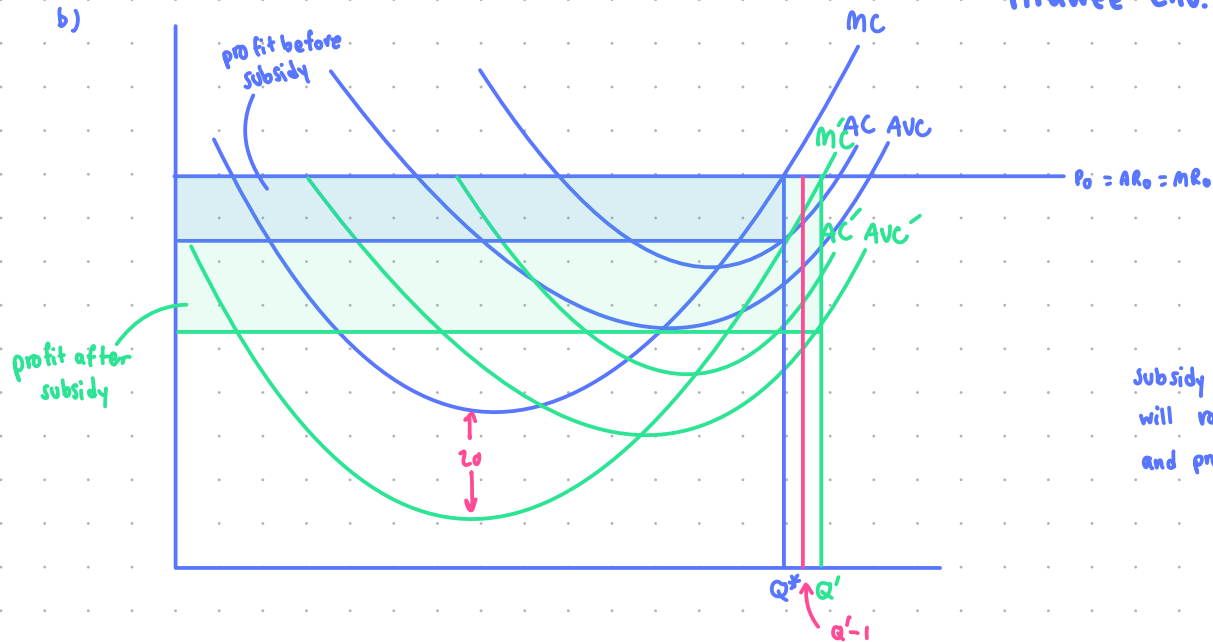
$$APC'(Q) = APC(Q) - \frac{20,000}{Q}$$



∴ Eq. quantity Q^* does not change because $MC \neq MR$ not

Q^* still satisfy the eq. conditions but profit increase. = the amount of lower fixed cost
= 20,000

b)



Subsidy 20฿/unit
will raise the quantity
and profit

- before subsidy : Eq. is at Q^*
- 1) $MR(Q^*) = MC(Q^*)$
 - 2) Slope $MR(Q^*) = 0 < \text{Slope } MC(Q^*)$
- after subsidy : Eq. is at Q'
- 1) $MR(Q') = MC(Q')$
 - 2) Slope $MR(Q') = 0 < \text{Slope } MC(Q')$

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

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

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

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

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

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

∴ To maximize its profit, the firm will increase its production to Q' and gain higher profit. The firm will also receive subsidy more than 20,000฿, due to the quantity it produces. However, if the firm produce more than Q' the cost will be higher and gain less revenue because when $MR > MC : Q \uparrow$

$MR < MC : Q \downarrow$

$MR = MC : \text{stop}$

Slope $MR < \text{Slope } MC$

