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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?

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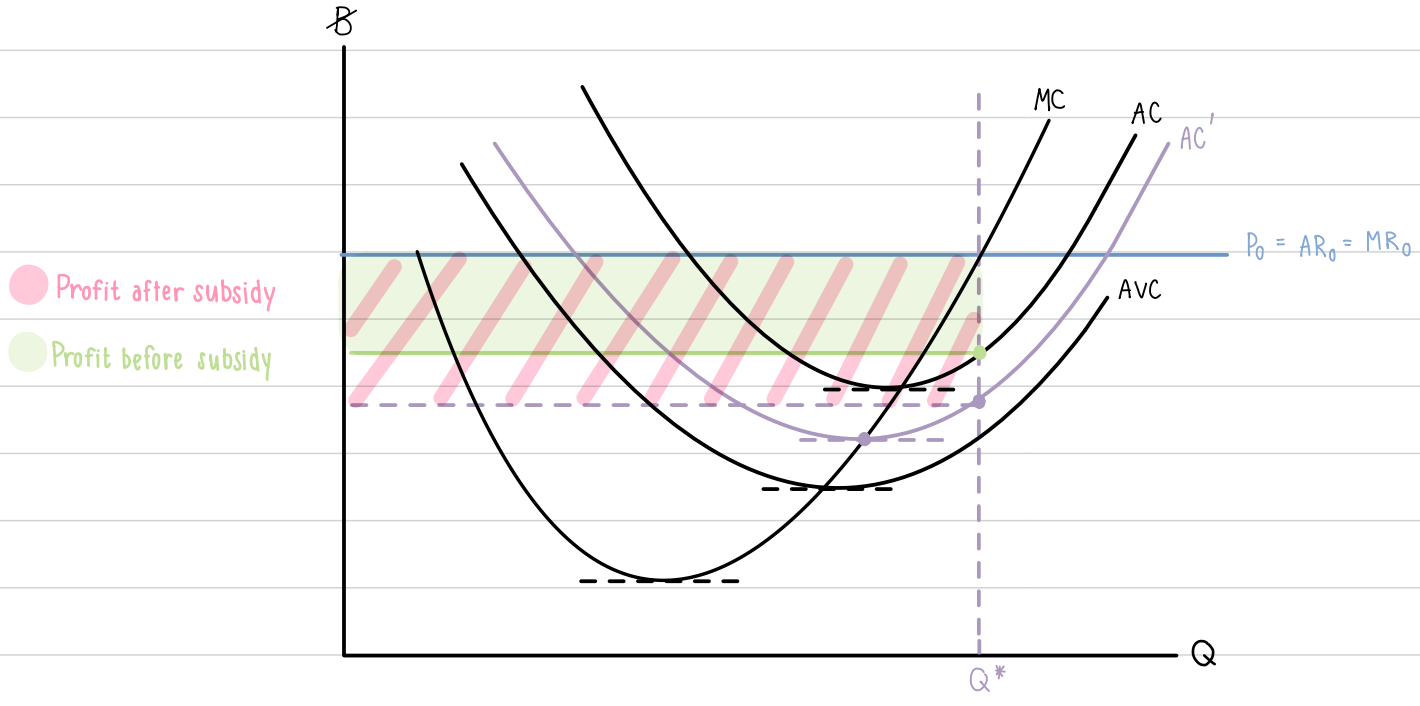
A) The government gives 20,000 ฿ as lump sum subsidy thus, TFC decreases.

• TVC is unchanged because $MC(Q) = \frac{d}{dQ} TVC(Q)$

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

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

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



Equilibrium Q^* does not change because MC and MR do not $-Q^*$ still satisfies the equilibrium conditions.

But the profit increases = amount of lower fixed cost which is 20,000

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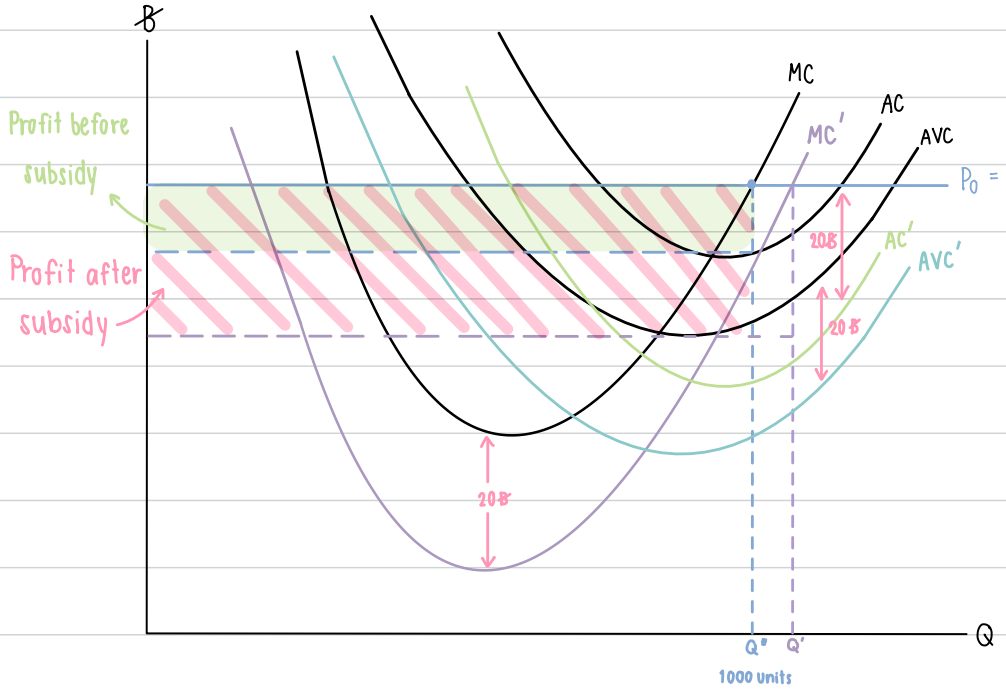

Subsidy = 20฿ per unit

∴ quantity and profit increases.

- Before subsidy : Equilibrium is at Q^*
  Where • $MR(Q^*) = MC(Q^*)$
  • Slope $MR(Q^*) = 0 <$ Slope $MC(Q^*)$
- After subsidy : Equilibrium is at Q'
  where • $MR(Q') = MC(Q')$
  • Slope $MR(Q') = 0 <$ slope $MC(Q')$

∴ To maximize the profit, the firm need to higher its production to Q' (>1000 units) and gain higher profit. The firm will also receive subsidy more than 20,000 baht according to the quantity that produces.

However, if the firm produces more than Q' the cost will be higher and gain less revenue

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

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

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

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

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

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