

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?

Q1) Government provide lump sum subsidy 20,000\$

$$TC = FC + VC : TC_2 = (FC - 20,000) + VC$$

$$TC_2 = FC_2 + VC$$

$$ATC_2 = AFC_2 + AVC$$

* since VC not change : MC not change

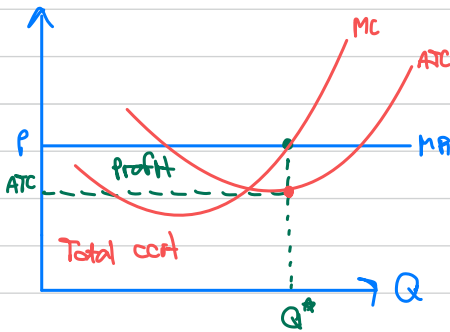
FC ↓ → AFC ↓

VC not change → AVC not change

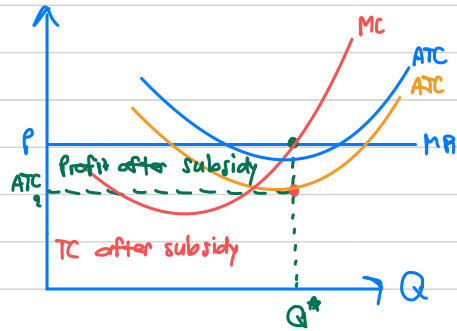
MC not change

TC ↓ → ATC ↓

Without subsidy



With subsidy



Profit maximize

When $MC = MR$

total revenue = $ATC \times Q^*$

total cost = $ATC \times Q^*$

as MC doesn't change so

Max π remain the same with Q^*

but with subsidy so TC decrease

∴ having more profit

∴ Firm will not change its production since receiving lump sum subsidy

∴ $\bar{P} = MC$ so Q^* not change

but $ATC \downarrow$ and profit \uparrow : $\bar{TR} - TC \downarrow$

; Total revenue remain the same

and total cost decrease

b) Government give subsidy 20¢/unit, producing 1,000 units = 20,000¢

$$TC = FC + VC ; TC_2 = FC + (VC - 20Q)$$

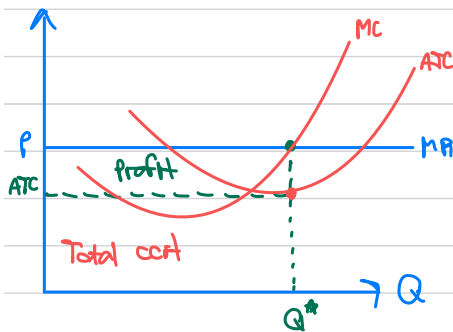
$$TC_2 = FC + VC_2$$

$$ATC_2 = AFC + AVC_2$$

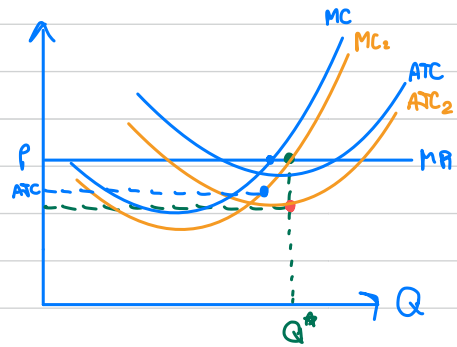
★ since vs change : MC change

FC not change → AFC not change
 VC ↓ → AVC ↓
 MC ↓
 TC ↓ → ATC ↓

Without subsidy



With subsidy



profit maximize

When $MC = MR$

$$\text{total revenue} = P \times Q^*$$

$$\text{total cost} = ATC \times Q^*$$

∴ By providing subsidy 20¢/unit quantity produce will be increase and profit also increase.

∴ Since $MC \downarrow$ so firm will decrease quantity sell until $P = MC_2$

$$\therefore Q \uparrow (Q^*_1 \text{ to } Q^*_2)$$

also $ATC \downarrow \rightarrow \text{profit} \uparrow : TR \uparrow - TC \downarrow$

$$\Pi \uparrow : (P \times Q \uparrow) - (ATC \downarrow \times Q \uparrow)$$

firms get 20¢/unit, but as firm $\uparrow Q$ so firm subsidy = $(20) \times (>1000) : 200$

∴ subsidy will be more than 20,000