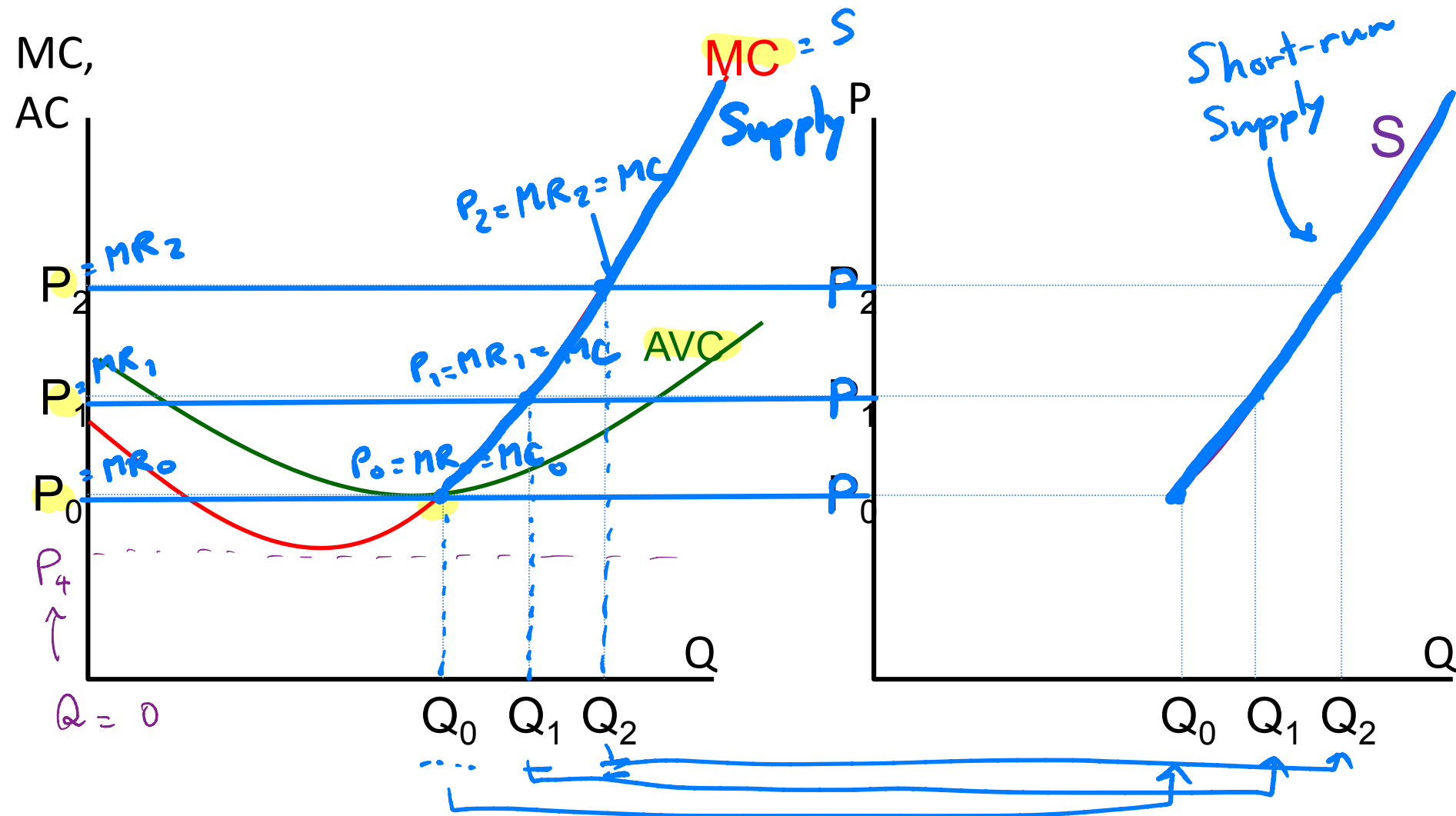


Firm's Short-Run Supply Curve



Applications

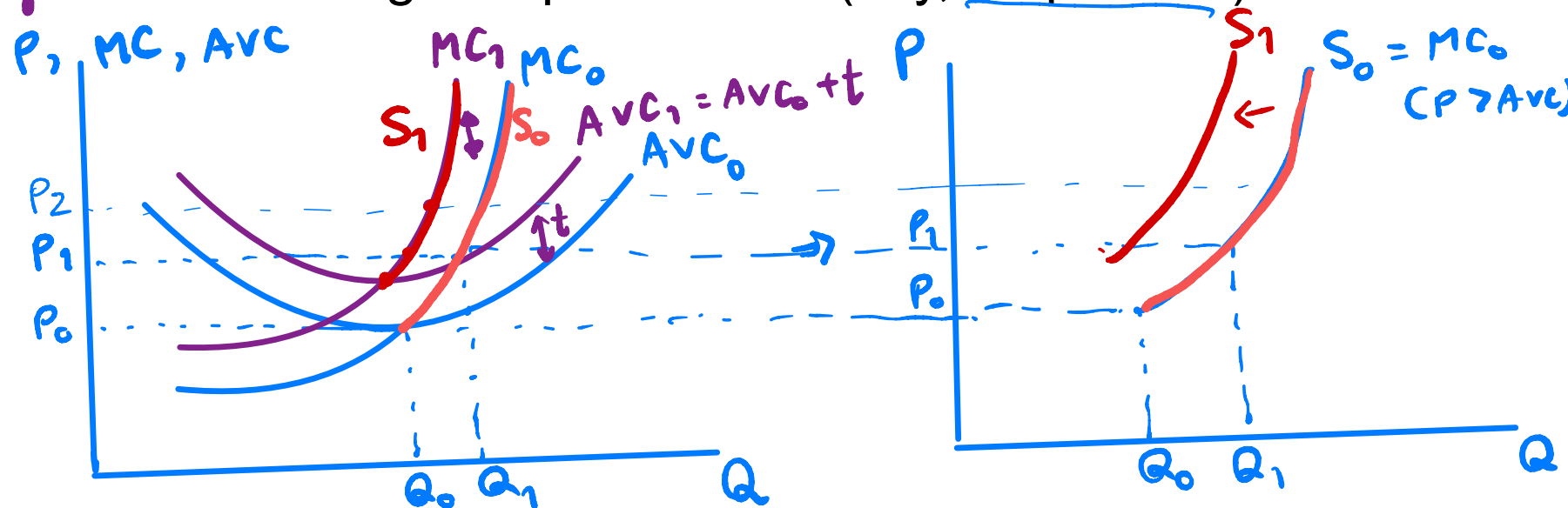
$$C_i(Q) = TC(Q) = TFC(Q) + TVC(Q)$$

$$AVC_i(Q) = \frac{TVC(Q)}{Q} ; MC_i(Q) = \frac{\Delta TC}{\Delta Q} = \frac{dC}{dQ}$$

- What would happen to AVC and MC curves if:

AVC_1 $\leftarrow$ MC does not change. Firm is charged a lump-sum tax (e.g. property tax) of T_0 ? $C_2 = TFC + TVC + T_0 \leftarrow$ fixed $\rightarrow AVC_2 = AVC_1 ; MC_2 = MC_1$

Firm is charged a per-unit tax (say, \$5 per unit)?



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

$$\text{Ex. } TC_0(Q) = 50 + 5Q + Q^2$$

$$\bullet \quad ATC_0(Q) = \frac{TC}{Q} = \underbrace{\frac{50}{Q}}_{AFC} + \underbrace{5 + Q}_{AVC_0}$$

$$AVC_1 = AVC_0 + t$$

$$TC_1(Q) = TC_0(Q) + t \cdot Q$$

per-unit tax

$$\bullet \quad ATC_1(Q) = \frac{50 + 5Q + Q^2 + tQ}{Q} = \underbrace{\frac{50}{Q}}_{AFC} + \underbrace{5 + Q + t}_{AVC_1}$$

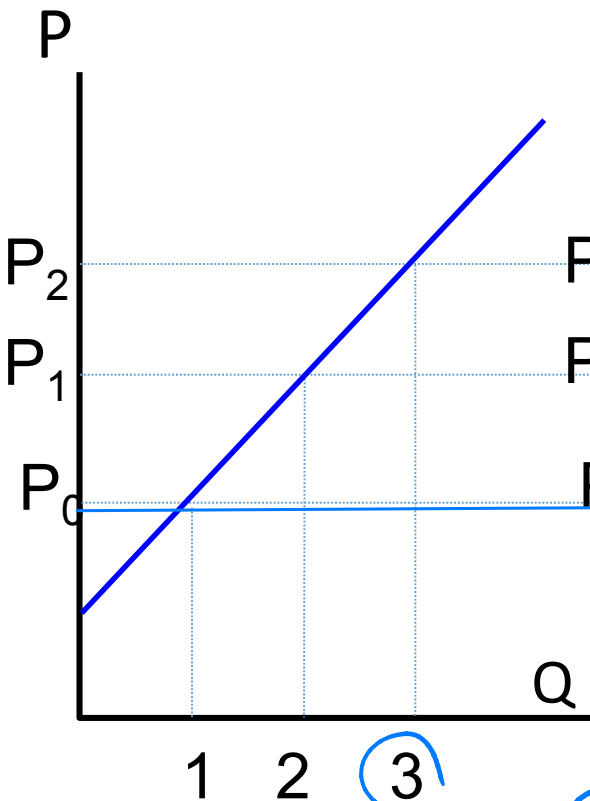
$$\bullet \quad MC_0(Q) = \frac{d(50 + 5Q + Q^2)}{dQ} = 5 + 2Q$$

$$MC_1 = MC_0 + t$$

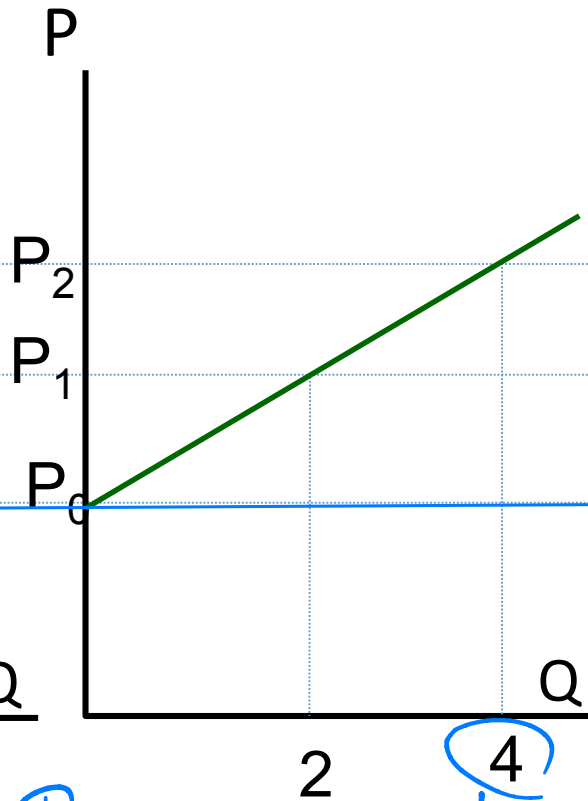
$$\bullet \quad MC_1(Q) = \frac{d(50 + 5Q + Q^2 + tQ)}{dQ} = 5 + 2Q + t$$

Market Supply Curve = horizontal sum of individual firms' supply

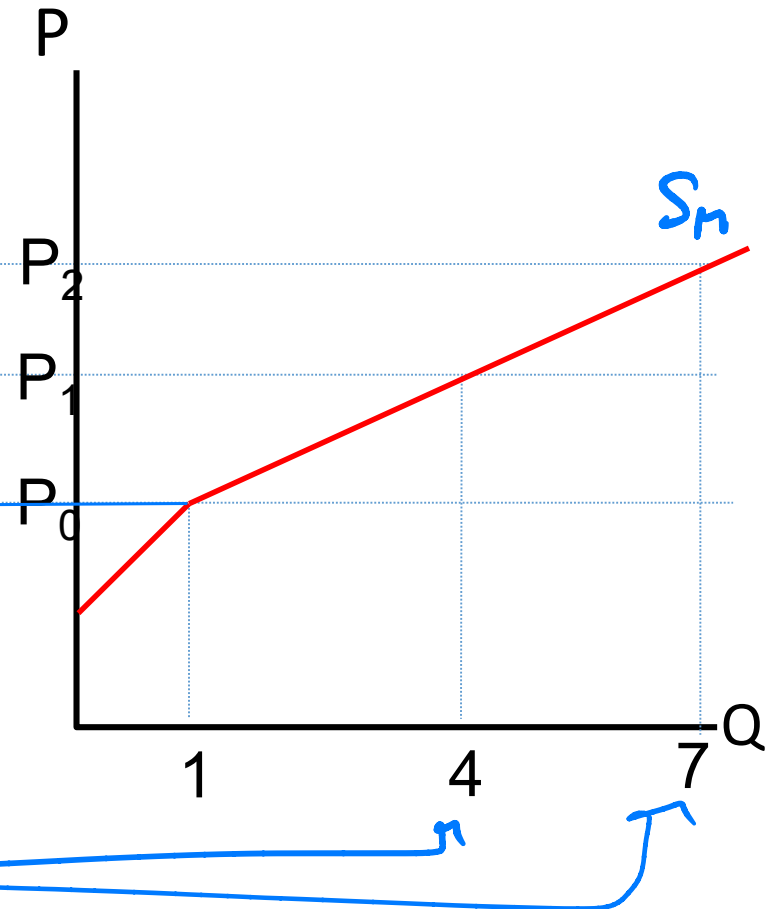
Firm 1



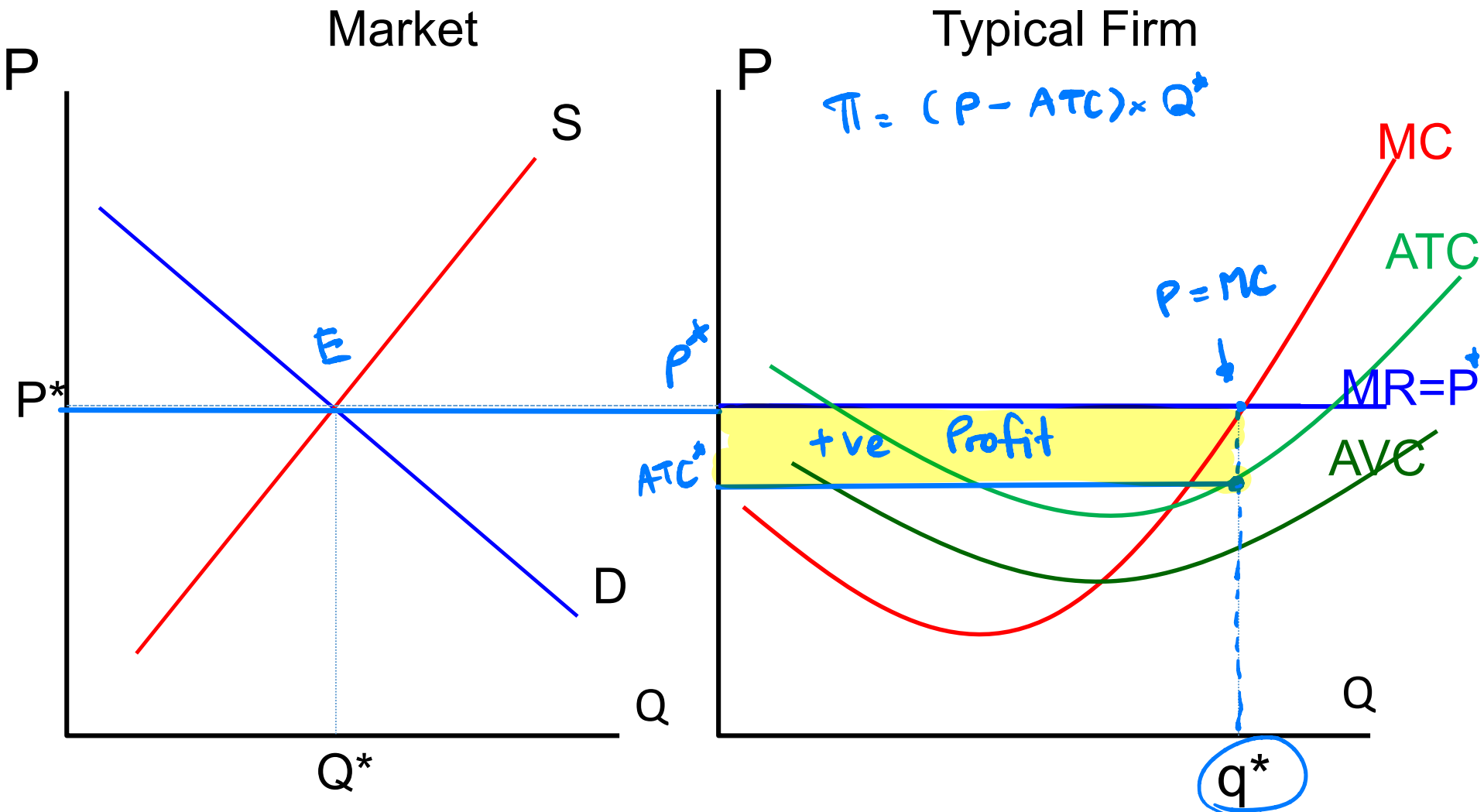
Firm 2



Market

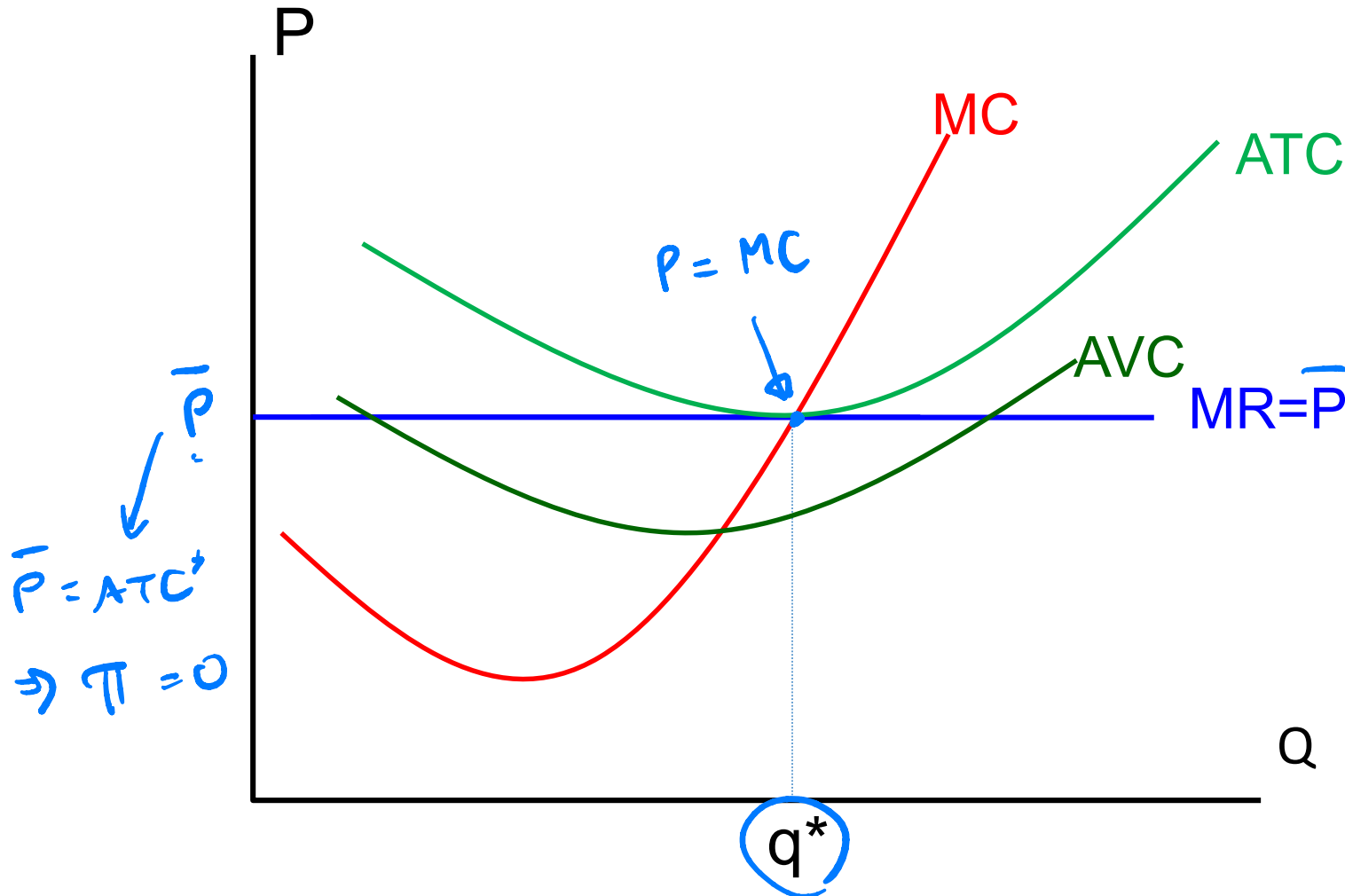


Short-Run Equilibrium: Positive Profit



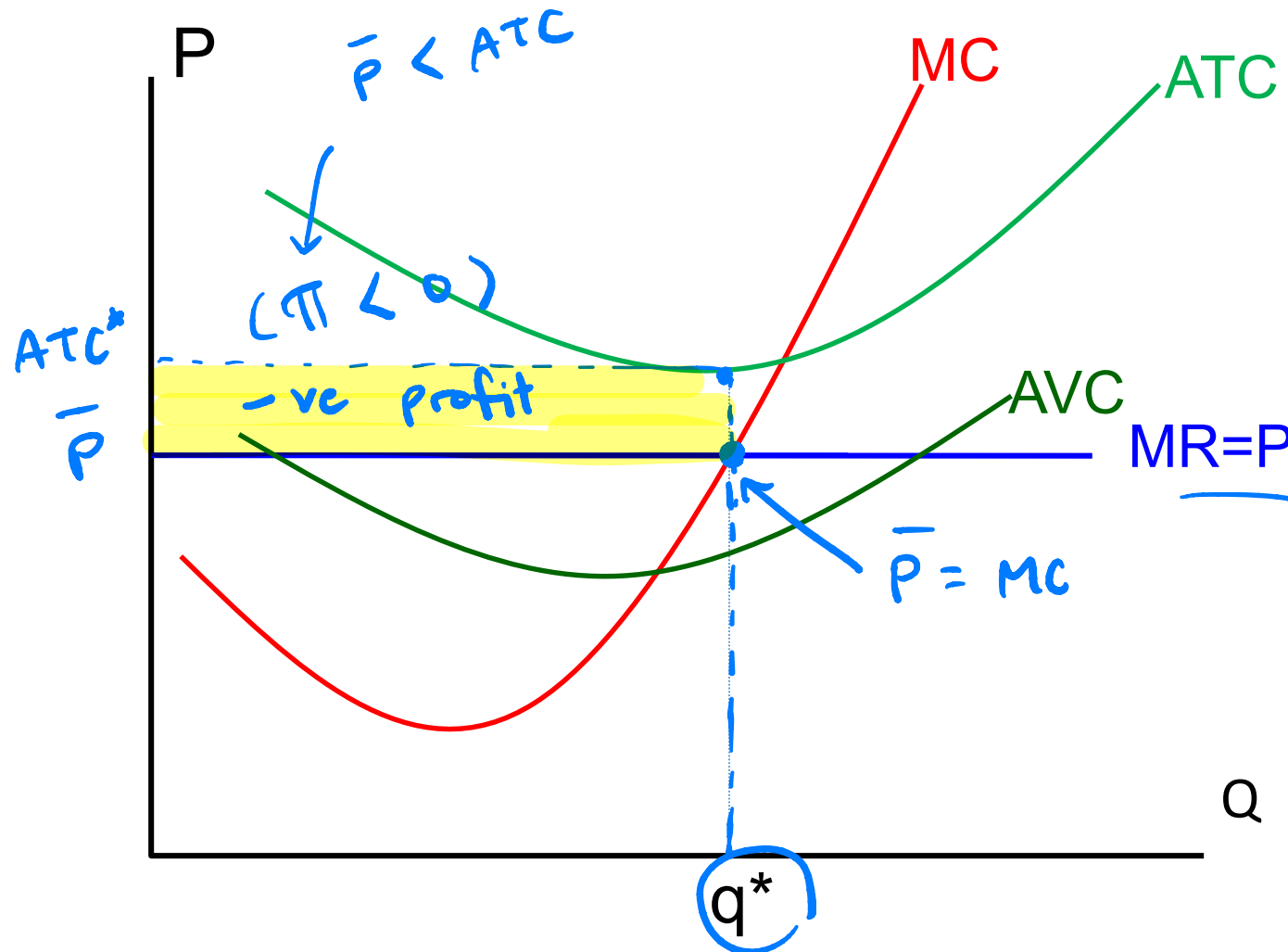
Short-Run Equilibrium: Zero Profit

Normal profit ($\pi = 0$)



Short-Run Equilibrium: Negative Profit

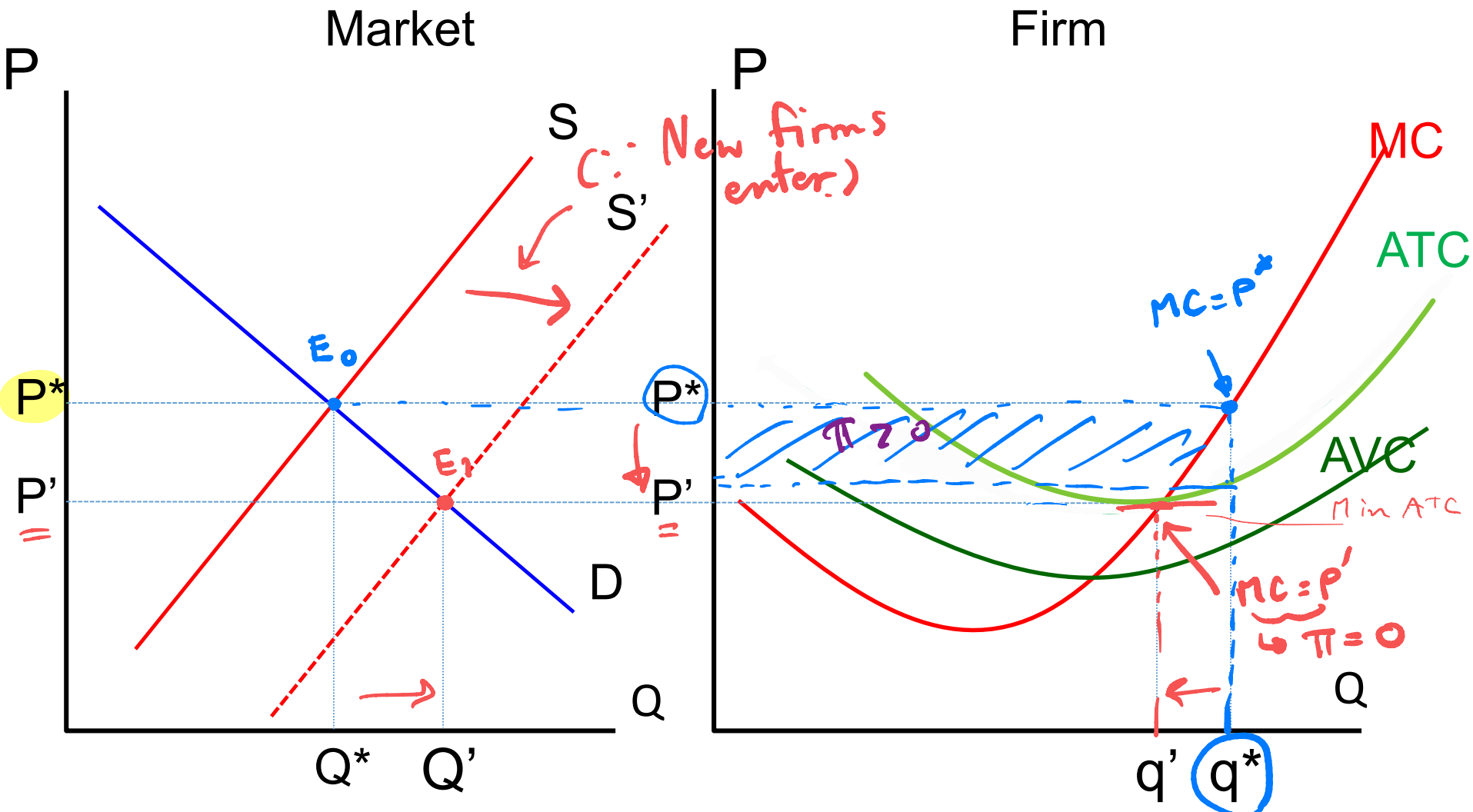
$$\pi = (P - ATC) \times Q$$



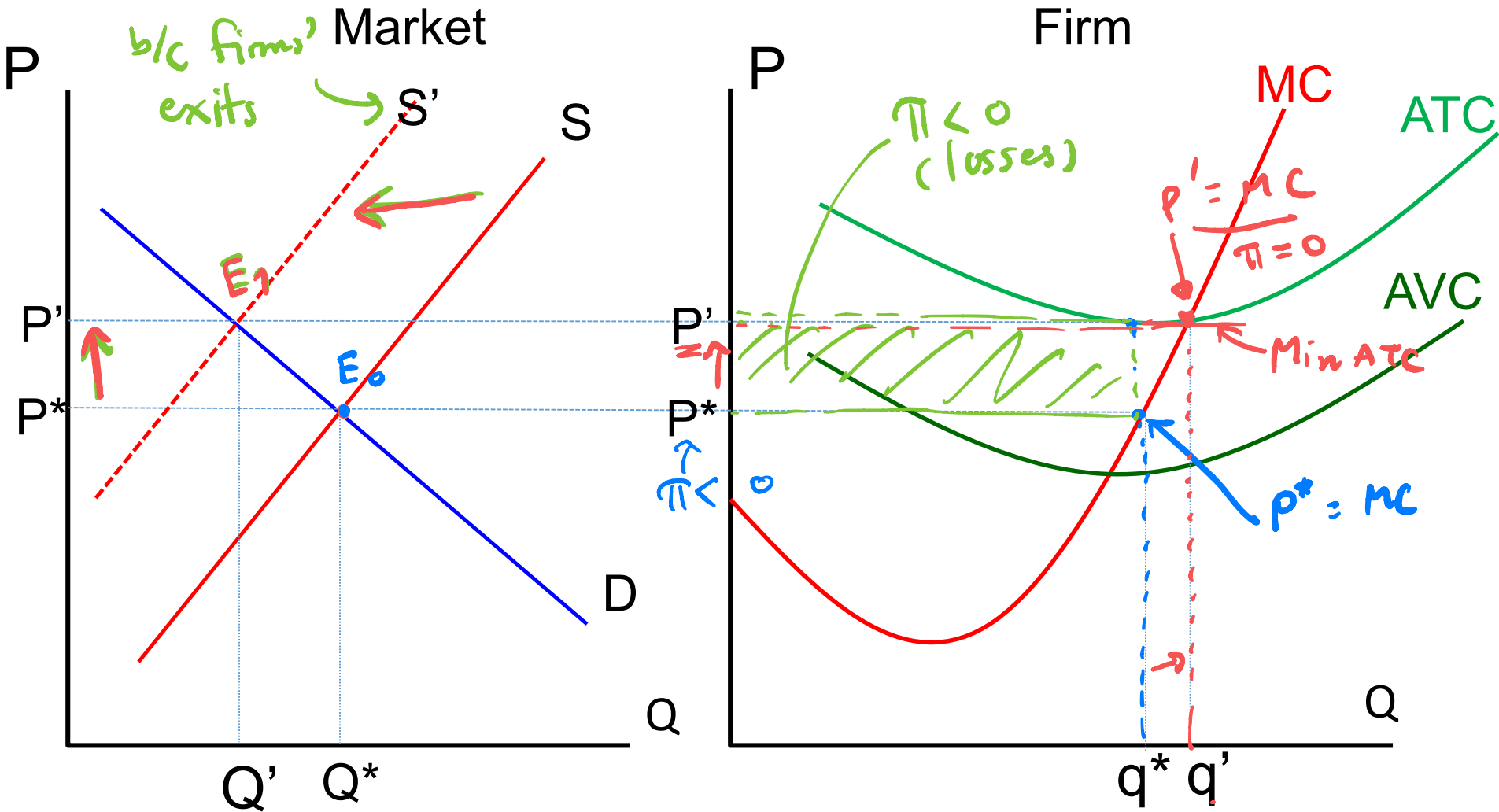
Long-Run Decisions

- In the long-run, the number of firms can change due to entry & exit.
- If existing firms earn positive economic profit,
 - New firms enter.
 - SR market supply curve shifts right.
 - P falls, reducing firms' profits.
 - Entry stops when firms' economic profits have been driven to zero.
- If existing firms incur losses,
 - Some firms will exit the market.
 - SR market supply curve shifts left.
 - P rises, reducing remaining firms' losses.
 - Exit stops when firms' economic losses have been driven to zero.

New Entrants Attracted by Positive Profits (SR)



Exits Caused by Losses (SR)



Long-Run Equilibrium

Conditions for a competitive market to be in a long-run equilibrium:

- Existing firms must be maximizing their profits.
 - $P = MC$
- Existing firms must not be suffering losses.
 - Not having negative profits
- Existing firms must not be earning profits.
 - Each receives normal profit (economic profit = 0).
- Each existing firm must be at the minimum point of its LRAC curve.
 - Unable to increase profits by changing size of the production.