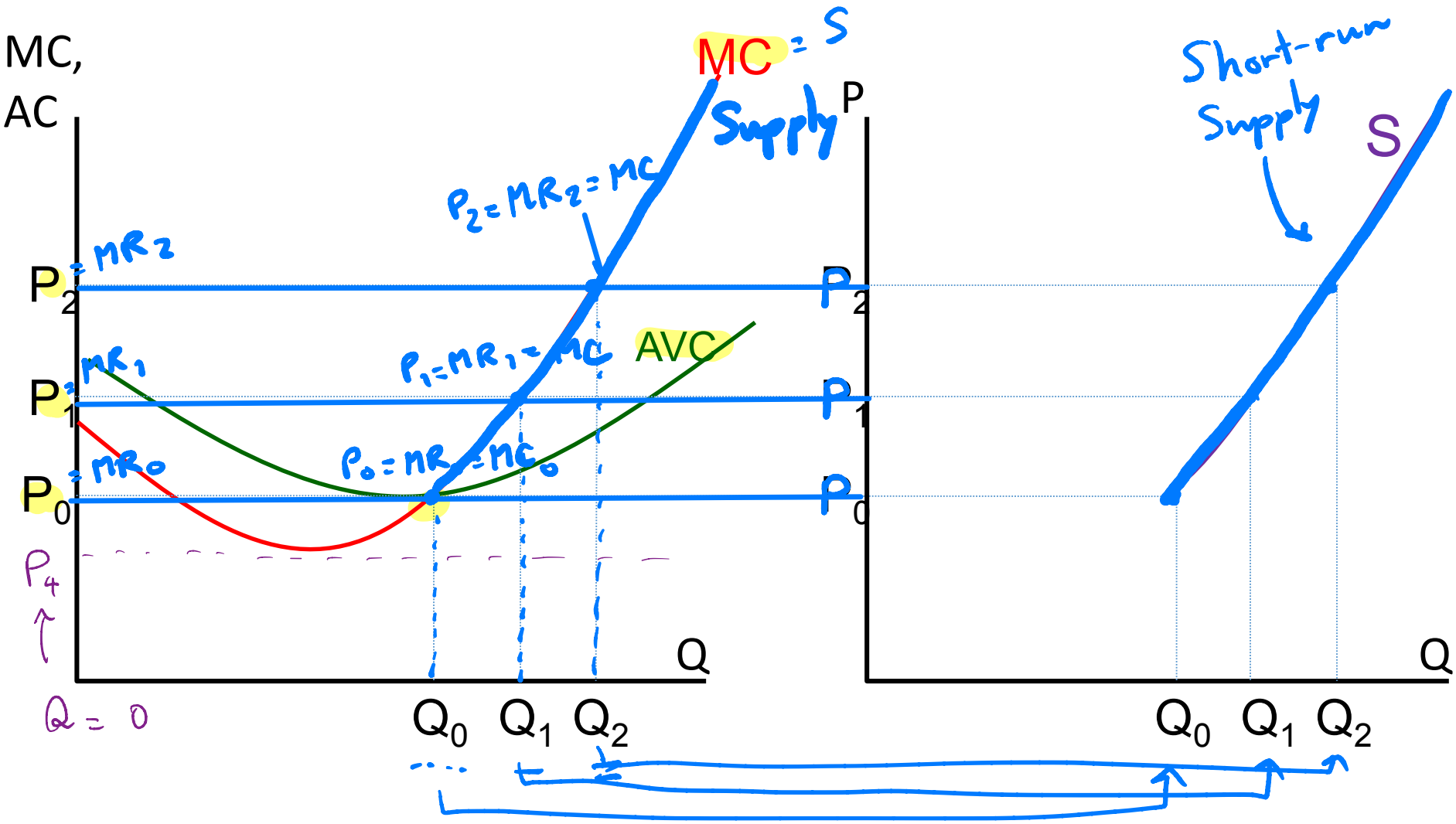
Firm's Short-Run Supply Curve

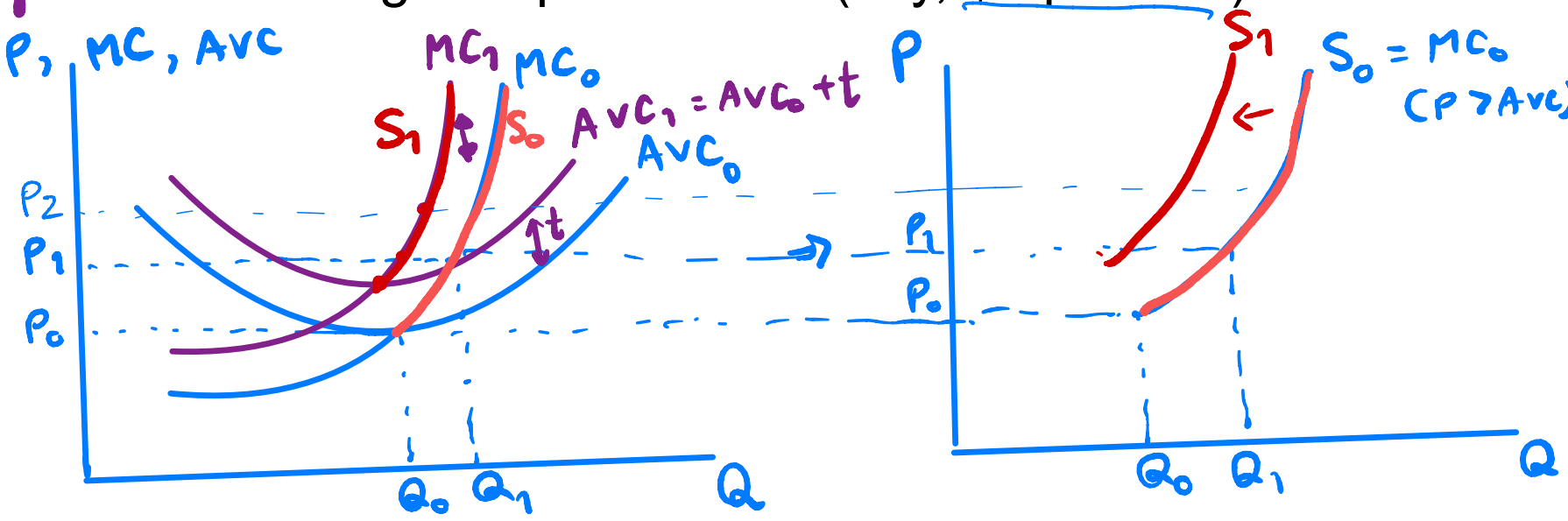


Applications

$C_1(Q) = TC(Q) = TFC(Q) + TVC(Q)$

$AVC_1(Q) = \frac{TVC(Q)}{Q}$; $MC_1(Q) = \frac{\Delta TC}{\Delta Q} = \frac{dC}{dQ}$

- What would happen to AVC and MC curves if:
  - Firm is charged a lump-sum tax (e.g. property tax) of T_0? $C_2 = TFC + TVC + T_0$ ← fixed → $AVC_2 = AVC_1$; $MC_2 = MC_1$ (AVC, MC does not change)
  - Firm is charged a per-unit tax (say, $5 per unit)?



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

Ex. $TC_0(Q) = 50 + 5Q + Q^2$

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

$AVC_1 = AVC_0 + t$

per-unit tax

$TC_1(Q) = TC_0(Q) + tQ$

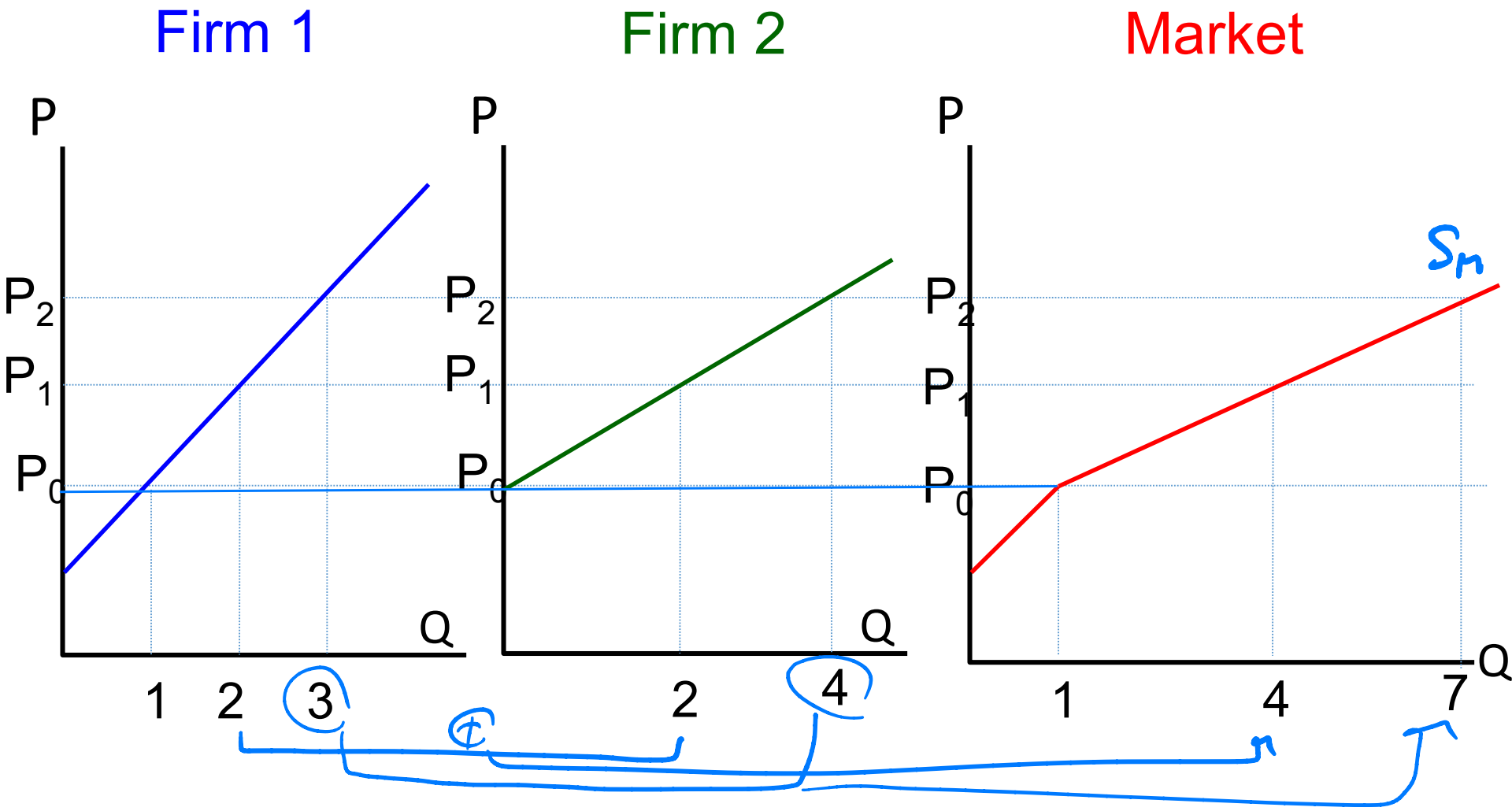
- $ATC_1(Q) = \frac{50 + 5Q + Q^2 + tQ}{Q} = \underbrace{\frac{50}{Q}}_{AFC} + \underbrace{5 + Q + t}_{AVC_1}$

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

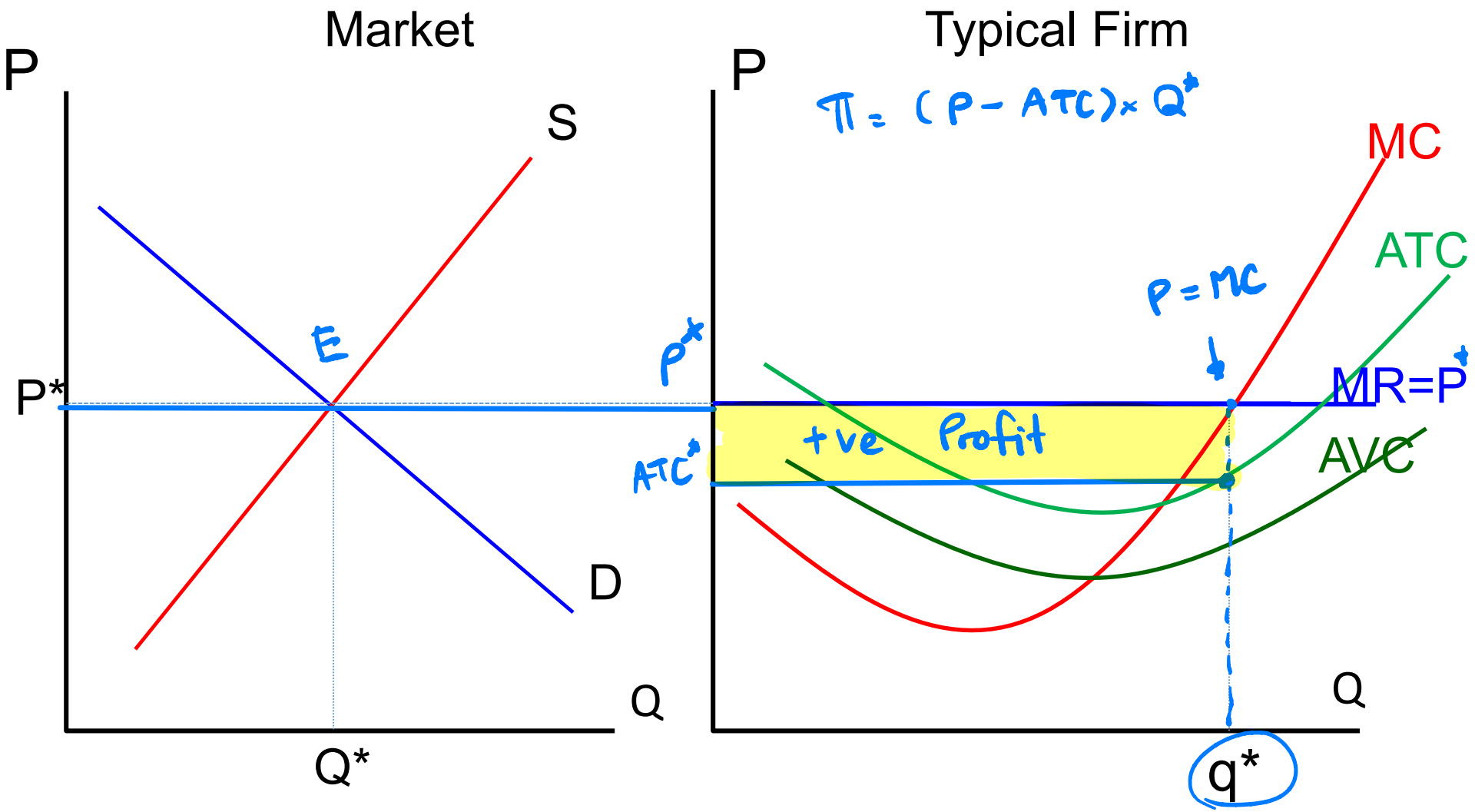
$MC_1 = MC_0 + t$

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

Market Supply Curve = horizontal sum of individual firms' supply

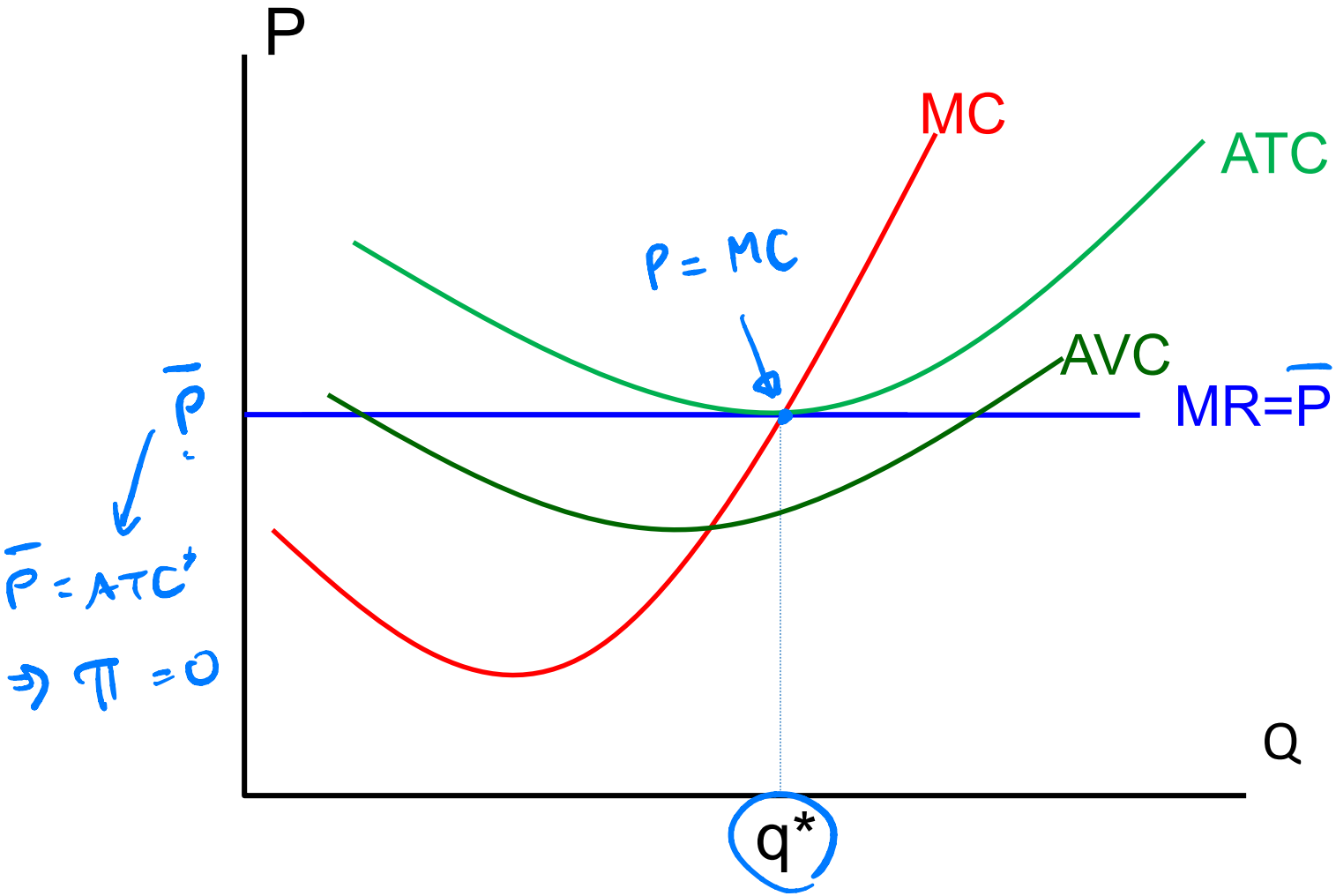


Short-Run Equilibrium: Positive Profit

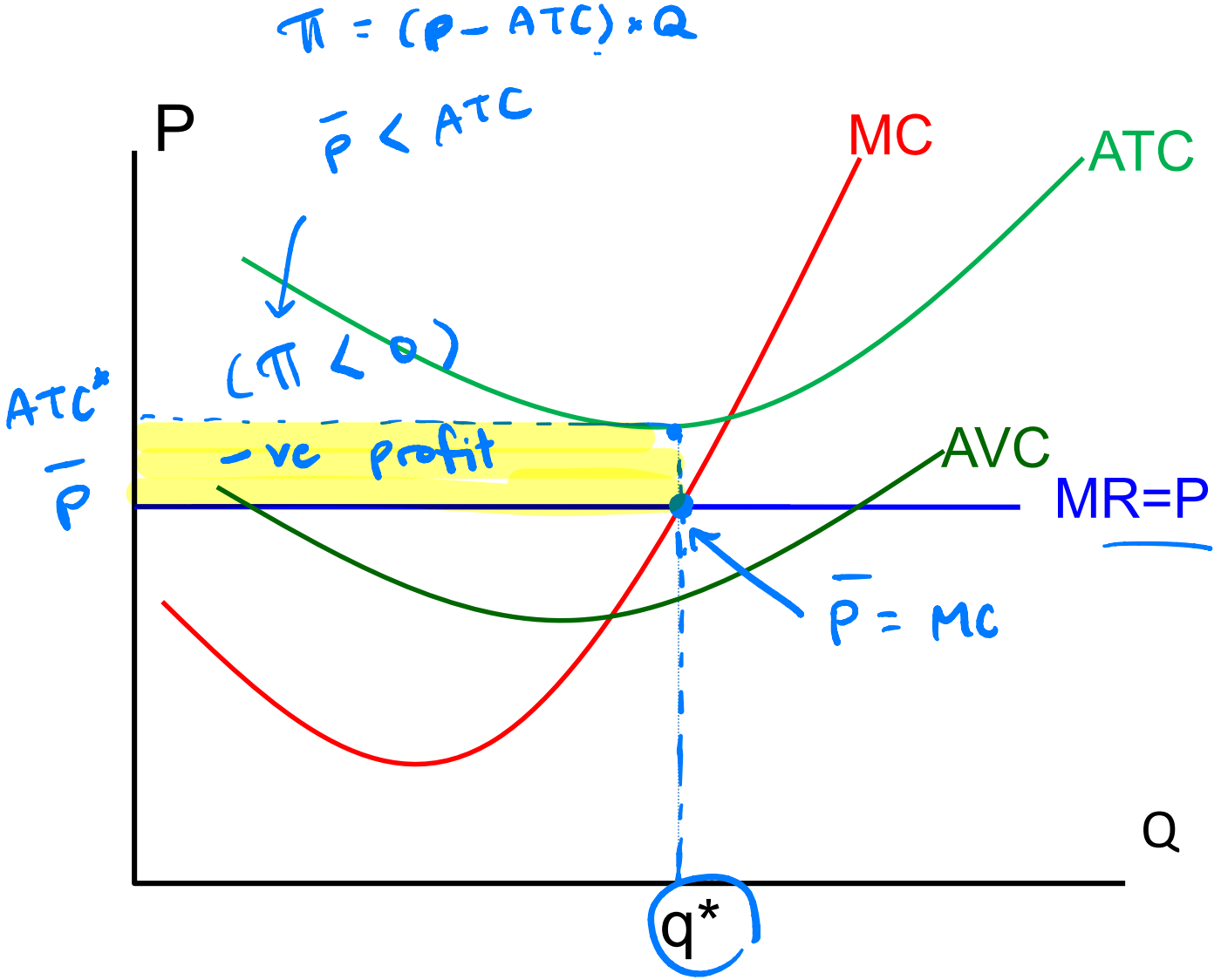


Short-Run Equilibrium: Zero Profit

Normal profit ($\pi = 0$)



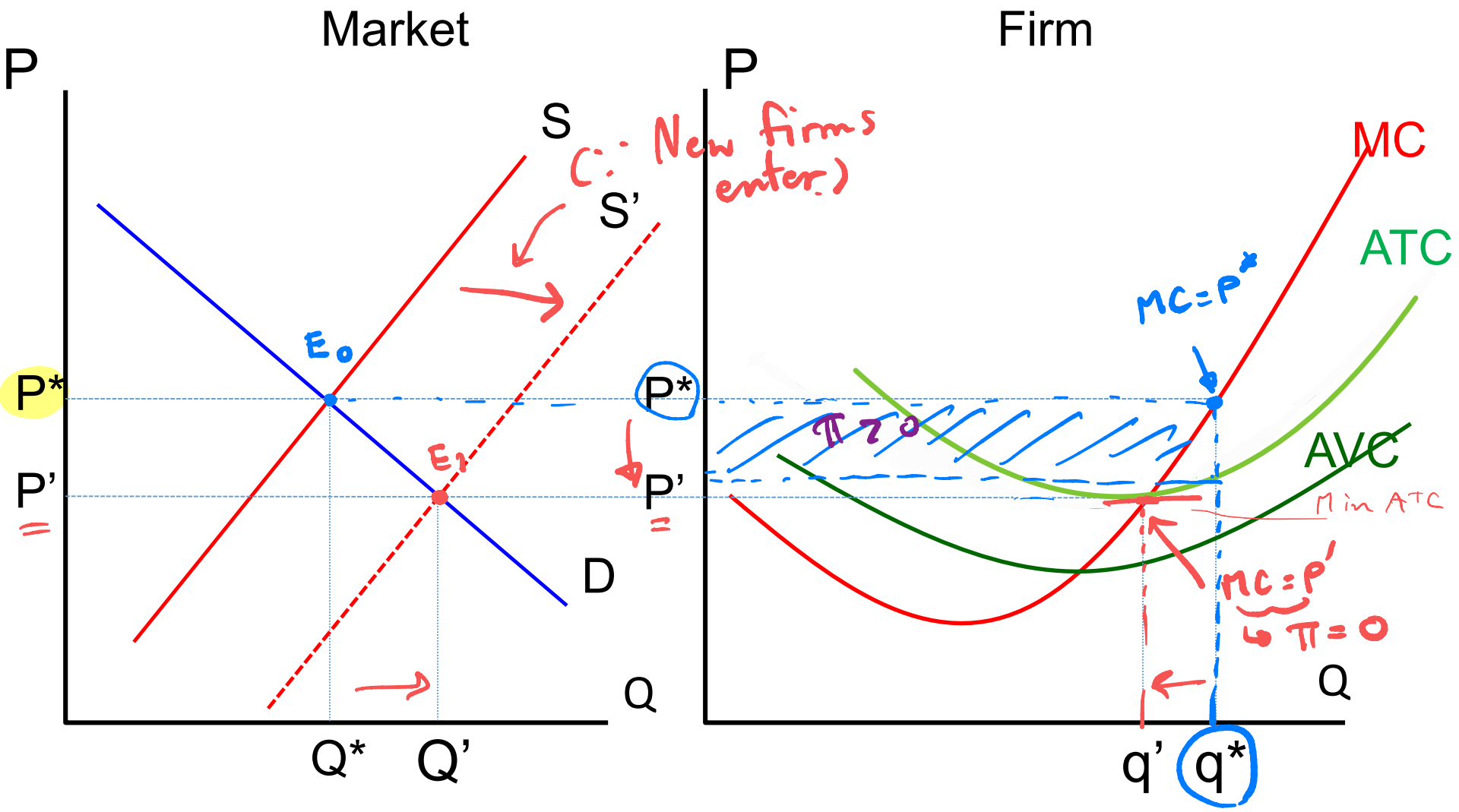
Short-Run Equilibrium: Negative Profit



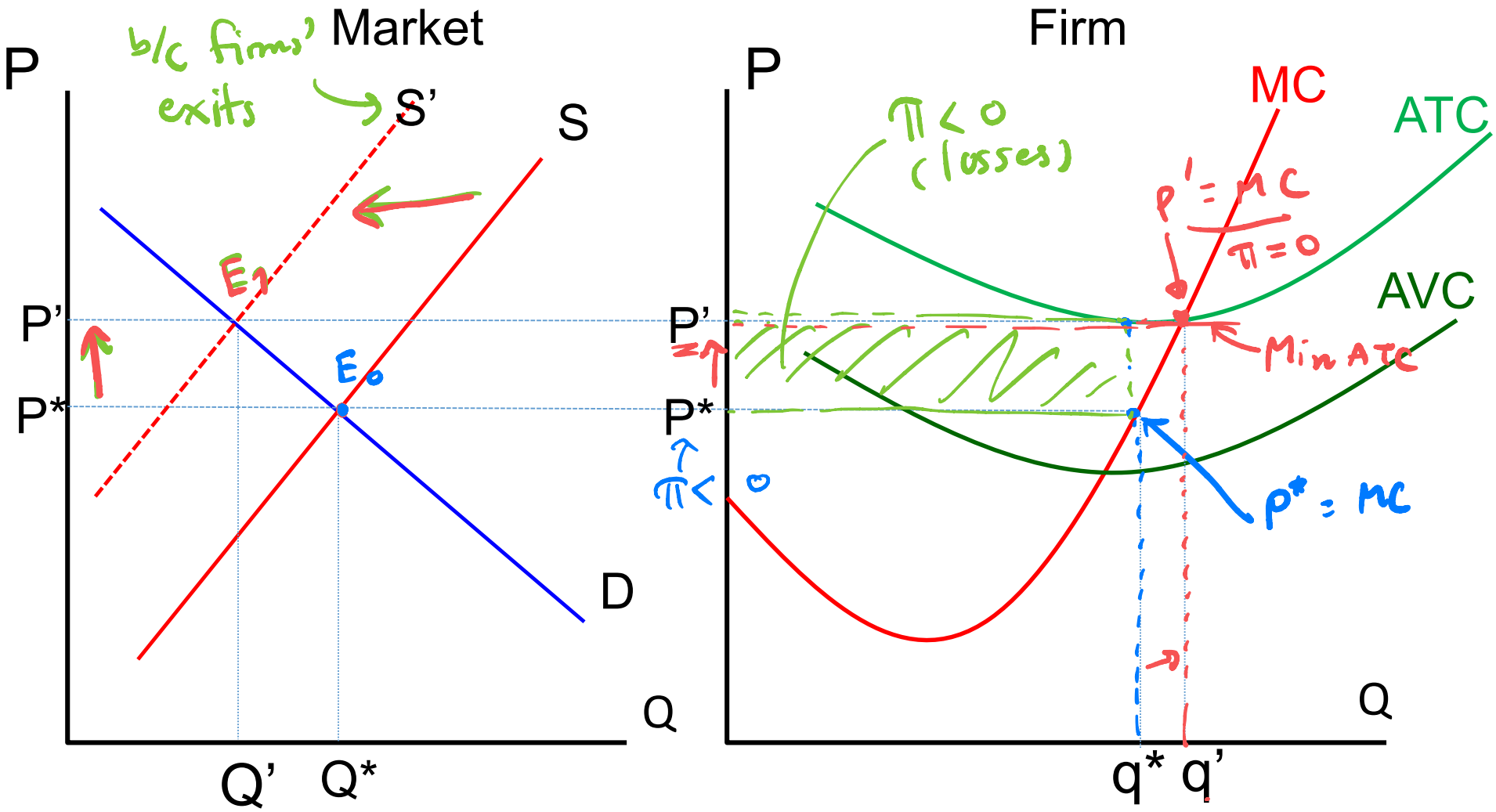
Long-Run Decisions

- 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)

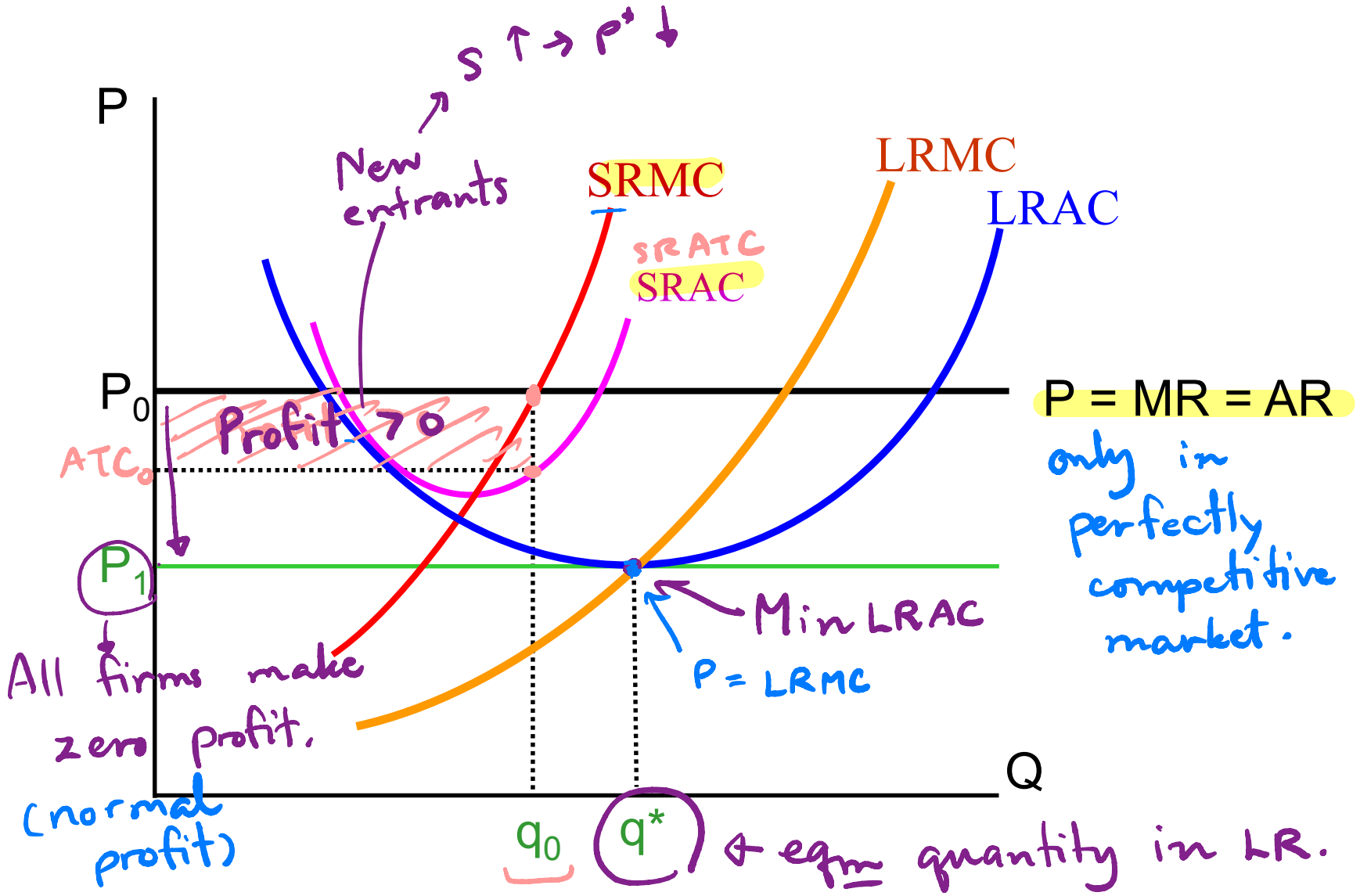


Long-Run Equilibrium

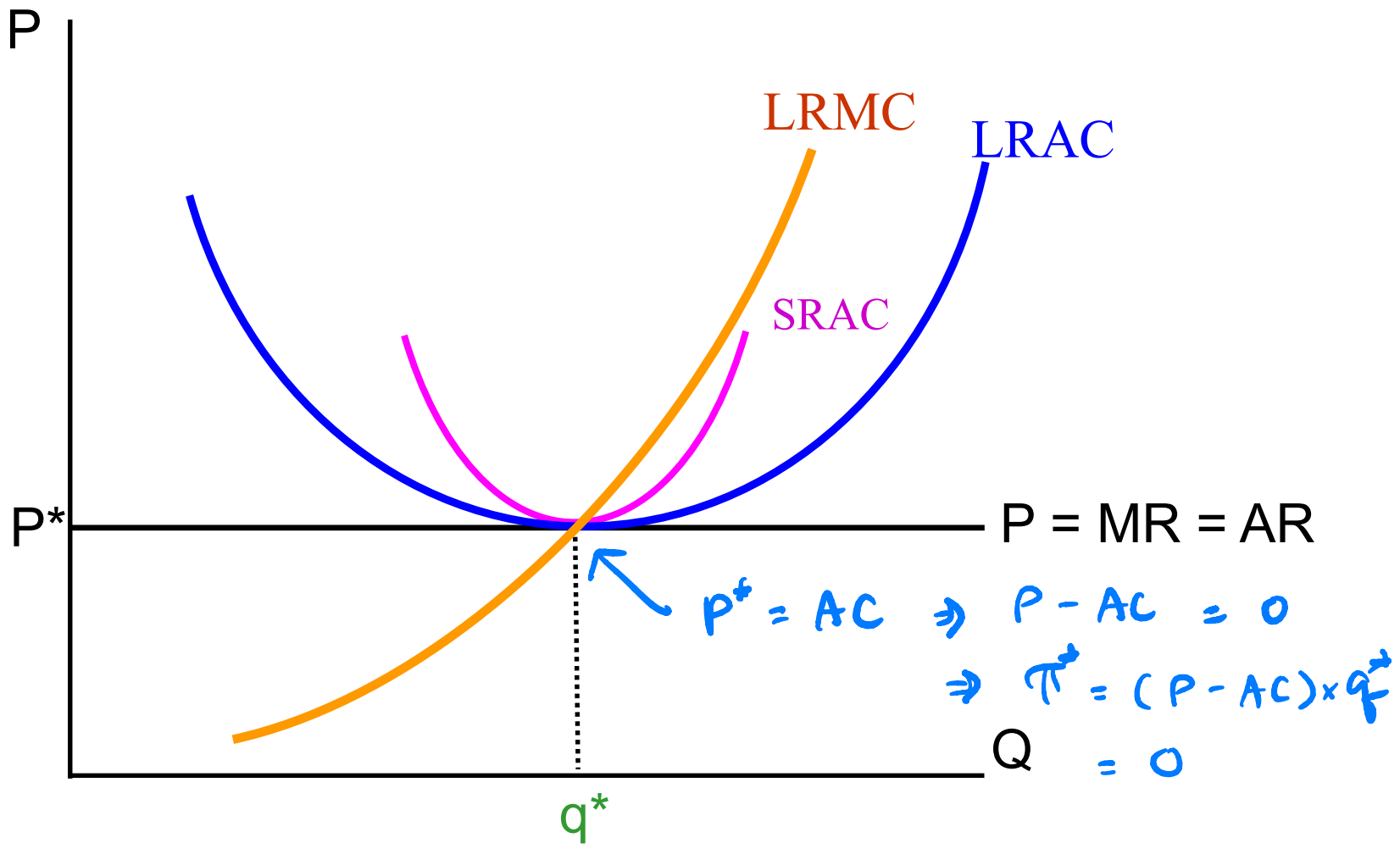
Conditions for a competitive market to be in a long-run equilibrium:

- 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.

SR vs. LR Profit Maximization



Long-Run Equilibrium for A Competitive Firm ⇒ Economic profit is 0.



Efficiency in Perfectly Competitive Market

P = MR = AR

- In the long-run equilibrium, we have:

  P = LRMC = Minimum LRAC.

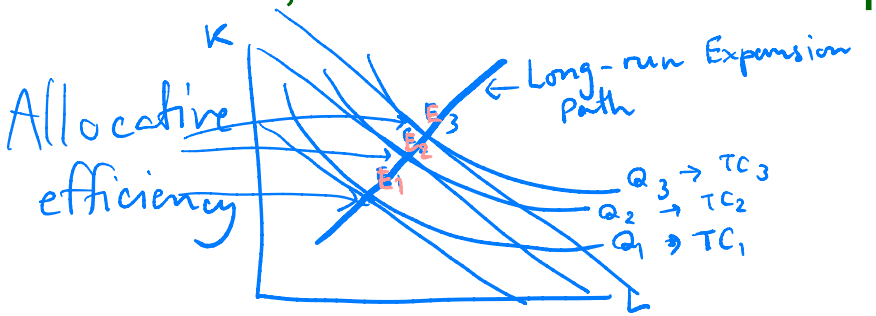
  π-max cond^{n}

- P = MC ➔ Allocative efficiency (MR = MC)

- P = Minimum LRAC ➔ Productive efficiency

  ↳ output Q^* that yields the "most least" cost.

- Hence, market outcome in perfect competition is efficient!

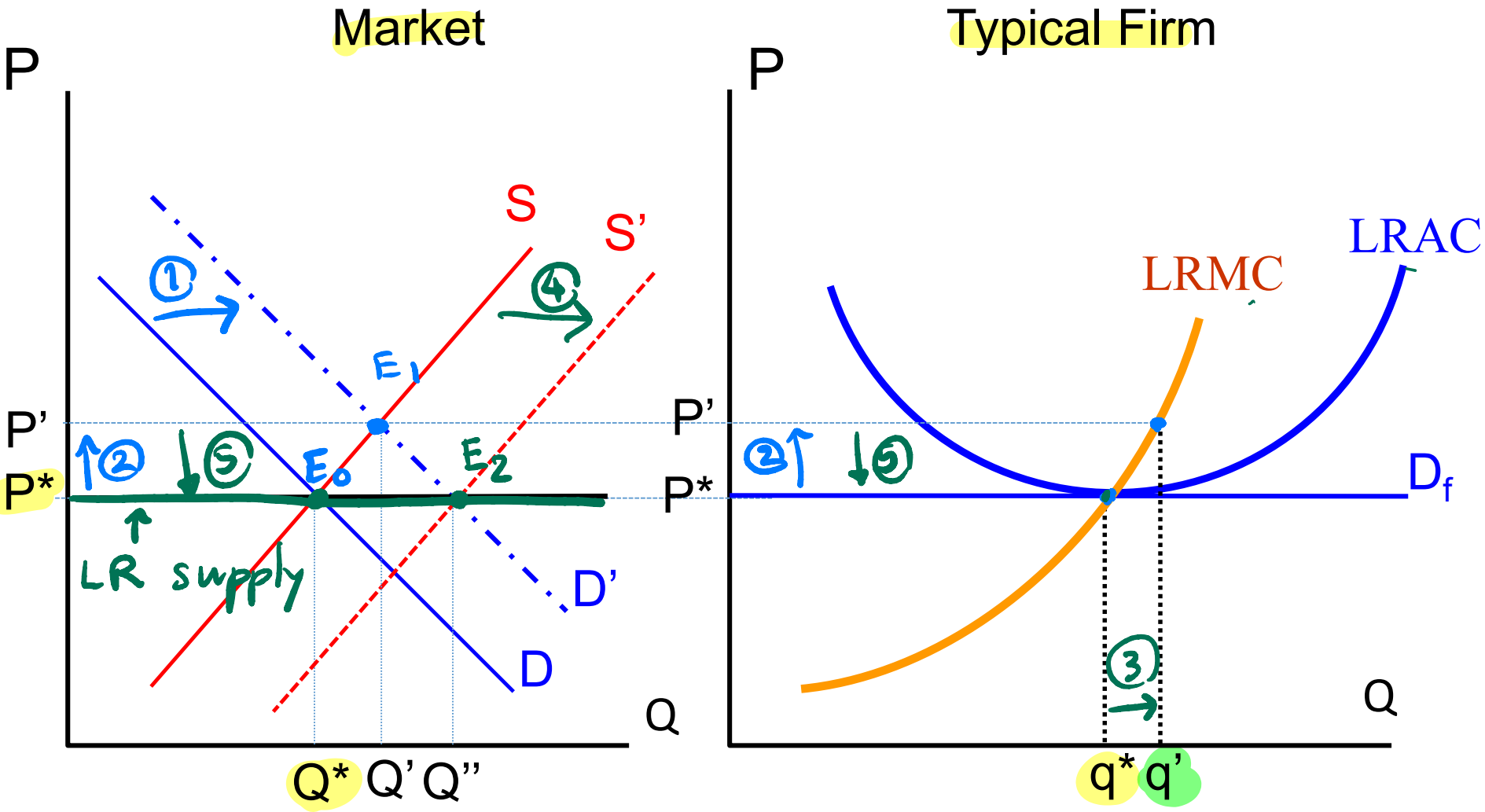


$LRAC = \frac{TC}{Q}$

Q^* where $\bar{P}$ = min LRAC

is productive efficient.

SR & LR Effects of An Increase in Demand (Constant Cost)



SR & LR Effects of An Increase in Demand (Increasing Cost)