Perfect competition
(book: "Pure competition")

- Homogeneous product
  - each firm sells identical products (consumers are indifferent)
- "Many" firms – the behavior of any individual firm does not affect the market
- Free entry & exit – there are no costs to joining or leaving the market
- Perfect information – prices are known to everybody
- Competitive firms are "price takers" – they can sell <u>everything</u> they can produce at the market price, but can't sell anything above the market price
  → firms have no pricing power

Profit max in comp. markets

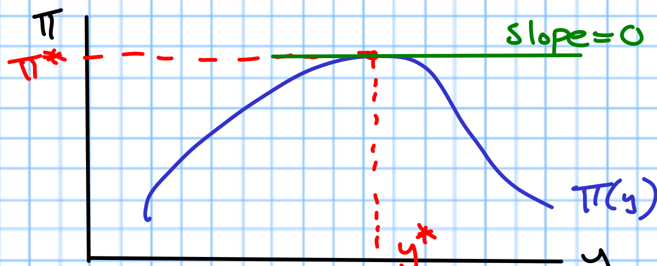
- We can think about costs as a function of output

$c = c(y)$

- We can also think about revenue as a function of output
  $r = r(y) = p \cdot y$
  - p is market price
  - Firms take it as given

Profit function:

$$\pi(y) = r(y) - c(y)$$



$$\frac{d\pi}{dy} = 0$$

$$\frac{d\pi}{dy} = \underbrace{\frac{dr}{dy}}_{\text{marginal revenue}} - \underbrace{\frac{dc}{dy}}_{\text{Marginal cost}}$$

At the profit maximizing y,

$MR - MC = 0$

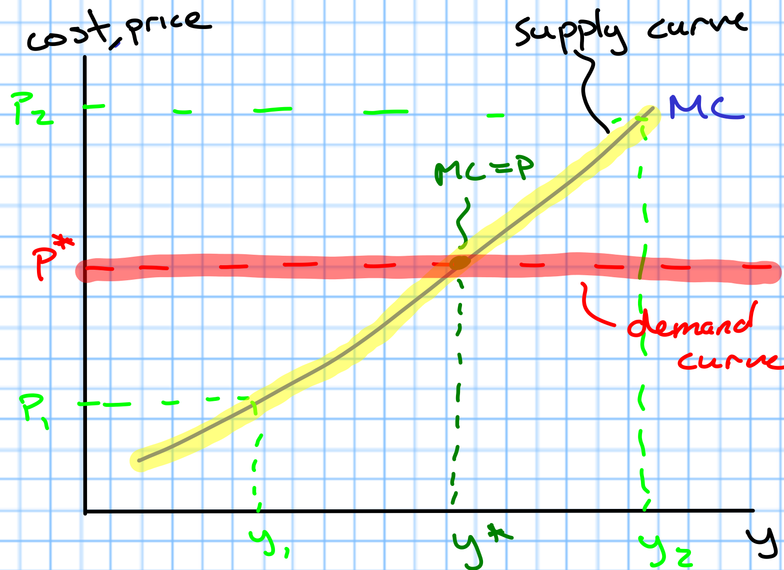
$\longrightarrow MR = MC$

For our competitive firms,

$r(y) = p \cdot y$

$MR = p$

$\longrightarrow MC = p \longrightarrow$ π-max condition for a comp. firm



p^* is the market price

y^* is the π-max quantity

- Competitive firms observe a horizontal demand curve

Short-run π-max

K is fixed at $\bar{K}$

fixed cost: $F = r\bar{K}$

$c(y) = c_v(y) + F$

- Suppose the firm is shut down in the short run

$\rightarrow y = 0$ (not producing)

- What are the firm's profits if they are shut down?

$$\pi(0) = r(0) - c(0)$$
$$= p \cdot 0 - (c_v(0) + F)$$
$$= 0 - F$$
$$= -F$$

- When will the firm choose to <u>not</u> shut down?

$\rightarrow \quad \pi(y) > -F$

$r(y) - c(y) > -F$

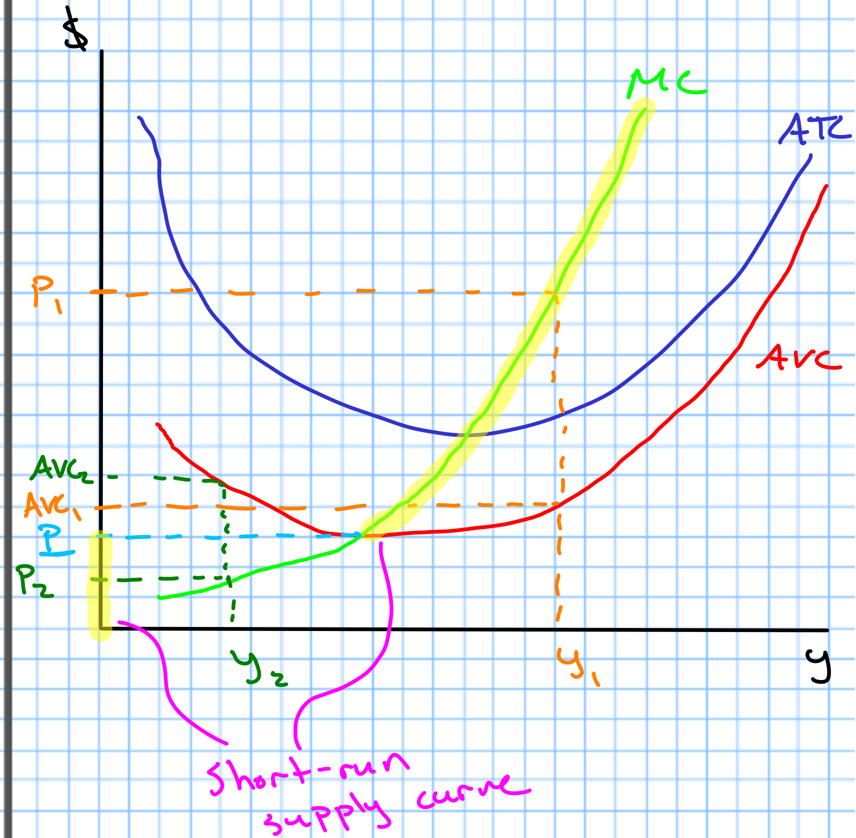
$py - (c_v(y) + F) > -F$

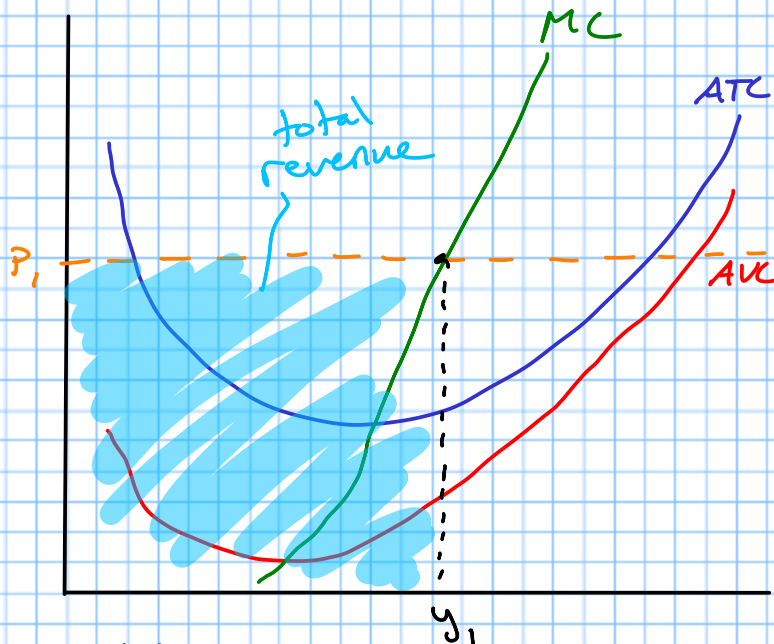
$py - c_v(y) - \cancel{F} > \cancel{-F}$

$py > c_v(y)$

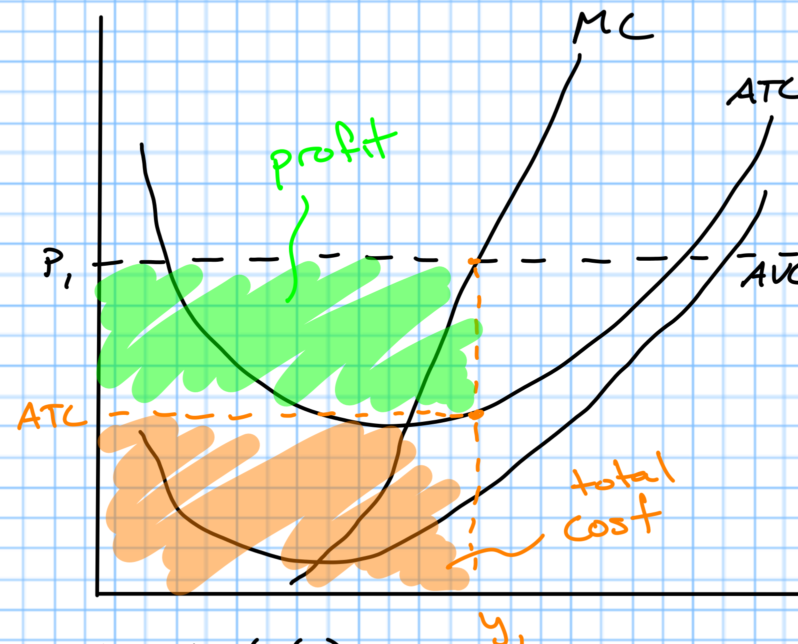
$p > \dfrac{c_v(y)}{y}$

$p > AVC$



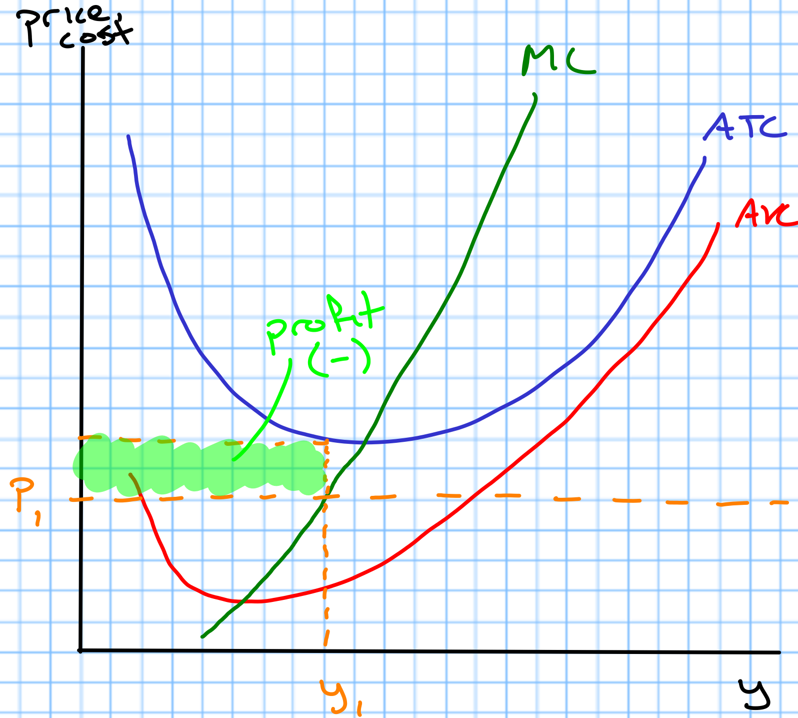


$$r(y) = p \cdot y$$



$$y(ATC) = \left(\frac{c(y)}{y}\right) y$$

$$c(y) = y \cdot ATC$$

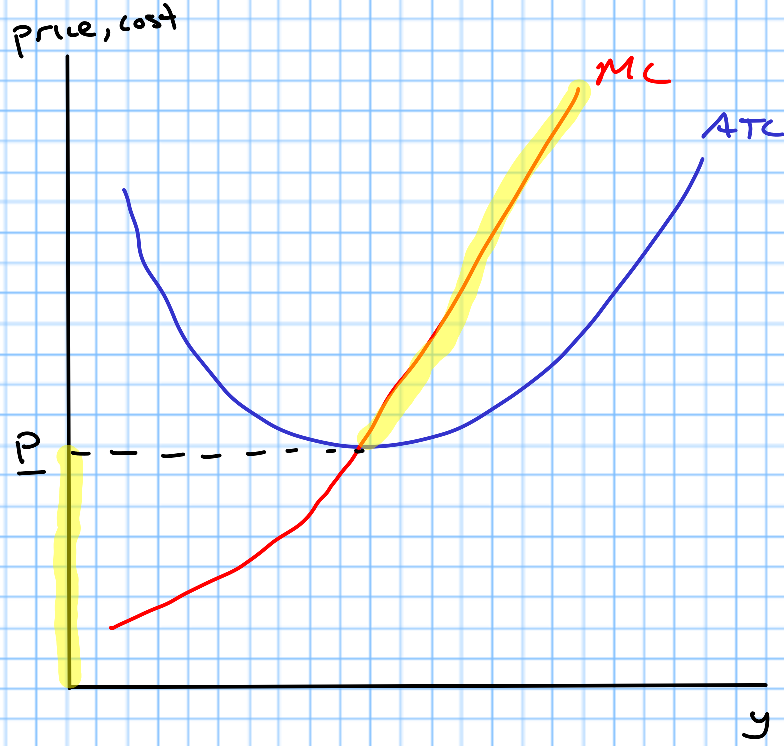


Long-run π-max

- Firms can adjust all inputs (no fixed cost)
- Suppose $y = 0$ (firm has exited)

$$\pi(0) = r(0) - c(0)$$
$$0 = 0 - 0$$

- In the long run, firms will not have negative profits (only stay open if $\pi > 0$)
- Exit if $P < ATC$



Long-run equilibrium

- Free entry / free exit
  - Suppose $\pi > 0$
    (firms are earning positive profits)
  - causes more firms to entering
  - Aggregate output increases (market supply shifts right
  - P decreases
  - π decrease
- Long run: $\pi = 0$