Economies of Scale

Monopolistic Competition

economies of scale occur when a firm or industry can double its output without doubling its cost

- external – when economies of scale occur at industry level ex. Hollywood

- internal – when economies of scale occur at firm level ex. airplanes

  today's focus

firm maxes profit when $\boxed{MR = MC}$

in perfect comp. $MR = p$ (firm faces horizontal demand curve, i.e. takes price as given)

but in imperfect comp firm faces downward sloping demand curve

$$Q = A - BP \Rightarrow P = \frac{1}{B}(A - Q)$$

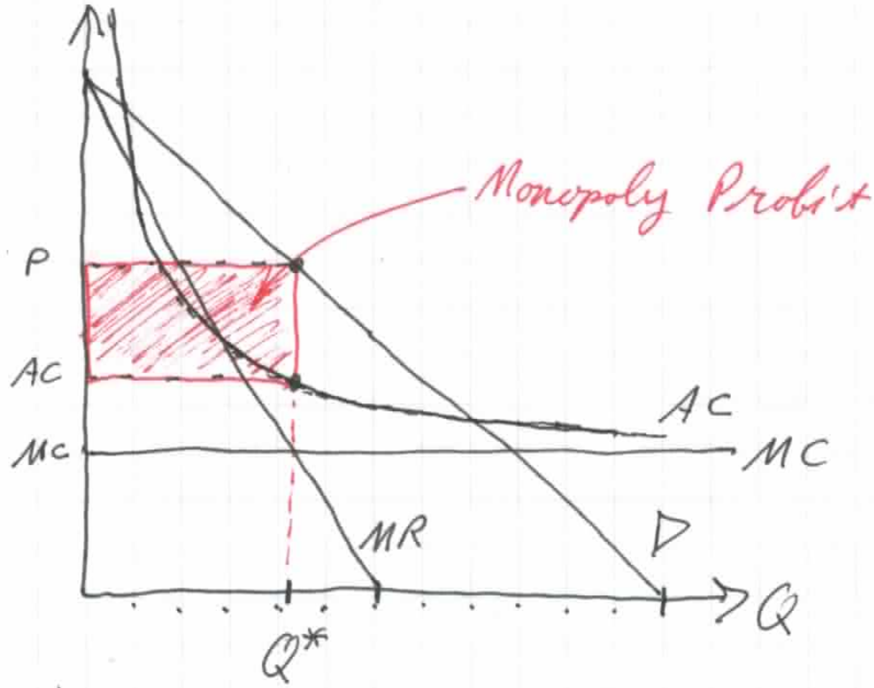
$$TR \equiv P \cdot Q = \frac{1}{B}(A-Q) \cdot \left[A - B \cdot \frac{1}{B}(A-Q)\right]$$

$$= \frac{1}{B}(A-Q) \cdot Q = \frac{1}{B}(AQ - Q^2)$$

$$\boxed{MR = \frac{1}{B}(A - 2Q) \Rightarrow P - MR = \frac{Q}{B}}$$

Costs: $TC = F + Q \cdot MC$

$$AC = \frac{F}{Q} + MC$$



$$\underset{Q}{\text{Max}}\ \Pi = TR - TC$$

1st O.C. $MR = MC$

$$\frac{1}{B}(A - 2Q) = MC$$

Monopolistic Competition

1. Firms can differentiate their product (so somewhat insulated from competition)
2. Firms take prices charged by rivals as given so behaves as a monopolist even tho it faces competition

Assumptions

1. a firm sells more as:
   - → total demand for industry's product rises
   - → price charged by rivals rises

2. total demand for industry's product is constant, so firms can only gain customers at the expense of their rivals

Firm faces the demand fn:

$$Q_D = \frac{S}{n} - Sb(P - \bar{P})$$

where $S \equiv$ industry demand

$n \equiv$ number of firms

$P \equiv$ firm's price

$\bar{P} \equiv$ avg price in industry

Market Equilibrium – we want to know how many firms will be in industry + what price will be (i.e. n + $\bar{P}$)

Three Steps:
1. relationship betw/n AC + n

2. relationship betw/n $\bar{P}$ + n

3. no entry or exit when $AC = \bar{P}$

$\boxed{\text{ASSUME: SYMMETRY – all firms face same demand fn + have same cost fn}}$

1. n & AC

when: $P = \bar{P}$ then $Q_D = \frac{S}{n}$

therefore: $AC = \frac{F}{Q} + MC = \frac{nF}{S} + MC$

2. $\bar{P}$ & n

rewrite demand fn as:

$$Q_D = \underbrace{\left(\frac{S}{n} + Sb\bar{P}\right)}_{\text{intercept}} - \underbrace{SbP}_{\text{slope}\cdot\text{price}}$$

$$MR = P - \frac{Q}{Sb}$$

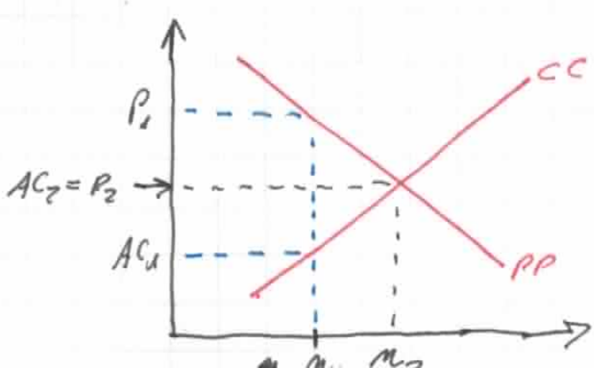
when $MR = MC$, then: $P = MC + \frac{Q}{Sb}$

but $n = \frac{S}{Q}$, so: $P = MC + \frac{1}{bn}$

3. In LR equilibrium $\boxed{AC = \bar{P} \text{ zero-profit}}$

entry occurs if $AC < P$

exit occurs if $AC > P$



becs $AC_1 < P_1$ firms will enter so LR equilibrium at n_2 where $AC_2 = P_2$

to find the eqlbrm $\bar{P} = AC$ & n:

$$AC = \frac{nF}{S} + MC \qquad P = MC + \frac{1}{bn}$$

$$\frac{nF}{S} + MC = MC + \frac{1}{bn}$$

$$n^2 = \frac{S}{bF} \implies \boxed{n = \sqrt{\frac{S}{Fb}}}$$

$$\boxed{\begin{aligned} AC &= \frac{1}{\sqrt{b}} \cdot \sqrt{\frac{S}{F}} \cdot \frac{F}{S} + MC = \sqrt{\frac{F}{Sb}} + MC \\ P &= \frac{1}{b} \cdot \frac{\sqrt{b}}{1} \cdot \sqrt{\frac{F}{S}} + MC = \sqrt{\frac{F}{Sb}} + MC \end{aligned}}$$

also note that when $P = \bar{P}$, then sales per firm are: $Q_D = \frac{S}{n} = S \cdot \sqrt{\frac{Fb}{S}}$

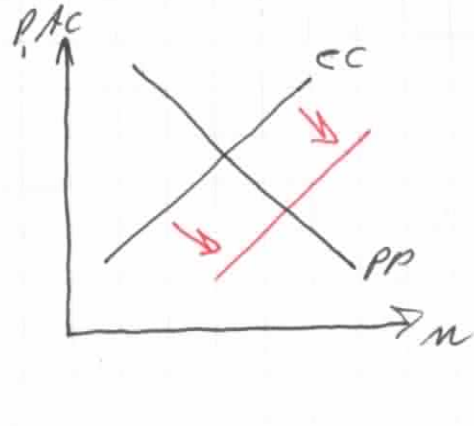
$$\boxed{Q_D = \sqrt{SbF}}$$

So where does Int'l Trade come in?

→ trade increases mkt size $S \uparrow$

so CC curve shifts out

becs: $AC = \frac{nF}{S} + MC$



→ PP curve unaffected becs:

$$P = MC + \frac{1}{bn}$$

increase in market size:

- → lowers price
- → supports more firms ⇒ more varieties
- → each firm sells more bec: $Q_D = \sqrt{SbF}$

BUT NOTICE: total product variety available to consumers rises, but the ~~[illegible]~~ number of varieties produced in each country will fall

- → consider a case where two identical countries ~~open~~ open to free trade
- → if PP curve were horizontal, the number of firms in the integrated mkt would be twice the number in ~~the~~ each country's autarky state
- → but the PP curve is not horizontal, so opening to trade will cause some firms to exit the industry

- → Scale Effect – surviving firms expand
- → Selection Effect – some firms forced to exit

Intraindustry Trade

Home capital abundant | Manuf is capital-intens
Foreign labor abundant | Food is labor-intensive

suppose that manuf is monop comp industry

Home will export Manuf to foreign beca of capital abundance + econ of scale

Foreign will export:

- Food to Home (due to labor abundance)
- Manuf to Home (due to econ of scale)

remember firms produce different varieties so Home not capable of producing full range of Manuf

Foreign's exports of Food — interindustry trade
Foreign's exports of Manuf — intraindustry trade

intraindustry trade does NOT reflect comparative advantage

If Home + Foreign have same K/L ratios, all trade betw/n them is intraindustry so ~~so~~ NO redistribution effects

But if Home + Foreign have very different K/L ratio then trade will be interindustry, so there will be redistribution effects