Chapter 6. Introduction to Trade Theory Under Imperfect Competition (Part 2)

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Outline

- In this part we will introduce the concept of monopolistic competition in a simple example.
- We will examine two situations :
  1. autarky
  2. perfect free trade
- In the next chapter we will study trade liberalization in the Krugman model.
- The example is taken from Krugman, Melitz and Obstfeld (2012), chapter 8.

Monopolistic competition

- 'Monopolistic competition' captures elements of monopoly and perfect competition :
  - firms sell differentiated **varieties** of the same good
  - they set a monopoly price for their variety
  - but they take other varieties' prices (and other aggregates) as given.
- We will consider a simple example of a monopolistically competitive sector with n identical firms.
- The goal is to study the impact of trade liberalization on two endogenous variables :
  - the price of a representative variety, p,
  - the number of varieties n.
- Gains from trade through increased product diversity.

Demand

Each firm faces the same demand function

$$Q = S\left[\frac{1}{n} - b(p - \bar{p})\right]$$

- Q : firm sales,
- S : total industry sales,
- n : number of firms in the industry,
- p : firm price,
- $\bar{p}$: average industry price,
- $b > 0$ captures the sensitivity of demand for a variety to its relative price.

Properties of the assumed demand function

$$Q = S\left[\frac{1}{n} - b(p - \bar{p})\right].$$

- With identical prices, each firm has market share $\frac{S}{n}$.
- A firm with a higher price will have a lower market share, but may still sell.
- S is unaffected by the average price.

Monopoly Pricing

- Given the demand function, individual profits equal

$$\Pi(p) = (p - c)S\left[\frac{1}{n} - b(p - \bar{p})\right] - F$$

  where $F > 0$ denotes a fixed cost and $c > 0$ denotes a variable cost.
- In monopolistic competition each firm solves $\max_p \Pi(p)$, taking $\bar{p}$ as given, which yields

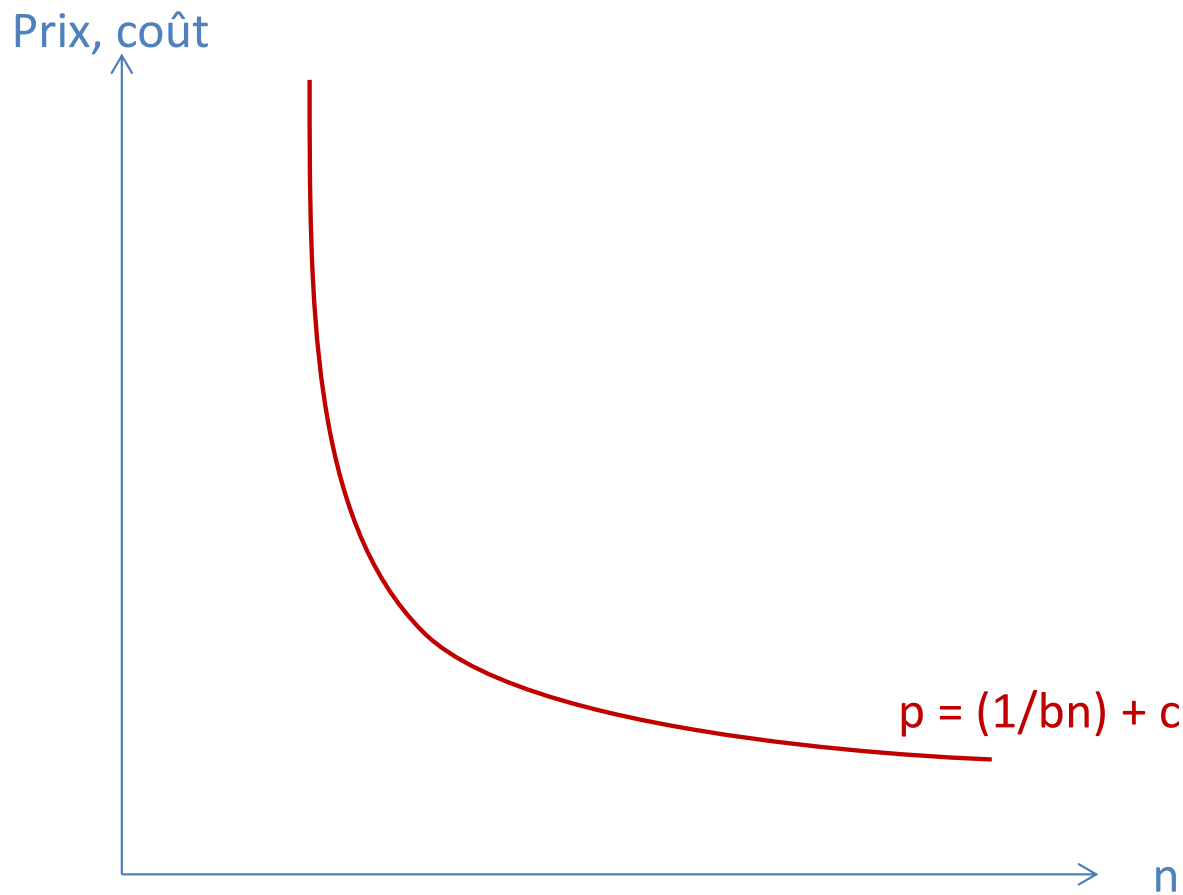
$$p = \frac{\frac{1}{n} + b\bar{p} + bc}{2b}$$

- Since all firms have the same optimal price, $\bar{p} = p$ so that

$$p = \frac{1}{bn} + c$$

- Each firm produces $\frac{S}{n}$.

Figure: Price and the Number of Firms (1/2)



Economies of Scale

- The representative firm's average cost equals :

$$AC = \frac{F}{Q} + c.$$

- Since all firms have identical output $\left(Q = \frac{S}{n}\right)$ average cost equals

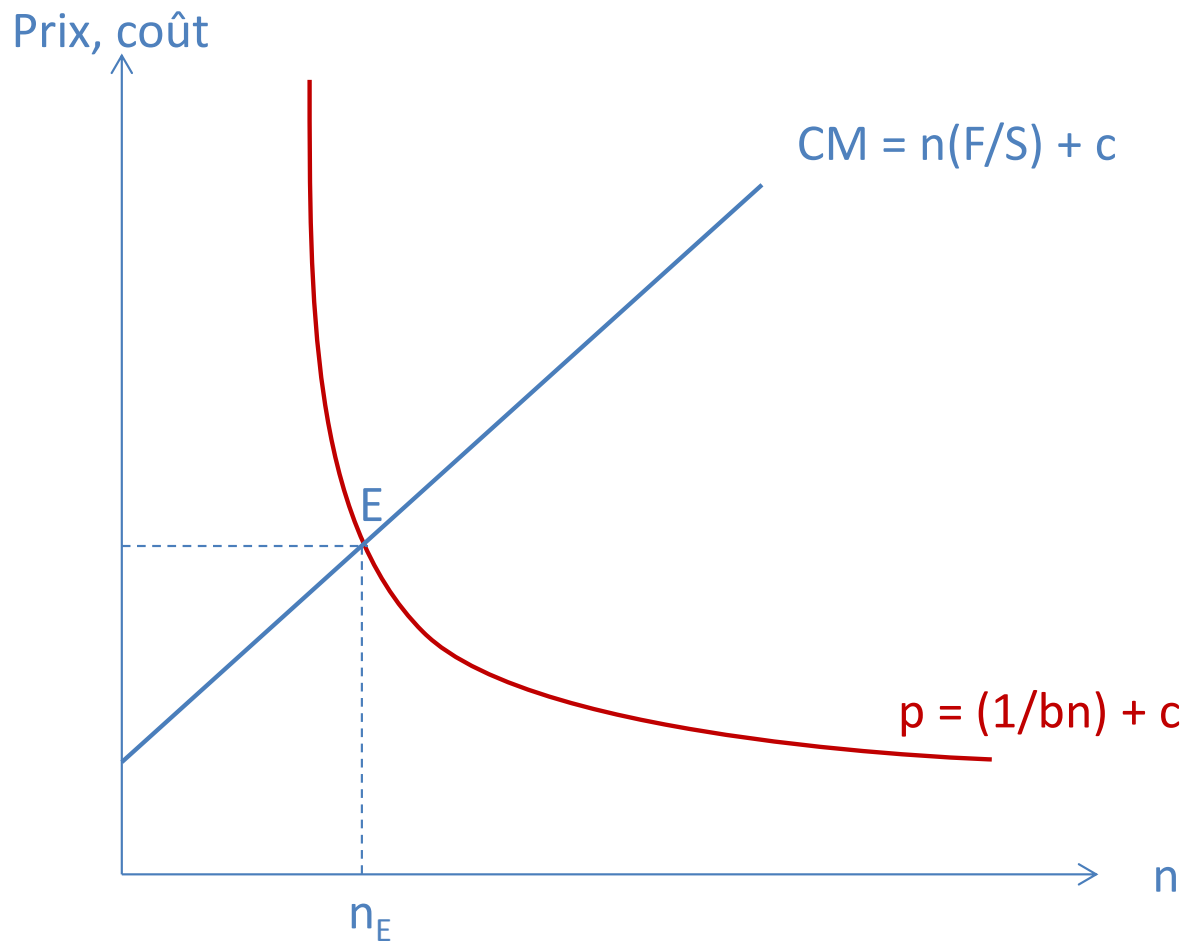
$$\boxed{AC = n\frac{F}{S} + c.}$$

$\Rightarrow$ Average Cost is increasing in n, because each firms has lower output

- Free Entry Condition : entry and exit occur until profits equal zero

$\Rightarrow$ In equilibrium price equals Average Cost.

Figure: Price and the Number of Firms (2/2)



Equilibrium number of firms

- Price = AC due to free entry.
- We can solve for free entry equilibrium n, p and Q :

$$\frac{1}{bn} + c = n\frac{F}{S} + c \Leftrightarrow \boxed{n = \sqrt{\frac{S}{Fb}}}$$

$$p = \frac{1}{bn} + c \Rightarrow \boxed{p = \sqrt{\frac{F}{Sb}} + c}$$

$$Q = \frac{S}{n} \Rightarrow \boxed{Q = \sqrt{SFb}}$$

Effect of Trade Integration

- Consider identical national economies.
- Perfect integration of these economies is equivalent to an increase in S.
- Short-run effects (when n is fixed) :
  - increase in production scale and decrease in AC
  - no effect on price
  - increase in profits
- Long-run effects :
  - increase in the equilibrium number of firms n
  - fall in the price of each variety p and of the industry average price $\bar{p}$
  - an increase in the scale of production Q

Figure: Effect of Trade Integration

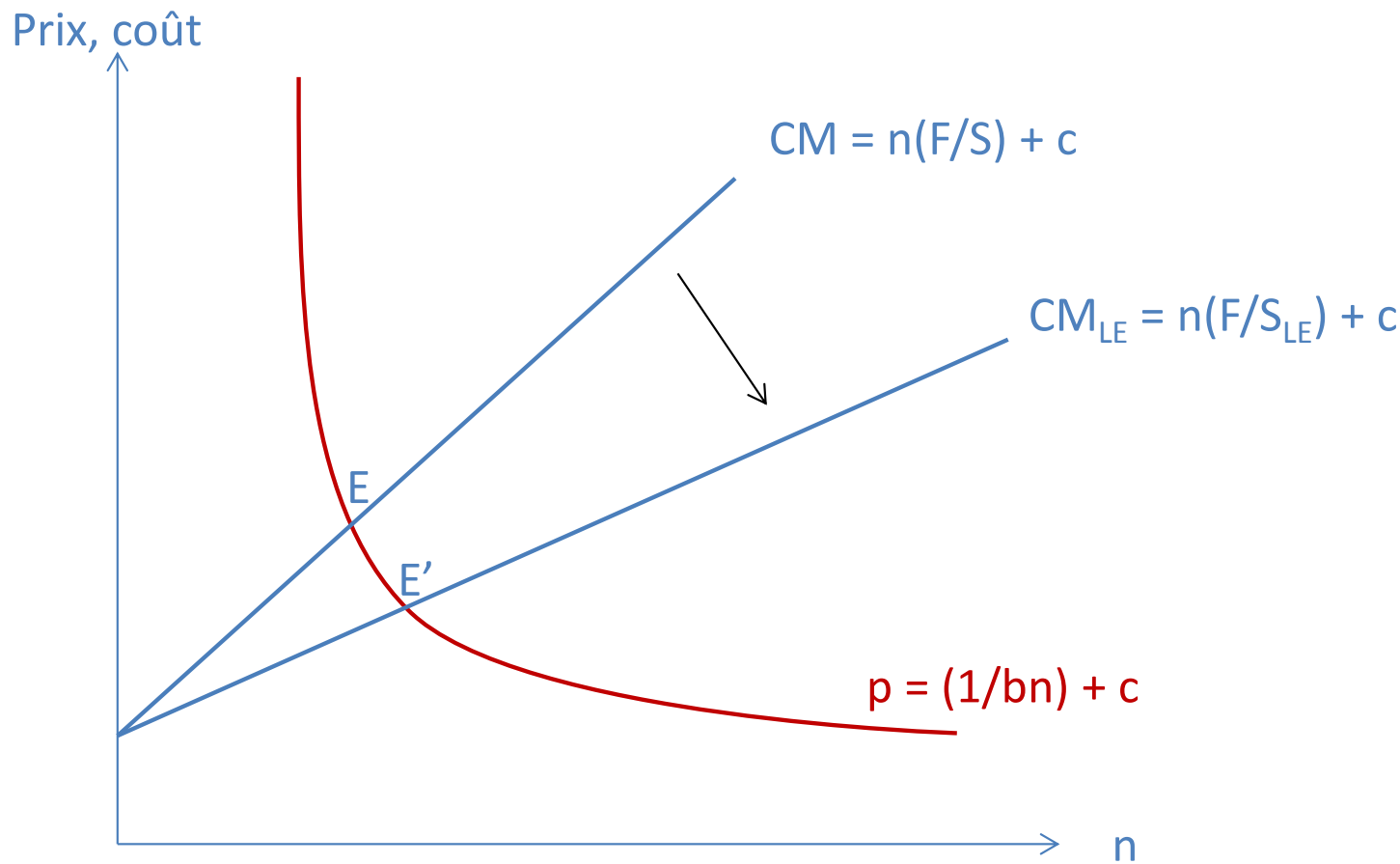
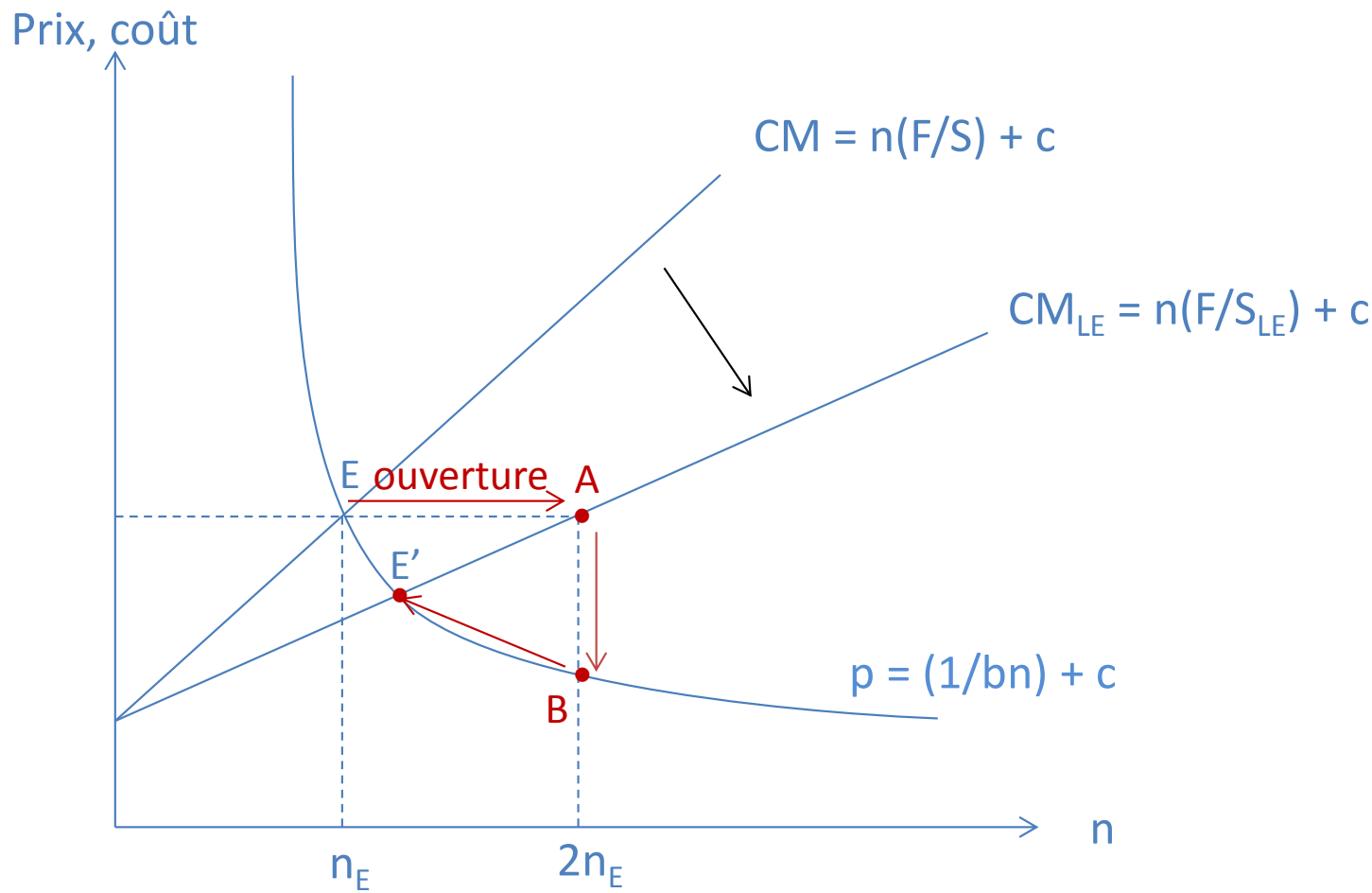


Figure: Effect of Trade Integration : Short- and Long-Run



Conclusion

- With internal economies of scale, trade integration allows firms to operate at a greater scale.
- But because of greater competition they must charge lower prices :
  - In the short-run, there is a large price fall and firms make losses.
  - In the long-run, some firms exit but the price remains lower than in autarky.
- Main predictions :
  - consumers gain from trade because of lower prices and more varieties
  - trade occurs within industries.
- This model complements HOS/Ricardo models.