Monopolistic Competition: The Background

Nottingham Lectures in International Trade 2012

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Plan of Lectures

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1. Monopolistic Competition: Introduction
2. Monopolistic Competition with CES Preferences
3. One-Sector Model with General Preferences

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   - 3 and 4 just like perfect competition

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Demand and Marginal Revenue

- Firms take income and the industry price index as given:

$$p_i = A y_i^{-1/\sigma} \qquad (1)$$

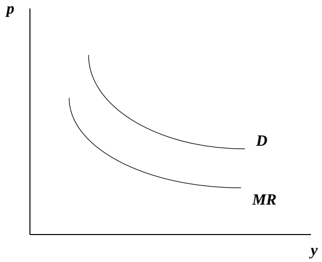
$$\text{where:} \quad A \equiv P^{\frac{\sigma-1}{\sigma}} I^{\frac{1}{\sigma}} \qquad (2)$$

- Hence their total and marginal revenue curves are (suppressing i):

$$TR = A y^{\frac{\sigma-1}{\sigma}} \qquad (3)$$

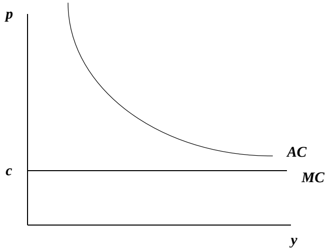
$$MR = \frac{\sigma-1}{\sigma} A y^{-1/\sigma} = \theta p \qquad (4)$$

- So the demand and MR curves are iso-elastic, with the latter a fraction θ of the former.



Average and Marginal Cost

- Homotheticity: Production uses a composite input, at unit cost 1
  - More on this later
- Overheads require f units; production c units per unit output
  - $TC = f + cy$
- Hence: $MC = c$
- $AC = c + \frac{f}{y}$
  - A rectangular hyperbola



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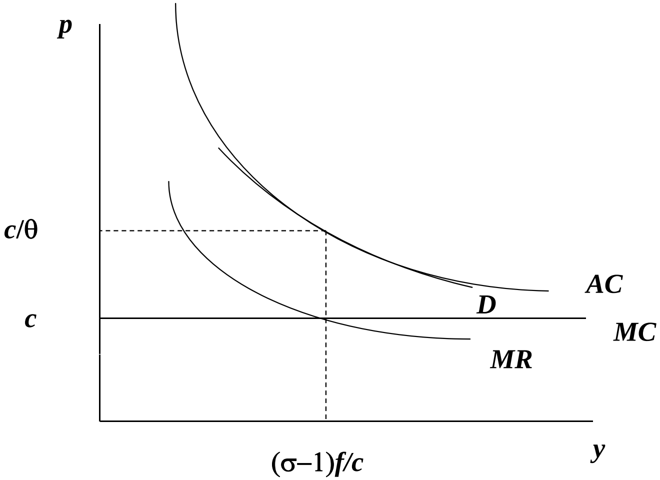
     - i.e., Equilibrium A is also independent of P, I, and therefore n

The Chamberlin Tangency Solution: Figure



Technical Digression: Relative Curvature of AC and p

- Proof that AC curve must be more convex than demand curve:
  - Unit-free measure of convexity of $y = f(x)$: $r \equiv -\frac{xf''}{f'}$
  - Convexity of AC curve (or any rectangular hyperbola):
    - $AC = c + \frac{f}{y} \quad \rightarrow \quad AC' = -\frac{f}{y^2} \quad \rightarrow \quad AC'' = \frac{2f}{y^3} \quad \Rightarrow \quad r = 2$
  - Convexity of iso-elastic demand curve:
    - $p = Ay^{-\frac{1}{\sigma}} \quad \rightarrow \quad p' = -\frac{1}{\sigma}Ay^{-\frac{\sigma+1}{\sigma}} = -\frac{1}{\sigma}\frac{p}{y}$
    - $\rightarrow \quad p'' = \frac{\sigma+1}{\sigma^2}Ay^{-\frac{2\sigma+1}{\sigma}} = \frac{\sigma+1}{\sigma}\frac{p}{y^2}$
    - $\Rightarrow \quad r = \frac{\sigma+1}{\sigma} \in (1, 2)$ provided $\sigma \in (1, \inf)$ QED
- This is consistent with:
  - Taste for diversity: Holds if and only if $\sigma > 1$
  - Second-order condition for any functional form:
    - $\pi = (p - AC)y \quad \rightarrow \quad \pi' = (p - AC) + (p' - AC')y$
    - $\rightarrow \quad \pi'' = 2(p' - AC') + (p'' - AC'')y$
    - $\Rightarrow \quad \pi'' < 0$ IFF $-\frac{yp''}{p'} < -\frac{yAC''}{AC'}$

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  - y large: economies of scale are highly exploited
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- Low σ:
  - Different varieties are less close substitutes
  - (greater preference for diversity)
  - $p >> c$: so p and MR curves are steep and far apart
  - y small: economies of scale are not highly exploited
  - More varieties, lower output of each

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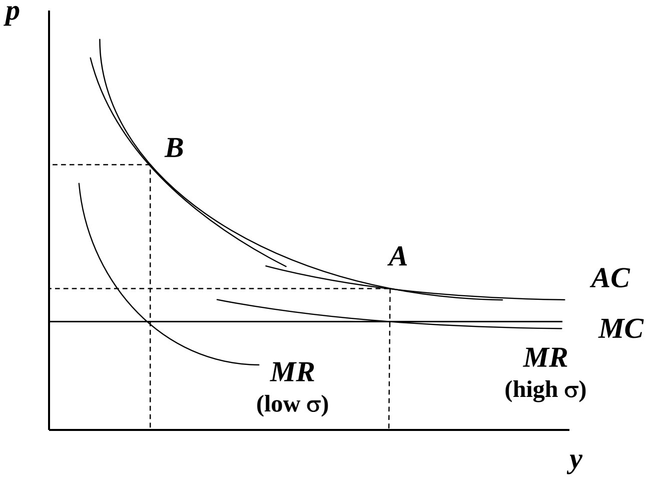

Equilibrium Anomalies

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  3. Relax CES assumption: Avoids all 3!
     - Krugman (1979), Melitz-Ottaviano (2008), Zhelobodko-Kokovin-Parenti-Thisse (2011)

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  - However, provided N is large, each firm rationally takes λ as fixed.
  - Echoing Chamberlin, the demand curve a firm perceives for its own product depends on its price only.

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  - i.e., higher consumption, or, equivalently, a lower price, makes households less responsive to price.

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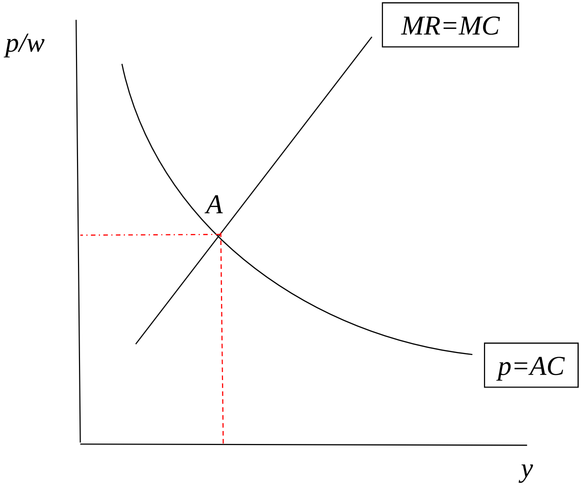

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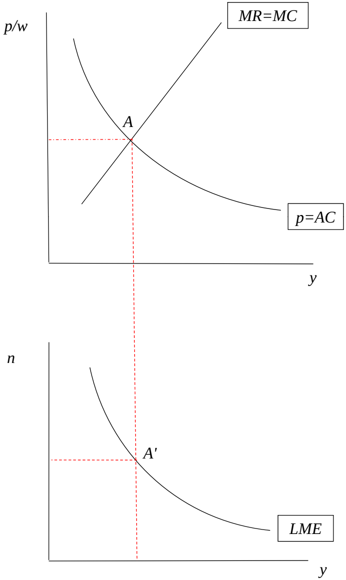
- The full model then consists of the four equations (6), (7), (8), and (9), in four unknowns: p/w, x, y and n.

Firm, Industry and Labour-Market Equilibrium: Figure



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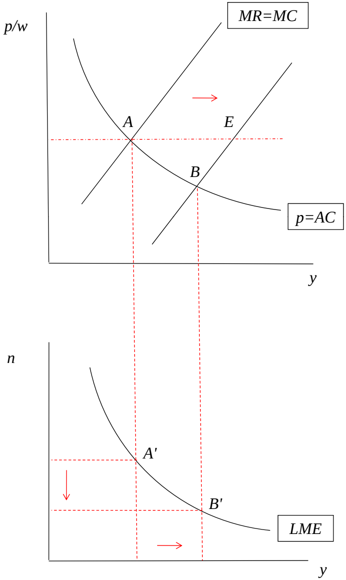
Effects of Globalisation: Figure



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  - Competition effect (in home market) offset by market-size effect (expansion of world demand).

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- Finally, because consumers demand all varieties, there is an increase in trade, all of which is intra-industry.

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  - CES special case de-emphasizes the implications of increasing returns; concentrates attention on the range of varieties available to consumers.

The CES Special Case: Figure