

Partial Equilibrium Trade Applications

Addendum: the Melitz trade structure (a primer)

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Overview

- 1 Background
- 2 Monopolistic competition with heterogeneous firms
- 3 Equilibrium conditions

- The Krugman structure includes important variety impacts (CES $\sigma > 1$: love-of-variety).
- Melitz argues that firm selection is also important.
- Firms have different levels of productivity:
 - high: select into both home and foreign (export)
 - low: more exposed to import competition
- A dynamic story of firm selection...

Monopolistic competition with heterogeneous firms

- Steady-state: number of firms dying equals number entering (turnover).
- Entry: **Sunk Cost** = Expected profits.
- Productivity is revealed
- Operation (**fixed cost**):
 - operate: non-negative profits
 - exit: negative profits
- Equilibrium is defined by a **marginal firm** earning zero operating profits.
- Melitz (2003) shows how to characterize the equilibrium in terms of the **representative firm** charging the *average* price.

$$TC^* = f + q^*/\phi^*; \quad AC^* = f/q^* + 1/\phi^*; \quad MC^* = 1/\phi^*$$

$$\tilde{TC} = f + \tilde{q}/\tilde{\phi}; \quad \tilde{AC} = f/\tilde{q} + 1/\tilde{\phi}; \quad \tilde{MC} = 1/\tilde{\phi}$$

Monopolistic competition with heterogeneous firms

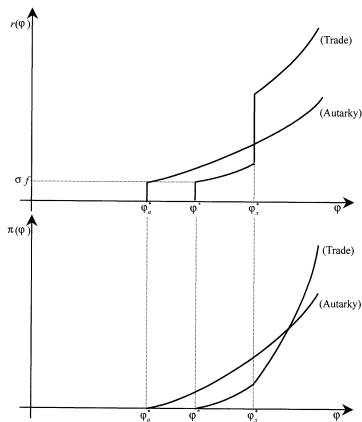


FIGURE 2.—The reallocation of market shares and profits.

Equilibrium conditions

- Price index:

$$P_s = \left(\sum_r N_{rs} \tilde{p}_{rs}^{1-\sigma} \right)^{1/(1-\sigma)},$$

- Compensated demand for the representative firm

$$\tilde{q}_{rs} = Q_s \left(\frac{P_s}{\tilde{p}_{rs}} \right)^\sigma.$$

- Optimal markup ($MR = MC$) for the individual monopolistic competitor:

$$\tilde{p}_{rs} = \frac{c_r}{\tilde{\phi}_{rs}(1 - 1/\sigma)}.$$

- Zero cutoff profits in terms of representative firm:

$$c_r f = \tilde{p}_{rs} \tilde{q}_{rs} \frac{a + 1 - \sigma}{a\sigma}$$

- Free entry:

$$c_r \delta f^S = \sum_s \tilde{p}_{rs} \tilde{q}_{rs} \frac{\sigma - 1}{a\sigma} \frac{N_{rs}}{M_r}$$

- Productivity of the representative firm:

$$\tilde{\phi}_{rs} = b \left(\frac{a}{a + 1 - \sigma} \right)^{1/(\sigma-1)} \frac{N_{rs}}{M_r}$$

- Demand for inputs across all firms:

$$D_r = \delta f^S M_r + \sum_s N_{rs} \left(f + \frac{q_{rs}}{\tilde{\phi}_{rs}} \right)$$