Lecture 11: Trade and Monopolistic Competition: Empirics

14.581: International Economics I

Pol Antràs

Harvard & MIT

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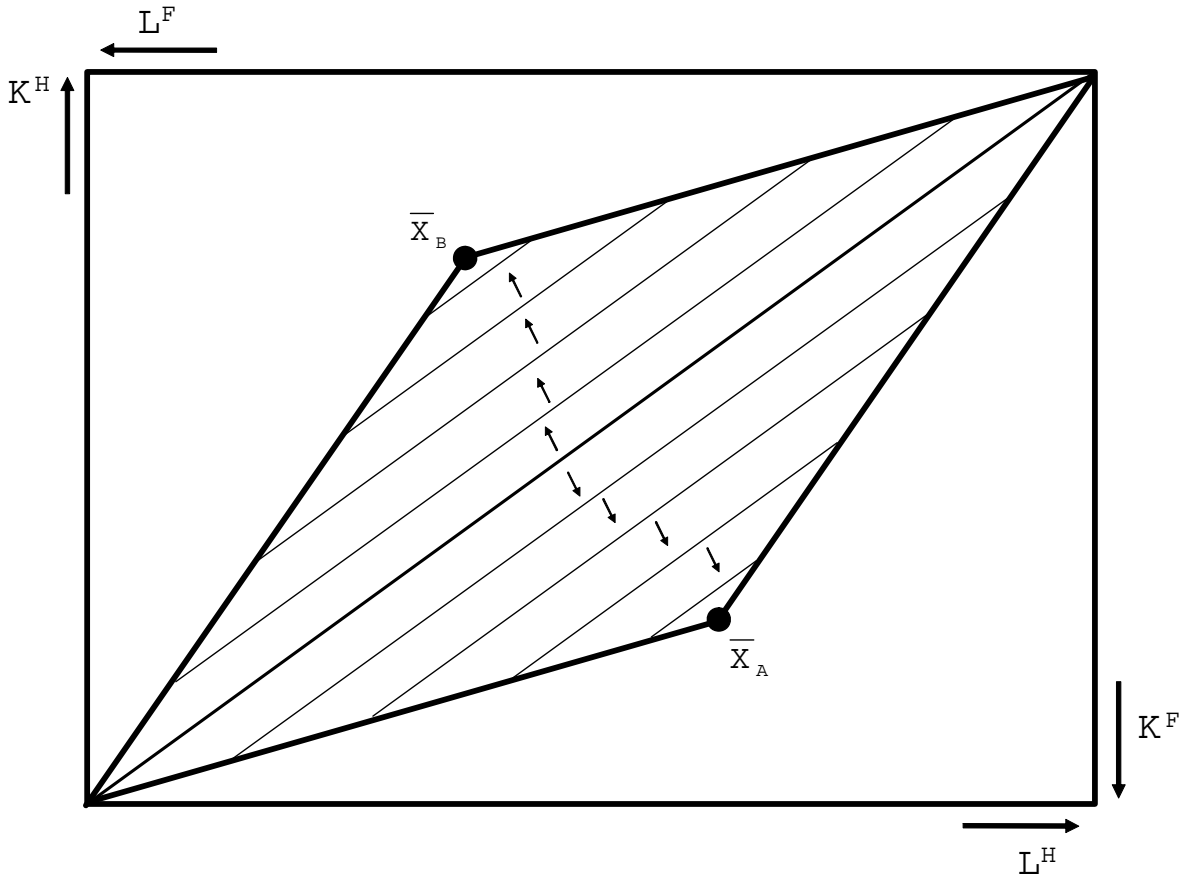
Introduction

- In this lecture we will discuss the main implications of monopolistic competition models for the structure of trade flows.
- We will review empirical studies shedding light on the role of monopolistic competition and product differentiation in shaping trade flows.
- We will study both overall trade flows as well as some of its components, such as its intraindustry component.
- We will also briefly discuss the literature on the gravity equation and the extensive margin of trade.

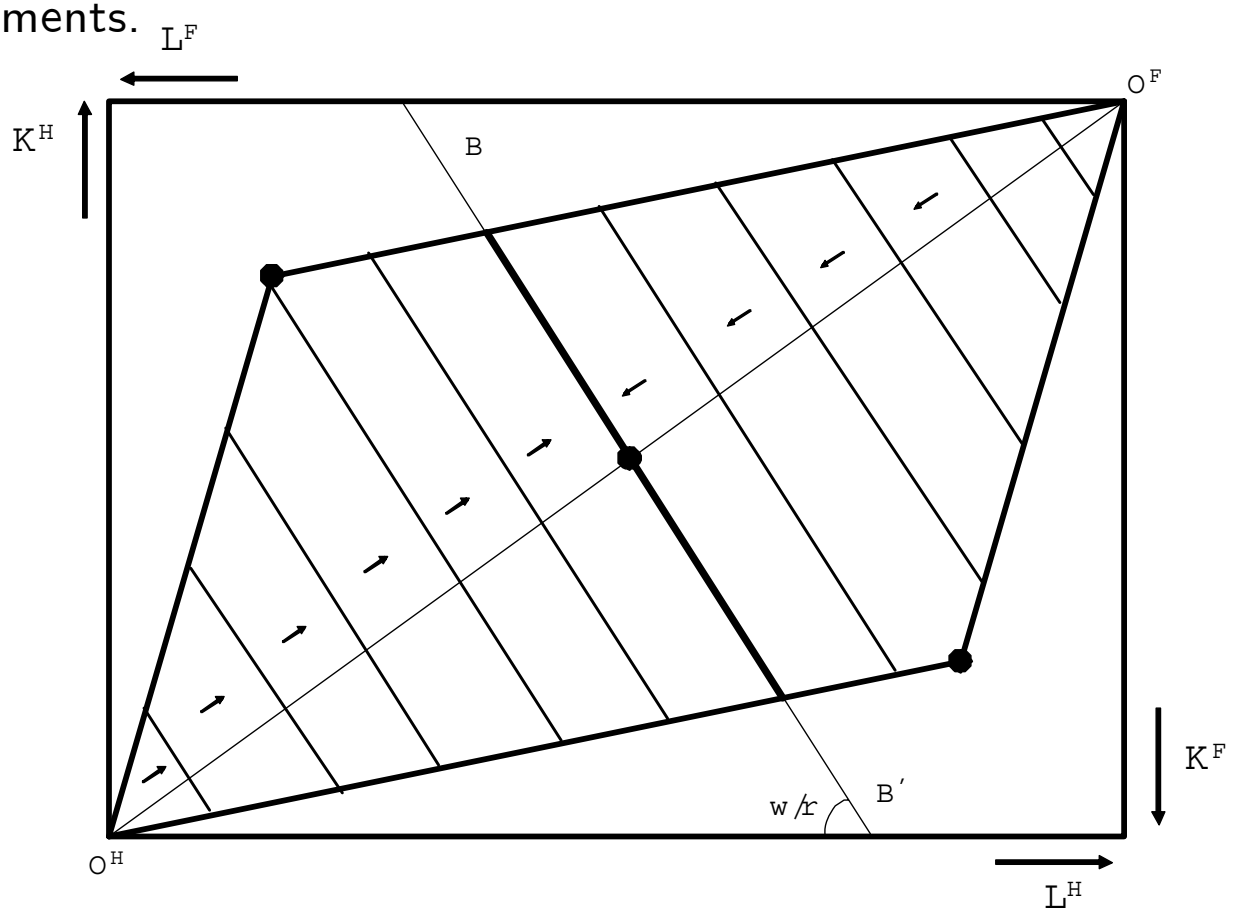
The Heckscher-Ohlin Benchmark

- Consider the case in which $I = J = K = 2$ and both sectors feature CRS and are perfectly competitive. From Lecture 5, remember that:
  - the volume of trade is increasing in relative factor endowment differences;
  - all trade is interindustry trade



A "Pure" Helpman-Krugman Model

- Continue to assume $I = J = K = 2$, but now let both sectors feature IRS and product differentiation.
  - in this case, the iso-trade lines look very differently;
  - volume is maximized when countries are of equal size, **regardless** of relative factor endowments.



Generalizations and Empirics

- This insight can be generalized to the case of an arbitrary number of factors, goods, and countries.
- Let $s^k = GDP^k / GDP^W$. With frictionless trade and complete specialization, the total volume of trade will be

$$\begin{aligned} VT &= 2\sum_k s^k \sum_{k' \neq k} \sum_i p_i X_i^{k'} = 2GDP^W \sum_k s^k \sum_{k' \neq k} s^{k'} \\ &= 2GDP^W \sum_k \sum_{k' \neq k} s^k \left(1 - s^k\right) = 2GDP^W \sum_k \left(1 - (s_k)^2\right). \end{aligned}$$

- If you minimize $\sum_k \left(1 - (s_k)^2\right)$ subject to $\sum_k s_k = 1$, you get $s_k = 1/K$.
- Helpman (1987) shows how to generalize this to a subset of countries A that may run trade imbalances.

$$\frac{V^A}{GDP^A} = s^A \left[1 - \sum_{k \in A} t_A^k + \sum_{k \in A} s_A^k t_A^k - \sum_{k \in A} \left(s_A^k\right)^2\right],$$

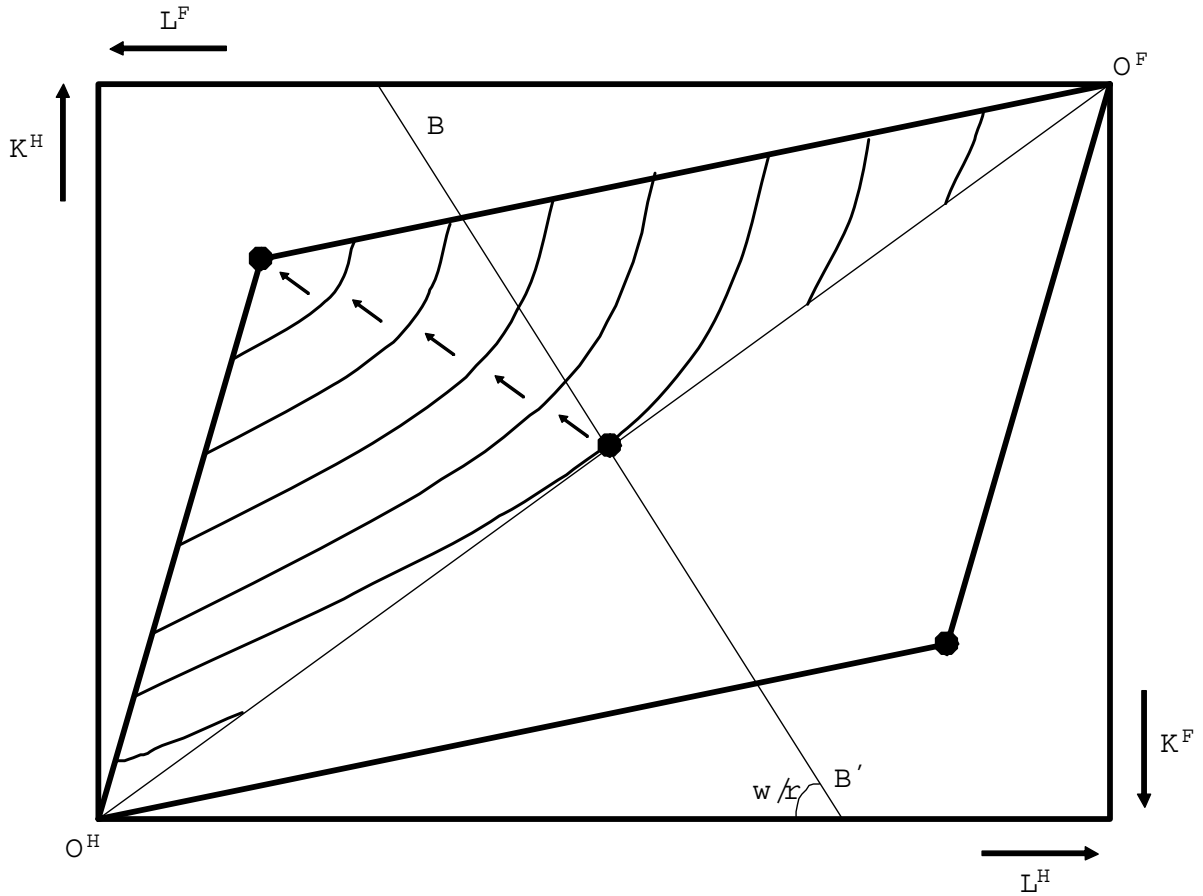
  with $t_A^k = NetExports^k / GDP^A$ and $s_A^k = GDP^k / GDP^A$.
- For set of 14 industrialized countries during 1956-1981, the relationship implied by the theory holds qualitatively (positive correlation).

Generalizations and Empirics (cted.)

- Hummels and Levinsohn (1995) note that the relationship also holds for country-pairs.
  - they find that for 91 OECD country-pairs, the model fits the data extremely well (controlling for country-pair fixed effects – e.g., trade barriers)
  - but they find that it also fits very well bilateral trade flows for a sample of non-OECD countries (Congo, Pakistan, Peru, Thailand,...)
- So this begs the question of whether we are testing monopolistic competition and product differentiation, or simply complete specialization
  - remember that with homothetic preferences and complete specialization, we obtain a gravity equation; the same is true for the above specifications.
- But Debaere (2005) notes that it makes a crucial difference whether one imposes or not the same coefficient on s^A and the similarity index:
  - when entering $\ln\left(s^A\right)_t$ and log of similarity separately, this does not have a big effect on the OECD sample,
  - but the results for non-OECD countries do not support the Helpman specification (which is good for monopolistic competition models).

A Hybrid Model

- Now let us go back to assuming $I = J = K = 2$, but now let one sector be a HK sector and the other one be a HO sector.
  - now the volume of trade will be positively affected both by relative size similarity and relative factor endowment differences

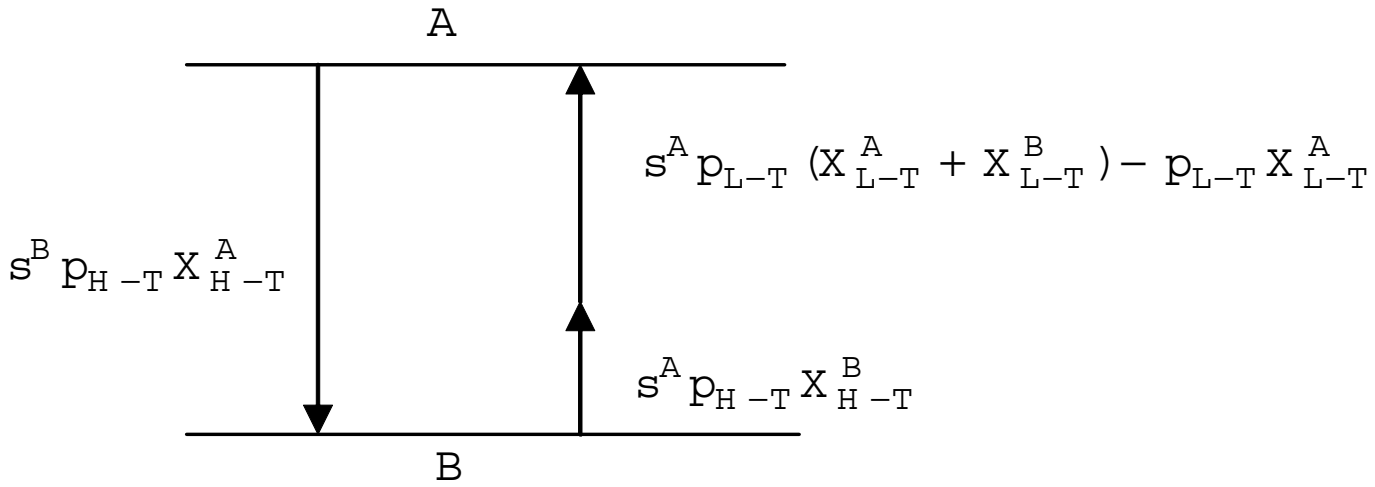


Intraindustry Trade

- Consider the following (Grubel and Lloyd) definition of the volume of intra-industry trade in country k

$$V_{I-I}^k = \sum_{i=1}^{I} 2 \min \left\{ EX_i^k, IM_i^k \right\}.$$

- For the case of two sectors, we can illustrate this graphically as follows (sector H-T is a HK sector):



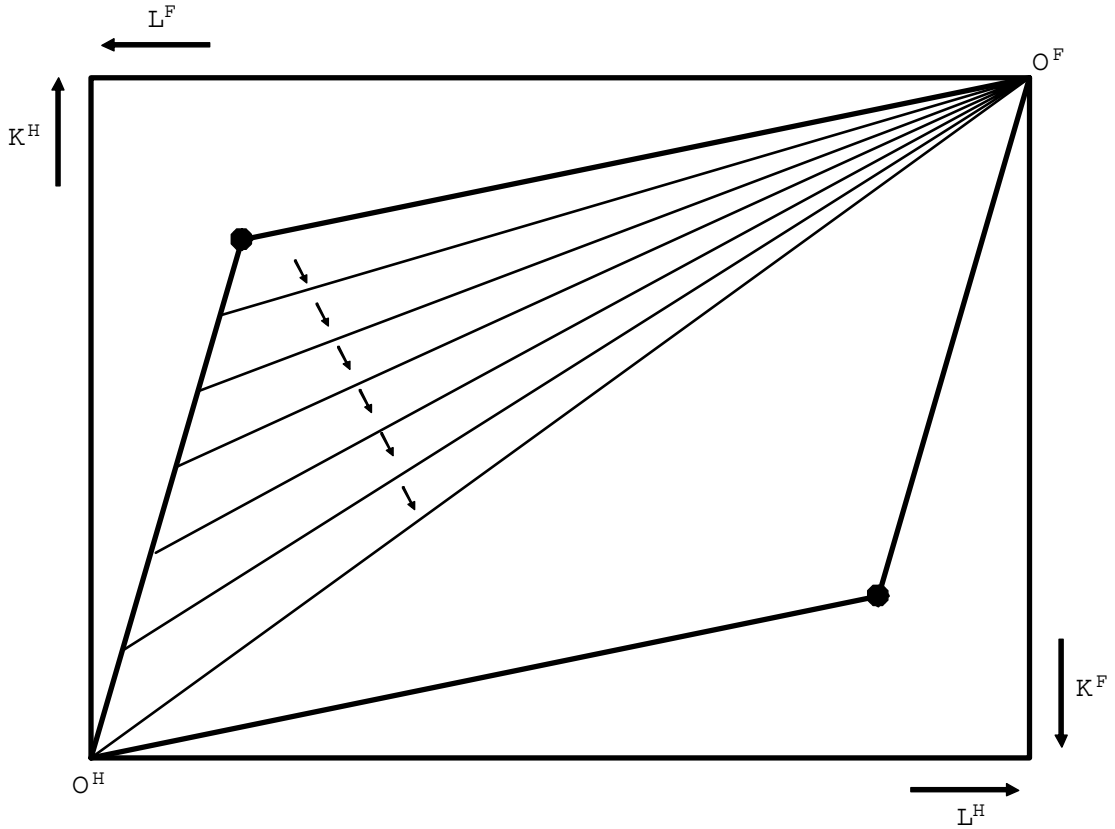
- In the above picture, the total volume of trade is $V = 2s^B p_{H-T} X^A_{H-T}$, while the volume of intra-industry trade is $V_{I-I} = 2s^A p_{H-T} X^B_{H-T}$.

Intraindustry Trade (cted.)

- Note that the share of intraindustry trade is:

$$Sh_{I-I} = \frac{V_{I-I}}{V} = \frac{s^A}{s^B} \frac{X^B_{H-T}}{X^A_{H-T}}.$$

  - The larger relative factor endowment differences, the smaller is Sh_{I-I}.



Intraindustry Trade: Empirics

- Helpman (1987) tests whether differences in factor composition, proxied by differences in income per capita, indeed reduce the share of intraindustry trade:
  - He finds a negative cross-sectional impact of differences in factor composition (controlling for the size of both larger and smaller country);
  - explanatory power falls through time.
- Hummels and Levinsohn (1995) make full use of the panel structure of the data and show that the results goes away when including fixed or random country-pair effects.
- Cieślik (2005) argues that previous empirical studies ran a misspecified equation, since one needs to control for the sum of the capital labor ratios of the two trading partners:
  - holding constant the sum of K/L and increasing the difference leads to lower intra-industry trade,
  - while holding constant the difference and increasing the sum raises this share;
  - Cieślik finds that these relationships hold empirically in the Hummels-Levinsohn data, including in panel estimation with fixed or random effects.

Other Work (Briefly)

- Romalis (2004) incorporates monopolistic competition and transportation costs to a Heckscher-Ohlin model with a continuum of goods:
  - trade costs break FPE and facilitate well determined net exports of particular commodities;
  - monopolistic competition allows for well determined bilateral trade flows;
  - he predicts and confirms for the U.S. that countries capture relatively larger market shares of commodities that use more intensively their abundant factors.
- Gravity Equation Literature: Anderson and Van Wincoop (2003), Evenett and Keller (2004).
  - has shed light on the role of multilateral resistance;
  - and on the relative importance of factor proportion differences and IRS in generating complete specialization.
- Extensive Margin of Trade: Hummels and Klenow (2005); Broda and Weinstein (2006).
  - extensive margin accounts for about 60% of larger exports of larger countries;
  - welfare gains from increased variety of imports could be of the order of 2.6% of GDP.