

# A Factor Endowment Theory of International Trade under Imperfect Competition

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The determination of trade pattern is a central topic in trade theory. The Heckscher-Ohlin Theorem has been one of the fundamental theorems. Since the Theorem is based on the assumptions of perfect competition and constant returns to scale, it is quite natural to ask whether the Theorem, or its modified version, is still true even under conditions of imperfect competition and non-constant returns.

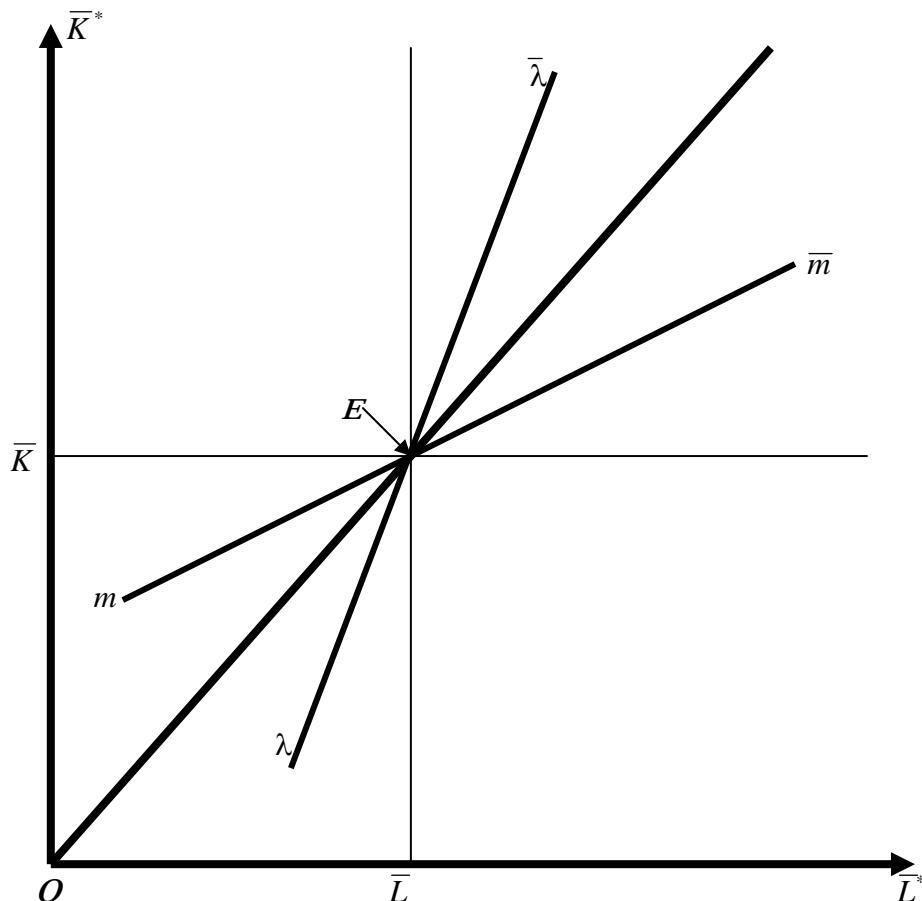
The answers that have been so far proposed are affirmative. Lahiri and Ono (IER, 1995) and Shimomura (Econ. Letters, 1998) considered two-country models in which there is an oligopolistic and increasing-returns-to-scale sector in each country and proved their oligopolistic versions of the Heckscher-Ohlin Theorem. However, both of them assumed free entry in any production sector. Thus, it has been an open question whether the factor endowment theory of international trade survives imperfect competition and increasing returns when entry into the increasing-returns-to-scale sector is assumed to be impossible and the industry is monopolized by a fixed number of firms

The purpose of this paper is to prove that we can still give an affirmative answer to the above question even in the case of an arbitrary difference in factor endowment ratios between trading countries. More specifically, constructing a two-country by two-factor by two-sector general equilibrium model of international trade in which one sector is monopolized under conditions of increasing returns to scale while the other sector is perfectly competitive under conditions of constant returns to scale, we establish an oligopolistic version of the Heckscher-Ohlin Theorem.

Let us outline our main results. First, we establish a fundamental proposition concerning the relationship between the home and foreign Cournot-Nash equilibrium outputs and the international distribution of factor endowments. Let  $(\bar{K}, \bar{L})$  and  $(\bar{K}^*, \bar{L}^*)$  be the pairs of home and foreign capital and labor endowments and  $(Y^N, Y^{*N})$  be a pair of Cournot-Nash equilibrium pair of home and foreign outputs in monopolized sectors. The fundamental proposition asserts that there exists a positive value, say  $\gamma$ , such that if the foreign country is more labor (resp. capital)-abundant country in a modified sense such that  $(\bar{K}^* - \bar{K}) < (\text{resp. } >) \gamma (\bar{L}^* - \bar{L})$ , then  $Y^N < Y^{*N}$  if the monopolized good is labor-intensive (resp. capital-intensive) than the competitive

good. The main difference between the standard Heckscher-Ohlin model and the present model is in that while  $\gamma$  is equal to  $\bar{K}/\bar{L}$  in the former model, it is equal to the capital-labor ratio in the competitive sector.

After we prove the fundamental proposition, we proceed to establish our oligopolistic Heckscher-Ohlin Theorem. Assume that the income effects on the demand for the monopolized good is sufficiently weak. Then, the fundamental proposition implies the oligopolistic Heckscher-Ohlin Theorem as follows: See Figure 1, where the slope of  $m\bar{E}\bar{m}$  (resp.  $l\bar{E}\bar{l}$ ) evaluated at  $E$  is the capital/labor ratio of the labor- (resp. capital-) intensive good. Suppose that the monopolized good is capital-intensive. Then if the foreign country is labor-(resp. capital-) abundant in the (modified) sense such that its factor endowment point is below (resp. above)  $m\bar{E}\bar{m}$ , then the foreign country exports the labor (resp. capital)-intensive good. If the monopolized good is labor-intensive,  $l\bar{E}\bar{l}$  is the border line. In any case we have the Heckscher-Ohlin trade pattern in a modified sense.



**FIGURE 1**