

EK 4307 INTERNATIONAL ECONOMICS
SALVATORE CHAPTER 5
FACTOR ENDOWMENTS AND THE HECKSCHER-OHLIN THEORY

The H-O theory is an extension of the previous models

- examines the basis for comparative advantage
- examines the effect that trade has on factor earnings in the two nations

Assumptions of H-O theory

- 2 nations; 2 commodities; 2 factors of production i.e capital (K) and labour (L)
- Identical technology
- Assuming commodities are X and Y, X is labour-intensive and Y is capital-intensive
- Production is under CRS
- Incomplete specialization
- Tastes are equal
- Perfect competition in both commodities and factor markets
- Perfect factor mobility within each nation
- No transportation costs, tariffs or obstructions to the free flow of international trade
- Fully employed resources
- International trade between the two nations is balanced

H-O is expressed in terms of (i) factor intensity and (ii) factor abundance.

Factor Intensity

2 commodities; X and Y, 2 FOP; labour (L) and capital (K)

Example #1 :

to produce 1 unit of Y will make use of 2K and 2L therefore K/L ratio = 1

to produce 1 unit of X will make use of 1K and 4L therefore K/L ratio = $\frac{1}{4}$

In this e.g Y is K-intensive and X is L-intensive

Example #2:

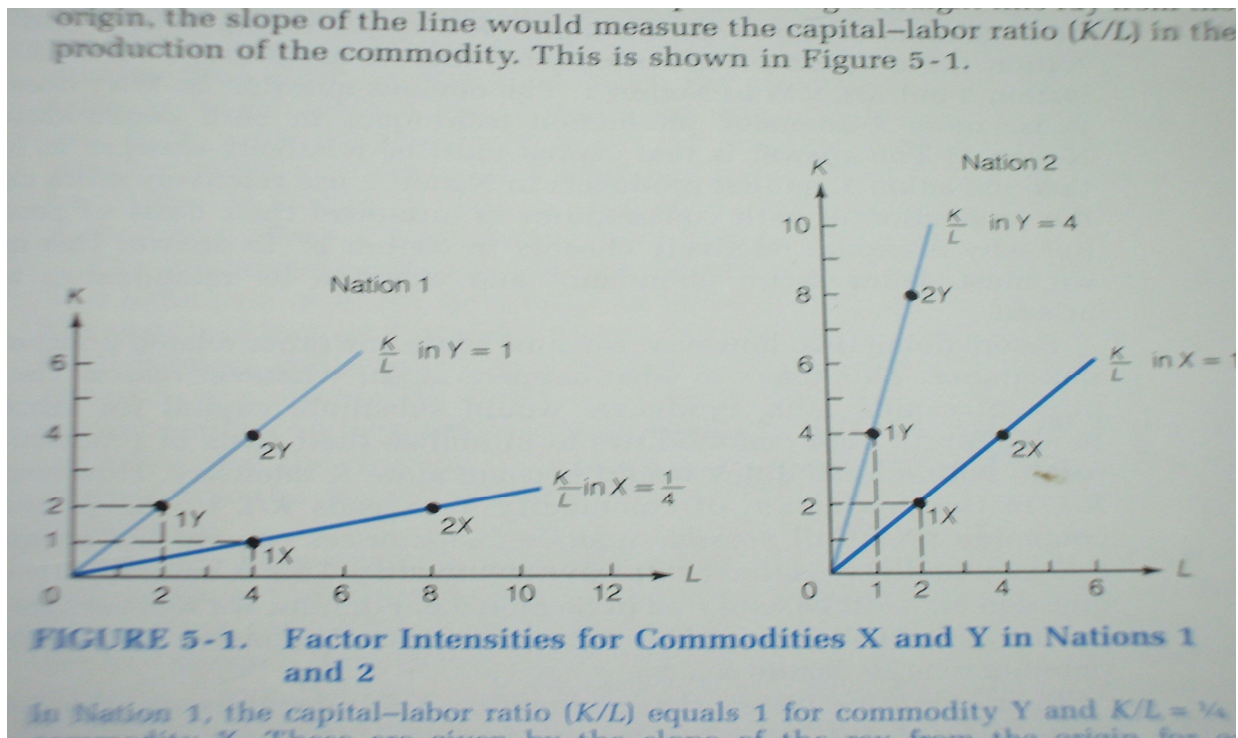
to produce 1 unit of Y will make use of 2K and 2L therefore K/L ratio = 1

to produce 1 unit of X will make use of 3K and 12L therefore K/L ratio = $\frac{1}{4}$

In this e.g Y is still K-intensive.

Looking at the two examples, what is *important* is to know the amount of K per unit of L used in production. It is *not important* to look at the absolute amount of K and L

For Graphical Illustration please refer to Figure 5-1



Nation 1: $K/L(Y) = 1$ and $K/L(X) = \frac{1}{4}$, Y is K-int and X is L-int

Nation 2: $K/L(Y) = 4$ and $K/L(X) = 1$, Y is K-int and X is L-int

Nation 2's $K/L >$ Nation 1's K/L because the relative price of K (r/w) is lower in Nation 2.

If r/w falls, producers would substitute K for L in the production of both X and Y to minimize their COP as a result K/L would increase for both X and Y.

Factor Abundance

2 ways to define (i) in terms of physical units and (ii) in terms of relative factor prices (i.e in terms of the rental price of K and the price of L time in each nation)

In terms of physical units:

Nation 2 is K-abundant if the ratio of the total amount of K to the total amount of L (TK/TL) in Nation 2 is greater than in nation 1

In terms of relative factor prices:

Nation 2 is K-abundant if the ratio of the rental price of K to the price of L time (PK/PL) is lower in nation 2 than in nation 1.

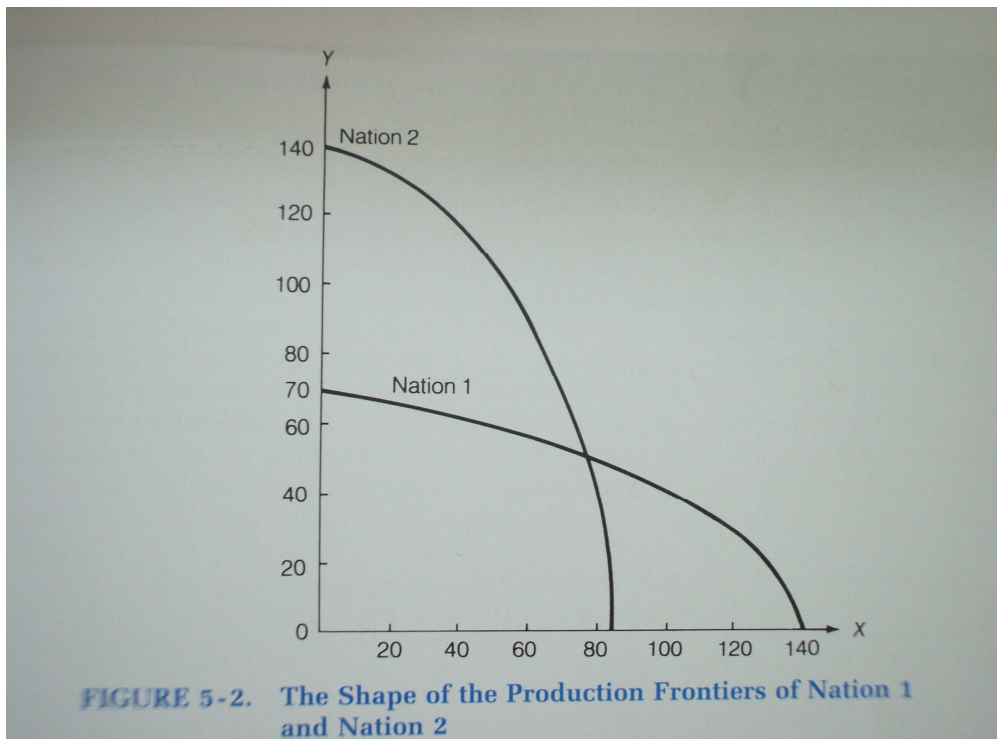
Assuming that tastes or DD preferences are the same in both nations, the two definitions of factor abundance give the same conclusions.

With TK/TL (nation 2) $>$ TK/TL (nation 1) in the face of EQUAL DD CONDITIONS AND TECHNOLOGY, PK/PL (nation 2) $<$ PK/PL (nation 1). Thus, nation 2 is the K-abundant nation in

terms of BOTH definitions

If contradictions exist, the definition in terms of relative factor prices should be used.

Factor Abundance and the Shape of the PPF (refer to Fig 5-2)



The PPF of nation 1 is flatter than the PPF of nation 2. Nation 1 can produce relatively more of X than nation 2.

Why?

Nation 1 is the L-abundant nation and X is a L-intensive commodity.

Heckscher-Ohlin theorem

The H-O theory can be presented in the form of two theorems; the H-O theorem and the Factor Price Equalization Theorem.

H-O Theorem: A nation will **export** the commodity whose production requires the intensive use of the nation's **relatively abundant and cheap factor** AND **import** the commodity whose production requires the intensive use of the nation's **relatively scarce and expensive factor**.

The relatively L-rich nation exports the relatively L-intensive commodity and imports the relatively K-intensive commodity

The H-O theorem postulates that the **DIFFERENCE IN RELATIVE FACTOR ABUNDANCE AND PRICES** is the cause of the pretrade difference in relative commodity prices between the two nations.

General EQM Framework of the H-O Theory

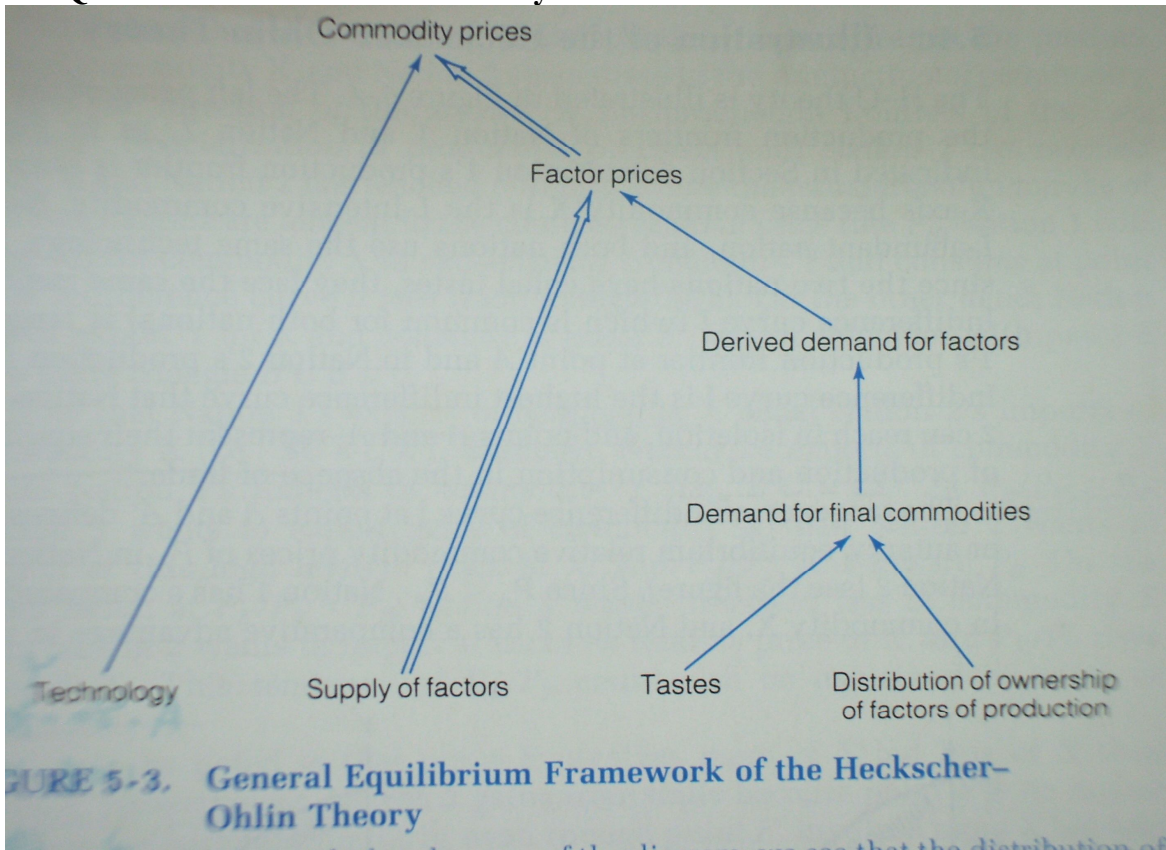
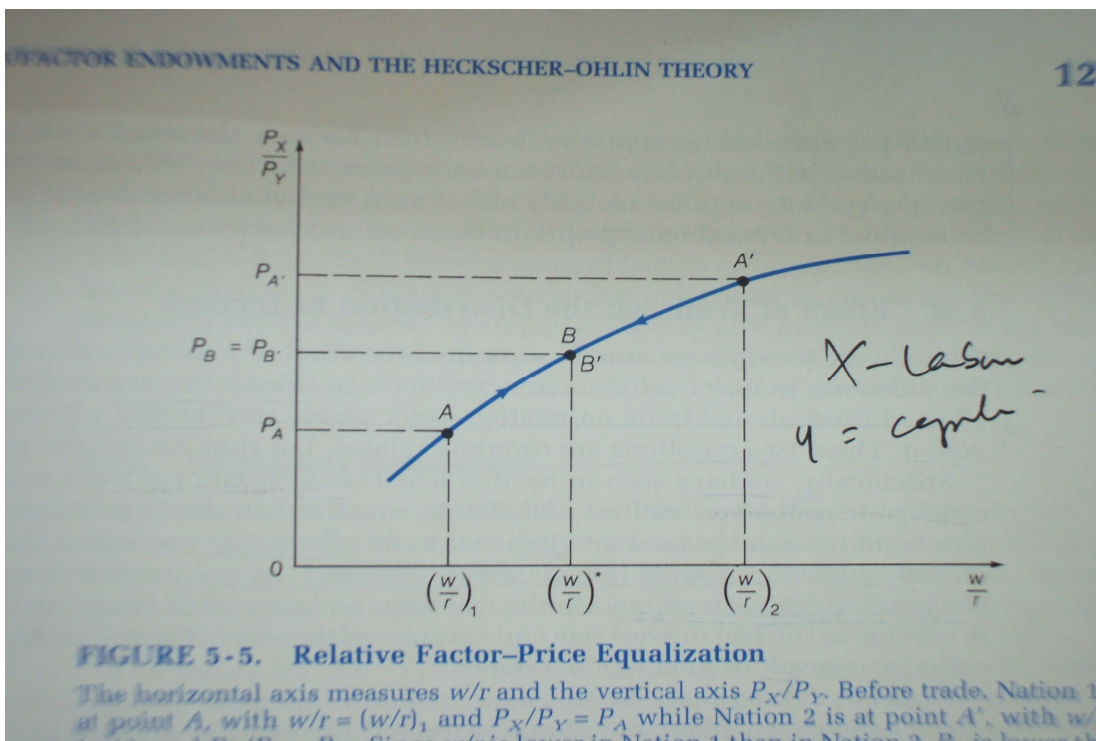


Illustration of the H-O Theory (refer to Fig 5-4)

The Factor-Price Equalization Theorem

International trade will bring about equalization in the relative and absolute returns to homogeneous factors across nations i.e international trade will cause the return to homogeneous capital to be the same in all trading nations.

Graphical Illustration of relative factor-price equalization (refer to Figure 5-5)



Since each nation operates under perfect competition and uses the same technology, there is a one-to-one relationship between relative price of L (w/r) and the relative price of X (P_X/P_Y).

Before trade:

Nation 1 is at A with $w/r = w/r_1$ and $P_X/P_Y = P_A$

Nation 2 is at A' with $w/r = w/r_2$ and $P_X/P_Y = P_{A'}$

With $w/r_1 < w/r_2$ in the absence of trade, $P_A < P_{A'}$, so nation 1 has a comparative advantage in X

With trade:

Nation 1 specializes in X and reduces the production of Y this cause the DD for L to increase relative to the DD for K and w/r rises and so does P_X/P_Y in nation 1.

Nation 2 specializes in Y and reduces the production of X this cause the DD for K to increase relative to the DD for L and w/r falls and so does P_X/P_Y in nation 2.

The process continue until $B=B'$ at which $P_B=P_{B'}$ and $w/r=w/r^*$ in both nations

To summarize P_X/P_Y will become equal as a result of trade and this will occur only when w/r has also become equal in the two nation

Empirical Tests of the H-O Model

(Self-Reading Section 5.6a and 5.6b)

5.6c Factor-Intensity Reversal

FIR refers to the situation where a given commodity is the L-int commodity in the L-abundant nation and the K-int commodity in K-abundant nation.

E.g

If X is the L-int commodity in nation 1 (low-wage nation) and at the same time is the K-int commodity in nation 2 (high-wage nation)

Why? Elasticity of Substitution.

Suppose that the elasticity of substitution of L for K is much greater in the production of X than in Y, this means it is much easier to substitute L for K (or vice versa) in the production of commodity X than in the production of Y.

The greater is the elasticity of substitution of L for K in the production of the two commodities, the more likely it is for FIR to occur.

When FIR is present neither the H-O theorem nor the Factor-Price Equalization Theorem holds.