International Trade

L10

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.***
- In short, the relatively labor-rich nation exports the relatively labor-intensive commodity and imports the relatively capital-intensive commodity.
- Of all the possible reasons for differences in relative commodity prices and comparative advantage among nations, **the H–O theorem isolates the difference in relative factor abundance, or *factor endowments*, among nations as the basic cause or determinant of comparative advantage and international trade.**
- **For this reason, the H–O model is often referred to as the factor-proportions or factor-endowment theory**.
- The H–O theorem postulates that **the difference in relative factor abundance and prices is the *cause* of the pre-trade difference in relative commodity prices between two nations**.

H-O Theorem

- 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 two nations**.
- This difference in *relative* factor and *relative* commodity prices is then translated into a difference in *absolute* factor and commodity prices between the two nations.
- It is **this difference in absolute commodity prices in the two nations that is the *immediate* cause of trade.**

Factor-price equalization Theorem

- **The international trade will cause the wages of homogeneous labor (**i.e., labor with the same level of training, skills, and productivity**) to be the same in all trading nations** (if all of the assumptions of H-O Theorem holds).
- Similarly, **international trade will cause the return to homogeneous capital** (i.e., capital of the same productivity and risk) **to be the same in all trading nations**.
- That is, international trade will make *w* the same in Nation 1 and Nation 2;
- similarly, it will cause *r* to be the same in both nations. Both relative and absolute factor prices will be equalized.

Factor-price equalization Theorem

- In the absence of trade the relative price of commodity X is lower in Nation 1 than in Nation 2 because the relative price of labor, or the wage rate, is lower in Nation 1.
- As Nation 1 specializes in the production of commodity X (the *L*-intensive commodity) and reduces its production of commodity Y (the *K*-intensive commodity), the relative demand for labor rises, causing wages *(w)* to rise, while the relative demand for capital falls, causing the interest rate *(r)* to fall.

- The exact opposite occurs in Nation 2. That is, as Nation 2 specializes in the production of Y and reduces its production of X with trade, its demand for *L* falls, causing *w* to fall, while its demand for *K* rises, causing *r* to rise.

Factor-price equalization Theorem

- To summarize, international trade causes *w* to rise in Nation 1 (the low-wage nation) and to fall in Nation 2 (the high-wage nation).
- Thus, **international trade reduces the pre-trade difference in *w* between the two nations. Similarly, international trade causes *r* to fall** in Nation 1 (the *K*-expensive nation) and to rise in Nation 2 (the *K*-cheap nation), thus reducing the pre-trade difference in *r* between the two nations.
- This proves that international trade ***tends to reduce*** the pre-trade difference in *w* and *r* between the two nations.

Effect of trade on distribution of income (Within each nations)

- Factor-Price Equalization: Effect of internation trade on factor prices **between** nations = Equalises w and r in the two nations (for homogenous input factors)
- The effect of international trade on relative factor prices and income ***within each nation****?*
- *Within each nation:* examine how international trade affects real wages and the real income of labor in relation to real interest rates and the real income of owners of capital *within* each nation

Effect of trade on distribution of income (Within each nations)

- Trade increases the price of the nation's abundant and cheap factor and reduces the price of its scarce and expensive factor.
- In our example, *w* rises and *r* falls in Nation 1, while *w* falls and *r* rises in Nation 2.
- Since labor and capital are assumed to remain fully employed before and after trade, the real income of labor and the real income of owners of capital move in the same direction as the movement in factor prices.
- Thus, trade causes the real income of labor to rise and the real income of owners of capital to fall in Nation 1 (the nation with cheap labor and expensive capital).
- On the other hand, international trade causes the real income of labor to fall and the real income of owners of capital to rise in Nation 2 (the nation with expensive labor and cheap capital).
- This is the conclusion of the ***Stolper–Samuelson theorem*****,**
- **i.e Trade increases real income of abundant factor and decreases real income of scarce factor**

Effect of trade on distribution of income (Within each nations)

- Since in developed nations (e.g., the United States, Germany, Japan, France, Britain, Italy, Canada) capital is the relatively abundant factor (as in our Nation 2), international trade tends to reduce the real income of labor and increase the real income of owners of capital. This is why labor unions in developed nations generally favor trade restrictions.
- In less developed nations (e.g., India, Egypt, Korea, Mexico), however, labor is the relatively abundant factor, and international trade will increase the real income of labor and reduce the real income of owners of capital.

Effect of trade on distribution of income (Within each nations)

- Since, according to the Heckscher–Ohlin theory, international trade causes real wages and the real income of labor to fall in a capital-abundant and labor-scarce nation such as the United States, shouldn't the U.S. government restrict trade?
- The answer is almost invariably no. The reason is that the loss that trade causes to labor (particularly unskilled labor is less than the gain received by owners of capital.
- With an appropriate redistribution policy of taxes on owners of capital and subsidies to labor, both broad classes of factors of production can benefit from international trade.
- Such a redistribution policy can take not only the form of retraining labor displaced by imports but also the form of tax relief for labor and provision of some social services.

Has International trade increased wage/income inequality between skilled and unskilled workers?

- Yes, it did- but it is not a major cause

- The international trade certainly contributed to the unskilled workers' problems in industrial countries, but it played only a minor role in (i.e., it may have been responsible for no more than 10 to 15 percent).
- Most of the increase in unskilled–skilled real wage inequalities was probably due to technological changes, such as automation and the computerization of many jobs which sharply reduced the demand for unskilled workers.
- Despite the sharp increase in international trade and off-shoring during the past two decades, research mostly support this version for difference in wage difference.

The Specific-Factor Model

- *The conclusion reached by the specific-factors model is that trade will have an ambiguous effect on the nation's mobile factors, benefit the immobile factors specific to the nation's export commodities or sectors, and harm the immobile factors specific to the nation's import-competing commodities or sectors*.

Empirical relevance of Factor-Price Equalisation?

- Has international trade equalized the returns to homogeneous factors in different nations in the real world?
- No
- The reason for this is that many of the simplifying assumptions on which the H–O–S theory rests do not hold in the real world.
- For example, nations do not use exactly the same **technology, and transportation costs and trade barriers** prevent the equalization of relative commodity prices in different nations
- Furthermore, many industries operate under conditions of **imperfect competition and nonconstant returns to scale**
- Therefore, that international trade has not equalized wages and interest rates for homogeneous factors in different nations
- Under these circumstances, it is more realistic to say that international trade has ***reduced*****,** rather than completely eliminated, the international difference in the returns to homogeneous factors.

Empirical Tests of the Heckscher–Ohlin Model

- The first empirical test of the Heckscher–Ohlin model was conducted by *Wassily Leontief* in 1951 using U.S. data for the year 1947.
- Since the United States was the most *K*-abundant nation in the world, Leontief expected to find that it exported *K*-intensive commodities and imported *L*-intensive commodities.
- Leontief utilized the input–output table of the U.S. economy to calculate the amount of labor and capital in a "representative bundle" of $1 million worth of U.S. exports and import substitutes for the year 1947.
- To be noted is that Leontief estimated *K*/*L* for U.S. import substitutes rather than for imports. Import substitutes are commodities, such as automobiles, that the United States produces at home but also imports from abroad (because of incomplete specialization in production).
- Leontief was forced to use U.S. data on import substitutes because *foreign* production data on actual U.S. imports were not available.

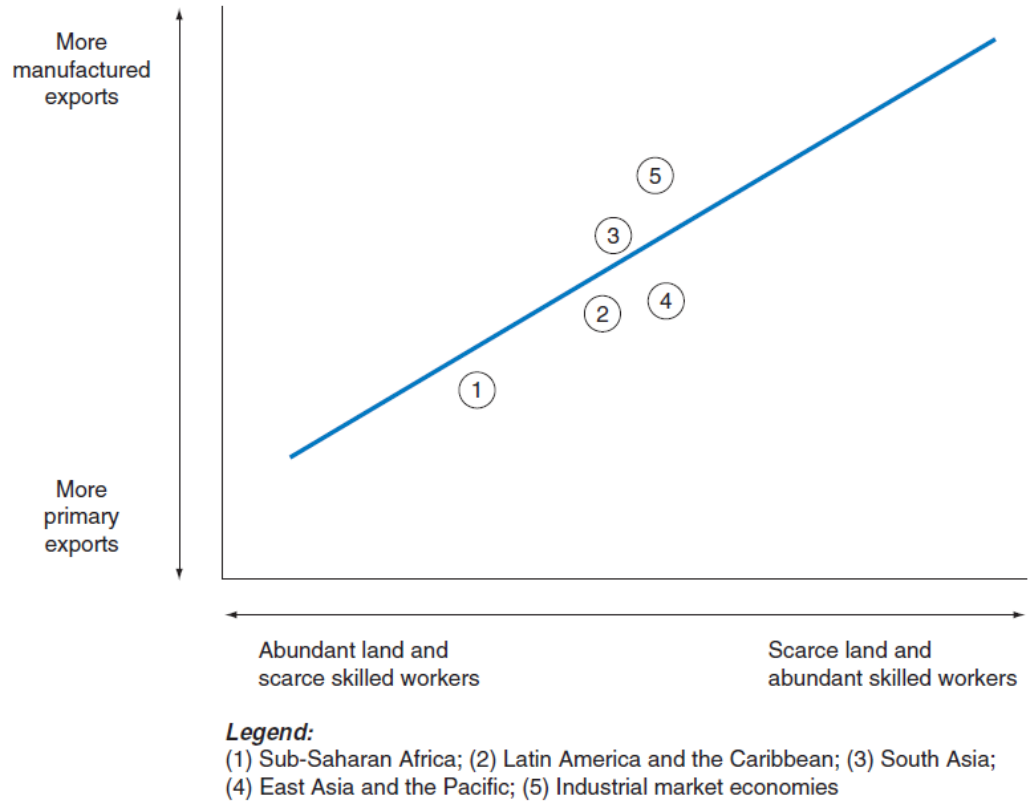
Empirical Tests of the Heckscher–Ohlin Model: The Leontief Paradox

- The results of Leontief's test were startling. U.S. import substitutes were about 30 percent more *K* intensive than U.S. exports. That is, the United States seemed to export *L*-intensive commodities and import *K*-intensive commodities.
- This was the opposite of what the H–O model predicted, and it became known as **the Leontief paradox**

Explanations of the Leontief Paradox and Other Empirical Tests of the H–O Model

- Input-output table of 1947-too close to World War II: repeated study by using 1951 trade data (in 1956)
- Many reasearchers texted this paradox: some gave the following explanations
- Kravis, Kenen, Baldwin, Leamer (from 1966 to recent decades studies tried to text HO and the Paradox)
- **- Ignored Human Capital**
- Human capital refers to the education, job training, and health embodied in workers, which increase their productivity.
- The implication is that since U.S. labor embodies more human capital than foreign labor, adding the human
- capital component to physical capital would make U.S. exports more *K* intensive relative to
- U.S. import substitutes.

Explanations of the Leontief Paradox and Other Empirical Tests of the H–O Model



Explanations of the Leontief Paradox and Other Empirical Tests of the H–O Model

- Conclusion (Baldwin, 2008):
- It seems that we can retain the traditional Hecksher–Ohlin model for explaining trade between developed and developing countries (often referred to as North–South trade) and
- A qualified or restricted version of the H–O model for the much larger volume of trade among developed countries (i.e., North–North trade) if the model is extended to allow for different technologies and factor prices across countries, as well as the existence of nontraded goods, economies of scale, product differentiation, and transportation costs.

Factor-Intensity Reversal

- Factor-intensity reversal refers to the situation where a given commodity is the *L*-intensive commodity in the *L*-abundant nation and the *K*-intensive commodity in the *K*-abundant nation.
- For example, factor-intensity reversal is present if commodity X is the *L*-intensive commodity in Nation 1 (the low-wage nation), and, at the same time, it is the *K*-intensive commodity in Nation 2 (the high-wage nation).
- Why: Elasticity of Substitution
- The elasticity of substitution measures the degree or ease with which one factor can be substituted for another in production as the relative price of the factor declines.
- For example, suppose that the elasticity of substitution of *L* for *K* is much greater in the production of commodity X than in the production of commodity Y. This means that it is much easier to substitute *L* for *K* (or vice versa) in the production of commodity X than in the production of commodity Y.

Factor-Intensity Reversal

- Factor-intensity reversal is more likely to occur the greater is the *difference* in the elasticity of substitution of *L* for *K* in the production of the two commodities.
- With a large elasticity of substitution of *L* for *K* in the production of commodity X, Nation 1 will produce **commodity X with *L*-intensive techniques** because its **wages are low.**
- On the other hand, Nation 2 will **produce commodity X with *K*-intensive techniques** because its **wages are high.**
- If at the same time the elasticity of substitution of *L* for *K* is very low in the production of commodity Y, the two nations will be forced to use similar techniques in producing commodity Y even though their relative factor prices may differ greatly.
- As a result, commodity X will be the *L*-intensive commodity in Nation 1 and the *K*-intensive commodity in Nation 2, and we have a case of factor-intensity reversal.

Factor-Intensity Reversal

- When factor-intensity reversal is present, neither the H–O theorem nor the factor–price equalization theorem holds.
- The H–O model fails because it would predict that Nation 1 (the *L*-abundant nation) would export commodity X (its *L*-intensive commodity) and that Nation 2 (the *K*-abundant nation) would also export commodity X (its *K*-intensive commodity).
- Since the two nations cannot possibly export the same *homogeneous* commodity to each other, the H–O model no longer predicts the pattern of trade.
- With factor-intensity reversal, the factor–price equalization theorem also fails to hold.