

Homework 2

Heckscher-Ohlin Model and Specific Factors Model

ECO-13101 Economía Internacional I (International Trade Theory)*

Question 5 must be submitted in class. The other questions are for your practice.

Question 1: Implication of HO Theorem

Suppose that there are three goods (software, shirts, wheat) and three factors (skilled labor, unskilled labor, land). Software is intensive in skilled labor, shirts are intensive in unskilled labor, and wheat is intensive in land. The US is land-abundant and skilled-labor-abundant relative to the rest of the world. Discuss intuitively the effects of moving from autarky to free trade on

1. The outputs of the three goods in the US;
2. The distribution of income in the US (which factors experience an increase in income);
3. The incentives to get a university education;
4. The degree of disparity in the income distribution (the ratio of the incomes of the high income workers to the incomes of the low income workers).

Question 2: Ricardian versus Heckscher-Ohlin Forces of Trade

Consider a world with two countries, home (h) and foreign (f). Both countries produce

*Rahul Giri. Contact Address: Centro de Investigacion Economica, Instituto Tecnologico Autonomo de Mexico (ITAM).
E-mail: rahul.giri@itam.mx

two goods, X and Y , using two inputs, labor (L) and capital (K). Output of each good in country $j = \{h, f\}$ is given by the following production function:

$$X^j = Z_x^j (K_x^j)^\alpha (L_x^j)^{1-\alpha} \quad , \quad Y^j = Z_y^j (K_y^j)^\beta (L_y^j)^{1-\beta} \quad ,$$

where $0 < \alpha, \beta < 1$, and $\beta > \alpha$. Z_x^j is the total factor productivity (TFP) in sector X in country j . It reflects the efficiency with which sector X can convert one unit of an input bundle (combination of labor and capital) into output. Z_y^j has an analogous interpretation. Thus, TFP represents the level of technology in each sector. Assume perfect mobility of factors across the two sectors within each country and perfectly competitive markets.

1. Assuming autarky, and denoting prices by p_x^j and p_y^j , setup the profit maximization problem of the firm in each sector in country j and obtain the first order conditions.
2. Use the first-order conditions to express the capital-labor ratio of each sector as a function of the wage-rental ratio (w_j/r_j).
3. Use the result from the previous part to derive an expression for the price ratio (p_x^j/p_y^j).
4. Based on the expression in the previous part explain how this model has both, Ricardian and Heckscher-Ohlin, forces to explain the differences in comparative advantage.
5. When these countries trade (suppose the world prices are p_x^* and p_y^*), will factor price equalization hold? Why or why not? Explain your answer by using the expression for price ratio derived in part (3).

Question 3: Specific-Factors Model

Figure 1 in the lecture notes on the specific-factors model describes an initial autarky equilibrium at point A and then a transition to a new equilibrium point C . The new equilibrium is the result of opening up of our small open economy to trade - the world price of good X is higher than that in the small open economy and the world price of good Y is equal to the price in the small open economy. Both point A and point C are short-run equilibrium points. Continue the analysis by explaining what will happen in the long run (i.e. when

capital is mobile between the two sectors) in terms of effects on outputs and real factor prices.

Question 4: Assumptions of HO Model

Read the article “Low-Skilled Jobs: Do They Have to Move?”, uploaded on the website and answer the following questions:

1. Why would the U.S. productivity and living standards rise if U.S. allows countries with a relative abundance of low-priced labor to perform its low-skilled work?
2. What is the crucial assumption on which the previous statement rests? What did we call this assumption in our lecture on the HO model?
3. In the article is this assumption violated? Why or why not?
4. According to Robert C. Feenstra, would there be gains from trade if this assumption is violated?
5. “Trade economists have shown that the shift of jobs overseas is one reason for the decades-long decline in the wages of low-skilled U.S. workers.” If the gains from trade are not certain because of the violation of the key assumption then what can the U.S. government do to compensate the low-skilled workers?
6. What is the cost (dis)advantage the U.S. New Balance plant has as compared to the Chinese? Explain your answer with calculations. How does New Balance recover the other costs and stay profitable?
7. What is the role of technology in this article?

Question 5: What does Mexico Import and Export

Go to the World Integrated Trade Solutions (WITS) webpage -

<https://wits.worldbank.org/WITS/WITS/Restricted/Login.aspx> -

and create your account (username and password). Once you login, under ‘Advanced Query’ select ‘Trade Data (UN Comtrade)’. Fill out ‘Query Name’, ‘Query Description’, choose ‘Comtrade’ as Data Source and then press ‘Proceed’. On the next page do the following:

(1) for Reporters select Mexico; (2) under Products choose SITC Revision 3 as the ‘Nomenclature’, and then from ‘Clusters’ choose ALL3 – Group (3-digit); (3) for Partners choose World; (4) for Years choose 1993 and 2007; (5) for Trade Flows choose Exports and Imports. When you download the data you will have the option to select a file format (excel or csv is best), and also an option to add more columns. You should add ‘Product Description’ to Selected Columns. Then Download the data.

1. Rank the commodity groups, highest to lowest, according to their share in total exports in year 1993. Do the same for 2007. List the top 10 exported commodities of 1993 and compare their rank in 1993 with their rank in 2007. What are the top 10 exported commodities of 2007, and how does their 2007 rank compare with their 1993 rank. How has NAFTA affected the export composition of Mexico?
2. Now do the exercise of the previous part for imports. How has NAFTA affected the import composition of Mexico?
3. For each commodity group compute the percentatge change in exports from 1993 to 2007. Rank them highest to lowest in terms of percentatge change. What are the top 10 commodities that experienced greatest growth in exports? Now, repeat the exercise for imports.
4. Make a scatter plot with share in total exports in year 1993 on the x-axis and the percentatge change in exports from 1993 to 2007 on the y-axis. Interpret what you see in this graph. Compute the correlation between the share in total exports in year 1993 and the percentatge change in exports from 1993 to 2007 across commodity groups.
5. Now do the exercise of the previous part for imports.