Heckscher-Ohlin model (2/2)

Problem 1

The production volume of 3 goods produced by the country is represented by the vector X = [7, 13, 11], and the world production of goods is equal to X^W = [1000, 1000, 1000]. World prices are p = [3, 2, 3], and the technology matrix (matrix of inputs-results) is given below:

$$A = \begin{bmatrix} 1 & 1 & 2 \\ 3 & 2 & 1 \\ 2 & 1 & 3 \end{bmatrix}$$

where the first row of the matrix is unit labor input, the second row is unit investment of land, and the third row is unit investment of capital. All countries of the world have identical homothetic preferences and balanced trade.

(a) Calculate the resources abundance of production factors in the country.

(b) Specify the structure of the country's trade.

(c) Show that the country's trade balance is equal to 0.

(d) Calculate the composition of factors of production in the country's trade.

(e) Calculate factor equilibrium prices.

Problem 2

Let's assume that two goods are produced in Australia: coal (C) and wool (W). Labour is used for production, but it varies in qualifications. Production in the coal sector uses a **highly skilled** labour in a relatively intensive way.

(a) On the Lerner-Pearce diagram, draw isovalues curves for coal and wool.

(b) Draw the unit cost line in the same diagram. Mark production points. What does the ratio of production inputs in both sectors define in this diagram?

(c) If Australia is relatively abundantly equipped with highly skilled labor, which good will it export?

(d) Suppose the price of wool is fixed. What change in price relation can be expected after start trading? Mark this change on the chart.

(e) How will nominal salaries and purchasing power of employees in Australia change?

Prepared by Łukasz Matuszczak, PhD

Problem 3

Let's assume that two goods are produced in some country: machines (M) and clothes (C), using capital (K) and labour (L). The production functions of both goods are as follows (i = M, C):

$$Q_i = (K_i)^{\alpha_i}(L_i)^{1-\alpha_i}$$

(a) Write the unit cost function.

(b) Write the isoquant formula of the unit value for each of the goods.

(c) Calculate the optimal allocation of labour with relation to capital in each sector. When are the machines relatively capital-intensive produced?

(d) Present your results in the Lerner-Pearce diagram.

(e) Mark in this diagram the so-called diversification cone.

(f) Is it possible in the country that produced both goods in autarky that after starting international trade it will specialize completely? Show on the chart.

Problem 4

Let's assume that all assumptions of the Heckscher-Ohlin model are fulfilled. The graphs below present the global balance (left chart) of the Country and Foreign Countries (marked with *) using the relative demand (RD) and relative supply (RS) curves and the general equilibrium (right chart) of the country's economy. Countries can produce two goods: food - F, and cheese - C, using capital and labour. Let's assume that food production is relatively labour intensive. Using the following drawings, explain what effects the following events will have on the terms of trade and the well-being of the country's citizens:

(a) Increase in the capital stock in the country

(b) Increase in labor resources in the country

(c) Technical progress in the production of food abroad

(d) Changing consumer preferences - an increase in spending on cheese