QUESTIONS - CHAPTER 7 FACTOR ABUNDANCE

Question 7.1
Since Deng Xiaoping took over leadership of China in 1977, tariffs have decreased dramatically. In 2001, China even joined the WTO, sending a signal to the world that tariff reduction will continue in the future. The effects of the opening up of China to international trade are heavily debated within the media. Some commentators claim that trading with China is a good thing because products become cheaper. Others stress the negative effect it has on some Western industries, such as the clothes industry.
Let’s analyse the integration of China in the world economy with the Heckscher–Ohlin model. Assume, to make things easy, that there are only two countries: China and the Western world (the Western world is considered to be one country). China is relatively labour abundant and the Western world relatively capital abundant. Furthermore, assume that only two goods are consumed and produced in China and the Western world. These are clothes (produced relatively labour intensively) and computers (produced relatively capital intensively).
7.1A Draw a consistent graph in which you indicate the autarky production and consumption points of China and the Western world with the help of production possibility frontiers and utility curves.
7.1B Explain intuitively whether the relative price of clothes in the Western world is higher or lower compared to the relative price of clothes in China when both China and the Western world are in autarky. How can you see this price difference in your graph?
7.1C Explain what will happen to the prices of clothes and computers in the Western world when the Western world and China start trading.
7.1D What effect will this have on the consumption of clothes and computers and on the production of clothes and computers in the Western world? Indicate the new consumption and production point in the graph with the help of a budget line and a new utility curve (if your graph becomes messy, please draw a new graph).
7.1E Is integration of China into the world economy a good thing for the Western world? Use the observations you made above in your analysis. Also comment on the distribution of welfare between industries and owners of production factors.
Question 7.2
Table 7.1 in the main text shows the autarky values for Austria. The values above the double line are exogenously specified parameters. The values below the double line are determined endogenously. If we change the parameter values above the line, we should be able to determine the endogenous values below the line. Determine the changes in (i) the wage–rental rate, (ii) the final goods price ratio, (iii) the welfare level, (iv) the production level of manufactures, and (v) the production level of food if:

7.2A The Austrian capital stock K increases.
7.2B The Austrian labor force L increases.
7.2C The capital intensity of manufactures decreases.
7.2D The share of income spent on manufactures increases.

Question 7.3
Starting with Wasily Leontief, empirical research has shown that trade patterns cannot be explained by differences in factor endowments between countries alone. A simple thought-experiment can shed some light on this issue.

7.3A According to the Heckscher–Ohlin model, will there (other things equal) be more trade between developed countries or between developed and less developed countries?
7.3B Does trade data show more intensive trading between developed countries or between developed and less developed countries (see Chapter 1)?
7.3C What do you conclude from your answers to question 7.3A and 7.3B regarding the factor abundance model?

Question 7.4
In the main text it is assumed that preferences are identical and homothetic.

7.4A What does it mean that preferences are identical and homothetic?
7.4B Show with an example that the Heckscher-Ohlin result does not necessarily hold when preferences are heterogeneous.
7.4C Show with an example that the Heckscher-Ohlin result does not necessarily hold when preferences are not homothetic.
Question 7.5
Which of the following assumptions apply to the Heckscher-Ohlin model?

7.5A Identical technologies between industries
7.5B Identical technologies between countries
7.5C Increasing returns to scale
7.5D Diminishing returns to scale
7.5E Perfect mobility of factors between industries
7.5F Perfect mobility of factors between countries
7.5G Perfect competition
7.6H Current account deficit
7.6I Unemployment

Question 7.6
Bowen, Leamer and Sveikaukas¹ test the Heckscher-Ohlin result with a dataset of 27 countries and 12 factors of production. Their research is based on the idea that trading goods is an indirect way of trading factors of production. They calculate the share of each country’s production factor endowment in total world endowment. If this share is larger than the share in world income, this country is said to be relatively well endowed with this factor. According to the Heckscher-Ohlin result this country should therefore be exporting the goods that make relatively intensive use of this factor of production. So if for example the following equation is valid:

\[
\frac{\text{Capital endowment country}}{\text{Capital endowment world}} > \frac{\text{Income country}}{\text{Income world}}
\]

This country is exporting capital intensive goods.

The table below shows the results of Bowen, Leamer and Sveikaukas.

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Table: Percentage of countries for which the net exports flow in the predicted direction

<table>
<thead>
<tr>
<th>Factor of production</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>56%</td>
</tr>
<tr>
<td>Labor</td>
<td>52%</td>
</tr>
<tr>
<td>Professional workers</td>
<td>22%</td>
</tr>
<tr>
<td>Managerial workers</td>
<td>59%</td>
</tr>
<tr>
<td>Clerical workers</td>
<td>37%</td>
</tr>
<tr>
<td>Sales workers</td>
<td>44%</td>
</tr>
<tr>
<td>Service workers</td>
<td>44%</td>
</tr>
<tr>
<td>Agricultural workers</td>
<td>67%</td>
</tr>
<tr>
<td>Production workers</td>
<td>41%</td>
</tr>
<tr>
<td>Arable land</td>
<td>70%</td>
</tr>
<tr>
<td>Pasture land</td>
<td>78%</td>
</tr>
<tr>
<td>Forest</td>
<td>67%</td>
</tr>
</tbody>
</table>

Source: Bowen, Leamer, Sveikauskas (1986)

7.6A Explain why a country for which the share of capital endowment in total world endowment is equal to its income share, does not trade capital.

7.6B Why does a country start exporting capital intensive goods when the capital endowment share is larger than the income share?

7.6C Do you think the results in the table give strong support for the Heckscher-Ohlin result?

Question 7.7
Wood has researched whether the Heckscher-Ohlin model can explain the trade between the Northern developed countries and the Southern underdeveloped countries. The figures below are based on his research. It shows that factor content of German trade with the South. Do these figures give support to the Heckscher-Ohlin result?

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Question 7.8

Different boxes throughout part II have summarised the type of products exported by different countries. The question arises if these export patterns are in accordance with the Heckscher-Ohlin proposition. The Excel file for question 7.8 contains earlier export data for a larger range of countries. On the website of the World Bank (www.worldbank.org) you can find a database called “The world development indicators”. This database offers a wide variety of statistics. Select a number of statistics that may tell you something about the factor endowment of different countries. Confront this data with the export statistics and tell whether the Heckscher-Ohlin proposition holds.

Question 7.9

The Excel file for question 7.9 displays an autarky equilibrium for the economy of North Korea, producing only food (f) and rockets (r). North Korea comes arguably closest to the theoretical situation of complete autarky. The simulation is in fact similar to figure 7.9 in the main text with slightly adapted parameters. The initial parameter setting is:

\[ \alpha_f = 0.3; \alpha_r = 0.7; K = 2; L = 5; \delta_f = 0.4 \]. The simulation automatically adjusts all three curves to display the equilibrium point.
The government of North Korea starts a new policy to promote building not only short-range missiles but also long-range nuclear rockets to threaten the United States. As a result of this policy the share of capital in the production process for rockets increases by ten percentage points. Unfortunately, a slight policy oversight caused the government to neglect food production, leading to widespread famine in North Korea (remember that importing food is impossible). As a secondary result of the policy, therefore the labor force decreases by forty percent.

7.9A Simulate the effects of the North Korean policy. How do prices, income, utility, and production of the North Korean economy change? Explain why these changes occur.

The leaders of North Korea manage to extract concessions from the United States. In return for the promise not to fire any more rockets North Korea receives two nuclear power plants. This significantly increases the capital stock of the country, namely by fifty percent. The Chinese government is concerned about the growing influence of America in North Korea. To support the North Korean regime the Chinese decide to deport all the North Korean refugees whom where seeking shelter in China back to their motherland. Consequently, the North Korean labor force now grows with 33.3 percent.

7.9B Simulate these new developments. How do prices, income, utility, and production of the North Korean economy change? Explain.

In response to all this good news the North Korean government secretly decides to increase spending on its pet project. The share of income spent on rockets doubles.

7.9C After the implementation of this policy total income decreases but welfare (= total utility) increases. Can you explain why?

7.9D Naturally, the North Korean population is not too happy with this last policy change. Explain why we do not see this reflected in our model of the economy.

Question 7.10

The government of North Korea (see question 7.9) decides that it needs at least one friend in this world to trade with. As they are aware of the implications of the neo-classical trade model they decide to trade only with countries with the same homothetic preferences and production technology. After searching the globe they decide to trade with Cuba, characterized by the
following economic parameters: $\alpha_f = 0.7; \alpha_r = 0.3; K = 0.5; L = 2.5; \delta_f = 0.6$. As a result of international restrictions Cuba and North Korea do not trade with other countries in the world.

The North Korean economy is characterized by the following parameters:

$\alpha_f = 0.3; \alpha_r = 0.7; K = 2; L = 5; \delta_f = 0.6$.

The Excel file for question 7.10 gives the autarky situation of both countries in the initial situation.

**7.10A** How can you see that both Cuba and North Korea are in autarky?

**7.10B** In autarky which country produces relatively more rockets? Explain why this is the case.

Assume that Cuba and North Korea start to trade with each other.

**7.10C** What is the international trade equilibrium price of rockets and food?

**7.10D** Which country is exporting rockets and which country is exporting food? Explain why this is the case.

**7.10E** Does international trade reach the objective of the North Korean government to increase the number of rockets pointed at the United States?