QUESTIONs CHApTER 6 PRODuCTiON VoLuME

Question 6.1

Armenia is a small country (changes in endowments do not result in price changes for factor inputs or final goods prices). Suppose that it produces two goods, Manufactures and Food. It produces these goods in a Heckscher-Ohlin world using high-skilled labor (H) and low skilled labor (L). Manufactures make relatively intensive use of H and Food is relatively L intensive. About 3 million Armenians are high-skilled, while 1 million people are low-skilled.

6.1A Draw the situation described above in an Edgeworth box. Put the origin of Food in the Southwest corner and the origin of Manufactures in the Northeast corner. Measure high-skilled labour (H) on the horizontal axis and low-skilled labour (L) on the vertical axis. Draw the contract curve, one efficient point of production, and the isoquants of both goods through the chosen efficient production point.

6.1B What indicates in the Edgeworth box the level of output of a good?

6.1C How can you determine the production levels of rice and clothes in full employment equilibrium?

After the fall of the Soviet Union and the declaration of Armenian independence, the socio-economic situation in Armenia deteriorates rapidly. As a consequence, people are voting with their feet. Estimates show that two million people have emigrated from Armenia since independence. It is the best (high-skilled) people who are going.

6.1D Show the effects of the Armenian emigration in the Edgeworth box you have drawn in 6.1A.

6.1E What are the effects on the production of Manufactures and Food? What do we call this effect in theory?

The table below shows the contribution to Armenian GDP per sector.

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<td>Agriculture</td>
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<td>Construction</td>
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<td>Transport &amp; Communication</td>
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<td>Services</td>
<td>47</td>
<td>37</td>
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Source: Economist Intelligence Unit
6.1F  Does the table provide support for the effect you have identified in question 6.1E? Explain your answer.

Question 6.2
Bangladesh is a developing country which ranks first in the top-five of unskilled-labour intensive manufacturing exporters (see Table 6.1). These exports consist mainly of clothing goods. The Multi-Fibre Agreement, which imposed all kinds of restrictions on world trade in textiles, was officially ended at the start of 2005. We will analyze its impact with the help of the two graphs below. The top graph shows the unit value isoquants for both goods. The bottom graph is an Edgeworth Box.

6.2A  Draw the optimal production point in the Edgeworth box.
6.2B What happens if the price of clothing increases as a result of the end of the Multi-Fibre agreement in 2005? Draw the new situation in both graphs.

In isolation, the MFA agreement would affect Bangladesh as you have analysed in question 6.2B. Yet, the labour force in Bangladesh has also expanded rapidly.

6.2C Expand the Edgeworth Box and analyse the combined effect of a labour force increase with a price increase for clothing. How does this impact the production level of Rice?

Question 6.3

Section 6.6 of the book describes an empirical study of the effects of the influx of Russian immigrants into Israel, which changed the composition of the Israeli labour force. It offers an opportunity to investigate the Rybczynski proposition. When confronting theory with empirical data, you have to be careful and correct for factors that are not explicitly modelled or assumed constant in theory.

6.3A Which factors, not explicitly modelled or assumed constant in Chapter 6, played a role in this particular study?

6.3B Do the assumptions of the model in Chapter 6 strengthen or weaken the theory?

Question 6.4

Box 6.2 describes an extension of the basic neo-classical model. Let's apply this analysis to the European Union (EU), which produces manufactures and food. The EU labour market is not as flexible as that of other countries. We assume, therefore, that the re-allocation of capital is more rapid than the re-allocation of labour.

6.4A Which production factor would you label as sector-specific here?

The EU now concludes a new trade agreement with some Central and East European countries in anticipation of their eventual entry into the EU. This agreement puts extra competitive pressure on the agricultural sector in the EU, which decreases the price in that sector.

6.4B Draw the distribution of capital over the manufacturing sector and the agricultural sector in the EU in a graph. Illustrate the equilibrium before the price decrease, immediately after the price decrease (Ethier), and the medium-term equilibrium after the price decrease (Neary).

6.4C Draw the long-run equilibrium in your graph of question 6.3B. Which production factor has ultimately benefited from the price decrease? Why?
6.4D Who supports the removal of adjustment barriers in the labour market? Why?

Question 6.5
Imagine a country producing only CDs and pottery. The capital-labour ratio for the production of CDs is 2 and for the production of pottery is 1. The country has an initial capital endowment of 8 and labour endowment of 6. Assume throughout this exercise that all available inputs will be employed.

6.5A How much labour and capital will be used in the production process of CD's and how much in the production process of pottery?

At a certain moment in time, both the capital and the labour endowment increase by 2 units (so the capital endowment is now 10 and the labour endowment 8). Final good and factor prices do not change.

6.5B How much labour and capital will be used in the production process of CDs and how much in the production process of pottery in the new situation?

6.5C Compare your answers to question 6.5A and question 6.5B. Is this in accordance with the Rybczynski proposition?

Question 6.6
Locate on the web or at your library the paper called "The Rybczynski theorem, factor price-equalisation, and immigration: evidence from the United States", written by G.H. Hanson and M.J. Slaughter. As the title suggests, it is an empirical investigation of the Rybczynski theorem.

6.6A Why do the authors study the development of relative prices across states?

6.6B What effect do the authors find for the state of California?

6.6C Does the Rybczynski theorem help in explaining the output mix in American States?

Question 6.7
The "question 6-7" Excel file on the website contains two figures. The first figure shows the unit value isoquants of manufactures and food. The second figure shows the Edgeworth box. Assume that we have two factors of production, workers with at least college (C), and workers with at most a high school diploma (H). The two lines inside the Edgeworth box reflect the college educated - high school educated ratios in the production of manufactures and food. The intersection of these two lines is the point of production. The simulation allows you to change the endowments, prices, and factor intensity parameters.
6.7A Show the effect of the migration of Russian Jews into Israel.

6.7B Suppose that Russia has the same factors of production, what does the Rybczynski proposition imply for Russian production?

The wages for high-educated workers increased somewhat in Israel due to changes in technology. There is a one-to-one relationship between wages and prices in our neo-classical framework.

6.7C Simulate the effect of the wage increase for college educated workers (by changing final goods prices). What happens to production levels and why? Does the Rybczynski result always hold with price changes?

6.7D Suppose that technological developments lead to a higher “college-educated labour intensity” in the production of manufactures. Change the correct parameter in the simulation. What happens to the production levels? Explain.

**Question 6.8**

The CES production functions for manufactures and food are given below:

\[
F = \left( \alpha_f K_f^{-\rho} + (1 - \alpha_f) L_f^{-\rho} \right)^{-1/\rho}
\]

\[
M = \left( \alpha_m K_m^{-\rho} + (1 - \alpha_m) L_m^{-\rho} \right)^{-1/\rho}
\]

6.8A Determine the contract curve for these production functions.

6.8B Compute the share of labourers active in manufacturing analogous to equation (6.A4) in the technical notes.

6.8C Determine the production level of manufactures (analogous to equation 6.A6).