

**Problem 1: (30 points)**

From 2000 to 2010 the terms of trade deteriorated in Sweden. At the same time, they improved in Norway.

- a. Discuss and explain, illustrating your answer graphically, what effects the change in terms of trade have for exports, imports, production, industrial structures and welfare in Sweden and in Norway.

*Answer guidance: use graphs of the production possibility curve for each country; show using a change in the slope of the budget line (that tangents the production possibility curve), that production, industrial structure, import and export in a 2-goods/industries economy changes. The illustration should also include indifference curves in order to allow for changes in exports and imports to be illustrated.*

- *In Norway: improved terms of trade will increase the price of the exported good, shifts resources towards that the export sector and out of the import competing sector, increasing exports and reducing imports and leading to more specialized industrial structure*
  - *In Sweden the opposite will happen (and requires an illustration accordingly), with reduced exports and imports, less specialized industrial structure as resources shift out of the export sector and into the import competing sector*
- b. What would we expect to be the impact on factor prices and resource allocation from the developments of terms of trade in the short run and in the long run? Explain and illustrate the process of adjustment.

*Answer guidance: the discussion should be based on the insight from the Ricardo-Viner model in the short run and the Stolper-Samuelson theorem in the long run - with a small open economy with two factors and two industries as the point of departure. The candidate should make an assumption about what factor the two different industries are relatively intensive in the use of. With increased terms of trade a structural change is triggered:*

- *Profitability in the export sector goes up*
- *Increased demand for labor (assumed to be used intensively in the export sector)*

*In the short run:*

- *Reallocation of labor from the export to the importing competing sector*
- *Increased relative wages*
- *Increased returns to capital in the export sector and reduced returns to capital in the import competing sector*

*Due to the difference in returns to capital btw the two sectors, capital will flow from the import competing to the export sector. This will trigger more allocation of labor in the same direction and reinforce the initial change in factor prices, and go on until the returns to capital is the same in both industries.*

*With reduced terms of trade the factor is used intensively in the import competing sector will gain both in the short and long run, and more so in the long run, based on the same line of reasoning.*

### **Problem 2: (25 points)**

Discuss and show graphically:

- a. What distinguishes the Specific Factor (Ricardo-Viner) model from the Heckscher-Ohlin model?

*Answer guidance: RV assumes that one factor is sector specific while the other factor is mobile across sectors. HO assumes that both factors are mobile across sectors. The former is suitable for short run analysis and the latter for long run analysis.*

- b. What do the two models tell us about the impact of international labor migration on production and factor prices?

*Answer guidance: RV tells us that immigration increases production in both sectors and leads to lower wages. HO tells us that immigration shifts resources towards the labor intensive sector and has no impact on factor prices (long run).*

- c. Who gains and who loses because of migration?

*Answer guidance: In the long run; no winners and losers. In the short run: workers in the country experiencing immigration lose, migrant workers gain, capital owners in the country experiencing immigration gain, capital owners in the other country lose and workers in this country also gain due to emigration and thus a fall in labour supply that leads to higher wages..*

### **Problem 3: (45 points)**

Mountainland does presently not trade with any other country, but has the opportunity of trading with country A or B. Compared to both A and B, Mountainland is relatively abundantly endowed with labor, while A and B are relatively abundantly endowed with capital. However, country A is more similar to Mountainland in terms of relative factor endowments than country B. In each of these economies, there are two sectors of production, Cars and Food. Car production is capital intensive and Food production is labor intensive.

a. Consider the following statement: Mountainland should trade with A instead of B because this will destroy fewer jobs in import-competing industries. Is the statement true or false? Explain your answer.

*Answer: The statement is false. Mountainland is more different from B, and the gains from trade will everything else being equal be greater if it starts to trade with B, which will have autarky prices that are more different from those in Mountain land. Opening up for trade with B will lead to greater reallocation of resources between sectors, to greater gains for worker and greater losses for capital owners in Mountain land. Hence, more redistribution is necessary to ensure that everyone gains from trade.*

c. Which groups in the economy will be in favor of trading with A and which groups will be in favor of trading with B? Explain your answer graphically.

*Answer: Opening up for trade with B will lead to greater reallocation of resources between sectors, to greater gains for worker and greater losses for capital owners in Mountain land. Hence, the workers will favour trade with B, while capital owners will favour trade with A. Use graph with factor prices on axes to illustrate the Stolper-Samuelson theorem for a smaller and a larger shift in product prices.*

Assume that the capital as well as labor employed in the Car and Food production are sector specific. Assume also the Mountainland has two regions, North and South, and that the capital owners are regionally immobile. Production in the two industries is located where the capital owners in the respective industry live. The owners of capital in the Car production live in the North and the owners of the capital employed in Food production lives in the South. Assume moreover that Mountainland has made a Free Trade agreement with Country B.

d. Who will gain and who will lose from a Free trade agreement with Country B? What will be the impact on regional income inequalities?

*Answer: A free trade agreement with B will lead to increased relative prices for food. That will increase the profitability in the food industries and lead to higher returns to capital and higher wages in this industry relative to the car industry. Since the capital owners are segregated geographically, this will increase income in the South relative to in the North and enhance regional income inequalities.*

Assume that workers' skills changes and become general, and as a consequence, all workers become mobile across sectors. Capital is still sector specific and owners are still immobile across sectors and regions.

e. Who will gain and who will lose from a Free trade agreement with B? Will there be any regional migration in response to the Free Trade agreement? What will happen to regional income inequalities?

*Answer: All workers will gain, irrespective of which industry they work in. This follows from R-V model. Workers will move from the car industry to the food industry. Since capital is sector*

*specific there will be no movement of capital. Capital owners in the food industry will gain and capital owners in the car industry will lose. Regional inequalities will increase since capital owners are immobile.*