

***UNIVERSITY OF OSLO***  
***DEPARTMENT OF ECONOMICS***

Exam: **ECON4415 – International Trade**

Date of exam: Wednesday, December 3, 2015      **Grades are given: December 22, 2014**

Time for exam: 2.30 p.m. – 5.30 p.m.

The problem set covers 4 pages (incl. cover sheet)

Resources allowed:

- No resources allowed (except if you have been granted use of a dictionary from the Faculty of Social Sciences)

The grades given: A-F, with A as the best and E as the weakest passing grade. F is fail.

**Problem 1:** (20 points)

- a. Explain and illustrate graphically the link between resource allocation across industries and gains from trade.
- b. Explain and illustrate graphically the link between resource allocation within industries and gains from trade.

**Problem 2:** (40 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.
- b. 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.

Assume that the capital and labor employed in Cars and Food production are sector specific, and that in Mountainland the capital owners are regionally immobile. The owners of capital employed 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.

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

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

- d. 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?

**Problem 3:** (40 points)

Consider 2 countries, North and South. North has a mass of  $L$  of identical agents, who work, consume and own the firms. South has a mass of  $L^*$  agents. Assume that  $L = L^*$ . There are two goods: Agricultural goods that are homogenous, and produced under perfect competition and constant returns to scale (CRS). Manufacturing goods are differentiated goods, produced under monopolistic competition and increasing returns to scale. There is one primary factor of production, labor, used in both agriculture and manufacturing. In the text below the North is described and the analogous expressions hold for the South.

Consumer preferences are given by

$$U = C_A^{1-\gamma} C_M^\gamma, \quad 0 < \gamma < 1 \quad (1)$$

$$C_M = \left[ \sum_i c_i^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}, \quad \sigma > 1 \quad (2)$$

where  $i$  denotes each variety of the manufactured good. Agricultural production output is given by

$$Z = L_A$$

and agricultural goods are chosen as numeraire, so that  $P_A = 1$ ; which gives equilibrium wage in agriculture

$$P_A = w_A = 1 \quad (3)$$

Each firm has monopoly power over a single variety  $i$ . Cost function in manufacturing is given by

$$TC_i = w_M^{1-\mu} P_M^\mu [\alpha + \beta x_i] \quad (4)$$

where  $x_i$  is the quantity produced by the firm,  $w_M$  depict wage in manufacturing, and  $P_M$  depicts the price index for manufacturing goods facing both firms and consumers:

$$P_M = [np^{1-\sigma} + n^*(p^*\tau)^{1-\sigma}]^{1/(1-\sigma)} \quad (5)$$

a. Solve firms' profit maximizing problem and derive the optimal price, equilibrium quantity produced by each firm and equilibrium number of firms for a given distribution of workers across sectors.

b. Explain what we mean with Forward and Backward linkages.

- c. Explain the impact of an increase in  $\mu$  on:
- Forward and Backward linkages
  - prices
  - number of firms
- d. Explain and illustrate graphically the impact of a trade agreement on industrial specialization and real wages in the North and South. Assume that before the trade agreement is signed both countries are active in the production of both goods.
- e. Based on your answer to *d.* and your general knowledge of trade theory, what predictions can be made on the impact of trade liberalization on international income inequalities?