Written Exam for the M.Sc. in Economics winter 2014-15

International Trade and Investment: Theory and Policy

Master's Course

December 17, 2014

(3-hour closed book exam)

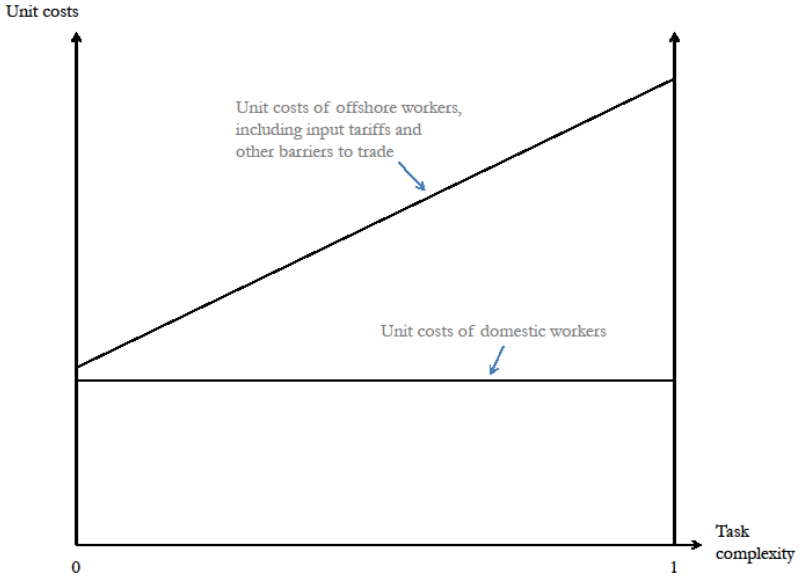
Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by "eksamen på dansk" in brackets, you must write your exam paper in Danish.

This exam question consists of 4 pages in total

Question 1:

Consider a small economy, where the tasks that go into production of the final output *Y* of sector *s* are defined such that they all require the same units of domestic labor. The productivity of domestic workers relative to offshore workers is increasing in the complexity of the task *i*. Each sector is small relative to the rest of the economy and workers are mobile across sectors.

Trade in inputs was prohibitive expensive in the old days and domestic workers therefore performed all tasks. This is illustrated in the figure below.



a) Falling barriers to trade have reduced the cost of offshoring such that it is now profitable to have the least complex tasks performed by offshore workers.

   Explain what happens to task specialization and relative employment of domestic workers. Illustrate your explanation using a graph with unit costs of offshore and domestic workers on the vertical axis and tasks in the order of increasing complexity on the horizontal axis.

b) Briefly discuss the net effect of offshoring on the employment of domestic workers.

c) The government now opens a green card scheme that facilitates recruitment of highly skilled foreign experts. The experts' relative productivity increases with task complexity such that they are more cost-effective than domestic workers in the most complex tasks.

   What happens to domestic workers' employment share, total employment and the average task complexity? Illustrate your results in a graph.

Question 2

Consider a small open economy that is endowed with two factors of production – labor and capital. The economy has two sectors – Agriculture and Manufacturing – which use capital and labor as production inputs. Assume that total labor endowment is fixed and equal to L. Similarly, the total endowment of capital is fixed and equal to K. Both factors are free to move between the two sectors. Assume that one firm operates in each industry and it faces an output price that is determined by the world market. The firm takes prices, wages and rents to capital as exogenously given. Moreover, it is assumed that the firm makes zero profits.

Technology for each firm in industry i is given by:

$$y_i = L_i^{\alpha_i} K_i^{1-\alpha_i}$$

where $i = A, M$ and $0 < \alpha_i < 1$.

a) Write down the unit-cost function, $c_i(w, r)$, for both industries. Show that the cost share of labor in industry i is:

$$\theta_{iL} = \frac{wL_i^*}{c_i(w, r)} = \alpha_i$$

where w denotes wages, r the rental on capital, while the optimal choices for labor and capital are given by $L_i^* = \left(\frac{\alpha_i}{1-\alpha_i}\frac{r}{w}\right)^{1-\alpha_i} y_i$ and $K_i^* = \left(\frac{1-\alpha_i}{\alpha_i}\frac{w}{r}\right)^{\alpha_i} y_i$.

b) Write down the zero profit condition for each sector, assuming $\alpha_A = 0.7$ and $\alpha_M = 0.2$. Assume moreover that both goods are produced in equilibrium and that factor prices are equalized across countries.

How do nominal and real wages change in the economy when the price of Agriculture, p_A, increases by 2 percent? Are workers better off?

c) In the short run, capital may not flow easily between industries. Assume now that capital stocks are fixed in each industry and labor is the only production factor that moves between the two industries. That is, denote the production inputs in Agriculture by L_A and K_A and assume that K_A is fixed. Similarly, Manufacturing uses L_M and K_M as production inputs, where K_M denotes the capital stock that is fixed and specific to Manufacturing. In total, this economy has 3 factors of production: L, K_A and K_M.

Write down the equilibrium condition for wages in this economy. How do nominal and real wages change in the economy when the price of Agriculture, p_A, increases by 2 percent? Are workers better off? Are the owners of Agriculture-specific capital better off?

Question 3

Identify whether these statements are true or false. If false, rewrite the sentence to make it true, changing maximum 1 or 2 words.

a) In the monopolistic competition model of Krugman, firms differ in terms of productivity and the most productive firms export to international markets.

b) The Law of Comparative Advantage states that a country should, on average, import the goods that have lower relative autarky prices compared to other countries.

c) In a Ricardian trade model with two goods and two countries, absolute advantage determines the trade pattern, while comparative advantage determines the wage level.

d) The monopolistic competition model of Krugman predicts that larger economies export more through the intensive margin.

e) According to Anderson and van Wincoop (2003), national borders reduce international trade relative to internal trade more for smaller economies.

f) Imagine offshoring is estimated to have a positive effect on the wages of low-skilled workers. This finding is consistent with the substitution effect being larger than the productivity effect.