Written Exam at the Department of Economics summer 2021

International Economics

Final Exam

June 9, 2021

(3-hour closed book exam)

Answers only in English.

This exam question consists of 3 pages in total

Falling ill during the exam
If you fall ill during an examination at Peter Bangsvej, you must:
- submit a blank exam paper.
- leave the examination.
- contact your GP and submit a medical report to the Faculty of Social Sciences no later than five (5) days from the date of the exam.

Be careful not to cheat at exams!
You cheat at an exam, if during the exam, you:
- Make use of exam aids that are not allowed
- Communicate with or otherwise receive help from other people
- Copy other people's texts without making use of quotation marks and source referencing, so that it may appear to be your own text
- Use the ideas or thoughts of others without making use of source referencing, so it may appear to be your own idea or your thoughts
- Or if you otherwise violate the rules that apply to the exam

Problem 1 (30 points)

True, false or unclear. Explain your answers. You can at most get half point for a correct answer without explanations.

1. A member country of the WTO has to treat all other member countries equally due to the "Most Favored Nation" principle. Therefore regional agreements that lower tariffs for some but not all member countries are not permitted.

2. Suppose there are two countries (Home and Foreign) and two goods (a freely traded good and a non-traded good) produced using only labor. Assume that Home is twice as productive as Foreign in both goods. Then the price of the non-traded good will be higher in Home.

3. In the Heckscher-Ohlin model, trade in goods is a perfect substitute for trade in factors.

Problem 2 (30 points)

Consider the Ricardian model where Home and Foreign have labor supply L and L^*, respectively. There are two goods (1 and 2) and preferences over the goods are Cobb-Douglas: $U = c_1^\alpha c_2^{1-\alpha}$. Production technology in Home is linear: $Q_i = a_i L_i$ for $i = 1, 2$, and similar equations exist for Foreign (denoted with *). All markets are competitive.

Assume that

$$\frac{a_2}{a_1} > \frac{a_2^*}{a_1^*} \tag{1}$$

Question 1. What is the economic interpretation of (1)?

Question 2. Set the price of good 2 to 1 and let p^A be the relative price of good 1 in Home in autarky. Derive p^A.

Question 3. Show that there are gains from trade. A graphical argument only gives partial credit.

Question 4. To what extent does the Ricardian model explain the international trade that we observe in the data?

Problem 3 (40 points)

Consider a Krugman model of a closed economy with only one factor of production (labor) with a total stock of L. There is a representative agent with utility:

$$U = \left(\sum_{i=1}^{n} c_i^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}$$

where n is the number of varieties of a good, c_i is consumption of good i and $\sigma > 1$.

Each variety is produced by a single monopolist. The labor cost of producing $q > 0$ units is

$$l = f + \frac{1}{\varphi} q$$

where $f, \varphi > 0$ and unit labor costs of producing zero units is zero. Let w denote the wage, i.e. factor payments to one unit of labor. The labor costs of production is identical for all firms.

Question 1. Derive the demand function for a single variety, i, taking total income wL as given. Show that it equals

$$c_i = \frac{wL}{P} \left(\frac{p_i}{P} \right)^{-\sigma}$$

where P is the ideal price index defined as

$$P^{1-\sigma} = \sum_{i=1}^{n} p_i^{1-\sigma}$$

Hint: Utility is ordinal. Hence, it is possible (though not required) to maximize $\sum_{i=1}^{n} c_i^{\frac{\sigma-1}{\sigma}}$ instead.

Question 2. Each firm chooses p_i to maximize profits, ignoring the effects of its choice on the prices set by other firms. Solve for the firm's optimal price.

Question 3. Let there be free entry into the market such that the profits of every firm equals zero. What is the equilibrium production of an individual firm?

Question 4. What is the equilibrium number of varieties?

Question 5. Show that the total income of the country is $Y = npq$

Question 6. Suppose the closed economy opens up to free trade with a similar sized country. Show that there are gains from trade. What are the sources of these gains?