Written Exam for the M.Sc. in Economics Winter 2016–17

Advanced International Trade

3–hour closed–book exam

December 15 2016

Please note that the language used in your exam paper must correspond to the language for which you registered during exam registration.

This exam consists of 3 pages in total.

NB: If you fall ill during the actual examination at Peter Bangsvej, you must contact an invigilator in order to be registered as having fallen ill. Then you submit a blank exam paper and leave the examination. When you arrive home, you must contact your GP and submit a medical report to the Faculty of Social Sciences no later than seven (7) days from the date of the exam.

Problem 1:

Consider a small open economy that takes world prices as given. Let the initial domestic price vector facing consumers and producers be denoted by:

$$p = p^* + t \tag{1}$$

where p is a vector of domestic prices, p^* is a vector of world prices and t is a vector of trade tariffs and subsidies. For an imported good, $t_i > 0$ represents a tariff raising the domestic price above the world price, while $t_i < 0$ indicates an import subsidy. Conversely, $t_i > 0$ indicates a subsidy for an exported good, while $t_i < 0$ represents a tariff for exports.

The tax revenue collected by the government is:

$$R = t \cdot (c - y) = t \cdot m \tag{2}$$

where c is a vector of consumption, y is a vector of production, m is a vector of net imports and $a \cdot b = \sum_{i=1}^{N} a_i b_i$ is the usual dot product of two N-dimensional vectors.

There are H households in the economy and each household has a labor endowment of one unit that is inelastically supplied to the production sector. Households maximize their utility, $u^h(c^h)$, subject to the budget constraint:

$$p \cdot c^h \leq w + R^h = w + \frac{t \cdot m}{H} \tag{3}$$

where c^h is the consumption vector of household h, w is the wage income and R^h is a lump-sum transfer from the government.

Suppose the government implements a trade reform such that t' is the new vector of trade tariffs and subsidies. As part of the trade reform, the government is also changing its transfer system:

$$R'^h = (p' - p) \cdot c^h - (w' - w) + \frac{t \cdot m}{H} \tag{4}$$

where $'$ refers to post-reform variables.

1. Does the trade reform make households better off?

2. The government's budget, i.e., tax revenue minus transfers, is given by:

$$B = t' \cdot m' - \sum_{h=1}^{H} R'^h \tag{5}$$

$$= t' \cdot (m' - m) - (p' \cdot y - w'H) \tag{6}$$

   Is the government's budget balanced, $B \geq 0$?

3. The World Trade Organization (WTO) argues that restricted trade is better than no trade. What condition is needed for this statement to be true?

Problem 2:

Consider a small open Heckscher-Ohlin economy producing two products using low-skilled and high-skilled workers. The zero-profit conditions are given by:

$$p_1 = w_L a_{L1} \mu_{L1} + w_H a_{H1} \mu_{H1} \tag{7}$$

$$p_2 = w_L a_{L2} \mu_{L2} + w_H a_{H2} \mu_{H2} \tag{8}$$

where p_g is the price of product $g = 1, 2$, w_f is the wages of worker $f = L, H$, a_{fg} is the optimal input choice of factor f when producing one unit of product g, and $0 < \mu_{fg} \leq 1$ represents technological improvements that are specific to factors and products.

1. Show that product price changes are related to factor price changes and cost shares:

   $$\widehat{p}_g = \theta_{Lg}(\widehat{w}_L + \widehat{\mu}_{Lg}) + \theta_{Hg}(\widehat{w}_H + \widehat{\mu}_{Hg}) \quad \text{for } g = 1, 2$$

   where $\widehat{z} = dz/z$.

   Provide definitions of θ_{Lg} and θ_{Hg}. Assuming $\theta_{L1} > \theta_{L2}$, how would you characterize products 1 and 2, respectively?

2. Suppose the production of good 1 experiences a uniform technological change, while product prices are fixed. That is, $\widehat{\mu}_{Lg} = \widehat{\mu}_{Hg} = \widehat{\mu}_g$ and $\widehat{\mu}_1 < 0 = \widehat{\mu}_2$. How are factor prices affected by this technological change?

3. Suppose now that technological change is biased towards low-skilled workers. That is, $\widehat{\mu}_{L1} = \widehat{\mu}_{L2} = \widehat{\mu}_L < 0 = \widehat{\mu}_{H1} = \widehat{\mu}_{H2} = \widehat{p}_1 = \widehat{p}_2$. How are factor prices affected by this technological change?

4. Summarize how offshoring affects factor prices according to the theory of Grossman and Rossi-Hansberg (2008). Briefly discuss if offshoring and technological improvements have similar effects on factor prices.

Problem 3:

Answer True or False to each of the statements below. Briefly explain your answer.

1. In Melitz (2003), exporting firms set higher prices than non-exporting firms.

2. Global uniform technological improvements increase welfare everywhere according to Dornbusch, Fischer and Samuelson (1977).

3. The Gravity Equation predicts that larger countries have higher bilateral trade because they export and import a wider range of products from each other.

4. In a monopolistic competition model with CES demand and increasing returns to scale technology, the only source of gains from trade comes from being able to consume foreign varieties.