Written Exam at the Department of Economics Winter 2017–18

Advanced International Trade

3–hour closed–book exam

February 13 2018

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

This document consists of 3 pages in total.

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Problem 1:

Consider the Dornbusch, Fischer and Samuelson (1977) model with two countries, Home and Foreign. Each country produces a continuum of goods indexed $z \in (0,1)$. The only factor of production is labor which is paid the wage w in Home and w^* in Foreign. The labor endowments of Home and Foreign are given by L and L^*. Consumers have identical CES preferences. The utility function of a representative Home consumer is:

$$U = \left[\int_0^1 c(z)^{(\sigma-1)/\sigma} dz \right]^{\sigma/(\sigma-1)} \tag{1}$$

where $c(z)$ is the consumption level of good z and $\sigma > 1$ is the constant elasticity of substitution. The consumer's budget constraint is:

$$w = \int_0^1 p(z)c(z)dz \tag{2}$$

where $p(z)$ is the price of good z. Let wages in Home be the numeraire, i.e., $w = 1$.

1. Show that the consumer spends the following share of the budget on good z:

$$s(z) = \frac{p(z)c(z)}{w} = \frac{p(z)^{1-\sigma}}{\int_0^1 p(z)^{1-\sigma}dz} \tag{3}$$

   Provide a short and complete explanation of the relationship in (3)

2. In the free trade equilibrium, countries produce the goods in which they have a comparative advantage. Suppose Home produces all goods in $(0, z')$, while Foreign produces all goods in $(z', 1)$, where z' is the good for which production costs are exactly the same in the two countries. This condition is one of two equilibrium conditions in the Ricardian trade model of Dornbusch, Fischer and Samuelson (1977). Define and describe using (3) the second condition they use to determine the equilibrium values for z' and the relative wages, w/w^*.

3. Consumer welfare is equal to w/P, where P is the aggregate CES price index. Does welfare increase when the two countries are allowed to trade with each other? If so, describe the sources of gains from trade. What happens to the consumption of goods when transitioning from autarky to free trade? Are the changes in consumption different from Dornbusch, Fischer and Samuelson (1977) who assume Cobb-Douglas utility?

Problem 2:

Consider an economy with two industries. Industry 1 is a perfectly competitive industry, producing a homogeneous good y using labor and capital. Let $c_1(w, r)$ denote the unit cost of industry 1, where w denotes wages and r capital rents. Industry 2 is a monopolistically competitive industry, with each firm producing a unique variety of a differentiated good using labor and capital. Let $c_2(w, r)$ denote the marginal cost of industry 2 and assume fixed costs to equal $\alpha c_2(w, r)$. That is, the fixed costs use labor and capital in the same proportions as the marginal costs. Consumers spend $\mu \in [0, 1]$ on the good produced by

industry 1 and $1-\mu$ on the varieties produced by industry 2. Demand for the differentiated goods are:

$$x = \left(\frac{p}{P}\right)^{-\sigma} \frac{(1-\mu)I}{P} \tag{4}$$

where $\sigma > 1$ is the constant elasticity of substitution parameter, p the price of a given variety, P the price index for the differentiated goods and I income. Let the price of the homogeneous good be the numeraire.

1. Write down the relationship between the prices of goods and factor prices. Does the Stolper-Samuelson theorem hold for this economy?

2. Show that the output of each firm in industry 2 is given by:

$$x = (\sigma - 1)\alpha \tag{5}$$

Provide a short and complete account of the relationship in (5).

3. Write down the full-employment conditions for the two factors. Does the Rybczynski theorem hold for this economy?

Problem 3:

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

1. In the monopolistic competition model of Krugman (1979), firms differ in terms of their productivity and only the most productive firms export to international markets.

2. An economy transitioning from restricted trade to free trade will always generate welfare gains for everyone.

3. The Armington model predicts that larger countries export larger quantities of each good.

4. The empirical study of Hummels, Jørgensen, Munch and Xiang (2014) show that offshoring increases the wages of low-skilled workers due to the productivity effect.