ECONOMIC INTEGRATION IN THE AMERICAS ECON 4421

T. J. KEHOE FALL 2002

PROBLEM SET #1

1. Consider a world with two countries and two produced goods. The production technologies in the two countries are different:

$$y_1^i = \ell_1^i / b_1^i, \ i = 1, 2$$

$$y_2^i = \ell_2^i / b_2^i, \ i = 1, 2.$$

In country 1 $b_1^1 = 1$ and $b_2^1 = 2$ while in country 2 $b_1^2 = 2$ and $b_2^2 = 1$. In each country the representative consumer has the utility function

$$u(c_1^i, c_2^i) = \log c_1^i + \log c_2^i$$

and the endowment $\overline{\ell}^1 = \overline{\ell}^2 = 10$.

a) Define an autarky equilibrium. Calculate the autarky equilibrium in each country. (Hint: the numbers for country 2 should be the same as those for country 1 with the roles of goods 1 and 2 reversed.)

b) Define a free trade equilibrium for the world economy. Calculate this equilibrium. (Hint: again notice the symmetry.)

c) Suppose now that country 1 imposes a 50 percent tariff on the imports of good 2 from country 2. The tariff revenues are redistributed in lump-sum form to the representative consumer in country 1. Define an equilibrium. Calculate this equilibrium.

d) Suppose now that country 2 retaliates by imposing a 50 percent tariff on the imports of good 1 from country 1. These tariff revenues are redistributed in lump-sum form to the representative consumer in country 2. Define an equilibrium. Calculate this equilibrium. (Hint: the answer is symmetric — in particular, $w^1 = w^2$.)

2. Consider a world with two economies and two produced goods.

a) Suppose that the production technologies are the same across countries,

$$y_1^i = \min [k_1^i / 3, \ell_1^i]$$

 $y_2^i = \min [k_2^i, \ell_2^i / 3],$

that the representative consumers' utility functions are the same across countries,

$$u(c_1^i, c_2^i) = \log c_1^i + \log c_2^i$$
,

but that the endowments of factors are different across countries, $\overline{k}^1 = 32$, $\overline{\ell}^1 = 40$ and $\overline{k}^2 = 40$, $\overline{\ell}^2 = 32$. Define a free trade equilibrium for the world economy. Calculate this equilibrium. (Hint: because of the symmetry in this problem, the equilibrium terms of trade are $p_1 / p_2 = 1$.)

b) Repeat the analysis of part a for a world in which the utility functions are the same but the production functions are

$$y_1^i = k_1^{i^{1/2}} \ell_1^{i^{1/2}} y_2^i = t_2^{i^{1/2}} \ell_2^{i^{1/2}}$$

and the endowments are $\bar{k}^1 = 4$, $\bar{\ell}^1 = 32$, $\bar{t}^1 = 9$ and $\bar{k}^2 = 9$, $\bar{\ell}^2 = 32$, $\bar{t}^2 = 4$. (Hint: Once again, the equilibrium terms of trade are $p_1 / p_2 = 1$.)

c) Using the answers to parts a and b, explain why you would expect to see certain interest groups arguing for and against free trade. Does the theory help you predict what groups these would be in each country? Explain.