D0M42 KU Leuven
Fall 2009 Gerald Willmann

Homework 1

due on Thursday Oct 29

Problem 1: Consider two countries, Turkey and Greece. Suppose both produce wine and clothes according to the following unit input requirements:

	Turkey	Greece
wine	$a_w^T = 4$	$a_w^G = 4$
clothes	$a_c^T = 16$	$a_c^G = 1$

The Turkish labor force is 64, and in Greece it is 32. Furthermore, assume that the representative consumer in both countries has the utility function $U(x_c, x_w) = x_c^b x_w$, where the exponent b is a positive parameter.

a) Depict both countries PPF and construct the relative supply schedule, carefully labelling your diagrams. Which country has the comparative advantage in which commodity?

b) Suppose $b = 1$. Derive the relative demand function and depict it in the same diagram as relative supply from above. What is the equilibrium relative price? Quantify each countries' imports and exports.

c) Derive the critical value(s) of b above/below which only one country is completely specialized while the other produces both goods. How much does each country gain from trade in such a situation?

Problem 2: Suppose that the production functions of sector 1 and 2 are $Q_1 = K_1^{0.3} L_1^{0.7}$ and $Q_2 = K_2^{0.6} L_2^{0.4}$, respectively.

a) Determine formally which of the two goods is capital intensive, that is, uses the higher captial/labor ratio for a given relative factor price.

b) Derive the corresponding unit cost functions and explain why unit costs equal output prices. Then use these equalities to express factor prices as functions of output prices.

c) Using your results from b), explain factor price equalization and verify the Stolper-Samuelson result.

Problem 3: A country's output vector is $X = (2, 2, 1)$, the world's output vector is $X^w = (55, 100, 110)$, the price vector is $p = (4, 4, 3)$, and the commonly used input output coefficients are

$$\begin{pmatrix} 1 & 2 & 1 \\ 1 & 1 & 1 \\ 2 & 1 & 1 \end{pmatrix}$$

where the first row describes labor coefficients, the second row describes land coefficients, and the third row describes capital coefficients. All countries have identical homothetic preferences and balanced trade.

a) Describe the country's pattern of commodity trade.

b) Describe its pattern of trade in factor content.

c) What are the equilibrium factor prices?

Problem 4: Carry out the empirical exercises that you find at the end of chapter 2 in the Feenstra book. You can download the data and stata do files at this URL:
`www.econ.ucdavis.edu/faculty/fzfeens/empirical/Chapter-2.zip`