

Problem Set 1 (revised 2/7/05)

Due *in Lecture* on Monday, *February 14*.

Ricardian Model of Trade

1. Home has 1200 units of labor available. It can produce two goods, artichokes (A) and breadbuns (B). The unit labor requirement in artichoke production is 3, while in bread buns is 2.

a. Graph Home's production possibility frontier (PPF), with the quantity of bread buns on the vertical axis.

b. What is the opportunity cost of artichokes in terms of bread buns?

c. In the absence of trade (autarky), what would the price of artichokes in terms of bread buns be?

2. Home is described in Problem 1. There is now also another country, Foreign, with a labor force of 800. Foreign's unit labor requirement in artichokes production is 5, while in bread bun production it is 1.

a. Graph Foreign's PPF.

b. Construct the world PPF and the world supply curve of bread buns. (When you draw the world supply curve of bread buns, make sure that the vertical axis is P_B/P_A .)

3. Now suppose world demand for bread buns takes the following form: $D_B + D_B^* = 400 \times (P_A/P_B)$

a. Graph the demand curve along with the supply curve.

b. What is the equilibrium relative price of artichokes?

c. Describe the pattern of trade.

d. Show that both Home and Foreign gain from trade. (Graphical presentation is asked. You should clearly show the slopes of the budget constraints.)

4. Suppose that Foreign observes a technological progress. Now her unit labor requirements in artichokes production and in bread buns are 2.5 and 0.5, respectively. No other things change.

a. Redraw a new world supply and demand diagram for bread buns and find the equilibrium relative price of artichokes.

b. Show that Home benefits from this technological progress in Foreign. (Graphical presentation is needed.)

Heckscher-Ohlin Model of Trade

On the diagram below, the endowment of Home is marked $(T/L)^H$, where T stands for land (“terrain”) and L for labor (by the way, this is sometimes called a “Johnson Diagram”, after economist Harry Johnson). The PPF for the same country is also shown below.

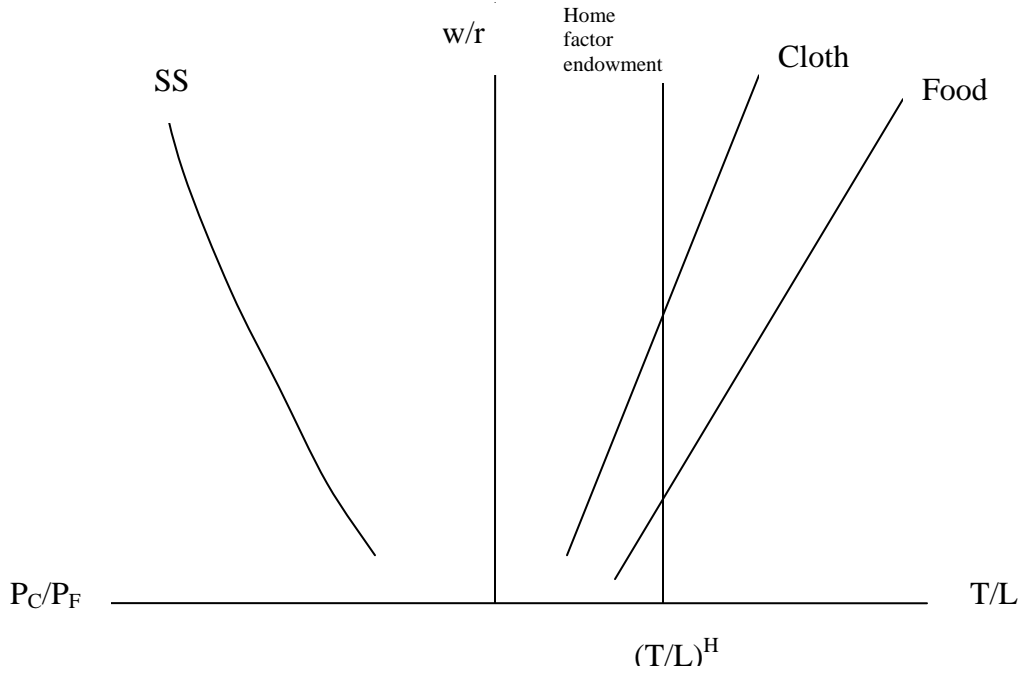


Figure 1: “Johnson Diagram”

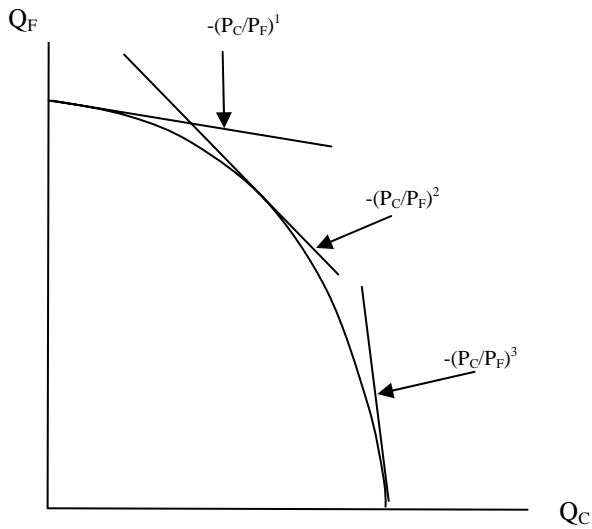


Figure 2: PPF for Home

5. Now answer these questions pertaining to Figures 1 and 2, redrawing these graphs as necessary.
- What are the factor ratios in use in the cloth and food industry for the price ratio $(P_C/P_F)^3$? What about $(P_C/P_F)^2$?
 - What happens to the relative returns to factors as the price ratio changes from $(P_C/P_F)^2$ to $(P_C/P_F)^1$? Can you explain this result intuitively?
 - At $(P_C/P_F)^1$ what are the factor ratios used in each industry? [Hint: Mark this ratio on the Johnson Diagram] Can you explain why the factors in Home can be fully employed at this relative price of commodities?
6. Now consider two countries, where Home and Foreign are endowed with factor ratios of $(T/L)^H$ and $(T/L)^*$ respectively.

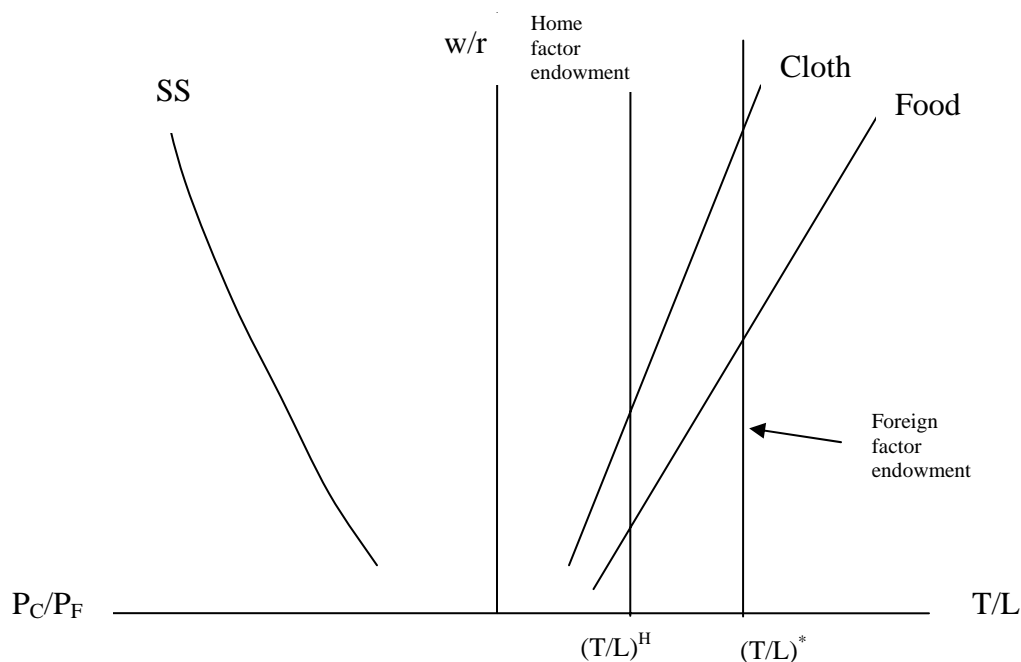


Figure 3: “Johnson Diagram” with Foreign Endowment

- Which country has more resources per unit of labor?
- Which country has the lower price of cloth in autarky? (Assume both goods are produced.)
- Draw in some autarky price ratios in figure 3. Where must the world price ratio fall? What world price ratio supports specialization in both countries?
- Is there a world price ratio where neither country specializes in production of one good? What happens to relative factor returns in both countries when trade occurs? Why?

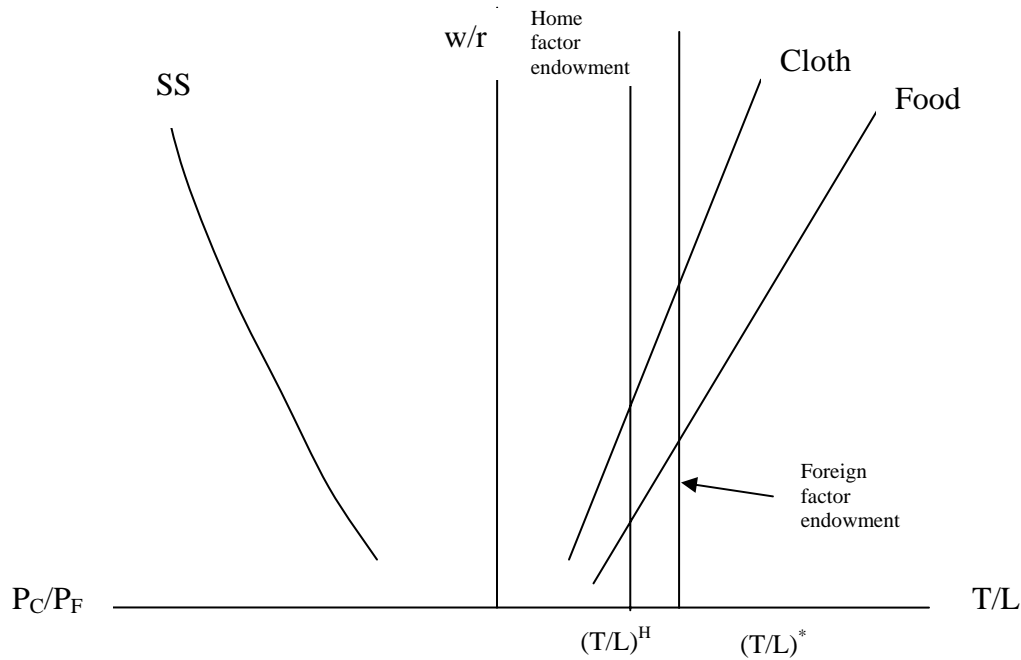


Figure 4: “Johnson Diagram” with Alternate Foreign Endowment

7. Now consider the pair of trading countries Home and Foreign where the endowments are configured somewhat differently (the endowment line is positioned differently now). Let $(P_C/P_F)^W$ be the equilibrium world price of the commodities.

- What are the factor ratios in food and clothing industries in Foreign? In Home? What are the relative returns to factors in Foreign and Home?
- What country produces relatively more cloth, and why?
- If consumption preferences are identical in both countries, which one will export cloth?
- If $(P_C/P_F)^*$ is the autarky commodity price ratio in Foreign, which group of factor owners in Foreign will oppose the introduction of trade?