

Problem Set 2

Due in Lecture on Wednesday, February 27th. “FT” denotes Feenstra-Taylor textbook

1. Specific Factors:

Starting from equilibrium in the specific-factors model, suppose the price of manufactured goods falls so that wages fall from W' to W in Figure 3-5.

- a. Show that the percentage fall in the wage is less than the percentage fall in the price of manufacturing, so that the real wage of labor in terms of manufactured goods goes up.
- b. What happens to the real wage of labor in terms of agriculture?
- c. Are workers better off, worse off, or is the outcome ambiguous?

2. Heckscher-Ohlin Model of Trade.

Consider the following $2 \times 2 \times 2$ Heckscher-Ohlin model (2 countries = home, foreign, 2 goods = natural gas, automobiles, 2 factors of production = land, capital),

On the diagram below, the endowment of Home is marked $(K/T)^H$ (by the way, this is sometimes called a “Johnson Diagram”, after Harry Johnson; refer to *Handout on Heckscher-Ohlin*). The PPF for the same country is also shown below.

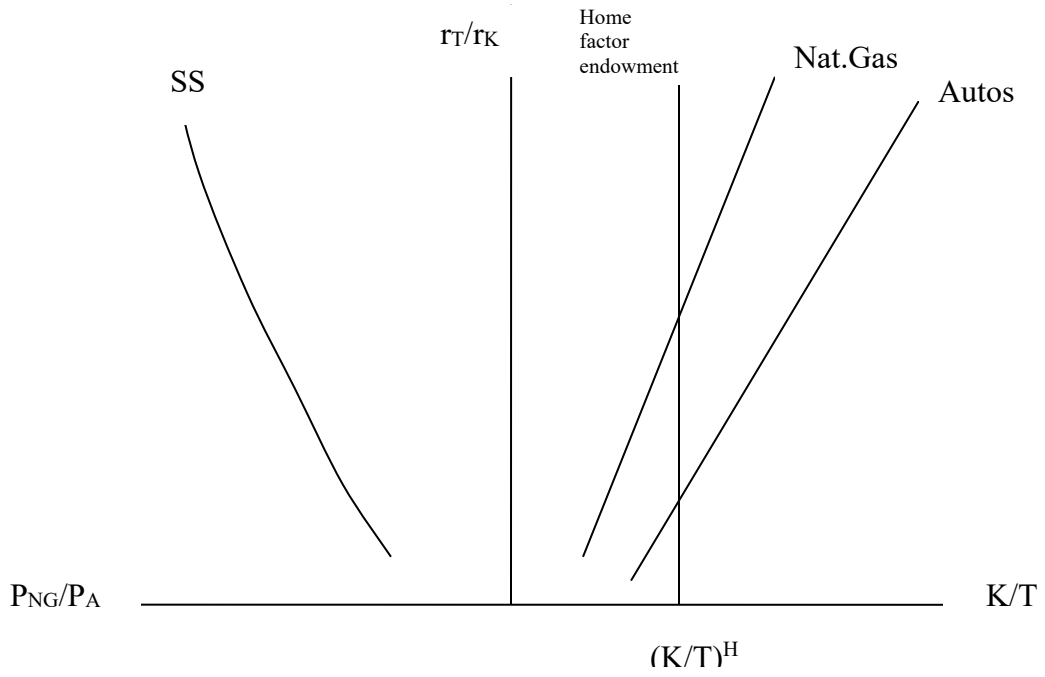


Figure 1: "Johnson Diagram"

Where K is capital, T is land, r_T is the rental rate for land, and r_K is the rental rate for capital.

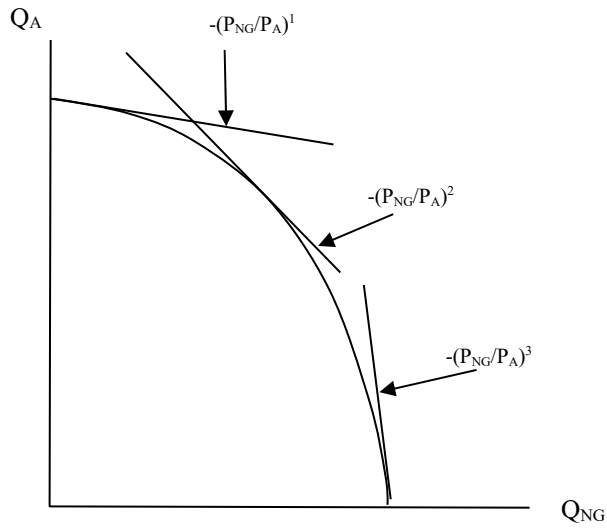


Figure 2: PPF for Home

- a. What are the factor ratios in use in the Natural Gas and Automobile industry for the price ratio $(P_{NG}/P_A)^3$? What about $(P_{NG}/P_A)^2$?
- b. What happens to the relative returns to factors as the price ratio changes from $(P_{NG}/P_A)^2$ to $(P_{NG}/P_A)^1$? Can you explain this result intuitively?
- c. At $(P_{NG}/P_A)^1$ what are the ratios of factors 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?

Assume Home and Foreign are endowed with factor ratios of $(K/T)^H$ and $(K/T)^*$.

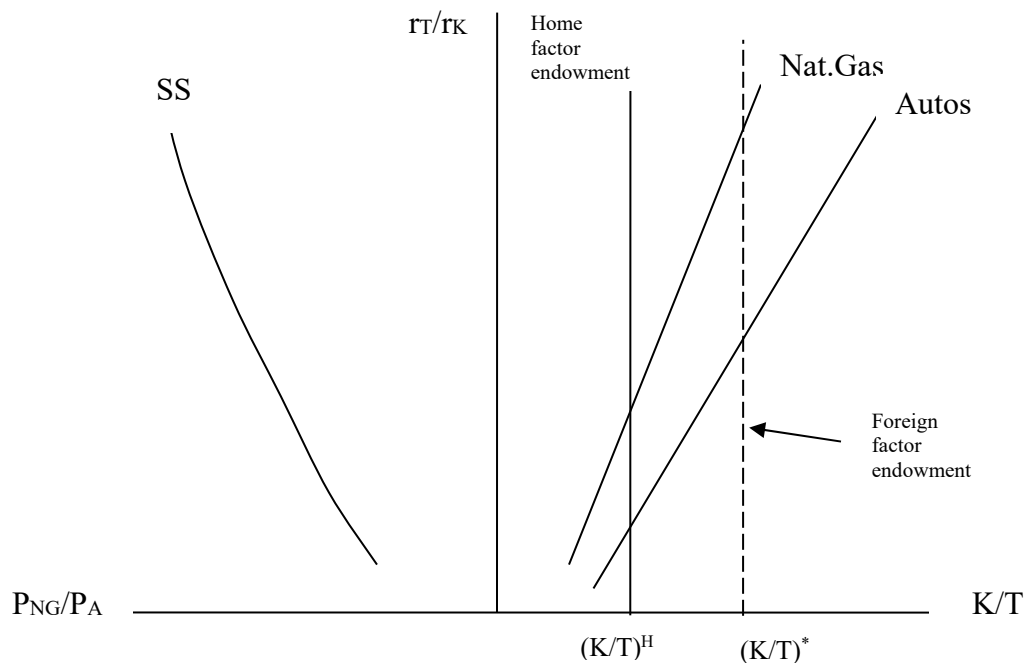


Figure 3: “Johnson Diagram” with Foreign Endowment

- d. Which country has more capital per unit of land (T)?
- e. Which country has the lower price of Natural Gas in autarky? (Assume both goods are produced.)
- f. 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?
- g. 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?

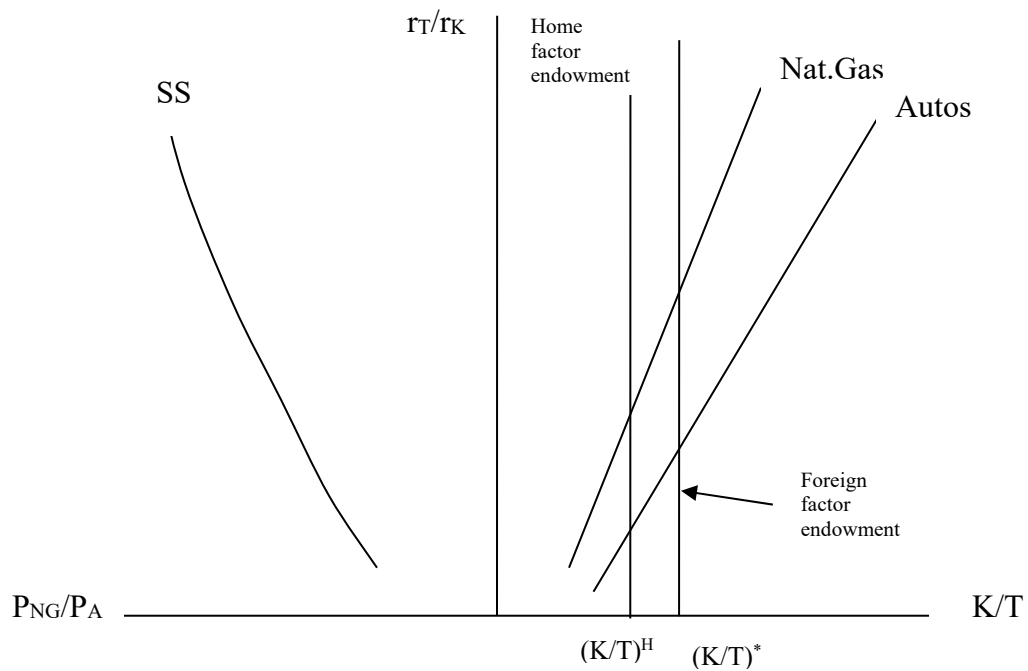


Figure 4: “Johnson Diagram” with Alternate Foreign Endowment

Consider the pair of trading countries Home and Foreign (the endowment line is positioned differently now). Let $(P_{NG}/P_A)^W$ be the equilibrium world price of the commodities.

- h. What are the factor ratios in Natural Gas and Automobiles industries in Foreign? In Home? What are the relative returns to factors in Foreign and Home?
- i. What country produces relatively more Natural Gas, and why?
- j. If consumption preferences are identical in both countries, which one will export Natural Gas?
- k. If $(P_{NG}/P_A)^*$ is the autarky commodity price ratio in Foreign, which group of factor owners in Foreign will oppose the introduction of trade?