

Problem Set 1 (rev'd 2/6)

Due in Lecture on Wednesday, February 8th. "FT" denotes Feenstra-Taylor textbook

- FT2 4th ed., Problem 3 (3rd ed., Problem 2).
- FT2 4th ed., Problem 4 (3rd ed., Problem 3).
- FT2 4th ed., Problem 5 (3rd ed., Problem 4).
- FT2 4th ed., Problem 6 (3rd ed., Problem 5).
- FT2, Problem 11 (4th, 3rd editions).

6. 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.

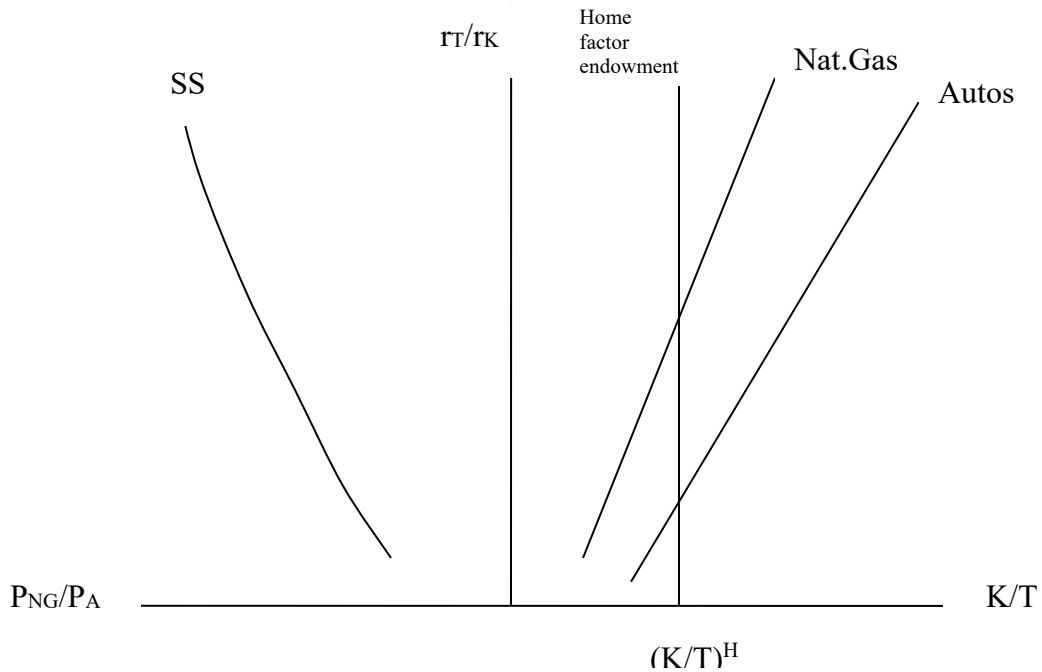


Figure 1: "Johnson Diagram"

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

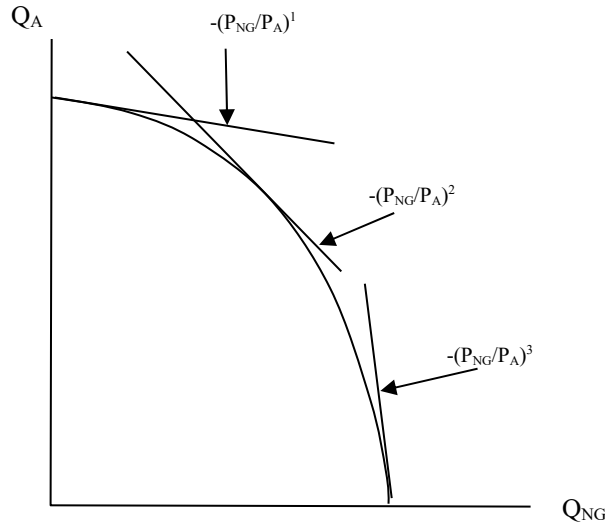


Figure 2: PPF for Home

- 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 $(P_{NG}/P_A)^2$?
- 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?
- At $(P_{NG}/P_A)^1$ 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?

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

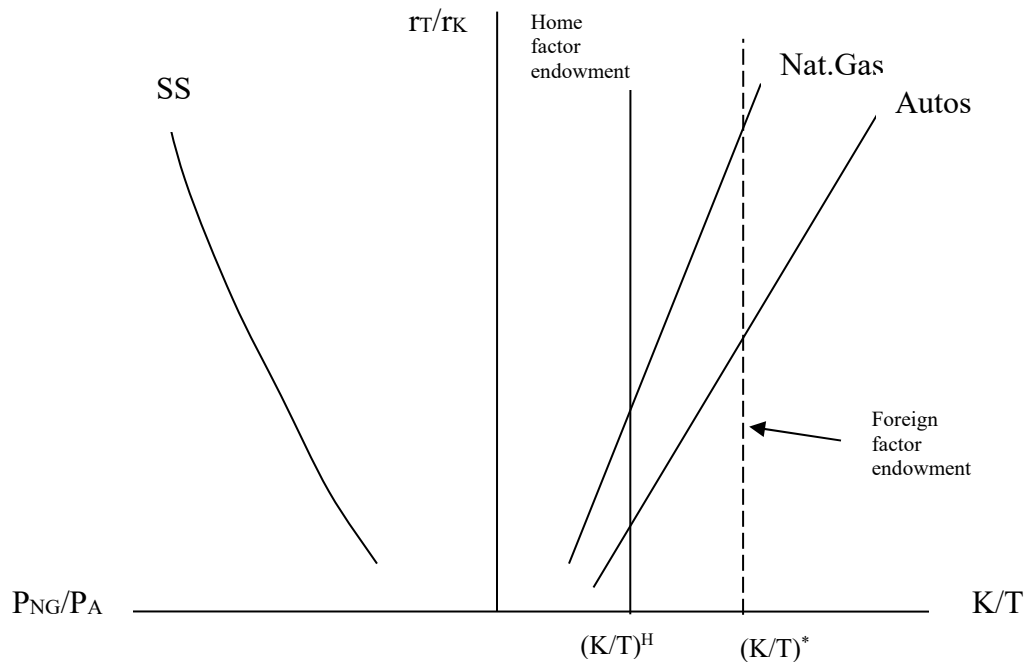


Figure 3: “Johnson Diagram” with Foreign Endowment

- 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?

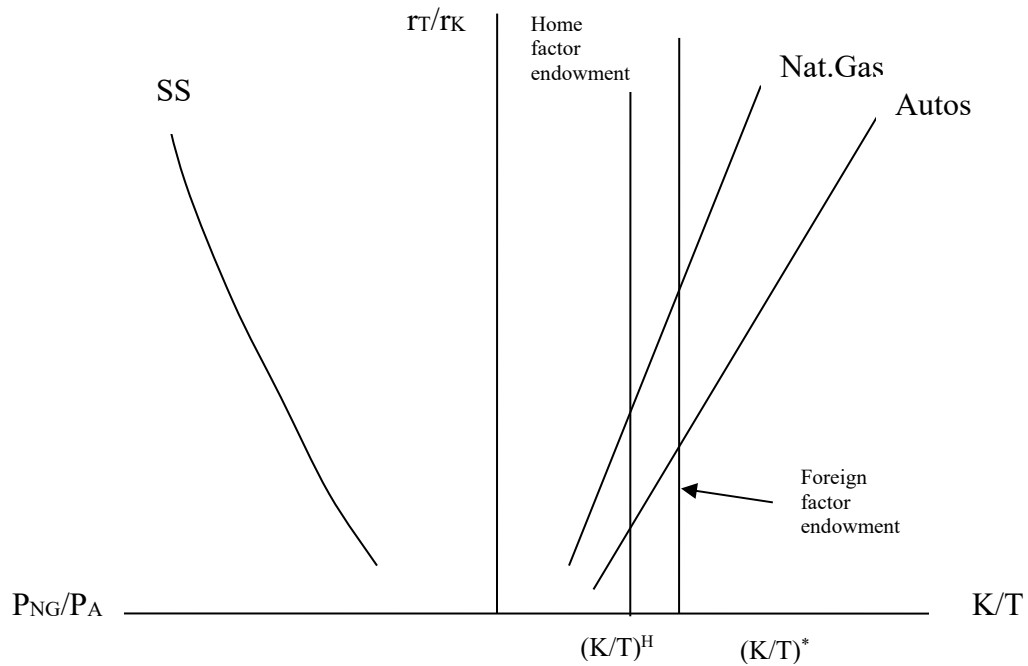


Figure 4: “Johnson Diagram” with Alternate Foreign Endowment

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?