Public Affairs 856
Spring 2017
University of Wisconsin-Madison

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Social Sciences 7418

Heckscher-Ohlin Theory and Factor Price Equalization

Let

P_C	Price, 1 yard of cloth ($/yard)
P_F	Price, 1 calorie of food ($/calorie)
w	Wage rate per hour labor ($/hour)
r	Rental rate per acre ($/acre)
L	Total labor endowment, hours
T	Total land endowment, acres

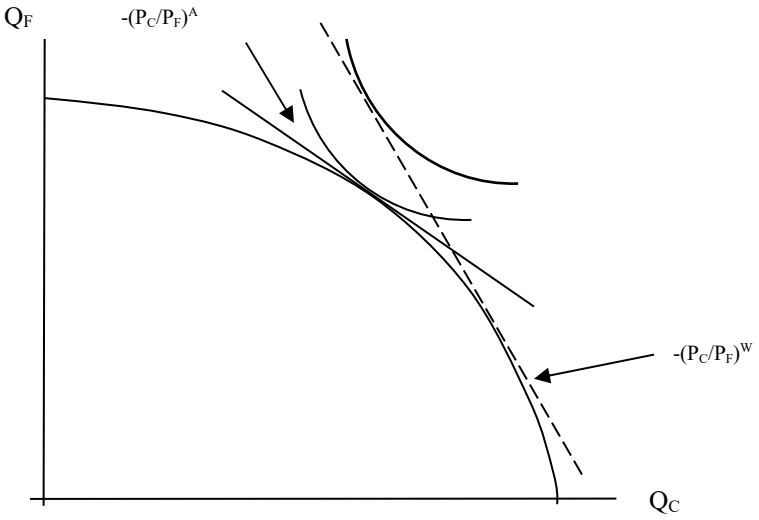

Figure 1: Home PPF

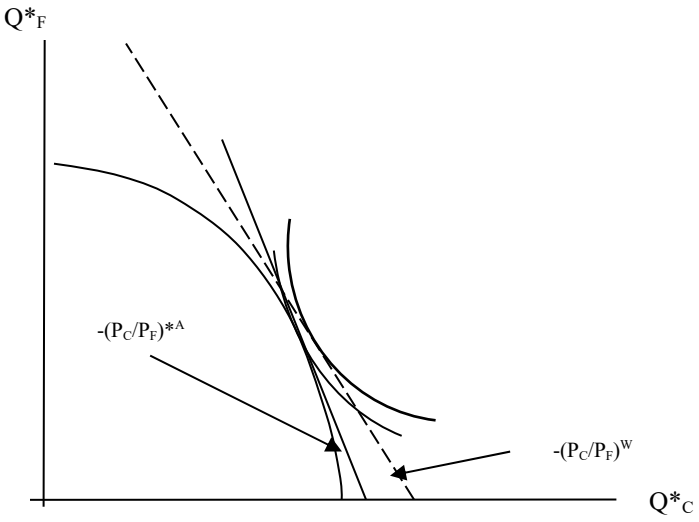

Figure 2: Foreign PPF

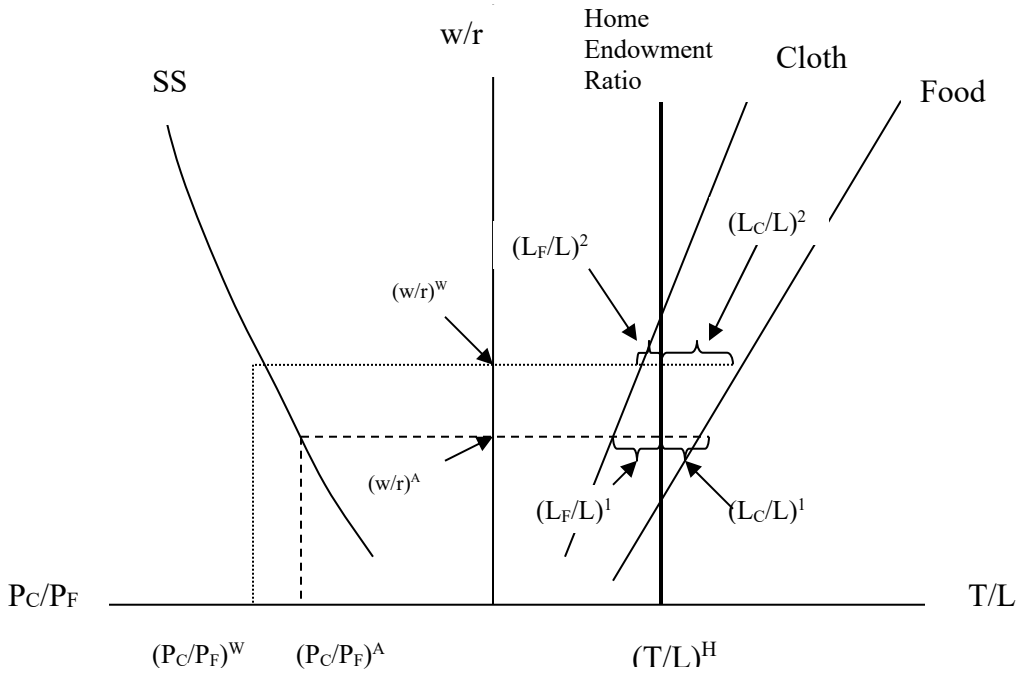

Figure 3: Johnson Diagram

Consider moving from autarky $(P_C/P_F)^A$ to world relative prices $(P_C/P_F)^W$

Note

$$T/L = (L_C/L)\times(T/L)_C + (L_F/L)\times(T/L)_F$$
$$T/L = (L_C/L)\times(T/L)_C + [1-(L_C/L)]\times(T/L)_F$$
$$T/L = (L_C/L)\times[(T/L)_C - (T/L)_F] + (T/L)_F$$

Re-arranging, and dividing through by the terms in the [.] yields:

$$T/L - (T/L)_F = (L_C/L)\times[(T/L)_C - (T/L)_F]$$
$$\therefore (L_C/L) = \frac{T/L - (T/L)_F}{(T/L)_C - (T/L)_F}$$

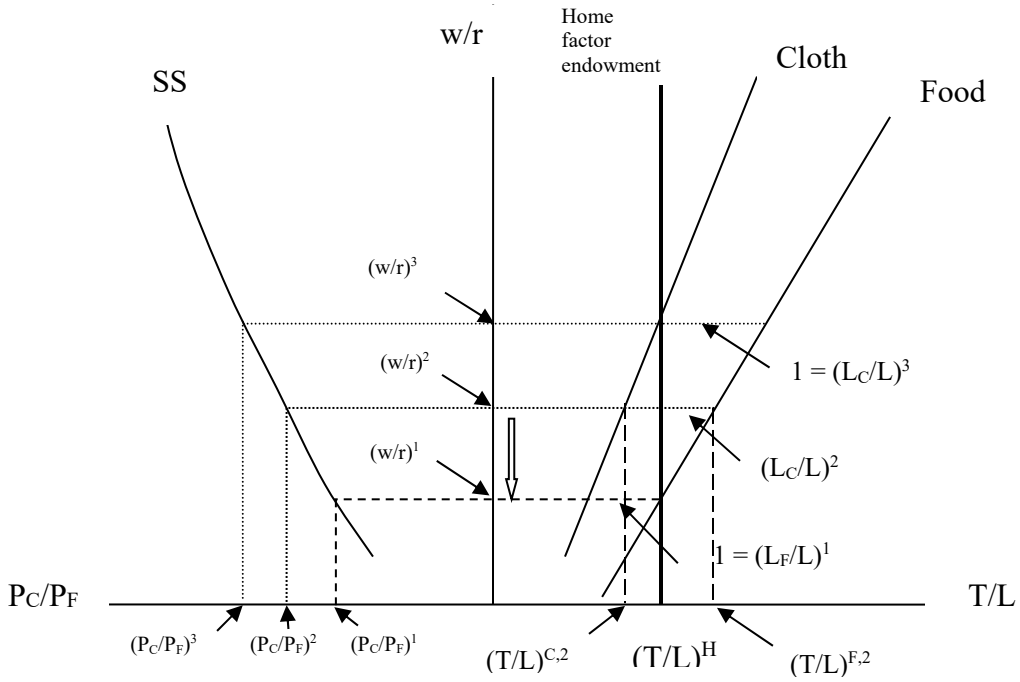

Figure 3: Johnson Diagram
Notice the limits to what the wage/rental ratio can do, as relative price of cloth falls.

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

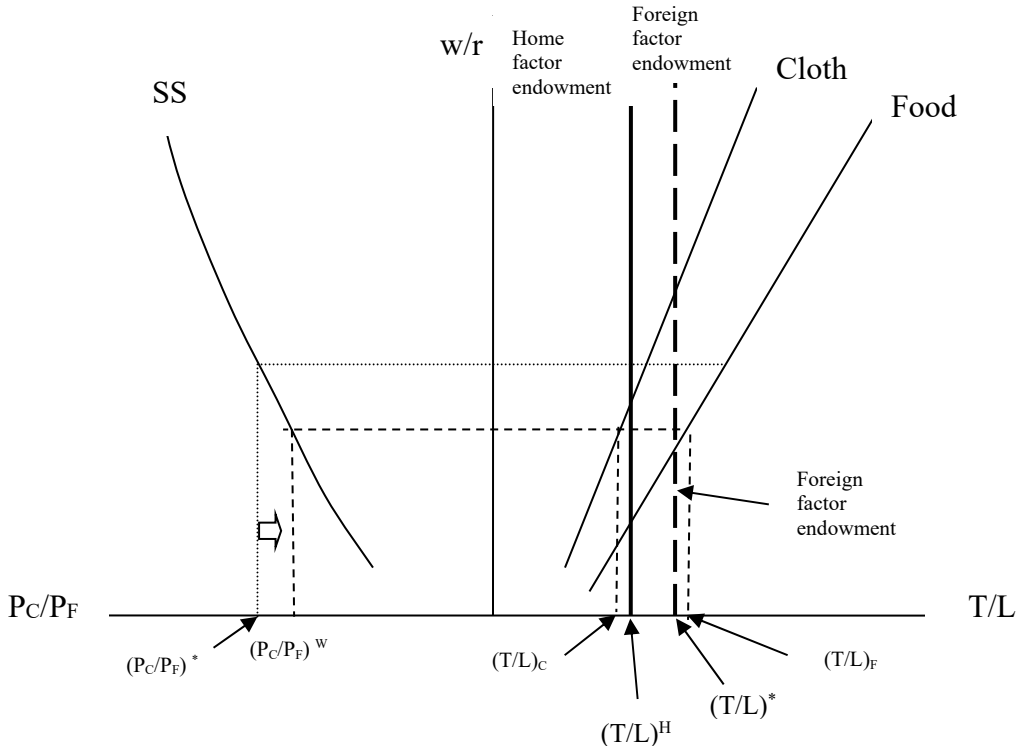

Figure 4: "Johnson Diagram" with Foreign Endowment

Key Theorems

Rybczynski Theorem: At constant prices, an increase in one factor endowment will increase by a greater proportion the output of the good intensive in that factor and will reduce the output of the other good.

Stolper-Samuelson Theorem: An increase in the relative price of the labor intensive good will increase the wage rate relative to both commodity prices and reduce the rent relative to both commodity prices.

Factor-Price Equalization Theorem: Free international trade between two countries will cause prices in the countries to become more equal. If both countries continue to produce both goods with free trade, their factor prices will actually be equal.