

SECTION 1
January 17, 2003

	Ricardian	Heckscher-Ohlin
Specifications	2 countries 2 sectors 1 factor: L (2 x 2 x 1)	2 countries 2 sectors 2 factors: L, K (2 x 2 x 2)
Endowment	-	Different
Preference	Identical	Identical
Technology	Different	Identical
Opportunity cost (MRT)	Constant	Vary
Results from Free Trade		
- Factor prices	Factor prices are determined locally.	Factor prices are equalized.
- Welfare implication	Both countries are better off.	1) Both countries are better off, in aggregate. 2) The abundant-factor owners are better off, while the scarce-factor owners are worse off. (This is one version of Stolper-Samuelson result)

Ricardian model: An example

- 2 countries: H (home) and F (foreign)
- 1 factor: $L=80, L^*=50$
- 2 sectors: x and y
- Production technology is summarized by the following unit cost requirements.
 - $A_x = 4, A_y = 4$
 - $A_x^*=3, A_y^*=2$
- Preferences:
 - $U(x,y) = xy$
 - $U(x^*,y^*)=x^*y^*$

Questions

1) What is the pattern of comparative advantage?

$$A_x/A_x^* = 4/3 < 2 = A_y/A_y^*$$

→ Home has comparative advantage in producing x, while foreign has comparative in y.

2) Solve for the autarky equilibrium in both countries and illustrate using diagrams.

Home country

Step 1 - Demand side: Consumer's utility maximization problem

Optimality condition – $MRS = P_x/P_y$

$$y/x = P_x/P_y \quad (1)$$

Step 2- Supply side: Firm's profit maximization problem

Optimality condition – $MRT = P_x/P_y$

$$A_x/A_y = P_x/P_y \quad (2)$$

Step 3- $MRS = MRT$

$$\rightarrow y/x = A_x/A_y = 1 \quad (3)$$

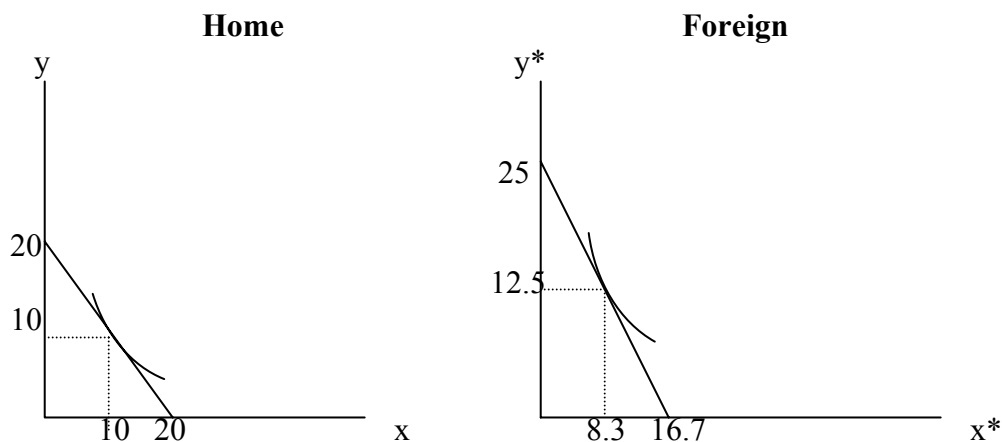
Step 4- Feasibility condition: $x(A_x) + y(A_y) = L$

$$\rightarrow 4x + 4y = 80 \quad (4)$$

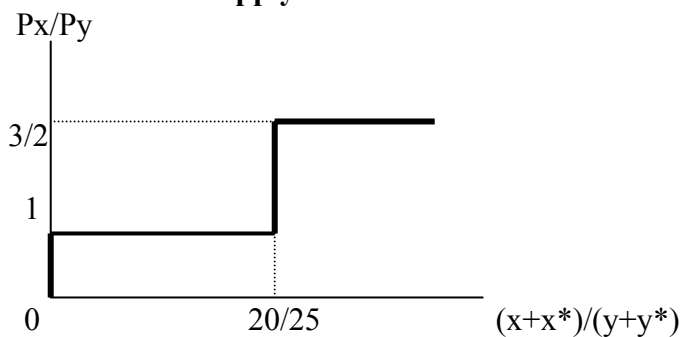
Step 5- Substitute (3) into (4). Therefore $x = 10$ and $y = 10$.

Foreign country

By following the 5 steps, we can show that $x^* = 8.33$ and $y^* = 12.5$.



3) Depict the world relative supply curve.



4) Solve for free-trade equilibrium.

Consumption points and production points are different under free trade regime.
Let C denote the consumption point.

Derive relative demand

$$\text{Home: } C_y/C_x = P_x/P_y \quad \rightarrow \quad C_y = C_x(P_x/P_y) \quad (5)$$

$$\text{Foreign: } C_y^*/C_x^* = P_x/P_y \quad \rightarrow \quad C_y^* = C_x^*(P_x/P_y) \quad (6)$$

Use (5) and (6) to write “relative demand” equation:

$$\begin{aligned} \text{Relative demand} &= (C_x + C_x^*) / (C_y + C_y^*) \\ &= 1 / (P_x/P_y) \end{aligned} \quad (7)$$

Solve for equilibrium price

In equilibrium,

$$\text{relative demand} = \text{relative supply} \quad (8)$$

From comparative advantage, home specializes in x and foreign specializes in y.

$$\rightarrow x = 20, x^* = 0, y = 0 \text{ and } y^* = 25.$$

Substitute equilibrium production into (7) to obtain equilibrium relative price.

$$\rightarrow P_x/P_y = y^*/x = 1.25$$

Solve for consumption points

Without loss of generality, we can normalize P_y as unity, then $P_x = 4.5$.

$$\text{Home budget constraint: } 1.25x + y = 1.25(20). \quad (9)$$

From (5),

$$y = 1.25x. \quad (10)$$

From (9) and (10),

$$x = 10, y = 12.5.$$

$$\text{Foreign budget constraint: } 1.25x^* + y^* = 25. \quad (11)$$

From (6),

$$y^* = 1.25x^*. \quad (12)$$

By (11) and (12),

$$x^* = 10, y^* = 12.5.$$

5) Show that both countries gain from trade.

	Autarky	Free trade
Home utility	100	125
Foreign utility	104	125

Both home and foreign gain higher utility by moving to free trade regime.

Heckscher-Ohlin Model

- **Factor Price Equalization**
 - In HO model, the FPE holds in both “absolute” and “relative” terms.
 - This claim is certainly not realistic.
 - Reason: The assumption that technology is the same in both countries is unrealistic.
- **Stolper-Samuelson result & magnification effect**
 - The free trade equilibrium itself is one example of the Stolper-Samuelson effect. To be precise, moving from autarky to free trade does have an income distribution effect, as a result of changes in good prices.
 - A change in good prices always generates the “magnification effect.”
- **Heckscher-Ohlin result**
 - Countries export the commodity of which production requires an intensive use of the abundant factor.
 - What do you think the U.S. should export, according to HO model? Capital-intensive good? Labor-intensive good?
 - To be continued!