

# Ricardian Model

PPF (Home)

cheese  
wine

$$L_c \cdot Q_c + L_w \cdot Q_w \leq L$$

Opp cost of cheese w.r.t wine =  $\frac{L_c}{L_w}$

where  $L_c$  - labor to produce 1C  
 $L_w$  - " " " 1W

$L$  - Total labor

Specialization criteria:-

$$\frac{P_c}{P_w} > \frac{L_c}{L_w} \Rightarrow \text{cheese}$$

$$\frac{P_c}{P_w} < \frac{L_c}{L_w} \Rightarrow \text{wine}$$

$$\frac{P_c}{P_w} = \frac{L_c}{L_w} \Rightarrow \text{Both}$$

absence of trade  
situation.

PPF (For)

$$L_c^* Q_c^* + L_w^* Q_w^* \leq L^*$$

opp cost of cheese w.r.t wine =  $\frac{L_c^*}{L_w^*}$

$$\text{If } \frac{L_c^*}{L_w^*} > \frac{L_c}{L_w}$$

$$Q_{c/w} < Q_{c/w}^* \Rightarrow \text{Home has CA in cheese}$$

$$\text{If } L_c < L_c^* \Rightarrow \text{Home has AA in cheese}$$

Relative Supply.

$$① \frac{P_c}{P_w} < \frac{L_c}{L_w} < \frac{L_c^*}{L_w^*}$$

$$\Rightarrow Q_c = 0 \quad Q_c^* = 0$$

$$\text{Rel qty} = \frac{Q_c + Q_c^*}{Q_w + Q_w^*} = 0$$

$$② \frac{P_c}{P_w} = \frac{L_c}{L_w} < \frac{L_c^*}{L_w^*}$$

Both  $Q_c$  and  $Q_w$  but  $Q_c^* = 0$

$$\text{Rel qty} = \frac{Q_c}{Q_w + \frac{L^*}{L_w^*}}$$

$$③ \frac{L_c}{L_w} < \frac{P_c}{P_w} < \frac{L_c^*}{L_w^*}$$

$$Q_c^* = \frac{1}{L_c} \quad Q_w = 0$$

$$Q_c = 0 \quad Q_w^* = \frac{L^*}{L_w^*}$$

$$\text{Rel qty} = \frac{L/L_c}{L^*/L_w^*}$$

$$④ \frac{L_c}{L_w} < \frac{P_c}{P_w} = \frac{L_c^*}{L_w^*}$$

$$Q_c = \frac{1}{L_c} \quad Q_w = 0$$

$Q_c^*$  and  $Q_w^*$

$$\text{Rel qty} = \frac{\frac{1}{L_c} + Q_c^*}{Q_w^*}$$

$$⑤ \frac{L_c}{L_w} < \frac{L_c^*}{L_w^*} < \frac{P_c}{P_w}$$

$$Q_c = \frac{1}{L_c} \quad Q_w > 0$$

$$Q_c^* = \frac{L^*}{L_w^*} \quad Q_w^* = 0$$

$$\text{Rel qty} = \frac{\frac{1}{L_c} + \frac{L^*}{L_w^*}}{0} = \infty$$

Model with many goods

$$\frac{P_1}{w^*} < \frac{P_2}{w^*} < \dots < \frac{P_N}{w^*}$$

$\frac{w}{w^*}$  - Relative wage

It will be cheaper to produce an item  $i$  in home if  $wL_i^* < w^*L_i^+$

$$\Rightarrow \frac{w}{w^*} < \frac{L_i^+}{L_i^*}$$

| Good        | $L_i$ | $L_i^+$ | $L_i^+/L_i$ |
|-------------|-------|---------|-------------|
| A } Home    | 1     | 10      | 10          |
| B } Home    | 5     | 40      | 8           |
| C } Foreign | 3     | 12      | 4           |
| D } Foreign | 6     | 12      | 2           |
| E } Foreign | 12    | 9       | 0.75        |

$$\frac{w}{w^*} = 5$$

Labors Allocation

$$\begin{aligned} MPL_C \times P_C &= w && \text{Cloth} \\ MPL_F \times P_F &= w && \text{Food} \end{aligned}$$

$w$  same as  $w^*$  labor is mobile

Equilibrium condition

$$\begin{aligned} MPL_C \times P_C &= MPL_F \times P_F = w \\ \Rightarrow - \frac{MPL_F}{MPL_C} &= - \frac{P_C}{P_F} \end{aligned}$$

HO Model

Condition for FIR

If there are  $n-1$  FIR  $\Rightarrow$  the US wants interest  $n$  times  
A commodity is capital/labor intensive  
eg: B is labor intense

$$\left(\frac{K}{L}\right)_B < \left(\frac{K}{L}\right)_A$$

Country 1 is cap abundant  
if  $\frac{P_1 K}{P_1 L} < \frac{P_2 K}{P_2 L}$  defn  
physical dyn  $\left(\frac{K}{L}\right)_1 > \left(\frac{K}{L}\right)_2$

Specific Factors Model

$$\begin{aligned} Q_C &= Q_C(K, L_C) \\ Q_F &= Q_F(T, L_F) \\ L_C + L_F &= L \end{aligned}$$

$$\text{Slope of PPC} = - \frac{MPL_F}{MPL_C}$$

FPE Theorem

If both countries experience incomplete specialization after trade and if there is immobility of factors, then relative price and absolute price of factors will equalize in both countries

the autarky and CRS,  
depend only on factor input  
ratio.

$$\left. \begin{aligned} MPK_{1A} &= MPK_{2A} \\ MPL_{1A} &= MPL_{2A} \\ MPK_{1B} &= MPK_{2B} \\ MPL_{1B} &= MPL_{2B} \end{aligned} \right\} (1)$$

Under perfect competition,  $MPK = P_K$   
and  $MPL = P_L$ .

$$\left. \begin{aligned} P_A \cdot MPK_{1A} &= P_1 K \\ P_A \cdot MPK_{2A} &= P_2 K \\ P_B \cdot MPK_{1B} &= P_1 K \\ P_B \cdot MPK_{2B} &= P_2 K \end{aligned} \right\} (2)$$

$$P_1 K = P_2 K \implies P_{1L} = P_{2L}$$

### FPE Set Theorem

FPE set is set of all  
weighted sums of integrated  
eq. empl vectors, where the  
weights take values b/w  
zero and 1

### HOV Theorem

Each country is the net exporter  
of the services of its abundant  
factor and net importer of the  
services of its scarce factor.

Stolper Samuelson Theorem  
SS Theorem states that the  
↑ in the relative price of a  
commodity favors the factors  
used intensively in the production  
of that commodity

Given:  $\frac{P_B}{P_A} > \left(\frac{K}{L}\right)_A > \left(\frac{K}{L}\right)_B$

To prove: if  $\left(\frac{P_B}{P_A}\right) \uparrow$  then  $\frac{P_L}{P_A} \uparrow$

Proof:

if  $\frac{P_B}{P_A} \uparrow \rightarrow$  Comm B'll be  
produced more

As more B and less A produced,  
there'll be shift in demand for  $\frac{K}{L}$ .  
Due to the shift from A to B  
there'll be excess supply of capital  
and excess demand of labor.

Price of  $P_K \downarrow$  and  $P_L \uparrow$

$$\frac{P_L \uparrow}{P_K \downarrow} \implies \left(\frac{P_L}{P_K}\right) \uparrow$$

Given a constant  $\frac{P_B}{P_A}$ ,  $\frac{P_L}{P_A} \uparrow$  as  
 $P_K \uparrow$

$\therefore$  MPL is an increasing function of the relative  
price of the abundant factor.

### Rybczynski's Theorem

$$\text{of } \left(\frac{K}{L}\right) \uparrow \Rightarrow \frac{A}{B} \uparrow \Rightarrow \frac{P_A \downarrow}{P_B \uparrow} \text{ or } \frac{P_B}{P_A} \uparrow$$

R      Condition

## Standard Trade Model

Isosave line:

$$P_c \cdot Q_c + P_f \cdot Q_f = V$$

World Relative Price  $\geq \frac{Q_c + Q_c^*}{Q_f + Q_f^*}$

Relative DD  $= \frac{D_c + D_c^*}{D_f + D_f^*}$

If Home is exported cloth and  
his is that of food.

then  $\frac{Q_c}{Q_f^*} < \frac{Q_c + Q_c^*}{Q_f + Q_f^*} < \frac{Q_c}{Q_f}$

The point where RS world and RD world  
meet:  $Q_c - D_c = D_c^* - Q_c^*$

$$Q_f^* - D_f^* = Q_f - D_f$$

Intertemporal cons.

Isosave line w.r.t to consistent one

$$V = Q_c + \frac{1}{1+r} \cdot Q_f$$

$$\Rightarrow Q_f = \frac{-(1+r)Q_c + V(1+r)}{1+r}$$

1st isosave line.

Intertemporal budget constraint

Home

$$D_c + \frac{1}{1+r} D_f = Q_c + \frac{Q_f}{1+r}$$

For

$$D_c^* + \frac{1}{1+r} D_f^* = Q_c^* + \frac{Q_f^*}{1+r}$$

Condition for intertemporal  
balance

$$D_f - Q_f = (1+r)(Q_c - D_c)$$

HIO model continued

Assns:-

Basic Assns:-

no trans cost; free trade;  
perf mkt; intl immobility of  
factors

other than that:-

Prod fn has tvc but  $\downarrow$  MP3 & CR3  
 $\Rightarrow$  Homog of degree 1

Prod fn of A and B is diff, but  
prod fn of A is same in country 1  
and 2 and 11111 B indep of lvl of income  
At a given relative price, the

Ratio of goods consumed is identical  
in both countries i.e. share of GDP

FIR are excluded