INTERNATIONAL ECONOMICS

Labor Productivity and Comparative advantage: The Ricardian model (cont'd)

A Numerical Example (1 of 5)

Unit labor requirements	Cheese	Wine
Home	$a_{LC} = 1\text{hour/lb}$	$a_{LW} = 2\text{hours/gallon}$
Foreign	$a^*_{LC} = 6\text{hours/lb}$	$a^*_{LW} = 3\text{hours/gallon}$

- What is the home country's opportunity cost of producing cheese? $\frac{a_{LC}}{a_{LW}} = \frac{1}{2}$, to produce one pound of cheese, stop producing $\frac{1}{2}$ gallon of wine.

A Numerical Example (2 of 5)

- The home country is more efficient in both industries, but has a comparative advantage only in cheese production.

$$\frac{1}{2} = \frac{a_{LC}}{a_{LW}} < \frac{a^*_{LC}}{a^*_{LW}} = 2$$

- The foreign country is less efficient in both industries, but has a comparative advantage in wine production.

A Numerical Example (3 of 5)

- With trade, the equilibrium relative price of cheese to wine settles between the two opportunity costs of cheese.
- Suppose the intersection of RS and RD occurs at

$\frac{P_C}{P_w} = 1,$ so one pound of cheese trades for one gallon of wine.

- Trade causes the relative price of cheese to rise in the home country and fall in foreign.

A Numerical Example (4 of 5)

- With trade, the foreign country can buy one pound of cheese for $\frac{P_C}{P_W} = \text{one gallon of wine,}$
  - instead of stopping production of $\frac{a^*_{LC}}{a^*_{LW}} = 2 \text{ gallons}$

    of wine to free up enough labor to produce one pound of cheese in the absence of trade.

  - Suppose $L^* = 3{,}000.$ The foreign country can trade its 1,000

    gallons maximum production of wine for 1,000 pounds of cheese, instead of the 500 pounds of cheese it could produce itself.

A Numerical Example (5 of 5)

- With trade, the home country can buy one gallon of wine for

$$\frac{P_W}{P_C} = \text{one pound of cheese,}$$

  - instead of stopping production of $\frac{a_{LW}}{a_{LC}} = 2 \text{ pounds}$

    of cheese to free up enough labor to produce one gallon of wine in the absence of trade.

- The home country can trade its 1,000 pounds maximum production of cheese for 1,000 gallons of wine, instead of the 500 gallons of wine it could produce itself.

Relative Wages

- Suppose that $P_C = \$12/\text{pound}$, and $P_W = \$12/\text{gallon}$.
- Since domestic workers specialize in cheese production after trade, their hourly wages will be

$$\frac{P_C}{a_{LC}} = \frac{\$12}{1} = \$12.$$

- Since foreign workers specialize in wine production after trade, their hourly wages will be

$$\frac{P_W}{a^*_{LW}} = \frac{\$12}{3} = \$4.$$

- The relative wage of domestic workers is therefore $\frac{\$12}{\$4} = 3$.

Relative Wages

- The relative wage lies between the ratio of the productivities in each industry.
  - The home country is $\frac{6}{1} = 6$ times as productive in cheese production, but only $\frac{3}{2} = 1.5$ times as productive in wine production.
  - The home country has a wage three times higher than the foreign country.

Relative Wages

- These relationships imply that both countries have a **cost advantage** in production.
  - High wages can be offset by high productivity.
  - Low productivity can be offset by low wages.
- In the home economy, producing one pound of cheese costs

  $\$12$ (one worker paid $\$12/\text{hr}$), but would have cost

  $\$24$ $(\text{six paid } \$4/\text{hr})$ in Foreign.
- In the foreign economy, producing one gallon of wine costs

  $\$12$ (three workers paid $\$4/\text{hr}$), but would have cost $\$24$

  $(\text{two paid } \$12/\text{hr})$ in Home.

Relative Wages

- Because foreign workers have a wage that is only $\frac{1}{3}$ the wage of domestic workers, they are able to attain a cost advantage in wine production, despite low productivity.

- Because domestic workers have a productivity that is six times that of foreign workers in cheese production, they are able to attain a cost advantage in cheese production, despite high wages.