

ECO 364 - Topic 1

The Ricardian Model

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- Despite enormous oil wealth, Nigeria has failed to achieve sustained economic growth and most of its citizens have very low standards of living.
- Successive governments have promoted a policy of self-sufficiency in food as a growth, anti-poverty and food-security strategy.
- Nigerians generally import about 20 percent of the cereals they consume and at different times, the government has banned rice imports so as to increase domestic production.


Is this a wise policy?

- At times, there are good reasons for a policy in food self-sufficiency. Such a policy could reduce the vulnerability of a country from the threat of trade embargoes.
- But this geopolitical argument for food self-sufficiency has limited validity. It might be applicable for a troubled country like North Korea; it probably does not apply to Nigeria.
- Most economists reject food self-sufficiency policies because such a policy prevents a country from gaining through specialization - producing and exporting goods that it is relatively best at producing.
- A policy of food self-sufficiency could actually increase poverty and reduce welfare in Nigeria - the exact opposite of what the government wants.

- During the late 18th century, the dominant school of thought was *mercantilism*.

We must always take heed that we buy no more from strangers than we sell them, for so should we impoverish ourselves and enrich them.

- Mercantilists believed that exporting was good since it brought gold and silver into the country, while importing was bad because it drained gold and silver from the national treasury.
- Mercantilists supported the imposition of high import tariffs.
- In the UK, the Mercantilist view manifested itself in the passing of the Corn Laws in 1815 - trade barriers intended to protect corn growers from cheaper imports.

- David Ricardo (1772-1823), a British economist, was in favor of free trade.
- Ricardo proposed the idea that countries could benefit from trade without adopting a beggar-thy-neighbor policy. 
- Ricardo showed that even if trade were (a) balanced and (b) free, countries could still gain from trade - all they have to do is export those goods in which they have *comparative advantage*.
- More importantly, Ricardo showed that two countries could gain from trade even if one of them was more productive in every industry compared to its trading partner.

- Two goods - cloth and wheat.
- Two countries - Home and Foreign.
- One factor - labor.
- One Home worker can produce 4 bushels of wheat and 2 yards of cloth.
 $\implies MPL_W = 4; MPL_C = 2.$

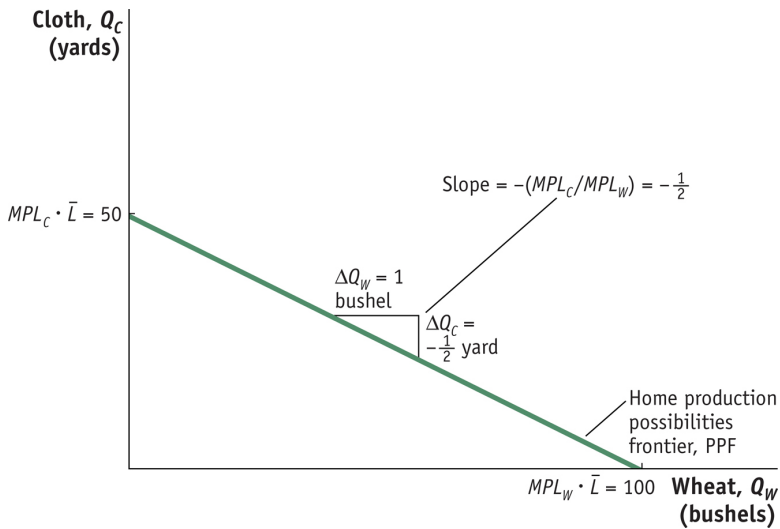
- Number of workers in the Home country, $\bar{L} = 25$.
- If all workers are employed in wheat production,

$$Q_W = MPL_W \times \bar{L} = 100.$$

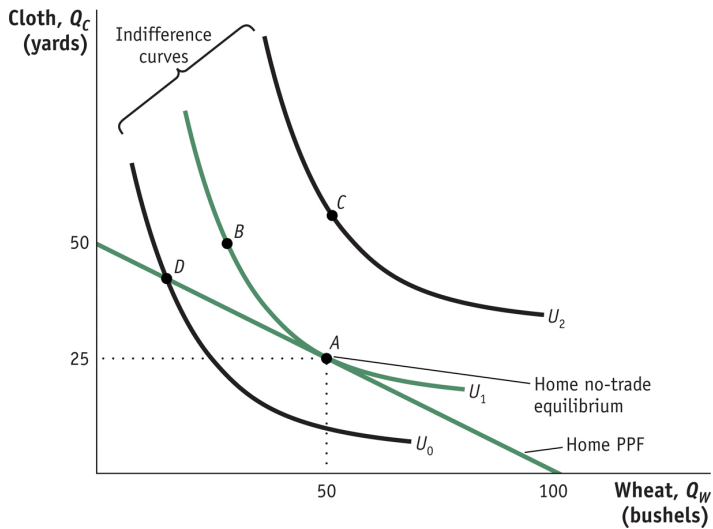
- If all workers are employed in cloth production,

$$Q_C = MPL_C \times \bar{L} = 50.$$

- Home can transform cloth into wheat at a constant rate - there are no diminishing returns in the Ricardian model.



- The PPF captures the supply side of an economy.
- But the equilibrium production and consumption of goods also depends on the demand side.
- Demand for wheat and cloth is captured by indifference curves.



- The equilibrium condition in the wheat industry is

$$P_W \times MPL_W = W_1.$$

- The equilibrium condition in the cloth industry is

$$P_C \times MPL_C = W_2.$$

- With free mobility of labor, $W_1 = W_2 = W$.

$$\implies P_W \times MPL_W = P_C \times MPL_C.$$

- The relative price of wheat (in terms of cloth) is

$$P_W/P_C = MPL_C/MPL_W.$$

- Foreign country has an *absolute disadvantage* in the production of both wheat and cloth.
- One Foreign worker can produce 1 bushel of wheat and 1 yard of cloth.
 $\implies MPL_W^* = 1; MPL_C^* = 1.$
- Number of workers in the Foreign country, $\bar{L}^* = 100.$
- As before, we can derive the production possibility frontier for the Foreign country.
- Combining this with demand, we can solve for the equilibrium production and consumption of wheat and cloth in the Foreign country.

- At Home, opportunity cost of producing a bushel of wheat is $\frac{1}{2}$ yards of cloth.
- At Foreign, opportunity cost of producing a bushel of wheat is 1 yard of cloth.
- Wheat can be produced relatively cheaply at Home \implies Home has a *comparative advantage* in the production of wheat.
- Similarly, Foreign has a *comparative advantage* in the production of cloth.

- The pattern of trade will be determined by the pattern of comparative advantage.
- Home will export wheat (since $P_W/P_C = \frac{1}{2} < P_W^*/P_C^* = 1$).
- Foreign will export cloth (since $P_C^*/P_W^* = 1 < P_C/P_W = 2$).
- But we would also like to know
 - The world relative price of wheat (or cloth).
 - The change in production and consumption of wheat and cloth in both the countries.

- Can the world relative price of wheat, \tilde{P}_W/\tilde{P}_C , be greater than 1?
- Then the relative wage at Home would be

$$\frac{\tilde{P}_W \times MPL_W}{\tilde{P}_C \times MPL_C} = (\tilde{P}_W/\tilde{P}_C) \times \left(\frac{4}{2}\right) > 1.$$

\implies All Home workers would want to produce wheat.

- The relative wage at Foreign would be

$$\frac{\tilde{P}_W \times MPL_W^*}{\tilde{P}_C \times MPL_C^*} = (\tilde{P}_W/\tilde{P}_C) \times \left(\frac{1}{1}\right) > 1.$$

\implies All Foreign workers would want to produce wheat.

- *This cannot be an equilibrium.* Therefore, $\tilde{P}_W/\tilde{P}_C \leq 1$.
- Similarly, it can be shown that $\tilde{P}_W/\tilde{P}_C \geq \frac{1}{2}$.

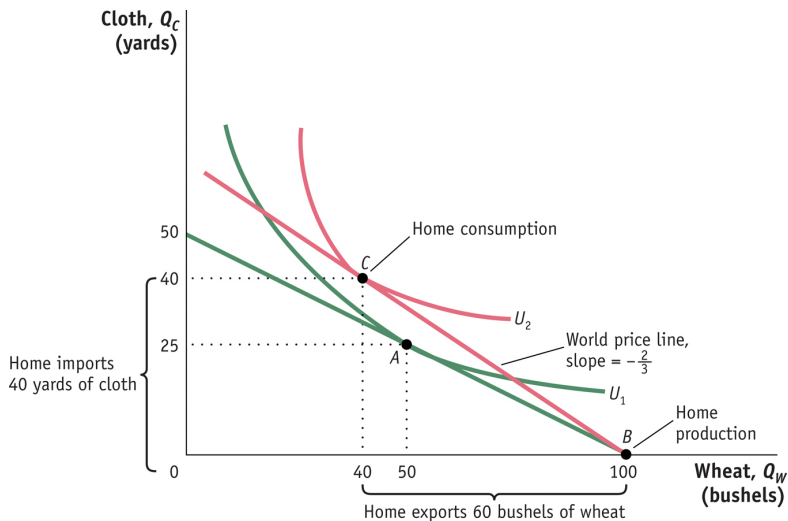
- In equilibrium, $\frac{1}{2} \leq \tilde{P}_W/\tilde{P}_C \leq 1$.
- Suppose $\tilde{P}_W/\tilde{P}_C = \frac{2}{3}$.
- The relative wage at Home is given by

$$\frac{\tilde{P}_W \times MPL_W}{\tilde{P}_C \times MPL_C} = \left(\frac{2}{3}\right) \times \left(\frac{4}{2}\right) = \frac{8}{6} > 1.$$

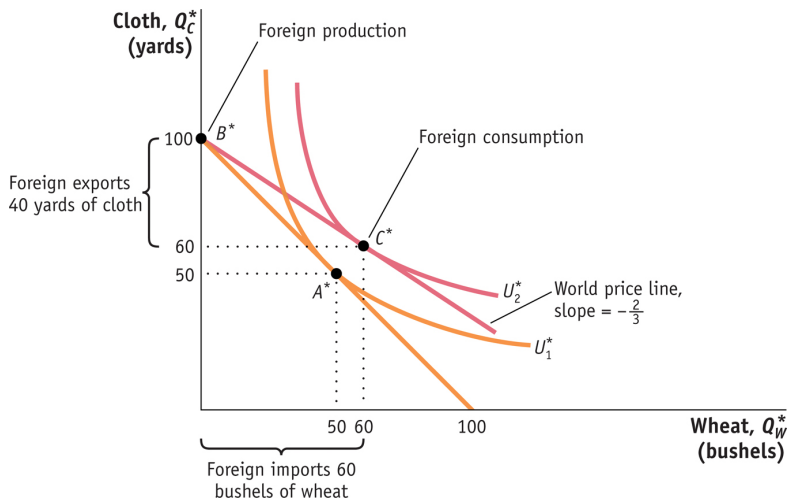
\implies Home completely specializes in the production of wheat.

- It can be checked that Foreign completely specializes in the production of cloth.

Production and consumption in the Home country



Production and consumption in the Foreign country



- To sum up, (i) countries produce and export according to comparative advantage, and (ii) there (usually) are gains from trade for both countries.
- In a free trade equilibrium, prices are equalized across countries. But what about wages?

- Wages are determined by absolute advantage.
- Since Home specializes in wheat production,

$$W = \tilde{P}_W \times MPL_W.$$

- Since Foreign specializes in cloth production,

$$W^* = \tilde{P}_C \times MPL_C^*.$$

- Using $\tilde{P}_W/\tilde{P}_C \geq \frac{1}{2}$, we have

$$\frac{W}{W^*} = (\tilde{P}_W/\tilde{P}_C) \times (MPL_W/MPL_C^*) \geq 2.$$

- The Home pays higher wages because it has higher productivity (E.g. better technology) in the production of both goods.

What if there is nothing a country can produce more cheaply or efficiently than anywhere else?

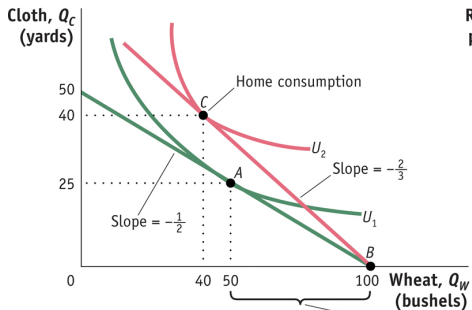
- Which goods and services a country should trade depends on comparative advantage and *not* on absolute advantage.
- Under balanced trade, if a country has absolute disadvantage in both sectors, wages will fall to give it *competitive advantage* in the sector in which it has comparative advantage.
- Using the analogy of firms to analyze the effect of international trade is misleading!!

In 1993, Ross Perot, a former U.S. presidential candidate, had warned that free trade between the U.S. and Mexico would lead to a “giant sucking sound” as jobs moved south; he was not worried about trade with Canada.

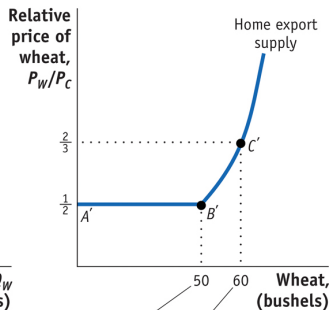
- A country can have **comparative** advantage in an industry either because of high productivity (Canada) or low wages (Mexico).
- But the cause of **comparative** advantage is irrelevant to whether its trading partner can gain from trade or not.
- A country gains from trade as long as the autarky price of a good is different from its free trade price.

- Market clearing ensures that the world relative price of wheat lies between $\frac{1}{2}$ and 1. But to derive the exact price, we need more information:
- Home export supply curve
- Foreign import demand curve

(a) Home Production and Consumption



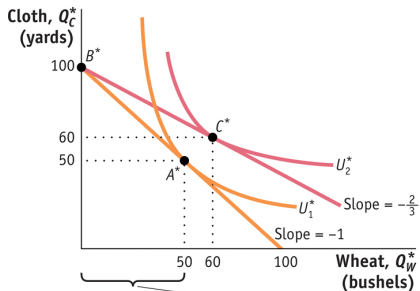
(b) Home Export Supply of Wheat



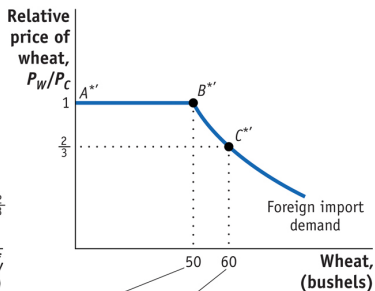
1. Home exports 0–50 bushels of wheat at a relative price of $\frac{1}{2}$ and . . .

2. . . 60 bushels of wheat at a relative price of $\frac{2}{3}$.

(a) Foreign Production and Consumption

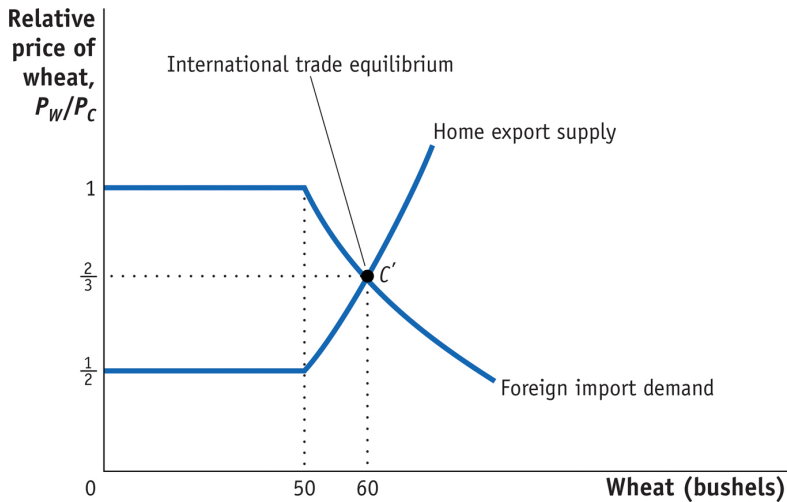


(b) Foreign Import Demand for Wheat



1. Foreign imports 0–50 bushels of wheat at a relative price of 1 and . . .

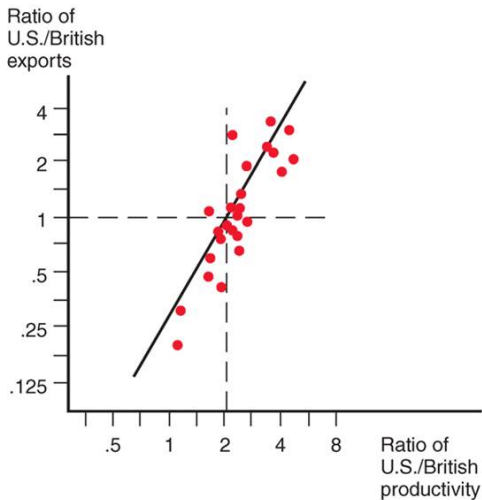
2. . . 60 bushels of wheat at a relative price of $\frac{2}{3}$.

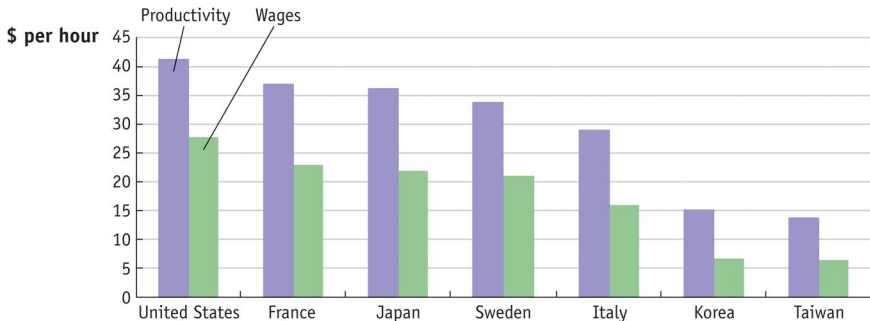


There are several reasons why the simple Ricardian model presented above may not be consistent with evidence.

- The existence of more than one factor of production reduces the tendency toward specialization.
- Countries sometime use trade policy to protect inefficient industries from foreign competition.
- There are costs of transporting goods and services; these costs might be high enough to keep out otherwise cheaper foreign products.

Bela Balassa, a Hungarian economist, looked at trade between U.S. and Britain in 26 industries for the year 1951.





- Labor productivity is measured as the value-added per hour.
- Labor productivity and wages are positively correlated not only across countries but also over time.
- Fears that countries like China and India will continue to pay low wages even as their productivity rises are misplaced.

A concern among many people in the West is that the rapid increase in productivity in emerging market economies will reduce welfare in the West. In a survey conducted by the Boston Consultancy Group, 30 percent of consumers in the U.K. and 44 percent of consumers in the U.S. said that China's growth will be bad for their economy.

Are the concerns of these Western consumers valid? The answer is much more nuanced than most people realize.

Let us return to the previous example:

- $MPL_W = 4, MPL_C = 2.$
- $MPL_W^* = 1, MPL_C^* = 1.$

The world relative price of wheat $\frac{\tilde{P}_W}{\tilde{P}_C}$ must lie between $\frac{1}{2}$ and 1.

Consider the following scenarios:

- ① The productivity of Foreign workers rises in the cloth industry.
 - Suppose MPL_C^* rises to 2.
 - Then $\frac{\tilde{p}_W}{\tilde{p}_C}$ must lie between $\frac{1}{2}$ and 2.
 - If the new $\frac{\tilde{p}_W}{\tilde{p}_C}$ is above 1, Home gains from Foreign growth.
- ② The productivity of Foreign workers rises in the wheat industry.
 - Suppose MPL_C^* rises to $\frac{3}{2}$.
 - Then $\frac{\tilde{p}_W}{\tilde{p}_C}$ must lie between $\frac{1}{2}$ and $\frac{2}{3}$.
 - If the old $\frac{\tilde{p}_W}{\tilde{p}_C}$ was above $\frac{2}{3}$, Home loses from Foreign growth.

The above example suggests that the sector in which productivity growth takes place in the Foreign country matters for how consumer welfare changes in the Home country.

- If there is growth in the export sector of the Foreign country, the Home country gains.
- If there is growth in the import sector of the Foreign country, the Home country loses.
- Irrespective of which sector is growing, Home will be *weakly* better off under trade relative to autarky.

Until now, we have taken the comparative advantage of countries as given. But where do such advantages come from?

- Sometimes, comparative advantage develops by chance. E.g. the watch-making industry in Switzerland.
- Sometimes, it may not even be possible to know which industries a country has comparative advantage in, until there has been some production. Finding true comparative advantage often involves trial and error. E.g. the steel industry in early 20th century Japan.