The Law of Comparative Advantage

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Our purpose here is to derive the costs to a buyer in country A, who is buying some good from country B, due to the production costs in country B. We will denote the monetary unit of country A as \$A and the monetary unit of country B as \$B. The dollar signs in these units do not mean dollars, but the monetary units of the countries. For example, if country B is Great Britain, one \$B = one £. Just to make the discussion definite, let us say that country A is the United States with a monetary unit of 1 \$A = 1\$ and country B is China with a monetary unit of 1 \$B = 1 Yuan. We will make the following assumptions.

- The United States has an absolute advantage over China in producing the good.
- China has a comparative advantage over The United States in producing the good.
- The good is an *economic* good in both countries, meaning that the costs of production are less than the prices per unit good in both countries.
- The seller of the good in China makes a profit of δ yuan for each unit of the good he sells to the buyer in country A.

Also, we stipulate the rate of exchange from China to the United States is R. Therefore the dollar value of a price given in yuan as Y is $D = RY$. Let us also stipulate that there is a good A that is much more valued in the US than in China. If the dollar value of A in the U.S. is D_A and its yuan value in China is Y_A, then the statement that A is valued more in the United States than in China means

$$D_A > RY_A \tag{1}$$

If this is the case, then China holds a comparative advantage over the United States in producing the good A. What Ricardo pointed out is the following. Let us suppose that China sells A to the U.S. for the dollar equivalent of the yuan price

$$Y_E > Y_A \tag{2}$$

such that

$$D_A > RY_E > RY_A \tag{3}$$

Since $Y_E > Y_A$, China clearly makes a profit on the trade. Also, because $D_A > RY_E$, the U.S. gets the good for a smaller price than it would have to expend if it produced the good itself! Both nations prosper! Next, note that

$$D_A > D_A - RY_A > R\delta > 0, \quad \delta \equiv Y_E - Y_A \tag{4}$$

where δ is defined as the Chinese trader's profit in yuan. Note that this last equation guarantees that the Chinese trader can get a profit, but it also places an upper limit on the profit he can get.

Since we have demonstrated that our assumptions lead to a selling price from the supplier in China that is less than the the price from a U.S. supplier, we have proven Ricardo's law of comparative advantage.