Why do Countries Trade?
Part II

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International Commerce
and the World Economy

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Adam Smith and Absolute Advantage

Adam Smith (1776) writing in the “Wealth of Nations” argued in favor of free trade as a response to the doctrine of *mercantilism*

Mercantilism based on premise that a nation’s well-being was based on its holdings of gold and silver – as a consequence mercantilists viewed exports as “good” and imports as “bad”

Think of two countries (US and China), with two goods (corn and steel), each being produced with one resource (labor)
Suppose the US is better at producing corn and China is better at producing steel.

From this there should be gains from trade, i.e., the US specializes in producing and exporting corn in exchange for steel, and vice-versa for China.

Typically we think of “better at producing” in terms of labor productivity, e.g., how many tons of corn or steel can be produced by a worker?

From this idea, we can get at Smith’s idea that countries will trade on the basis of their absolute advantage.
David Ricardo and Comparative Advantage

- Smith’s arguments persuaded some countries to reduce their tariffs in late 18th Century and on
- There was still a nagging concern – what happens if one country has an absolute advantage in producing both corn and steel?
- Ricardo introduced notion of opportunity cost of producing one good in terms of foregone production of other good
- In his “Principles of Economy and Taxation” (1817), Ricardo demonstrated idea of comparative advantage
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- Marginal product of labor indexes productivity of workers in each country, US having *absolute advantage* in producing corn, China in steel.
- US also has *comparative advantage* in producing corn, and China in steel.
- *Opportunity cost* of producing extra ton of steel in US is 3 tons of corn compared to 1 ton in China.

**Table 1: Marginal Products of Labor (MPL)**

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons of Steel</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Tons of Corn</td>
<td>30</td>
<td>20</td>
</tr>
</tbody>
</table>
**David Ricardo and Comparative Advantage**

**Gains from specialization** if each country produces on basis of its comparative advantage, i.e., world output of each good is higher

**Key question:** what if one country has an absolute advantage in producing both goods – can there still be gains from specialization?

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>China</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons of Steel</td>
<td>-10</td>
<td>+20</td>
<td>+10</td>
</tr>
<tr>
<td>Tons of Corn</td>
<td>+30</td>
<td>-20</td>
<td>+10</td>
</tr>
</tbody>
</table>
Suppose labor productivity is doubled in China, such that it has absolute advantage in producing both corn and steel.

Pattern of comparative advantage remains, and still gains from specialization, i.e., move 2 workers into corn production in US, and 1 into steel in China.

Gains from specialization always exist if countries have different opportunity costs.

Table 3: Marginal Products of Labor (MPL)

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons of Steel</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>Tons of Corn</td>
<td>30</td>
<td>40</td>
</tr>
</tbody>
</table>
Suppose pattern of productivity is as in Table 1, and US and China each have 1000 workers.

If US allocates all labor to steel or corn, it produces 10,000 tons of steel or 30,000 tons of corn.

If China allocates all labor to steel or corn, it produces 20,000 tons of steel or corn.

These quantities can be used to form production possibility frontiers for US and China, i.e., all combinations of steel and corn given supplies and productivity of labor in each country.
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US Production Possibilities

Chinese Production Possibilities

Corn

30,000

20,000

10,000

20,000

Steel
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- **Absolute advantage** given by distance of each production possibility frontier from origin
- **Comparative advantage** given by slope of each production possibility frontier, $\frac{MPL_C}{MPL_S}$
- **Relative price of steel to corn** ($\frac{p_S}{p_C}$) reflects opportunity costs of production under autarky
- $\frac{p_S}{p_C}$ given by slope of production possibility curve for each country, i.e., relative price of steel higher in US than in China
Assume US and China have same preferences for corn and steel – described by indifference curves

National income in each country is \( Y = p^C.C + p^S.S \), which can be rearranged as:

\[
C = \frac{Y}{p^C} - \frac{p^S}{p^C}.S
\]

Autarky equilibria \( (A^{US} \text{ and } A^{C}) \) where consumers in each country maximize utility subject to \( Y \)

Supply and demand for corn and steel equal in each country – but relative autarky prices differ
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Corn

30,000

US Income

20,000

Chinese Income

I₁

I₂

A

A

US Income

Chinese Income

10,000

20,000

Steel
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- Relative price of steel is bid down in US, and relative price of steel is bid up in China
- With trade, each country *totally specializes* in good in which it has comparative advantage:
- For example, for profit maximizing firms in US:
  \[
  \frac{MPL^C}{MPL^S} > \frac{p^S}{p^C} \quad \text{or} \quad p^C \cdot MPL^C > p^S \cdot MPL^S
  \]
  i.e., marginal revenue of corn production is higher
- With same wage rate \( w \) in both sectors, then:
  \[ MR^C = w > MR^S \]
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US production

US and Chinese consumption

Chinese production
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- Consumers are better off in each country as a result of specialization, i.e., they get greater utility.
- Labor is also better off with specialization – workers getting a higher real wage in equilibrium.
- Model can be extended to trade in many goods with many countries (Eaton and Kortum, 2012).
- Ricardo’s model is very powerful, but is based on assumption of constant marginal productivity of labor and predicts complete specialization.