Trade-offs and Trade

Krugman/Wells Economics
Models in Economics

• A **model** is a simplified representation of a real situation that is used to better understand real-life situations.
  - create a real but simplified economy
  - Ex.: Cigarettes in World War II prison camps
  - simulate an economy on a computer
  - Ex.: Tax models, money models…

• The **“other things equal” assumption** means that all other relevant factors remain unchanged.
• The **production possibility frontier (PPF)** illustrates the trade-offs facing an economy that produces only two goods. It shows the maximum quantity of one good that can be produced for any given production of the other.

• The PPF improves our understanding of trade-offs by considering a simplified economy that produces only two goods by showing this trade-off graphically.
The Production Possibility Frontier

Quantity of coconuts

Quantity of fish

Feasible and efficient in production

Feasible but not efficient

Not feasible

Production possibility frontier

PPF
Increasing Opportunity Cost

Producing the first 20 fish . . . requires giving up 5 coconuts.

But producing 20 more fish . . . requires giving up 25 more coconuts.

PPF
Production Possibilities for Two Castaways

(a) Tom’s Production Possibilities

<table>
<thead>
<tr>
<th>Quantity of coconuts</th>
<th>Quantity of fish</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>28</td>
<td>40</td>
</tr>
</tbody>
</table>

Tom’s consumption without trade
Production Possibilities for Two Castaways

(a) *Hank’s Production Possibilities*

Quantity of coconuts vs. Quantity of fish

- Hank’s consumption without trade
- Hank’s PPF

Graph showing the Production Possibilities Frontier (PPF) for Hank with two axes: Quantity of coconuts on the vertical axis and Quantity of fish on the horizontal axis.
## Tom and Hank’s Opportunity Costs

<table>
<thead>
<tr>
<th></th>
<th>Tom’s Opportunity Cost</th>
<th>Hank’s Opportunity Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>One fish</td>
<td>3/4 coconut</td>
<td>2 coconuts</td>
</tr>
<tr>
<td>One coconut</td>
<td>4/3 fish</td>
<td>1/2 fish</td>
</tr>
</tbody>
</table>
Specialize and Trade

- Both castaways are better off when they each specialize in what they are good at and trade.
- It’s a good idea for Tom to catch the fish for both of them, because his opportunity cost of a fish in terms of coconuts not gathered is only $\frac{3}{4}$ of a coconut, versus 2 coconuts for Hank.
- Correspondingly, it’s a good idea for Hank to gather coconuts for the both of them.
Comparative Advantage and Gains from Trade

(a) Tom’s Production and Consumption

- Tom’s consumption without trade
- Tom’s consumption with trade
- Tom’s production with trade
- Tom’s PPF

(b) Hank’s Production and Consumption

- Hank’s production with trade
- Hank’s consumption with trade
- Hank’s consumption without trade
- Hank’s PPF
How the Castaways Gain from Trade

<table>
<thead>
<tr>
<th>How the Castaways Gain from Trade</th>
<th>Without Trade</th>
<th>With Trade</th>
<th>Gains from Trade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Production</td>
<td>Consumption</td>
<td>Production</td>
</tr>
<tr>
<td>Tom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>28</td>
<td>28</td>
<td>40</td>
</tr>
<tr>
<td>Coconuts</td>
<td>9</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Hank</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Coconuts</td>
<td>8</td>
<td>8</td>
<td>20</td>
</tr>
</tbody>
</table>

Both Tom and Hank experience gains from trade:

- Tom’s consumption of fish increases by two, and his consumption of coconuts increases by one.
- Hank’s consumption of fish increases by four, and his consumption of coconuts increases by two.
Comparative vs. absolute advantage

- An individual has a **comparative advantage** in producing a good or service if the opportunity cost of producing the good is lower for that individual than for other people.
- An individual has an **absolute advantage** in an activity if he or she can do it better than other people. Having an absolute advantage is not the same thing as having a comparative advantage.
Tom has an **absolute advantage** in both activities: he can produce more output with a given amount of input (in this case, his time) than Hank.

- But we’ve just seen that Tom can indeed benefit from a deal with Hank because *comparative*, not *absolute*, advantage is the basis for mutual gain.

- So Hank, despite his absolute disadvantage, even in coconuts, has a comparative advantage in coconut gathering.

- Meanwhile Tom, who can use his time better by catching fish, has a comparative *dis*advantage in coconut-gathering.
Comparative Advantage and International Trade

(a) The U.S. Production Possibilities Frontier  (b) Canadian Production Possibilities Frontier

Quantity of pork (millions of tons)  Quantity of aircraft

U.S. consumption without trade
U.S. consumption with trade
U.S. production with trade
U.S. PPF

Canadian production with trade
Canadian consumption without trade
Canadian consumption with trade
Canadian PPF
If the US concentrates on producing pork and ships some of its output to Canada, while Canada concentrates on aircraft and ships some of its output to the US, both countries can consume more than if they insisted on being self-sufficient.
Misunderstanding Comparative Advantage

A common mistake is to confuse comparative advantage with absolute advantage.

Ex.: US vs. Japan in 1980s:

- Commentators: “US might soon have no comparative advantage in anything'
- Wrong! They meant “absolute advantage"