3.1 Where do Gains from Trade Come from?

Recall the Scarcity Principle - the opportunity cost of spending time on one activity if less time for another. This is all the explanation we need for why we can do better if everyone focuses on the activity at which they perform the best relative to others.

Example 3.1
Joe Jamail is one of the most sought after trial lawyers in the United States and brings in up to $10,000/day working as a trial lawyer. He has decided it is time for him to update his will. He can certainly take a day to write his own will for no fee or he can hire a lesser lawyer for two days, at a rate of $500/day, to write an equally acceptable will. Should Joe write his own will?

Example 3.2
You are trying to organize a game of 3-on-3 tonight. Unfortunately your teammates, Valerie and Lovella, have a huge chemical engineering assignment due in the morning. You know nothing about engineering but as an up and coming economist you can give them advice on how they should allocate their time (a scarce resource) this afternoon.

The assignment has 190 question, 60 related to design and 130 related to analysis. Lovella is better than Valerie at both subjects. Particularly, she can do 30 design problems in an hour while Valerie can only do 10. Also, she can do 60 analysis problems in an hour while Valerie can only do 40.

You would like them to finish the assignment before this evening so you can make it to the 3-on-3 game. How would you recommend they allocate their time this afternoon?
3.1.1 Comparative Advantage vs. Absolute Advantage

- Absolute Advantage: The ability to produce a good using fewer inputs than another producer does. Units of comparison are (Input per Good A). In the Jamail example - (Time per Will). In engineering example - (Time per Question)

- Comparative Advantage: The ability to produce a good at a lower opportunity cost than another producer. Units of comparison are (Good B per Good A). In engineering example - (Design Questions per Analysis Questions)

Example 3.3
In Example 3.2 who has an absolute advantage in doing time problems? Who has an absolute advantage doing space problems?

Example 3.4
In Example 3.2 who has a comparative advantage in doing analysis problems? Who has a comparative advantage doing design problems? Hint: The opportunity cost of analysis problems must have the units (design problems/analysis problem), think about how many design problems must each give up when they choose to instead complete an analysis problem.
3.2 Gains From Trade

- Interdependence: Each day we rely on people from around the world to produce the goods and services we use. This section will help illustrate how we gain from trade.

- Production Possibility Frontier (PPF): A graph that shows the various combinations of output that the economy can possibly produce given the available factors of production and the available production technology that firms can use to turn these factors into output.

By having each individual specialize in the good for which they have a comparative advantage, total production in the economy increases, and everyone can be made better off.

Consider the following:

- Two countries: the U.S. and Japan
  - Two goods: computers and wheat
  - One resource: labor, measured in hours
- We will look at how much of both goods each country produces and consumes
  - if the country chooses to be self-sufficient
  - if it trades with the other country

Production Possibilities in the US:
The U.S. has 50,000 hours of labor available for production, per month.

- Producing one computer requires 100 hours of labor.
- Producing one ton of wheat requires 10 hours of labor.
- The PPF for the US looks like the following:

![PPF US Diagram](image)

How do you derive a PPF?

First derive the intercepts, or endpoints of the PPF:
The U.S. has 50,000 labor hours. It takes 100 hours to produce a computer. If the U.S. uses all its labor to produce computers, then it will produce $50,000/100 = 500$ computers. Hence, the horizontal intercept is (500 computers, 0 wheat).
It takes 10 hours to produce a ton of wheat. If the U.S. uses all its labor to produce wheat, then it will produce $\frac{50,000}{10} = 5000$ tons of wheat. Hence, the vertical intercept is (0 computers, 5000 tons of wheat).

The PPF is the straight line that connects the two endpoints.

Some key feature regarding the points on a PPF graph:

- Attainable
- Efficient
- Inefficient
- Opportunity Cost

Example 3.5
Use the following information to draw Japan’s PPF.

- Japan has 30,000 hours of labor available for production, per month.
- Producing one computer requires 125 hours of labor.
- Producing one ton of wheat requires 25 hours of labor.

Your graph should measure computers on the horizontal axis.
3.2.1 Without Trade
Suppose there is no trade and both the US and Japan prefer to use half their labor to produce each of the goods.

Without trade a country consumes what it produces.

Example 3.6
Suppose the U.S. produces 3400 tons of wheat. How many computers would the U.S. be able to produce with its remaining labor? Draw the point representing this combination of computers and wheat on the U.S. PPF.

Suppose Japan produces 240 computers. How many tons of wheat would Japan be able to produce with its remaining labor? Draw this point on Japan’s PPF.
3.2.1 With Trade

- Trade unties consumption from production. When countries trade with one another they are no longer forced to consume within their production capabilities.
- With trade, otherwise unattainable points outside the PPF can be consumed.
- The following is just one example that could occur under trade between the two countries.

Example 3.7
Suppose the U.S. exports 700 tons of wheat to Japan, and imports 110 computers from Japan. (So, Japan imports 700 tons wheat and exports 110 computers.)

How much of each good is consumed in the U.S.? Plot this combination on the U.S. PPF.

How much of each good is consumed in Japan? Plot this combination on Japan’s PPF.
• Gains from trade arise from comparative advantage (differences in opportunity costs).

• When each country specializes in the good(s) in which it has a comparative advantage, total production in all countries is higher, the world’s “economic pie” is bigger, and all countries can gain from trade.

• The same applies to individual producers (like the farmer and the rancher) specializing in different goods and trading with each other.

3.3 Historical Points

• In Adam Smith’s 1776 book, An Inquiry into the Nature and Causes of the Wealth of Nations (aka Wealth of Nations), he writes of the ability of producers to benefit through specialization and trade.

"Book I, Chapter 1. Of the Division of Labor: THE greatest improvement in the productive powers of labor, and the greater part of the skill, dexterity, and judgment with which it is anywhere directed, or applied, seem to have been the effects of the division of labor....To take an example, therefore, the trade of the pin-maker; a workman not educated to this business, nor acquainted with the use of the machinery employed in it, could scarce, perhaps, with his utmost industry, make one pin in a day, and certainly could not make twenty. But in the way in which this business is now carried on, not only the whole work is a peculiar trade, but it is divided into a number of branches, of which the greater part are likewise peculiar trades. One man draws out the wire, another straights it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving, the head; to make the head requires two or three distinct operations; to put it on is a peculiar business, to whiten the pins is another; it is even a trade by itself to put them into the paper; and the important business of making a pin is, in this manner, divided into about eighteen distinct operations, which, in some factories, are all performed by distinct hands, though in others the same man will sometimes perform two or three of them...."

• In David Ricardo's 1817 book Principles of Political Economy and Taxation, Ricardo develops the theory of comparative advantage and argues against restrictions on free trade.

• The benefits of free trade are an issue that is generally agreed upon by most economists, and the theories and arguments developed by these two individuals 200 years ago are still used today.