Comparative Advantage and Trade

What determines which people produce which goods?

In this simple “economy” there are two goods, meat and potatoes, and two people who we will call the rancher and the farmer. (I wonder why?)

Both people have 8 hours to spend producing potatoes, meat, or a combination of both.

The following table shows their production opportunities.

Notice that the left half of the table and the right half of the table basically contains the same information.

In terms of *time*, the farmer needs 60 minutes and the rancher needs 20 minutes to produce an ounce of meat.

The farmer needs 15 minutes and the rancher needs 10 minutes to produce an ounce of potatoes.

During the 8 hour work day, the farmer can produce 8 ounces of meat (since there are 8 sixty-minute periods in the day) or 32 ounces of potatoes (since there are 32 fifteen-minute periods).

During the 8 hour work day, the rancher can produce 24 ounces of meat (since there are 24 twenty-minute periods in the day) or 48 ounces of potatoes (since there are 48 ten-minute periods).

The rancher has an *absolute advantage* in producing both goods. [the ability to produce with fewer inputs (in this case, time)]

The next figures show the farmer's production possibilities frontier, and the rancher's production possibilities frontier.

The y-intercepts are based on only producing meat, the x-intercepts are based on only producing potatoes, and points A and B represent spending 4 hours on each activity.

From Table 1, we see that the farmer can produce 4 ounces of potatoes in the time that he can produce 1 ounce of meat.

To produce an additional 1 ounce of meat, the farmer must sacrifice 4 ounces of potatoes. Thus, the opportunity cost of an ounce of meat is 4 (oz. potatoes per oz. meat).

To produce an additional 1 ounce of potatoes, the farmer must sacrifice 1/4 ounce of meat. Thus, the opportunity cost of an ounce of potatoes is 1/4 (oz. meat per oz. potatoes).

This opportunity cost is also the slope of the farmer's production possibilities frontier. The increase in meat production, per unit reduction of potato production, is 1/4.

Why is the production possibilities frontier a straight line in this simple economy?

For the rancher, the opportunity cost of an ounce of meat is 2 (oz. potatoes per oz. meat).

The rancher's opportunity cost of an ounce of potatoes is ½ (oz. meat per oz. potatoes).

The slope of the rancher's production possibilities frontier is ½, reflecting this opportunity cost. The increase in meat production, per unit reduction of potato production, is ½.

Gains From Trade

Suppose that if they had to be self-sufficient (producing everything they consumed), the farmer would choose point A and the rancher would choose point B.

With specialization and trade, it is possible for both people to consume more of everything.

Instead of producing (16,4), the farmer could produce (32,0), specializing in potato farming. If he trades 15 ounces of potatoes to the rancher for 5 ounces of meat, his final consumption is (17,5).

Instead of producing (24,12), the rancher could produce (12,18), focusing more on ranching. If he trades 5 ounces of meat to the farmer for 15 ounces of potatoes, his final consumption is (27,13).

Notice that the price of meat settled upon, 3 ounces of potatoes per ounce of meat, was in between the farmer's opportunity cost of meat, 4, and the rancher's opportunity cost of meat, 2.

The rancher has a *comparative advantage* in producing meat, since his opportunity cost is smaller. The farmer has a *comparative advantage* in producing potatoes, since his opportunity cost (1/4) is smaller than the rancher's opportunity cost (1/2).

Why didn't both the farmer and the rancher specialize?

If the rancher only produced meat, the farmer would not have enough potatoes to sell to the rancher. In a large economy with more than two people, we would expect full specialization.

Why comparative advantage determines trade:

Consider a price of meat (per oz. potatoes) of 3.

The rancher's opportunity cost is 2, so producing and selling an extra ounce of meat "costs" 2 ounces of potatoes and gains 3 ounces of potatoes. The rancher will specialize in ranching.

The farmer's opportunity cost is 4, so reducing production of meat by one ounce, and buying it from the rancher, reduces meat production "costs" by 4 ounces of potatoes, which is less than the 3 ounces of potatoes paid to the rancher. The farmer will specialize in farming.

Notice that whenever the two individual's opportunity costs are different, we can find a price at which both people specialize by producing the good with the comparative advantage.

Applications:

1. Should Tiger Woods mow his own lawn?

2. Should the United States trade with other countries (export and import)?

–Trade allows each country to specialize in its comparative advantage, so more total consumption is possible. The U.S. exports computers, food, cars, and cigarettes, and imports clothing, cars, and oil.

–Unlike the farmer/rancher example, even if the U.S. gains from trade overall, there are some losers. U.S. textile workers are hurt.

–Trade deficits mean that we are importing more than we export, in terms of market value. Foreigners acquire our assets, which they can sell to buy our goods in the future. This is like trading today's goods for future goods.