

# Homework 1

## Comparative Advantage

Econ 101  
Professor Guse

Al and Carl both like to consume wine and bread and both are capable of producing wine and bread. Carl can make up to 60 loaves of bread per month. For each bottle of wine he makes his bread output drops by a  $\frac{1}{2}$  loaf. Al can make up to 20 bottles of wine per month. For each loaf of bread he bakes his wine output decreases by a  $\frac{1}{2}$  bottle.

1. Draw Al's monthly *production possibility frontier* - the set of output combinations he is capable of producing.
2. Suppose Al is currently producing and consuming on his PPF making 10 bottles of wine per month.
  - (a) Mark this point in your picture of Al's PPF.
  - (b) How many loaves of bread does Al bake each month?
  - (c) What is Al's opportunity cost of increasing his wine output by 1 bottle to 11 / month?
  - (d) What is Al's opportunity cost of increasing his bread output by 1 loaf per month?
3. Draw Carl's monthly *production possibility frontier* - the set of output combinations he is capable of producing.
4. Suppose Carl is currently producing and consuming on his PPF making 20 bottles of wine per month.
  - (a) Mark this point in your picture of Carl's PPF.
  - (b) How many loaves of bread does Carl bake each month?
  - (c) What is Carl's opportunity cost of increasing his wine output by 1 bottle per month?
  - (d) What is Carl's opportunity cost of increasing his bread output by 1 loaf per month?

5. Draw Al and Carl's combined PPF and mark the current production and consumption point.
6. Propose a production and distribution scheme in which both Al and Carl are still producing on their individual PPF and can each increase their consumption of *both* goods by one unit. Mark this point in your combined PPF diagram.
7. The following question is taken from Baumol and Blinder's *Introductory Economics* text.

A person rents a house for which she pays the landlord \$12,000 per year. The house can be purchased for \$100,000, and the tenant has this much money in a bank account earning 4% interest. Should she buy? Explain using opportunity cost.

8. Problem 5, Parkin, Chapter 2. A farm grows wheat and produces pork. The marginal cost of producing each of the products increases as more of it is produced.
  - (a) Make a graph that illustrates the farm's PPF.
  - (b) The farm adopts a new technology that allows it to use fewer resources to fatten pigs. Use your graph to illustrate the impact of the new technology.
  - (c) With the farm using the new technology described in part (b), has the opportunity cost of producing a ton of wheat increased, decreased, remained unchanged? Explain and illustrate your answer.
  - (d) Is the farm more efficient with the new technology than it was with the old one?
9. Critical Thinking Question 3, Parkin Chapter 2. Ethanol can be produced from either sugar or corn. A gallon of ethanol costs \$0.90 to produce from Brazilian sugarcane and \$1.00 to produce from U.S. corn. The U.S. Department of Agriculture expects 20 percent of the corn harvest to be used to produce ethanol in 2007, an increase of 34 percent from 2006.
  - (a) Does the U.S. have a comparative advantage in producing ethanol?
  - (b) Will the opportunity cost of producing ethanol in the United States increase in 2007?
  - (c) Could the United States gain by importing ethanol (or sugarcane) from Brazil?
  - (d) Assume that the numbers quoted above \$0.90 and \$1.00 per gallon are the costs to ethanol refiners from using sugar and corn respectively in their production. Suppose that growing sugar cane in Brazil reduces forest cover and growing corn in the U.S. pollutes waterways. How likely is it that these numbers reflect the full opportunity cost of ethanol production? How do these considerations change your answer to parts (a) and (c)?