Economics 102
Fall 2015
Homework #2
Due Monday, October 5, 2015

Directions:

- The homework will be collected in a box **before** the large lecture.
- Please place your name, TA name and section number on top of the homework (legibly). Make sure you write your name as it appears on your ID so that you can receive the correct grade.
- Late homework will not be accepted so make plans ahead of time. **Please show your work.** Good luck!

Please realize that you are essentially creating "your brand" when you submit this homework. Do you want your homework to convey that you are competent, careful, professional? Or, do you want to convey the image that you are careless, sloppy, and less than professional. For the rest of your life you will be creating your brand: please think about what you are saying about yourself when you do any work for someone else!

1. Comparative Advantage, Joint PPF

Suppose that the United States and China both produce computers and shirts and that each country has a linear production possibility frontier with respect to the production of these two goods. Suppose that in a year an American worker can produce 100 shirts and 0 computers or 20 computers and 0 shirts, while a Chinese worker can produce 100 shirts and 0 computers or 10 computers and 0 shirts.

a. In the United States, what is the opportunity cost of producing an additional shirt (measured in terms of foregone computers)? In China, what is the opportunity cost of producing an additional shirt (measured again in terms of foregone computers?

b. Given the above information, draw the PPF for the United States with computers per worker measured on the x-axis and shirts per worker measured on the y-axis. In a separate graph, draw the PPF for China. For both PPFs assume that you are drawing the PPF per worker (that is, assume that you are drawing a PPF based on each economy employing a single worker). What does the slope of the PPF signify in terms of opportunity cost? Provide a clear explanation in your answer.

c. Suppose that the United States and China each have 100 workers that can produce computers and/or shirts. If each country devotes half of these workers to the production of computers and half to the production of shirts, how many shirts and computers does each country produce? Assuming that the only producers of shirts and computers in the world are China and the United States, what is the world output of shirts and computers?

d. Suppose we now assume that each country specializes by devoting all of its workers (100 for each country) to the industry in which it has a comparative advantage. In this case, what is the world output of shirts and computers? Show your work and explain your answer fully.

e. Assuming that the two countries are completely specializing (as in (d)), now allow the two countries to trade with each other. What is the range of acceptable trading prices for one shirt? Illustrate your answer using the number line approach presented in class: in your diagram make sure you represent both the United States' perspective as well as China's perspective.

2. Qualitative Supply and Demand

The famous Italian pizza, Margherita, is made of tomatoes, basil and mozzarella. In this question, assume that ketchup, made from tomatoes, is a complement to pizza.

State whether the new equilibrium price and quantity is higher or lower in the market specified after the following changes. Assume that each market is initially in equilibrium and that you are analyzing the effect of the desired change on the equilibrium price and equilibrium quantity in the market relative to the initial equilibrium price and equilibrium quantity. (Hint: Drawing graphs might help!)

a. Consider the market for tomatoes. Suppose after a flood, tomatoes fields are destroyed.
b. Consider the market for mozzarella. Suppose the workers involved in the production of mozzarella unionize and all factories producing mozzarella must now pay their workers a higher wage.
c. Consider the market for basil. Suppose the government imposes a limit on how much basil may be produced. (Assume this limit is less than the current equilibrium quantity in the market for basil.)
d. Consider the market for ketchup. Suppose a government policy to limit the production of tomato paste is imposed where the quota limit on tomato paste is smaller than the equilibrium quantity in the tomato paste market. What is the impact of this quota limit on tomato paste on the market for ketchup? Assume that tomato paste is a primary ingredient in the making of ketchup.

e. Consider market for Italian Pizza, Margherita. Suppose that all the events described in (a), (b), (c) and (d) occur simultaneously. Explain your answer fully and illustrate your answer with a graph.

3. Quantitative Supply and Demand

Consider the market demand for computers in which the initial demand curve and supply curves are given by the following equations where Q refers to the quantity of computers and P is the price per computers in dollars:

Demand curve: $Q_1^D = 1050 - 2P$
Supply curve: $Q_1^S = P - 300$

a) What is the initial equilibrium price and quantity in this market? Show your work.
b) Now suppose the demand curve shifts to the right and can now be expressed by the equation:

New Demand curve: $Q_2^D = 1200 - 2P$

Find the equilibrium price and quantity in the following cases, and for each case, show your work.

i) The supply curve remains the same, i.e. $Q_1^S = P - 300$

ii) The supply curve shifts to the right and is now expressed by the equation:
$Q_2^S = P - 90$

iii) The supply curve shifts to the right and is now expressed by the equation:
$Q_3^S = P - 150$

c) What do you observe about the equilibrium quantity in each case in (b) with the initial equilibrium in (a)? What about the equilibrium price?
d) Given the increase in demand from the initial demand curve to the new demand curve, how big did the horizontal increase in the quantity supplied need to be in order to return the price in the market to its original equilibrium level? In your answer, assume that the new supply is parallel to the initial supply curve: that is, the two supply curves have the same slopes.

4. Aggregate Market Demand

Beantown is a small, closed economy with two espresso shops: SanCafe and HoshiCafe. SanCafe and HoshiCafe are the only consumers of coffee beans in Beantown. San at SanCafe most often buys 10 pounds of coffee beans at $2/pound, and sometimes he is willing to pay $2.50/pound but buys only 5 pounds of coffee beans. On the other hand, Hoshi at HoshiCafe is willing to pay $1.50/pound for 10 pounds of coffee beans, but most often she buys 20 pounds of coffee beans at $1.25/pound. Both San and Hoshi have linear demand curves for coffee. Assume that San and Hoshi are the only consumers in the market for coffee in Beantown.

a) Given the above information, draw two graphs: in the first graph represent San's demand curve and in the second graph represent Hoshi's demand curve. Write the equations for both of these demand curves.
b) Draw the market demand curve for coffee beans in Beantown.
c) Find the equations for the market demand curve. Make sure you provide the relevant range or domain for your equations. And, show your work in finding these equations!

5. International Trade

San and Hoshi keep making espressos in Beantown. They supply espresso according to the following equation where P is the price per cup of espresso and Q is the quantity of cups of espresso:

Market Supply: $P - (1/8)*Q^S = 4$

The espresso drinkers demand espresso according to the equation:

$P + (1/2)*Q^D = 14$

a) Given the above information, what is the equilibrium price and quantity in Beantown's espresso market? Show how you found your answer. Then, provide a graph of this market.

b) Find the consumer surplus (CS), producer surplus (PS) and the total surplus (TS) in this market. [Note: Drawing a graph would be helpful.]

Now, the Beantown government decides that trading espresso with the rest of the world would be good for the economy. The world price of espresso is $5.

c) How much do Beantowners pay for their espresso now? Do they buy more espresso at this price and, if so, what is the new quantity demanded domestically? How much of that demand is met by SanCafe and HoshiCafe? Is any espresso imported and if so, how many cups of espresso are imported?

d) Calculate CS, PS and TS for this open economy and compare them to those in the closed economy. Are San and Hoshi happy with the espresso market being opened to trade? Explain your answer.

Soon after Beantown starts trading in the espresso market, there is a big protest in front of the State Capitol. Among the many banners there are signs saying "We Stand With San and Hoshi", "Buy Local" and "Trade Destroys Domestic Jobs". The government, worried about the upcoming elections, calms the protestors by announcing a tariff of 50 cents on each imported espresso.

e) What is the price of an espresso after the new tariff is imposed? How many espressos are sold in total at this price? How many of the sold espressos are produced domestically and how many are imported?

f) Calculate CS, PS and TS when the tariff described in (e) is implemented. Does the government benefit from the tariff and, if so, how much? What is the deadweight loss?

6. A PhD student in economics from Beantown decides to do research on the effect of an import quota instead of a tariff. In her model of an open economy, she assumes an import quota of 6 espressos. [The demand and supply equations are the same as in the previous problem, and the world price of espresso is $5.]

a) What is the price of one espresso with this import quota? How many espressos are purchased in total? How many of these are domestically produced? (Your answers may end up having fractional prices and quantities.)

b) Calculate CS and PS given this import quota. Does the government benefit from this quota? Do license holders (in this case, businesses that are licensed to import espresso) benefit and, if so, what is their revenue? Explain your answer fully.

c) What is the deadweight loss incurred as a result of the import quota? What does the DWL reflect? In your own words, explain why the DWL areas represent efficiency loss in the economy.