

Economics 101  
Fall 2013  
Homework #2  
Due Tuesday, October 1, 2013

Directions: The homework will be collected in a box before the 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, and 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!**

**Question 1:**

An international spy agency has three agents at their disposal to send on missions: Ethan Hunt, James Bond, and Jason Bourne. These spies can split their time by either apprehending evildoers or rescuing innocent people. The following table shows the maximum number of evildoers each spy can catch and the maximum number of innocent people he can save in a month:

	Hunt	Bond	Bourne
Number of evildoers caught	8	5	4
Number of innocent people saved	6	2	4

- What are the opportunity costs of apprehending evildoers for each spy? What are the opportunity costs of rescuing innocent people for each spy?
- Who has the absolute advantage in catching evildoers/rescuing innocents?
- Draw on separate graphs the production possibility frontiers for each agent, putting the number of innocents rescued on the x axis and number of evildoers caught on the y axis. Label your graphs clearly and completely.
- Now construct the joint PPF of the three agents. Clearly mark and give the locations of the kink points. Write down the equation for each segment of the joint PPF.

## Question 2:

Use the demand and supply framework to qualitatively analyze the market in each case below

- a) Fashion icon Blair Waldorf recently unveiled a new design of high heel shoes at a fashion show. Assuming that the supply of high heels stays the same (older designs are taken off the market to make room for the new ones), how will demand for high heels change? What will be the effect on equilibrium price and quantity? In your answer assume that consumers are eager to be seen wearing a “Blair Waldorf” creation.
- b) To go up from the Burj Khalifa’s 120th floor to 123rd floor in Mission Impossible 4 Ethan Hunt needs gloves that stick to any surface. During the mission, he realizes that gloves do not work properly if used constantly for a long period of time. How will Hunt’s demand for grappling hook guns change at the end of the mission after he has been using his gloves? That is, will Hunt’s demand for grappling hook guns shift right, left, or remain unchanged given the above information? Assume that grappling hook guns and gloves are substitutes, and grappling hook guns can be used for a long period of time. What are the effects on equilibrium price and quantity (increase/decrease/no change/ambiguous) in the market for grappling hook guns?
- c) Suppose the two legal comedy-dramas “Drop Dead Diva” and “The Good Wife” are substitutes for one another. Suppose CBS, a station that we will assume all TVs get without cable subscription, premiered the series “The Good Wife”. Holding everything else constant, what was the impact on the demand for the DVD version of “Drop Dead Diva”?
- d) If the government announces during the month of December that a tax increase of 2 percent per coat is to take place in January, what would you expect to happen in December to the demand for coats? What are the effects on equilibrium price and quantity in December?
- e) If bread is an inferior good, then what are the effects on equilibrium price and quantity of bread as consumer incomes increase?
- f) Assume that the markets for sugar cane, rum, and whiskey are initially in equilibrium. Assume further that Hurricane Marilyn destroys much of the Jamaican sugar cane crop. Sugar cane is a principal ingredient in rum, but it is not an ingredient in whiskey. Assuming that rum and whiskey are substitutes for consumers, how will supply and demand of rum and whiskey shift as a result of this hurricane damage to the sugar cane crop? What are the effects on equilibrium price and quantity in each of the markets in this question?

### Question 3:

As beginner-level ninjas Naruto, Sasuke, and Sakura demand a traditional Japanese concealed weapon, the “shuriken.” Their demand curves for shuriken are given by  $Q^{\text{Naruto}} = 15 - P$

$$Q^{\text{Sasuke}} = 20 - 2P$$

$$Q^{\text{Sakura}} = 30 - 4P$$

- a) Draw in three separate, horizontally aligned graphs the three individual demand curves. Label each graph clearly and completely.
- b) In a new graph draw the market demand curve. Label any kink points that are in your graph (Note: you may have more than one kink point). Give the equation of the market demand curve for each linear segment of the demand curve expressed with  $P$  as the dependent variable (that is, write each segment of the demand curve in slope intercept form). Label your graph clearly and completely: in the graph identify the slope of each linear segment of the market demand curve, the coordinates of any kink point, and the y-axis and x-axis intercepts.

### Question 4:

Consider the market for widgets in which the initial demand curve is given by the equation  $Q_1^D = 1050 - 2P$  and the initial supply curve is given by the equation  $Q_1^S = P - 300$ .  $Q$  refers to the number of widgets and  $P$  refers to the price per widget in dollars.

- a) What is the initial equilibrium price and quantity in this market?
- b) Now suppose the demand curve shifts to the right and now is expressed by the equation  $Q_2^D = 1200 - 2P$ . Find the equilibrium price and quantity in the following cases:
- (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  $Q_2^S = P - 240$
  - (iii) The supply curve shifts to the right and is now expressed by the equation  $Q_2^S = P$
- c) What do you observe about the equilibrium quantity in each case compared to the initial equilibrium in (a)? What about the equilibrium price?
- d) Note: this question is a bit more challenging, but we are confident that you can do it! Given the increase in demand, how much would supply have to increase for the equilibrium price to return to the price found in (a)? (Hint: there are many ways to think about this question. One way is to think about the new supply curve as  $Q^S = P - 300 + c$ , at what value of  $c$  is the equilibrium price the same as in (a)? There are other ways to think about this question. For example, Professor Kelly thought about it using a graph to guide her work.) Assume that the new supply curve is parallel to the initial supply curve: that is, the two supply curves have the same slopes.

### Question 5

Consider the market for paper on the Battlestar Galactica. Demand is given by  $P = 10 - (1/5)Q$ . (For reference, paper is in thousands of sheets and price is in cubits, the currency used on the Battlestar Galactica). Supply is given by  $P = (1/5)Q$

- a) What is the equilibrium price of paper and the equilibrium quantity of paper?
- b) What is the producer and consumer surplus at the equilibrium found in (a)?
- c) Suppose Admiral Adama wants to conserve resources and mandates that people need a permit to produce paper. He sets a maximum output quota of 15 thousand pages. Is this quota binding? If so, what is the deadweight loss caused by the policy?

### Question 6

Consider the market for freshly hunted boars in Westeros. The rich people in Westeros collectively have demand for boars expressed by the equation  $Q = 500 - 10P$  where  $Q$  is the quantity of boars and  $P$  is the price per boar. (The price is in gold coins, though this is not relevant to the problem). The poor of Westeros also like boars, but have very little money, so their demand for boars is expressed by the equation  $Q = 500 - 50P$

- a) Draw the demand curves of the rich and poor in Westeros on separate graphs. As ever, label your intercepts, remembering that the “y” intercept represents the price at which zero quantity is demanded.
- b) Draw the market demand curve for boars in Westeros. Clearly label the kink point. Give the equation of the market demand curve for each linear segment of the demand curve. Express the demand curve with quantity as the dependent variable, i.e. with  $Q$  on the left hand side.
- c) Suppose the supply curve for boars is given by the equation  $Q = 20P - 400$ . What is the equilibrium price and quantity of boars given this supply curve and the market demand curve you found in (b)?
- d) Given the equilibrium you found in part (c), calculate the value of producer surplus and consumer surplus. Show your work for both calculations.
- e) How much of the consumer surplus goes to the poor when the boar market is in equilibrium?
- f) Westeros is ruled by King Joffrey, who is displeased by how much he has to pay for freshly hunted boar. He wants the price to be lower, so he passes a law mandating that the price must be no more than 15 gold coins. What is the new equilibrium quantity?
- g) What is the deadweight loss caused by Joffrey’s policy?