Economics 101

Summer 2013

Homework #2

Due Tuesday, June 4, 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, 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. Each of the following situations is independent of the other situations. For each draw a graph illustrating the situation and do the requested analysis.
   1. Consider the market for soft drinks that is initially in equilibrium with a market price of P1 and a market quantity of Q1. Suppose there is a successful campaign to educate the public about the caloric values in soft drinks and their contribution to obesity. At the same time suppose that the price of corn syrup, a key ingredient in many soft drinks, rises. Draw a graph illustrating the initial equilibrium and the new equilibrium after these described changes. Provide a verbal description of the outcome in this market due to these changes.
   2. Consider the market for mass transit that is initially in equilibrium with a market price of P1 and a market quantity of Q1. Suppose that after Hurricane Sandy swept through the Atlantic states that New York City officials mandated that all cars coming into New York City must have at least three occupants at all times, otherwise individuals wishing to travel in New York City would need to take mass transit during the weeks of clean-up from this storm. Analyze the impact of this edict from city officials on the market for mass transit. Provide a graph of your analysis and also a verbal description of how the equilibrium price and equilibrium quantity responded to this edict.
   3. Consider the market for gasoline that is initially in equilibrium with a market price of P1 and a market quantity of Q1. Suppose that there is a war in the Middle East that disrupts petroleum production (petroleum is a major input to the production of gasoline) while at the same time people’s incomes in the United States increases. Assume gasoline is a normal good. Draw a graph illustrating the initial equilibrium and the new equilibrium after these described changes. Provide a verbal description of the outcome in this market due to these changes.
   4. Consider the market for noodles that is initially in equilibrium with a market price of P1 and a market quantity of Q1. Noodles are an inferior good. Suppose that people’s incomes fall due to the financial crisis. Draw a graph illustrating the initial equilibrium and the new equilibrium after the described changes. Provide a verbal description of the outcome in this market due to these changes.
2. Problem 2 consists of two different scenarios requiring you to find the market demand curve.
   1. Joe, Mary, and Ellen all have the same individual demand curve for peanuts. This demand curve is P = 10 - Q. They are the only consumers of peanuts in the market.
      1. Draw four graphs horizontally lined up with one another. In the first graph draw Joe’s demand curve, in the second graph draw Mary’s demand curve, in the third graph draw Ellen’s demand curve, and in the fourth graph draw the market demand curve. Be sure to identify any intercept values as well as any “kink” values in the four graphs.
      2. From the graphs in (i) write an equation in slope intercept form for the market demand curve.
      3. Show algebraically how you could find the market demand curve.
   2. Paul, Chris and Jon have different demand curves for popcorn. Paul’s demand curve is P = 10 – Q; Chris’ demand curve is P = 8 – Q; and Jon’s demand curve is P = 6 – Q. They are the only consumers of popcorn in the market.
      1. Draw four graphs horizontally lined up with one another. In the first graph draw Paul’s demand curve, in the second graph draw Chris’ demand curve, in the third graph draw Jon’s demand curve, and in the fourth graph draw the market demand curve. Be sure to identify any intercept values as well as any “kink” values in the four graphs.
      2. From the graphs in (i) write an equation in slope intercept form for the market demand curve.
      3. Show algebraically how you could find the market demand curve.
3. Problem 3 consists of two different scenarios requiring you to find the market supply curve.
   1. The market supply curve is given as P = 100 + 2Q. Several new firms enter this market and now you are told that at each price there are now 50 more units of the good available. What is the equation for the new market supply curve?
   2. Firm A’s supply curve is P = 2Q and Firm B’s supply curve is P = 10 + 2Q. There are only these two firms in the market.
      1. Draw three graphs horizontally lined up with one another. In the first graph draw Firm A’s supply curve, in the second graph draw Firm B’s supply curve, and in the third graph draw the market supply curve. Be sure to identify any intercept values as well as any “kink” values in the three graphs.
      2. From the graphs in (i) write an equation in slope intercept form for the market supply curve.
      3. Show algebraically how you could find the market supply curve.
4. Consider the market for smart phones. Initially the market demand for these phones is given as P = 500 – .005Q and the market supply for these phones is given as P = .005Q. For all questions in this problem make sure you show your work and not just your final answer.
   1. Given this information, what is the equilibrium price and equilibrium quantity of smart phones in this market?
   2. What is the value of consumer expenditure on smart phones given this initial information?
   3. What is the value of consumer surplus in the market for smart phones?
   4. What is the value of producer surplus in the market for smart phones?

Now, suppose that tastes and preferences for smart phones changes so that at every price an additional 20,000 phones are demanded. There are no changes in the market supply curve.

* 1. Given this information, what is the new equilibrium price and equilibrium quantity of smart phones in this market?
  2. Given this new information, what is the value of consumer expenditure on smart phones in this market?
  3. What is the new value of consumer surplus in the market for smart phones given this change in tastes and preferences?
  4. What is the new value of producer surplus in the market for smart phones given this change in tastes and preferences?

1. Consider the market for soybeans in Smallia. The market demand is given as P = 1000 – 2Q while the market supply is given as P = 200 + 6Q. Assume that the market for soybeans in Smallia is closed to international trade. For each of the following questions please show your work and not just your final answer.
   1. Given the above information, what is the equilibrium price and equilibrium quantity in this market?
   2. What is the value of consumer surplus in this market given the above information?
   3. What is the value of producer surplus in this market given the above information?

Now suppose that the government of Smallia implements a price floor in the market for soybeans and this price floor is set at $500 per unit of soybeans.

* 1. Describe the impact of this price floor on the market for soybeans and in your answer explain why this is the impact.

The government decides to institute a price ceiling in this market for soybeans instead of the price floor. The government sets this price ceiling at $400.

* 1. Describe verbally (no numbers needed here) the impact of this price ceiling on the market for soybeans and in your answer explain why this is the impact.
  2. Now determine how many units of soybeans will actually be traded in this market given this price ceiling.
  3. What is the value of consumer surplus given this price ceiling?
  4. What is the value of producer surplus given this price ceiling?

1. Suppose the market for corn in Utopia has market demand of P = 1000 – 2Q and market supply of P = 200 + 6Q. Assume the market for corn in Utopia is a closed market. Use this information to answer this set of questions. Make sure you show all of your work and do not just provide your final answer.
   1. Given the above information, what is the equilibrium price and equilibrium quantity in this market? What is total farmer revenue in this market?

Suppose the government implements a price floor of $900 per unit of corn in this market where the government agrees to maintain this price floor by purchasing any excess supply at the price floor price.

* 1. Given this price floor, how many units of corn will be purchased by consumers? How many units of corn will be supplied by farmers in Utopia? How many units of corn will be purchased by the government?
  2. Given this price floor what will be the direct cost to the government of implementing this price floor?

Suppose that the cost of storing each unit of corn is $100 per unit for the year.

* 1. Given this information and the described price floor what will be the total cost to the government of implementing this price floor?
  2. Given the price floor what is total farmer revenue from selling corn in this market?

Now, suppose the government replaces the price floor program with a subsidy or price guarantee program. Furthermore, suppose that the price guarantee is $900 per unit of corn.

* 1. Given this information and the price guarantee program, how many units of corn will consumers purchase? What price will consumers pay for this corn?
  2. Given this information and the price guarantee program, how many units of corn will be purchased by the government?
  3. Given this information and the price guarantee program, what will be the cost to the government of this program?
  4. Comparing the two different policies, the price floor or the price guarantee, which of these two programs will corn farmers in Utopia prefer and why will they prefer it?
  5. Comparing the two different policies, the price floor or the price guarantee, which of these two programs will the government of Utopia prefer and why will they prefer it?

1. Romia is a small, closed economy that produces pianos. Currently the domestic demand for pianos in Romia is given by the equation P = 2000 – 2Q while the domestic supply for pianos in Romia is given by the equation P = 200 + 4Q.
   1. Given the above information calculate the equilibrium price and equilibrium quantity in the market for pianos in Romia. Then, calculate the value of consumer surplus (CS) and producer surplus (PS).

Suppose that Romia is considering opening its piano market to trade and that the world price of pianos is $1500.

* 1. Given this information, analyze the effect on Romia of opening its piano market to trade. In your answer be sure to comment on how this decision will impact imports or exports of pianos in Romia while also commenting on how many pianos domestic consumers will purchase if the market opens to trade and how many pianos domestic producers will produce if the market opens to trade. In addition, calculate the values of CS with trade and PS with trade.
  2. Is opening this market to trade beneficial for Romia? Fully explain your answer to this question.

Suppose that Romia is considering opening its piano market to trade and that the world price of pianos is $800.

* 1. Given this information, analyze the effect on Romia of opening its piano market to trade. In your answer be sure to comment on how this decision will impact imports or exports of pianos in Romia while also commenting on how many pianos domestic consumers will purchase if the market opens to trade and how many pianos domestic producers will produce if the market opens to trade. In addition, calculate the values of CS with trade and PS with trade.
  2. Is opening this market to trade beneficial for Romia? Fully explain your answer to this question.

Now, suppose the market for pianos in Romia is opened to trade and the world price is $800 per piano. Use this information and the equations for the domestic demand and domestic supply curves to answer the net set of questions.

* 1. Given this information, suppose you are told that the government has enacted a tariff that resulted in the government receiving $60,000 in tariff revenue. By how much did the tariff raise the price of pianos given this information? Hint: if you do this correctly you should find that there are two different tariffs that Romia could apply in this market to get this level of tariff revenue.
  2. Given your two answers in (f) go back and calculate the value of imports under each tariff price and then prove numerically that both tariffs result in tariff revenue of $60,000.

1. Consider the small, closed economy of Exurbia. Exurbia produces mittens and the domestic market demand and domestic market supply curves for mittens in Exurbia are as follows where Q is pairs of mittens and P is the price per pair of mittens:

Domestic Demand: Q = 20,000 – 2000P

Domestic Supply: Q = 2000P – 4000

* 1. For the closed economy of Exurbia calculate the equilibrium price and equilibrium quantity of mittens, as well as the value of consumer surplus (CS) and producer surplus (PS). Then draw and label a graph depicting the closed market for mittens in Exurbia.
  2. Now, suppose that the economy of Exurbia opens its mittens market to trade. Furthermore suppose that the world price of mittens is $3 per pair of mittens. Find the level of imports when Exurbia opens this market to trade. In addition find the quantity demanded domestically, the quantity supplied domestically, the value of CS with trade, and the value of PS with trade. Then draw and label a graph depicting the open market for mittens in Exurbia. Is opening this market to trade beneficial for Exurbia? Explain your answer.
  3. Now, after opening this market to trade, the government of Exurbia decides to implement a quota in this market. They decide to impose a quota of 2000 pairs of mittens in this market. Find the level of imports when Exurbia opens this market to trade and imposes this quota. In addition find the quantity demanded domestically, the quantity supplied domestically, the value of CS with the quota, the value of PS with the quota, the license holder revenue due to the quota, and the deadweight loss associated with the quota. Then draw and label a graph depicting this quota in the market for mittens in Exurbia.

1. In Boomtown government officials are considering implementing an excise tax on the producers of tennis balls. They have called you in to analyze the impact of this proposed tax. Currently (before the excise tax) market demand and market supply of tennis balls is given in Boomtown are given by the following equations where P is the price per case of tennis balls and Q is the quantity of cases of tennis balls:

Market Demand: P = 90 – (3/2)Q

Market Supply: P = 20 + (1/4)Q

The government officials propose implementing an excise tax of $7 per case of tennis balls on producers. Use this information to answer the following set of questions. Be sure to show how you got your answers.

* 1. Intuitively, implementation of this tax will cause which curve in our demand and supply graph to shift? Explain the direction of this shift and how this shift will impact equilibrium price and equilibrium quantity in this market once the excise tax is imposed.
  2. With the imposition of this excise tax, how much tax revenue will be collected by the government in Boomtown?
  3. With the imposition of this excise tax, what will be the change in consumer surplus relative to the initial level of consumer surplus?
  4. With the imposition of this excise tax, what will be the change in producer surplus relative to the initial level of producer surplus?
  5. What is the deadweight loss due to this excise tax? Verify that the sum of (CS with the tax + PS with the tax + Tax revenue + Deadweight Loss) is equal to the value of total surplus prior to the imposition of the excise tax. (If it is not, then you have made a math error and you need to redo the problem to correct this error.)
  6. Calculate the consumer tax incidence (CTI) and the producer tax incidence of this excise tax. Who bears the greater economic burden of this excise tax? Explain your answer.
  7. Suppose the government would like to decrease consumption of tennis balls to 28 cases. How big an excise tax would the government need to implement to reach this goal?