

Economics 101
Spring 2015
Answers to Homework #2
Due Thursday, February 19, 2015

Directions: The homework will be collected in a box **before** the lecture. Please place your name 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!

1. Yoshi, Tom and Gary help out Professor Kelly in handling the workload of the Econ 101. They take care of the homework, and they split their time between writing the problems and correcting the homework. The following table reports the amount of problems they can write and homeworks they can correct in 1 day if they **ONLY** write problems or **ONLY** correct homeworks:

	# of Problems Written	# of Homeworks Corrected
Tom	2	26
Yoshi	3	27
Gary	6	15

a) What is the opportunity cost to write one problem for each of these TAs? What is the opportunity cost of correcting one homework for each of these TAs?

b) Who has an absolute advantage in writing problems? Who has an absolute advantage in correcting homeworks? Who has the comparative advantage in writing problems? Who has the comparative advantage in correcting homeworks? Explain your answers.

c) In three separate graphs, draw the PPF for each TA, measuring problems written on the vertical axis and homeworks corrected on the horizontal axis. Make sure you label your graphs so that we know which PPF corresponds to which TA. After drawing the PPFs, write an equation for each TA's PPF.

d) What are the terms of trade for which Tom and Yoshi would trade? That is, what is the range of acceptable prices that Tom and Yoshi will agree to for these two goods? To simply this let's consider the acceptable range for Tom and Yoshi for one written problem.

e) What are the terms of trade for which Gary and Yoshi would trade? That is, what is the range of acceptable prices that Gary and Yoshi will agree to for these two goods? To simply this let's consider the acceptable range for Gary and Yoshi for one written problem.

f) What are the terms of trade for which Gary and Tom would trade? That is, what is the range of acceptable prices that Gary and Tom will agree to for these two goods? To simply this let's consider the acceptable range for Gary and Tom for one written problem.

g) Draw the Joint PPF measuring problems written on the Y-axis and the homeworks corrected on the X-axis.

h) Today Professor Kelly asks them to write 8 new problems. If they write these 8 problems, how many homeworks will they be able to correct today? Who will write the problems and who will grade the homework? Explain your answer fully.

2. Use the framework of the supply and demand model to answer these questions. Assume that each market described is initially in equilibrium and then evaluate what happens to the market given the provided scenario.

a) A new technology increases the mileage per gallon of any car currently being operated. Given this new technology and holding everything else constant, what happens to the demand curve and supply curve for gasoline? What happens to the equilibrium price and quantity of gasoline? Explain your answer fully.

b) Apple is preparing to launch the Iphone6S next March, earlier than expected. Given this information and holding everything else constant, what will happen to the demand curve and supply curve for Iphone6 (a different phone older than the Iphone6s). What will happen to the equilibrium price and quantity in the Iphone6 market?

c) The city of Madison establishes a new higher, minimum wage for coffee shop worker. Assume that this is an effective minimum wage in the Madison labor market. Given this change in the minimum wage and holding everything else constant, what happens to the demand curve and supply curve for coffee from coffee shops in Madison? What happens to the equilibrium price and quantity of coffee at Madison coffee shops?

d) Suppose the price of diesel fuel decreases because of a new refinery process being used to produce diesel fuel. Given this change and holding everything else constant, what is the effect on the market for diesel cars? What happens to the equilibrium price and quantity of diesel cars?

e) Suppose the price of diesel fuel decreases because of a new refinery process being used to produce diesel fuel. Given this change and holding everything else constant, what is the effect on the market for gasoline-powered cars? What happens to the equilibrium price and quantity of gasoline-powered cars?

f) Five Guys is the best burger joint in Madison. The price of their main raw material, meat, decreases by 45%. At the same time a strong competitor from California, In&Out, decides to open a burger joint on State Street. What is the effect of these two changes on the demand for Five Guys burgers? How do these changes impact the equilibrium price and quantity of Five Guys burgers?

3. Joe decides to open a quarterback's academy in San Francisco. The supply equation for quarterback lessons is given by the following equation where S_{Joe} is the quantity of hour-long lessons supplied and P is the price per lesson:

$$S_{\text{Joe}} = 7P - 56$$

The demand for quarterback lessons in San Francisco is represented by the following equation where D_{Joe} is the quantity of hour-long lessons demanded and P is the price per lesson:

$$D_{\text{QB}} = 19 - 1/2P$$

- a) Given this information, calculate the equilibrium price and quantity of quarterback lessons in this market. Show your work.
- b) Draw a graph of the market for quarterback lessons in San Francisco. Make sure you label your graph carefully and completely.
- c) What is the value of Consumer Surplus (CS) in this market? What is the value of Producer Surplus (PS) in this market? What is the value of Total Surplus (TS) in this market? Highlight the Consumer and Producer Surplus on the graph you drew for (b).

Suppose Joe is a really good coach and more students want to participate to his academy and this increase in interest results in a shift in the demand curve for his quarterback lessons. The new demand curve is given by the following equation:

$$D_{\text{QB}} = 34 - 1/2P$$

- d) Given this new demand curve and holding everything else constant, find the new equilibrium quantity and price in the market for quarterback lessons in San Francisco. Show your work.
- e) Draw a new graph that illustrates the initial demand curve, the new demand curve and the supply curve. Mark the initial equilibrium price and quantity and the new equilibrium price and quantity.
- f) Given the new demand curve, calculate the value of Consumer Surplus (CS') and Producer Surplus (PS'). What is the value of Total Surplus (TS') now? Illustrate these areas in your graph that you drew in (f).

Suppose that Steve notices that quarterback lessons are a good business in San Francisco and he decides to move from Tampa to San Francisco. His supply curve for one hour of quarterback lessons is:

$$S_{\text{Steve}} = 3P - 15$$

- g) (Assume that we are still using the new demand curve for the remainder of this problem.) Find the equation of the new market supply curve for quarterback lessons in San Francisco.
- h) Given Steve's entry into the quarterback lesson market in San Francisco and holding everything else constant, what are the new equilibrium price and equilibrium quantity in this market? Show your work.

f) Given Steve's entry into the quarterback lesson market in San Francisco and holding everything else constant, what are the new Consumer and Producer Surplus, CS" and PS"? Show these areas in a well-labeled graph. (This is a pretty tough question but we believe you can do it!!!!) Calculate the value of total surplus, TS", as well.

4. Uber is a famous app that allows an individual to book a taxi ride through their smart phone. Unlike cabs companies, Uber charges different prices according to the level of demand at the time the individual is requesting a ride: higher demand, the individual pays a higher price; lower demand, the individual pays a lower price. Suppose the demand and supply for Uber rides in Madison are given by the following equations where Q is the quantity of rides and P is the price per ride:

Supply of Uber rides in Madison: $Q = (9/8)P - 9$

Demand for Uber riders in Madison: $Q = 36 - (3/4)P$

- a) Draw a well labeled graph illustrating the demand and supply curves for Uber rides in Madison.
- b) Calculate the equilibrium price and quantity in the market for Uber rides in Madison. Show your work.
- c) Calculate the value of Consumer Surplus, CS, and Producer Surplus, PS, in this market. Illustrate these areas in your graph. Calculate the value of Total Surplus, TS.

Suppose a bad storm hits Madison and this storm causes the demand for Uber rides to increase dramatically. The new demand curve for Uber rides in Madison is given by the equation:

$$Q = 81 - (3/4)P$$

- e) Given this new demand curve and holding everything else constant, what are the new equilibrium price and quantity in this market? Show your work.
- f) Given this new demand curve and holding everything else constant, what are the new Consumer and Producer Surplus, CS' and PS'? Show these areas in a well-labeled graph. What is the value of the new Total Surplus, TS'?

Suppose that the cab companies who compete with Uber argue that the pricing policy of Uber is harming consumers because this pricing policy results in consumers paying a higher price when there is greater demand. The municipal government in Madison decides to implement a price ceiling of \$36 per ride on Uber due to the cab companies' argument.

- g) Calculate the effect of this new price ceiling on the market for Uber rides in Madison. First, do this analysis based on the original pre-storm demand curve. Then redo your analysis for the effect of this price ceiling on the post-storm demand curve. What prices will consumers pay under the two scenarios? What quantity of Uber rides will consumers take under the two scenarios? Is there a difference in the market outcome under the two scenarios? If so, describe that difference.
- h) Analyze the impact of this price ceiling on consumer surplus and producer surplus. Do this analysis for the low demand scenario and then repeat it for the high demand scenario. With both

scenarios decide if there is a deadweight loss and if there is, calculate the value of this deadweight loss.

i) Is the cab companies' argument that Uber's pricing method harms consumers and therefore there is need for government intervention in this market correct? Take a position on this and then make your argument. We want to see good strong writing here: so take your time to work on an answer that is expressive and that others can follow.

5. Ethanol is used as an additive in the production of car fuel and it is produced from corn. After a drop in the price of crude oil fuel, the demand for ethanol from fuel producers decreases. Consequently the market price of a unit of ethanol decreases from its original price of \$22 per unit. The demand and supply curve for ethanol after this drop in the price of crude oil are represented by the following equations where Q is the quantity of ethanol units and P is the price per ethanol unit:

$$\text{Supply: } Q = 2P - 20$$

$$\text{Demand: } Q = 40 - P$$

a) In a graph draw the demand and supply curves for ethanol. Calculate the equilibrium price and quantity of ethanol given the above equations. Mark this equilibrium in your graph and make sure the graph is completely and clearly labeled.

b) Given the above information and holding everything else constant, calculate the value of Consumer and Producer Surplus, CS and PS. What is the value of Total Surplus, TS? Show all your work.

The US government decides to implement a program to help the farmers who have been affected by the decreases in the price of ethanol. There are two policies being considered as methods to help these farmers. The first program involves considering the impact of introducing a \$6 per unit subsidy on the production of ethanol. The second program involves considering the impact of setting a price floor of \$22 per unit of ethanol (remember this was the original price before the decrease in the price of crude oil).

d) Let's start with the analysis of the subsidy program. Given a subsidy to producers of ethanol of \$6 per unit of ethanol, what will be the price of ethanol for consumers, what will be the price of ethanol that producers receive including the subsidy, and what will be the quantity of ethanol produced with this program? Show how you calculated these answers. Then, draw a graph of the ethanol market that represents this subsidy program.

e) Now, for the analysis of the price floor. Given a price floor of \$22 implemented by the government in the market for ethanol, what will be the price of ethanol to consumers, what will be the quantity of ethanol consumed by consumers, and what will be the quantity of ethanol produced with this program? Show how you calculated these answers. Then, draw a graph of this market that represents this price floor.

f) Compare the two policies in terms of their cost to the government, the values of Consumer Surplus and Producer Surplus, and the size of the deadweight loss. Show how you found all of these values. Assume that the government is NOT buying the surplus with the price floor program. After you provide the work showing your analysis, put your answers into the following table:

Results when there is no intervention in the Ethanol Market		Results when there is a \$6 per unit subsidy in the Ethanol Market		Results when there is a price floor of \$22 in the Ethanol Market	
CS		CS		CS	
PS		PS		PS	
Cost to Govt.		Cost to Govt.		Cost to Govt.	
DWL		DWL		DWL	

g) We have three options:

Option I: no intervention in the ethanol market by the government

Option II: government intervenes in this market and implements a subsidy of \$6 per unit of ethanol

Option III: government intervenes in this market with a price floor of \$22 per unit of ethanol (government does NOT buy the surplus)

Given these three options and your analysis in (f), which option will consumers of ethanol prefer?

Which option will producers of ethanol prefer?