

***** ANSWER KEY *****

Economics 101 – Prof. Kelly

Fall 2009

Homework #2

Due Wednesday, September 30

Directions:

Write your name, TA name, and section number at the top of each page. Please use a staple if you intend to turn in multiple sheets. Place your homework in the appropriate TA box before class on Wednesday, September 30. Late assignments will not be accepted!

1. Badgers' practice schedule

The Badgers football coaching staff is planning the weekly practice schedule for the 2009 season. NCAA regulations allow up to 20 hours of practice per week. The Badgers will split that time between non-football workouts in the weight room, and practicing football plays on the field. Practicing plays is important for winning games this year, while lifting is sure to pay dividends in later seasons, as players get bigger and stronger over time. The team has to do all activities together, for team unity's sake.

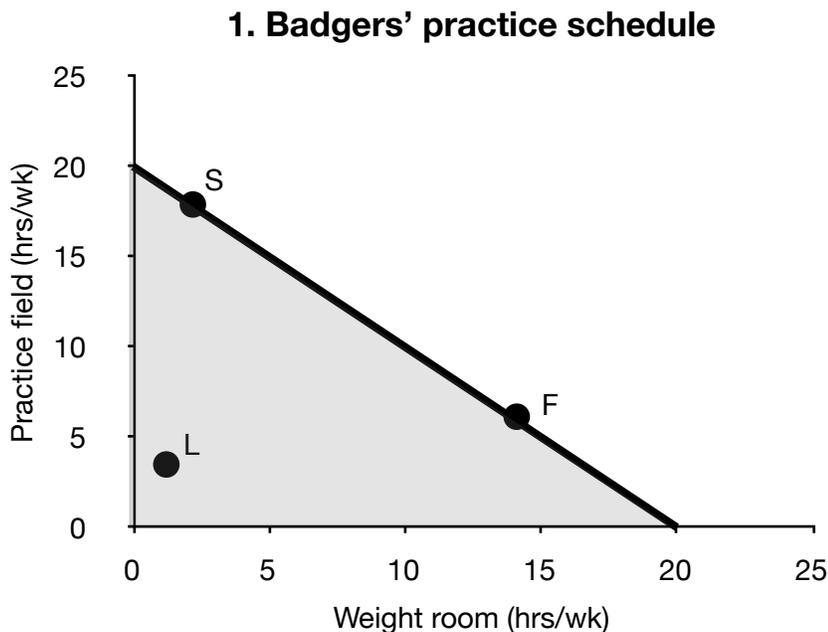
Given the above information, please answer the following questions:

- a) At the Badgers' production possibility frontier, what resources will they use, and how much?
- b) What are the possible allocations of those resources?
- c) Graph the Badgers' PPF. On your graph, be sure to label both axes and identify the relevant time period.
- d) Discuss how the Badgers allocation of resources this year will affect their record in 2009. Discuss how the Badgers allocation of resources this year (2009) will affect their record in 2010.
- e) Suppose you are a freshman player on the Badger football team. Which point would you choose on the Badgers 2009 production possibility frontier? Label this point F on your graph. Explain why you selected this allocation of resources.
- f) Suppose that your friend Bubba is a graduating senior on the Badger football team. Which point would Bubba choose on the Badgers 2009 production possibility frontier? Label this point S on your graph. Explain why Bubba would select this point.

g) Suppose Lump is a lazy player on the Badger football team who plans to quit the team after the 2009 season. Identify a point that could represent Lump's desired production point on your graph. Label this point L. Explain why this point might represent Lump's preferred point of production for the team.

Answer:

The Badgers have the resource of time at their disposal, of which they will spend a full 20 hours per week in order to produce at the frontier. They can divide this time between practicing plays and lifting weights, both of which will yield positive results for the team's record. The production possibility frontier drawn for one week of practice will be a linear line that includes the point that represents 20 hours of play practice and 0 hours of weight lifting, as well as the point that represents 0 hours of play practice and 20 hours of weight-lifting. The PPF will also include any combination of play practice and weight-lifting that lie on the straight line connecting these two endpoints. The figure below illustrates the PPF for the Badgers for one week during football season.



From the description, you know that allocating more time to workouts will be more beneficial to the 2010 record, while an allocation spending more time on plays will benefit 2009's record. F should allocate more time to workouts since this will improve the future performance of the team (remember, this is the freshman perspective). S should allocate more time to plays since Bubba's

primary concern is trying to ensure that his final season is a high-performing season (especially if he wants to be drafted as a professional player). L should be somewhere inside the budget line, perhaps at the origin since Lump does not want to work hard and is not invested in either this season or the future Badger seasons.

2. Cleaning the house

You live in a house with two roommates, Nick and Cam. Nick and Cam are messy people, and sometimes you are too. The problem is, Nick and Cam despise one another. You are on good terms with each of them, but they realized in August that they're just not a match. Here's the situation: you are about to walk into class when your parents call. They're coming to visit from Waukesha! They'll be at your (very messy) house in 5 minutes. Your room is clean, but Nick's and Cam's are hideous! The whole place has to be clean or the folks won't take you, Nick, and Cam out to The Great Dane for brats. You know that Nick and Cam are both at home, so you pull out your cell phone.

From previous emergency cleanups, you know that Nick can be made to pick up 3 dirty shirts per minute. It also takes him 1 minute to dispose of 2 fast food bags (and any contents that spilled). Cam is slower. Even if forced, he'll only pick up 2 dirty shirts per minute, and cleaning up a bag of fast food garbage takes him a whole minute. To get the place clean in time, you have to maximize the use of Nick's and Cam's time. Neither roommate wants to help the other, and neither one can possibly spend more than 5 minutes on the job. When instructing them to clean up, you have to be persuasive, because they both abhor picking up food, and they really dislike going into each other's rooms. (Remember though, you can't really split up the task of picking up one shirt or the task of picking up one bag.)

Given the above information, please answer the following questions:

a) Who should specialize in each task? Explain your answer thoroughly.

Answer:

Opportunity cost		
	Nick	Cam
Shirt	2/3 bag	1/2 bag
Bag	3/2 shirt	2 shirts

Cam has the comparative advantage in picking up shirts since he has the lower opportunity cost per shirt. Nick has the comparative advantage in picking up bags since he has the lower opportunity cost per bag.

- b) Nick and Cam are both smart college students who know when they're being duped. Name a rate of exchange between the two of them that will be fair for both, and explain very clearly why you chose it. (Hint: choose an integer value for the price of one bag, measured in shirts).

Answer:

Nick is specializing in fast food bags and therefore will sell the bag-clearing task to Cam. Cam will pay Nick in the form of completed shirt pickups. Nick will demand a payment of at least his opportunity cost for a bag, which is $\frac{3}{2}$ shirt. Cam will be willing to pay, at most, his opportunity cost for a bag, which is 2 shirts. So the trading price of 1 bag is somewhere between $\frac{3}{2}$ and 2 shirts. Using the hint, your only choice is a price of 2 shirts per bag. The other extreme would be 3 shirts per 2 bags. The middle of the range yields $1\frac{3}{4}$ shirt for one bag. These are discrete tasks, so a trade of $1\frac{3}{4}$ shirts for a bag is impossible. A price of $1\frac{3}{4}$ shirts/bag means each trade must include at least 4 bags for 7 shirts (do the math to verify this).

- c) Suppose there are 11 shirts and 4 bags in Nick's room. There are also 2 shirts and 4 bags in Cam's room. Can they clean it all, each working for only 5 minutes? How will they fairly trade?

Answer:

If Cam picks up 2 shirts in his room and 8 shirts in Nick's room, he will have used the entire 5 minutes. Nick will, in trade for 8 picked-up shirts, pick up Cam's 4 bags, then have exactly enough time to pick up the remaining 3 shirts and 4 bags in his room.

- d) Could Nick and Cam have cleaned up the mess described in part (c) if each of them had stuck to their own room for their 5 minutes of work? Explain your answer thoroughly.

Answer:

Had they worked alone, Nick's room would still be dirty, ruining everyone's dinner plans. Cam is able to pick up his 4 bags in 4 minutes, then spend a final minute

picking up his 2 shirts. Cam uses all of his 5:00, but he gets his room clean. Nick would need 2 minutes for his 4 bags, and 3:40 to pick up his shirts. That amounts to 5:40, which is more time than he has. They can only succeed if they specialize and trade!

3. Krugman article

According to Paul Krugman, what are some of the characteristics of a recession of the macroeconomy? What are two different strategies mentioned for dealing with recessions? Krugman tells us that there are (sometimes heated) disagreements among serious economic thinkers. What does this say about economics as a discipline?

Answer:

(Clarification: this article can be found at <http://www.nytimes.com/2009/09/06/magazine/06Economic-t.html>.) This is an open-ended question with many possible answers. Some characteristics of recessions Krugman mentions are inadequate demand, lack of jobs. And some possible policy strategies are: to do nothing and hope the economy recovers on its own; increase government spending to bolster demand; the Federal Reserve using purchase of Treasury bills to drive interest rates down.

4. Secondary Badger tickets

Suppose the secondary student ticket market for Badger football tickets is competitive. Ticketholders are the suppliers, and choose to either attend the game themselves or supply the ticket in the market. Non-ticketholders demand tickets. The secondary student ticket market refers to the re-selling of football tickets from the initial owner of the ticket to a new owner.

Given the above information, please answer the following questions:

- a) Give an example of an event that would shift the demand curve for secondary tickets to the Badger football game leftward. Explain your reasoning.

Answer:

Such a shift would result from any event not directly related to price, that would cause fewer people to want to attend the game. Bad weather forecasted for all Saturdays, starting QB hurt, stadium deemed unstable, flu outbreak, etc. Each of these events would decrease the quantity demanded at each price, which is what

is meant by shifting the demand curve leftward (on the usual 1st quadrant graph with quantity on the horizontal axis, price on the vertical axis).

- b) Give an example of an event that would shift the supply curve for secondary tickets to the Badger football game rightward. Explain your reasoning.

Answer:

All of the same events from (a) would cause ticketholders to be less inclined to attend the game, and therefore more willing to sell their ticket. This would increase the quantity supplied at each price, which is what is meant by shifting the supply curve rightward (on the usual 1st quadrant graph with quantity on the horizontal axis, price on the vertical axis).

5. Secondary Badger tickets

Suppose we are still analyzing the competitive secondary student ticket market for Badger football tickets. Assume there are 10,000 tickets in all. This is the quantity demanded by non-ticketholders at price \$0. Suppliers have found that if they're selling for anything less than \$120, some non-ticketholders will demand tickets. Of course, at a price of \$0, no one wants to sell their tickets. The current equilibrium price per ticket in this market is \$72. Assume that both the market demand curve and the market supply curve are linear.

Given the above information, please answer the following questions:

- a) What is the equation expressing dollar price per ticket in terms of quantity demanded (measured in tickets)? Use P to represent the ticket price, and Q_D to represent the quantity of tickets demanded. Express your equation in slope-intercept form.

Answer:

Since \$120 is the upper bound for price that buyers will pay, we know that 0 tickets will be demanded at that price. Using points (10,000 , 0), which is given, and (0 , 120) on the demand curve, we can calculate:

$$P = -.012Q_D + 120$$

- b) What is the equilibrium quantity in the secondary student ticket market for Badger football tickets?

Answer:

You may plug the equilibrium price, \$72, into either equation. We have the demand equation only, so:

$$72 = -.012Q_D + 120$$

$$-48 = -.012Q_D$$

$$Q^* = 4000 \text{ tickets}$$

- c) What is the equation expressing dollar price per ticket in terms of quantity supplied (measured in tickets)? Use P to represent the ticket price, and Q_S to represent the quantity of tickets supplied. Express your equation in slope-intercept form.

Answer:

We are given one point on the supply curve: $(0, 0)$, since suppliers will supply no tickets at price \$0. We know that equilibrium is where the two lines intersect, so $(4000, 72)$ from (b) is also a point on the supply curve. Using points $(0, 0)$ and $(4000, 72)$ on the supply curve, we can calculate:

$$P = .018Q_S$$

- d) What if a consumer protection law is enacted such that no one can sell a ticket for more than \$63 (3 times its face value)? Assume that all tickets in the secondary market are sold on eBay, making this consumer protection law completely enforceable. Describe the new equilibrium quantity and price for tickets in this market once this law is enacted. Illustrate your answer with a well-labeled graph. Is there a shortage or a surplus of tickets in this situation? Provide a numerical measure of the shortage or surplus.

Answer:

This legislation does not change the underlying price/quantity preferences of suppliers or buyers, so the supply curve and demand curve remain the same. The market tends toward the original equilibrium, so the price will remain as close to \$72 as possible--in this case right at the ceiling of \$63 per ticket. However, at this new price, the quantity demanded and quantity supplied are different from one another. This means there will be a surplus (or shortage) of supply. The equations from parts (a) and (b) allow us to find the quantities demanded and supplied, respectively, at this price.

$$63 = 120 - .012Q_D$$

$$-48 = -.012Q_D$$

$$Q_D = 4750 \text{ tickets}$$

$$63 = .018Q_S$$

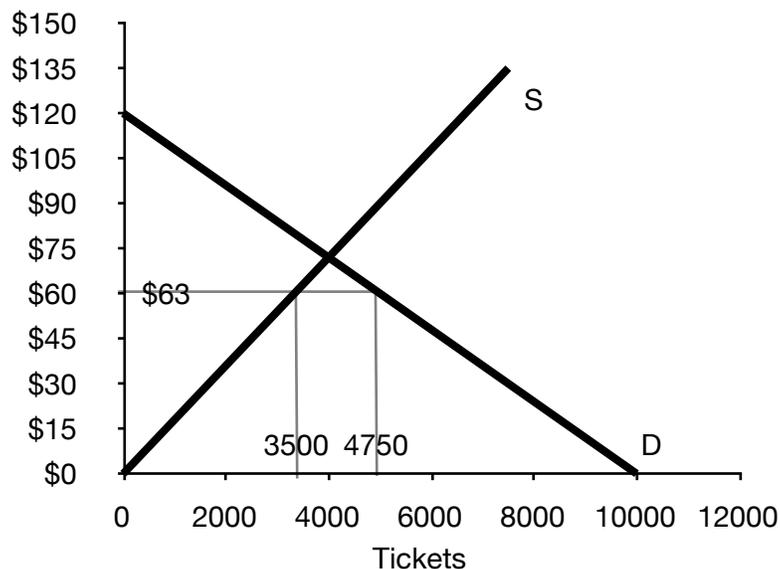
$$Q_S = 3500 \text{ tickets}$$

$Q_S - Q_D =$ surplus (or shortage if negative)

$$3500 - 4750 = -1250 \text{ tickets}$$

There will be a shortage of 1,250 tickets if the price is set at \$63.

5. Secondary Badger tickets



6. Wooden toothpicks

Assume the market for wooden toothpicks is competitive. Earlier this week, in a nationally published study, 4 out of 5 dentists enthusiastically endorsed the benefits of toothpicking for dental health. At the same time, the government relaxed restrictions on logging, making wood (a raw material used in the production of toothpicks) cheaper.

a) What will happen to the equilibrium price of wooden toothpicks?

Answer:

The advocacy of the dentists will cause the demand curve for toothpicks to shift to the right, while the reduction in the price of wood causes the supply curve to shift

to the right as well. Since we do not know the magnitude of these two shifts, we cannot say with certainty what happens to the equilibrium price: it may increase, decrease, or remain at its initial level.

b) What will happen to the equilibrium quantity of wooden toothpicks?

Answer:

Given that both the demand and supply curves shift to the right, we know with certainty that the equilibrium quantity of toothpicks increases.

