

Problem Set # 1
Answers Due 2 days after Session 2

1) Not a problem but something to fool around with. You may recall the flap several years ago in which John Poindexter (of Iran-Contra fame) was fired from the Defense Department for attempting to set up an “opinion market” to summarize individuals’ assessments of the likelihood of particular international events – e.g. a coup in Saudi Arabia. This idea – that markets aggregates knowledge - is also the subject of *New Yorker* columnist James Surowiecki’s recent book, *The Wisdom of Crowds*. One well known example of “opinion markets” are the electronic markets sponsored by the University of Iowa Business School. They currently run markets to forecast the upcoming elections as well as economic events. Follow the link below to and work your way to the winner-take-all market for president. It is worth following this market over the semester to see how well it tracks events.

<http://www.biz.uiowa.edu/iem/markets/>

2) This first problem is designed to get you think about the meaning of economic efficiency.

Teton village is a commercial development at the foot of the Grand Teton Mountains, about 20 minutes west of Jackson, Wyoming. The development is built around tourism – summer vacationers and particularly winter skiers and it contains a mixture of housing, hotels and some shopping. In the summer, it is easy to take quick trips from Teton Village into Jackson. In the winter, the snow often makes Teton Village more isolated. The developers of Teton Village are now considering various expansion plans which would mean some mix of new housing, hotels and shopping.

This past summer, I had an interesting conversation with a different developer who owns a big chunk of downtown Jackson. He essentially said, “Think about the demographics – age, income - of people who can afford to fly out to ski in Teton Village. Once you recognize who they are, you realize that the recent development of high speed ski-lifts really changes the efficient combination of housing versus shopping in Teton Village. If the developers are not aware of that, they will end up with very inefficient land use.”

In this case, what does the developer likely mean by an “very inefficient land use”? Take this meaning and explain why high speed ski lifts might have something to do with efficient land use.

3) What follows is a set of supply/demand questions that can be answered with one diagram apiece. These problems (and many of the problems we have) involve translating a story – i.e. words – into an appropriate graph. The fact that something happens in the story means that either the supply curve or the demand curve or both curves move. It is important that you learn to distinguish which curve is doing the moving and we will do that through working through a number of straightforward examples.

In addition, even though we are just beginning, it is not too early to start paying attention to the precise shape of the supply curves and demand curves that you draw – i.e. be more precise than the simple **X** shape we draw in class. Three quick examples:

- In the quick classroom sketch, we draw a supply curve as sloping upward – i.e. if consumers want to elicit more output, they need to pay a higher price. But you know that you can go out right now to McDonald's and buy as many Big Macs as you can possibly stomach while paying the same price per burger – i.e. in this particular case, you **don't** have to increase the price to elicit more output. Right now, sketch a picture of the supply curve implied by these Big Macs. We call this a **perfectly elastic** supply curve.
- Conversely, if we think of the quantity of apartments within a 20 minute walk of the main MIT entrance, that quantity is more or less fixed, at least in the short run¹. In this case, raising the price, even by a lot **won't** be able to elicit more apartments since there aren't any more apartments. Sketch a picture of the supply curve this story implies. We call this a perfectly **inelastic** supply curve.
- Similar ideas apply to demand curves. Your demand for some products may be very sensitive to price. For example, if there is a 20 percent rise in the price of fresh apples, you may sharply reduce your purchases of apples and buy other fresh fruits instead. We call this an **elastic** (but not perfectly elastic) demand curve – sketch what you think this looks like. On the other hand, if you have arthritis and are taking an anti-arthritis drug prescribed by your doctor, a 20 percent rise in the price per dose of the drug may cause very little change in the amount you buy (an **inelastic** demand curve – sketch this one too).

Draw supply and demand curves to illustrate each of the following situations. You may add one or two sentences of explanation but you don't have to unless they are explicitly asked for. Think carefully about whether each change would affect supply or demand.

¹ In the long run, higher rents might have an effect by causing single family homes or commercial property to be converted into apartments.

a) As the economy entered recession in 2001, the price of single-family homes fell fairly sharply in the Chicago area. (i.e. draw the housing market in, say, the year 2000 and show how that changed in 2001)

b) As the economy entered recession in 2001, the price of a Ford Taurus sedan **did not** fall by very much (draw the market for the Ford Taurus in 2000 and show how that changed in 2001)

c) Over the last year, the banana harvest was attacked by a fungus that substantially reduced the harvest. The retail price of bananas has risen substantially. Draw a picture of the market for bananas that illustrates this price rise.

d) Two months ago, an article in the *Journal of the American Medical Association* presented evidence that eating 3 bananas a day substantially reduced the likelihood of certain kinds of cancer. Since the article appeared, the retail price of bananas has risen substantially. Draw a picture of the market for bananas that illustrates this price rise.

For the next few graphs keep in mind that a change in supply in one market might influence the demand curve in another market (and vice versa).

e) Yesterday, Delta Airlines announced the elimination of 7,000 jobs over the next 18 months as it attempts to regain profitability. For reasons we will discuss later in the semester, Delta has a higher cost structure (i.e. higher cents per passenger mile) than newer discount airlines like Southwest.

Use appropriate supply and demand diagrams and a few sentences of explanation to sketch how Southwest might have had a part in forcing the job losses at Delta.

f) Until very recently, undergraduate enrollments in electrical engineering and computer science majors had been very high. But recent data from MIT and elsewhere suggests that undergraduate enrollments in electrical engineering/computer science programs fell sharply in 2003 compared to 2002 year before.

Draw two sets of supply-demand curves: One set representing the market for computer scientists in the US economy, and the second set representing high school senior demand for a college education in electrical engineering/computer science. Trace the impact of the collapse of the high tech/dot.com bubble on these two markets. Using words, briefly describe how the computer scientist market would affect the market for a college education in electrical engineering/computer science.

g) Viagra, a drug that enhances male sexual performance, has been large pharmaceutical moneymaker in the last decade. Until now, Viagra has had a monopoly in its market. Over the last year, two other pharmaceuticals have entered this market. These new pharmaceuticals have similar effects to Viagra but they are different enough that they do not violate Viagra's patents (which is why they can enter the market without licensing Viagra's patents, etc.).

g.i) Draw supply/demand diagrams describing two markets. One is the market for Viagra per se. The second is for all drugs of this type (regardless of brand). Show how the entrance of the two new drugs affects each of your diagrams.

g.ii) A larger elasticity of demand means that a demand curve is more sensitive to price. Briefly explain which demand curve you expect to be more elastic – the demand curve for Viagra per se or the demand curve for all drugs of this kind.

4) As you know, e-bay is an enormously popular auction site where you can find many items that 10 years ago would have been sold in local markets. For example, last night, the site listed 119 hamster cages. Ten years ago, these cages probably would have been sold through local pet stores.

Consider two alternate worlds. In one, the item is sold on e-bay. In the other, the item is sold in a local store (and there is no e-bay). In which case do you expect the item to get a higher price. If, like every good economist, you say “It depends”, explain what it depends upon.
