Solutions available Wednesday, September 25

1. Concerned about the behavior of his own teenage children, the governor of a large Southern state is considering policy to help reduce consumption of alcoholic beverages. His advisors have suggested a new tax, the Tax Against Beer (TAB). While beer is currently taxed, this tax would increase the overall tax on beer. It would have the effect of raising the price of beer (and thus the tax revenue raised per unit of beer sold) by 10%.

You are given the following information, and asked to calculate the effect of the tax on both consumption of alcoholic beverages and on government revenue.

Price elasticity of demand for alcoholic beverage: -0.4
Number of alcoholic beverages currently consumed per year: l,000,000

a) By how much will consumption of alcoholic beverages fall after the tax is imposed?
b) Will government revenue increase or decrease after the tax is imposed? How do you know this?
c) How might your answers to (a) and (b) vary if looking at the long-run, rather than the immediate effect?

2. Concerned about the high cost of housing in their city, officials in Busytown solicited ideas to help residents afford new homes. Note that Busytown is a densely populated urban city. It is surrounded by a lake on one side, and mountains on the other, so there is little room to expand. The following suggestions were received:

- Councilman Humperdink notes that the lack of space is a problem. He proposes easing zoning restrictions, so that lots can be subdivided to allow more housing units on existing lots.
- Sergeant Murphy argues that Humperdink's plan will benefit developers, rather than homebuyers. He suggests providing a $10,000 housing subsidy to all Busytown residents, arguing that this extra cash will help them cope with the high cost of housing.

You have been asked by city leaders to evaluate these two proposals.

a) Using a supply and demand diagram, illustrate the effect of Councilman Humperdink's plan to ease zoning restrictions. Be sure to show both the initial equilibrium and what changes occur after the law is changed. Briefly explain why you have drawn the curves as you did.
b) Using a second supply and demand diagram, illustrate the effect of Sergeant Murphy's proposed subsidy. Again, be sure to show both the initial equilibrium and what changes occur after the law is changed. Briefly explain why you have drawn the curves as you did.
c) Based on your analysis, which policy would you recommend? Why?

3. The current subway fare in Capitol City is $2.50. At this price, riders take 5,000 trips on the subway per day. To help offset rising costs, city leaders propose raising the fare to $3.25.

   a) Based on evidence from previous fare increases, the price elasticity of demand for subway rides in Capitol City is -0.4. Given this, how many trips will be taken if the proposed fare increase takes effect?
   b) Using a demand curve to illustrate key points, calculate the lost consumer surplus that occurs after the fare increase.

4. Angered by the high price of medication, Senator I.M. Healthy proposes taxing pharmaceutical companies. The Senator argues that the tax will lead to a significant reduction in the profits pharmaceutical companies earn.

For the purposes of this question, you may assume that medicine is sold in a perfectly competitive market. Below, use a supply and demand diagram to illustrate the likely effect of a tax per bottle of medication sold, with the tax collected from pharmaceutical companies as proposed by the Senator.

How will the tax affect prices for consumers and producers? Who is likely to bear the bigger burden of the tax?

Explain intuitively why that is the case, and why you have drawn your supply and demand curves as you did.

5. Suppose that the demand for sailboats is given by $P = 10,000 - 0.5Q$. The supply of sailboats is $P = 2Q$.
   a) Find the equilibrium price and quantity of the sailboats, assuming that the market is competitive.
   b) Calculate the producer and consumer surplus associated with the equilibrium found in part (a). Illustrate on a graph.
   c) Giving in to demands from the Bigshot Boss Lobby (BBL), who feel workers are wasting their time on lakes when they should be working, the government levies a $1,000 tax on consumers of sailboats. Compute the quantity of sailboats sold after the tax, the price paid by consumers, and the price received by producers. Illustrate on a graph.
   d) Find the new producer and consumer surplus associated with your answer to part (c).
   e) How much revenue does the government raise from the tax?
   f) How does the sum of consumer surplus, producer surplus, and revenue after the tax (your answers to (d) and (e)) compare to the sum of producer and consumer surplus found before the tax (your answer to (b))? What does the difference between the two represent?
   g) Who bears the bigger economic burden – consumers or producers? What does this tell you about the relative elasticities of suppliers and consumers of sailboats?