

**Application of Applied Competitive Analysis (Nicholson, chapter 15):
the United States Sugar Program**

For In Class Discussion in Class #14 – Please come prepared

Read the U.S. Sugar Program case carefully. Although the case is old, it describes an actual U.S. policy that is very much alive today. To make your work easier, we'll use the numbers in the printed case rather than updating them to 1999. Also, use the assumptions outlined in Question 1 at the end of the case when solving the following problems.

- a) At 22 cents per pound (the regulated U.S. price), total domestic demand for nutritive sweeteners is 29 billion pounds. Using the price elasticity of demand estimate found on page 2 of the case, what is the demand function for nutritive sweeteners as a function of price? (Hint: this equation will take the form of $Q(P) = KP^{-a}$. If you don't know what a is from visual inspection, see Example 14.3 on page 414 of your textbook).
- b) Using this demand function, solve for total US sugar demand at the world price of 6.8 cents per pound.
- c) Draw a carefully labeled diagram of the demand and supply for sugar in the U.S. market that incorporates the following features:
 - A world sugar supply curve that is perfectly elastic at the world price.
 - A downward sloping U.S. demand curve that intersects the world and domestic prices at the correct quantities (you'll need information from (a) and (b) to get this right)
 - A region of domestic supply that reflects High Fructose Corn Syrup production (recall that both are nutritive sweeteners and hence you can treat HFCS as a form of domestic sugar supply for this problem). Also, be sure to use the assumptions on HFCS production stated on question 1 of the case.
 - A region of domestic supply that reflects U.S. sugar production. Based on the data in Exhibits 2 and 6, you can roughly assume that domestic supply is an upward sloping linear function that starts at 6.8 cents per pound (the world price) and reaches the domestic support price of 22 cents at when quantity supplied is 14 million pounds.
 - A region of domestic supply that reflects sugar imported under the quota system. Note that this number is given in Exhibit 2 (use the 1989 data).
- d) Although HFCS costs 15 cents per pound to produce, it appears from the Exhibit 4 that it sells for the domestic price of sugar. What are the excess costs that consumers pay annually for HFCS above what they would pay for the comparable amount of sugar at world prices? How much of this excess cost reflects real cost of production and how much is surplus accruing to HFCS producers as a result of the price support program?

- e) Using the assumptions about domestic supply costs given in your figure above, what is the annual dollar value of the surplus that domestic producers receive from the price support program?
- f) What is the dollar value of the surplus that foreign sugar producers receive as a result of the price support program?
- g) What is the total amount of annual transfers of consumer surplus from U.S. consumers to: U.S. sugar farmers, U.S. HFCS manufacturers, and foreign sugar producers as a result of the program? (You just need to give a total)
- h) Using your estimate from (b) of U.S. sugar consumption in the absence of the price support system, what is the dead weight loss to U.S. consumers from the price support program? (Hint: integrate the demand function over the relevant range)
- i) Comparing the size of the deadweight loss from the program to the producer surplus accruing to U.S. sugar farmers and HFCS manufacturers, would you say that this program is an efficient public policy? Comment.
- j) On page 4 of the case, Michael Warner of the American Sugarbeet Growers Association says, “In my home, the Red River Valley of North Dakota, an independent study by North Dakota State University showed that the sugar industry has an economic impact of one billion dollars. Thirty thousand jobs in that valley rely on the sugar industry... In the debate over price, these folks suggest that I take a reduction of six cents per pound in the loan rate. What does that do? For the American sugarbeet industry it means about a \$300 per acre loss and the end of the domestic industry.”

- How relevant is the size of the North Dakota industry (in billions of dollars) to an evaluation of the cost and benefits of this program?

- If the average sugar output per acre is worth \$300 in North Dakota as Mr. Warner says, and there are ¼ million acres of sugarbeet land in production in North Dakota, does this imply that the economic loss from ending the sugar program is ¼ million times \$300? (Assume that what Mr. Warner says is correct – as it surely is – that ending the program would end North Dakota’s sugarbeet production). If this figure isn’t correct, what might be a reasonable estimate of the economic loss – or how might you calculate a reasonable estimate? (Hint: what is Mr. Warner assuming about what would happen to the sugarbeet farmland if the program were cancelled – and how realistic is this assumption?)

- Mr. Warner states that 30,000 sugarbeet farming jobs would be lost in North Dakota if the program were to end. Does this imply that the economic loss in employment is 30,000 times the earnings of these workers? If not, how might you calculate a reasonable estimate? (Hint: consider what would happen to those workers if the program were to end.)

In answering the questions above, please bear in mind the economists’ mantra that “All costs are opportunity costs.”