

EC 300 Homework 1: Due September 7<sup>th</sup>

1. The weekly demand and supply for beer sold in Topeka bars can be given by the equations:

$$Q_d = 20 - 4p + 2p_w + 3Y + 15HOLIDAY$$

$$Q_s = -4 + 26p - 2p_g - 1p_t$$

$Q$  = pints of beer (in thousands)

$p$  = price of beer (\$ per pint)

$p_w$  = price of wine (\$ per bottle)

$Y$  = Average income (000's of \$)

$HOLIDAY$  = variable which takes a value of 0 when there is no holiday and takes a value of 1 if there is a holiday

$p_g$  = price of grains (\$ per bushel)

$p_t$  = price of transportation (\$ per ton-mile)

- a. Suppose the price of wine is \$7 per bottle, average income is \$30,000 ( $Y = 30$ ), the price of grains is \$3 per bushel and the price of transportation is \$3 per ton-mile. Calculate the equilibrium price and quantity of beer for a week in which there is no holiday.

- b. If all other variables remain the same as in part a., what is the equilibrium price and quantity of beer on the week of Labor Day? (i.e. a week in which there is a holiday)

- c. Suppose the drought in California destroys a significant portion of winery's crops resulting in the price of wine increasing to \$10 per bottle. In addition, higher than average grain yields drove down the price of grain to \$2 a bushel. What would be the resulting equilibrium price and quantity over the week of Labor Day?

2. Suppose the demand and supply for meth in a US market are given by the following equations:

$$Q_D = 10 - 4P + 70P_C - 30Y$$

$$Q_S = -4 + 60P - 2P_M - 1DEA - 0.5MILES$$

$Q$  = Pounds of Meth

$P$  = Price per lb. of Meth in 1000s of dollars

$P_C$  = Price per kg. of cocaine in thousands of dollars

$Y$  = Local income per capita

$P_M$  = Price per gallon of methylamine

$DEA$  = DEA spending in state in millions of dollars

$MILES$  = Miles from US/Mexican border

- a. Suppose that in Albuquerque, NM the following holds:

$$P_C = \$20 \text{ thousand}$$

$$Y = \$35 \text{ thousand}$$

$$P_M = \$4$$

$$DEA = \$10 \text{ million}$$

$$MILES = 300 \text{ miles}$$

What will be the supply and demand functions in their simple form (i.e. with only  $Q$  and  $P$  as the variables)?

- b. Based on the same assumptions as part a. what will be the equilibrium price and quantity of meth in Albuquerque?

- c. Walt and Jesse are co-owners of one of the main suppliers in the Albuquerque market; their firm accounts for 40% of the market. Suppose Walt and Jesse decide to retire and exit the meth market. How would you model the impact their retirement has on either (or both) the supply and/or demand functions in part a.? I want you to both write out post-retirement supply and demand functions AND clearly explain what you modeled.

- d. Based on your answer in part c., show what will happen to the equilibrium price and quantity of meth in the Albuquerque market as a result of Walt and Jesse's retirement.

3. Suppose the demand and supply for bottled drinking water in Tampa, FL is given by the following equations:

$$Q_d = 2 - .5p$$

$$Q_s = 2p$$

$Q$  = millions of bottles of water

$p$  = \$ per bottle of water

- a. Given these supply and demand equations calculate the equilibrium price for bottled drinking water in Tampa? How many bottles of water are sold?

Suppose that during an emergency situation such as an approaching hurricane the supply for bottled drinking water remains the same, but the demand changes to:  $Q_d = 7.5 - 0.5p$ .

- b. What will be the equilibrium price of bottled drinking water during the emergency situation? How many bottles of water are sold?

- c. Suppose the state of Florida has an anti-price gouging law that prohibits retailers from increasing the price of necessities (like drinking water) by more than 25% during emergency situations. Write a brief explanation of what the impact of this law would be during an emergency situation. Write it as if you were writing a brief explanation for a student newspaper, but utilize the actual supply & demand functions to give precise analysis on what the impact will be.

- d. If the first letter of your last name begins with the letter A through H, write a brief argument IN SUPPORT of the anti-price gouging law. If the first letter of your last name begins with the letter I through Z, write a brief argument IN OPPOSITION to the anti-price gouging law. I will grade your argument based on your ability to use sound economic logic to support your position. (Hint: don't simply say "I support the anti-price gouging law because it is fair. The End." And don't simply say "I opposed anti-price gouging law because you shouldn't interfere with the market. The End.")