

Extra practice question.

Consider a market model for product “x”. In the market, we have two *identical* consumers and two *heterogeneous* producers. Suppose that demand function for each consumer can be given by $Q_x = 6 - 2 * p_x + 4p_y$, where p_y is the price of good y. And, the two equations for supply curve of each producer are $P_x = 2Q_x$ and $P_x = Q_x$. Consider the following questions.

- a. State the relationship between good x and good y. Can we say that good x is an inferior product, just simply based on the given equation?

From now on, let's assume that $p_y = 5$.

- b. Find the equation for market demand. (You can use whichever method, but make sure you correctly specify the domain of the function.)
- c. Draw the two individual supply curves on the same diagram, and label all the important points of each curve.
- d. Using the horizontal summation approach, would the equation for market supply curve be equal to $P_x = 3Q_x$?
- e. If the proposed solution in “d” is wrong, explain why it's wrong and find the correct equation for market supply curve. (Hint: when I refer to the market supply curve, your equation should be written in terms of p-equal form.)
- f. Use your information in “b” and “e” to find the market equilibrium. How much would each producer produce in the equilibrium? How much is the quantity that each consumer consumes?
- g. Only use the information in “a” to intuitively explain what happen to the market of good X if government taxes good y for 10% of unit price. (Hint: Alternatively, you can answer this question by solving for the new equilibrium price and quantity of good X by using new price of good Y which is 10% higher than before. But, this is tedious. So, don't do it that way if you're not asked to. I only want to make sure you know/understand the logic behind the Ceteris paribus concept.)

Continue with the assumption that $p_y = 5$. But, now suppose that the government taxes consumers by using the value-added tax. The value added tax is charged on the consumer of final goods in terms of x% of unit price paid at the cashier counter. For simplicity, assume that value-added is 5%. Consider the following questions.

- h. Rewrite the new equations that represent market demand and market supply after the value-added tax is put in place. (Hint: As we discussed in class, it helps to distinguish P_x into two prices, namely P_x^d and P_x^s . The former is price of consumer and the latter is the price of producer.)
- i. What is the relationship in the equilibrium between P_x^d and P_x^s , given the structure of tax that will be imposed on consumers.
- j. Use the condition in "i" and draw the market demand curve on p-q diagram. To make everything easy, put the vertical axis in your diagram as P_x^s , i.e. price of producer. Does the whole market demand curve shift up parallel in the same way as when simple unit tax is imposed?
- k. Solve for market equilibrium after tax. How much consumer is paying more, compared to before tax equilibrium? Calculate consumers' and producers' burden.
- l. How much is the total revenue that government can collect?

Good luck....End of the walk way.