

Problem 5. The Economic Effects of Taxation in Monopoly and Competitive Markets

The inverse demand curve for a commodity market is $P=180-Q$. The inverse supply curve is $MC=Q$. Given this information, answer the following questions:

- a) What is the equilibrium price level if this market is competitive?
- b) What is the equilibrium quantity level if this market is competitive?
- c) What is the equilibrium price level if this market is monopolized?
- d) What is the equilibrium quantity level if this market is monopolized?
- e) What is the net economic efficiency cost of the monopoly market compared to the competitive market baseline?

Now suppose a unit tax is imposed of 20 per unit.

- f) What is the equilibrium demand price level in the competitive market when this 20 unit tax is imposed?
- g) What is the equilibrium quantity in the competitive when this 20 unit tax is imposed?
- h) What is the net-efficiency cost of this tax, relative to the pre-tax status quo in the competitive market?

Now going to the monopoly market:

- i) What is the equilibrium demand price level in the monopoly market when this 20 unit tax is imposed?
- j) What is the equilibrium quantity in the monopoly market when this 20 unit tax is imposed?
- k) What is the net-efficiency cost of this tax, relative to the pre-tax status quo in the monopoly market?

If you have done this problem correctly, the price rise in the monopoly market should be less than in the competitive market (contradicting the intuition that a monopolist would "pass on more of the tax" than firms in a competitive market), and its output reduction will be less. But the net-efficiency cost of the tax in the monopoly market will be a lot greater (again providing a counter intuitive result: the market with less adjustment to the tax (less price rise, lower quantity decrease) will impose the greater efficiency cost.

- l) Why is the price rise less in the monopoly market than the competitive market?

- m) Why is the efficiency cost of taxation in the monopoly market greater than the efficiency cost of taxation in the competitive market?