

The Ohio State University  
Department of Economics

Econ 501a  
Winter 2001  
Prof. James Peck

### Final Examination

Directions: Answer all questions in the space provided. Use the back of the page if necessary. Show all work and label all graphs.

Part I: Short Answer.

1. **(10 points)** Briefly explain both parts of the following statement.  
“Perfectly competitive markets induce socially efficient output choices, holding technology fixed. However, perfectly competitive markets do not induce enough effort to improve technology.”

2. **(10 points)** Suppose that a \$1 per unit tax is imposed on an otherwise unregulated monopolist. Will the deadweight loss associated with the monopolist's output choice increase, decrease, or remain the same (as compared to the deadweight loss before the tax)? If you use a graph to help you explain, label the curves.

3. **(10 points)** The market for turbogenerators in the 1960's consisted of two oligopolists, General Electric and Westinghouse. In 1963, GE announced a "price protection" plan which guaranteed that, if it were to cut its price on any new order, GE would retroactively grant the same discount on all orders taken within the preceding 6 months. Westinghouse announced a similar price protection plan to its customers in 1964.

From the perspective of game theory, explain how these price protection plans reduce the temptation of GE and Westinghouse to cut their prices, once they have been high to begin with.

Part II: Longer Answer.

4. **(25 points)** This question relates to the Dilbert cartoon, below. Suppose that the firm is in a perfectly competitive industry, with the production function given by

$$x = K^{1/2}(AL)^{1/2},$$

where  $A$  is a parameter representing the efficiency of workers. Also suppose that we are in a short run situation, with

$$\overline{K} = 4, \quad w = 2, \quad \text{and} \quad r = 1.$$

(a) Derive the firm's short run supply function (which will be a function of  $x$  and the parameter,  $A$ ).

(b) Suppose that the price of output is 10,  $p_x = 10$ . How much labor will the firm hire, and how much output will the firm produce, if  $A=1$ ?

(c) Now suppose that the efficiency of all workers is doubled, so  $A=2$ . If the price of output is still 10,  $p_x = 10$ , how much labor will the firm hire, and how much output will the firm produce?

(d) Comment briefly on Dilbert's claim in the cartoon.

**Note (February 2002):** I cannot find the cartoon, but it roughly goes as follows. Catbert, the evil human resources head, tries to encourage everyone to double their productivity. Then Dilbert says, "won't that mean that the firm will fire half of us (and keep output constant)?"

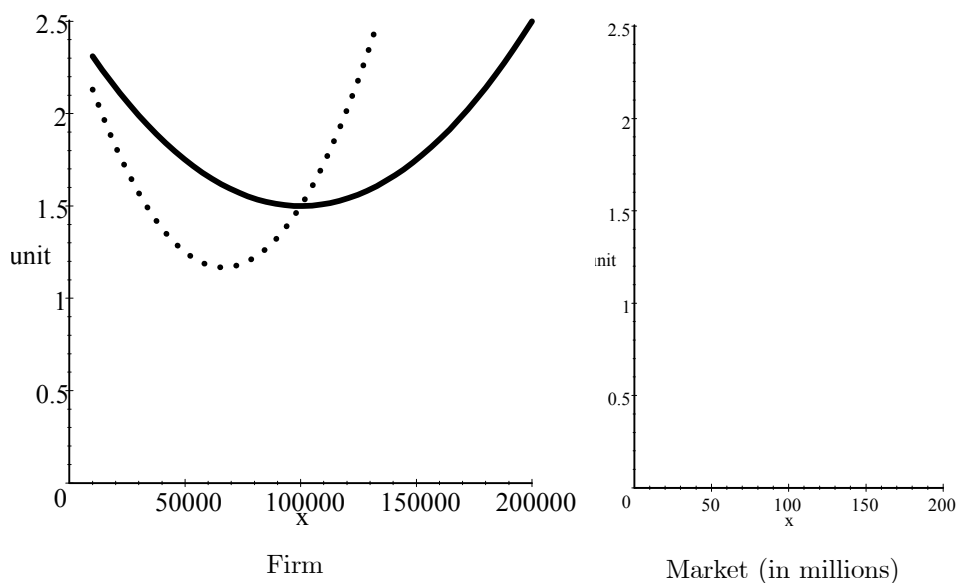
5. **(25 points)** Suppose the local tavern industry is perfectly competitive, and that all bars in the city have the identical cost curves depicted below. (The dotted line is short run marginal cost, and the solid line is long run average cost.) The market is initially in long run and short run equilibrium, with a market price of \$1.50 and each bar selling 100,000 drinks per year.

Then, in an effort to stimulate business, the city permanently eliminates the liquor licence fee of \$10,000 per year. In the short run, existing bars are not required to pay the fee, but no new bars can enter the industry. In the long run, new bars can enter the industry and operate at the lower cost.

(a) In the short run, in which direction (up, down, or unchanged) do the following variables move, relative to their initial values: market price, quantity sold by each firm, profits received by each firm?

(b) In the long run, in which direction (up, down, or unchanged) do the following variables move, relative to their initial values: market price, quantity sold by each firm, industry output?

**hint: Think carefully about which curves move and which ones are unchanged.**



6. **(20 points)** Rain Forest Soap, a monopolist in the organic laundry detergent industry, has two types of customers. Group A clips coupons from the magazine, *Endangered Species Quarterly*, and has the (inverse) demand curve given by

$$p_x - C = 4 - \frac{x^A}{500},$$

where  $p_x - C$  is the total price paid by group A, including coupon discounts,  $C$ . [For example, if  $p_x = 2.5$  and  $C = 1$ , we would have a total price of 1.5.]

Group B does not read *Endangered Species Quarterly*, and has the (inverse) demand curve given by

$$p_x = 5 - \frac{x^B}{1000}.$$

Rain Forest Soap has constant marginal costs of **\$2** per unit.

*What are the profit maximizing values of  $x^A$ ,  $x^B$ ,  $p_x$ , and  $C$ ? What will be Rain Forest Soap's profits? Hint: The coupon program allows the firm to charge whatever total price it wants in the two markets.*