Economics 204  
Problem Set 7

1. Suppose that the price of labor (the wage rate) is $200 a day and that the rental price of capital is $100 a day. Currently the ABC printing firm is using ten units of capital and five units of labor to produce 1,000 brochures a day. Each brochure sells for $2.50. At the current input use levels, the marginal product of capital is 50 brochures per day and the marginal product of labor is 80 brochures a day.

   a. Is the firm making an economic profit at its current levels of operation?

   Yes: Total revenue = P*Q = $2.5*1000 = $2500
   Total cost = $200*5 + $100*10 = $2000
   The firm is making $500 profit

   b. Could the firm increase its profits at the current level of output by adjusting its use of labor and capital? If so, how should input use be adjusted?

   Yes—MP_L/MP_K = 80/50 but P_L/P_K = 200/100. These are not equal—labor costs twice as much as capital, but at the current margin it is not twice as productive. The firm could increase profits by replacing some L with some K.

2. The profit maximizing rule that firms should equate marginal cost with marginal revenue doesn’t apply to competitive firms because they maximize profits by equating price with marginal cost. True or false? (Ch 7)

   False, All firms maximize profits by setting MR=P, but MR is the price for price taking firms.

3. For each scenario, indicate the SHORT run and LONG run effects on (1) the market price, (2) the industry quantity of cab rides, and (3) the number of Gus’s cab rides.

   Assume the industry is a CONSTANT cost industry. (Ch7)

   Use the templates on the website if you need help drawing the curves—just shift as indicated in the answer key.

   Remember: this means that the LR supply curve is perfectly elastic.

   a. Gus realizes that he owes $2000 in back taxes.
   This is a sunk cost—no change in long or short run for Gus or for industry.

   b. A fire destroys half the cabs in town, but not Gus’s.

   SR: Individual cabdriver MC, AVC curves are unchanged, but the SR industry supply has shifted back, leading to a higher P and a lower Q. For the remaining cabs, they set the new higher P=MC, leading to an increase in their individual q.
LR: MC, AC costs of individual cabdrivers are unchanged. The short run profits will be competed away as new firms enter, driving down the price. The long run equilibrium price and quantity will eventually be the same as they were before the fire.

c. The city imposes a $1 tax on cab rides.

SR: MC for each driver shifts up by $1. As a result, the industry supply curve shifts back, increasing P and Q. However, the price will not rise by the full $1. Individual cab drivers get a higher price, but each supplies fewer rides.

LR: MC and AC both increase by $1. This means that the industry supply curve also shifts up by $1 (the break even price is higher). The flat MR curve for Gus therefore also shifts up. Gus supplies exactly the same number of rides as before, but just charge a $1 higher price. (Question for you: Why do consumers bear the whole burden of the tax in the long run but not in the short run?)

d. The city imposes a $100 annual license fee on cabs.

SR: No change in MC or AVC, so no change in short run supply for the industry.

LR: AC increase, raising the break even price. The industry supply curve shifts up, increasing the price and decreasing the industry quantity. The MR curve for Gus shifts up so his q rises. Why does his q rise when industry Q falls? Some firms exit.

4. Repeat c and d above assuming the industry is an INCREASING cost industry.

e. The city imposes a $1 tax on cab rides.

Now the LR supply curve has a positive slope. SR effects are the same as above. In LR, industry P rises, Q falls. Gus’s q can go either way.

f. The city imposes a $100 annual license fee on cabs.

SR effects same as above. LR, P rises, Q falls. Gus’s q increases.