UC Berkeley
Economics 121
Spring 2006
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Problem Set #1 – Suggested Solutions

1.   Describe two possible benefits of competition other than price being close to
        marginal cost. State briefly what is assumed in attributing the benefits that
        you mention to competition.

Sketch of possible answers:
-   Incentives to cut costs: Competitive firms can earn positive profits by being more
    efficient than other firms in the market, so they have an incentive to lower their
    costs. This ultimately leads to a decrease in market price as other firms either
    adopt the lower-cost technology or are pushed out by the lower-cost firms. Note
    that when thinking about profit maximization (in theory), even a monopoly has an
    incentive to cut costs (and thus the market price will fall). However, there is
    evidence that monopolies do not always minimize costs, perhaps because of
    "finite greed" or the lack of a comparison firm that could be used to judge
    efficiency (harder to benchmark costs).
-   Law of Large Numbers: More firms are better than fewer firms, even without any
    explicit incentive to lower costs. The existence of more than one firm increases
    the likelihood that there will be at least one firm with a low cost structure. As the
    number of firms in the market increases, the likelihood of having a low-cost firm
    in the market increases.
-   Evolutionary Biology: Competition implies the existence of more firms, which
    produce a greater variety of products available to consumers. Consumers can then
    select from among these products the ones that are most attractive to them. This is
    a signal to the market to produce more of the attractive products and fewer of the
    unattractive products.
-   Note that the second and third points are benefits of diversity. In class, we
    discussed some assumptions involved in claiming that diversity is a benefit of
    competition, including:
        o   Monopolies are not rewarded for diversity (Intel example).
        o   Competitive firms are rewarded for diversity (contrast: TV market, pre-
            cable)
        o   One firm does not eliminate all other producers (biodiversity; US vs EU
            view of competition)

2.   A firm has a marginal cost of $3 per widget, and sets its price at $5. It
        estimates that its demand elasticity is 2. Would you advise it to change its
        price and if so in which direction? Explain.

Approach 1: Use formula: $\dfrac{p-mc}{p} = -\dfrac{1}{\varepsilon_{firm}}$

$$\frac{p-3}{p} = -\frac{1}{2}$$

$$p-3 = -\frac{1}{2}p$$

$$\frac{1}{2}p = 3$$

p=$6

Since the p that is calculated using the Lerner equation is higher than the p that the firm has set, advise firm to *raise* price to $6.

Approach 2: Another good approach is to note that, using the logic of the Lerner index, raising price by 1% to $5.05 increases margins by 5 cents=5/200=2.5%, while lowering demand by only 2% (from ε=2, given), so it increases profits. Thus, the firm should raise its price. This approach does not yield an exact price recommendation, but has the advantage of not assuming that elasticity is constant.

3.　　The gross margin (Lerner index) in an industry is 0.3, until a price comparison web site opens up and sharpens competition, after which the gross margin falls to 0.25. Estimate the decrease in deadweight loss as a function of industry revenue, using the formula discussed in class or otherwise (explain).

Use formula given in class:
$$\frac{\Delta DWL}{pQ} = \frac{e}{2}(\ell_0^2 - \ell_1^2) = \frac{e}{2}(0.3^2 - 0.25^2) = \frac{e}{2}*(0.0275) = 0.01375e$$

So, for example, the reduction in deadweight loss as a percentage of total industry revenue is approximately 1.4%, if there is unit elasticity.

4.　　In Carlton and Perloff, their Equation (3.1) and the discussion around it and in Table 3.1 take $\eta_0 = 0$. What value would replace the entry (there is only one) of "-10" in Table 3.1 if instead η_0=0.2?

The general formula for elasticity of demand for an individual firm in a market with n identical firms is:
$$\varepsilon_i = \varepsilon n - \eta_0(n-1)$$

Looking up the relevant values in Table 3.1, we find that ε=-1, n=10. We are given that η_0=0.2. Substituting:
$$\varepsilon_i = (-1*10) - (0.2*9) = -11.8$$

Note that, unlike the notation we've been using in lecture, CP take demand elasticity to be a negative number…