Department of Economics
University of California | Fall 2004
Woroch/Lopez/Sydnor

Economics 121

PROBLEM SET 2

Due: Thursday, October 7, 2004, 12:30 PM (in lecture)

1. **True/False/Uncertain:** Decide whether the following statements are true, false or uncertain, and then explain the reasoning behind your answer.
   a) The Bertrand Paradox will arise for a duopoly on the Hotelling line as transportation costs go to zero.
   b) If production exhibits learning by doing, then a scope economy arises between the product produced at different points in time.
   c) When firms in an industry act as price takers, their index of scale economies, s, will be less than 1 when the industry reaches equilibrium.

2. Engineering economists have found that the cost of producing small cars (S) and trucks (T) can be expressed as follows:

   * $C(S, T) = 10 + S + 2T + ST$ if $S > 0$ and $T > 0$
   * $C(S, T) = 8 + 2T$ if $S = 0$ and $T > 0$
   * $C(S, T) = 4 + S$ if $S > 0$ and $T = 0$

   Both S and T are measured in thousands of vehicles per year.

   a) Find the incremental cost function of producing trucks when a positive amount of small cars are produced: $S > 0$.
   b) Evaluate incremental cost of trucks at $T = 10$ when $S = 10$ and then again when $S = 20$.
   c) Are there scope economies? Demonstrate how you came to this conclusion.
   d) List three potential sources of scope economies in the production of these two products using your knowledge of the industry.
   e) Are there multi-product increasing or decreasing returns to scale? Demonstrate your answer.
   f) Are there product-specific scale economies for either product?
   g) Suggest a source of product-specific scale economies again using your knowledge of the production of automobiles.

3. DVD Palace is located in Springfield, where each year 100 people are willing to buy a DVD player at up to $150. There are also 100 people in Shelbyville, who are willing to pay $150 for a DVD player but must incur a $50 transportation cost of getting to and from the DVD Palace. DVD Palace has marginal costs of $20 per player and pays a rent of F per year.

   a) What is the highest price DVD Palace can set such that both residents of Springfield and Shelbyville will purchase a DVD player? Show that this gives them a higher profit than if they set a price of $150 and sold to Springfield residents only.
   b) Suppose that F = $7,000. Calculate: - stores profits - consumer welfare – total welfare.
   c) Show that opening another store in Shelbyville (where the residents would no longer have to pay transportation costs) is more profitable that having one store in Springfield only.

d) Is opening a second store optimal from a social welfare perspective?

4. The following table gives the profits of the only two manufacturers of Widgets – Widget Corp. and Tegdiw Inc. The two firms set prices simultaneously and (for simplicity) must choose a high or low price.

		Widget Corp: High	Widget Corp: Low
Tegdiw Inc	High	100 / **500**	200 / **250**
Tegdiw Inc	Low	0 / **400**	100 / **300**

The profits for Tegdiw Inc are given in the lower left of each box (in bold). The profits for Widget Corp are in the upper right.

a) Does either firm have a dominant strategy?
b) What are all the possible Nash Equilibria for this game?
c) Give an intuition for the payoffs in this game (i.e. suggest a market structure that could yield this situation).

5. Consider the Ready to Eat (RTE) Breakfast Cereal industry:
   a) Explain why continuing product differentiation in this industry makes it less and less profitable to enter the market with a new cereal.
   b) What advantages might the larger cereal companies (e.g. Kelloggs, General Mills) have over the smaller firms in the industry when it comes to introducing new cereal types?
   c) Can you give an explanation for why the big three all have a similar Raisin Bran product (Post Raisin Bran, Kellogg's Raisin Bran, Total Raisin Bran), but there is only one Froot Loops (a Kellogg product)?