Problem Set 3: Solution

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Total possible points = 10 + 2 extra credit

(8 points if you attempt all questions and 2 points for answers being correct).

Due date: Friday Feb 1^{st} beginning of class.

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1. Welfare loss due to monopoly (Similar to Chapter 3 Question 10)

Suppose that the demand for tickets to a game is given by

$$P = 200 - 0.004A$$

and the corresponding marginal revenue is

$$MR = 200 - 0.008A$$

where A is the number of attendees. Assume that the constant marginal cost of fan attendance is 20

1. What will the price and attendance be with competition:.

   Since P = MC.

   $$P^* = 20$$

   and

   $$A^* = 50,000 - 250P = 45,000$$

2. How much consumer surplus exists?

   CS is the area under the demand curve and above the price. Therefore

$$CS = 180 * 45,000 * 0.5 = 4,050,000$$

3. What are the monopoly price and attendance

   In monopoly MR = MC. Therefore

$$200 - 0.008A = 20$$

$$A^* = 22,500$$

   and thus,

$$P^* = 200 - 0.004 * (22,500) = 110.$$

4. How much profit does the monopolist earn?

$$Profit = PS = (P - MC) * A = 90 * 22,500 = 2,025,000$$

5. How much consumer surplus is left (if any)?

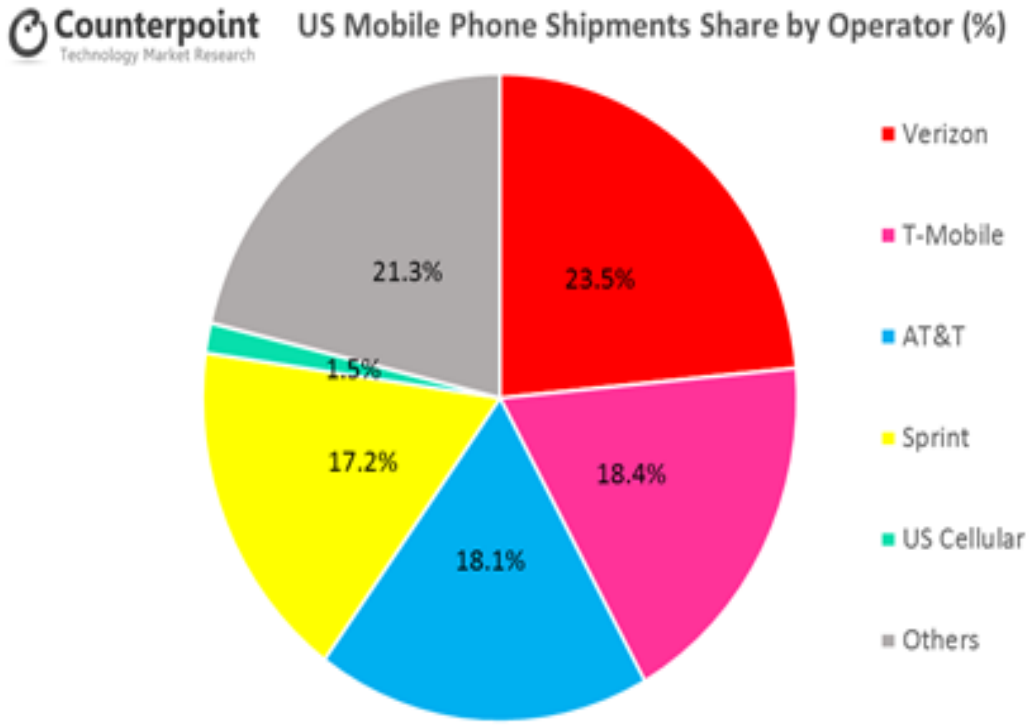
$$CS = 90 * 22,500 * 0.5 = 1,012,500$$

6. Calculate the social welfare loss (Dead weight loss)

   The welfare loss is

$$= 4,050,000 - 2,025,000 - 1,012,500 = 1,012,500$$

2. Herfindahl-Hirschman Index (HHI)



From the above pie chart calculate the Herfindahl-Hirschman Index (You can simply consider "others" as just one firm)

$$HHI = \sum_{i=1}^{n} S_i^2$$

$$= 21.3^2 + 23.5^2 + 18.4^2 + 18.1^2 + 17.2^2 + 1.5^2$$

$$= 1970.2$$

3. Noll Scully Ratio (Extra credit)

Pick a league of your choice and calculate the Noll Scully Ratio for a particular season. (It can also be a college league for example Pac-12 Football)