

ECO410H: Practice Questions 3

1. Consider a differentiated goods industry characterized by Bertrand price competition. Industry experts include 3 goods in the industry: Goods 1, 2, and 3 produced by Firms 1, 2, and 3 respectively. Unbiased estimates of market demand are:

$$q_1 = 100 - 20p_1 + 10p_2 + 5p_3$$

$$q_2 = 100 + 10p_1 - 20p_2 + 5p_3$$

$$q_3 = 100 + 5p_1 + 5p_2 - 20p_3$$

Market prices of $p_1 = \$10.17$, $p_2 = \$10.17$, and $p_3 = \$9.04$ are observed. Using the Bertrand NE you “back out” constant marginal costs of \$8 for each good. Firms 1 and 2 propose merging. Determine the *antitrust market* by applying the *hypothetical monopolist test*.

2. On page 9 of the 2010 U.S. Horizontal Merger Guidelines (HMG’s), this example appears:

Example 5: Products A and B are being tested as a candidate market. Each sells for \$100, has an incremental cost of \$60, and sells 1200 units. For every dollar increase in the price of Product A, for any given price of Product B, Product A loses twenty units of sales to products outside the candidate market and ten units of sales to Product B, and likewise for Product B. Under these conditions, economic analysis shows that a hypothetical profit-maximizing monopolist controlling Products A and B would raise both of their prices by ten percent, to \$110. Therefore, Products A and B satisfy the hypothetical monopolist test using a five percent SSNIP, and indeed for any SSNIP size up to ten percent. This is true even though two-thirds of the sales lost by one product when it raises its price are diverted to products outside the relevant market.

- (a) Write down the implied demand system.
- (b) Assume price competition. Solve the implied duopoly model for the equilibrium prices of good 1 and good 2.
- (c) What is the Lerner Index for each good? The example does not tell us anything about fixed costs. Why are we able to solve for the equilibrium prices and Lerner Index without this information?
- (d) Does Footnote 3 in the HMG’s – reproduced below – have anything to do with Example 5? Does Footnote 3 have anything to do with Elzinga and Mills (2011)?

Footnote 3: High margins commonly arise for products that are significantly differentiated. Products involving substantial fixed costs typically will be developed only if suppliers expect there to be enough differentiation to support margins sufficient to cover those fixed costs. High margins can be consistent with incumbent firms earning competitive returns.

- (e) Assuming a hypothetical monopolist, solve for the equilibrium prices of goods 1 and 2.

- (f) Explain why your analysis implies that the relevant product market includes only goods 1 and goods 2. Are there other substitutes for these goods available? If yes, why aren't these substitutes included in the antitrust product market?