

ECO410H: Practice Questions 3 – SOLUTIONS

1. Start with either of the goods involved in the merger: Good 1 or 2. Next, add the next closest substitute. From the given system of demand equations, Goods 1 and 2 are the closest substitutes. Hence we ask if a hypothetical monopolist that had control over Goods 1 and 2 would raise prices by a small, but significant and nontransitory amount (SSNIP).

$$\pi = TR - TC$$

$$\pi = (p_1 - 8)q_1 + (p_2 - 8)q_2$$

$$\pi = (p_1 - 8)(100 - 20p_1 + 10p_2 + 5p_3) + (p_2 - 8)(100 + 10p_1 - 20p_2 + 5p_3)$$

We are supposed to hold other prices constant: hence put \$9.04 in for p_3 .

$$\pi = (p_1 - 8)(145.2 - 20p_1 + 10p_2) + (p_2 - 8)(145.2 + 10p_1 - 20p_2)$$

$$\frac{\partial \pi}{\partial p_1} = 145.2 - 20p_1 + 10p_2 - 20p_1 + 160 + 10p_2 - 80 \stackrel{set}{=} 0$$

$$40p_1 - 20p_2 = 225.2$$

$$2p_1 - p_2 = 11.26$$

$$\frac{\partial \pi_2}{\partial p_2} \stackrel{set}{=} 0$$

Use symmetry between Firms 1 and 2:

$$2p - p = 11.26$$

$$p = 11.26$$

Clearly the hypothetical monopolist would raise prices by much more than a SSNIP: \$10.17 to \$11.26 is a 10.7% increase in price, which is substantially higher than the typical 5% standard. Hence, the antitrust market includes only Goods 1 and 2.

2. (a) See your notes from Class 3.
(b) You should show the full derivation. $p_1 = 100$ and $p_2 = 100$
(c) The Lerner index is 0.4 for each good: 40 percent of the price is mark-up over marginal costs. We can solve for the equilibrium prices (and mark-ups) without knowing fixed costs because fixed costs by definition do not vary with price, which is the choice variable in this model. Hence when we solve the model via derivatives any fixed costs would disappear.
(d) Yes, Footnote 3 is highly relevant to Example 5 and very much consistent with the arguments put forth in Elzinga and Mills (2011). You should explain.
(e) You should show the full derivation. $p_1 = 110$ and $p_2 = 110$.
(f) See the HMG's for an explanation of why this analysis implies that goods 1 and 2 form the relevant product market. Yes, there are definitely other substitutes for these goods available: most of the lost sales of good 1 are not being diverted to good 2: they must

be going to other substitutes. These other substitutes are not included because the hypothetical monopolist test says that our product market should focus on the most important substitutes and we should not include every possible substitute as this would make market shares virtually meaningless. For Example 5 to be valid it must be that good 1 and good 2 are closer substitutes than other goods. If not, the next best substitute should have been included first in performing the hypothetical monopolist test.