

Problem Set 5

Econ 250

1

After several years of severe price competition that damaged Boeing's and Airbus's profits, the two companies pledged not to have another price war. However, Boeing made an unusual offer to sell 100 small aircraft to a leasing corporation at special discount prices. Boeing's move follows a similar one by Airbus. Based on the analysis of section 9.1 in your book, why do you think it is so difficult for aircraft manufacturers to collude and avoid price wars?

Ans: Aircraft manufacturers receive orders infrequently. Moreover, the terms of each sale are seldom made public. For these reasons, it is very difficult for them to collude. The incentive to cheat on a tacit or explicit agreement would be very high because: (a) the short run is very important with respect to the long run (low discount factor); (b) the probability that cheating would be detected is low.

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"Price wars imply losses for all of the firms involved. The empirical observation of price wars is therefore proof that firms do not behave rationally." True or false?

False, there are problems like the secrecy of prices. Because of this secrecy, and other problems with maintaining collusion, there may be some equilibrium where it is rational to engage in price wars.

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a) In the US, when shipping firms were forced to announce all prices, prices actually increased suggesting that collusion was easier to sustain. Suggest a reason why.

b) Suppose that firms play a modified tit for tat strategy whereby if another firm cheats, each other firm prices at marginal cost for T periods. Suppose that the discount factor is sufficient to ensure that firms do not cheat on collusion. Suppose also that you observe that price wars still happen but only in situations of unexpected demand shocks. Provide a hypothesis to explain your observation.

c) In 2005, the two biggest Canadian Airline producers Air Canada and West Jet, faced competition from a new entrant, Jetsgo. By Christmas time of 2005, prices were remarkably low and Jetso was finally driven out of the industry leaving many travellers stranded and unable to get their money back. Low prices might be explained due to the breakdown of collusion. Provide two possible explanations.

d) How does market structure affect the ability of firms to collude?

e) Is collusion legal? Is collusion always bad for society? Discuss.

Ans: a.) Secret pricing can cause the difficulty of not knowing if everyone else is maintaining the agreement. When in public, no one can hide.

b.) When prices are secret, price wars are sometimes necessary as it is difficult to differentiate cheating by one firm to a demand shock for that firm. Price wars cannot necessarily be avoided under these circumstances.

c.) Jetsgo seems like a firm not identical to the other two, potentially concerned about a.) its future existence and therefore having a very low discount rate, or b.) there could have been a price war as Jetsgo violated prices so that the other two could drive them away and maintain their collusive agreement.

d.) The more firms that are in an industry the more difficult cooperation is. It is more likely firms are asymmetric, or there may be some troubled firms that rock the boat.

e.) No, to varying degrees collusion is illegal. Collusion is bad for society if it is purely based on driving up firm profits and pushing up prices, but not necessarily bad for society in innovations and technology.

4

Consider a price-setting oligopoly with n firms, all with constant marginal cost c . Suppose market demand is given by $D(p)$ and the discount factor is $.8$. Determine the maximum number of firms such that there exists an equilibrium with collusive monopoly pricing.