

1. Suppose that competition within the widget industry is characterized by the classical one-stage Cournot (quantity) game. Under what conditions is profitable for two of the  $N$  ( $N > 2$ ) firms in the industry to merge? Assume no further mergers will ever occur.

- case i) All firms have constant and identical unit cost  $c$ .
- case ii) Each firm also has fixed cost  $F$ . A merger then reduces total cost fixed cost.
- case iii) Unit costs,  $c_i$ , differ across firms
- case iv) Unit costs,  $c_i$ , differ across firms, firms are constrained to produce  $q_i \leq K_i$ , and additional capacity,  $x_i$ , costs  $\gamma(x_i)$

Evaluate, in light of these results, the likely usefulness of the Cournot model in thinking about the effects of proposed mergers.

2. Firms  $U_1$  and  $U_2$  produce differentiated widgets at zero cost and sell them to consumers at prices  $P_1$  and  $P_2$ , respectively. Prices are chosen in a one-shot noncooperative (Bertrand) game. Demands are given by:

$$Q_1 = 12 + P_2 - 2P_1 \qquad Q_2 = 12 + P_1 - 2P_2$$

- a. Are prices strategic substitutes or strategic complements given this demand structure? Derive the best response curves.
  - b. Compute the equilibrium prices and profits of the two firms.
3. Briefly discuss the following conclusions regarding the methods for defining relevant geographic markets using the market definition principles discussed in the DOJ/FTC Merger Guidelines.
- a. If the prices for the relevant products in the two geographic areas are highly correlated (using time series data) then the two areas are in the same relevant geographic market for antitrust purposes.
  - b. If there is a significant difference in the level of prices for the relevant products in the two geographic areas then the two geographic areas are not in the same relevant geographic market for antitrust purposes.
  - c. If production of the relevant product in one geographic area is routinely transported for sale in a second geographic area then the two areas are in the same relevant geographic market for antitrust purposes.

d. If a demand shock in one geographic area does not affect prices for the relevant product in a second geographic area then the two areas are not in the same relevant geographic market for antitrust purposes.

4. Microsoft has been involved in a series of antitrust investigations relating to marketing practices for their operating systems. A brief chronology of significant events in one of their previous encounters with the Department of Justice follows (dates are for news reports of events):

March 12, 1991	<i>Wall Street Journal</i> reported that the Federal Trade Commission was investigating possible antitrust violations by Microsoft, relating to their marketing of Microsoft DOS (MS-DOS).
February 5, 1993	After intensive lobbying by concerned parties, the FTC declined to pursue a staff recommendation to seek an injunction against Microsoft.
August 21, 1993	Department of Justice, in a highly unusual move, announced it was taking over the antitrust investigation.
July 16, 1994	Settlement in the DOJ investigation and a European Commission antitrust investigation against Microsoft announced. Some view the settlement as favorable to Microsoft.
January 20, 1995	Judge Sporkin grills DOJ, Microsoft; evinces substantial hostility to proposed consent decree.
February 14, 1995	Sporkin rejects settlement
June 16, 1995	Appeals court returns settlement to different lower court judge for review (rebuke of Sporkin decision)
August 21, 1995	Settlement approved by lower court.

a. Describe how you might use stock market data to estimate the anticipated effect on Microsoft of antitrust restrictions on their marketing and licensing practices. Be specific as to the data you would use, the estimates you would calculate, and their interpretation.

b. On the 14.272 Web page are a Stata dataset and ascii file that contain the daily closing prices for Microsoft and the Standard & Poors' 500 over the 1991-1996 period.

Microsoft shares outstanding: 115.6 million 3/91  
280.2 million 3/93  
281.5 million 9/93  
583.4 million 3/95  
585.6 million 6/95

Use these data, or any other you would like to collect, to produce a "back-of-the-envelope" estimate of the change in the present discounted value of Microsoft's future profits expected as a result of possible antitrust action against the firm. You need not look at all events, and you

do not have to run regressions. You should, however, state specifically any assumptions you make (e.g., risk adjustments to returns, prior probabilities of relevant outcomes, event selection, event windows, etc.)

- c. How would your conclusions change, if at all, if the probability of an FTC vote to seek an injunction was believed to be 50% prior to the announcement of the actual outcome?
  - d. How might you assess the credibility of your conclusions (other sources of evidence, alternative approaches, etc.)?
5. Consider a merger between two firms that manufacture ready-to-eat (RTE) cereals. RTE cereals are sold to supermarkets, which then sell to final consumers. A merger simulation is proposed that will use econometric techniques to estimate the demand structure for RTE cereals (product-specific elasticities and cross-elasticities). Discuss the following two issues:
- a. The only price data available are for retail RTE prices charged by supermarkets. What assumptions need to be made to use the estimates of the retail demand structure to simulate the effects of the merger on prices accurately?
  - b. Supermarkets often have special sales for different brands of RTE cereals. It is thought that consumers “stock up” on cereal when it is on sale. How would these behavior affect your interpretation and use of the estimated price elasticities and cross-elasticities? How might you take the “stock up” behavior into account?