

Introduction to Industrial Organization

Homework #4

Fall 2013

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1. Assume that Microsoft has a monopoly in providing operating systems, called "Windows", for personal computers. Assume also that the marginal cost to Microsoft of supplying its operating system for one more computer is zero. Denote by P_M the price charged by Microsoft for its operating system. Various computer manufactures produce homogenous computers. Cost of production per computer are equal to $\$1000 + P_M$ where the $\$1000$ captures other computer component costs, such as the microprocessor, monitor, etc. Finally, assume that the downstream computer industry is perfectly competitive and aggregate demand is given by $Q = 50,000,000 - 10,000P$.
 - a. For any given price, P_M , of operating systems, what will be the price and sales of computers?
 - b. What price P_M should Microsoft set for its operating system? How much money will downstream manufacturers make? What will be the final price of a computer?
 - c. How much money would a vertically integrated firm controlling both the supply of Windows and the assembly of computers make? What price would such a firm charge for its computers?
 - d. Should Microsoft integrate downstream with computer manufacturers?
2. Reconsider the model in "1", except with Comcast as a downstream monopolist.
 - a. For a given price, P_M , for Windows, what price p would Comcast set for computers? How many computers will be sold?
 - b. What price P_M , should Microsoft set for its operating system? How much money will Microsoft make? How much money will Comcast make? What will be the price of a computer?
 - c. Could Microsoft and Comcast make more money by merging? If so, how much? Would such a merger benefit or harm computer users?
3. Reconsider the model in "1" (with perfectly competitive downstream firms). But now, the marginal cost to a downstream firm of producing a computer is $\$500 + P_M + P_I$ where P_M is the price paid to Microsoft for "Windows" and P_I is the price paid to Intel for a microprocessor. Assume that Intel has a monopoly over the provision of microprocessors.
 - a. Suppose that Microsoft and Intel simultaneously and independently set the prices for Windows and Pentium chips, P_M and P_I . What are the Nash equilibrium prices that Microsoft and Intel set?

b. Suppose Microsoft and Intel agree to bundle microprocessors and Windows together for a price P_{MI} . What bundle price maximizes Intel and Microsoft's joint profits? Would consumers benefit from such an agreement?

4.

The fashion (clothing), consumer electronics, fine fragrance industries are known to practice or have practiced resale price maintenance. In each case, indicate the probable motivation for RPM and the likely welfare consequences.

5.

Consider the RPM model of consumer service discussed in lecture 30. Show that the levels of customer service that emerge in equilibrium are below the levels that would emerge under vertical integration. Explain the intuition for why more customer service is provided under vertical integration than under RPM.