Chapter 8: Commodity Bundling and Tie-in-Sales

Learning Objectives:

Students should learn to:

1. Distinguish commodity bundling (fixed proportions) from tie-in sales (variable proportions).
2. Explain intuitively the rationale for commodity bundling.
3. Analyze commodity bundling decisions using the simplified version of the Adams/Yellen model with two goods. This model assumes:
    a. Constant marginal costs of production with no economies of scope
    b. Consumers have a reservation price for each good
    c. Consumers will buy exactly one unit of a good per period if the price is less than the reservation price
    d. There are no consumption externalities so that $R_B = R_1 + R_2$ where R_B denotes the reservation price of the bundle and R_i denotes the reservation price of commodity i.
    e. Consumers are not uniform but differ in their respective R_B, R_1, and R_2.
    f. Consumers can be divided into groups based on their preferences and a given set of price offers.
4. Distinguish pure and mixed bundling strategies and determine the optimal bundling strategy given data on reservation prices for different groups.
5. Give examples of several types of tie-in sales.
6. Determine appropriate prices for tied goods.
7. Explain how market leverage can be used to enhance profits. The student will be able to explain the idea of complementary products and relate this to the incentives to bundled or unbundled products.
8. Solve models of monopoly firms who produce complementary products. The student will be able to relate the results of this model to the idea of market externalities and market coordination.
9. Discuss some of the major anti-trust cases involving tie-in sales and commodity bundling.
10. Understand that bundling and tying can be part of a competitive equilibrium and not necessarily aimed at squeezing out rivals.

Suggested Lecture Outline:

Spend two fifty-minute long lectures on this chapter.

Lecture 1:

1. Product tie-ins and commodity bundling
2. Commodity bundling as a way to price discriminate
3. Required tie-in sales with variable proportions

Lecture 2:

1. Complementary goods and network externalities
2. Antitrust policy, bundling, and tie-in sales

Suggestions for the Instructor:

1. Take plenty of time to present the Figures.
2. It is probably useful to point out that there are seldom analytical solutions to mixed bundling problems and so some trial and error is usually necessary to find the optimal strategy.
3. Some classroom discussion of incompatible products and services in conjunction with tie-in sales is useful. Get the students to bring up examples of where this is common and also where the use of "genuine" replacement parts is common.
4. The nuts and bolts example is very important for future chapters and should be covered here. This is not an item to skip because of lack of time.
5. Point out that the basic principle of interrelated demands holds even when the relationship is not one-to-one as in the nut and bolt example.

Solution to the End of the Chapter Problems:

Problem 1

By allowing the students to pick and choose rather than buying a bundle, each group is getting one of the items at a price well below their reservation price. While the sleepers get no consumer surplus from the meal plan price of $2,500, they get $2,500 in consumer surplus from the dorm price of $3,000 or the package price of $5,500. Similarly, the eaters get surplus $3,500 from the meal plan price of $2,500 or the package price of $5,500. By creating a bundle the university can capture a large amount of this consumer surplus. Assuming all students need to sleep and eat, a package price of $8,000 would significantly raise revenue. This would exhaust all the surplus of the sleepers and all but $1,000 of the surplus of the eaters.

Problem 2

a	
$0 \leq a < 7$	Profit without bundling is larger than profit with (pure) bundling.
$a = 7$	Profit without bundling equals the profit with (pure) bundling.
$7 \leq a < 30$	Profit with (pure bundling) is larger than profit without bundling.
$30 \leq a \leq 60$	Profit without bundling equals the profit with (pure) bundling.
$a > 60$	Profit without bundling is larger than profit with (pure) bundling.

Problem 3

(a) This allowed them to effectively charge more to the large users since the margin is constant but the total cost is proportional to sales of paper. This is analogous to the Xerox example in the text.

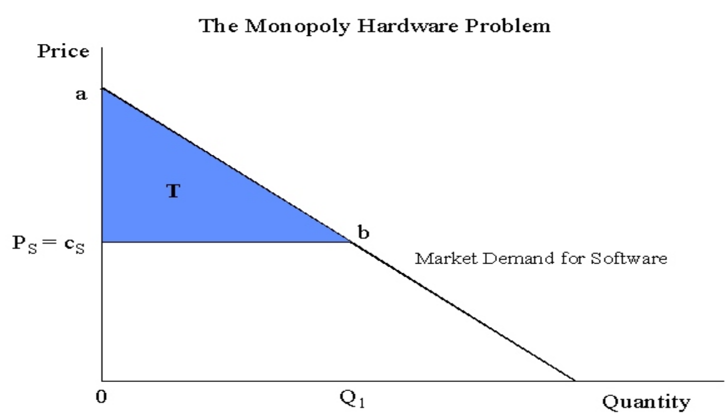
(b) The high markup on Electrofax paper soon attracted new firms offering to supply the paper at a much lower price than the Electrofax producers. What would you predict would be the response of the Electrofax producers to this competition?

A number of responses might be in order.

1. Promote the quality of the paper sold by Electrofax. When selling the machine present lots of material on the importance of using only genuine Electrofax paper. Try to show that the competition's paper is of inferior quality.
2. Void any warranty on the machine if paper other than Electrofax paper is used.
3. Refuse to repair the machine (even if not under warranty) if other than Electrofax paper is used.
4. Make the firms sign a long-term contract to buy paper from Electrofax when the machine is purchased.
5. Don't sell spare parts and don't fix machines that have used competitors' paper.
6. Offer two prices for the machine, a regular price that is quite high and a discounted price that requires the purchase of Electrofax paper.
7. Sell the machine and a certain amount of paper as a bundle and offer the machine alone only if the firm agrees to buy all paper from Electrofax.
8. Bundle the paper with something else like the replenishing fluid (like ink).
9. Realize that market power or the ability to price discriminate is fading and raise the price of the machine and lower the price of paper.

Problem 4

(a) The important point here is that the products are complementary and software is basically useless without the hardware. The software will be priced at cost since the market is competitive, that is $P_S = c_S$. The easiest way to view this problem is to think of HAL as the amusement park or club owner from Chapter 3 who wants to get as much surplus from the consumer as possible. Because the hardware is necessary to use the software, HAL can set a price that will just appropriate the entire consumer surplus from the software consumers. Consider the diagram below.



The market demand for software shows the willingness to pay to software services. With a competitive software sector the price will be c_S. The total amount that HAL can charge for the total number of computers is given by the area abc_S (T). Because all the consumers are the same, HAL can simply divide this amount by the number of consumers to get a price per machine or customer. If the competitive software price fell, the total price for hardware could be increased as the area T increased. Similarly, if the price of software rose, the amount of consumer surplus that could be extracted would fall. It is clear that with a competitive software sector, any consumer surplus appropriated in this market will go to HAL.

(b) The purchase of a software firm will not have a large impact on the profits of HAL since HAL was receiving monopoly rents beforehand. In fact HAL was getting all the rents in the market beforehand. The acquisition of the software firm allows HAL to tie the products. The optimal two-part tariff would be to set the price of the software at marginal cost and set the hardware price equal to the amount of consumer surplus at that price and quantity. But that is what was happening before the acquisition, so there is no benefit from such an acquisition.

Problem 5

(a) Because many of the customers riding from Philadelphia to Washington are actually passengers who originated in New York., the LRW Line and the NSRR are two complementary products. Noncooperative pricing will then lead to inefficient price just as in the nuts and bolts example. Cooperative pricing will make it possible to offer a ride from New York to Washington at a price that raises the surplus for consumer and producers, alike.

(b) Clearly, the entry by LRW into the Philadelphia-Washington market will hurt NSRR. The latter now faces competition in its only market whereas it faced none earlier. There is a good chance, therefore, that NSRR will wish to block LRW's move. One way to do this is to file an antitrust law suit claiming that LRW's action is aimed at preventing NSRR from entering the New York-to-Washington market and is therefore anticompetitive. However, LRW can respond that it is simply working to eliminate the inefficiency pricing that results from noncooperative pricing and, as a happy by-product, is bringing competitive pressures to bear in the Philadelphia-Washington market. Since NSRR is still free to enter the New York-Philadelphia market, it is difficult to see any real justification for the claim of an antitrust violation or that antitrust policy makers should respond to this development. However, if there is not room for two services, each fully connected from New York to Washington with a stop in Philadelphia, then there may be concern. If the easy access to the New York-to-Washington ride gives LRW an advantage overall, it may be able to drive NSRR from the market and then enter as an unthreatened monopoly.

Problem 6

(a) Now demand for each product is still 150 implying an average fixed cost for each drug of \$300/150 = \$2. When added to the marginal cost of \$4, the break-even price is \$6. Since the average cost for a bundle is \$(300/50) + \$7 = \$13, which is more than what the consumer who want a combined medication currently pay \$12. Therefore, the equilibrium product offering would be two separate products at an associate price of \$6 for each remedy.

(b) Now demand for a pain relief is 200 implying an average fixed cost of \$300/200 = \$1.5 and demand for a decongestant is 150 implying an average fixed cost of \$300/150 = \$2. When added to the marginal cost of \$4, the break-even price is \$5.5 for a pain relief and \$6 for a decongestant. However, since the average cost for a bundle is \$(300/100) + \$7 = \$10, which is less than what the consumers who want a combined medication currently pay \$11.5. Any firm could enter the market and sell just the bundle for \$10. In turn, the impossible continued offering of the two separate products would push all 250 consumers to buy the bundle at which point the break-even price for the bundle drops to \$(300/250) + \$7 = \$8.2. Therefore, the equilibrium product offering would be the bundle product at an associate price of \$8.2.