PRICING WITH MARKET POWER (Continued)

TYPES OF BUNDLING

- Mixed Bundling: Selling both as a bundle and separately
- Pure Bundling: Selling only a package

MIXED VERSUS PURE BUNDLING

MIXED VS. PURE BUNDLING: SCENARIO

- Perfect negative correlation
- Significant marginal cost

Observations

Reservation price is below MC for some consumers. Mixed bundling induces the consumers to buy only goods for which their reservation price is greater than MC.

BUNDLING EXAMPLE

- Sell Separately
  Consumers B, C, and D buy 1 and A buys 2
- Pure Bundling
  Consumers A, B, C, and D buy the bundle
- Mixed Bundling
  Consumer D buys 1, A buys 2, and B & C buys the bundle

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>PB</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell separately</td>
<td>$50</td>
<td>$90</td>
<td>----</td>
<td>$150</td>
</tr>
<tr>
<td>Pure bundling</td>
<td>----</td>
<td>----</td>
<td>$100</td>
<td>$200</td>
</tr>
<tr>
<td>Mixed bundling</td>
<td>$89.95</td>
<td>$89.95</td>
<td>$100</td>
<td>$229.90</td>
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</tbody>
</table>
C_1 = $20
C_2 = $30

Sell Separately
3($50 - $20) + 1($90 - $30) = $150

Pure Bundling
4($100 - $20 - $30) = $200

Mixed Bundling
($89.95 - $20) + ($89.95 - $30) - 2($100 - $20 - $30) = $229.90
C_1 = $20  C_2 = $30

Question
If MC = 0, would mixed bundling still be the most profitable strategy with perfect negative correlation?

MIXED BUNDLING WITH ZERO MARGINAL COSTS

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<tr>
<td>Sell separately</td>
<td>$80</td>
<td>$80</td>
<td>----</td>
<td>$320</td>
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<tr>
<td>Pure bundling</td>
<td>----</td>
<td>----</td>
<td>$100</td>
<td>$400</td>
</tr>
<tr>
<td>Mixed bundling</td>
<td>$90</td>
<td>$90</td>
<td>$120</td>
<td>$420</td>
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BUNDLING IN PRACTICE
- Automobile option packages
- Vacation travel
- Cable television
- Mixed Bundling in Practice
  - Use of market surveys to determine reservation prices
  - Design a pricing strategy from the survey results
The Complete Dinner vs. a la Carte: A Restaurant’s Pricing Problem

- Pricing to match consumer preferences for various selections
- Mixed bundling allows the customer to get maximum utility from a given expenditure by allowing a greater number of choices.

**Bundling**

Tying is a practice of requiring a customer to purchase one good in order to purchase another.

Examples
- Xerox machines and the paper
- IBM mainframe and computer cards

Allows the seller to meter the customer and use a two-part tariff to discriminate against the heavy user

- McDonald’s
  Allows them to protect their brand name.

**ADVERTISING**

Assumptions
- Firm sets only one price
- Firm knows $Q(P,A)$

How quantity demanded depends on price and advertising
EFFECTS OF ADVERTISING

ADVERTISING
Choosing Price and Advertising Expenditure

\[ \pi = PQ \cdot (P, A) - C(Q) - A \]

\[ MR_{Ads} = P \frac{\Delta Q}{\Delta A} = 1 + MC \frac{\Delta Q}{\Delta A} = \text{full MC of adv.} \]

A RULE OF THUMB FOR ADVERTISING

\[ (A/Q)\frac{\Delta Q}{\Delta A} = E_A = \text{Adv. elasticity of demand} \]

\[ (P - MC)/P = -1/E_p \]

\[ \frac{A}{PQ} = -(E_A/E_p) = \text{Rule of Thumb} \]

To maximize profit, the firm’s advertising-to-sales ratio should be equal to minus the ratio of the advertising and price elasticities of demand.

- R(Q) = $1 million/yr
- $10,000 budget for A (advertising--1% of revenues)
- \( E_A = .2 \) (increase budget $20,000, sales increase by 20%)
- \( E_p = -4 \) (markup price over MC is substantial)

Question
Should the firm increase advertising?
YES

- \( \frac{A}{PQ} = -(2/-4) = 5\% \)
- Increase budget to $50,000

Questions
When $E_A$ is large, do you advertise more or less?
When $E_P$ is large, do you advertise more or less?

Advertising: In Practice
Estimate the level of advertising for each of the firms

- Supermarkets    $E_P = -10; E_A = 0.1$ to $0.3$
- Convenience stores $E_P = -5; E_A = \text{very small}$
- Designer jeans   $E_P = -3$ to $-4; E_A = 0.3$ to $1$
- Laundry detergents $E_P = -3$ to $-4; E_A = \text{very large}$