Part 2

Price Discrimination (Chapter 12)

Price Discrimination Summary

1st Degree

The monopolist charges each consumer the maximum price he/she is willing to pay.

2nd Degree

Price varies according to quantity demanded, i.e. quantity discount.

3rd Degree

The monopolist charges different prices for different consumer groups.

3rd Degree Price Discrimination

For the monopolist to implement the **3rd Degree PD**, it has to be able to "**screen**" consumers.

Screening is a process for sorting consumers based on their characteristics.

These characteristics can be

- Observable, e.g. sex and age.
- Unobservable but inferable, e.g. PED and willingness to pay.

3rd Degree Price Discrimination

Two Interesting Screening Mechanisms

Time

- Some consumers want to be the first who own the product.
- Sellers price goods higher when they are first introduced.

Coupons and Rebates (a partial refund)

- For example, you buy a printer ink cartridge for $20, when it is empty, you can send it to the seller and get a rebate of $2.
- Consumer who take time to process rebates shows that they are price-sensitive.
- Sellers will offer lower prices for these consumers.

3rd Degree Price Discrimination

3rd Degree Price Discrimination with Capacity Constraints

Capacity Constraints: Production or supply of goods is limited, e.g. seats of airlines, cars of car rentals, etc.

Suppose that the monopolist can produce up to Q' units.

It is to supply Q' units of output in two market segments.

How should it allocate Q' between these two segments?

3rd Degree Price Discrimination

3rd Degree Price Discrimination with Capacity Constraints

Let Q1 be quantity supplied to Segment 1
Q2 be quantity supplied to Segment 2

It should allocate Q' = Q1 + Q2
such that MR(Q1) = MR(Q2).

If MR(Q1) > MR(Q2), it can increase revenue and hence profit by supplying more quantity in Segment 1.

3rd Degree Price Discrimination

LEARNING-BY-DOING EXERCISE 12.6

Price Discrimination Subject to Capacity Constraints

This exercise shows you how to determine the profit-maximizing prices and quantities for a firm that wants to engage in third-degree price discrimination but operates with a capacity constraint.

Suppose that the demand curve in market segment 1 is $Q_1 = 200 - 2P_1$ and the demand curve in market segment 2 is $Q_2 = 250 - P_2$. The marginal cost of selling in each market segment is \$10 per unit. The firm's overall capacity is 150 units.

Problem What are the profit-maximizing quantities and prices in each market segment?

Third Degree Price Discrimination

Implementing the 3rd Degree Price Discrimination

Suppose the monopolist cannot "screen" consumers.

How can it ensure that the consumers targeted to pay the high price ACTUALLY pay the high price?

Versioning refers to a strategy of selling two or more versions of a product with different quality levels at different prices.

Versioning takes advantage of the trait that the least price-sensitive buyers tend to be the most quality-sensitive.

Third Degree Price Discrimination

Implementing the 3rd Degree Price Discrimination

Damaged Goods Strategy refers to a versioning strategy in which the firm creates a low-end version of its full-price good by deliberately damaging the product.

For example, one version of a 1990 IBM laser printer was "added" chips to slow down printing speed.

Other examples include goods in shopping outlets.

Tie-in Sales

Apart from Price Discrimination, ANY FIRMS with market power have another technique that can be used to "capture" surplus from consumers.

Definition: A **tie-in sale** occurs if customer can buy one product ONLY IF they agree to purchase another product as well. Examples include printers and ink cartridges, photocopiers and papers, computers and monitors, etc.

The firm can extend its market power from one product to the other.

Tie-in Sales – Bundling

Package tie-in sales *(or **bundling**)* occur when goods are combined so that customers cannot buy either good separately.

For example, one Disney Land ticket includes “admission fee” and “roller coaster fee”.

Bundling may be used in place of price discrimination to increase producer surplus when consumers have different willingness to pay for the goods sold in the bundle.

Bundling MAY NOT increase profit.

Tie-in Sales – Bundling

TABLE 12.2 Bundling Can Increase Profit When Customer Preferences Are Negatively Correlated

	Reservation Price (maximum willingness to pay)	
	Computer	**Monitor**
Customer 1	$1,200	$600
Customer 2	$1,500	$400
Marginal cost	$1,000	$300

WITHOUT Bundling

Max. profit from computer = 500, i.e. sold to Customer 2.

Max. profit from monitor = 300, i.e. sold to Customer 1.

Max. total profit = 500 + 300 = 800.

Tie-in Sales – Bundling

TABLE 12.2 Bundling Can Increase Profit When Customer Preferences Are Negatively Correlated

	Reservation Price (maximum willingness to pay)	
	Computer	Monitor
Customer 1	$1,200	$600
Customer 2	$1,500	$400
Marginal cost	$1,000	$300

WITH Bundling (MC = 1300)

At P* = 1800, BOTH customers buy the bundle.
Total Profit = 500 x 2 = 1000.
At P = 1900, ONLY Customer 2 buys the bundle.
Total Profit = 600.

Tie-in Sales – Bundling

TABLE 12.3 Bundling Does Not Increase Profit When Customer Preferences Are Positively Correlated

	Reservation Price (maximum willingness to pay)	
	Computer	**Monitor**
Customer 1	$1,200	$400
Customer 2	$1,500	$600
Marginal cost	$1,000	$300

WITHOUT Bundling

Max. profit from computer = 500, i.e. sold to Customer 2.
Max. profit from monitor = 300, i.e. sold to Customer 2.
Max. total profit = 500 + 300 = 800.

Tie-in Sales – Bundling

TABLE 12.3 Bundling Does Not Increase Profit When Customer Preferences Are Positively Correlated

	Reservation Price (maximum willingness to pay)	
	Computer	**Monitor**
Customer 1	$1,200	$400
Customer 2	$1,500	$600
Marginal cost	$1,000	$300

WITH Bundling (MC = 1300)

At P = 1600, BOTH customers buy the bundle.
Total Profit = 300 x 2 = 600.
At P* = 2100, ONLY Customer 2 buys the bundle.
Total Profit w/ Bundling = 800 = Total Profit w/o Bundling

Tie-in Sales – MIXED Bundling

Mixed Bundling is when firms allow customers to purchase components individually as well as in bundles.

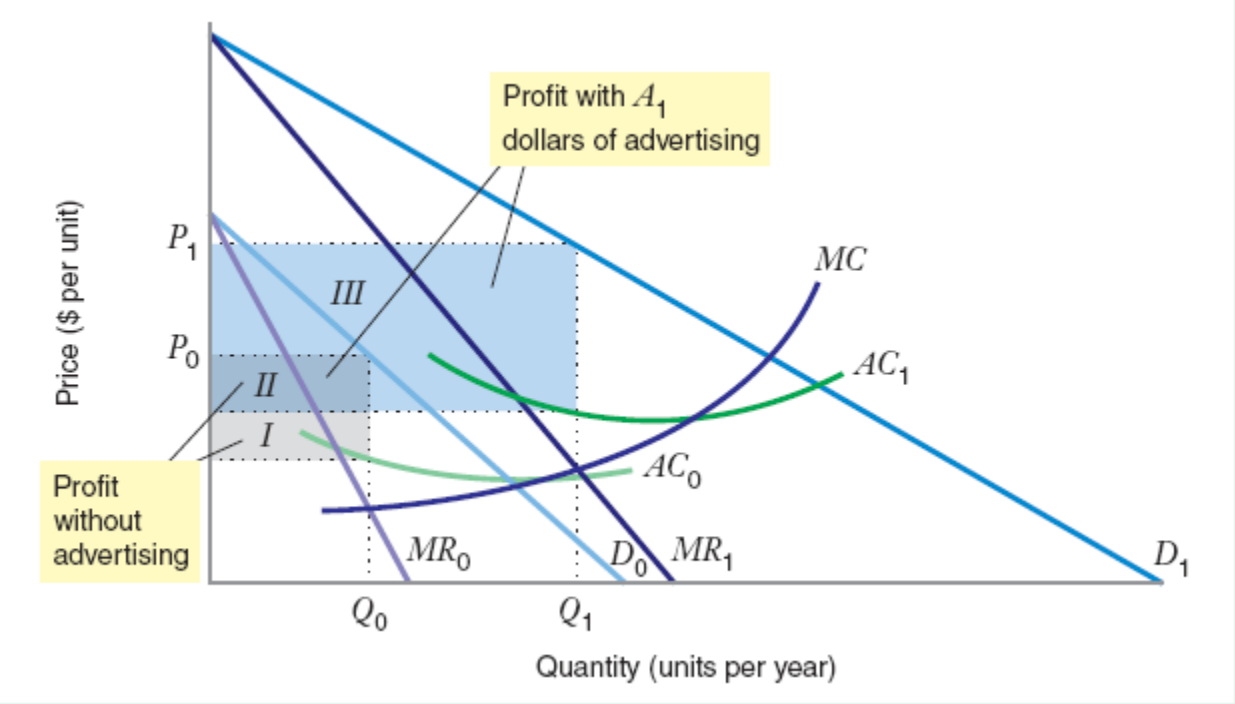
- The firm should sell only computer to Customer 4.
- It should sell only monitor to Customer 1.
- For Customers 2 and 3, it can offer bundles.

TABLE 12.4 Mixed Bundling Can Increase Profit

	Reservation Price (maximum willingness to pay)	
	Computer	**Monitor**
Customer 1	$ 900	$800
Customer 2	$ 1,100	$600
Customer 3	$1,300	$400
Customer 4	$1,500	$200
Marginal cost	$1,000	$300

Advertising

The firm can capture surplus using ***non-price strategies*** such as advertising.



Advertising

Advertising comes with costs; therefore, for a firm to maximize profit, two conditions must hold:

1) Quantity is optimally chosen:

$$MR(Q) = MC(Q)$$

2) Expenditure on Advertising is optimally chosen:

$$MR(A) = MC(A)$$

Advertising

Recall the Inverse Elasticity Pricing Rule (IEPR):

$$\frac{P - MC}{P} = -\frac{1}{\varepsilon}$$

The IEPR tells us the profit-maximizing price.

We can derive a similar expression for a profit-maximizing firm to choose the optimal level of advertising:

$$\frac{A}{PQ} = -\frac{\theta}{\varepsilon}$$

where θ is the advertising elasticity of demand.

LHS = ratio of advertising expenditure to TR
RDH = ratio of the two elasticities

Advertising

LEARNING-BY-DOING EXERCISE 12.7

Markup and Advertising-to-Sales Ratio

Suppose you own a restaurant specializing in fine steak dinners, and you want to maximize your profits. Your marketing studies have revealed that your own price elasticity of demand is -1.5 and that your advertising elasticity of demand is 0.1. Assume that these elasticities are constant, even if you change your price and your level of advertising.

Problem

(a) Interpret the advertising elasticity of demand.

(b) How much should you mark up your price over marginal cost of your dinners? What should your advertising-to-sales ratio be?