

### **3rd degree price discrimination - a closer look**

How to do third degree price discrimination:

First, separate the buyers of your product into at least two groups that vary based upon the demand for the product.

Second, determine the profit-maximizing price to charge for your product, charging a higher price to members of groups with higher demand

Example: **Beer at a nightclub**

High demand group: Men

Low demand group: Women

Charge men a higher price per beer than women

Example: **Ocean cruises**

High demand group: Younger people

Low demand group: Older people

Charge younger people a higher price per cruise than older people

Example: **A prescription drug**

High demand group: U.S. buyers

Low demand group: Buyers in Mexico

Charge the U.S. buyers a higher price per pill than the buyers in Mexico

Warning: **Make sure that arbitrage among the groups is difficult or impossible.**

Example of arbitrage ruining your pricing scheme:

Suppose that cruise ship tickets can be transferred among folks. In this case, old people would buy tickets for a cruise, then re-sell them on eBay to younger people for a profit. The cruise line would sell only cheap tickets to old people and lose out on higher-priced sales to young people.

(Solution: make cruise tickets non-transferable).

The point of 3rd degree price discrimination: Higher profits

If executed properly, 3rd degree price discrimination will result in higher profits for the firm (compared to a situation in which it always charged the same price for its product).

Warning: If executed improperly, price discrimination will result in lower profit. (Example: Ford used to sell a lot of cars cheaply to car rental companies. But too many regular consumers would avoid buying new Fords because their resale values were very low due to the many formal rental Ford cars flooding the used car market.)

A prescription drug example. You sell a prescription drug in both Mexico and the U.S. It costs \$1.25 to produce and sell each pill in either country

Demand for your drug in Mexico is:

$$Q_{\text{mexico}} = 8 - 2P_{\text{mexico}}$$

(Pesos have been converted to U.S. dollars already)

Demand for your drug in the U.S. is

$$Q_{\text{U.S.}} = 10 - 1P_{\text{U.S.}}$$

What should you do in Mexico?

| $P_{\text{mexico}}$ | $Q_{\text{mexico}}$ | total revenue | total cost | total profit |
|---------------------|---------------------|---------------|------------|--------------|
| \$ 4.00             | 0                   | \$ -          | \$ -       | \$ -         |
| \$ 3.50             | 1                   | \$ 3.50       | \$ 1.25    | \$ 2.25      |
| \$ 3.00             | 2                   | \$ 6.00       | \$ 2.50    | \$ 3.50      |
| \$ 2.50             | 3                   | \$ 7.50       | \$ 3.75    | \$ 3.75      |
| \$ 2.00             | 4                   | \$ 8.00       | \$ 5.00    | \$ 3.00      |
| \$ 1.50             | 5                   | \$ 7.50       | \$ 6.25    | \$ 1.25      |
| \$ 1.00             | 6                   | \$ 6.00       | \$ 7.50    | \$ (1.50)    |
| \$ 0.50             | 7                   | \$ 3.50       | \$ 8.75    | \$ (5.25)    |
| \$ -                | 8                   | \$ -          | \$ 10.00   | \$ (10.00)   |

What should you do in the U.S.?

| $P_{US}$       | $Q_{US}$ | total revenue   | total cost     | total profit    |
|----------------|----------|-----------------|----------------|-----------------|
| \$ 10.00       | -        | \$ -            | \$ -           | \$ -            |
| \$ 9.00        | 1        | \$ 9.00         | \$ 1.25        | \$ 7.75         |
| \$ 8.00        | 2        | \$ 16.00        | \$ 2.50        | \$ 13.50        |
| \$ 7.00        | 3        | \$ 21.00        | \$ 3.75        | \$ 17.25        |
| <b>\$ 6.00</b> | <b>4</b> | <b>\$ 24.00</b> | <b>\$ 5.00</b> | <b>\$ 19.00</b> |
| \$ 5.00        | 5        | \$ 25.00        | \$ 6.25        | \$ 18.75        |
| \$ 4.00        | 6        | \$ 24.00        | \$ 7.50        | \$ 16.50        |
| \$ 3.00        | 7        | \$ 21.00        | \$ 8.75        | \$ 12.25        |
| \$ 2.00        | 8        | \$ 16.00        | \$ 10.00       | \$ 6.00         |
| \$ 1.00        | 9        | \$ 9.00         | \$ 11.25       | \$ (2.25)       |
| \$ -           | 10       | \$ -            | \$ 12.50       | \$ (12.50)      |

5103-unit11-3 Page 9

Summary with third degree price discrimination:

Charge \$2.50 per pill in Mexico, sell 3 pills, have profits of \$3.50 in Mexico

Charge \$6 per pill in the U.S., sell 4 pills, have profits of \$19.00 in the U.S.

Total: Sell 3 + 4 = 7 pills

Total profits: \$3.50 + \$19 = **\$22.50**

5103-unit11-3 Page 10

Suppose that new world treaties require that you charge the same price per pill in Mexico as you do in the U.S. What should you do?

5103-unit11-3 Page 11

| P          | Qmexico=<br>8-2P | Qus=<br>10-P | total<br>revenue | total<br>cost  | total<br>profits |
|------------|------------------|--------------|------------------|----------------|------------------|
| \$10       | 0                | 0            | \$0              | \$ -           | \$0.00           |
| \$9        | 0                | 1            | \$9              | \$ 1.25        | \$7.75           |
| \$8        | 0                | 2            | \$16             | \$ 2.50        | \$13.50          |
| \$7        | 0                | 3            | \$21             | \$ 3.75        | \$17.25          |
| <b>\$6</b> | <b>0</b>         | <b>4</b>     | <b>\$24</b>      | <b>\$ 5.00</b> | <b>\$19.00</b>   |
| \$5        | 0                | 5            | \$25             | \$ 6.25        | \$18.75          |
| \$4        | 0                | 6            | \$24             | \$ 7.50        | \$16.50          |
| \$3.50     | 1                | 6            | \$25             | \$ 8.75        | \$15.75          |
| \$3        | 2                | 7            | \$27             | \$ 11.25       | \$15.75          |
| \$2.50     | 3                | 7            | \$25             | \$ 12.50       | \$12.50          |
| \$2        | 4                | 8            | \$24             | \$ 15.00       | \$9.00           |
| \$1.50     | 5                | 8            | \$20             | \$ 16.25       | \$3.25           |
| \$1        | 6                | 9            | \$15             | \$ 18.75       | (\$3.75)         |
| \$0.50     | 7                | 9            | \$8              | \$ 20.00       | (\$12.00)        |
| \$0.00     | 8                | 10           | \$0              | \$ 22.50       | (\$22.50)        |

5103-unit11-3 Page 12

Summary with no price discrimination:

Charge \$6 per pill in the U.S. and in Mexico, sell 4 pills in the U.S. and 0 in Mexico, have profits of \$19.00 (all from the U.S.).