

# EE481: Industrial Economics

## Price Discrimination (Part 1)

Dr. Wanwiphang Manachotphong

Department of Economics, Thammasat University

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# What you have learned in microeconomics

Price-discrimination = charging the consumers different prices for the same product. (firms would like to extract more consumer surplus)

We examine three questions

- Firms have to have some market power in order to price discriminate.
- Price discrimination can be categorized into 3 types
  - 1 First-degree - perfect price discrimination
  - 2 Second-degree -
  - 3 Third-degree -

## Perfect Price Discrimination (First-Degree)

- Firm can identify the willingness to pay of every consumer.
- No dead-weight loss  $\rightarrow$  efficient but may not be fair.

## Third-Degree Price Discrimination

- Monopoly pricing for “each group” of consumers. So, there will be some deadweight loss.

## Third-Degree Price Discrimination (maths)

Recall from the derivation of  $\frac{P - mc}{P}$  in the SCP chapter.

$$\frac{P - mc_i}{P} = \frac{s_i}{\varepsilon},$$

where  $mc_i$  is firm  $i$ 's marginal cost,  $s_i$  is firm  $i$ 's market share in an oligopoly market,  $\varepsilon$  is the elasticity of the demand curve (the flatter, the more elastic).

## Second-Degree Price Discrimination

Price discrimination can be categorized into 3 types according to the completeness of information

- 1 First-degree - firm observes the willingness to pay of EACH buyer.
- 2 Second-degree - firm does not observe the willingness to pay of EACH buyer....
- 3 Third-degree - firm observes the willingness to pay of EACH GROUP of buyers.

Some forms of second-degree price discrimination

- Two-part tariff
- Multi-part tariff
- 
- Bundling, Tie-in sale

## Second-Degree Price Discrimination

Second-degree price discrimination is a form of non-linear pricing  
Nonlinear Pricing = consumer's price per unit is not a constant

- Second-degree price discrimination uses the nonlinear pricing method to extract welfare from consumers.

## Examples of Two-Part Tariff

Firm changes a lump-sum fee AND a per-unit fee.

| Product       | Lump-sum | Per-unit fee |
|---------------|----------|--------------|
| Golf Course   |          |              |
| Football Game |          |              |
| Nintendo Wii  |          |              |
| Printer       |          |              |
| Bank Loan     |          |              |

# A Single Two-Part Tariff

- Suppose there are 2 types of consumers
  - 1 the High willingness to pay (high-type)
  - 2 The Low willingness to pay (low-type)

## Two Two-Part Tariff

- Firms can increase their profits from offering two two-part tariff instead of a single two-part tariff
  - different collateral-interest rate combinations
  - different co-payment and insurance premium combinations
  - offering buffet or a'-la-carte

# The low-type usually get most of their surplus extracted

- Suppose there are 2 types of consumers.
  - Type 1 (Low-type) : has a low valuation of the product
  - Type 2 (High-type) : has a high valuation of the product
- First, Suppose the company design a two-part tariff that extracts all surplus from the low-type

## If only 1 two-part tariff is offered the high-type buys more q

- Suppose this company offers only 1 two-part tariff (call tariff  $a$ ) the high-type would maximize their utility by choosing at point “ $B$ ”
  - Type 1 chooses  $\{E_1^a, q_1^a\}$
  - Type 2 chooses  $\{E_2^a, q_2^a\}$

## Type 2 has more surplus for firm to extract

- Let's suppose firm would like to extract more surplus from Type 2.
- This can be done by moving the expenditure outlay for type 2 up and up.  
(Assume Parallel Shifts for now)
- As long as Type 2's indifference curve is below point "A", Type 2 consumer would not choose point "A".
- Firm now offers ONLY "A" and "D", or package  $\{E_1^a, q_1^a\}$  and  $\{E_2^d, q_2^d\}$ .
- You can check that type 1 would choose  $\{E_1^a, q_1^a\}$  and type 2 would choose  $\{E_2^d, q_2^d\}$ .

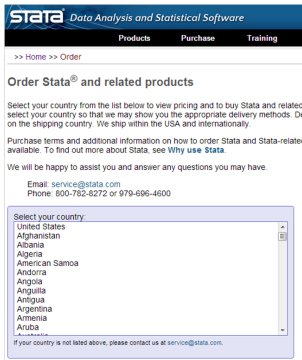
## Firm can maximize expenditure from type 2

- Firm can earn even more expenditure from type 2 if it adjusts the expenditure outlay (to achieve the highest that just touches type 2's indifference curve).
- This usually results in a higher fixed fee and a lower variable fee
- Firm now offers "A" and "C" only, or package  $\{E_1^a, q_1^a\}$  and  $\{E_2^c, q_2^c\}$ .

## Can this be done in the real world?

- In the real world, it is hardly possible to figure out what would be the right  $E$  and  $q$  for each type, let alone there are usually more than 2 types of customers.
- A store membership card that you pay a fixed fee, but get some % discount is a kind of two two-part tariff.

# Is this a 1st, 2nd or 3rd degree price discrimination?



Then choose ->



Price per a single-user STATA SE version license

- Business = \$1,695, Educator = \$895, Government = \$1,695

# Is this a 1st, 2nd or 3rd degree price discrimination?

| Oxford tube                                                  |      |                                            |               |                                                                                                                             |      |
|--------------------------------------------------------------|------|--------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------|------|
| BUY TICKETS   TUBE FARES   TUBE TIMES   TUBE STOPS   WHAT TO |      |                                            |               |                                                                                                                             |      |
| Tube Fares                                                   |      |                                            |               |                                                                                                                             |      |
| Single                                                       |      | Return<br>Day/Next Day                     |               | Period Return<br>Within 3 months                                                                                            |      |
| Adult                                                        | £ 14 | Adult                                      | £ 16          | Adult                                                                                                                       | £ 20 |
| Student / Over 60                                            | £ 11 | Student / Over 60                          | £ 13          | Student / Over 60                                                                                                           | £ 15 |
| Under 16                                                     | £ 7  | Under 16                                   | £ 8           | Under 16                                                                                                                    | £ 10 |
|                                                              |      | Groups                                     | £ 35          | Groups                                                                                                                      | £ 40 |
| Nightrider                                                   |      | Tube 12                                    |               | Kids 4 free                                                                                                                 |      |
|                                                              |      | <u>On Board</u>                            | <u>Online</u> | Up to 2 children under 16 travel free when accompanied by a fare-paying adult (excluding Tube-12), any day except Saturday. |      |
| Adult                                                        | £ 14 | Adult                                      | £ 72          |                                                                                                                             |      |
| Student / Over 60                                            | £ 11 | Student / Over 60                          | £ 62          |                                                                                                                             |      |
| Under 16                                                     | £ 7  | Under 16                                   | £ 36          |                                                                                                                             |      |
| Return for the price of a single                             |      | 12 single journeys for use within one year |               |                                                                                                                             |      |

# Is this a 1st, 2nd or 3rd degree price discrimination?

- Different Mobile Internet Packages by AIS:

| Monthly Fee<br>(THB)                                | Conditions           |           |
|-----------------------------------------------------|----------------------|-----------|
|                                                     | 3G/EDGE <sup>+</sup> | Wifi      |
| 149                                                 | 150 MB               | -         |
| 350<br>₩ AIS Music Store                            | 1 GB                 | -         |
| 550                                                 | 2 GB                 | unlimited |
| <b>HOT</b> 799                                      | unlimited            | unlimited |
| 899<br>₩ e-magazine 10 เล่ม<br>₩ e-newspaper 6 ฉบับ | unlimited            | unlimited |
| 999<br>₩ e-magazine 10 เล่ม<br>₩ e-newspaper 6 ฉบับ | unlimited            | unlimited |

# Is this a 1st, 2nd or 3rd degree price discrimination?

- Kinokuniya Membership Card costs THB 500/year.
- Gives a 10% discount on all full priced books.

## KINOKUNIYA CARD

Be rewarded every time you shop.



Receive 10% discount\* on full priced books, DVDs and selected figurines in the Comics Department every time you shop with us.

Your Kinokuniya Card can also be used for online and phone orders. Please quote your membership number when placing an order.

# Is this a 1st, 2nd or 3rd degree price discrimination?

|  Mercedes-Benz |      |              |                                      |             |
|-------------------------------------------------------------------------------------------------|------|--------------|--------------------------------------|-------------|
| Price List                                                                                      |      |              |                                      |             |
| ประกาศใช้ตั้งแต่วันที่ 21 สิงหาคม 2555                                                          |      |              |                                      |             |
| (Model)                                                                                         | รุ่น | Engine (CCI) | กำลังเครื่องยนต์ (ลิตรวัตต์/ แรงม้า) | Price (THB) |
| The new generation C-Class                                                                      |      |              |                                      |             |
| C 200 BlueEFFICIENCY                                                                            |      | 1,796        | 135/184                              | 2,149,000 * |
| C 220 CDI BlueEFFICIENCY                                                                        |      | 2,143        | 125/170                              | 2,499,000   |
| C 200 BlueEFFICIENCY ELEGANCE                                                                   |      | 1,796        | 135/184                              | 2,739,000 * |
| C 200 BlueEFFICIENCY AVANTGARDE                                                                 |      | 1,796        | 135/184                              | 2,929,000 * |
| C 250 CDI BlueEFFICIENCY AVANTGARDE                                                             |      | 2,143        | 150/204                              | 3,180,000   |
| C 250 BlueEFFICIENCY AVANTGARDE                                                                 |      | 1,796        | 150/204                              | 3,249,000 * |

# Is this a 1st, 2nd or 3rd degree price discrimination?

- iPhone's price drops when the new model comes out.
  - iPhone5S (coming soon 23,500), iPhone5C (coming soon 19,500), iPhone 4S (14,900 THB).



# Practice Problems

- No need to submit this homework. But these problems will help prepare you for the exams.
- ① (Church and Ware) Chapter 5, problem 3.
- ② (Carlton and Perloff) Chapter 10, Problem 3, 5.

## Reference and Further Reading I



Carlton, D.W. and J.M., Perloff.  
*Modern Industrial Organization*. 4th Edition.  
Pearson Addison Wesley Press, 2005.



Grabowski, H., and J. Vernon. *Brand Loyalty, Entry and Price Competition in Pharmaceuticals after the 1984 Drug Act*.  
Journal of Law and Economics 35: 331-50, 1992.