Monopoly Behavior
or
Price Discrimination
Chapter 25
Monopoly Pricing

- Uniform pricing: charging the same price to every customer
- Competitive firms are *price takers*, suffer losses if they don’t charge the one, uniform market price
- We’ve been thinking about the behavior of a monopolist charging a uniform price
- But, a monopolist is a *price maker*, free to set price, including non-uniformly
- Today: non-uniform pricing, especially price discrimination
- Price discrimination: different prices for different people
- Other non-uniform pricing schemes: two-part tariffs, bundling, tie-ins
Non-uniform Pricing

Price-discrimination earns a monopoly higher profits

- Non-discriminating firm faces tradeoff:
  - Charge high price for customers with high WTP
  - Charge low price and sell more units to more customers
  - Optimum typically involves compromise

- Price-discriminating firm avoids this tradeoff:
  - Charges higher price to those with high WTP capturing their consumer surplus
  - Charges lower price to those with less WTP generating extra sales
Example

- Movie theater, \( MC = 0 \): everyone fits, showing movie is costless, so \( \pi = \text{revenue} \)

- Potential audience: 10 college students WTP $10, 20 senior citizens WTP $5

- Uniform price = $5 \implies \pi = 5 \cdot 10 + 5 \cdot 20 = 50 + 100 = 150

- Uniform price = $10 \implies \pi = 10 \cdot 10 + 10 \cdot 0 = 100 = 100

- Price discriminate \implies \pi = 10 \cdot 10 + 5 \cdot 20 = 100 + 100 = 200
Intuition: why non-uniform pricing works in general

- Firm faces a profit-maximization problem
- Uniform prices is one tool to solve the problem
- Non-uniform pricing allows other, multiple tools
- This can only help solve the problem, at worst the extra tools are useless and you can choose not to use them
Conditions for Price Discrimination

- Firm has market power

- Consumers have different demand elasticities, firm can identify them

- Firm can prevent/limit resales from low-paying to high-paying customers
  - Resales difficult for services, when transaction costs are high
  - E.g. show student ID when buying student software, mail in class schedule
Three Types of Price Discrimination

- **Perfect price discrimination** (first-degree): sell each unit for consumer’s full reservation price; prices differ across buyers

- **Quantity discrimination** (second-degree): different price for larger quantities (bulk discounts); prices same for all buyers

- **Multimarket price discrimination** (third-degree): prices same within group, but different groups/markets are charged different prices
Perfect Price Discrimination

- All-knowing monopoly sells each unit at reservation price, height of demand curve
- Monopolist reaps all possible gains-from-trade, leaves buyers with zero surplus
- However, monopolist supplies efficient level of output, outcome is Pareto efficient

\[ \text{MC}(y) \]
\[ \text{PS} \]

$/output unit

\[ y^c \]

y

$p(y)$
Quantity Discrimination

- Hard to determine individual reservation prices
- But easy to know that most customers are willing to pay more for first unit than second (demand slopes down)
- Firm varies prices with number of units purchased
- E.g. utility block pricing, bulk discounts
Firm only knows which group/market is likely to have higher reservation prices

Different prices for different groups

E.g. theater example, airline classes, software pricing, coupons
Multimarket Price Discrimination

How does the monopolist maximize profits across markets?

- Choosing price for each market $\iff$ choosing quantity for each market
- $\pi(y_1, y_2) = p_1(y_1)y_1 + p_2(y_2)y_2 - c(y_1 + y_2)$
- Profit maximizing condition:

  \[ MR_1(y_1) = MR_2(y_2) = MC(y_1 + y_2) \]

- Equate MR across markets to $MC$
- If one market generated more marginal revenue than the other, could increase profits be shifting production to that market
\[ MR_1(y_1) = MR_2(y_2) = MC(y_1 + y_2) \]

- Demand differs across markets, so price will be different
- Where is price higher?
  - In the market with a higher markup
  - Markup = \[ \frac{1}{1 + \frac{1}{e}} \]
  - I.e. in market with less elastic demand
Multimarket Price Discrimination

\[ MR_1(y_1) = MR_2(y_2) = MC(y_1 + y_2) \]
Example: workout 25.5
Welfare effects:

- Inefficient production & consumption
- Lower welfare than under PC or perfect price discrimination
- Welfare may be higher or lower than in single-price monopoly
Other Kinds of Non-uniform Pricing

- Two-part tariffs: lump-sum fee + constant price per unit

- Tie-in sales: can buy one product only if you buy another one as well
  - Requirement tie-in
  - Bundling (or package tie-in)

- Can think of these as a form of quantity (2nd degree) discrimination, where the average price per unit varies with the number of units purchased
Two-part Tariffs

- Lump-sum fee + per unit price
- E.g. telephone service (connection fee + per minute rate); club cover charges; NFL personal seat license
- Because of fixed fee, average price per unit is higher the fewer units you buy
- Uniform pricing: raise $p$ above $MC \Rightarrow$ earn more per unit, but lower CS
- Two-part tariff (ideal): capture each customer’s max potential CS by charging different lump-sum fees, then set $p = MC$
- Like with first degree PD, there is *no inefficiency*
- But monopolist reaps *all* gains-from-trade, so equity suffers
Tie-in Sales

- **Requirement tie-in:**
  - E.g. Printer + ink/toner cartridges, razors + blades
  - Helps firm identify heavy users, i.e. those with high WTP

- **Bundling:**
  - E.g. Software such as Microsoft Windows + Internet Explorer, internet & cable service, preseason & regular season tickets, service + parts
  - Allows firms that can't price discriminate to charge different people different prices
  - Profitability depends on tastes (negatively correlated demand for the two goods) and the ability to prevent resale