Alternative Pricing Schemes
Industrial Organization

Session 12

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Outline

- The Coase Conjecture and Price Skimming
- Sales
- Non-linear pricing
  - Two part tariffs and the Disneyland monopolist
- Geographical price discrimination
  - Cars
- Bundling

Coase model of a durable monopoly good

- Assume a seller cannot sign contracts limiting his future production.
  - Upon sale of a unit, optimal strategy is to try to sell another unit at as high a price as he can get
  - This would go on until price equals marginal cost
- Suppose very little time is needed to transact
  - Intelligent consumers, assuming the price will soon fall to the competitive level, will be unwilling to pay more than the competitive price for the early units.
  - This could go on until price equals marginal cost; monopolist can lose all control of situation.

Assumptions of Model

- Lifetime of good exceeds the basic "period"
  - Period is the length of time between price revisions
  - Goods offered by monopolist at two different dates are substitutes
  - Customers have "rational" expectations

Example

- 7 customers
- Valuations v=1,2,…,7
- Each consumer derives utility from 1 unit of the good
- Time is discrete t=1,2,… and discount factor δ between periods
- No cost to produce the good and the good is infinitely durable

- First
  - Assume monopolist makes once and for all offer in the first period of the monopoly price, which is 4. He sells to consumers with valuations 4 to 7
  - Monopoly profit is 4*4=16
- At beginning of period 2, have residual demand of consumers with valuations 1 through 3. Monopolist is then tempted to charge a lower price.
  - Some consumers with high valuations may still accept paying 4 because they are eager to get the good
  - However, likely that consumer with valuation 4 does not buy, because his surplus is zero
  - Necessary condition to purchase: $v-4 \geq \delta(v-2)$

- Equilibrium:
  - A sequence of prices and consumers' expectations such that the expectations are rational given the firm's behaviour and such that the firm's behaviour is optimal given the consumers' expectations
  - Monopolist price discriminates over time
    - Books
    - Computers
- Flexibility hurts the monopolist

Responses

- An artist may make a lithograph and destroy the plate
- A seller rents rather than sells
  - IBM
  - Xerox
    - Crucial difference between seller and renter is that if a renter "overproduces" he suffers capital loss on old units, the costs are internalised; rational for him to limit production
    - For a seller, buyer suffers cost; sellers end up overproducing
    - Firms that rent can resemble monopolists producing nondurable goods

- Find ways of capacity commitment (spend too little on fixed costs and too much on marginal cost)
- Give price guarantees (a money-back guarantee exercisable at any time)– makes it very expensive for firms to lower price to new consumers
- Transfer monopoly power to service contracts or in another area
  - Car servicing
  - Polaroid in film
  - Gillette in blades
- Implicit contracts not to lower price – DeBeers never reduced nominal price of diamonds.

A Price Discrimination Model of Sales (Conlisk, Gerstner, Sobel QJE 1984)

- Empirical features of retail sales
  - Sales come as no surprise to consumers, indeed regular sales are expected
  - Sales induce greatly increased purchases for a short period
  - Sales are followed by substantial price rises

Assumptions

- Durable goods
- New potential consumers in each period
- If consumer makes a purchase then does not enter the market again for some time
- Heterogeneous consumers (for simplicity just two groups, with high and low initial reservation prices)
- Discount factor of β

Price Path

Let the reservation prices be V_1 (*high*) and V_2 (*low*)

n period cycle, with prices $p_1, p_2, p_3, \ldots p_j \ldots p_n$

$p_n = V_2$ in the sale

Price in period j must satisfy the following inequality when compared with prices h periods later:

$V_1 - p_j \geq \beta^h (V_1 - p_{j+h})$

Let period j+h=period n: then $p_{j+h} = p_n = V_2$, then

$V_1 - p_j \geq \beta^{n-j} (V_1 - V_2)$, rearranging

$p_j \leq (1 - \beta^{n-j}) V_1 + \beta^{n-j} V_2$

Over the cycle, less weight is put on V_1 and more weight is put on $V_2 \Rightarrow$ price falls steadily over a cycle ending with a sale

Summary

- 6 key ingredients of the model
  - Sufficient consumer heterogeneity
  - Monopolist must regularly update his strategy
  - A continual influx of new consumers
  - Consumers must understand enough to want to wait for a sale
  - Stationary setting and free of competition
  - Monopolist sells rather than rents the product
- Cumulation of low-valuation customers forces the sale

Uncertainty Theory of Sales Lazear, 1986

- Example of clothing retailer who is uncertain about consumer tastes for style, color, etc.
- Retailer offers a range at the beginning of the season, some sell, some do not
- Prices of latter group are marked down to clear
- Not price discrimination, just reaction to better information about consumer tastes

What exactly is uncertainty in Lazear's model?

- In the two period model, a firm encounters one buyer in the first period who is willing to pay V for the good, but no more.
- The firm is uncertain about V, but does know how it is distributed.
- He learns from what happens in the first period, and encounters another buyer in the second period also with value V.
- Relates directly to new products

How does this relate to fashion?

- Some goods go out of style quickly whereas others seem to retain popularity
- Fashion or obsolescence can be modelled as follows:
- In the first period the good is worth V, but in the second period it is worth V/K, where $K \geq 1$

Evidence on Sales (Pashigan and Bowen, 1991)

- Study of retailing of clothes in US
- Two seasons: spring-summer and fall-winter
- Each seasons starts with high prices and ends with sales: price dispersion over season
  - has increased over time since 1960s
  - is much greater for women's clothing than for men's clothing
  - Is greater than for other durable consumer goods

Evidence

- Frequency of discounting: higher for imported, fancy, retail chains
- Size of discounts: largest for imported, fancy and retail chains
- Pashigan and Bowen conclude that evidence is more favourable to uncertainty hypothesis than to price discrimination. Do you agree?

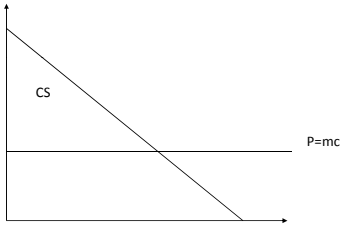
Another Example of Inter-temporal Pricing

- Peak-time pricing schemes

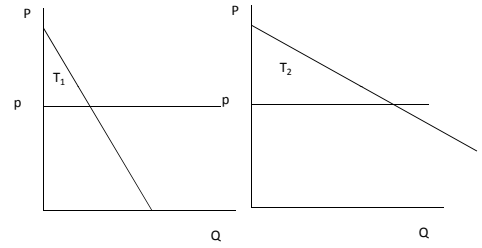
Two Part Tarriffs (Oi 1971)

- A two-part tariff is one in which the consumer must pay a lump sum fee for the right to buy a product
- Examples
  - Tennis Clubs
  - Block tariffs decreasing with the level of consumption – electricity, gas, and telephone service
  - Photocopiers: machines are leased with user paying a fee depending on use
  - Disneyworld!
- Examples aimed at consumers having different willingnesses to pay and sellers having no information on consumer types.

- Case 1: All consumers have same demand curve. Set fee equal to entire consumer surplus and the price equal to marginal cost for each unit thereafter



- Suppose that there are two types are customers each with different demand curves



- The lump-sum fee it charges cannot exceed T1 if Type 1 consumers are to participate.
- Opposing forces:
  - If it charges a low price, it sells more of its product and can charge a higher lump-sum fee.
  - Its ability to charge a high lump-sum fee is constrained by Type 1 consumers.

- The firm may make higher profits by concentrating on Type 2 consumers, letting Type 1 not buy the product
- With two types of customers, optimal to charge fixed fee equal to less than entire surplus of low-demand customers, and $p_c<p<p_m$ for rest of items
- Intuition: Tirole, p. 146, or BETTER, Oi (1971) p. 82 and 83
  - Suppose $p=p_c$ and the fixed fee was equal to the entire surplus of the low demand customers. Can lower the fixed fee slightly and raise p. You as the monopolist will have a slightly lower revenue (Tirole calls this a second order effect) from these costumers because of the deadweight loss of $p>p_c$. However, this will be more than offset by the higher price charged to the high demand customers (Tirole calls this a first order effect because it is greater).

- Now suppose that $p=p_{m.}$ The monopolist could lower price slightly. This would reduce his profit from the price slightly (Tirole terms this second order), but increase the consumer surplus by a lot more (a first order effect). Because the monopolist can charge a lump-sum "admission" fee he can capture this consumer surplus and thus his profits are higher.

On two-part tariffs

- Only when there is one type of consumer (unrealistic) is it necessarily optimal to charge fixed fee (A) equal to entire surplus and then mc for rest of items.
- The less similar are Type 1 to Type 2 consumers, the more difficult to extract consumer surplus from Type 2 with a single two-part tarriff

- Can have two two-part tarriffs, but pricing structure is subject to self-selection contraint: one group must not prefer other group's two-part tarriff
- For example, (T_1, p_1), (T_2, p_2), where $T_2>T_1$ and $p_2<p_1$
- Example: mobile phones!
- Note: finding general optimal nonlinear pricing scheme is extremely complicated

Commodity Bundling

- Assume production costs are 90

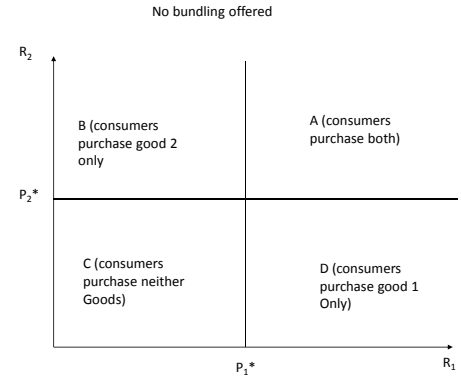
Type of consumer	Word processor	Spreadsheet
Type A consumers	120	100
Type B consumers	100	120

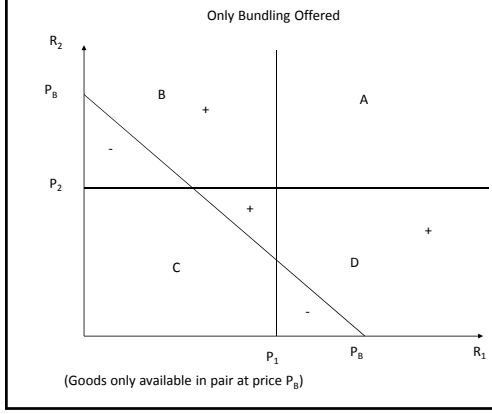
General example
Adams and Yellen (1976)

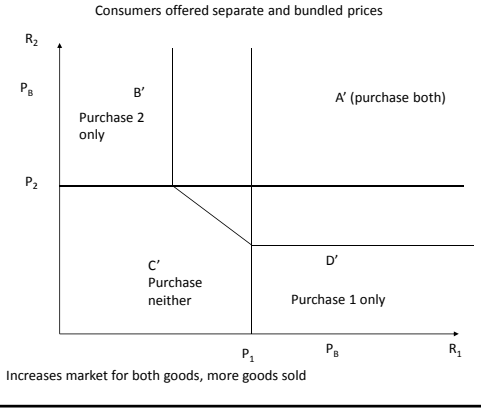
- Consumers characterized by their reservation prices R1 and R2 for goods 1 and 2 respectively

Three options open to firms

- 1) Set the single price on each commodity separately, (p_1^*, p_2^*), which yields the greatest profits. A pure components strategy or simple monopoly pricing
- 2) Offer the two commodities for sale only in a package comprised of one unit of each at the price p_B^* chosen so as to maximize profits. This is the pure bundling strategy.
- 3) Combine strategies 1 and 2 by offering each commodity separately and a package of both, at a set of price $(p_1^*, p_2^* p_B^*)$, which maximizes overal profits. A mixed bundling strategy.







Price Discrimination in Cars (Verboven 1996)

- Hedonic Price index
  - Car pre-tax prices are regressed on car characteristics and country dummies: showed country effects: Belgium 100, France 105, Germany 110, Italy 116, UK 120
- Geographical market segmentation arising from:
  - Selective and exclusive distribution systems allowed under EC regulation 123/85
  - Bureaucratic difficulties for individuals importing cars from another EU country
  - Right hand drive in UK

- Concentration does not differ much across different geographical markets
- Quotas on Japanese imports are very strict and small in France, Italy; less restrictive in Germany and UK; non in Belgium
- Dealer mark-ups in UK thought to be high
- RESULTS
- Large differences in demand elasticities across countries: firms tend to have lower own price elasticities in their 'domestic' markets; so price of a car is usually higher if sold in domestic market rather than in a 'foreign' market
- Demand elasticities higher for smaller, less sophisticated car: so mark-ups lower for these cars than for better cars

- High mark-ups on Japanese cars where import quotas are binding
- Definite evidence of geographical market segmentation: consumer preferences correlated across cars with same country of origin, but not across similar cars from different countries
- Analysis cannot account for all cross-country price differences: other possibilities
  - Collusion between manufacturers in UK and in Germany
  - Higher dealer mark-ups in UK
  - Prices in UK may include warranties and road side assistance (could explain 10-15% of differentials)

Conclusion

- Pricing and elasticities
- Price discrimination
- A durable goods monopolist
- Sales
- Two-part tariffs
- Geographical price discrimination
- Bundling