

Nonlinear pricing

- Schemes that are used when a firm does not know the individual demand of each consumer (type) but has an idea of the distribution of demand in the consumer population
- Can increase profits of firms with market power who can prevent resale.
- Non-linear pricing schemes described next are used to practice second-degree price discrimination

Price discrimination schemes:

- Non-linear pricing
- Two-part tariffs
- quantity discounts
- tie-in sales/ bundling (multiple goods [units of same good] must be purchased at same time) - next lecture
- quality choice (quality spectrum choice) make products with different quality less good substitutes s.t. consumers who value the good the most pay a high price and don't want to substitute to lower price ones)

Nonlinear pricing.

Why do cell phone providers charge a monthly fee plus a per minute charge?

Regime	Pay-as-you-go	Two-part tariff	Two-part tariff
Calling Price	10¢/min	10¢/min	10¢/min
24/7	10¢/min	10¢/min	10¢/min
Monthly Fee*	\$0.00	\$3.99	\$4.99
Monthly Allowance	0 min	100 min	200 min
Overage Charge	\$0.10/min	\$0.10/min	\$0.10/min

Two-part tariffs.

Consider a single consumer whose demand for long-distance minutes is $q = 750 - 10p$ per month.

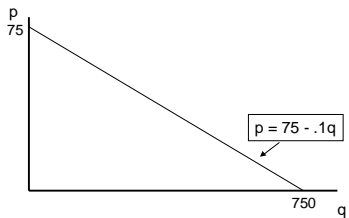
A monopolist with marginal costs of zero would charge this consumer $p = 37.5$.

– $q = 375, \pi = 37.5 \cdot 375 = 14,062$.

What if the monopolist charged the consumer a monthly fee of 20,000 and a per minute price of 0?

- At a price of 0, the consumer would purchase 750 minutes.
- Her consumer surplus would be $.5 \cdot 75 \cdot 750 = 28,125 > 20,000$.
- The consumer would accept this offer.
- The firm would earn higher profits: $20,000 > 14,062$.

Two-part tariffs graphically.



Other examples of nonlinear pricing.

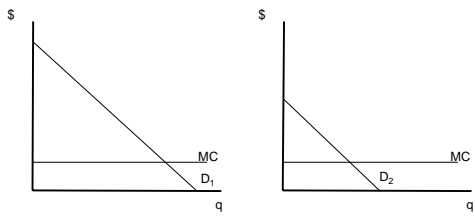
- Cost-Co (annual fee and then per unit price of items)
- Amusement parks (pay an entry ticket price that entitles to 4 rides and next rides pay 10 cents each)
- After-markets:
 - razors & blades,
 - printers & toner,
 - software & service
 - car and replacement parts.

Optimal two-part tariffs.

- If it faces one type of consumer, a firm maximizes profits by setting the **per unit price (p)** equal to its MC and setting the **entry fee (F)** equal to the individual's consumer surplus.
- If consumers have different individual demand curves, firms ideally want to charge them different entry fees.

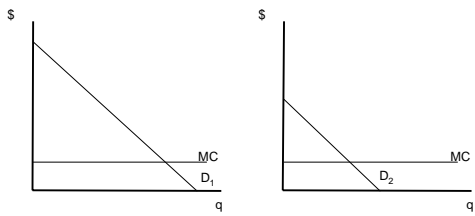
Two-part tariffs with $p=MC$.

If it is possible to charge two different entry fees, T_1 and T_2 :

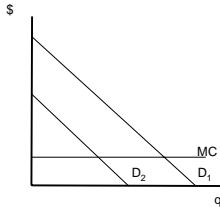


Two-part tariffs with $p > MC$.

If it is not possible to charge two different entry fees then optimal p may be $>$ than MC and $T=CS$ (type 2 at that price):



It can be optimal to set $p=MC$ and exclude type 2 by $T=CS_1(MC)$.



Why is this called nonlinear pricing?



TCP = Total Customer Payment
 = $F+pq$ for 2-part tariffs
 = pq for simple pricing

Numerical example - to be solved in class:

Two consumer types : $Q_1=600-0.2p$ $Q_2=600-0.4p$ and $MC=200$

- no price discrimination, what is optimal price?
- Optimal price discrimination when not possible two part tariffs?
- If can charge two different two part tariffs what are the optimal ones?
- If can charge the same two part tariff (p,T) what is the optimal pricing strategy?

Numerical example - to be solved in class:

- Always check if it is optimal to sell to all types of consumers, sometimes the firm may want to exclude some consumers from purchasing.
- If can charge two different two part tariffs (if can identify the different types of consumers) then this is the best of the worlds...

- but typically some consumers may want to pretend they are some other types ...
- This is hard work for firms but allows them to earn higher profits than single uniform pricing ($T=0$, special case of two-part tariffs)

Next lecture:

- recap non-linear pricing so far
- bundling
- Agricultural marketing orders
- other pricing schemes
- talk about group project requirement

- ~~March 13th~~: Problem set 3 is due. We will solve PS 3 in class and solve additional practice exercises for midterm.
- ~~March 18 (optional) we will solve practice exercises for midterm~~
- ~~March 20th~~ in-class midterm, open book, bring your notes and calculator if needed).
