#### Price discrimination

Types of price discrimination

The (ambiguous) welfare effects of price discrimination

Parallel imports: not justified the EU *per se* prohibition of clauses which prevent parallel imports.

Price discrimination as monopolisation device

Anti-dumping

# Price discrimination

It is a pervasive phenomenon: examples

Three types of price discrimination (PD):
1<sup>st</sup> degree (perfect) PD
2<sup>nd</sup> degree PD: self-selection of consumers
3<sup>rd</sup> degree PD: when different observable characteristics

Two main ingredients of price discrimination

- ability to "sort out" different consumers and charge them different prices

- no arbitrage opportunities

### Welfare effects of PD

- PD is not always bad: the extreme case of 1<sup>st</sup> degree PD, under which the first-best is attained (but: unrealistic example)
- Quantity discounts ( $2^{nd}$  degree PD). If consumers are charged according to T+pq, the unit price (p+T/q) decreases with the number of units bought.
- Welfare increases because the fixed fee is used to extract surplus, allowing for a lower variable component than under linear pricing

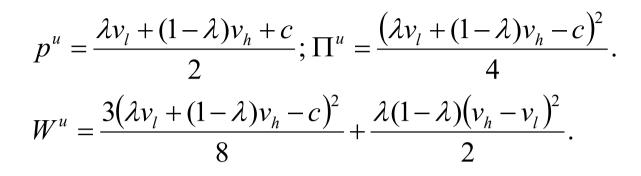
#### Quantity discounts: welfare effects

A monopolist serves two types of consumers, l ('low') and h ('high'), with weight  $\lambda$  and 1-  $\lambda$  in the market. Type i's (i=l,h) demand is: q=v<sub>i</sub>-p, with v<sub>h</sub>>v<sub>l</sub>. The monopolist's marginal cost is c<v<sub>l</sub>.

<u>No discounts, or uniform pricing</u> (both markets served). The firm's programme is:  $Max_p \Pi = (p-c) [\lambda (v_1-p)+(1-\lambda) (v_h-p)]$ 

From  $d\Pi/dp=0$ , the solution is:

## Quantity discounts, II



Quantity discounts: Two-part tariffs as PD

The monopolist uses the tariff T+pq. Assume also that  $v_l > (v_h + c)/2$ , which ensures all buy under both uniform (linear) pricing and two-part tariffs.

For low types to buy, the firm will set T=CS1+ $(v_1-p)^2/2$ . Therefore, its programme becomes:

### Quantity discounts, III

 $Max_{p} \Pi = (p-c)(\lambda(v_{1}-p)+(1-\lambda)(v_{h}-p)+(v_{1}-p)^{2}/2,$ 

whose solution is given by  $p^{qd}=c+(1-\lambda)(v_h-v_l)$ .

One can check that  $p^{qd} < p^u$ ,  $\Pi^{qd} < \Pi^u$ , and  $W^{qd} < W^u$ .

Intuitions: the firm makes more money because it has two instruments (T,p) rather than one (p). Variable part is lower than p<sup>u</sup> because the fixed part is used to extract surplus (and this explains why W is higher).

# 3<sup>rd</sup> degree PD and parallel imports

- Re-interpret the model above: h and l are two EU countries with different demands (transport costs set to zero for simplicity).
- If price discrimination across countries is allowed:
- In each country i, the firm solves  $\max_{p_i} \prod_i = (p_i c)(v_i p)$ , with solution:

$$p_i^d = \frac{v_i + c}{2}; \Pi^d = \lambda \frac{(v_i - c)^2}{4} + (1 - \lambda) \frac{(v_i - c)^2}{4};$$
$$W^d = \frac{3}{8} \left( \lambda \frac{(v_i - c)^2}{4} + (1 - \lambda) \frac{(v_i - c)^2}{4} \right).$$

# Parallel imports, II

- If PD was prohibited (i.e., the firm cannot prevent parallel imports), then two cases may arise:
- 1) Under uniform pricing, sales in both markets. In that case, same result as previous example, and: W<sup>d</sup><W<sup>u</sup>.
- Under uniform pricing, one market is not served: the firm may prefer to set p<sup>h</sup>=(v<sup>h</sup>+c)/2, even if this implies no sales in country l.

Example: if  $v^{h+c}>2v^{l}$ ,  $q_{l}=0$ , and  $\Pi^{h}=(1-\lambda)(v^{h-c})^{2/4}$ . If  $\lambda$  small enough, then  $\Pi^{h}>\Pi^{u}$  and  $W^{h}>W^{u}$ .

General result: PD welfare detrimental if q<sup>PD</sup> decreases.

#### Further remarks

- PD and investments. Since PD increases the firms' profits, the uniform pricing policy may have long-run negative effects (on investments, innovations etc.)
- PD and market power. Both small and large firms will have incentives to discriminate prices across countries. But in the former case welfare effects are less relevant.
- To the extent that PD will induce firms to invest more, allowing 'small' firms to engage in PD may foster competition.
- Sensible, to use a safe harbour: PD allowed for firms below a certain market share (not the current policy!).

# PD as monopolisation device

- PD may also affect market structure, i.e. be used by an incumbent to exclude rivals.
  - For instance, we have seen that discriminatory offers help exclude entrants
- Rebates and selective discounts are other possible forms of PD which may lead to exclusion (but not much theory on this).
- But an obligation to dominant firms not to discriminate (transparent pricing) may have adverse effects (helps a dominant firm to solve the commitment problem)

# Anti-dumping actions

- Anti-dumping actions are allowed by WTO rules, provided two conditions are fulfilled:
  - 1) export prices are below their normal value
  - 2) exports cause a material injury to the importing country's industry
- Both conditions are ambiguous (subject to political influence): anti-dumping provisions often used.
- But differing export and home prices is not an 'unfair practice': predatory price test should be used instead.
- Likely adverse consequences on consumers, importing sectors (and collusion may be facilitated).