Industrial Economics

Price Discrimination

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Price Discrimination

- Price discrimination means different prices for different customers or different customer groups for the same product. It can take place only with a downward-sloping demand curve, which supposes monopoly power.
- It supposes the following two conditions:
  1. The monopolist possesses information about the willingness-to-pay of different customers or customer groups and can distinguish between them at the moment of trade. This information maybe explicit or may be revealed through self-selection.
  2. Consumers cannot trade with each other after having bought from the monopolist (no arbitrage condition).

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- If either of these conditions is not fulfilled, linear pricing (identical prices for all goods) is the only option.
- A standard monopoly with linear pricing always leaves some consumer surplus to its customers.
- Price discrimination is always about capturing some of the consumer surplus for the producer with monopoly power.
- The producer does not need to be absolute monopolist for this. Monopolistic competition can work.
- The customer groups with the highest willingness to pay are the most interesting ones in terms of consumer surplus to be captured.

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- The welfare implications of price discrimination are quite interesting.
- Total welfare actually increases, as the need for the monopolist to restrict quantities in order to generate a monopoly profit disappears.
- However, consumer surplus decreases. Price discrimination is thus detrimental for the welfare of most consumers (only those customers remaining unserved under standard monopoly may gain somewhat) and doubly beneficial for the monopolist.
- Customers with the highest willingness-to-pay, independently whether this is due to wealth or need, are the ones losing most from price discrimination.

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- There exist different forms of price discrimination, some of which are originally due to Pigou.
- Unfortunately, the economic literature has not completely unified different categories of price discrimination in a completely coherent set of categories.
- It usually talks about three categories.
- The problem arises to the extent that category 3 below (self-selection by quality) is sometimes associated with category 2 and sometimes with category 4.
- In order to avoid confusion, we will offer in the following four different categories, instead of the usual three.
- Note that the first and the last one are fairly uncontroversial.

1. Perfect discrimination

- The producer knows the willingness-to-pay of each individual customer and can keep his customers separated. For a long time this was considered a purely theoretical case.
- However, Internet shopping, smart-phone use and big data make this case more and more an everyday reality.
- Perfect discrimination will lead to a level of production that is equal to the quantity produced under perfect competition $p_z = MU_z$ ("z" indicates the consumer with the lowest willingness-to-pay).
- It is Pareto optimal.
- It also possesses widely undesirable distributional properties as the consumer surplus is zero and the producers capture the totality of the surplus.
- First-degree price discrimination.

2. Self-selection by quantity

- When the producer cannot distinguish or separate his customers, he can offer different contracts, which always combine a fixed entry fee (which can be zero) with different levels of unit costs.
- This is also called a binomial tariff (other terms are "bundling", or quantity discounts).
- High-volume customers will choose high entry fees and low unit costs; low volume customers will choose low entry fees and high unit costs.
- The entry fee will allow capturing some of the consumer surplus.
- In principle, binomial tariffs could be individualised for each customer, but this would again require perfect information.
- In practice, recurring to a self-selection mechanism indicates precisely that such perfect information is not available.

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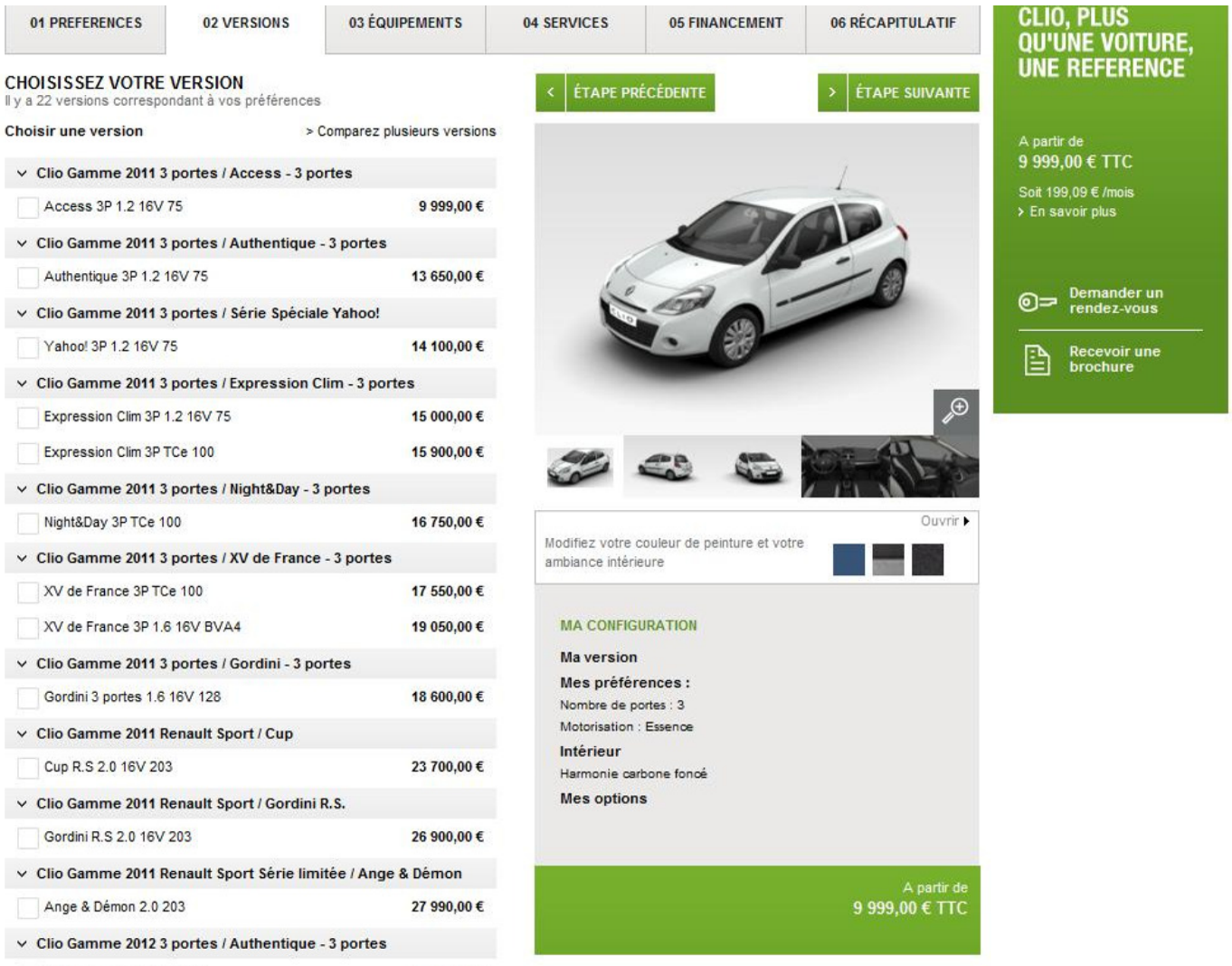
- Common examples are "flat fees", for instance, with mobile phone subscriptions.
- With quantity discounts it is particularly important than one customer cannot transfer the goods he has acquired to another customer.
- Certain forms of technical linkages (razors/blades, printers/cartridges etc.) or super market discounts can also constitute different forms of binomial tariffs.
- To the extent that binomial tariffs allow the monopolist to include previously excluded customer groups with low willingness-to-pay, overall welfare is increased.
- The sum of consumer surplus decreases, of course, when compared to standard monopoly.
- Third-degree price discrimination.

3. Self-selection by quality

Automobiles (from Durrmeyer, Niedermayer, Shneyerov, 2017)



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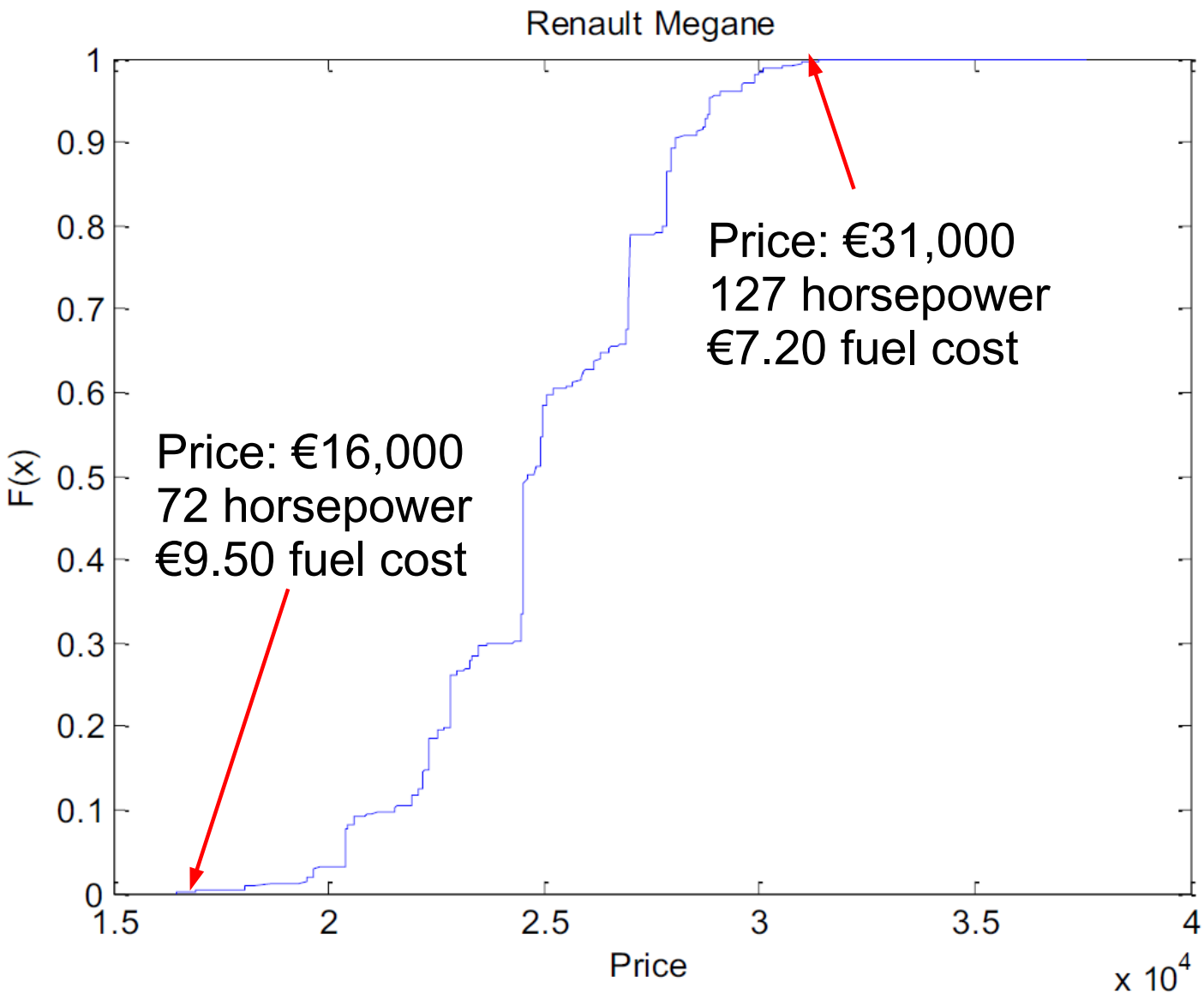

3. Self-selection by quality

- When the producer cannot distinguish or separate his customers he can also offers different contracts, all with different linear prices (so no fixed entry fees), but with different quality elements.
- Typical is the differentiation between First Class, Business Class and Economy Class.
- The idea is to capture some of the consumer surplus of the consumer groups with a higher willingness to pay.

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- The French economist Jules Dupuit has described the phenomenon very well more than 150 years ago:

quote by Jules Dupuit, 1849

It is not because of the few thousand francs which would have to be spent to put a roof over the third-class seats that some company or other has open carriages with wooden benches. What that company is trying to do is prevent the passengers who can pay the second class fare from travelling third class; it hits the poor, not because it wants to hurt them, but to frighten the rich. And it is again for the same reason that the companies, having proved almost cruel to the third-class passengers and mean to the second-class ones, become lavish in dealing with first-class passengers. Having refused the poor what is necessary, they give the rich what is superfluous.

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- To the extent that quality differentiation allows the monopolist to include previously excluded customer groups with low willingness-to-pay, overall welfare is increased.
- There is an additional distortion of some consumers getting too low a quantity.
- The sum of consumer surplus decreases, of course, when compared to standard monopoly.

4. Inverse elasticity pricing

- The producer does not know his customers personally but can distinguish them as belonging to different social groups (young, old, students, unemployed, business traveller).
- The elasticity of each group is known. Pricing then takes place for each customer category according to an inverse elasticity rule $\frac{p_i - MC}{p_i} = -\frac{1}{\epsilon_i^D}$ that is differentiated for each customer group "i".
- The more inelastic supply, the higher the price. It holds that $MR_i = MR_j = MC$.

4. Inverse elasticity pricing

- The inverse elasticity rule, however, still leaves a small surplus to each group.
- Groups with lower than average elasticity lose when compared to standard monopoly.
- Groups that possess higher than average elasticity gain when compared to standard monopoly.
- Overall, the profit of the monopolist increases.
- However, total welfare impacts are actually ambiguous with inverse elasticity pricing.
- Third-degree price discrimination.

The contribution of Pigou

- Pigou in the Economics of Welfare (1920, Chapter 17 on "Discriminating Monopoly") described three categories, which correspond to category 1, a weaker version of category 1 and category 4. There is no self-selection in Pigou.

quote by Stole, 2006

Pigou (1920) introduced the terminology of first-, second- and third-degree price discrimination. There is some confusion, however, regarding Pigou's original definition of second-degree price discrimination and that of many recent writers (e.g., see Tirole (1988)), who include self-selection via nonlinear pricing as a form of second-degree discrimination. Pigou (1920) did not consider second-degree price discrimination as a selection mechanism, but rather thought of it as an approximation of first-degree and, as such, regarded both first and second-degrees of price discrimination as "scarcely ever practicable" and "of academic interest only".