Chapter 35: Price discrimination (1.5)

- Definition and types of price discrimination
- Reasons for price discrimination
- Pre-requisites for price discrimination
- Advantages and disadvantages of price discrimination

| Necessary conditions for the practice of price discrimination | Explain that price discrimination may only take place if all of the following conditions exist: the firm must possess some degree of market power; there must be groups of consumers with differing price elasticities of demand for the product and the firm must be able to separate groups to ensure that no resale of the product occurs
| Draw a diagram to illustrate discrimination, explaining why the higher price is set in the market with the relatively more inelastic demand |

When I was a young man and frequently out being naughty, I was often infuriated by a policy of discrimination found in discos and clubs where men paid an entrance fee and women did not. It was not until many years later that I understood the underlying economic logic in the price-setting: more women mean more men, and since men apparently have a more inelastic demand for clubbing (and for women?) they can be charged more than women. I said I understand it – I still don’t like it. Perhaps it is a good eye-opener as my feelings might be something similar to those that women have endured for ages. Just a thought!

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1 Favorite in-class fun with my crowd; ask the students if they have been out clubbing. There are always a couple who have. Pick one of the lads and ask him if he paid. Ask one of the girls if she paid. Then explain: “Josh, you paid a bundle of cash to get into the club and Jasmine got in for free. Right? Here’s why Josh;
Definition and types of price discrimination

Price discrimination means that different people will be willing to pay different prices for the same good. The next time you take a really cheap flight or bus/train trip, try to get into a conversation with a well-dressed individual sitting in the waiting lounge. If it turns out that this is a businessperson on a business trip, tell him/her that you are an economics student and that you are writing about pricing policies of airlines/ buses/ railroads. Ask what he/she paid for the ticket – I wager that it will be a considerably higher price than yours! The businessperson has been subjected to price discrimination, since the airline/ bus company has sold the same basic good at different prices to different consumer groups; a business person who is willing/able to pay a relatively high price and a student with higher price sensitivity for tickets.

Firms operating in perfectly competitive markets are price-takers and therefore lack pricing power. A firm with pricing power, e.g. a monopoly, can set any price – within the confines of demand – as it is operating behind entry barriers of some sort. Thus far we have assumed single-pricing strategies in our models, yet nothing prohibits a firm from charging different prices for a good. Economic theory identifies three main ways to price discriminate:

1. **First degree price discrimination**: the firm charges whatever the market demand will bear. Auctions and ‘haggling’ at open markets are a form of price discrimination, as each good goes to the highest bidder.

2. **Second degree price discrimination**: the firm sells at quantity discounts or ‘tiered markdowns’. For example, many publishing houses will have different prices on school textbooks depending on the quantity ordered. The first 30 copies cost $25 per book, the second thirty $22 per book, and any order above 60 receives a 15% discount.

3. **Third degree price discrimination**: the firm separates the market into distinct groups or segments and sells the good at different prices. The disco club and flight ticket examples fall into this category – as does most price discrimination. We will deal solely with 3rd degree price discrimination here.

Reasons for price discrimination

There are three main reasons (plus one “Outside the box”) why firms would have an incentive to price discriminate:

1) The most obvious reason for price discrimination is that selling a good at different prices will serve to increase profits. This is intuitively obvious; a firm that has market power can increase profits by selling the good at the highest possible price according to consumers’ willingness to pay. The firm might also use price discrimination to cut prices in order to force competitors out of the market (predatory pricing) or in order to penetrate a new market.

2) Firms might also think in long run terms, and price discriminate in order to capture a future market, for example by letting students purchase magazine subscriptions at a lower rate, the firm can look forward to higher future subscriptions – at the normal subscription rate. An export firm

Be prepared for some anger. Many people do not realise the extent to which they have been discriminated against. A fellow passenger once caused quite a scene when he found out that I paid less than 10% of what he had paid.
selling at a lower price abroad is very common and such practice is often vilified (= spoken ill of). This form of discrimination helps exporting firms attain economies of scale and strengthen competitiveness. In addition to the above pecuniary (= financial) motives, one should not disregard the goodwill firms can earn by letting certain groups benefit from lower prices; senior citizen discounts on buses; student access to educational material on the Internet; free parking for handicapped, etc.

3) All the above examples arise from the private sphere, yet a good many examples of price discrimination arise in the arena of public and merit goods. Public utilities can charge lower rates to firms than households in order to provide competitive infrastructure for industries. Price discrimination can also help public monopolies to cover costs in high cost areas, for example by discriminating in railroad tickets the additional costs of providing train services to rural areas can be covered. A frequently used form of public price discrimination is based on concepts of fairness, where it is considered beneficial to society that all groups have equal access to goods. Such discrimination is often based on income; high income earners could pay more for municipal child care and schooling than lower income households.

4) Finally, as an Outside the box issue, it is possible for a price-discriminating firm to supply a good where a single-price market simply would not exist, due to high average costs. Discrimination can also allow a public monopoly such as a utility service to produce at an even higher output level than the break-even level of output (i.e. beyond the point where AC = AR).

Applied economics; innovative price discrimination

One of the most inventive forms of price discrimination I have heard of in later years came from my friend Glenn. He runs a ju-jitsu and his dojo faced the same profit issues as other gyms; fluctuating demand and therefore highly uncertain revenues. Glenn’s solution was as brilliant as it was simple; charge differently for old and new students.

The basic idea is to charge an entry level price which never changes! A new student in 2011 would pay SEK 2,000 (about $250 at 2003 exchange rates) for a year-long membership – while students who joined the club in 2005 continue to pay the membership fee they started with. The SEK 2,000 fee will never change as long as the student continues to be a member. However, as soon as a member leaves the club and doesn’t pay that year’s membership fee, he/she will start all over again if/when a new membership is bought. Thus, a student who entered in 2005 would still pay SEK 1,800 in 2003, but by leaving the club during 2009, he/she would pay the (higher) entry-level fee upon re-joining in 2011.

This is quite brilliant. It provides an incentive for students to remain in the club which diminishes drop-out behaviour. The club will keep more of its students and have a much better grasp of future costs and revenue.

- Methods of price discrimination
  There are any number of ways for a firm to price discriminate. The most common are:

1. Time; airline tickets are subject to ‘X weeks in advance’ and movie theatres have different rates for different times of the day. Electricity, squash court rental and fishing licenses will all be fairly easy to divide into ’peak’ and ‘off-peak’ groups of demand.
2. **Age**; apart from previous examples, there are under-12 discounts for cinema tickets, amusement parks and air travel\(^3\); while senior citizen discounts are often available for such services as haircuts.

3. **Income**; lawyers often price discriminate for their services according to income as do prostitutes and private tutors\(^4\); health care and college tuition are also often cases where different income groups pay different prices.

4. **Gender**; the aforementioned discrimination of nightclubs against men is one example.\(^5\) Other examples – against women – would be haircuts and personal hygiene products.\(^6\)

**(Type 3 Medium heading) Pre-conditions for successful price discrimination**

There are three pre-conditions for successful price discrimination.

1) The first is that the firm must be able to identify *different distinct groups* of consumers. As an extension of this, the groups must have distinct differences in their price elasticities of demand. Otherwise the firm would be unable to charge different prices in the first place.

2) The second requirement is for the firm to be in a *position of market power*, i.e. be able to set prices, which excludes the possibility of price discrimination in a perfectly competitive market as firms operating under such circumstances will not have pricing power. I will use a monopoly to illustrate the effects of discriminatory pricing.

3) The final and rather obvious condition is that the firm must be able to *limit the effects of arbitrage* – i.e. re-selling. If I could get one of my students to buy my airline and cinema tickets at student-discount prices I would. This must be rendered impossible by the producer in order to be able to charge some groups higher prices. Thus, airline tickets have the travellers’ names on them which must match their passports, while the student-discount cinema ticket can only be used upon showing a valid student ID. Basically, firms must be able to keep the different groups separate in order for the discriminatory scheme to function. This doesn’t necessarily have to involve complicated administration in separating the groups, since there are often built-in segmenting walls, for example when an international firm sells services and price discriminates between countries.

**Figure 2.3.49** below shows how a price-discriminating monopoly arrives at the profitmax price and output for the two market segments I and II, each with its own PED. The sum of MR (MR\(_I\) + MR\(_{II}\)) for each segment equals total market MR, and profitmax output at MC = MR is 40,000 units. The differing elasticities of demand in market segments will set two different prices; \(\$7\) in market I and \(\$5\) in market II. (Note that the diagrams only illustrate how output and price is set – not the amount of profit. This is shown

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\(^3\)Notice that airline tickets are used as an example in many methods of price discrimination. I strongly suspect that the confusion as to what an airline ticket actually costs is most intentional. Airlines simply don’t want price transparency as this would lead to price competition. They want us confused, and by using several layers of discriminatory pricing, airlines increase our search costs of finding correct price information. Yet the only thing I want to hear is ‘Smoking or non-smoking, Sir?’

\(^4\) I love putting these two professions in the same bracket. Guaranteed to yank a few chains in the halls of learning.

\(^5\) I keep hearing from my students at the OSC revision courses how their teachers have said that this is in fact *not* an example of price discrimination but rather a marketing method – more women attract more men etc. Yes, agreed. However, there is nothing in the definition of price discrimination which stipulates that there are given reasons *why* firms might price discriminate. The basic fact is that when a firm charges different prices for the same good it is price discrimination – regardless of the underlying motives for the discrimination. Yes, I looked it up.

\(^6\) Yes, I looked this up too. It seems that women’s PED for products dealing with personal cleanliness and appearance is lower than men’s! It works for me: I shocked my students and colleagues in an interview in the school paper by commenting on how shampoo and dish-washing liquid were perfectly substitutable for me. Since dish-washing liquid is cheaper I use that to wash my *hair* head.
Now we look at how producers and consumers can stand to gain and/or lose by the process of price discrimination. Assume a monopoly firm setting a profitmax price and output, shown in figure 2.3.50 below. (Please compare this to figure 2.3.49, as it builds on those figures.) The single-price monopoly is making an abnormal profit of $120,000 ($3 \times 40,000$ units) at the profitmax point of output. Now, assume that the firm is able to identify two distinct groups having different demand and sets the highest possible price for half of total output. Diagram B shows that these 20,000 units could be sold at a price of $7. The dual-price monopoly charges two prices and sells 20,000 units at $5 and 20,000 units at $7. Now, here’s the tricky bit; as output has not changed there is no change in costs! This means that average costs are the same, $2, having been set by the original output of 40,000 units. Therefore the element of abnormal profit per unit goes from $3$ to $5$, bringing the profit for the higher-priced batch to $100,000$. Adding the profit from the lower-priced batch ($3 \times 20,000 = 60,000$) brings the total abnormal profit up to $160,000$. The net addition to abnormal profit by price discriminating is $40,000$, shown by the square in diagram B.
A LITTLE DEPTH: FURTHER PRICE DISCRIMINATION

Let’s continue one step further. Say that the firm manages to divide the market into four segments, where...
each group can be priced according to its demand, shown in figure 2.3.51. The highest-demand group will pay $8 for 10,000 units; the second-highest pays $7 for 10,000 units and so on. The addition to total abnormal profit by further price discrimination (going from two prices to four prices) is $20,000, shown by the two striped squares in diagram C. By dividing the market into four price groups, the firm makes a total abnormal profit of $180,000.

**Advantages and disadvantages of price discrimination**

**Producers**
The advantages to the producer are obvious; higher total profits. As an extension of this, a producer would be able block market entry by setting output at the break-even point \( AC = AR \) and make up for this by selling ‘portions’ of total output at discriminating prices – the producer would still be able to make an abnormal profit in spite of producing at break-even point. One can say that the abnormal profits gained by price discrimination serve to pay for an amount of goods sold at break-even cost. This will dissuade potential entrants as it will be most difficult to match the incumbent’s price.

**Consumers**
Consumers stand to both lose and gain from price discrimination. Some groups will benefit from lower prices while others will ‘subsidise’ the winners. Clearly consumers would lose if competition fell due to

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**Outside the syllabus:** Note that the finer the demand segment, the more *consumer surplus* is captured by the firm. Remaining consumer surplus is shown by the increasingly “saw-toothed” blue triangles in the diagrams.
predatory pricing by the price discriminator, but again, abnormal profits allow the firm increased funding to plough back into the business in the form of R&D, resulting in new products and improved quality. Yet the main objection by consumers is probably the transfer of income to the producers, since the overall picture is that consumer expenditure increases but not necessarily the quantity consumed. The transfer, or ‘capture’ of consumer surplus by the producer clearly shows the redistribution effects. On an international scale, there is a bit more conclusive evidence of consumer loss, since multinational companies often price discriminate on a country-wide basis owing to the fact of pure geographical barriers to arbitrage. This helps explain why – ceteris paribus – international firms often set the price higher in high-income countries than in low-income countries, for example medicines, paperback books and services.

**Society**

It is also possible that both consumers and producers gain from price discrimination. One possible advantage to society due to price discrimination is the possibility of producing a good where normally no firm would be willing or able to supply it. No firm would produce in a market where AC was higher than the profitmax price. *Figure 2.3.53* illustrates the price of round trip travel by car on the bridge between Denmark and Sweden; at the profitmax (= lossmin!) output of 4,000 units the demand curve renders a maximum price of SEK 500 – but the average cost is SEK 550. It is impossible to make a profit – the loss is SEK 200,000.

![Fig. 2.3.53 Loss-making monopoly; Öresund bridge](image)

A price discriminating firm could counteract the loss by setting output at profitmax and then discriminating against consumer groups A and B by, for example, setting a higher price for peak-time travel. 4,000 units are produced at an AC of SEK 550. 2,000 units are sold to **group A**; the total loss is SEK 50 × 2,000 = SEK 100,000.

The remaining 2,000 units are sold to **group B** – e.g. people willing to pay a higher peak-time price – at a price of 700. (Remember that total output sets the ‘floor’ for AC!) The profit per unit of the units sold to Group B is SEK 150, giving a total of **SEK 300,000** as a contribution towards making up for the loss of
SEK 200,000. In the final outcome, **total net abnormal profit** is the total profit contribution minus the total loss; **SEK 300,000** - **SEK 200,000** = **SEK 100,000**.
Price discrimination is often practiced by publicly-owned monopolies, such as mail service, telecommunications and railroad travel. Price discrimination stands to benefit consumers by enabling a monopolistic firm to break even – or even earn a profit – from a non-economically viable activity which would normally not be undertaken.

The aim of public monopolies is often to provide a societally optimal level of output rather than a profitmax level. The monopoly could seek simply to break even in terms of profit and set output where average costs equal average revenue – 70,000 units in the diagram.

However, posit that installing telephone lines, railroad tracks and postal routes to outlying rural districts comes at a very high marginal cost. Should these members of society pay for this or should society as a whole pay? If an economy chooses the latter – as many in fact do – then the social benefits of supplying all areas are considered to outweigh the costs. Yet price discrimination can actually enable the public monopoly to cover the higher costs.

Assume that the public health service monopoly wishes to provide all areas in the country with equal amounts of health care hours. Initial total quantity provided is 70 million hours per year, but an additional 10 million hours of health care is needed to give what is considered uniform health coverage throughout the country. Producing 80 million hours of health care will cause average costs to exceed average revenue, resulting in a loss of $80 million (grey area in the diagram) at an hourly rate of $2. The monopoly can make up for this loss by charging higher rates for certain groups, such as rates based on income or higher rates for non-essential (cosmetic) surgery.

The diagram illustrates a possible (highly idealised – as in “mermaidomics”) outcome, where discrimination-pricing at $7 per hour adds a contribution of $80 million, resulting in a break-even outcome for the monopoly. One can say that the 25% of the population paying a higher price have subsidised the lower cost of health care for the remaining 75%. The discriminating monopolist has benefited society.
1. A firm charges a higher price for its product in a certain geographical area due to higher storage costs. Why is this not price discrimination?

2. What difficulties would arise for firms trying to price discriminate on sales made over the Internet?

3. How does the possibility of arbitrage (re-selling) affect a firm’s ability to price discriminate?

4. Outside the syllabus! Assume that a firm could perfectly price discriminate, i.e. set a separate price along every possible point on the demand curve. Where would profitmax be? What would happen to consumer surplus? And, really tricky question; where would the MR curve be?

5. Explain how a society might actually benefit from price discrimination. Account for both ‘winners’ and ‘losers’.
Summary and revision

1. Price discrimination occurs when firms with market power set different prices for the same good according to different price elasticities of demand amongst consumers.

2. Economics identifies three types of price discrimination:
   a. First degree price discrimination: firms charge whatever the market will bear and attempts to get each individual consumer to pay whatever he/she is able and willing.
   b. Second degree: this is when firms set per-unit prices lower when the buyer purchases larger quantities – a bulk-buyer discount.
   c. Third degree: when sellers identify different groups of buyers and sells goods according to the PED for each group.

3. Firms price discriminate for several reasons. The obvious reason is that since average costs do not change the can increase profit by selling some of the units at higher prices. Other reasons include market capture by a firm wishing to expand and/or attain economies of scale; earn goodwill by setting prices lower for disadvantaged groups; public monopolies might price discriminate in order to increase output to a more societally beneficial level; a loss-making monopoly can use price discrimination to recoup some/all of the loss.

4. There are many ways for a price discriminating firm to segment the market into groups. The more commonly used segmentation variables are age, sex, time, income and geographical location.

5. The necessary preconditions for successful price discrimination are: 1) There must be distinctly identifiable groups with different PED values; 2) The seller must have a degree of market power; 3) The seller must be able to limit arbitrage – e.g. groups getting the good at a low price selling to groups prepared to pay a higher prices.

6. When sellers divide the market into ever smaller segments, profit for the seller rises and consumer surplus decreases.

7. Possible advantages for firms of price discrimination are increased profits, possibility of increasing market share and then attaining economies of scale, and societal goodwill.

8. Possible advantages for consumers include lower prices for some groups, improved products if firms use increased profits for R&D, and – in the case of a loss-making monopoly – getting the good produced at all.

9. Possible disadvantage for firms is that separating the market increases administration costs.

10. The potential disadvantages to consumers would be that some consumers end up paying a higher price (and they will not necessarily be the poorest groups), the loss of consumer surplus, and increased abnormal profits might help finance predatory pricing.

11. A publicly owned monopoly can increase societal welfare via price discrimination by setting the price at a loss making level (MC pricing) and then recouping some/all of the losses by charging certain groups more for the good/service.