Innovative pricing

Innovative pricing or price discrimination?

Definition: *the activity of creating new pricing schemes or tariff structures.*

Pure innovative pricing is where such new pricing schemes are introduced with no (perceptible) change to the product or service.

--> The traditional term in economics for this phenomenon is price discrimination: charging different prices to different customers for the same product or service. But more recently, it has inherited the more exciting label, innovative pricing, to reflect the fact that some companies put a lot of innovative effort into devising such pricing schemes.

Price discrimination

Price discrimination refers to the practice of charging different prices for the same good or service to different customers, based on various factors such as:

- their willingness to pay,
- demographics,
- location,
- or other relevant characteristics.

The goal of price discrimination is typically to maximize revenue or profit by capturing consumer surplus and tailoring prices to different market segments.

Why do companies engage in innovative pricing?

Companies engage in innovative pricing:

- For profit,
- They give a way to extract sufficient revenue from a market to cover costs.

Innovative pricing schemes which are then maintained in a stable form for some time can be seen as a form of discrimination or segmentation by customer characteristics or by product/service quality.

Innovative pricing schemes which are constantly subject to change can be described as a form of ‘noisy’ price discrimination.

What is the rationale for price discrimination?

- Price discrimination occurs where a producer sells the same product or service to different buyers at different prices.
- The rationale is that some buyers are willing to pay more for a particular product or service than others.
- It is profitable to design a pricing scheme whereby those prepared to pay a lot are charged a lot, while those prepared to pay only just above cost are charged just above cost.
  - E.g. if consumer A has an elastic demand curve and consumer B has an inelastic demand curve, it is profitable to charge B a higher price than A.

PROBLEMS WITH PRICE DISCRIMINATION

There are three potential problems with price discrimination.

1. The first is the legal one: in general there is a presumption in law that price discrimination acts against the consumer interest.
2. The second is a philosophical problem with the definition.
3. The third is the issue of whether it is ethical.

CONDITIONS FOR PRICE DISCRIMINATION

Two conditions need to be satisfied if price discrimination is to be used profitably:

1. there must be different willingness-to-pay (or price elasticities) in different markets. If not, then price discrimination will not be profitable.
2. the sorting devices used in price discrimination must be successful at sorting consumers into the required different groups. Price discrimination will break down if all those who have been targeted to pay a high price manage to get served in the low price market.

DEGREES OF PRICE DISCRIMINATION

It is traditional to recognise three degrees of price discrimination.

1. **First-degree price discrimination (Personalized Pricing):** This involves charging each customer the maximum price they are willing to pay. Companies gather data on individual customers and set prices accordingly. This type of price discrimination is challenging to implement in practice and is less common.
2. **Second-degree price discrimination (Quantity Discrimination):** Prices vary based on the quantity of the product or service consumed. For example, bulk discounts or tiered pricing plans often fall under this category. Customers who purchase larger quantities receive a lower per-unit price.
3. **Third-degree price discrimination (Segmented Pricing):** Prices are set based on different segments of customers, such as age groups, location, income levels, or other demographic factors. Common examples include student discounts, senior citizen discounts, or regional pricing variations.

First Degree

This is a rather idealised form of price discrimination, for two reasons:

1. because it will always be difficult to establish a particular buyer's maximum willingness-to-pay. It certainly isn't in a buyer's interest to reveal it to the seller!
2. because first-degree price discrimination requires in effect a different price for each person – and it is difficult to see how a seller could develop a subtle enough pricing scheme to cater for this.

- Some would argue that haggling between an experienced seller and a naive buyer can approximate to first-degree price discrimination. The seller works out just how much the buyer would be prepared to pay, and gets that price.
- CAUTION: In anything less than first-degree price discrimination, it is recognised that the producer cannot expect to set a different price for each buyer. At best, the producer can set a discrete number of prices in different settings, or perhaps define a pricing rule that results in a variety of different prices for different customers. But the producer cannot hope to extract all the profit. Some customers at least end up paying less than the maximum they would be willing to pay.

Second degree

Two key points about second-degree price discrimination:

1. each buyer ends up with the highest price tag that they would accept.
2. even those who are not willing to pay much will still get a chance to buy so long as they are prepared to pay the lowest price tag.

- So for example, if prices are set at 10, 8 and 6, then the customer willing to pay up to 11 actually pays 10, the customer willing to pay up to 9 actually pays 8, and the customer willing to pay 7 ends up paying 6. In this way, price tags are closely matched to the consumers who are willing to pay that amount, but not much more than that.

Third degree

Usually, the high prices are set in markets where demand is inelastic while the low prices are set where demand is elastic. But unlike the case of second-degree price discrimination, there is no guarantee in this case that each customer ends up paying the highest price tag consistent with their maximum willingness-to-pay.

- Eg. some of the customers willing to pay 7 will not get a chance to buy at 6, because they are unfortunate enough to live in a high price region.

SOME GENERIC EXAMPLES OF PRICE DISCRIMINATION: Two-Part Tariffs

In the two-part tariff, the buyer pays a fixed cost and a usage-related cost.

Eg. the domestic telephone subscriber pays a fixed rental charge, and then a charge for each call made. This means in effect that heavy users pay a smaller average cost per call since the fixed cost is diluted over more calls. This can be interpreted as price discrimination, if the heavy user is price sensitive and the light user is price insensitive: the price elastic user is charged a lower cost per call than the price inelastic user.

SOME GENERIC EXAMPLES OF PRICE DISCRIMINATION: Two-Part Tariffs

Figure illustrates how these two-part tariffs work for mobile phones. It shows total cost as a function of call minutes, for three different tariffs offered by one operator.

As the graph shows, total cost can vary significantly according to which tariff is chosen.

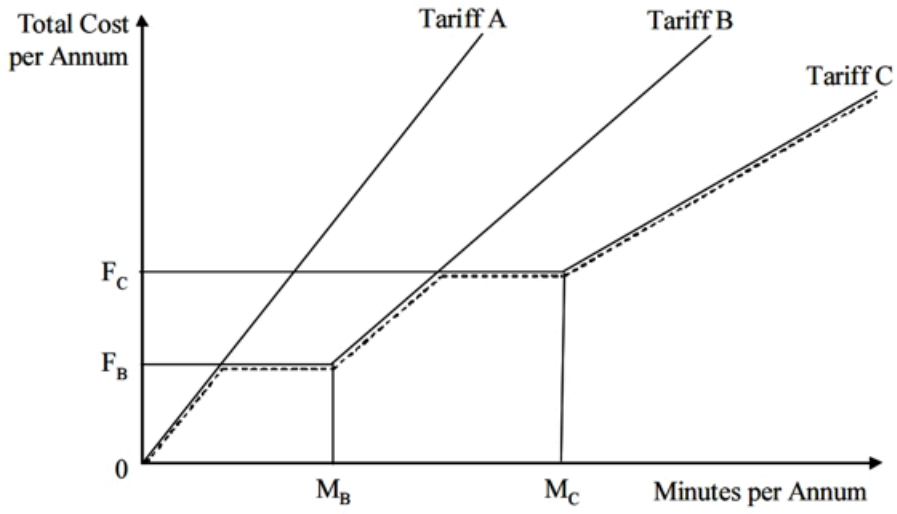
The dotted line shows the 'best deal'.

Tariff A makes no fixed fee but has a relatively high charge per minute.

Tariff B has a fixed fee of FB and MB free minutes. Above that, call charges are lower than in Tariff A.

Tariff C has the highest fixed fee (FC) and in return offers MC free minutes. But it also has the lowest marginal cost per minute for call minutes in excess of MC.

The occasional user would be best to choose Tariff A, while the heavy user is best to choose Tariff C. Tariff B would be the best choice for the intermediate user, between these two extremes.



Mobile phone tariffs

Other examples of two-part tariffs are the entry fee to an amusement park, club membership charges, and so on. Quantity discounts offer a similar pricing structure to the two-part tariff.

SOME GENERIC EXAMPLES OF PRICE DISCRIMINATION: Pricing According to Consumer Characteristics

- Students often pay a lower price than the standard price.
- The same applies to pensioners.

The marketing logic of this is that students as a group tend to have a lower maximum willingness-to-pay (or ability to pay) than those in full-time employment, and student demand is more price elastic than the norm.

Such price discriminatory schemes are widespread (e.g. travel cards, museum entrance fees, journal and club subscriptions).

SOME GENERIC EXAMPLES OF PRICE DISCRIMINATION: Pricing Over Time

- Peak-time travel is more expensive than off-peak travel.
- Off-peak telephone calls are typically much cheaper than peak-time telephone calls.
- Night-time electricity is cheaper than daytime electricity.
- Holidays in August tend to be more expensive than holidays in February.
- In some high technology areas, a new product may be introduced first at a high price, but if you are prepared to wait, the price will fall later on.

All of these are examples of price discrimination over time: the willingness-to-pay for peak-time travel, high- season holidays, and early delivery of a new product is high, and such pricing schemes exploit this.

This form of discrimination lies perhaps between second and third degree, but is usually classified as second degree.

Another form of intertemporal price discrimination is penetration pricing: the product is initially sold at a very low mark-up on costs (or even at a loss) with the aim of building up market share. Then a higher price is charged when the product is established.

NOISY PRICING

Noise refers to information or activity that confuses or misrepresents genuine underlying trends.

It is suggested that some multi-store retailers may set different prices in different stores to sort out the searchers from the rest.

The argument is that the busy customer, whose time is scarce and valuable and does not have the time to search, will pay the first acceptable price he comes across, while the customer with time to spare will do more market research and seek out a lower price.

NOISY PRICING

EXAMPLE: Financial services offer many examples of noisy pricing.

In general, whether we are talking about borrowing or lending, it is generally true that new accounts offer more favourable rates of interest than old accounts.

Why?

The idea is that customers tend to be slow to switch from one account to another, even when the latter offers a better deal. Consumers with time to spare, or who are particularly sensitive to price will switch when it is favourable to do so, while the rest will not.

Some financial institutions exploit this by ‘churning’. This is the practice of introducing new accounts with better terms and gradually making the old accounts less attractive. In this way, financial institutions can price discriminate by offering better terms to new account holders (who have just switched) and poorer terms to existing customers (with inertia).

NOISY PRICING

EXAMPLE: Tariffs for mobile phone usage are also subject to noisy pricing. Tariffs change regularly.

The consumer may pay considerable attention to these at the time of purchase, in order to work out the best deal for his needs. But relatively few customers continually monitor these tariffs to work out whether their existing service still offers the best deal for them – and if not, switch to another.

Mobile phone operators can, by this continuing process of tariff innovation, expect to charge higher prices to those with inertia and lower prices to those who are more sensitive to price.

NOISY PRICING

- Some have argued that the growth of e-commerce and online shopping will eradicate noisy pricing.
- After all, noisy pricing depends on a certain degree of ignorance on the part of the consumer. It is a hassle to search around for the best deals, and that is part of the reason why customers don't switch.
- But the evidence on this is mixed.
- In a study of prices and price dispersion amongst online bookstores, Clay et al. (2001) found that over their sample period there was no evidence of a reduction in average prices or of price dispersion. This suggests that even if online shopping makes price comparisons easier, that is still not working through to less 'noise' in pricing. Part of the reason may be that online sellers sometimes make it time-consuming to dig out details of their pricing structures. This is especially true with online sites selling train tickets. That in turn makes it time-consuming to perform price comparisons. However, these search costs are declining with the emergence of web-sites that act as search engines over a number of online bookstores.

RECENT EXAMPLES OF INNOVATIVE PRICING

- While the Internet may make it easier for the consumer to work around noisy prices, it also offers the supplier great opportunities to create new innovative pricing schemes.
- One example, which has attracted a lot of interest, is Priceline (www.priceline.com).
- This online site sells airline tickets, hotel rooms, rental cars, home finance, and so on. There is nothing exceptional about that – except its pricing model. Instead of the supplier quoting prices for a particular product or service, the consumer is asked to state his/her own price.
- So, for example, the consumer requests a particular journey by air and states a price which he is willing to pay for that journey. Priceline require some flexibility on the part of the consumer. In particular, the consumer must commit to buy at that price without complete knowledge of the deal: he does not know exactly which airline will carry him or the precise timing. But in return for that flexibility, Priceline claim that they can allow consumers to save up to 40 per cent on brand-name products and services.
- Varian (2000) shows how this is just another form of price discrimination.
- Those who are price sensitive but product flexible can signal this flexibility by using Priceline. Those for whom travel is time critical but are not price sensitive are better to buy their tickets from conventional outlets.

WHAT CONSTRAINS PRICE DISCRIMINATION?

Although innovative pricing and price discrimination can be profitable, some suppliers may be reluctant to use them. There are a number of constraints on price discrimination as a strategy.

1. **Regulation**: price discrimination may be illegal. If price differentials between different products do not appear to relate to cost differentials, the anti-trust authorities may take the view that this is discrimination against the group of consumers who suffer from the higher cost-to-price mark-up.

WHAT CONSTRAINS PRICE DISCRIMINATION?

2. Competition: Certain types of price discrimination are only viable if the producer has a degree of market power.

Competition in general erodes the potential to make monopoly profits, and this includes those monopoly profits made through price discrimination.

Competitors will find it attractive to supply the market in which would-be monopolist is charging a large cost-to-price mark-up.

WHAT CONSTRAINS PRICE DISCRIMINATION?

3. **Arbitrage**: price discrimination breaks down if consumers targeted to pay a high price manage to buy at the lower price.
   - One reason, of course, is that the consumers who buy at a low price could in principle resell in the high price market – and that clearly undermines price discrimination.

   Price discriminatory schemes which charge a corporate subscription to companies but a much lower rate to private individuals would break down if private individuals from a company bought the benefits of subscription for the company as a whole, but only paid the low price. Subscription contracts are often written to preclude such outcomes.

WHAT CONSTRAINS PRICE DISCRIMINATION?

4. Commitment and Reputation: Intertemporal price discrimination – that is charging a high price at launch, but reducing the price later – can be a good mechanism to sort out customers with high willingness-to-pay from those with low willingness-to-pay.

It exploits the impatience of consumers, and the competitive advantage for corporate customers in being able to secure early delivery of a new product. But this game will not work indefinitely.

If you gain a reputation for intertemporal price discrimination of this sort, then consumers will get wise to it and may delay purchase in anticipation of future price cuts.

In such a setting, some producers may decide to make a firm public commitment that they will not cut prices – so there is no point in consumers waiting for the price cut that will never come.

But such commitments only work if you keep to them

CASE STUDY OF INNOVATIVE PRICING: AIR TICKETS

If you were to ask the person sitting next to you on a flight, ‘how much did you pay for your return fare?’ he probably would not have paid the same price as you.

How can an airline charge different passengers different fares for what is (in essence) the same product or service? In this context, the words ‘in essence’ are very important. The fact that two passengers are sitting side by side on a particular flight does not imply that they were sold exactly the same thing. Perhaps one traveller was sold an expensive and flexible return that allows him to travel on any flight, while the other was sold a cheap but restricted ticket that allows no flexibility. The two passengers were not sold exactly the same thing even if they end up sitting together.

In the same way, airlines can charge different fares according to:

(a) the time of sale and the time of travel,

(b) where the ticket was bought, especially whether the tickets are sold online or through a travel agent;

(c) whether the customer is a student, a leisure traveller or a business traveller;

(d) the class of accommodation;

(e) whether the ticket sale is bundled with other travel tickets; and many other factors.

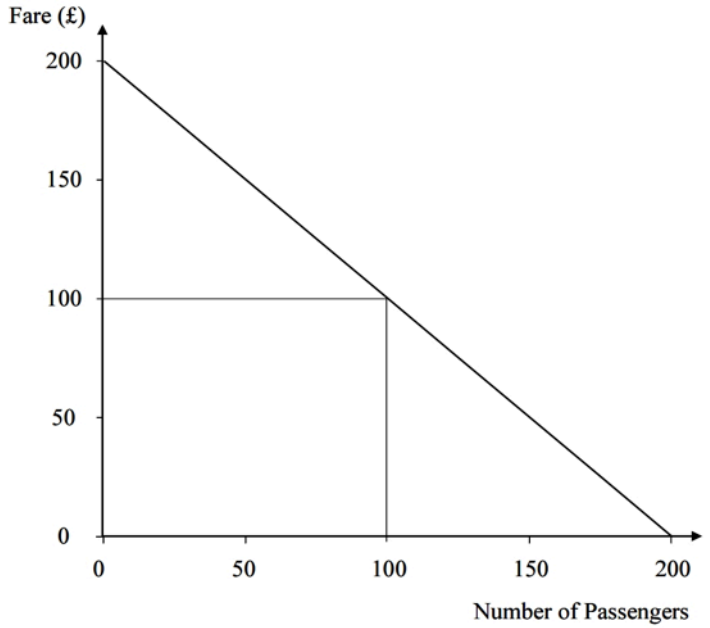
CASE STUDY OF INNOVATIVE PRICING: AIR TICKETS

All these innovative pricing schemes can be categorised into two broad groups:

- **systematic price discrimination**: price differences are well known and well understood but some customers still opt to pay the higher price.
- **noisy price discrimination**: price differences show an element of randomness and some customers do not know where to find the best bargains. The second category offers another dimension to price discrimination because it distinguishes between those customers with the time to seek out the best price and those busy customers who don’t have time to search but will buy so long as the price is reasonable.

CASE STUDY OF INNOVATIVE PRICING: AIR TICKETS

Why do companies want to do this? The simplest answer is that price discrimination happens because companies find it profitable.
To see this, consider the very basic demand curve in Figure.
This describes how market demand for seats on a particular flight would vary as the airline alters its fares.
If the airline charges a high fare (around £200), then demand will be very low, but if the airline charges a very low fare (about £1) then demand will be very high.



Demand curve for air travel

CASE STUDY OF INNOVATIVE PRICING: AIR TICKETS

We can also interpret the demand curve in a different way. It tells us how many (and which) customers are prepared to pay how much. Those customers at the left-hand side of the diagram are prepared to pay a lot (up to £200) while those at the right-hand side are only prepared to pay a little.

Now to simplify things, make two assumptions.

1. First, suppose that it costs the airline nothing to transport one additional passenger in an empty seat. This may be a slight exaggeration but not much.
2. Second, suppose that the capacity of the aeroplane is 200 people (plus crew).

If the airline decides to set just one fare, then the most profitable price will be approximately £100, as shown on the diagram, and the revenue raised will be £10,000. But there are two defects in this pricing strategy.

- First, at this fare the plane may only be half full (100 passengers). There are some potential customers who would be prepared to pay something to travel and it costs nothing to offer them a seat, but the plane leaves without them.
- Second, there are some passengers who would be prepared to pay higher fares. For these two reasons the airline is not achieving as much revenue as it could

CASE STUDY OF INNOVATIVE PRICING: AIR TICKETS

Suppose, instead, that the airline sets a range of fares.

And suppose it can – by skilful innovative pricing – ensure that those customers willing to pay more end up paying more.

Then the airline can extract a good deal more revenue from the market.

Figure shows how this works in the case of three fares:

- passengers 1-50 are charged £150,
- passengers 51-100 are charged £100,
- passengers 101-150 are charged £50.

This way, the airline can raise £15,000 from ticket sales – 50 per cent more than when it sets a single fare

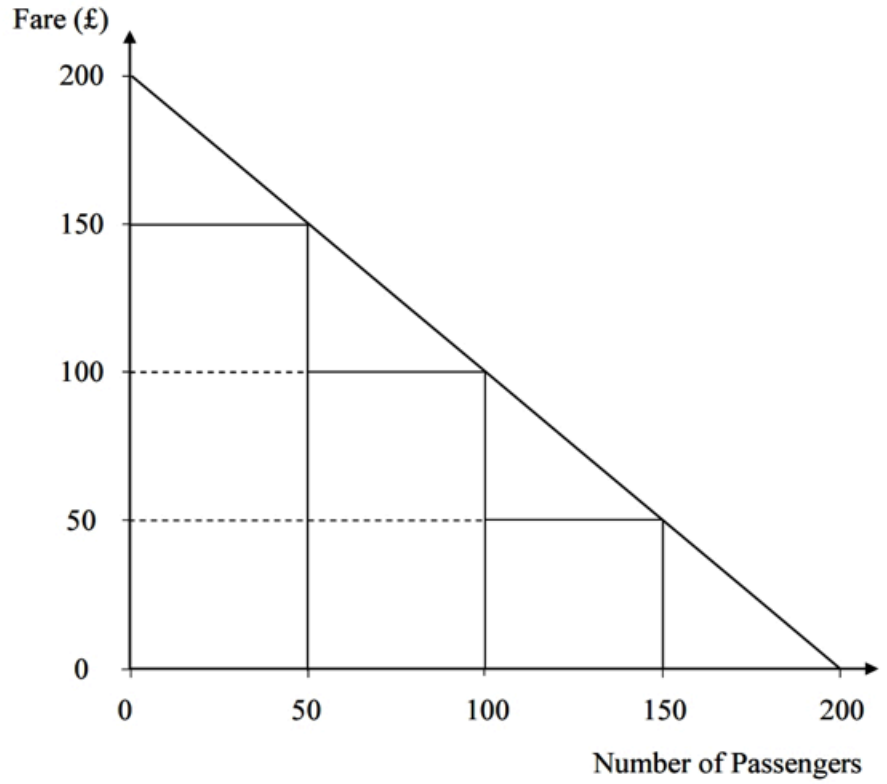


Figure 6.3 Price discrimination: three fares

CASE STUDY OF INNOVATIVE PRICING: AIR TICKETS

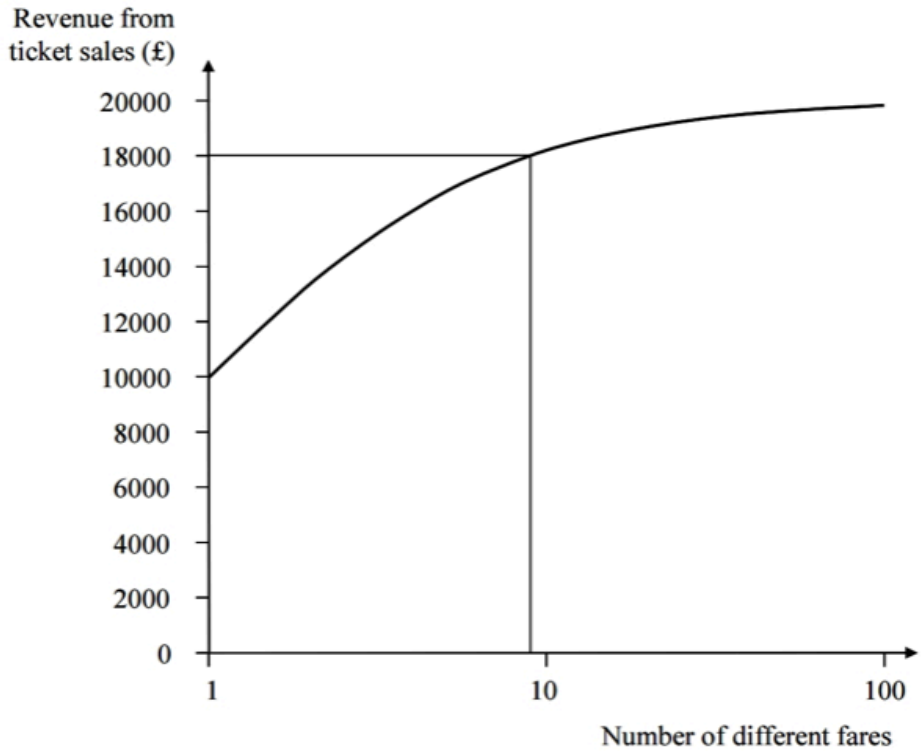
As a general proposition, the more distinct fares the airline can set the more revenue can be raised.

Following similar calculations to those, Figure summarises how revenue increases with the number of distinct fares.

In the limit, if the airline can charge each passenger exactly the maximum he would be prepared to pay then it can extract the maximum possible revenue.

The real world is never as simple as our simple diagram, but if it were, this maximum revenue is about £20,000 – double what could be raised by setting one fare only.

That is why this innovative pricing strategy is so profitable.



Revenue achieved by innovative pricing

CASE STUDY OF INNOVATIVE PRICING: AIR TICKETS

It is not just desire for profit that leads to such a strategy.

In any business where there are large set-up costs (or fixed costs) this strategy may be necessary just to **break even.**

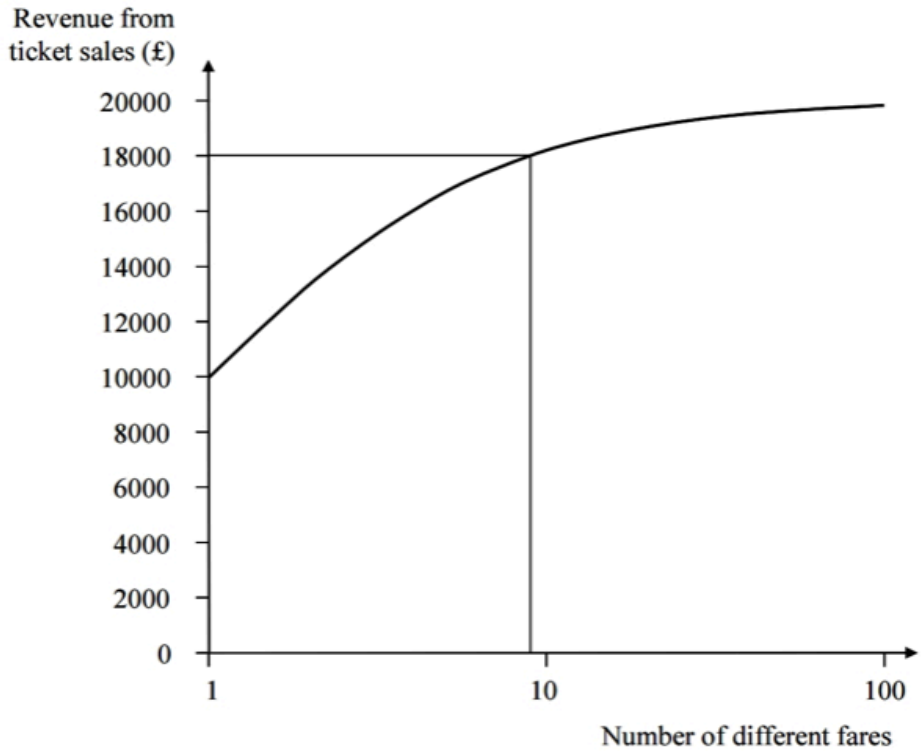
In terms of our simple example, suppose that the fixed cost of operating the flight was £18,000. The airline has to meet this cost regardless of how many passengers it carries.

The airline with just one fare can only raise £10,000, but that isn't enough to cover its fixed costs.

The airline charging three prices can raise £15,000, but that isn't enough either.

From Figure we can see that it requires nearly 10 distinct fares to raise £18,000 and break even, and 10 or more to make a profit.

So innovative pricing becomes not just a way of making a large profit but may be essential if the company is merely to break even.



Revenue achieved by innovative pricing

Conclusions

Price discrimination can have both positive and negative effects.

- On the positive side, it can increase overall market efficiency by allowing businesses to capture more consumer surplus, potentially leading to lower prices for certain groups.
- However, it can also lead to issues of fairness and may be seen as discriminatory. Additionally, implementing price discrimination strategies can be complex and may require careful consideration of market conditions and consumer behavior.

It's worth noting that certain forms of price discrimination may be illegal in some jurisdictions, especially if they are deemed to be discriminatory or anti-competitive. Businesses need to be mindful of legal and ethical considerations when implementing pricing strategies.

Exercise Perfect Price Discrimination

Jack, an ingenious student, develops a new personalized laser gun as part of a competition. After graduating, he starts his business. As part of his business plan:

- The lasers operate on user hand print recognition so resale is not possible (condition #2)
- Annual market demand curve faced by the firm is 5500 - 100P = Q (condition #1)
- Fixed costs are $20,000 per year.
- Variable cost is $15 per gun.
- At Sloan, Jack did very well in his organizational/consumer behavior classes and is able to read people very well (condition #3). Thus, he is able to determine and charge the reservation price to each customer. How many guns will Jack sell and what will his total profit be?

Solution

Total Cost = Fixed Cost + Variable Cost =
$20,000 + $15Q

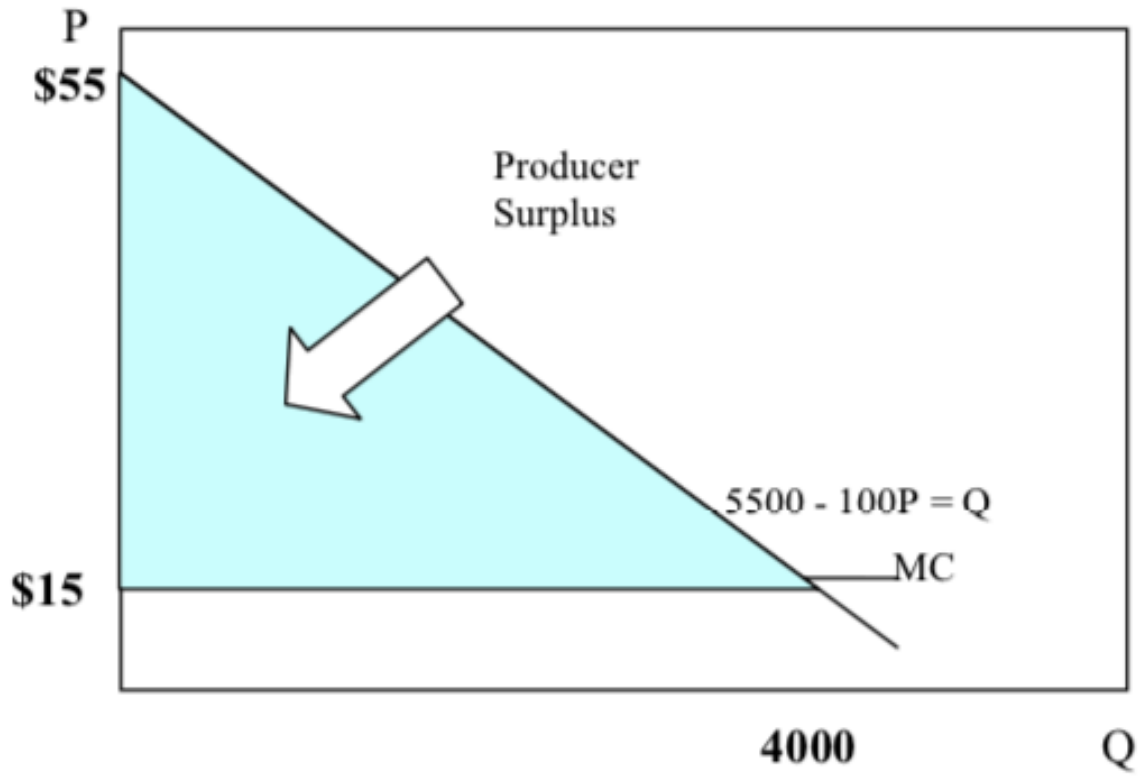
Marginal Cost = ∂TC/∂Q = $15

Since Jack can charge the reservation price, he captures the entire consumer surplus as shown below:

He will sell 4000 guns. His annual profits are:

π = Area of Producer Surplus - Fixed Costs

π = .5*($55 - $15)*(4000) - $20,000
π = $60,000



Exercise Pricing to Observable Market Segments

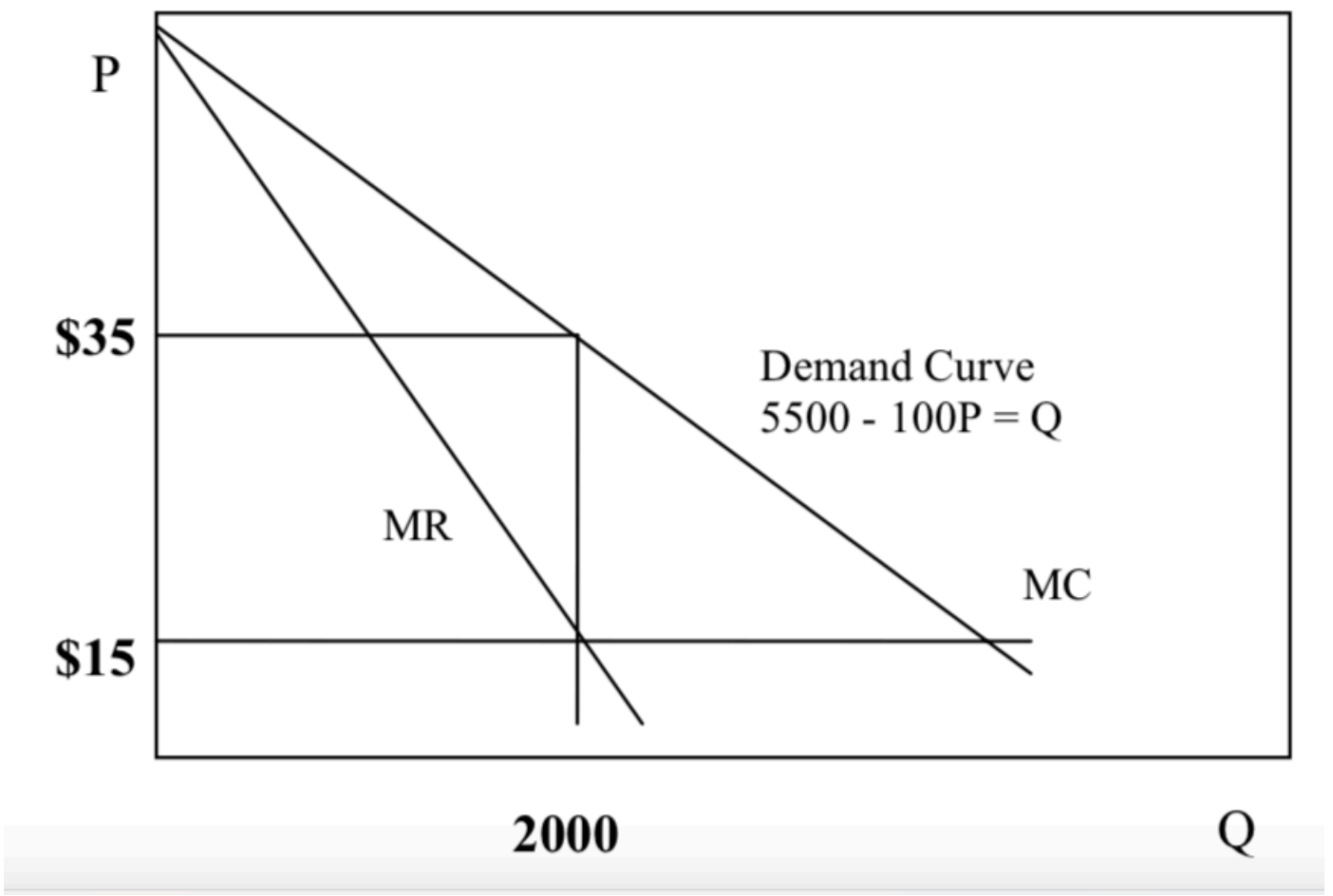
Let’s consider the case where there are two customer segments.

- One group consists of the usual customers mentioned before and the other group is students.
- However, the students have a different buying pattern and have the following demand curve: 2000 - 50P = Q.
- How should Jack price if he is trying to supply both customer segments and can easily segment the two types of customers? (note that in this case, he is not able to determine each customer’s reservation price as before, but he is still able to tell if the customer is a student or not).

Solution

For the **usual customers**, Jack should do the following:
Total Cost = Fixed Cost + Variable Cost = $20,000 + $15Q
Marginal Cost = ∂TC/∂Q = $15 (same as before)
Demand: 5500 - 100P = Q

Rearrange in terms of P:
P = (5500 - Q)/100
P =55-.01Q
Total Revenue = P*Q
Total Revenue = $55Q - .01Q^2$
Marginal Revenue = ∂TR/∂Q = 55 - .02Q
MR = MC
55 - .02Q = 15
Q = 2000 units
Price=P =55-.01Q=55-.01*2000
Price = $35

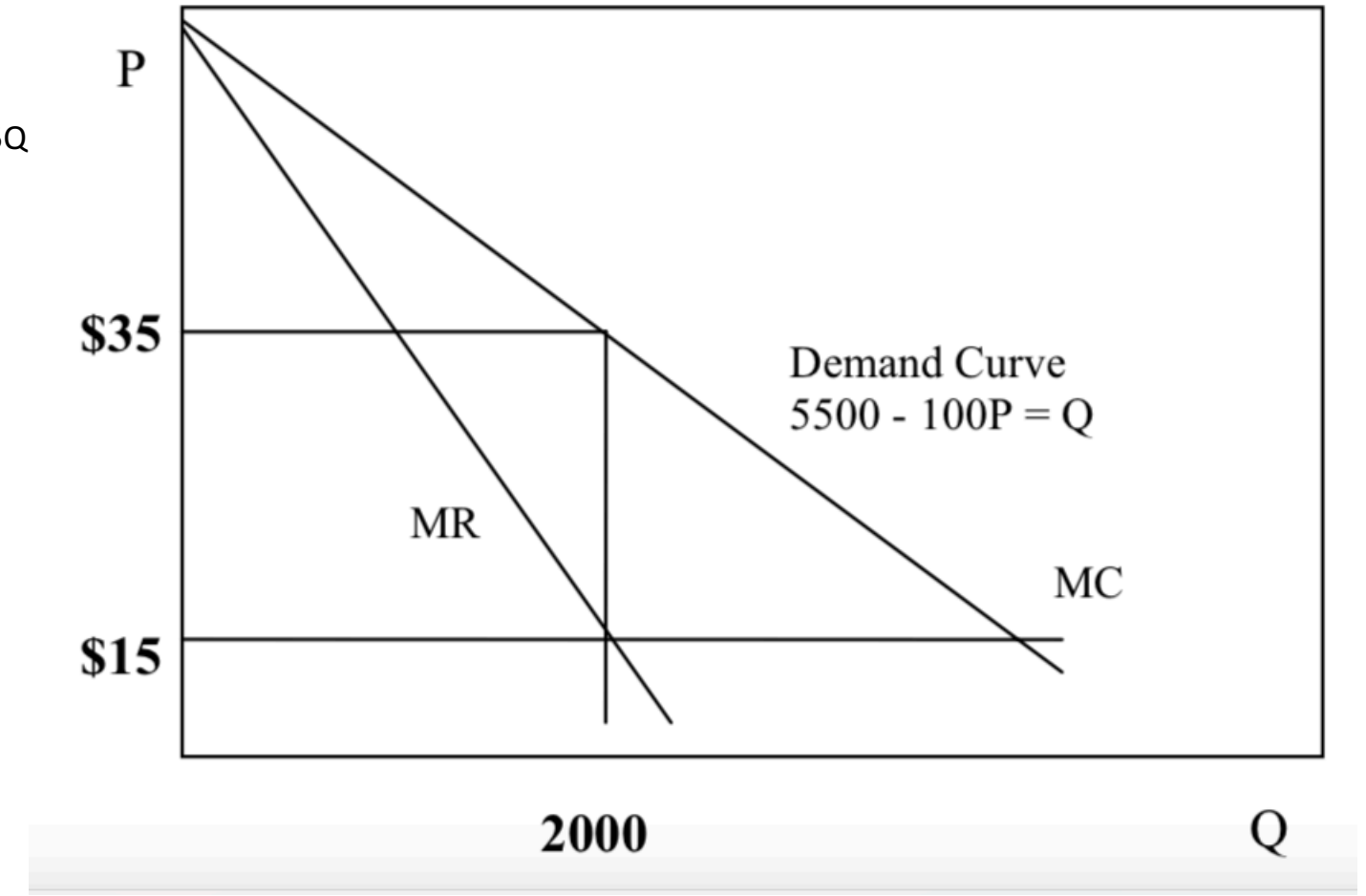


Solution

For the **MIT students**, Jack should do the following:

Total Cost = Fixed Cost + Variable Cost = $20,000 + $15Q
Marginal Cost = ∂TC/∂Q = $15 (same as before)
Demand: 2000 - 50P = Q

Rearrange in terms of P:
P = (2000 - Q)/50
P =40-.02Q
Total Revenue = P*Q
Total Revenue = $40Q - .02Q^2$
Marginal Revenue = ∂TR/∂Q = 40 - .04Q
MR = MC
40 - .04Q = 15
Q = 625 units
Price=P =40-.02
Q=40-.02*625
Price = $27.50



Solution

His annual profits from the usual customers and students are:
$\pi = P_{normal}*Q_{normal} + P_{student}*Q_{student}$ - Fixed Cost - Variable Cost

$\pi = \$35*2000 + \$27.50*625 - \$20{,}000 - \$15*(2000+625)$
$\pi = \$27{,}812.50$

Observations:

The price charged for students is less than for usual customers. This is as expected since they are more price elastic.

To charge different prices, Jack would need to be able to distinguish students from usual customer (for example, use student IDs).