

# The pricing of transport activities

*Contributed by Stephen Ison*

### Learning Outcomes:

On reading this chapter, you will learn about:

- Price discrimination in the pricing of transport services
- Pricing malpractice, namely predatory pricing, as it has been applied in transport services and price fixing, and thus what constitutes 'fair' and 'unfair' pricing policies in the pricing of transport services
- A closer examination of private transport services with a particular focus on the pricing of such services.

## INTRODUCTION

Pricing is a vital component in the economics of transport services. As we have already seen, not only does the price determine who gets and who doesn't get a particular service, but also determines the distribution of the 'rewards' between the provider and the user of transport services, with imperfect market structures characterised by higher rewards for the providers of such services. That of course assumes that transport services operate along purely free market principles, which of course in most cases they do not. Although most are subsidised and/or regulated, a basic understanding of these issues is required before we go on and examine the issues of transport regulation in Chapter 10.

In this chapter therefore we examine further the issues surrounding the pricing of transport services. Earlier chapters have already outlined the theory behind the price, with in simple terms the price being dependent upon the market conditions facing the individual firm. An important finding from that analysis was that in order to achieve economic efficiency the price should equal the marginal cost. This chapter will also consider how people actually pay for their transport services, as in many ways the pricing of transport is very different from a typical consumer good. With say a basic commodity such as groceries and general foodstuffs, the price is displayed and people hand over cash or some other form of payment and consequently obtain the groceries that they desire. With regard to the payment for transport activities, however, it is far from straightforward. Individual bus or rail journeys tend to follow that basic pattern of payment of a fare

followed by consumption of the service through undertaking the actual journey; however, more regular travel brings with it a host of other issues, such as season tickets, the use of smart cards etc. Furthermore, the pricing of private transport services is more complex again, as that is 'paid' for through a combination of different mechanisms – not only directly by the user through vehicle purchase, vehicle licensing, fuel and other running costs, but also through the tax system, which in most developed countries makes a significant contribution to the upgrade, maintenance and renewal of the road system. This is an area which is likely to see considerable change in the near future, with far more emphasis placed on a direct user charge, and this chapter will consider the key points surrounding this issue.

### **PRICING IN PUBLIC TRANSPORT SERVICES**

The price set by public transport operators, particularly if they are operating under conditions of monopoly, will depend on 'what the market will bear'. The reason for this is that the market does not consist of homogeneous consumers. Different parts, or segments, of the market will comprise of customers who will respond differently to changes in price, advanced booking requirements, ticket flexibility and so on. Thus market segmentation. When considering pricing under a monopoly situation then the various segments will have differing levels of elasticity, and this can be used to the operator's advantage when deciding what price to charge. As such, individuals undertaking work-related journeys during peak times, with inelastic demand, can be charged a relatively higher fare as can be seen in Table 8.1. Individuals however for whom the journey time is somewhat less important, and therefore where demand is relatively more elastic, will be charged a lower fare in order to stimulate travel. What is known as price discrimination will therefore be undertaken, in order to maximize revenue and this is likely to take place at the national public transport level, namely with respect to rail and airline travel.

In terms of local public transport, then, passengers tend to purchase their tickets at the 'point of use', that is, at the time of departure and in such a situation it is not possible to segment the market. In addition, local public transport passengers are likely to be more sensitive to waiting and journey times than they are to the level of fares.

#### **Price discrimination**

Price discrimination refers to a situation where a company charges particular consumers a higher price than others for the same product for reasons unrelated to cost. Price discrimination is extensively used in the transport sector with bus, coach, rail and airline operators charging a range of prices for the same service depending on the time of the day, when the tickets are booked or the particular period time of the year. It does not simply refer to transport services, however, but can also be applied in other areas of transport operation, such as the pricing of car parking spaces. An example of this can be seen in Table 8.1 where the car park tariff varies depending on the number of hours parked, which is simple market pricing, or whether it is a weekday or Saturday, which is a classic case of price discrimination.

The basic principle of price discrimination is to increase an operator's total revenue and earn higher profits, and as a result reduce consumer surplus. Consumer surplus is a concept that

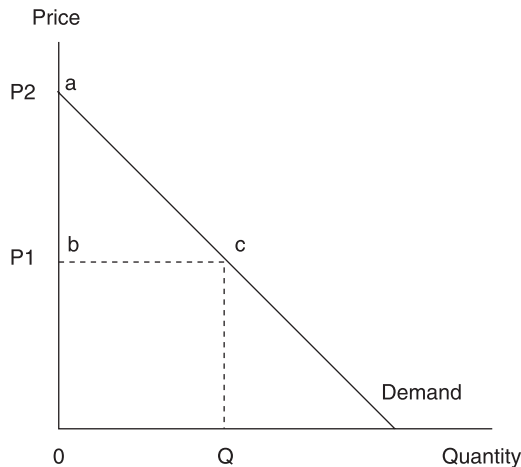
■ **Table 8.1** Weekday and Saturday opening times and daytime charges, Grand Arcade 7.30am – 5.00pm, Cambridge, from April 2008

Hours	Weekday tariff £	Saturday tariff £
0–1	1.60	1.80
1–2	3.20	3.60
2–3	4.80	5.40
3–4	8.00	8.80
4–5	14.50	16.50
5+	21.00	21.00

Source: Cambridge City Council (2008)

has been dealt with in the previous chapter, but given its importance to price discrimination it is worth recapping here. Consumer surplus refers to the difference between the actual price a consumer pays for a product and what they would be willing to pay. As such, in Figure 8.1 the actual market price is P1 but some consumers would be willing to pay a price as high as P2, some would be willing to pay a price just below P2 and so on. There is thus consumer surplus equal to the area abc and this is something that transport operators are keen to exploit by price discrimination.

In order to practise price discrimination and reduce the consumer surplus certain conditions must prevail. First, the seller must possess a degree of market power, although the operator does not have to be a monopolist. Possessing a degree of market power means that the seller faces a downward sloping demand curve. Second, the seller must be able to divide the market into individual segments and thus separate different customers within a particular market, such as peak and off-peak. These segments must be clearly divisible and there must be no mechanism through



■ **Figure 8.1** Consumer surplus

which high-yield premium charge consumers can ‘down trade’ to the lower-charge segment. Such market dividers are known as inhibitors and prevent trading between different market segments from occurring. This tends to mean that price discrimination is more likely to be practised in service industries, such as transport, where the market can be divided relatively easily in terms of time. Indeed, divisions tend to be on the basis of time of day, day of the week or season of the year. Other inhibitors can be based upon geographical location, age and time of purchase (booking).

Third, each market segment must have differing elasticities of demand. There is no point in dividing up the market into different segments if all segments have identical elasticities of demand, as each could only be charged the same price and hence there would be no price discrimination.

Ideally, an operator would like to sell each unit (or ticket) separately, charging the highest price that each consumer is prepared to pay and if this was achievable the seller would obtain the entire consumer surplus from the consumer. This can be illustrated by the use of Figure 8.2 and is known as perfect price discrimination.

To undertake this form of price discrimination the seller must know the exact shape of each consumer’s demand curve and perhaps with more difficulty charge each consumer the maximum price they are prepared to pay. In Figure 8.2 if the supplier was a profit maximiser then it would charge a price of  $P_m$ , earning abnormal profit of  $bcde$ , with the consumer obtaining consumer surplus of  $abc$ . If the seller was able to perfectly price discriminate then the consumer willing to pay the highest price would be charged  $P_1$ . Having sold that unit the second unit would be sold for a slightly lower price and so on. As such, the seller would charge down the demand curve, which would thus become the marginal revenue curve. The operator would continue to sell the product until point  $f$  is reached, with a quantity of  $Q_1$  sold. The operator would be profit maximising (producing where  $MR=MC$ ) and would have obtained the entire area of consumer surplus.

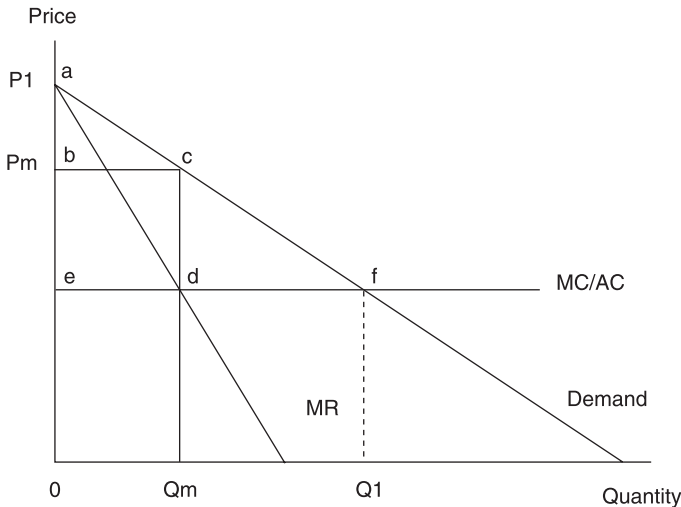
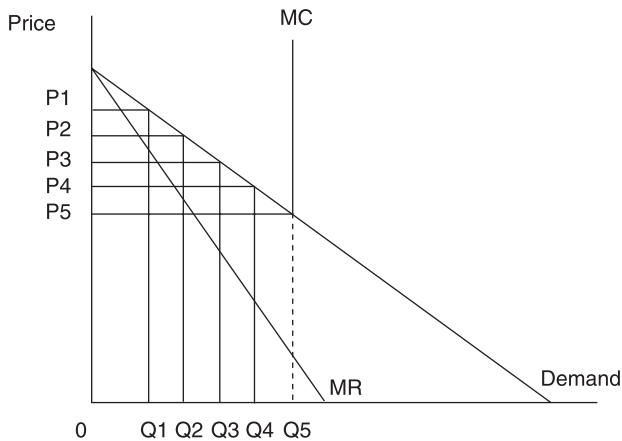


Figure 8.2 Perfect price discrimination

This type of price discrimination is an ideal from the point of view of a transport operator, but for obvious reasons is not very common. While it is not a common practice airline operators by practising yield management are aiming to get somewhere close to such as situation, and this is illustrated in the following case study.

### Case study 8.1 Sale of airline tickets

On a typical airline flight there are three classes, namely First, Business and Economy. Figure 8.3 refers to travel in a particular class and the assumption is made that the marginal cost (MC) of one extra passenger is constant up to the point where the aircraft reaches full capacity, which is represented by Q5. At this point the MC curve becomes perfectly inelastic.



■ *Figure 8.3 Airline price discrimination*

If the airline operator was to profit maximise it would set a price equal to P2 and sell a quantity of Q2 tickets. As can be seen however this would mean that the airline would be operating at below full capacity, with Q5-Q2 seats empty at the time of departure. As such, the airline operator would seek to price discriminate and release seats onto the market at different prices at different time periods. This it is able to do because consumers will purchase their tickets at different times. For example, certain passengers will have a low ability to pay but will be able to book well in advance. As such, they may be able to buy their tickets at a price of P4. Others who are only able to finalise their travel plans close to the time of departure may be willing to pay P1. As these consumers have different price elasticities, this allows the airline to price discriminate. This it does by pricing along the demand curve and although they may not be able to perfectly price discriminate they are obtaining additional areas of consumer surplus and are therefore adding to their level of profit. Technically this is known as 3rd degree price discrimination, as each group of consumers is charged a different price. 1st degree on the other hand occurs where each individual consumer is charged a different price, hence perfect price discrimination would be an example of this.

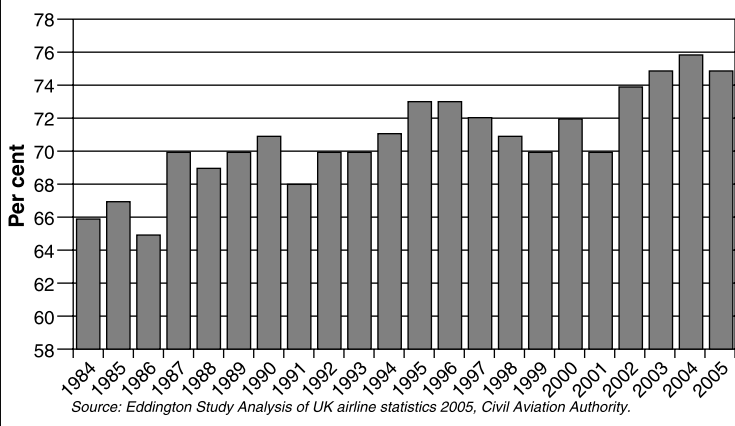
Airline operators are able to price in this way since they are able to separate their customers and prevent arbitrage and this is possible since tickets when purchased are not transferable. When purchased the passenger needs to give a particular name and when checking in this is matched against the name in the passport and this prevents arbitrage taking place.

Airline operators have become highly sophisticated in determining how many tickets to issue onto the market at any one time, providing them with the opportunity to maximise their yield. Yield management is an important strategy for the airline sector be it traditional carriers or low-cost operators. The following relates this to load factors, yield management and airline pricing as outlined by the Eddington Study (2006).

**Yield management in the aviation sector**

Airlines are already using pricing very successfully through yield management, which involves a sophisticated and flexible approach to pricing. Using historical sales information to allocate some seats to price-sensitive, low-paying non work/leisure travellers, while holding others for time-sensitive, high-paying business travellers, airlines aim continually to find the best product mix of differently priced seats, to gain the highest possible revenue from the fixed capacity of each airline flight. Widespread use of yield management techniques allowed dramatic efficiencies to be achieved in the airline industry throughout the 1980s and 1990s. In 1984, UK airlines sold only 66 per cent of seats on each flight on average. By 2005, this figure had risen to 76 per cent. In recent years, technological improvements have enabled airlines to continue improving their yield management.

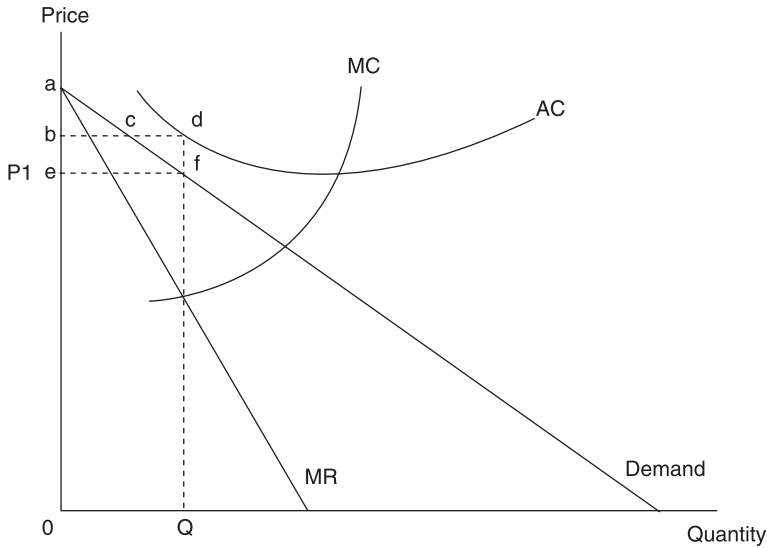
**Load factors for scheduled UK airlines, 1984–2005  
(percentage of seats used)<sup>a</sup>**



<sup>a</sup>Chart produced from data published by the Civil Aviation Authority UK Airline Statistics 2005: 12 Table 2.2

Source: Crown Copyright Eddington Report (2006)

Airlines therefore profit maximise through revenue maximisation by practising price discrimination. In so doing, airlines attempt to obtain the largest level of passenger revenue for a fixed level of capacity.



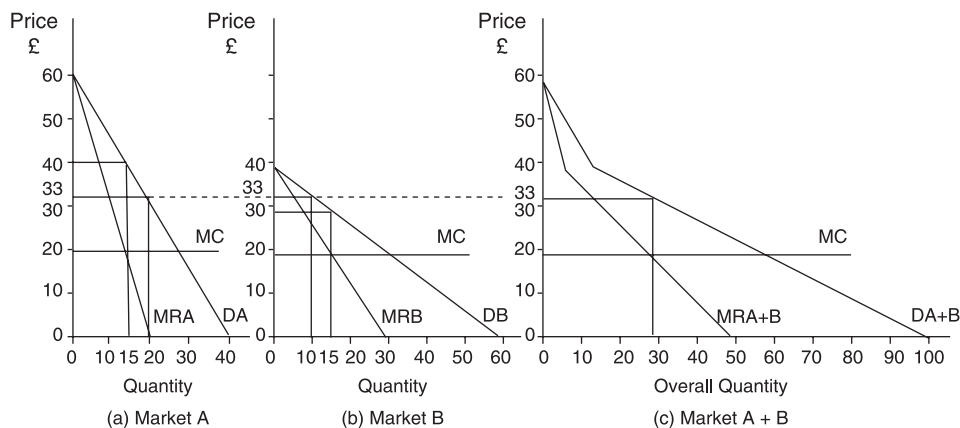
■ *Figure 8.4 Loss making operator and perfect price discrimination*

Pricing along the lines outlined in the above case study can actually be of benefit to consumers. Figure 8.4 illustrates a situation in which a transport operator charging a single price of P1 is making a loss of bdf. This could represent an airline operator serving a remote sparsely populated area and as can be seen it is not covering its average cost and consequently it would cease operating in the long run. If however it were to charge more than one price it might be able to make a profit and continue to operate the service. If, as explained above, the operator was to price down the demand curve starting at point a, then those airline tickets sold would be profitable as they would be sold at a price above the average cost. Tickets sold beyond c up to point f and the output of Q however would represent loss-making sales to the airline operator. Nevertheless, as long as area abc is greater than area cdf then the strategy will lead to a profitable outcome and the passengers will continue to find the service is in operation.

Whilst perfect price discrimination is an ideal strategy from the operator's point of view it is very difficult and costly to practise. As such, operators may practise a more crude form of price discrimination dividing the market into two or more segments based on different price elasticity conditions. This is a policy of charging different prices to consumers in different markets and is a common type of discrimination characterised by such things as discounts to students and senior citizens and peak and off-peak rail use. In each case some characteristic has been used to divide consumers into distinct groups such as students and non-students who have a different ability and willingness to pay. In this situation the student union card is used as a means of enacting price discrimination.

The idea behind this more common form of price discrimination can be seen in Figure 8.5.

In this situation there are two markets, markets A and B. The demand in market A is less elastic than it is in market B. This could represent the peak and off-peak nature of rail travel, with the split between the commuter and the leisure rail user. The overall quantity in Figure 8.5(c) is derived by the horizontal summation of the demand in market A and B. If only one price were to be charged,



■ **Figure 8.5** Price discrimination in two different markets

under conditions of profit maximisation ( $MR=MC$ ), then the price charged would be £33 and 30 units would be sold. If the  $MC/AC$  is constant at £20, then the abnormal profit earned would be £390. In terms of markets A and B this would represent 20 units sold in market A and 10 units sold in market B.

If an operator were to practise price discrimination and charge a price where  $MR=MC$  in each market separately then it would be possible to increase its level of profit. Thus a price of £40 could be charged in market A with 15 units sold (which is where  $MRA = MC$  in market A) and a price of £30 charged in market B with 15 units sold ( $MRB = MC$  in market B). This would result in abnormal profit of £450 representing an increase in profit of £60. Clearly this is at the expense of consumer surplus, but the passengers who make up market B do in fact benefit since the price charged to them is less than it was before price discrimination was undertaken.

It might not however be worthwhile for the operator to sell to more than one group of consumers. In fact it may be that demand is so low in one market and so costly to provide to that market that the operator may be better off charging a single price and selling only to the larger group, since the additional cost of serving the smaller group could outweigh the additional revenue.

While the above relates to price discrimination and charging passengers what they are prepared to pay, transport operators may also use predatory pricing in order to achieve an objective of higher profit in the long run.

### Predatory pricing

Predatory pricing is said to occur when a firm, normally with market power in more than one market, reduces its price below cost in the short run so as to obtain abnormal profit in the long run. Predatory pricing is aimed at either achieving or maintaining a monopoly situation, with the price set so as to bankrupt competitors, ‘encourage’ them to merge or in fact collude. Clearly, the market power comprises barriers to entry, since a failure to prevent new entry would make it difficult for the operator undertaking predatory pricing to raise their prices once an incumbent



operator had been removed from the market. Thus whilst the consumer may benefit in the short run from lower prices, such activity may not be in the public interest in the long run.

While it would seem relatively straightforward in theory to show that predatory pricing has occurred (by ascertaining whether the price charged is below average variable cost), in practice it can be very difficult to prove that such an activity has taken place. For example, small firms may accuse larger firms of predatory pricing when in reality it may be no more than robust competition based upon lower operating costs. Where the confusion can occur is in the allocation of costs between different aspects of operation in larger firms. This results in it becoming very difficult to establish the actual average cost for a particular aspect of the firm's business, and thus in turn it becomes very difficult to prove that a firm is pricing at below the average cost. Predatory pricing is an appealing strategy in a segmented market. The reason for this is that the dominant firm is able to impact a rival firm without changing the prices it charges in other markets that it serves. Because of the destructive effect of predatory pricing, it is illegal in most developed countries. Thus in Britain, for example, it can result in investigation by the competition agencies, such as the Competition Commission, and if a case of predatory pricing found to be proven will result in the imposition of severe financial penalties. Some of the issues surrounding predatory pricing are developed further in Case study 8.2, which surrounds acquisitions against EWS, the main British rail freight company, of predatory pricing and other anti-competitive practices.

### **Case study 8.2 EWS and predatory pricing**

EWS (English, Welsh and Scottish Railways) has been at the centre of a number of accusations of predatory pricing, two of which are highlighted in this case study – one which was upheld and one for which it was cleared. This case study attempts to develop the ideas outlined in the chapter with regard to predatory pricing and more general anti-competitive practices.

#### *Case 1 – The heavy haul sector*

EWS is the main heavy haul operator in the UK, and by far the largest rail freight company in Britain. A major part of its business is in coal haulage, and for this Enron Coal Services (ECSL) acted in the role of a freight forwarder and offered customers in the sector end-to-end services in the transportation of coal. It thus acted both as a partner for EWS (for the business with which it contracted EWS as the rail haulier) and as a competitor to EWS (for the business it contracted with other rail freight operators). In early 2001 Freightliner bulk, the other main rail freight company in Britain, entered the heavy haul sector of the market in direct competition to EWS, having previously concentrated on the market it inherited on privatisation, namely the carriage of containers. Between February 2001 and August 2002 EWS became the subject of a number of referrals to the industry regulator, the Office of the Rail Regulator (the ORR), in respect of its coal haulage operations. In particular, some of its actions in the market came into question and the issue arose as to whether this constituted 'fair' competition or was action in contravention of UK and EU competition laws. Specifically, EWS was accused of:

- Discriminatory pricing practices in relation to ECSL by offering selective price reductions to various customers. These rates were significantly lower than quoted by ECSL for

the same flows. This severely compromised ECSL's competitive position, particularly its ability to offer end-to-end services to some of its customers.

- Predatory behaviour towards Freightliner. The ORR found that EWS had offered prices to two electricity generators that were significantly below its average costs for these flows.
- Exclusive contracts – several power generator customers were required to sign long-term supply contracts with EWS (in one case up to a period of ten years), in which part of the contract was an exclusivity clause in which the contractor could not engage other rail freight companies in the haulage of coal. These came in different forms, thus in one case it was a straightforward exclusion clause, in another a discount scheme was offered which was dependent upon continued use of EWS services, and the third in the form of a minimum annual payment which represented around 60 per cent of the contractor's haulage requirements.

The fine imposed on EWS by the ORR was £4m; however, similar to the OFT's 'leniency policy' highlighted later in this chapter, this represented a 35 per cent 'discount' due to EWS's cooperation in the investigation.

### *Case 2 – Chartered passenger trains*

A second case involving EWS was referred to the ORR in 2003 which surrounded the passenger charter market. For information, although principally a rail freight operator, EWS is the main owner and operator of locomotives in Britain because all of the British passenger rolling stock is of the multiple car or trainset variety. Its services are thus in demand for one-off type operations such as tourist trains on the West Highland line in Scotland that require the hauling of passenger coaches. The complaint against EWS highlighted a number of issues:

- a) EWS had offered prices to certain customers that were significantly below its published terms and that these were designed specifically to undercut the prices offered by a competitor.
- b) EWS had offered certain concessions on its usual terms of trade to specific customers, conditional on those customers continuing to deal exclusively with EWS – these concessions were, in effect, also designed to exclude a competitor.

After its investigation and review of the 'factual' allegations contained in the complaints, the ORR found that in this case it had no grounds to conclude that EWS had engaged in predatory pricing or anti-competitive behaviour. Interestingly, very little information surrounds this case, and hence the actual reasons behind the ORR decision are not clear. It may have, for example, found that EWS did indeed have a degree of exclusivity clauses, but these may have been based upon the start up costs of providing these services to particular customers and thus EWS was simply ensuring recovery of these costs rather than engaging in anti-competitive behaviour.

In many respects what this case study shows is actually nothing at all, but that in itself underlines the difficulty with predatory pricing and issues surrounding anti-competitive behaviour. It also stresses the point raised in the main text that whilst in theory predatory pricing may seem quite straightforward, in practice there is a very narrow line between what

constitutes competitive market behaviour and what constitutes anti-competitive behaviour. For example it could be argued that the key objective of any firm is to either eradicate the competition that exists or protect its current market position by preventing any potential competitor from entering that market. As in sport, however, the competition should be won through fair means and not foul, and hence the 'best' competitor succeeds. The two cases in some ways show where this dividing line lies, with in the first case exclusivity contracts simply being designed to keep the competition out. In the second (which we can only speculate on), if similar exclusivity contracts were found these were in place for a different reason – to ensure recovery of costs, for which any rival operator could have put an initial bid in to run these services.

An alternative strategy to predatory pricing is for an operator to collude with a competitor, fixing a price which is in the interests of both operators, but works against the public interest.

### Price fixing<sup>1</sup>

Firms in oligopolistic markets such as the airline sector often face a dilemma as to whether to compete with each other in order to increase their market share and hopefully their profits or to collude. Collusion allows firms to act as a monopolist with the aim of maximising their joint profits. There are clearly benefits from collusion not least in that by agreeing on what price to charge or what market to serve organisations can reduce the level of uncertainty. Competition on the other hand can lead to price wars, predatory pricing or retaliatory action from which all organisations could find their profits reduced. Formal collusion whereby all firms in a market are part of a cartel means that they are acting as a single monopoly as in Figure 8.6.

In the figure demand is the industry demand curve and the marginal revenue curve represents the summation of the marginal costs of the firms operating in the cartel. The profits of the cartel are maximised since  $MC=MR$  and they are providing  $Q$  output which is sold at a price of  $P$ .

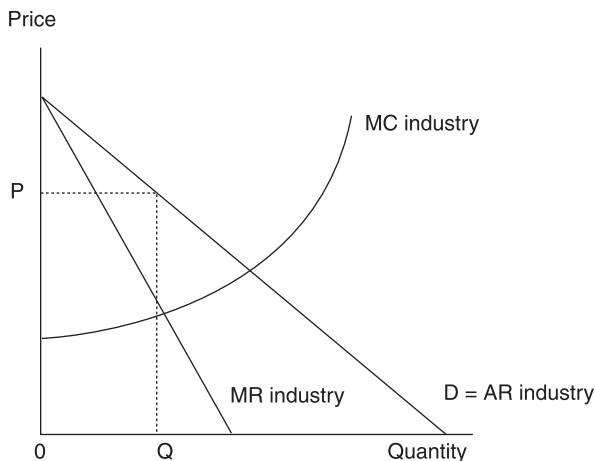


Figure 8.6 Cartel based profit maximisation

Price fixing is one such collusive activity, a situation where firms within a market agree on the price they are going to sell their goods or services at in order to remove price competitiveness and thus increase their profits. In such a situation organisations could compete in terms of non-price factors such as the level of service offered or the routes served rather than in terms of price. This is a feature which can be found in oligopolistic markets and can represent a situation in which an organisation might think that if it increases its price other organisations will not follow and it will lose market share. We saw an example of this in Chapter 7 which led to the kinked demand curve. If, however, all the organisations in the cartel agree to set a particular price (whilst demand may be reduced) all organisations may benefit through an increase in revenue if demand is price inelastic. As such, price fixing is a form of collusion which enables organisations to increase their profit levels, but it can be seen to act against the public interest since the organisations are behaving as if they were a monopoly. As with predatory pricing, therefore, active collusion (as opposed to tacit collusion – see Chapter 7), in most developed countries, is against competition legislation and thus is illegal.

Collusion by organisations is more likely to occur if:

- There are only a few organisations operating in the market
- The organisations trust each other, so that the agreement reached is not reneged on
- The organisations have similar costs and as such are likely to agree on the proposed price change
- The organisations provide similar products so there is little scope for competition based on the quality or level of service
- The market is fairly stable in that neither demand nor costs are changing dramatically. If they were, then agreement on the price to charge would be difficult
- There are barriers to entry into the market such that new firms will find it difficult to penetrate the market in order to take advantage of the increased profits.

Collusion can take a number of different forms with members of the cartel agreeing on courses of action such as: what price to charge or level of output to set, what customers to supply or what discounts to give.

Collusion is difficult to prove since it is usually undertaken in secret behind closed doors, is often informal and the discussions are verbal.

### **Case study 8.3 BA price fixing**

#### *Introduction*

In August 2007 the Office of Fair Trading (OFT) fined British Airways £121.5m for illegally fixing fuel surcharges levied on its passengers undertaking long-haul flights. The fine, which represents 1 per cent of BA's turnover, was the result of investigations by the OFT (which began in June 2006) into collusion between BA and Virgin Atlantic in terms of setting fuel surcharges over the period August 2004 to January 2006. BA and Virgin are said to have discussed or informed each other about their proposed changes to fuel surcharges, as opposed to independently setting levels which is required by Competition Law over that period. Competition Law forbids firms agreeing prices since competition is seen as a prerequisite for cheaper goods

and services for consumers. Fuel surcharges on passengers were introduced in May 2004 as a way of aiding airline operators offset the rising cost of aviation fuel and have subsequently become a significant component of the price of an airline ticket. This case study seeks to outline BA and Virgin Atlantic's anti-competitive price fixing behaviour.

*The Competition Act 1998*

Under the Competition Act 1998 organisations are prohibited from entering into agreements, practices and conduct which could be damaging to competition in the UK. In addition to this the Enterprise Act 2002 gave the OFT additional powers in order to investigate people suspected of price fixing.

The OFT leniency policy grants immunity from penalties for reporting particular categories of infringement of the Competition Act and for assisting the OFT in its investigation. The financial penalty depends on such things as how serious the infringement is and the turnover of the organisation and can be as much as ten per cent of their worldwide turnover.

*Price fixing of fuel surcharges*

The investigation of BA price fixing was undertaken by the OFT alongside the US Department of Justice who were investigating allegations of illegal price fixing on air cargo long haul fuel surcharges. Over the period August 2004 to January 2006 the fuel surcharge of BA and Virgin Atlantic increased from £5 to £60 for a long haul return ticket.

It can be quite difficult to distinguish between price fixing which is illegal and legal price setting that constitutes price leadership. In this case of fuel surcharge price fixing, Virgin Atlantic contacted the OFT in order to report the collusive activity and as such escaped a fine itself since under the OFT 'leniency policy' it was granted immunity.

Price fixing in terms of the fuel surcharge is said to have taken place on a number of occasions as spelt out in Table 8.2

■ **Table 8.2** *The price fixing activity*

<i>Date</i>	<i>The collusive activity</i>
August 2004	BA and Virgin Atlantic exchanged information on the 6th August 2004 regarding the intentions of their respective organisations to increase the fuel surcharge (FS). BA told Virgin Atlantic of its intention to increase its FS to £6. On 9th August both announce an increase in their FS to £6 with effect from 11th August 2004.
October 2004	BA understands that there may have been attempts by Virgin Atlantic to contact BA prior to the second increase, but these were not successful. BA announces an increase in its FS on 8th October to £10. On the same date Virgin Atlantic announced a corresponding increase in its FS to £10.
March 2005	In two sets of calls on 21st March BA and Virgin Atlantic exchanged information concerning proposed increases in their respective organisations' FS. On 21st March Virgin Atlantic announced an increase in its FS to £16 with effect from 24th March. On 22nd March BA announced the same price increase in its FS with effect from 28th March 2005.
June 2005	BA informs Virgin Atlantic on 23rd June that it is going to announce an increase in its FS to £24. On 24th June 2005 BA announced an increase in its FS to £24 with effect from 27th June. That same day Virgin Atlantic announced the same increase in FS to £24.

■ *Table 8.2 — continued*

<i>Date</i>	<i>The collusive activity</i>
September 2005	On the 5th September Virgin Atlantic informed BA that it intended to increase its FS and be the first to announce the increase on this occasion. On 6th September 2005 Virgin Atlantic announced an increase in its FS to £30 with effect from 7th September. On 8th September BA announced an increase to £30 with effect from the 12th September 2005.
November 2005	On 18th November Virgin Atlantic informed BA that it was about to announce a reduction in its FS to £25. Shortly afterwards Virgin Atlantic announced a reduction to £25.
January 2006	On 6th January Virgin Atlantic informed BA that it intended to increase its FS to £30. Later that day Virgin Atlantic announced an increase in FS of £30. BA did not change its FS in response.

*Source:* Adapted from Times Online (2007)

It is unlikely that the fixing of the fuel surcharge undertaken by BA and Virgin Atlantic will have led to joint profit maximisation as outlined but the collusive price fixing activity is however likely to have increased their profit margins, otherwise it would be a futile exercise. It is however a risky activity, as shown by BA's experience since it is illegal and liable to financial penalty if exposed.

The whole episode reflects negatively on the reputation of BA and Virgin Atlantic. In saying this, the ability to claim immunity acts as an incentive for any sector to police itself, to the benefit of the consumer.

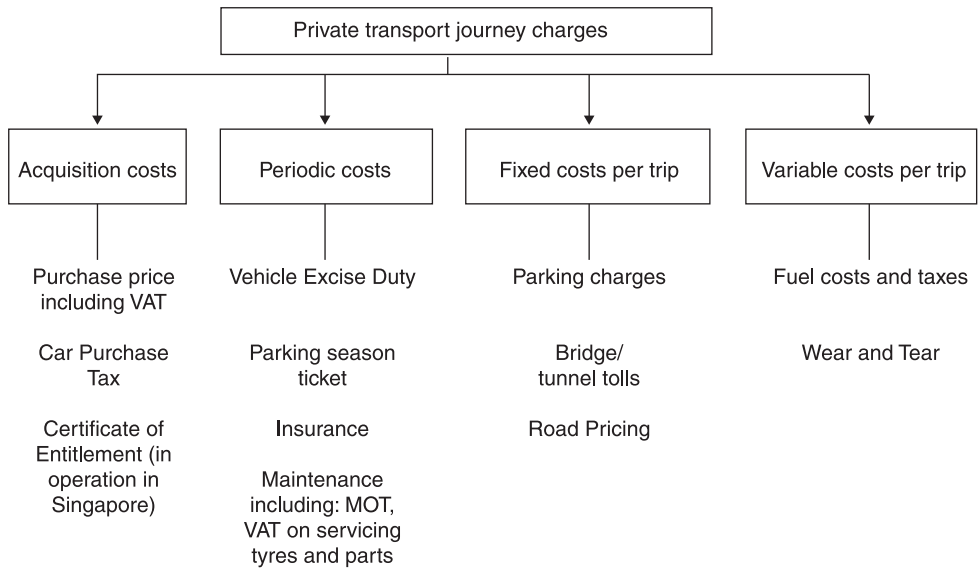
So far this chapter has dealt with pricing with respect to public transport, detailing the possible practices of price discrimination, predatory pricing and price fixing. What follows relates to pricing in terms of private transport, which in many respects is a far more complex area.

## **PRICING OF PRIVATE TRANSPORT SERVICES**

The pricing of private transport services, namely, cars, vans, motorcycles and the like, is multi-faceted as stated above, being paid via a combination of mechanisms starting with the purchase and licensing of the vehicle, the purchase of fuel; and running costs and also a range of taxes most notably Vehicle Excise Duty and Fuel Duty. In various locations there is also road user charging in operation, most notably in Central London and further a field in Singapore and Stockholm. These prices can be seen placed under various headings as illustrated in Figure 8.7.

### **Acquisition costs**

Acquisition costs are those incurred when a vehicle is obtained. These refer to the purchase price of the vehicle including VAT. The private motorist will typically ignore these costs when under-



**Figure 8.7** Charges incurred when undertaking a private transport journey

taking an individual trip, but they can be substantial particularly when new vehicles are involved. There can be other acquisition costs involved in certain countries such as car purchase tax and the Certificate of Entitlement which is a system in use in Singapore.

Car purchase tax is to be found in most EU countries and is paid in addition to VAT on new cars bought. Car purchase tax of 10 per cent was abolished in the UK in 1992 and replaced by an increase in fuel duty. This was a move welcomed by the motor industry who had long canvassed for its abolition regarding it as a discriminatory tax applying only to cars, with all other consumer goods being only subject to VAT.

The Certificate of Entitlement (COE) is a system used in Singapore in order to limit car ownership and as such the number of vehicles on the road. The system requires Singaporean residents to bid for the right to purchase a vehicle, with a limit placed on the number of COE. Typically, COE bidding starts on the first and third Monday of each month and lasts for three days. There are various categories as seen in Table 8.3. A bid can be submitted anytime during the three-day process with a reserve price being the maximum that the bidder is prepared to pay for a COE. If the current COE price is above the bidder’s reserve price then the individual will be out of the bidding unless they revise their reserve price. It is important to note that the reserve price can only be revised upwards and not downwards. Clearly this is to prevent bidders from submitting an initial bid for a COE which is somewhat higher than they would actually be prepared to pay. In the event of an unsuccessful bid then the bid deposit will be credited to the bidder’s bank account.

As can be seen in Table 8.3 6,038 bids were received by the Land Transport Authority in the second open bidding at the end of August 2008. Of these approximately 80 per cent (4,800) were successful. The non-transferable COE are linked to specific vehicles, but both the COE and the vehicle can be sold to a new owner. In terms of Transferable COE they can be changed from vehicle to vehicle. As can be seen, the Quota premium ranged from \$14,001 for Category E to \$1,310 for Category D.

**Table 8.3** August 2008 second bidding exercise for certificates of entitlement

	<i>Quota premium</i>	<i>Total bids received</i>	<i>Number of successful bids</i>
<b>Non-transferable categories</b>			
Category A (Cars 1600cc and below, and taxis)	\$13,289	2,318	2,036
Category B (Cars 1601 and above)	\$13,890	1,362	1,071
Category D (Motorcycles)	\$1,310	548	445
<b>Transferable categories</b>			
Category C (Goods vehicles and buses)	\$12,989	492	370
Category E (Open)	\$14,001	1,318	878

Source: Land Transport Authority (2008)

## Periodic costs

These can also be called standing charges and are the basic costs of owning a car for use on the roads network. They refer to charges that have to be paid whether or not the car is used and as such include the annual registration tax (Vehicle Excise Duty) and insurance.

The majority of developed countries operate an annual registration tax, called vehicle excise duty (VED) in the UK. In the majority of cases this is related to the power of the car or engine size but in a number of cases, including the UK, it is linked to addressing environmental issues and to encourage fuel efficiency. This can be seen in Table 8.4 below with a range of VED Bands based on carbon emissions, with band G being the highest emitting band in 2008–09.

In the UK vehicles which are more than three years old require a Ministry of Transport (MOT) test each year. This is to ensure that the vehicle complies with a minimum road safety and environmental standard. There are various test fees depending on the type of vehicle, but at the time of writing, the fee for a car with up to 8 seats is £53.10.

**Table 8.4** UK vehicle excise duty rates (£12 month rate), 2008–09 (for private vehicles registered from March 2001)

<i>VED band</i>	<i>CO<sub>2</sub> (g/km)</i>	<i>Petrol and diesel cars</i>	<i>Alternative fuel cars</i>
A	100 and below	£0	£0
B	101–20	£35	£15
C	121–50	£120	£100
D	151–65	£145	£125
E	166–85	£170	£150
F	186–225	£210	£195
G*	Over 225	£400	£385

Source: Directgov (2008)

Note: \*For cars registered on or after 23 March 2006.



## Fixed costs per trip

The fixed costs which may be incurred by those undertaking a journey include parking charges whether that be public on-street, through pay and display or off-street in public or privately owned car parks.

The journey may also involve a river crossing for which a charge or toll is made. For example at the time of writing the tolls shown in Table 8.5a and b were in operation at two such river crossings in the UK:

■ **Table 8.5a** *Severn River crossing westwards toll only*

Vehicle Category 1 (Up to 9 seats)	£5.30
Vehicle Category 2 (Small bus up to 17 seats, Goods vehicles up to 3500KG)	£10.60
Vehicle Category 3 (18 seats and more, Goods vehicles from 3500KG)	£15.90

■ **Table 8.5b** *Dartford River crossing: charges in operation 0600–2200*

Between 2200–0600 charges are £1.00 for each category	
Motor Car: including Motor Car with three wheels or taxi	£1.00
Light or Medium Goods Vehicle: Motor Coach, Omnibus or tractor: having more than two axles	£1.80
HGV, Motor Coach or Omnibus or Tractor having more than two axles	£2.90
Special Type Vehicles	£2.90

Road pricing is designed as a measure to reduce congestion (see Chapter 3). As such, it will impact on the price of a journey, since it represents a charge for the use of road space. There are a small number of schemes worldwide including the Electronic Road pricing scheme in Singapore and the congestion charging schemes in Stockholm and Central London. Case study 8.4 considers the London congestion charging scheme in more detail.

### Case study 8.4 Central London congestion charging

The first major congestion charging scheme in Britain was launched in Central London in February 2003, the aim of the scheme being to reduce congestion.

Motorists entering the congestion charging zone between the hours of 7am and 6pm Monday–Friday (excluding public holidays) are charged £8. 700 video cameras enforce the scheme via the scanning of the rear number plate of the vehicles that enter the area during the charging period. The information obtained is matched against a database of motorists each evening in order to ascertain who has paid the charge. Payment can be made via the Internet, by phone or at shops or petrol stations. If the motorist has failed to pay the charge before midnight a fine of £100 is imposed and if the offender pays within 14 days then the fine is reduced to £50. In relation to the charge certain groups are exempt or given a discount from part or all of the charge:

- Certain vehicles receive a 100 per cent discount including alternative fuel vehicles, namely those powered by an alternative fuel, bi fuel or dual fuel, and not solely by petrol or diesel. They are exempt on environmental grounds but must also meet strict emissions criteria.
- Blue and orange badge holders are also exempt.
- Certain NHS staff, patients and emergency vehicles (police vehicles, fire engines, and ambulances) are exempt.
- Certain vehicles such as those with more than 9 seats and two-wheeled motorbikes (and sidecars), mopeds, black cabs licensed with the Public Carriage Office (PCO) and mini cabs licensed with the PCO are also exempt.

### *Advantages of the scheme*

- Congestion in urban areas can be viewed as market failure with the actions of road users in Central London affecting other road users. Congestion has a cost associated with it not least in terms of the increased time taken to undertake a journey and the opportunity cost that involves. The charge is aimed at reducing congestion, thus freeing up the road network and so reduce the time taken to complete a journey.
- Economics is concerned with the optimum use of scarce resources and since road space in Central London can be viewed as a scarce resource then charging for its use will mean that it can be used more efficiently. Thus those that value the time most will pay the charge.
- The revenue raised from congestion charging is to be used to improve the alternatives, namely, public transport.
- Individuals tend not to like being charged and as such the use of regulation has tended to be more acceptable. The use of regulation however tends to be a 'blunt instrument', something which cannot be fine tuned to tackle varying demand conditions and unlike congestion pricing it produces no revenue.
- Encourages efficient transport systems in terms of land use space, i.e. mass movers of people.
- Unlike measures such as enhancing public transport services in the area, one major advantage with a congestion charge is that the charge can be varied at very short notice. It is therefore very flexible.
- In simple terms it works. If set at the right level, a congestion charge will impact on congestion.

### *Disadvantages of the scheme*

- Clearly one issue with congestion charging is the invasion of privacy given that the system relies on taking a photograph of vehicle number plates.
- The charge can be viewed as a regressive measure as those who pay the charge and are on lower incomes pay a larger proportion of their income than those on higher incomes in order to drive in central London. In order to negate this claim, the use of the revenue generated from the scheme is all important. If the revenue is used to subsidise and enhance public transport as an alternative to the car, then the charge can be seen as more equitable.

- The cost has been seen as a disadvantage. It has been estimated that the cost of setting up the scheme has been £200m and it costs an additional £80–90m to operate per year.
- The scheme utilises a rather simplistic technology. Namely cameras on all the roads into the central area and a fixed price of £8, the charge not changing in line with the level of congestion experienced. This may however change over time and as the scheme evolves it could see the use of global positioning satellites (GPS) and cars fitted with satellite receivers in order to allow a charge to be made based on distance, time and location.
- Ideological argument – in urban areas individuals already pay for the roads through local taxes, hence why should they pay again?

### Variable costs per trip

The last main item shown in Figure 8.7 is the variable costs per trip. These are costs that are incurred on each trip and which vary in accordance with one or more of the characteristics of the trip. For example, trip length, trip destination, timing of the trip and traffic conditions. The major element of this cost relates to fuel.

In addition to VAT fuel is subject to fuel tax, called Fuel Excise Duty, which is charged as a rate per unit of fuel, i.e. per litre/gallon (Potter 2008). The rate will differ depending on the type of fuel, whether it be petrol, diesel, LPG or low-sulphur.

The fuel duty rates vary across the European Union, thus impacting on the retail price, as seen in Table 8.6.

■ **Table 8.6** Retail price of premium unleaded petrol and tax (2008)

	<i>Tax as % of retail price</i>	<i>Retail price (Eurocents per litre)</i>
Netherlands	64	1.69
Denmark	62	1.58
Germany	65	1.57
Finland	64	1.57
Italy	61	1.54
Belgium	61	1.53
France	64	1.51
United Kingdom	67	1.51
Portugal	60	1.50
Sweden	63	1.47
Irish Republic	57	1.34
Austria	56	1.33
Luxembourg	54	1.32
Greece	47	1.27
Spain	53	1.23

*Source of data:* Potter (2008) based on [www.aaroadwatch.ie/eupetrolprices/](http://www.aaroadwatch.ie/eupetrolprices/) (accessed 12.08.08) and Transport Statistics Great Britain, 2007, Table 10.8.

*Note:* This data covers all tax on petrol (including VAT).

## **A change in the tax structure?**

There has been a debate in the UK about the potential implementation of a national road pricing scheme although this seems unlikely at the present time. If it were to be seriously considered then one of the key issues would be the type of technology used. It would need to be flexible enough to charge based on time, distance, and place as well as being able to target the environmental costs (DfT 2004). The motoring taxes as outlined above are not able to match that of a national road pricing scheme in terms of sophistication in addressing the issue of congestion when and where it occurs (DfT 2004) – but then this is not the prime function of motoring taxes.

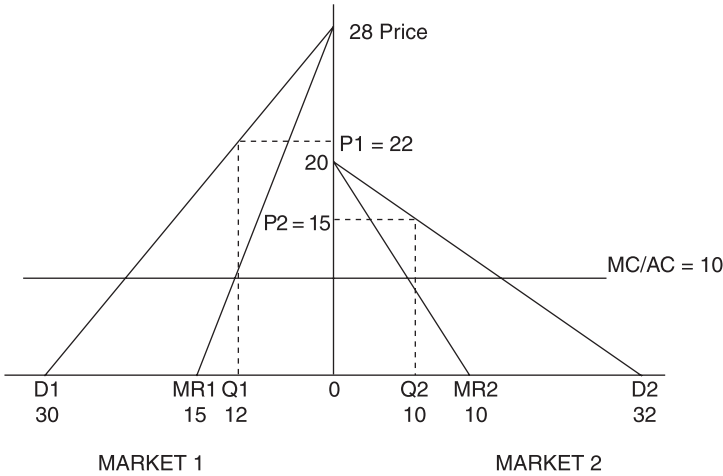
If a national road pricing scheme were to be introduced then important decisions would be required in terms of whether it should replace fuel duty – whether in whole or in part. If it were to be totally replaced then it would require a change in European law. Equally, it would not be possible to abolish fuel duty until the whole country was operating distance charging.

## **CHAPTER SUMMARY AND REFLECTION**

This chapter has examined the issues surrounding the pricing of transport services. In a free market economy, the price is set by and large by the type of market structure, and hence is generally determined by the forces of demand and supply. As will be seen later in Chapter 10, in mixed markets the price is a combination of the market and intervention by transport authorities in the form of regulating the price and/or capacity. This chapter has therefore considered ‘deviations’ from these two positions in order to gain a better understanding of pricing issues in transport markets. Firstly therefore price discrimination was introduced as this is an important aspect of public transport pricing being extensively utilised by bus, rail and air operators. The aim of price discrimination is to increase the operator’s profits by eroding the passengers’ consumer surplus. Airline operators, in particular, have been astute when it comes to price discriminating with respect to price or practising yield management – charging varying prices to their customers with differing time-sensitive elasticities in order to increase the number of seats sold. It should also be noted however that price discrimination may be used by public transport authorities to better manage the demand for a given transport system and thus spread the demand for the service across a larger time range. In addition to price discrimination public transport operators have been known to use predatory pricing, charging a price below cost as a means of undercutting competitors in order to create a monopoly situation. An alternative strategy to predatory pricing is one of price fixing, where operators collude, fixing the price at an artificially high level, in order to increase profit. An example is given of airline price fixing of fuel surcharges between 2004 and 2006. Both measures however are illegal as they are anti-competitive and act against the public interest. Finally, pricing of private transport services has been detailed, being multifaceted in nature, with acquisition, periodic, fixed and variable costs.

## CHAPTER EXERCISES

### Exercise 8.1 Price discrimination



■ *Figure 8.8 Price discrimination in two rail markets*

Figure 8.8 refers to a rail operator that is practising price discrimination, charging a different price to the passengers in market 1 compared to those in market 2. It is assumed that costs are constant, therefore  $MC = AC$ .

- What does Figure 8.8 reveal about the type of passengers using the service and their relative elasticities?
- Calculate the abnormal profit earned by the rail operator by price discriminating.
- Based on the information presented in Figure 8.8 sketch out the diagram for the rail operator if it were not to price discriminate.
- Are there any beneficiaries from price discrimination and what happens to consumer surplus when price discrimination is practised?

### Exercise 8.2 Pricing behaviour

Transport operators in oligopolistic markets practise predatory pricing and price fixing from time to time. Outline what you perceive to be the benefits to transport operators of such practices and the reasons why they are illegal in many countries world-wide.