IMPERFECTLY COMPETITION IN TRANSPORT MARKETS

EE382

- The imperfect market structures of monopoly and oligopoly and their high prevalence in transport markets
- The main sources of barriers to entry into transport markets
- The disadvantages and advantages of imperfect markets in the provision of transport services
- The tendency for competitive transport markets to veer towards imperfect market structures through company mergers and acquisitions
- One perspective of the process of competition and how industry structure may change and evolve over time

TYPES OF IMPERFECT MARKET STRUCTURES

- Monopoly
- Contestable
- Oligopoly

MONOPOLY

- A monopoly in transport services is said to occur where there is only one supplier to the market (pure monopoly)

- In practical terms a monopoly situation is generally considered to exist in Britain where one firm controls more than 25 per cent of the market

- Example rail or bus services

STRONG BARRIER TO ENTRY

- Initial costs
- Sunk costs
- Brand loyalty
- Anti-competitive behavior
- Economies of scale
- Patents and licenses

INITIAL COSTS

- Require a certain initial expenditure on capital
  - Purchasing of a fleet of aircraft in order to enter the airline industry
  - Purchasing of a license to enter the taxicab industry

Example, Air Scotland

- Established in 2002 by Dhia Al-Ani in partnership with the Greek charter company Electra Airlines
- Scotland's first low cost airline
- Involves tremendous costs
  - Leasing or purchasing aircraft
  - Airport, labor and marketing costs
- Began scheduled flights in 2003, the company has experienced a number of problems and as a result has changed ownership

SUNK COSTS

- An expenditure that a producer has to make in order to enter a market that is unrecoverable on exit from the market

- Example the Channel Tunnel

BRAND LOYALTY

- A new entrant may find such existing competition a deterrent to entering the market

Example- British Airways image revitalization

ANTI-COMPETITIVE BEHAVIOR

- Predatory pricing through cross-subsidization
- Vertical restraints
- Negative branding
- Collusion

Example – The British Airways and Virgin Atlantic feud

- The launch of Virgin in an attempt to disturb the transatlantic monopoly enjoyed by BA
- The early 1990s, Virgin accused BA of dirty tricks in its attempt to prevent the fledging airline from developing into a serious competitor
  - The pouching of Virgin's passengers by using ticket touts to offer cheaper fares at airport and by obtaining Virgin passengers lists to target passengers for special deals
  - Pressure travel agents into promoting BA instead of Virgin
  - Making Virgin flights less attractive to consumers by delaying onward flights for Virgin travellers
  - Feeding damaging stories and information about Virgin to the media
  - Applying for routes that would secure it an unfair advantage

ECONOMIES OF SCALE

- If a producer is able to grow to such a size that it is operating on a significantly lower average cost curve than its competitors it will be able to sustain a lower price whereas its competitors will fail to compete

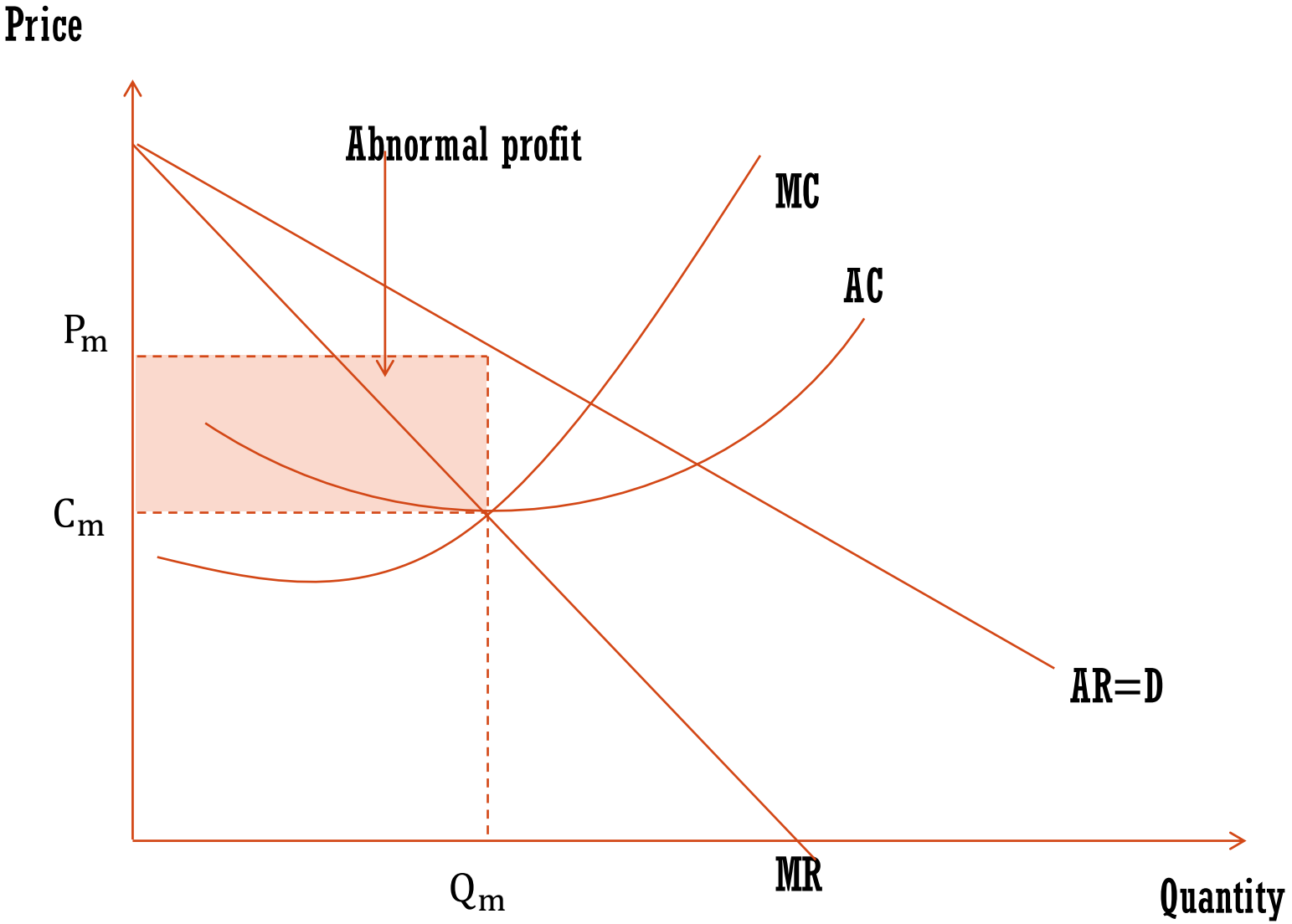
PATENTS AND LICENSES

- A patents offers fixed-term legal protection for a business from competition, allowing it to enjoy abnormal profits for the lifetime of the patent
  - Are usually awarded for producers using new technology in order to act as an incentive for technological advancements

- Licenses intended to reduce harmful or unnecessary competition and to encourage investment into the particular service

THE MODEL

- Assume that the market is one of pure monopoly
- Price maker
- Able to determine the quantity that it sells but it is not able to do both as it has to operate with the existing demand condition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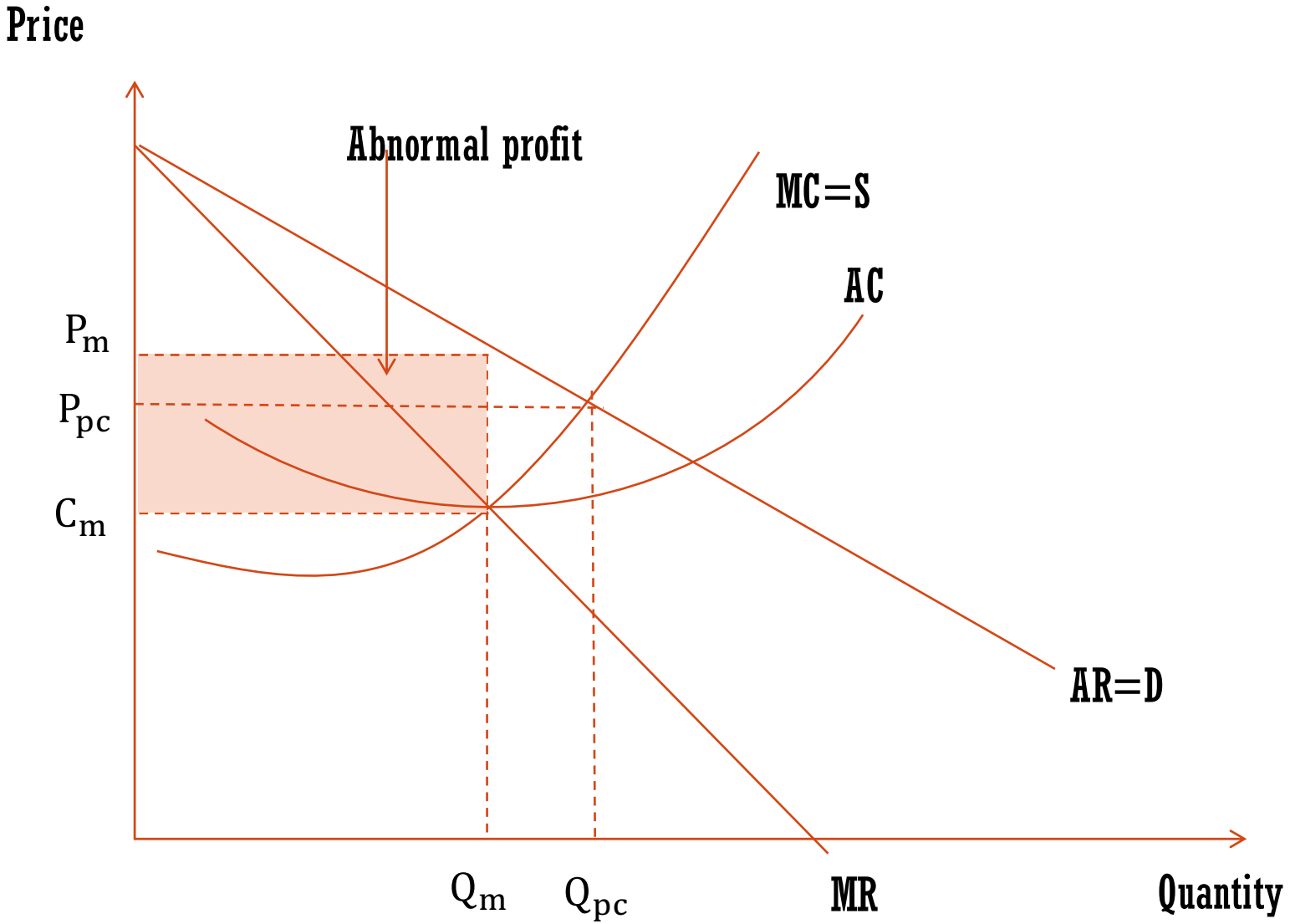
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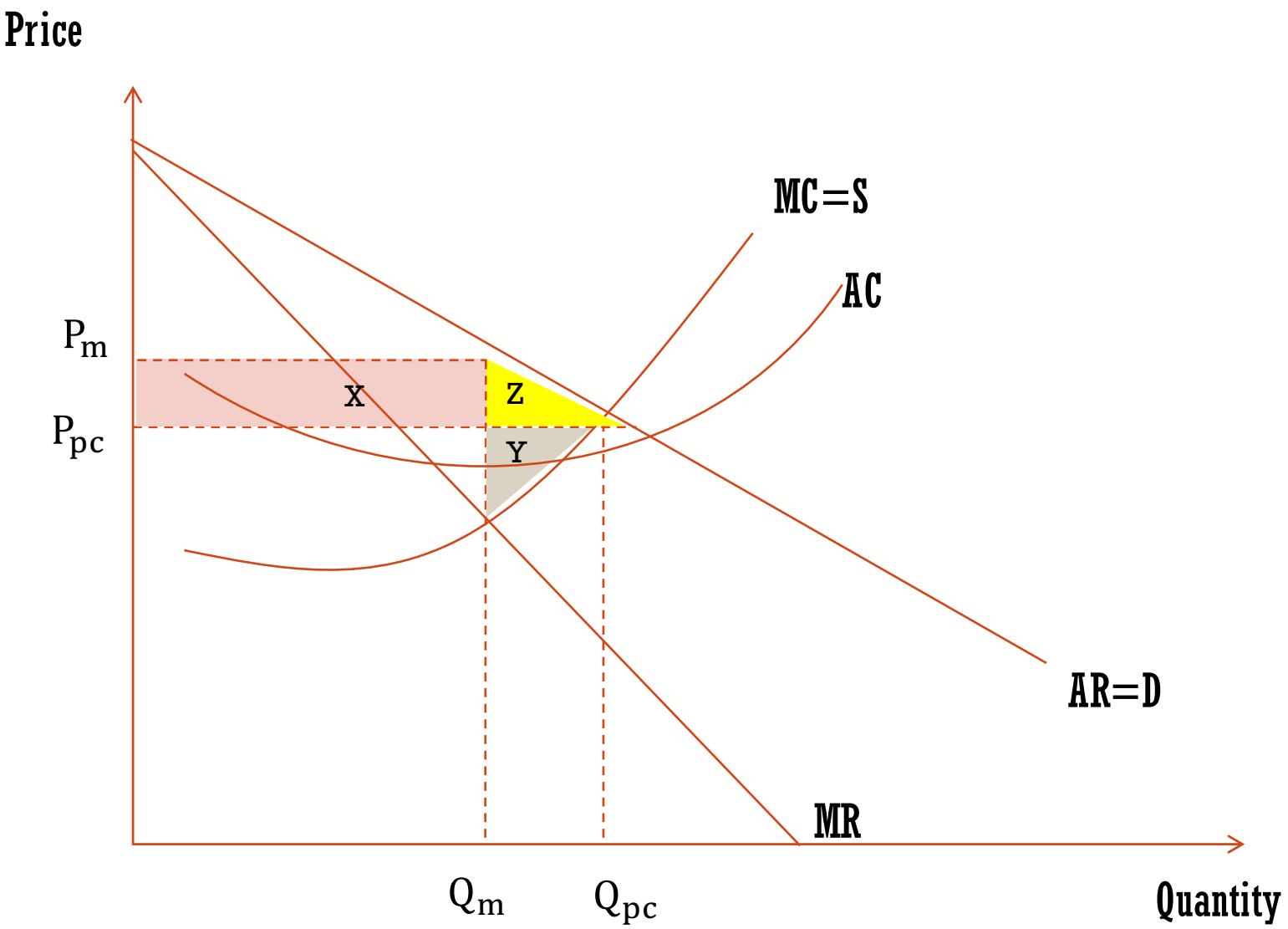
THE LEVEL OF EFFICIENCY OF A MARKET UNDER MONOPOLY CONDITIONS

- The producer is not operating at the lowest point on its average cost curve and so the market is not productively efficient

- The price is higher than the MC at that level of output and so the market is falling to achieve allocative efficiency as well
  - The producer is overcharging and so too little is being supplied and consumed from an efficiency perspective

- The reason that the monopoly is doing this
  - Increases its producer surplus and its welfare
  - Compared to perfect competition producer surplus has been increased by area X but reduced by Y
  - The cost borne by the consumers who see a reduction in their welfare of areas X and Z
  - Area Y and Z is known as the deadweight welfare loss of monopoly
  - The market is not Pareto efficient
  - A profit-maximizing monopoly is likely to lead to inefficient market outcomes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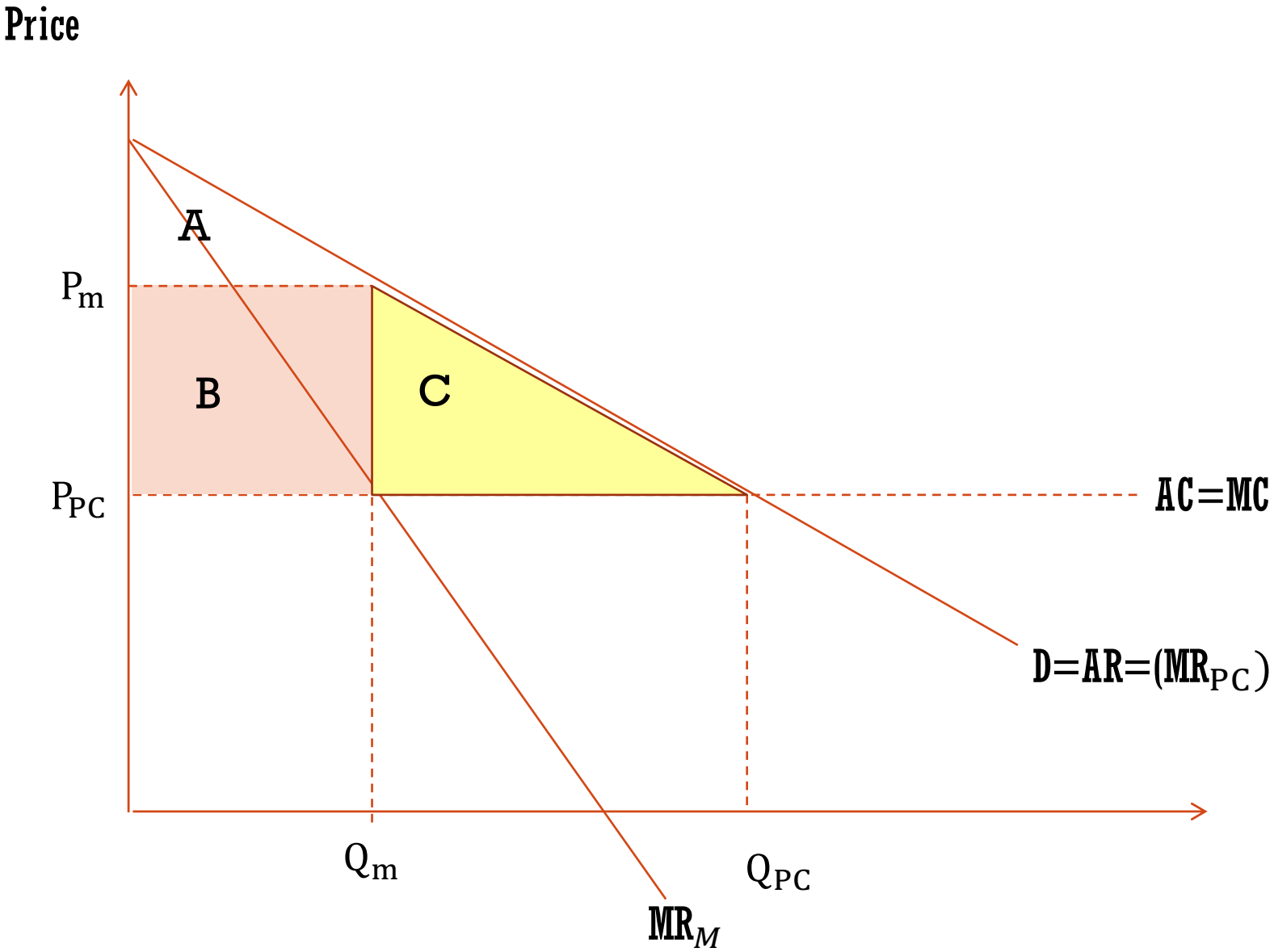
DISADVANTAGES OF MONOPOLIES

- Production inefficiencies
- Higher prices charges and lower output produced
- Reduces consumer surplus and is regressive
- Net welfare loss
- The market no longer regulates itself

- Production inefficiencies
  - Unlike perfect competition where in the long run production will always occur at the lowest point on the long run average cost curve, a monopolist is not 'forced' into achieving this position
  - Resources are being inefficiently used in the production of that good or service
  - Costs are not minimized, production resources are not being used in their best combination
  - Monopoly is almost always economically inefficient

- Higher prices charges and lower output produced
  - If left to the market, the prices charged will be higher and the output level produced will be lower than a perfectly competitive industry facing exactly the same cost conditions

- Reduces consumer surplus and is regressive



- From consumer surplus, perfect competition versus monopoly graph, costs have been assumed to follow constant returns with no economies of scale, hence the average cost curve is horizontal and MC=AC

- Under perfect competition total consumer surplus is given by a summation of the areas marked by A+B+C, as the price is set at P_{PC}

- If this market was a monopoly, the area of consumer surplus would reduce to area A

- This reduction in consumer surplus concerns the balance between utility received in the exchange of transport services for financial gain between the consumer and the producer

- The area of consumer surplus been reduced, area B has been transferred from the consumer in the form of lower prices paid for the service, to the producer in the form of higher profits gained from the production of the service

- Not only is this a simple transfer, but is also potentially a regressive measure as bus users will include the less well off within society, whilst shareholders will include the better off – Such actions therefore take from the poor (due to the necessity of many transport services) and give to the rich, thereby increasing the divisions between the rich and poor within society

- Net welfare loss
  - The imbalance in the trade between the consumer and the producer in favor of the producer results in a reduction of the total benefits that could be accrued from the exchange

- The market no longer regulates itself
  - Where one firm dominates the market, then the market can no longer regulate itself in terms of producing economically efficient goods and services at equitable prices

ADVANTAGES OF MONOPOLY

- A higher level of expenditure on research and development
- Market size
- Wasteful competition
- Hotelling's law

- A higher level of expenditure on research and development
  - The firm will have more financial resources and a higher level of confidence in the future to enable it to invest in a significant ongoing program of research and development

- Market size – a natural monopoly
  - The basic argument is that the market is of such a (relatively small) size, that only one firm can operate in the market and achieve all of the economies of scale
  - The market demand curve cuts the average cost curve before the point of minimum efficiency scale
  - At the maximum market size, therefore average production costs are still falling
  - As a result, in order to take advantage of all of the potential economies of scale only one firm should supply the market

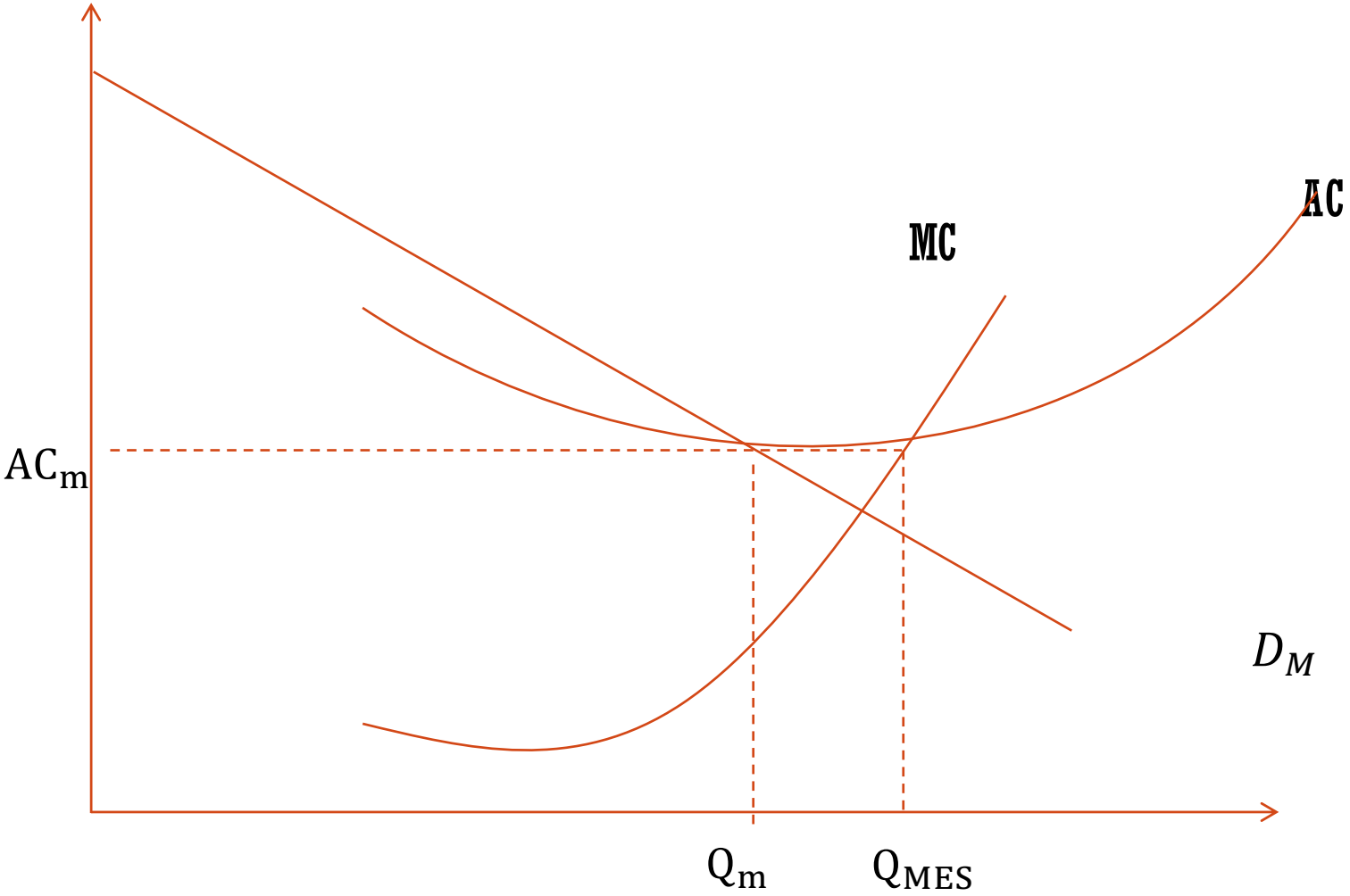
- If the market was to be divided between a number of different firms, then as the major constraint is the market size, no firm would be of a significant size to capture most of these economies

- Natural monopoly

- E.g. gas pipelines, rail services

- **Natural monopoly**

Cost and revenues



- Wasteful competition
  - Occurs where effectively double or triple the production resources are used to provide a service
  - Economies of carriage exist where the cost per passenger carried can only be minimized where there is a single operator
    - Bus markets where many tend towards monopolies on the basis of economies of carriage
    - A given bus market may support more than one operator and all may be operating at the MES point in the production of services, costs in the carriage of passengers could be significantly reduced if only one company operated on the route
    - Due to economies in carriage, therefore, any competition on the route/area could be considered as wasteful

- Hotelling's law
  - E.g. ice-cream sellers on a beach
  - Hotelling (1929) showed that if there was only one seller who owned and operated two ice cream vendors on a beach, these would be placed at the optimum locations in order to cover the entire beach
  - If on the other hand two different ice cream sellers owned and operated the outlets, they would be located next to each other in the middle of the beach
    - Each seller would seek to not only cover its 'share' of the beach but also potentially take custom away from its rival
  - Although the price of ice cream would be lower, the added distance users of the beach would have to walk would be the cost of having that competition

HOTELLING'S LAW APPLIED TO BUSES

Example

- The Dalmatian Bus company is publicly owned and has a monopoly on the route between Town A and Town B

- The time taken between the two towns is 30 mins, and Dalmatian sends out one bus from A and at the same time one bus from B

- The service frequency therefore between the two towns would be one bus every 30 minutes

- If however in order to introduce competition on this service Dalmatian was privatized and split between Dalmatian Bus and a newly formed rival the Grey Bus Company, the same running pattern is unlikely to be maintained

- While Grey Bus 'should' run a service from Town A when Dalmatian sets off from Town B, it is far more likely to run slightly ahead of it

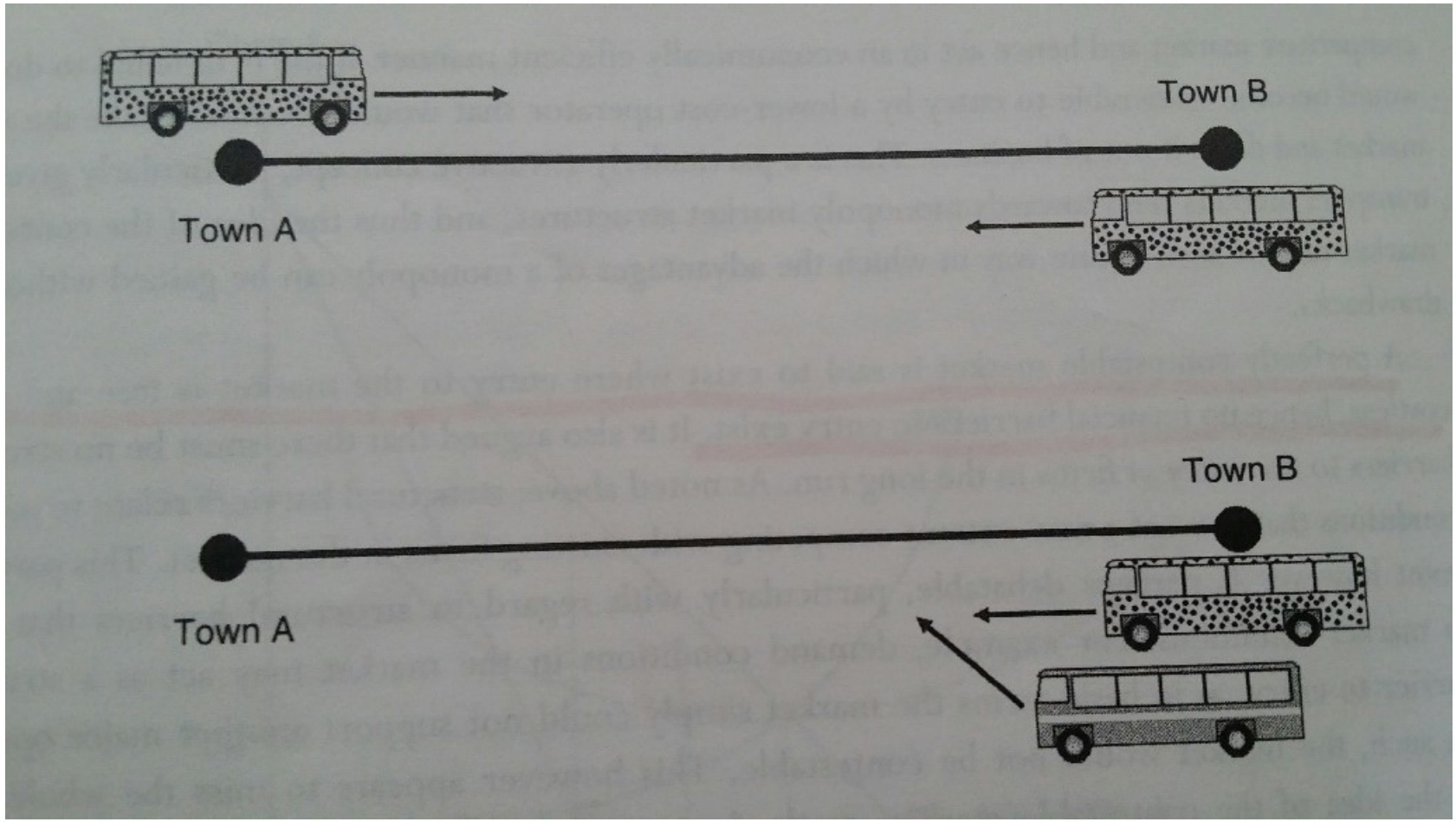
- By so doing Grey Bus will attempt to capture all the passengers on the route from Dalmatian

- Frequency therefore will have fallen from one bus every half hour to effectively a bus every hour, hence the introduction of competition on the route has halved the frequency of service

- Dalmatian is likely to retaliate and will reschedule their service to run slightly ahead of Grey Bus

- This process is likely to continue and hence the confusion and disruption caused by constant changes in timetables will represent a further deterioration in the standard of service provided

HOTELLING'S LAW APPLIED TO BUSES



PRICE DISCRIMINATION

PRICE DISCRIMINATION

Three forms of price discrimination

- Perfect or first-degree price discrimination
- Second-degree price discrimination
- Third-degree price discrimination

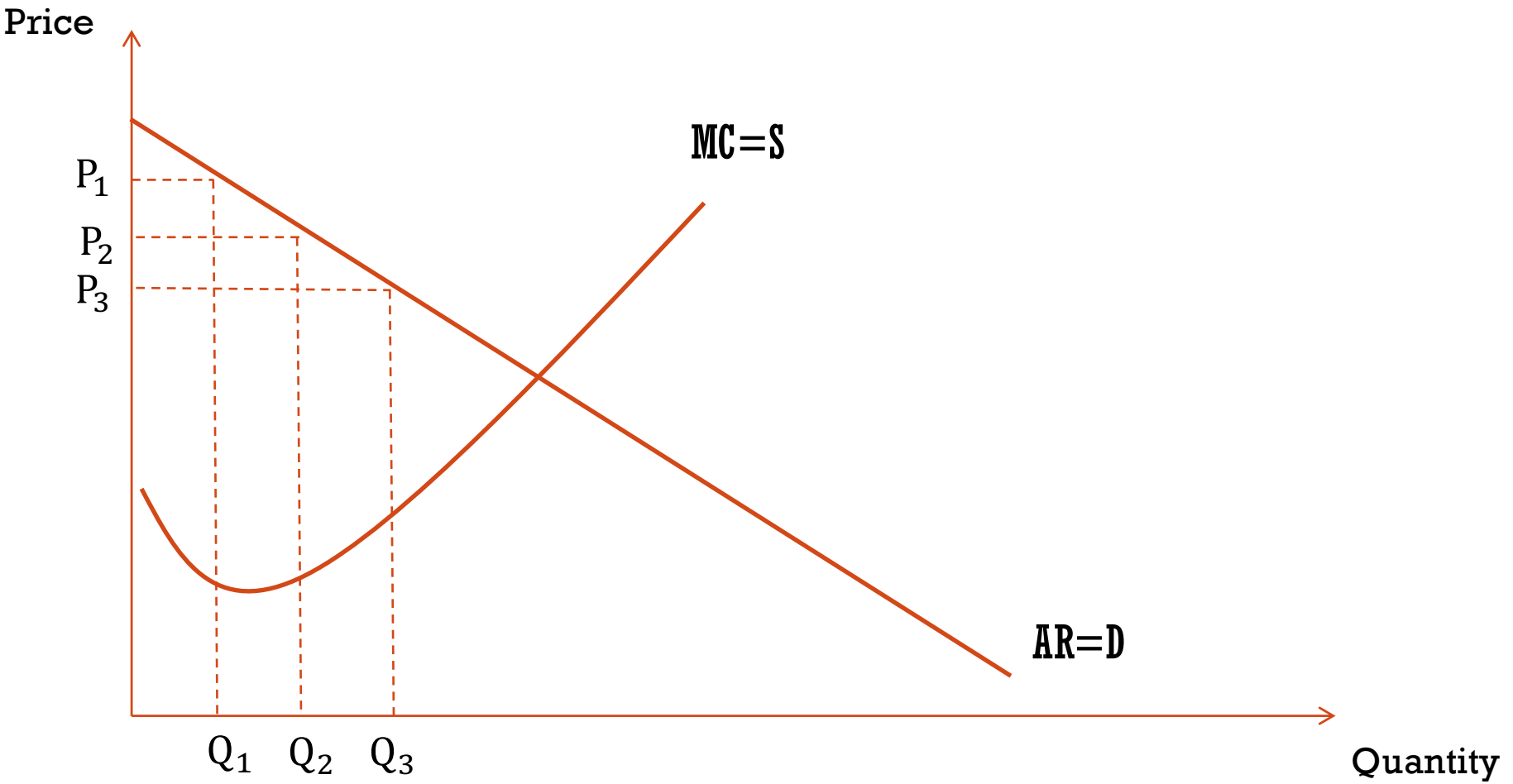
The purpose off using this pricing strategy is to increase profit beyond the maximum that a single price can achieve and to maximize producer welfare by transforming as much consumer surplus to producer surplus as possible

PERFECT OR FIRST-DEGREE PRICE DISCRIMINATION

- The strategy of selling each individual unit to the consumer who values it the most and is willing to pay the most of it

- Example – the private market for second-hand cars
  - The sellers of the cars negotiate with the buyers on an individual basis and will sell them to those who place the highest bid

PERFECT PRICE DISCRIMINATION



SECOND-DEGREE PRICE DISCRIMINATION

- Excess capacity pricing
- The strategy of charging late consumers a lower price in order to sell any remaining spare capacity and so earn some revenue from it

- Example Ticket for airlines and bus services

Assume that the MC is constant up until a certain level of output denoted Q_{fc} at which it then jumps to a new level

- The fixed costs are paid in order to establish the business even if there is no output supplied to the market
- The MC of the first unit – simply the VC associated with that unit
- Each subsequent unit of output may then cost a constant amount until full capacity is reached at Q_{fc}

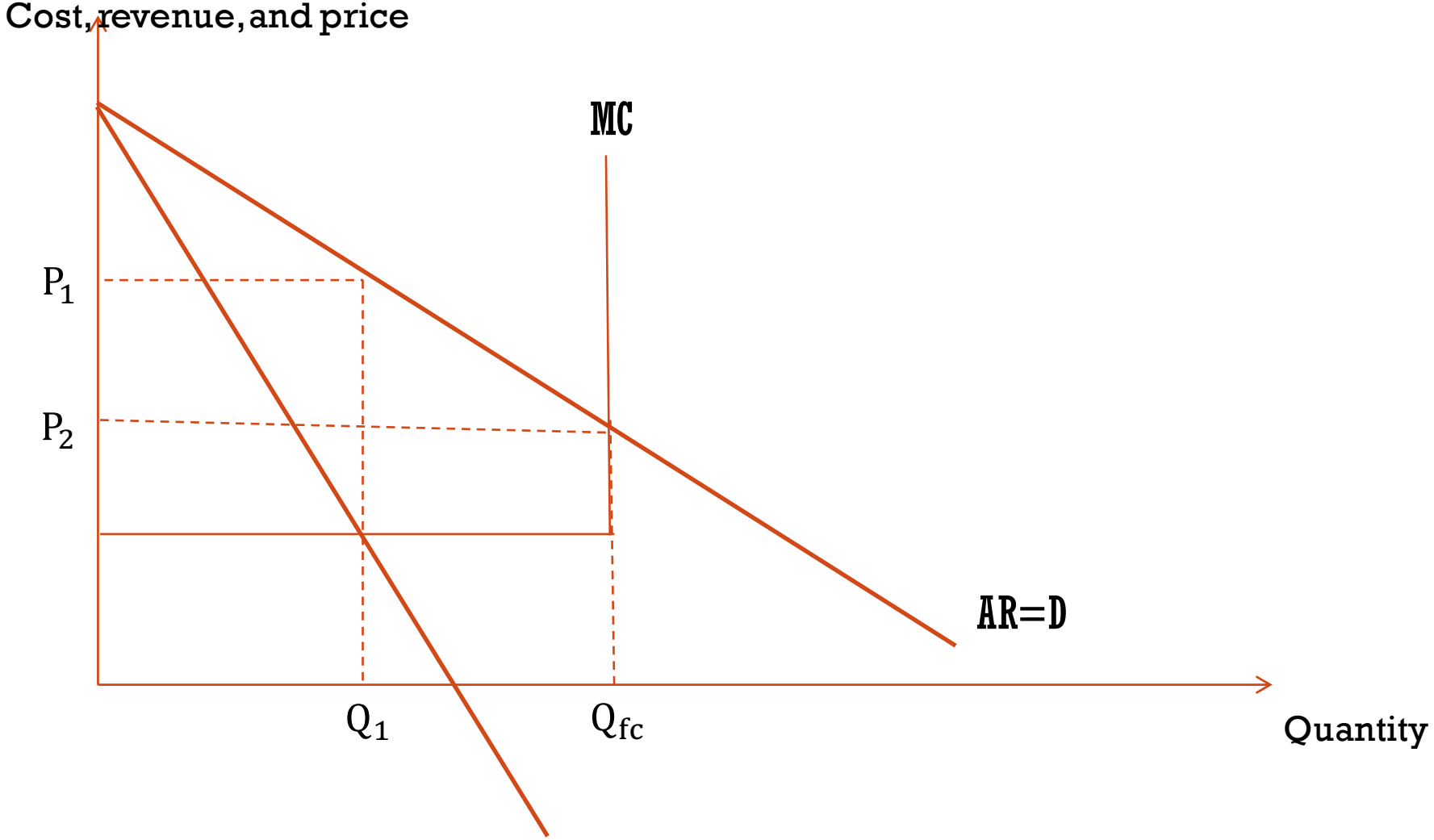
- The producer will maximize profits by selling Q_1 units at a price of leaving a level of excess capacity that is equal to P_1 , which will incur minimal extra costs to supply $Q_{fc} - Q_1$

- If the producer sells these units for a higher price than their MC it will be adding to its profits even if that price is less than P_1

- Consequently it will sell these for P_2 which is the maximum that consumers are willing to purchase them for as shown by the demand curve

- It is selling exactly the same product for different prices to different consumers and so is engaging in price discrimination

SECOND-DEGREE PRICE DISCRIMINATION



Why there are last-minute ticket deals for many airline and bus service?

- Initial costs of establishing business such as purchasing a coach, insurance, route licenses, fuel, hiring a driver and administration staff – can be seen as being the cost of producing zero units or in case of transportation zero passengers

- MC of transporting the first passenger is then simply the variable costs incurred by doing that – cost of processing the necessary administration of selling the relevant ticket

- MC of transporting the second passenger will be the same as this and so will the third and the fourth and so on until the coach is full

- At this level, one more passenger will generate the additional cost of hiring or purchasing a second coach; purchasing additional insurance, route license etc. – the MC cost jumps to a higher level

- Further passengers will simply generate the variable costs again, though as the expenditure has already been made and so the marginal cost falls back again and the pattern is repeated

E.g.

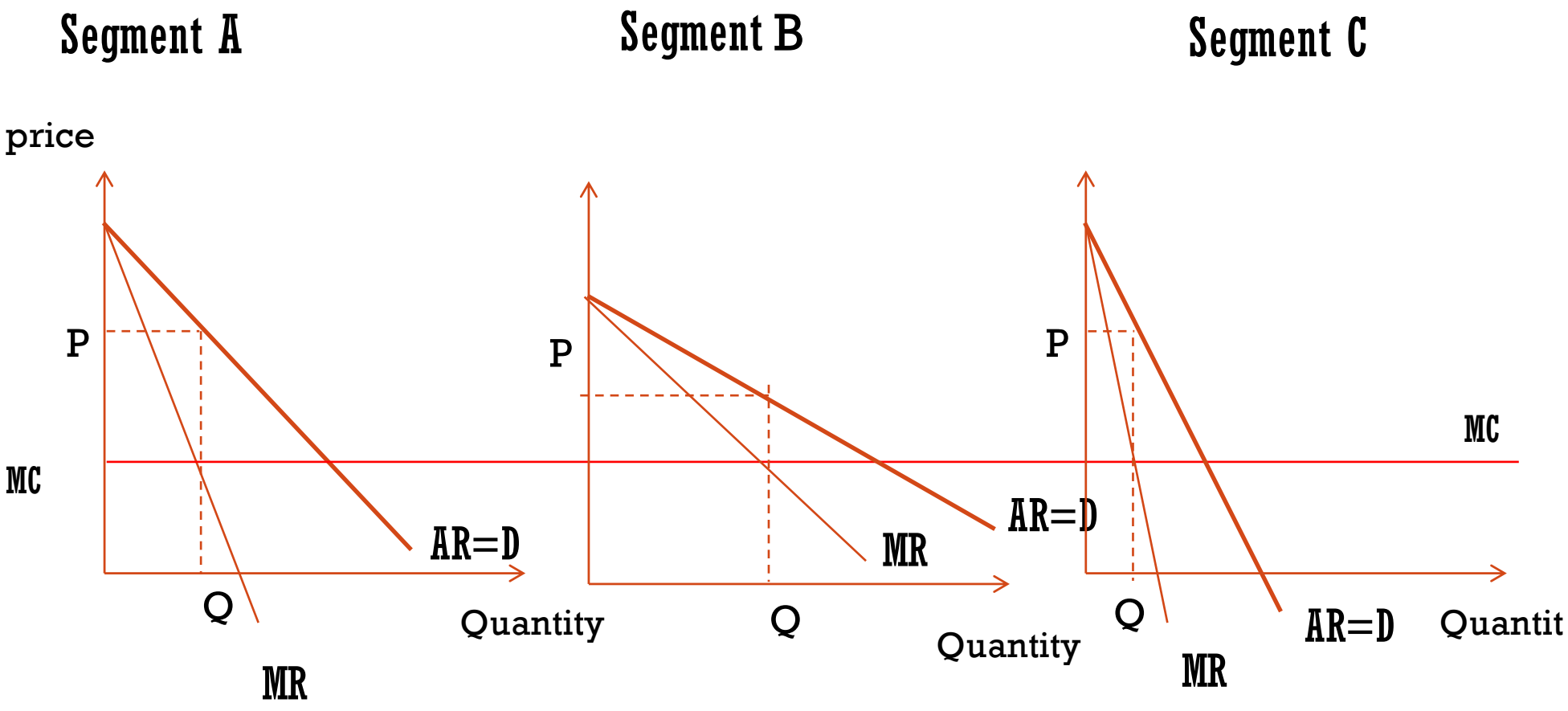
- The first coach can seat 50 people the bus company could employ the profit-maximizing rule, selling (for insurance) the first 35 tickets for a price of £30

- At the last minute, it will seek the coach by selling the remaining tickets at a discount rather than operating the coach service with 15 spare seats that could be earning some profit

THIRD DEGREE PRICE DISCRIMINATION

- The producer is able to separate the market into different segments based upon the demand characteristics of the consumers in each and then to set optimal price in each segment

THIRD DEGREE PRICE DISCRIMINATION



Two ways that a producer can divide the market into segments

- Dividing the market into clear groups that then have to prove their identity
  - Example local bus companies divide their markets into segments that include children and old age pensioners
  - Both of these segments benefit from lower prices because the companies understand that they are likely to have a more price-elastic demand than adults of working age

- To employ a self-selection strategy
  - Company creates a set of conditions that are likely to cause the different segments to reveal themselves and then allow the consumers to select which segment they belong to
  - Example Airlines operating within Europe
  - To fly on Fridays and Mondays is considerably more expensive than to fly mid-week

EXAMPLE

THIRD DEGREE PRICE DISCRIMINATION BY EUROSTAR

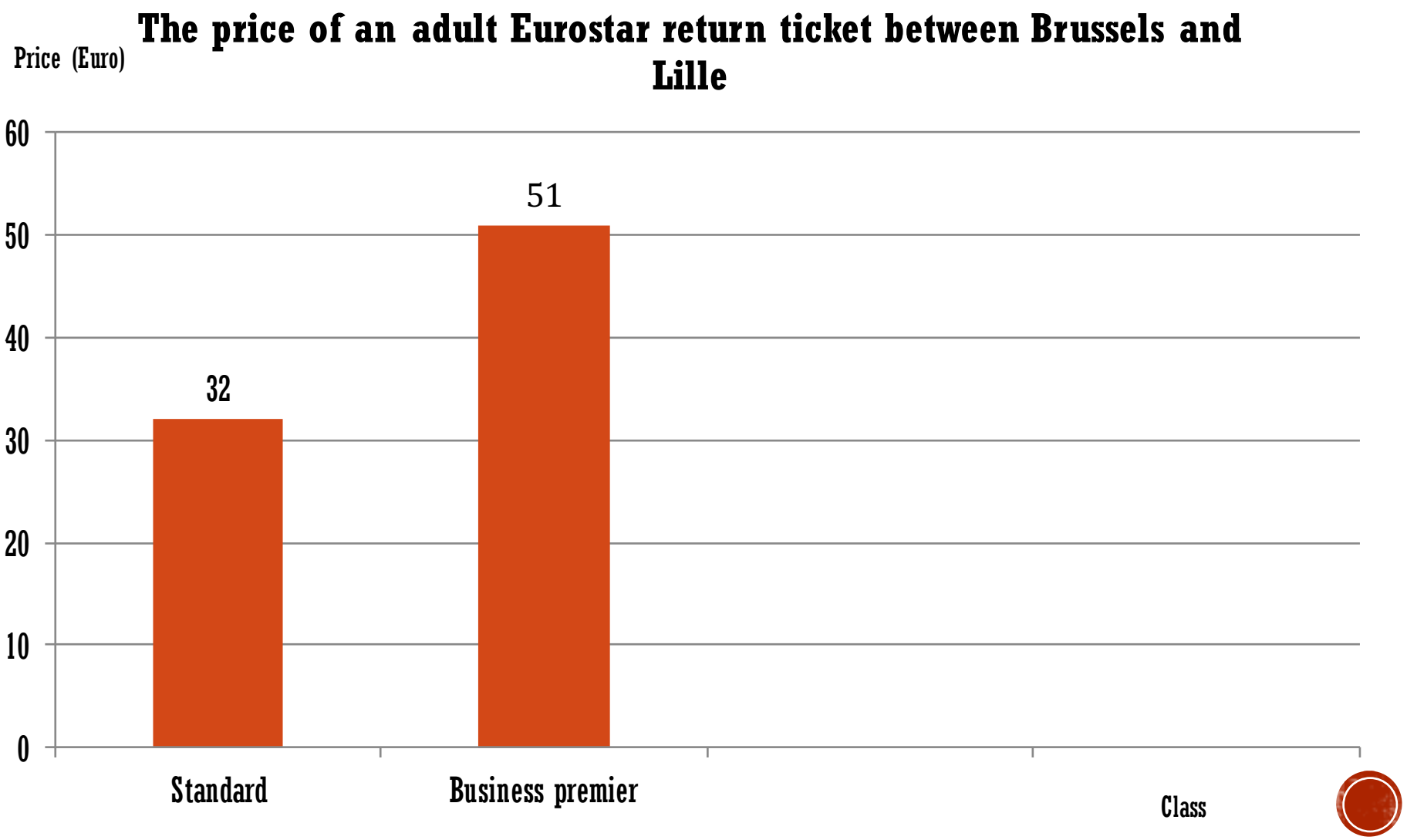
THIRD DEGREE PRICE DISCRIMINATION BY EUROSTAR

- A marked difference in price between the two classes of tickets

- The operator is selling what is effectively the same product to different groups of consumers at different prices and is able to do so because of the different demand elasticities that exist in each segment

- The business segment are much more price inelastic than the standard segment

EUROSTAR TICKETS



YIELD MANAGEMENT

- The Yield is the amount that consumers actually pay

- Third-degree price discrimination is based upon the different elasticities of demand that consumers have, whereas yield management is based upon the differences in the amount of demand that exists for different products

Example

Transport providers –including the airlines, railway and bus operators, and ferry companies – often employ analysts to monitor the sales of their seats

- Those that are selling well obviously have a high demand and so the fares will be increased accordingly to ensure that the providers are maximizing their revenue
- It is simply a case of the providers utilizing supply and demand – as demand increases or shifts outwards, the price will rise
- Similarly, those seats that are selling poorly obviously have a low demand and so prices will be reduced in an attempt to stimulate further demand

- In this way, consumers that had purchased tickets before the price change will have paid a different amount than those who delay their purchases, but this is not the same as third-degree price discrimination because they do not necessarily have a different elasticity of demand for the seat

- Transport providers utilize both third-degree price discrimination and yield management
- They know that traveler demand is likely to become more price inelastic as the departure date approaches and so they plan to increase the base price accordingly
- The analyst that are employed monitor and change those base prices in response to the actual levels of demand –upwards if the demand is higher than expected and downwards if the opposite is true
- By using both strategies transport providers are able to increase the revenue that they earn

PUBLIC SERVICE VEHICLE OPERATIONS IN BRITAIN

PUBLIC SERVICE VEHICLE OPERATIONS IN BRITAIN

- The public service vehicle (bus and coach) industry remains by far the most dominant form of public transport in Great Britain

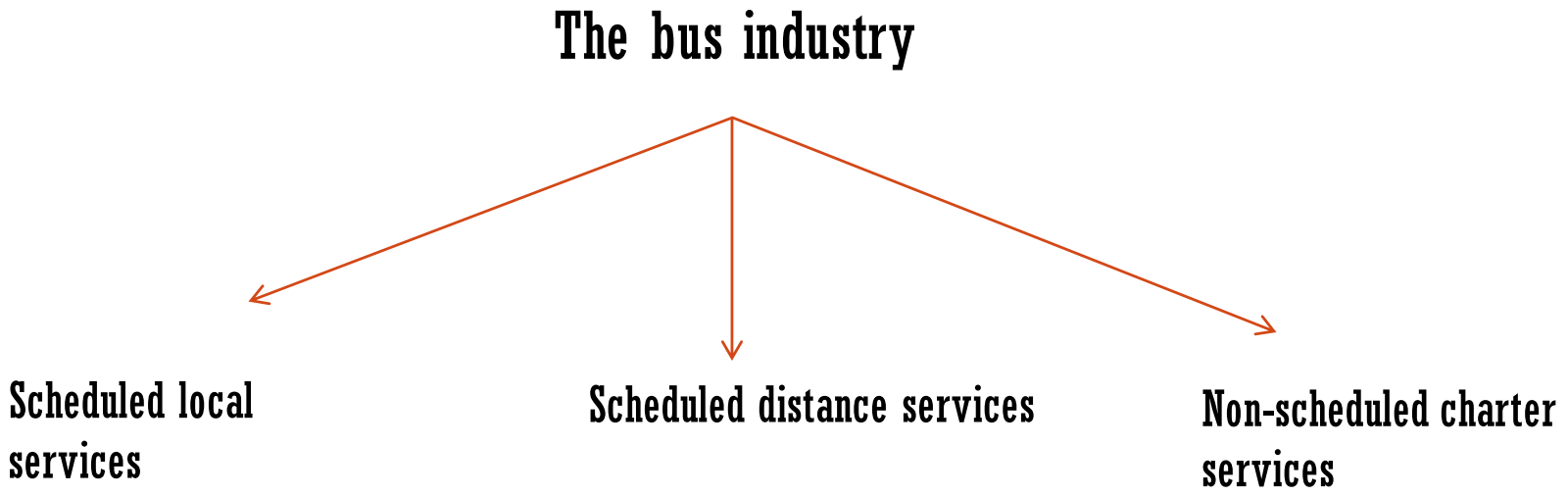
- The commission for integrated transport (2004) assets that in 2002/2003 some 4.4 billion passenger journeys were made by bus compared to 2 billion journeys on all rail modes in the same year

- Assume that there is a separate Public Service Vehicle (PSV) market according to the convention by the British Competition Commission

- Given this definition and the resulting absence of close substitutes, the market demand for bus travel is likely to be relatively price inelastic

- Two geographical definitions
  - Local markets
  - National market

THE STRUCTURE OF THE BUS INDUSTRY



- The schedule services – the vehicles that stop at set places along predetermined routes at predetermined times
- Local services – within city or county boundaries
- Distance services – traverse such boundaries
- The non-scheduled charter services- privately hired for particular journeys

- 1800 private-sector bus operators and 17 local authority-owned companies in Great Britain

- The national industry was dominated by 5 large companies: First, Arriva, Stage Coach, Go-Ahead, and National Express, which together account for approximately 80 % of employment and 70% of the market turnover

- They are each concentrated in different local market

- Local markets are highly monopolized

- This monopolization of local services is sustained by barriers to entry
- 5 particular barriers to entry
  - Supply-side economies of scale
  - Demand-side economies of scale
  - Competitive responsiveness
  - Lack of service differentiation
  - Reputation

- Supply-side economies of scale
  - Large operators are able to purchase new vehicles significantly more cheaply than small operators and by virtue of having younger fleets subsequently enjoy lower maintenance costs

- Demand-side economies of scale
  - Larger operators within a local market are able to tie in passengers through the employment of discounted return journeys and network tickets that can be used on any of its vehicles within an area

- Competitive responsiveness
  - One can view each route as a separate market – incumbents are able to use their multiple markets to respond effectively to small scale entrants
  - To aid this, price and service characteristics can be adjusted rapidly

- Lack of service differentiation
  - New entrants have only a limited potential to differentiate their service or to reduce their operating costs through technical innovation

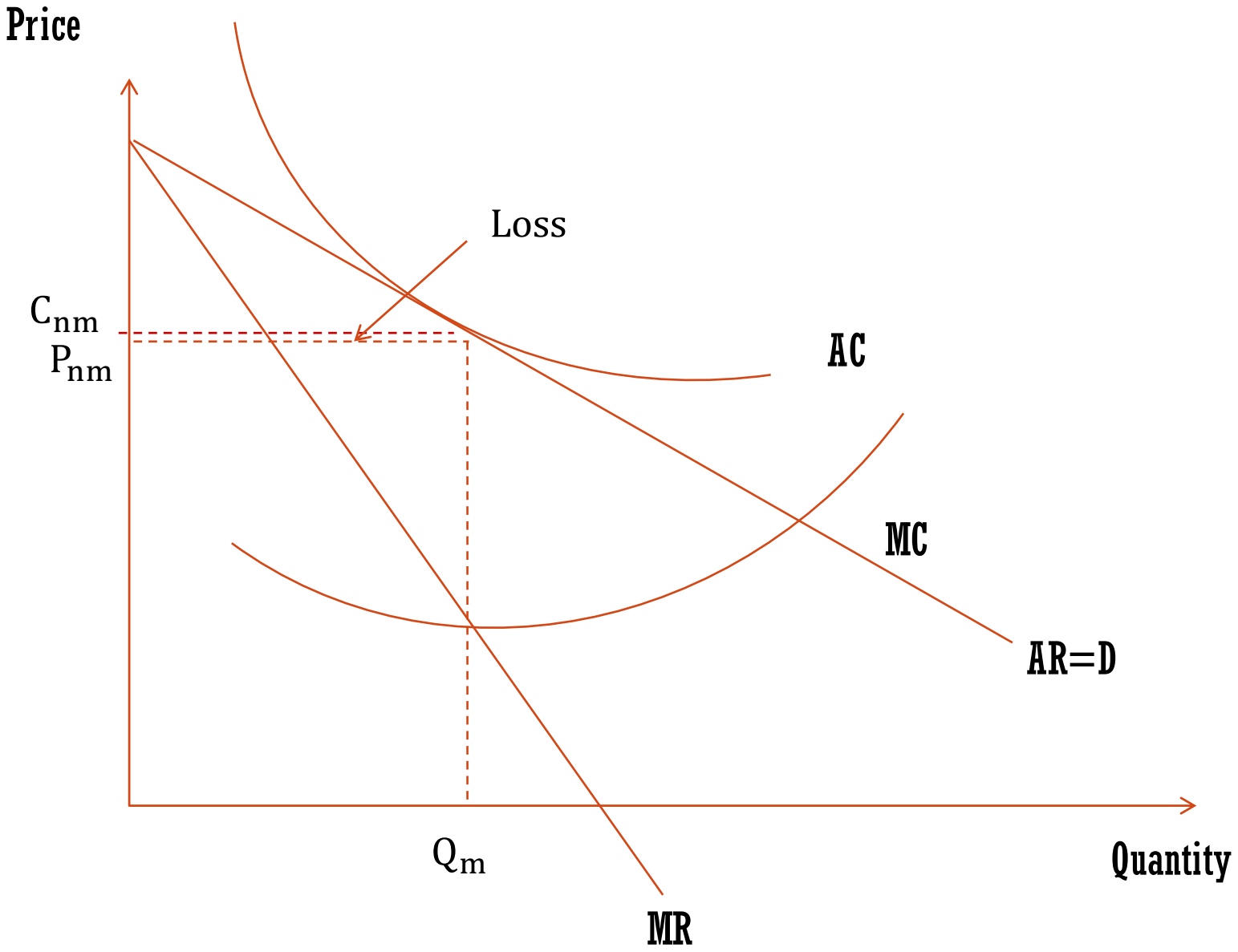
- Reputation
  - The reputation of an incumbent for responding aggressively and effectively to entry acts as a not-insignificant barrier to entry

- In order to establish a PSV operating company in any of the three sub-market it is necessary to obtain **an operator's license**

- **Legal costs** are required and the Traffic Commissioners have the same avenue of decisions open to them – If the application process has been successful the new licensee will need to obtain the required vehicles

NATURAL MONOPOLIES

- One producer
- Markets in which the capital costs are so high that the producer needs to receive all of the market revenue just to stay in operation
- Any competition within such a market would cause all producers to fail to make normal profit and so would lead to all producers being forced out of the market and there being a complete absence of supply
- Need government subsidisation
- Example railway


Price
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REFERENCES

- Mallard G., and Glaister S. (2008). Transport Economics: Theory, Application and Policy. Palgrave Macmillan.

- Cowie J. (2010). The Economics of Transport. Routledge.