Transport subsidy

EE381/382

- The economic rationale behind the payment of subsidy to transport operators
- Supply side and demand side subsidy measures
- The drawbacks of paying a subsidy

Introduction

- Transport markets are made up of a combination of market forces and the actions of transport planning authorities, with subsidy playing the pivotal role in reconciling these two ‘forces’ in the actual market place

- How much subsidy should actually be paid to the operator to run the service?
- What is the best way to pay that subsidy?
- What is the likely impact of the subsidy payment on what the authority is trying to achieve, i.e. what are the side effects of paying subsidy on the standard of service provided and the efficiency of the operator providing it?

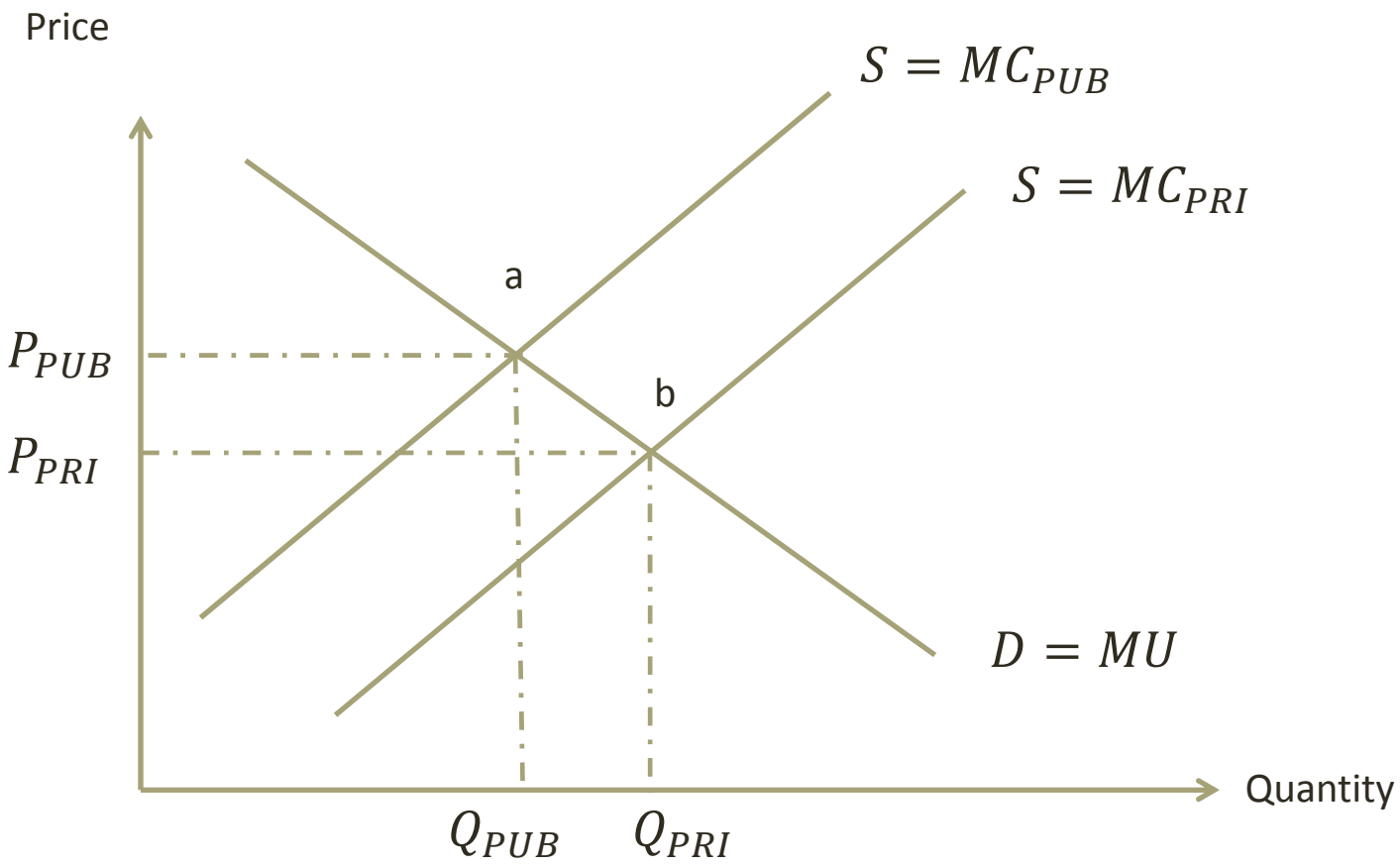
The Rationale for Public Subsidy

- Externalities
  - Spill overs occur when the costs of producing a good or service fall not only on the producer of that good or service but also on others that are not involved in the activity in any capacity
  - The full cost of an activity therefore can be divided into two categories
    - Private costs- fall on the producers or users of that product
    - Public costs- fall on others who are not involved in the activity and consequently do not benefit from it

External costs and over production

- They are not taken into account when individuals make private production and consumption decisions as only the private costs of that decision are considered
- In terms of an external cost, this leads to over-production of a given good or service

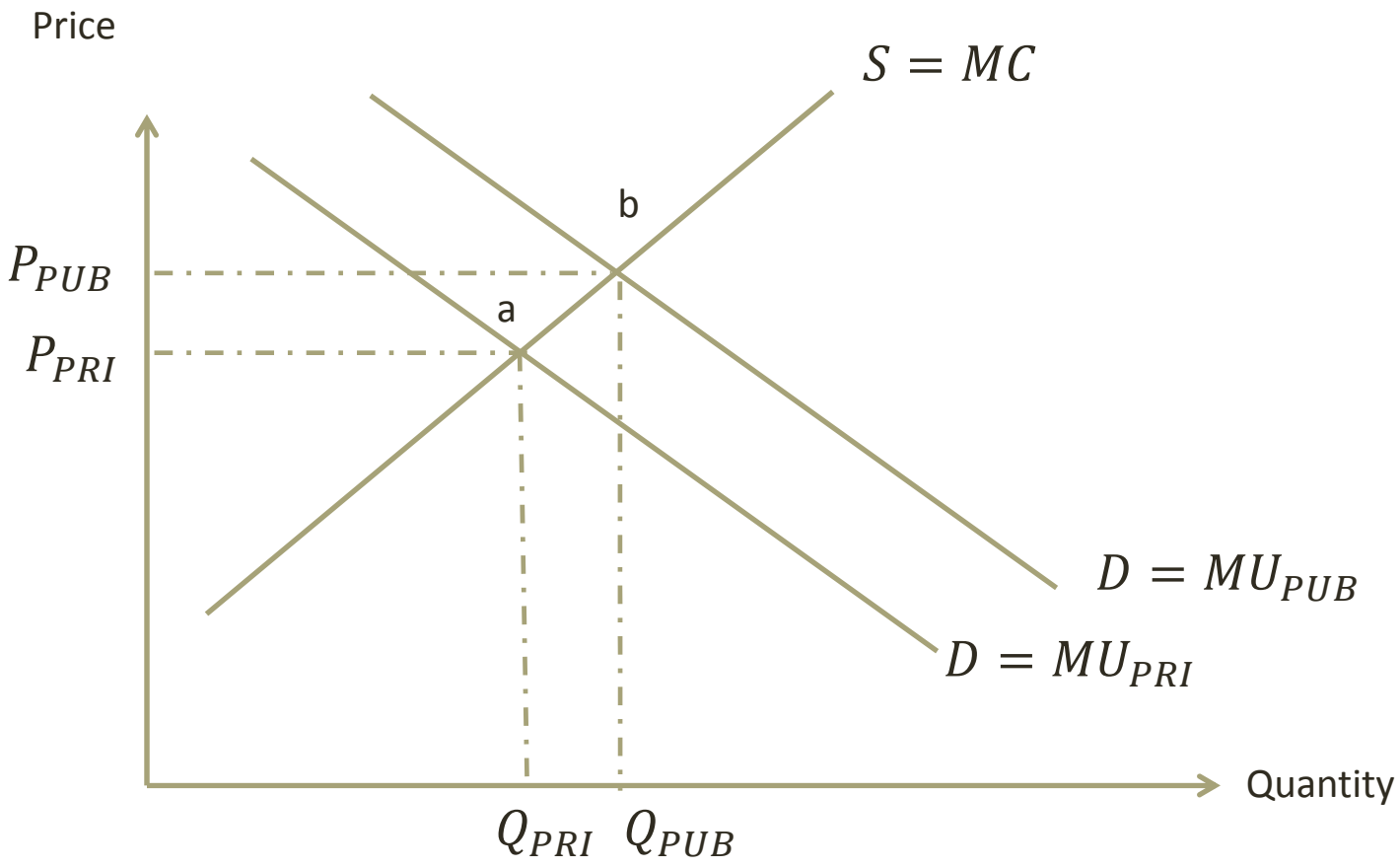
Over production due to an external cost



External benefits and under consumption

- There may also be benefits that are not registered in the market place
- E.g. If an individual chooses to undertake a program of physical fitness and also change to a healthy diet, then a number of benefits will arise
  - Because of their actions they will probably be less of a drain on health resources and consequently less of a drain on the tax resources used to pay for those health services
  - The individual's employer will benefit in the form of less days off sick and a more wide awake employee
- Most of these will accrue directly to the individual concerned , but others in society will also benefit from the individual's new healthy lifestyle

Under-consumption due to an external benefit



- Both over production and under consumption are cases of market failure, as the presence of externalities breaches one of the conditions of perfect competition

- The presence of externalities on their own therefore are not sufficient to justify the subsidization of transport services; however, the issue is the extent are far reaching consequences of such spill over effects

The economic rationale for the subsidization of transport services

The idea of market failure, where the market as such is either providing too much (over production) or too little (under consumption). Correction of such market failures the strong rationale for the payment of subsidy

Support inefficient operations however is not one of the criteria for the payment of subsidy, the four main ones being:

- In support of land use efficient modes of transport
- To lessen the impact of environmentally unfriendly modes of transport
- To support economic development or regeneration of an area
- To support socially necessary services

In support of land use efficient modes of transport

- Inefficient use of land does create major problem –traffic congestion
- Authorities have two choices:
  - Penalize users of the land inefficient modes of transport through some form of tax
  - The form of directly reducing the fares charges hence directly subsidizing the services, or through increasing the quality of the service provided

To lessen the impact of environmentally unfriendly modes of transport

- Tax the more environmentally unfriendly forms of transport and/or subsidize the less environmentally harmful modes

Example

- Rail travel is known to possess an external benefit
- Those using rail services are not using private transport, therefore road users directly benefit through reduced congestion, faster and less stressful journeys and a reduced number of accidents on the roads

To support economic development or regeneration of an area

- Transport can be viewed as the vital component in promoting and sustaining economic growth

- Economic development is normally associated with improved or upgraded transport links and services

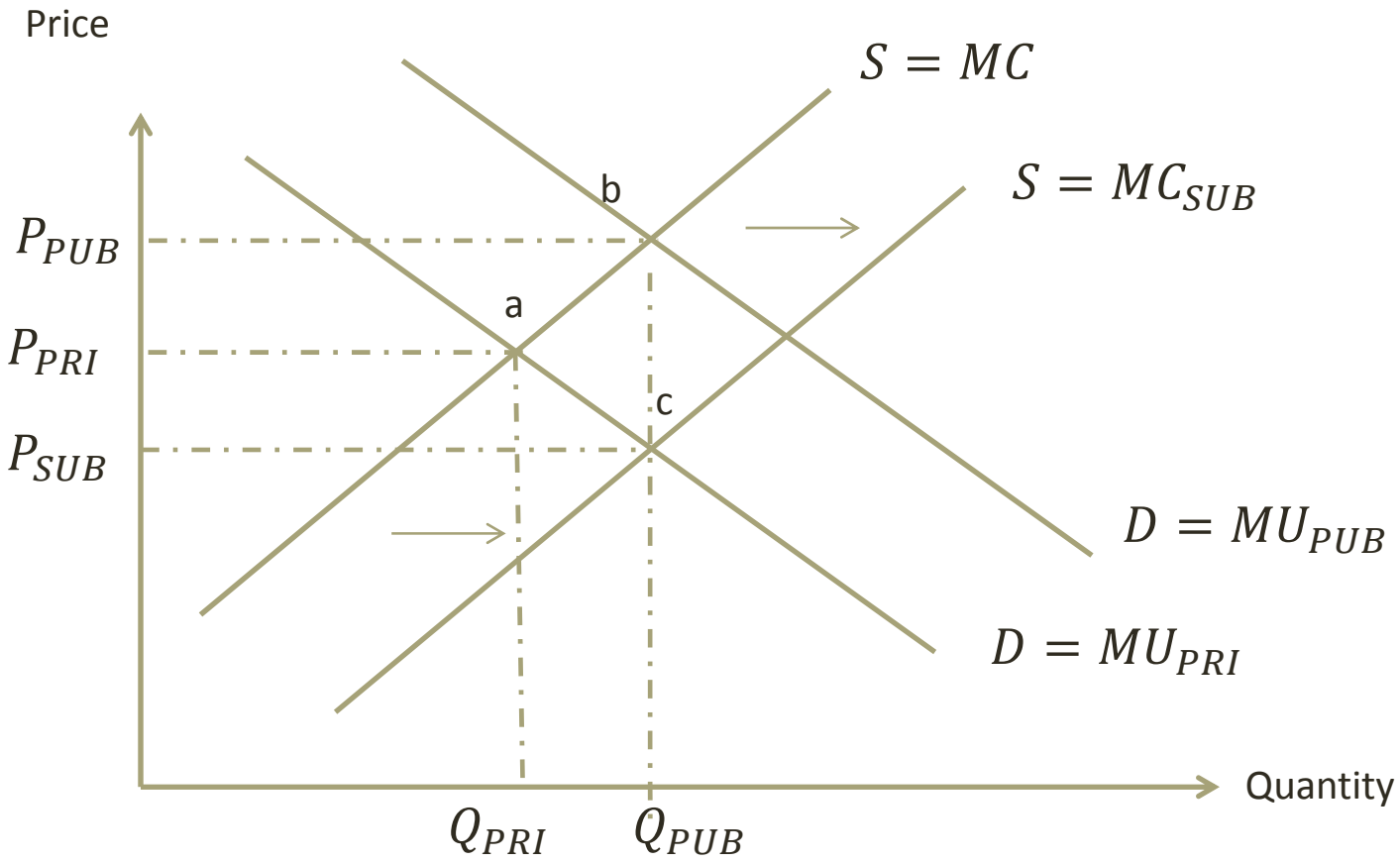
To support socially necessary services

- Barr (2004) views transport as a 'participative requirement' – it is required in order to fully participate within society
- With regards to transport needs, public transport fulfills this role. A socially necessary service and provides the rationale for the payment of subsidy- to provide some minimum standard of living
- "Socially Necessary" –the provision of public transport in socially and economically deprived and /or rural areas
- Transport services therefore need to be subsidized to assist in the development of such areas and prevent a massive imbalance appearing between the 'haves' and the 'have nots' within society

Intervention in the market

- Supply side measures
  - The subsidy is paid directly to the operator, not the consumer
  - This enables the operators to supply a level of service that it would otherwise not have been able to in the absence of the subsidy
  - The direct effect of a supply side measure is to increase the supply of that service to the market

Subsidy to operators to correct for under-consumption



Intervention in the market

- Demand side measures
  - Is used to correct for a demand side market failure and exists where specific groups or individuals are ‘targeted’ to receive the subsidy
  - The individual is given a ‘concession’ (a reduced fare) to use a transport service, either public or private, but in reality most if not all concern some concession on the use of public transport
  - Concessionary fares are given to individuals that the state has decided should receive some form of discount on their travel needs

Case Study

ISSUES SURROUNDING CONCESSIONARY FARE REIMBURSEMENT

- The most common form of demand side measure found in transport markets are **concessionary fare schemes**

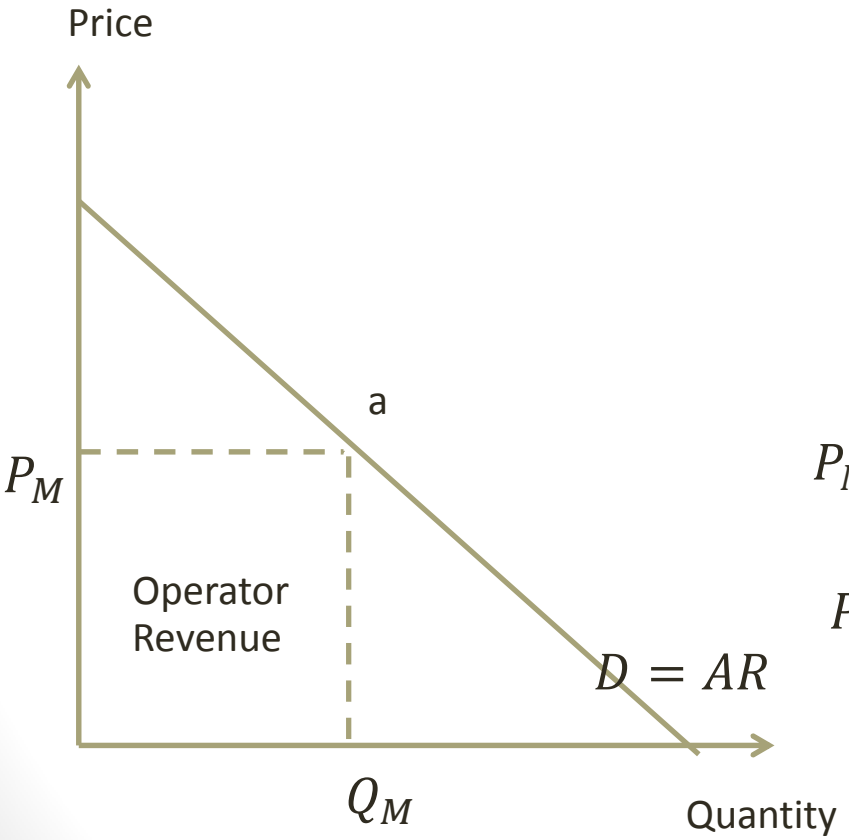
- The original Transport Act 1985 allowed for voluntary **concessionary fare schemes** to be operated for the **elderly and registered disabled**, thereby leaving it entirely up to local authorities to specify their own schemes for these two groups, including the option of not having one

- There are a number of ways such schemes could be operated
  - **Option 1**: As an entirely demand side based scheme where the concession holder pays the full fare to the operator. The traveller would then reclaim all fares at a later date from the authority.
  - **Option 2**: A voucher or token system could be used, where tokens are issued to entitlement holders, who would then use these instead of paying the fare
  - **Option 3**: A pass system, where the entitlement holder shows a pass on boarding and the operator records the number of concessionary passengers. The operator is then reimbursed for every recorded concessionary passenger carried

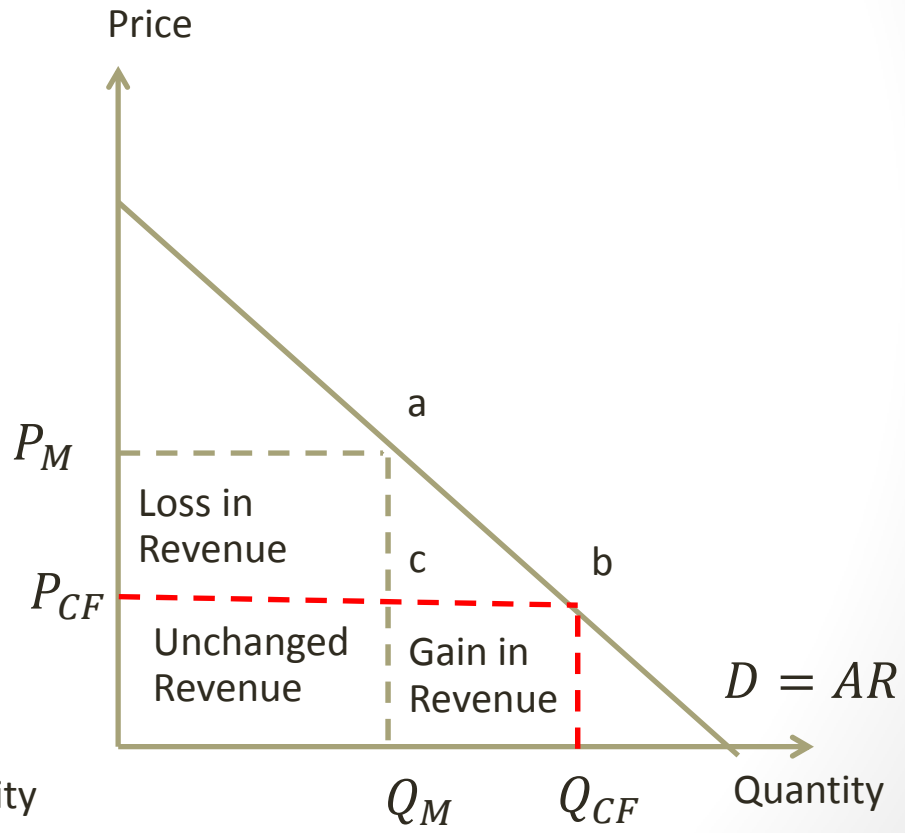
- Within Britain a pass system is used
- How operators are compensated by the authority raises many issues
  - The underlying principle is that the operator should be no better and no worse off as a result of the scheme
  - For example, say a 50 per cent concession is introduced, and there is a hypothetical bus company that charges a flat fare of £1, consequently those entitled to the concession only pay 50p. For each concessionary fare carried, therefore, should the operator receive 50 p as compensation for the loss in revenue?
  - The answer is no due to the concept of '**generated traffic**'

Generated traffic

Before the introduction of a 50% concessionary reduction



After the introduction of a 50% concessionary reduction



- The additional travellers who did not travel before and this is known as the ‘generated traffic’

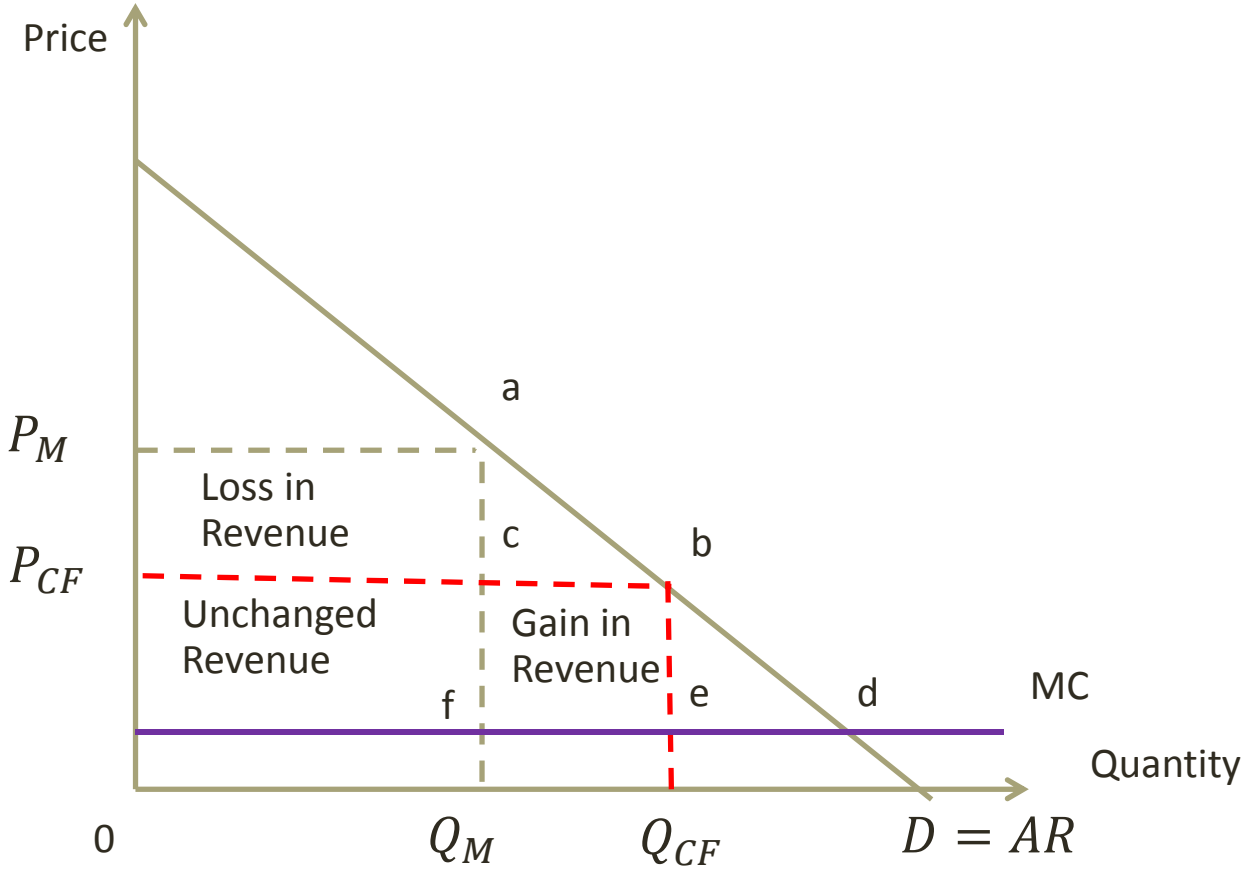
- These individuals are now paying the operator the concessionary fare, in this case 50p. These extra 50ps therefore are fares the operator had not received before and are due to the increase in bus use, or generated traffic, brought about by the introduction of the concession

- This represents a net gain to the operator’s revenue and needs to be taken into account in any fare reimbursement

- The loss in revenue on the other hand, those concessionary travellers who would have travelled at the full fare (the area P_{CF}, P_M, a, c)
- The amount of compensation due to the operator would be loss in revenue minus the revenue gain from the generated traffic (the area Q_M, c, b, Q_{CF})
- This would still not leave the operator no better or no worse off as there is an additional cost connected with carrying more passengers
- This will generally slow down boarding times and hence more buses may be required to maintain route frequency
- The operator therefore also needs to be compensated the extra cost incurred as a result of carrying the generated traffic

Generated traffic with marginal costs added

After the introduction of a 50% concessionary reduction, marginal costs added

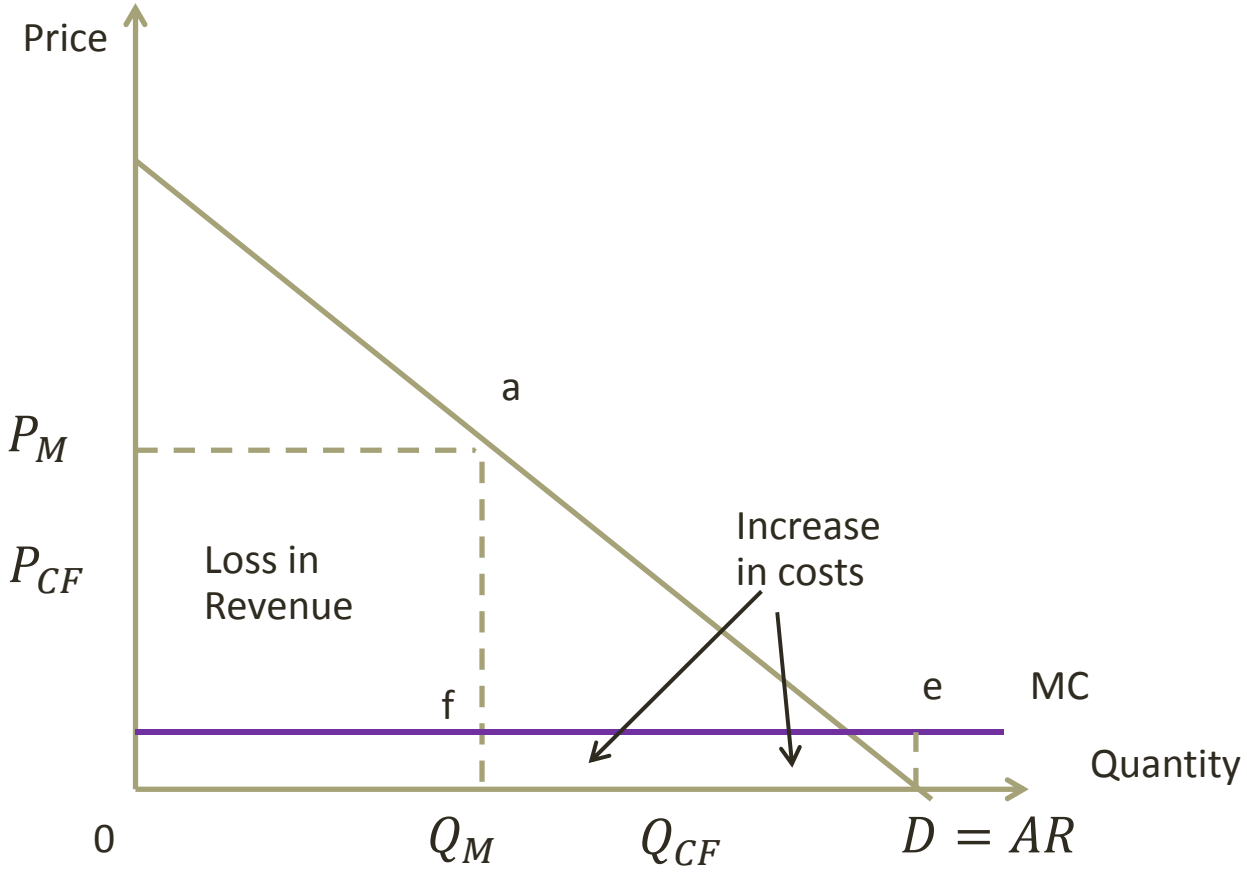


- Assume constant non varying economies of scale – constant MC
- The operator needs to be compensated by the area Q_M, f, e, Q_{CF} in order to cover these added costs in order to be no better or no worse off as a consequence of the concessionary fare scheme
- In practice operator reimbursement has caused much confusion and resentment amongst operators are to what the actual level of 'generated' traffic should be
- These reduced fare schemes were only valid at off peak times, the expectation was that concessionary travellers would only use spare capacity and thus MC would be minimal

Under a free concessionary fare scheme

- Demand for the concessionary group would now increase to point d and while the level of generated traffic will be significant, the level of generated (operator) revenue will be zero
- On the introduction of the English National scheme gives the following measures that should be taken into account in the process of operator reimbursement
  - The average number of pass holders
  - The average bus fare for the concession group, or where this is not available, the average bus fare charged
  - The expected fare reimbursement revenue
  - The expected number of concessionary fare trips
  - The expected additional costs

Concessionary fare reimbursement, free concessions After the introduction of a free concessionary fare



Under a free scheme there is no revenue accruing to the operator from the concessionary passengers

- Hence in order for the operator to be left no better or worse off than if the scheme did not operate, they should be reimbursed the loss in revenue and the additional cost of the generated traffic, which is given by area O, P_M, a, Q_M plus area Q_M, f, e, Q_{CF}

- The whole process of concessionary fare reimbursement is still a messy area , as how the level of generated traffic is estimated is by the use of elasticities of demand

- The question of whether it is ‘right’ that the reimbursement does not include some form of normal profit for the operator? By using the average fare in the compensation, this means that it will include operator profit, but only on the lost revenue, thus leaving the operator ‘no better or worse off’ as a result of the scheme

- Many bus operator argue that the full fare should be compensated on all passengers carried as in effect they are providing a service to the government in putting such schemes into operation

- The problem of full fare reimbursement however is that operator could increase profits by simply increasing the average fare, hence the level of reimbursement would automatically increase – this would be a particular danger where there is inelastic demand and a high number of concessionary passengers

Drawbacks of paying subsidy

- It is always a second best solution
- Can lead to inefficient operations
- The winner's curse syndrome
- Subsidize a service that doesn't actually need a subsidy

It is always a second best solution

- The payment of subsidy to a transport operator to provide a service is what is known as a second best solution
- When subsidy is paid however this interferes with that process and it becomes dependent upon accurate forecasting and planning in order to ensure that subsidy is used where it is most needed
- This process will never be as efficient as the market, although note that it should be more effective

Can lead to inefficient operations

- Public subsidy is used to support inefficient operations rather providing the service for which it was intended

The winner's curse syndrome

- The idea of the winner's curse is used in auction theory to explain why winning bids may be based upon judgmental failures where the auction is ultimately won by the most optimistic valuation of the auction's item (Alexandersson and Hulten, 2006)
- The transport operator would bid for potential transport contracts based upon market information, and this information would tend to be optimistic in its forecasts of the potential market.
  - The winner of the contract therefore would be that operator with the most optimistic revenue figures, hence, all else being equal, requiring the lowest subsidy to operate the service.
  - The net results would be that when successful, the winner bidder would find out the optimism of their forecast and encounter losses on the service

Other issues surrounding transport subsidy

Cross- subsidization

- Occurs where the profits of one route or service are used to pay for the losses on another route or service

- Cross-subsidization appears to be a good thing:
  - The system entirely self-funded with no reliance on public subsidy such as tax payers' money
  - In a regulated transport market where an operator may be protected from competition through the regulatory system, then it may seem only fair that in turn for this regulatory protection the operator sacrifices a part of their profit to provide some unprofitable routes for the authority

Argument against cross-subsidization

- It hides the true costs of providing a particular services
- Rather than the operator being penalized by using potential profits to fund loss-making routes, it is the users of the profitable routes that are being ‘penalized’ as they are paying for the users of the poorly used routes
- There are other and better measures and policy instruments available to ensure that necessary services are provided to those that need them

Reference

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