

# 9. SUBSIDY

# Pricing and subsidies

- Close connection between **pricing and subsidy**
- When the **prices** are **not right** – there is often a need for subsidy
- **Why** so often the prices in transport are not right?

# Discussion questions

Discuss the following simple statements, which should help to build on and develop some of the issues discussed in this lecture:

- **Low subsidy** is “good” and high subsidy is “bad”
- Transport should only be subsidized on the basis of what can be **afforded** by the relevant authorities
- Public transport is a **public good**, therefore should be subsidized
- **Road networks**, because they are provided and maintained by the state, are therefore provided free of charge

# Subsidy

- The transport markets are made up of a **combination** of market forces and the actions of transport planning authorities
- Subsidies are playing the pivotal role in **reconciling** these two forces in the actual marketplace
- If the transport authority wants to have a service that does not generate the **profit**, it can allocate a subsidy for the difference between costs and revenues
- Any **problems** with such approach?

# Subsidy or payment for public service?

- The payment of subsidy is also closely related to aspects of **regulation**
- With the more private sector involvement, many argue that there is no longer a subsidy but rather a payment for the **contract** for providing a public service
- The issue is further complicated by the fact, that paying transport subsidies has also a very strong **political** dimension

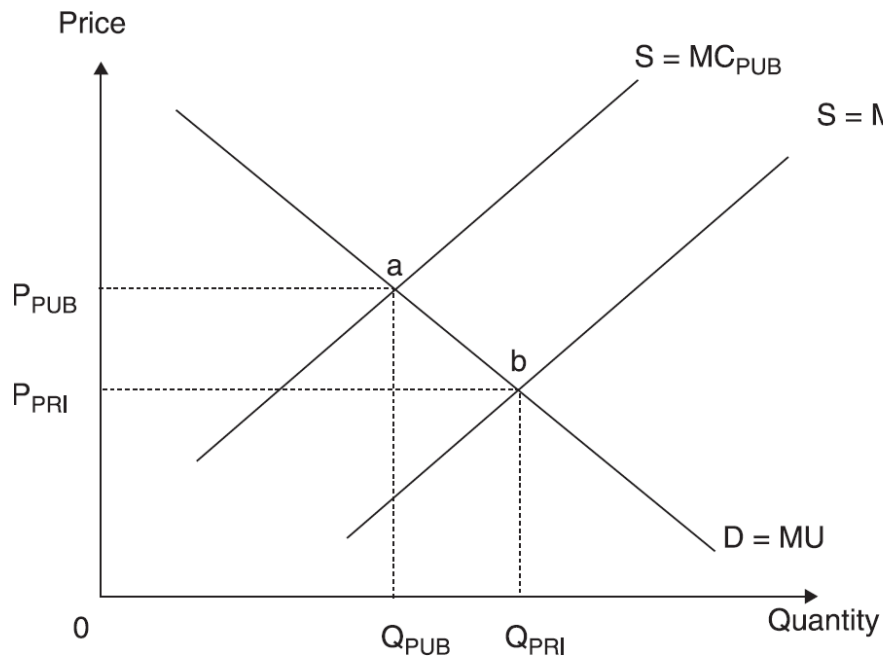
# The rationale for public subsidy

- Transport subsidies are helping to keep the whole **transport system** working (commuting)
- It pushes transport operations towards more **land use efficient and environmentally friendly** modes of transport
- What is the relationship between **subsidies and efficiency?**
- There are many **externalities** in the transport industry

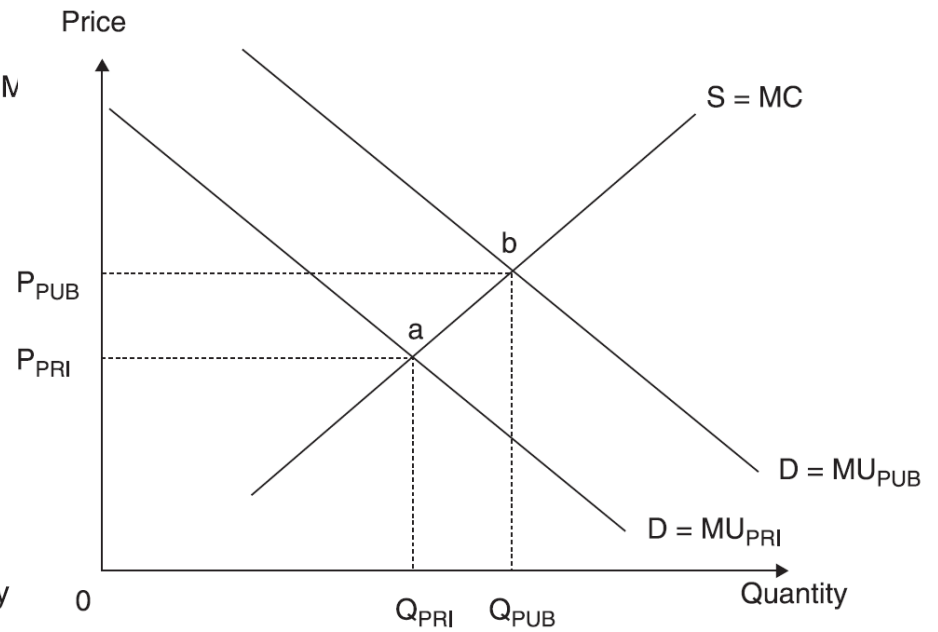
# Externalities

- **Externalities** = spill – over effects; they occur when costs (or benefits) fall not only on the producer of the service
- Private costs + public costs = **social costs**
- **External costs** and over–production (pollution, noise....)
- **External benefits** and under–consumption (land use, environmentally efficient modes of transport, education ...)

# Externalities



*Over production due to an external cost*



*Under-consumption due to an external benefit*



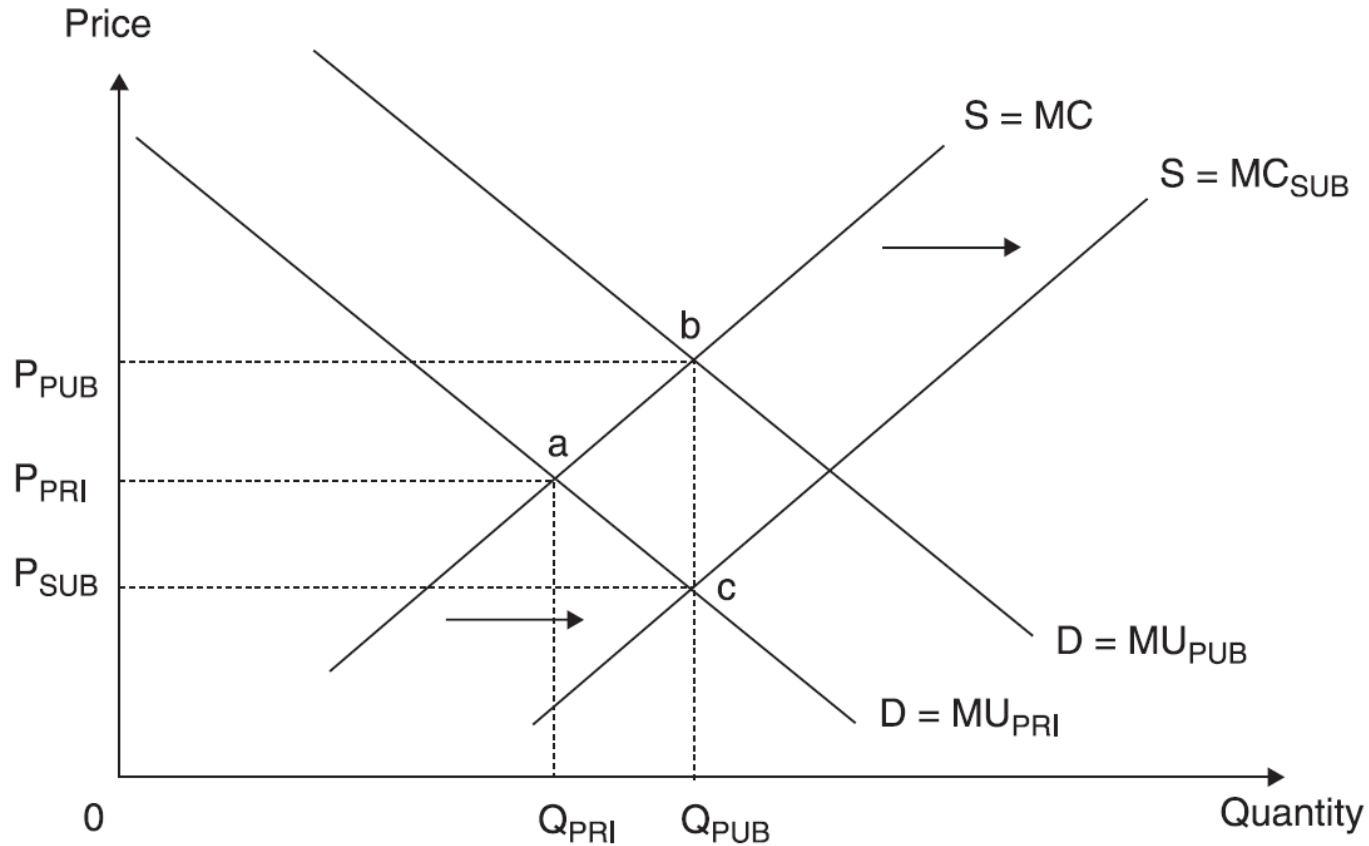
# The economic rationale for subsidization

- **Market failure** present → its correction is the strongest argument for subsidy
- **Two bads** (market failure + taxation) = One good (optimal market solution)
- Subsidy as a tool to improve the **efficiency** of market x Subsidy as a tool to subsidize **inefficient** (public) operators

# The economic rationale for subsidisation

- In support of **land use efficient** modes of transport → against car use and congestions
- To lessen the impact of **environmentally unfriendly** modes of transport → to support trains and ships against cars and planes
- To support **economic development** or regeneration of an area
- To support **socially necessary** services → the problem of rural demand

# Subsidy to operators to correct for under-consumption (supply side measure)



11.3 Subsidy to operators to correct for under-consumption

# Demand side measures

- Far more **straightforward**
- Used to correct for a **demand** side market failure
- **Specific** groups and individuals are targeted to receive the subsidy
- In effect the individual is given a **concession** (a reduced fare) to use a service
- **Free Fare Systems** (to be analysed later)

# Drawbacks of paying subsidy (1)

- It is always a **second best** solution → the best solution is always market with perfect competition; when subsidy is introduced, it will be usually accompanied by some form of regulation
- Can lead to **inefficient** operation → because the organization is not working to strict market principles, then costs are not as low as they should be → most research found that operators with higher levels of subsidy tend to be less efficient; what is the causality?; rural services problem; US research: federal subsidies have adverse effect on efficiency; local subsidies small positive effect

# Drawbacks of paying subsidy (2)

- The **winners curse** syndrome → the idea is from auction theory to explain why winning bids may be based upon judgemental failures where the auction is ultimately won by the most optimistic valuation
- Subsidise a service that **doesn't** actually **need** a subsidy → rather than being used to provide an essential service, the subsidy is being used to boost the operators' profits → the risk of withdrawing the marginally profitable commercial services in knowledge that the authorities will reinstall it with the subsidy

# Cross-subsidization

- Cross-subsidization occurs where the **profits** of one route or service are used to pay for the **losses** on another route or service.
- It has often been used in the past to **reduce** the level of **total subsidy** or at least reduce the level of subsidy to be paid.
- It can be used for local **bus or rail** services where the profits from high density routes are used to cover some of the losses from little used low-density routes, hence reducing the overall reliance on subsidy
- It is necessary to **protect** such system from competition
- Is it a **good system**?

# Cross-subsidization - drawbacks

- **Hides true costs** of providing a particular service → true costs of operations are hidden → we do not know what are true csts of providing the service → direct accountability is therefore lost
- **Users of profitable** routes are **penalized** → as they are paying for the users of the poorly used routes
- There are **better instruments** to ensure provision of services → why the users of profitable bus/rail routes should contribute when car drivers make no contribution at all?



# Methods of paying subsidy (1)

- **Deficit** subsidy → authority pays the difference between revenue and costs → this used to be an open-ended subsidy → authority covered the size of deficit, irrespective of the size
- **Net cost** contract → Under such contract, the operator acts as a sub-contractor to government to provide transport services within a given area → this reduces cross-subsidisation and produces greater visibility → should government opt for short- or long-term contract?

# Methods of paying subsidy (2)

- **Full cost** contract → bid for subsidy is based on the full costs of running the service or network → Fares charged are specified by the authority but collected by the operator who then returns the revenue to the authority → the net subsidy is costs of operations minus the revenue from passengers. → all revenue risk rests with the authority and none with operator
- Design, Built, Operate and Maintain (**DBOM**) → used for big infrastructure projects → tenders will be based upon the price required to design, build, operate and maintain the infrastructure over a set period of time → due to the high investment required → usually long term contracts

# Case: Free Fare Tallin

- The **subsidy** level of public transport systems **varies** considerably among systems worldwide.
- While **limited-scale** free-fare public transport (FFPT) services such as limited campaigns and fare evasion for special groups or specific services are prevalent, there is only limited evidence on the consequences of introducing a **full-fledged** FFPT.
- The case of **Tallinn**, Estonia offers a **full-scale** experiment that provides a unique opportunity to investigate the impacts of FFPT.

Cats, O., Susilo, Y. O., & Reimal, T. (2017). The prospects of fare-free public transport: evidence from Tallinn. *Transportation*, 44, 1083-1104.

# Background

- **Pricing** is a policy instruments that can be devised to bring about a modal shift in favour of public transport.
- A survey (2013) found that the Europeans believe that the two best measures to improve urban transport are **lower prices** (59 % of all respondents) and **better** (56 %) **public transport**.
- The support for these measures was high among all users and particularly high among those that consider road **congestion** to be an important problem.
- In half of the 28 EU member states lowering fares was the most frequently selected instrument. In contrast, only 9 % believe that **road pricing** is a good measure

# What Are Free - Fare Systems?

- Some activist groups, non-governmental organizations and political parties **advocate** for completely revoking fares in public transport systems.
- While free-fare public transport services exist in numerous **countries**, they remain the exception.
- The term **Free – Fare Public Transport (FFPT)** is used here rather than the common ‘free public transport’, since this policy is not free-of-charge.
- While passengers have no out-of-pocket costs, the public transport **system does not run for free**.
- Service provider will have to cover **for the lost fare** revenues in order to fully subsidize the service.

# Pricing and subsidy in Urban PT

- **Urban public transport** systems are **subsidized** in virtually all European cities.
- However, the extent of subsidy **varies** considerably among cities (e.g., 15 % in Hannover, 50 % in Stockholm, 68 % in Haag).
- Most **Baltic cities** including Stockholm, Copenhagen, Malmö, and Turku have a subsidy level between 30 and 60 % (Nielsen et al. 2005a).
- Note that this is true **across various procurement strategies** as these cities have adopted different contracting schemes.
- Moreover, the public transport **pricing** scheme also **varies** considerably among these cities.

# The case of Tallin

- **Tallinn**, with approximately 420,000 residents, is the first European capital and the largest city in the world so far that offers FFPT services to all of its inhabitants.
- The City of Tallinn introduced this policy as part of its overarching **agenda** to promote sustainable transport solutions.
- The FFPT policy was introduced on **January 2013**.

# Public transport in Tallin

- Public transport in Tallinn had in 2012 a substantial **market share**, with 40 % of all trips in the city performed by the urban public transport system. Moreover, 30 % of the trips were performed by foot. However, this favourable modal split followed a **negative trend**.
- The share of **public transport trips decreased** during the last two decades, since Estonia regained its independence in 1991.
- The **motorization rate**—the number of private cars per 1000 inhabitants—has more than doubled during the same period, up to the level of 456 cars per 1000 residents



# Situation

- Ticket sales covered in 2012 only one-third of the costs. This is a very low fare–box recovery rate. A single ride ticket costed **1 euro** in December 2012.
- Since 2003, a **smart card** was launched. It included a 40 % fare reduction for residents of Tallinn and children, elderly and others had fare exemption.
- The full-scale FFPT can therefore be conceived as the **final stage** in a sequence of steps. Nevertheless, **fares** were identified as a primary **problem**.
- On an annual municipal public transport satisfaction survey from 2010, **fare** was the most commonly mentioned source of **dissatisfaction** with 49 % of the respondents, followed by crowding (29 %) and frequency (21 %).

# Policy Aims

- A full-scale FFPT policy for all city residents was initiated with the following objectives: (a) promoting **modal shift** from private car to public transport; (b) **improving the mobility** of unemployed and low-income residents, and; (c) **stimulating the registration** of inhabitants as residents of Tallinn in order to increase the municipal income tax.
- This led the City of Tallinn to initiate a popular **referendum** where 75 % of the voters supported the new policy albeit the voting rate was only 20 %.
- Following the referendum, the city council approved the measure. Notwithstanding, the FFPT became a **controversial political topic** in Estonia in general and in Tallinn in particular.

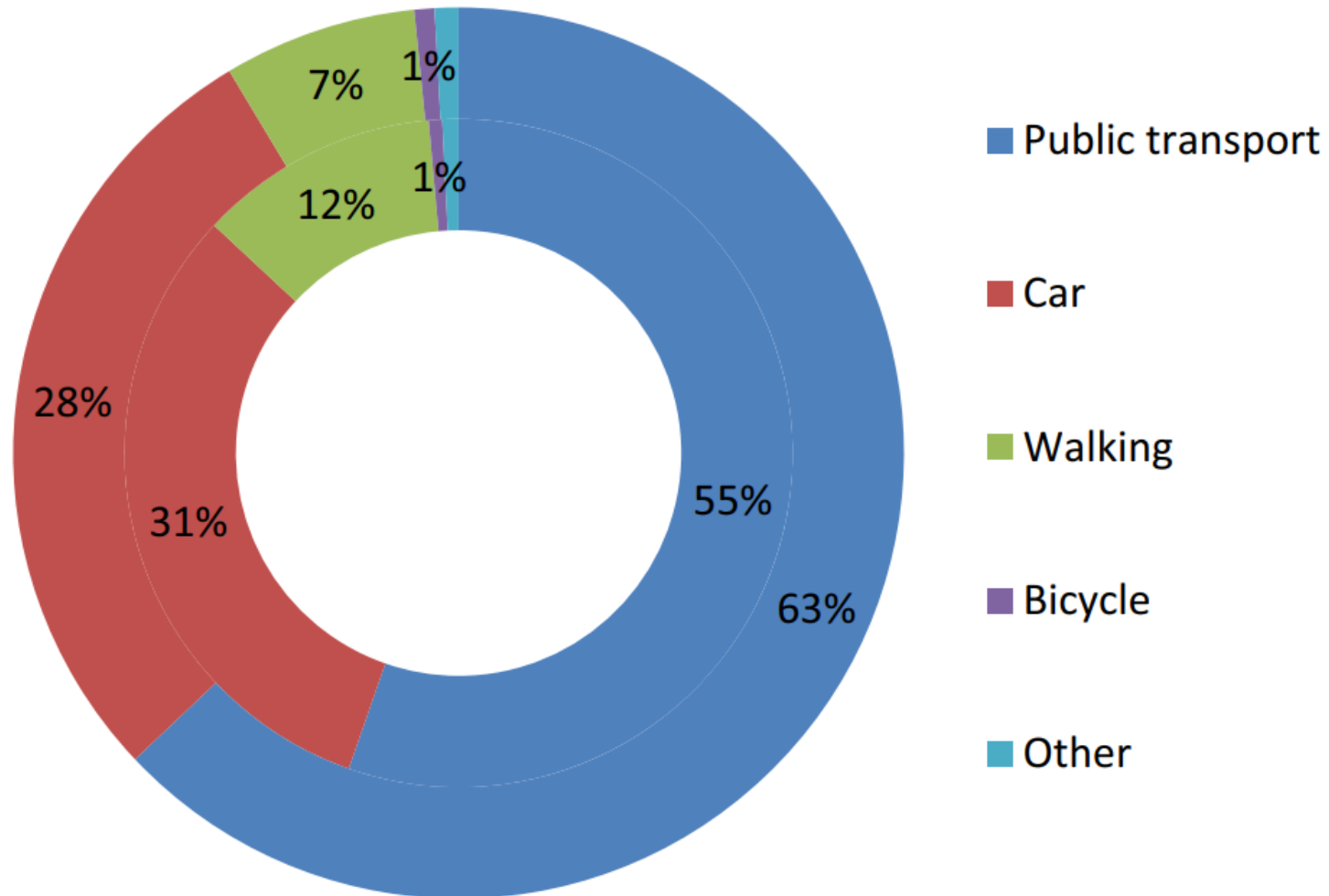
# Financing

- When initiating the FFPT policy, the City of Tallinn proclaimed that the **lost ticket revenues** will be covered through increased municipal income tax. The annual revenues from ticket sales amounted to 12 million euros in 2012.
- In Estonia, a share of the **income tax** is charged by the municipality at which a person is registered. Some of the people who migrate to Tallinn do not change their registration and thus continue pay their income tax to their city of origin.
- This is especially prevalent among **students** and people who migrate from the countryside and feel affiliation towards their place of origin and thus prefer to support it financially.

# Financing II

- While the exact number of Tallinn inhabitants that are **not registered** was unknown, municipal officials estimated it at about 25,000–30,000.
- It should be noted that the fare reduction for Tallinn residents in 2003 resulted with 30,000 **newly registered** residents. City authorities estimate that each registered resident contributes approx. 1000 euro in annual municipal tax.
- Hence, if the FFPT is successful in attracting more than **12,000** nonregistered Tallinn inhabitants to register themselves in order to benefit from the new policy, then the increased municipal tax collection can compensate for the lost ticket revenues.

# Modal split in 2012 (inner ring) and 2013 (outer ring)



# Main result

- Almost a year after the introduction of FFPT, public transport usage increased **by 14 %** and there is evidence that the mobility of **low-income residents has improved**.
- The effect of FFPT on ridership is substantially **lower** than those reported in previous studies due to the good level of service provision, high public transport usage and low public transport fees that existed already prior to the FFPT.

# Modal shift

- There is a considerable **shift from walking to public transport** in 2013, with a 40 % decrease in the share of walking trips.
- It is noteworthy that while the share of car users decreased by 5 %, the average **distance travelled by car increased** resulting with a 31 % increase in total vehiclekm.
- This is explained by the increase in daily travel distance, i.e., from 7.98 to 9.07 km per person, a 13 % increase, driven by **changes in shopping and leisure destination choices**.
- In summary, the modal shift from car to public transport **was accompanied by an undesired shift** from walking to public transport and an increase in car traffic.

# Equity issues

- There is **mixed evidence** concerning whether FFPT improved mobility and accessibility of low-income and unemployed residents.
- FFPT led to a **trip generation** effect among these user groups and the respective market share of public transport increased by more than 20 %.
- However, there is **no indication** that employment opportunities improved as a result of this policy. Satisfaction with public transport and popular support in FFPT increased during the study period.



# Financing

- One of the objectives of the FFPT policy is to increase local income tax collection.
- The policy has been successful in this regard with **11,000** new residents in 2013, approx. 40 % of unregistered residents based on estimates made by city officials prior to policy introduction.
- On average, the municipality receives 1000 euro in tax from each registered resident.
- Hence, the newly registered residents contribute annually approximately **11 million euro**, almost equivalent to the lost income from ticket sales.
- Furthermore, 42 % of the respondents that were unregistered in the end of 2013 answered that FFPT makes them **more inclined to register** themselves as Tallinn residents

# Political economy

- The newly registered residents induces also a **loss to other municipalities** where they were formerly registered which benefited from the misalignment between place of residence and place of registration.
- Given the relative importance of Tallinn in Estonia (33 % of the population and 50 % of the GDP), these changes cause **redistribution effects** that may increase **regional disparity** at the national level.

# Summary

- **The long-term effects** of a FFPT still remain to be assessed and will allow determining whether the results attained in the analysis period are sustained.
- **A cost-benefit analysis** of the FFPT policy should also encompass wider economic benefits such as labour market effects and location choice.
- The next step of this study will be **to further investigate individual travel patterns** by performing a detailed multivariate analysis of before and after travel diaries to identify the role of individual attributes such as trip purpose, travel attitudes and socio-demographic attributes on changes in travel behaviour.

# Free Fares - Assessment

- Fearnley (2013) analysed the impact of free-fare policies on modal shares and other policy goals (economic, political, and environmental)
- He argued that although these policies seem to be attractive, their rate of **goal achievement** is poor and comes at high costs
- The effects on **car ridership** are marginal and typically offset by a few years of growth.
- Successful free-fare traffic schemes are those that concentrate only on public transport **ridership growth**.
- Other goals are best achieved **with targeted measures**.

# Free Fare in Central Europe

- Slovakia has introduced **100% fare** discounts for children, students, and pensioners for **railways** from November 2014. The Czech Republic has introduced **75% discounts** for children, students, and pensioners for both **trains and buses** from September 2018.
- The policies significantly **increased ridership** and the modal share of railways went up significantly. The mobility of the targeted groups was significantly affected and the share of young and elderly riders increased.
- However, the policies were **costly** and also had some **undesirable side effects** that could have been prevented by better policy design.

Tomeš, Z., Fitzová, H., Pařil, .... (2022). Fare discounts and free fares in long-distance public transport in central Europe. *Case Studies on Transport Policy*, 10(1), 507-517.

# Free fare – Rail Slovakia

The **intention** of free fare policy was:

- To increase the modal share of rail
- To improve social inclusion

**Coverage:** Free fare in PSO rail services for children, students and pensioners.

**No discounts for buses!**

*Čarek (2017): Learning the lesson of free rail travel. Railway Gazette International.*

# Results

- Increased **ridership**
- Higher vehicle **occupancy**
- Occasional **overcrowding**
- Rise in the government **subsidies**
- **Shift** of demand from buses to trains

# Policy pitfalls

- How to maintain service **quality**? (for paying customers)
- Cumbersome **registration**
- Introduction of compulsory seat **reservations**
- Student **parties** and **homeless** people in trains
- **Modal shift** from buses to trains
- **Little** effect on **car** ridership
- **Hurting** commercial rail services and competition



# Assessment

- Significant market **distortions** and unintended consequences
- The scope was **too broad** (possible restriction in students travel)
- Once introduced – **hard to cancel** (political risk)
- The **rise in supply** – better even for paying customers

*Čarek (2017): Learning the lesson of free rail travel. Railway Gazette International.*

# Czech Republic – Better design?

- The **design** of the policy was more sophisticated in the Czech Republic, where it was undoubtedly inspired by the shortcomings of the Slovak policy. The exclusion of buses in Slovakia was a significant omission.
- The crucial decision in the Czech policy design was to keep some **monetary costs** present
- However, both designs did **little to differentiate** between peak and off-peak travel and have no bonuses/stimulation for travel from or to disadvantaged regions

Tomeš, Z., Fitzová, H., Pařil, ..... (2022). Fare discounts and free fares in long-distance public transport in central Europe. *Case Studies on Transport Policy*, 10(1), 507-517.

# FREE FARES - summary

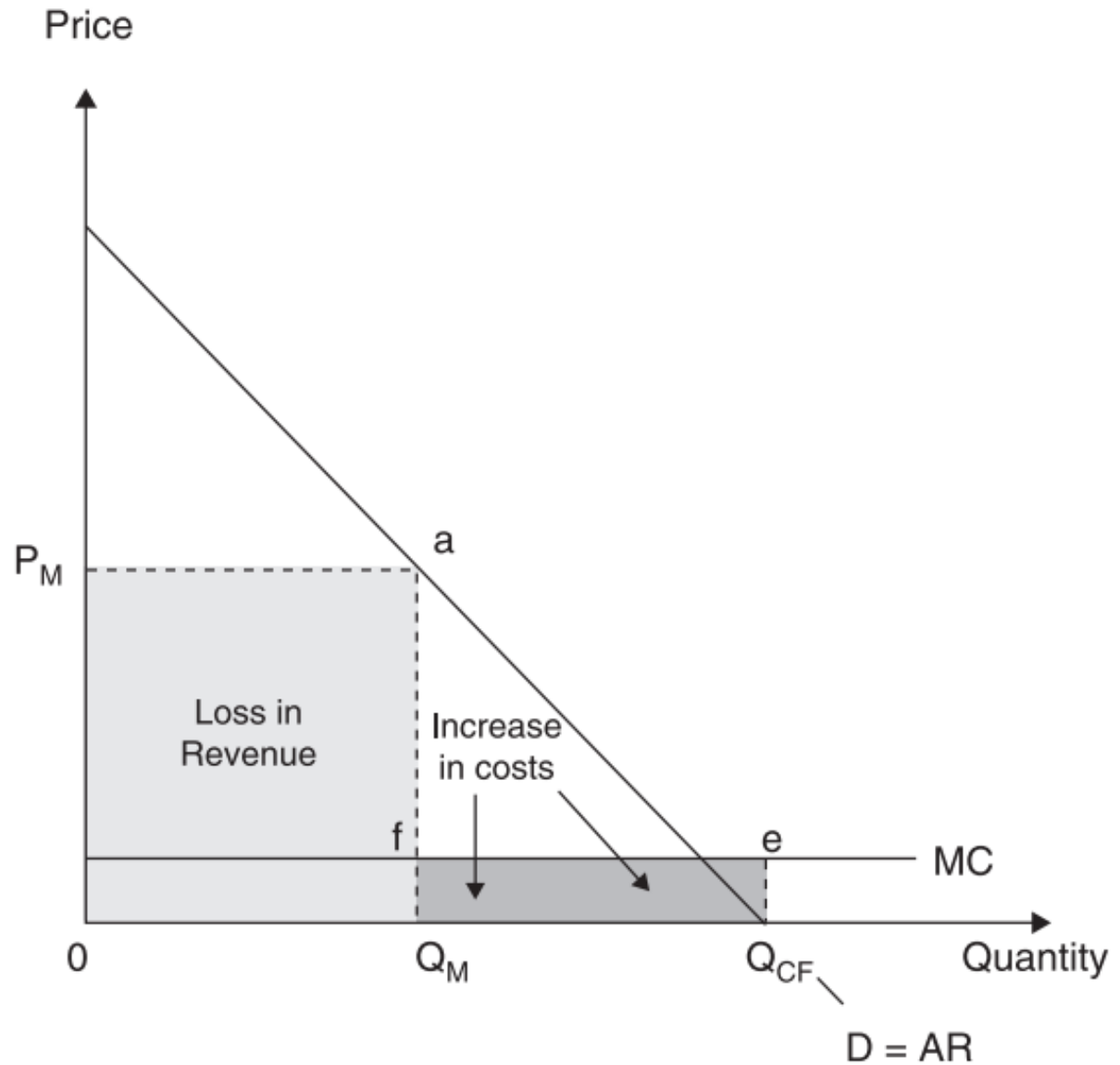
- Free fares and fare discounts are frequently used tools. They are utilized to stimulate public transport **ridership**, and promote transport **equity** and justice.
- Policymakers are trying to limit car usage growth and promote public transport to battle **congestion** and decrease environmental damage.
- The aim of fare reduction policies is to make transport **cheaper**, improve its affordability, and stimulate ridership. The crucial issue is the price elasticity of demand.
- However, research suggested that **price** is not the only factor and is not the most important in determining transport ridership (service quality, time, route, and status)
- Particularly problematic has been **switching car user**

# Free Fares - Political economy

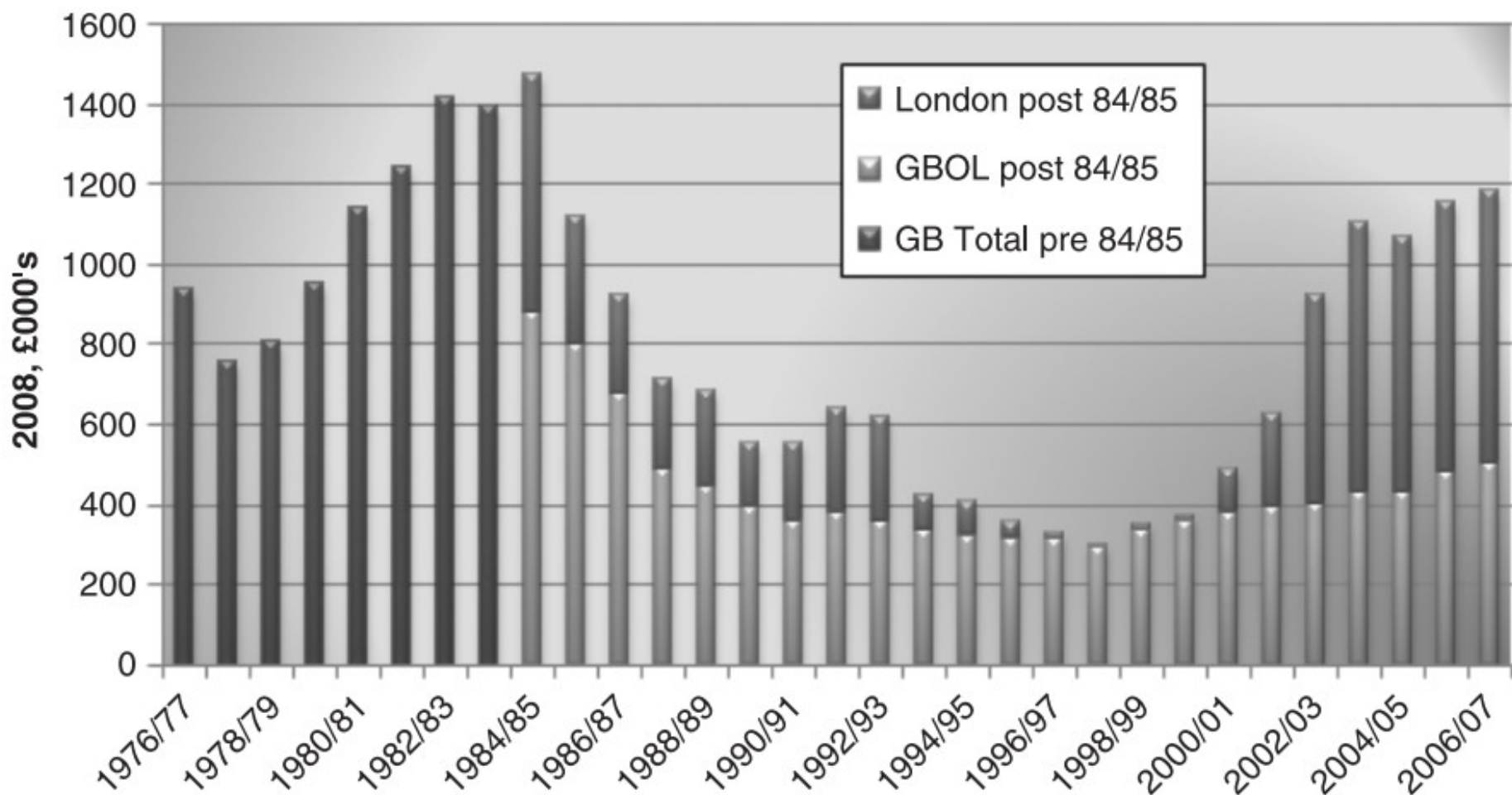
Scheiner – Starling (1974) analysed the political economy of free-fare transport. They argued that four issues are critical:

- 1) **demand elasticity** and its responsiveness to the introduction of free fares
- 2) **the costs** of such policies and their financing
- 3) identification and evaluation of the **benefits**
- 4) **political feasibility** of the policy.

After the introduction of a free  
concessionary fare



■ *Figure 11.7* Concessionary fare reimbursement, free concessions



**Figure 11.8** Public financial support for services, 1976/77 to 2005/06, 2008 prices

Source: Compiled from DfT Statistics