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Barriers to transport pricing – review of research

by[1]

Amihai Glazer – UCI
Heike Link – DIW
Tony May – ITS
David Milne – ITS
Esko Niskanen – adpC

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1 Introduction

Several policy documents at the EU and national level strongly argue for reform in transport pricing, with the aim of increasing efficiency (most recently White paper, September 2001). Much theoretical research and results of several EU-funded empirical research projects (AFFORD, PETS, TRENEN II) support this view, by showing the efficiency benefits that can potentially be achieved by introducing appropriate pricing policy measures. Practical experience, however, shows that there exist many kinds of barriers to the suggested reforms.

This paper will review existing research on barriers to transport pricing. It will also develop policy conclusions and suggestions for future research. Most of the relevant research considers pricing urban transport, so we necessarily focus on this case (mode). Practically no studies are available concerning other modes. However, many of the principles discussed should also apply to other modes: interurban road, rail, air and water.

Section 2 presents two fundamental (background) questions and section 3 a classification of barriers to be followed in the later sections. Section 4 reviews literature on institutional (structural) barriers, and section 5 on acceptability related (behavioural) barriers. Section 6 presents some concluding comments.

2 Two fundamental (background) questions

2.1 Do people and politicians accept (consider) economic efficiency as a major policy goal?

Efficiency considerations are the prime motive for marginal cost-based pricing (see e.g. Milne, Niskanen and Verhoef, 2000, 2001b). Here we mean economic efficiency in a broad sense, also covering economic aspects of external effects of transport (environmental impacts, costs of accidents etc.) and of the issue of sustainability. Much of the debate on the relevance or feasibility of marginal cost-based pricing in transport in practice then reduces to the question of whether economic efficiency in fact is, or should be, a prime motive guiding transport policy-makers. That is, do politicians and the public actually desire (or accept) the traditional economic definition of efficiency as a major goal and, hence, the policies that should lead to it?

More specifically, is economic efficiency (broadly defined) an important practical policy goal or criterion, compared to the range of issues that, typically, seem to dominate discussions around real-world policy-making (evidently also the policy-making itself) – such as equity, environmental concerns, business interests, political acceptability and all manner of detailed practical considerations? In particular, regarding urban transport pricing, this question especially applies to the motives of local policy-makers.

Therefore, a useful distinction when considering the barriers to transport pricing is between whether people and politicians oppose efficiency as a goal (as a basis for policy) and whether they only oppose marginal cost pricing as a policy that would (potentially) lead to the achievement of the goal. Both questions are relevant, and will be considered in this paper. Also will be considered related questions why people and politicians may oppose efficiency as a goal and why they may oppose marginal cost pricing.

2.2 Do consumers prefer uniform pricing for differentiated prices?

Economic efficiency calls for charging different prices for goods with different marginal social costs (marginal social cost pricing). Yet, it has been claimed that people may not want complicated pricing schemes which aim to achieve efficiency at a very detailed level, but, rather, prefer simple schemes. One motivation for such simple schemes may be that they allow the consumers to avoid making mistakes (Glazer, 2000).

One example comes from transit pricing in the U.S. Already in the late 1960s, economists in the U.S. explained how prices that vary with distance and with time of day could increase efficiency of the transit industry. But from 1970 to 1983, only 33 areas (transit agencies) introduced time-of-day pricing; 11 of them discontinued the program. For almost all systems studied, over the years inflation reduced the real value of the time-of-day differential; only three areas increased the differential since its inception. And even these numbers exaggerate the use of differential pricing, since in some areas time-of-day fares simplified former fares (Cervero, 1985). Although a benefit of electronic fare technology can be the greater ease of adopting distance-based pricing, two of the largest transit agencies (Chicago's CTA and New York's MTA) planned to implement flat fares on their electronic fare collection systems. In contrast, 74 percent of bus systems offer passes with unlimited use for a set period (Fleishman, et al., 1996, pp. 24, 28). More recent data show a continuing decline in use of differential pricing. Consistent with these data, a survey of 165 transit professionals from 63 transit systems in the United States found 53 percent saying that a very important objective in establishing fares was to “keep fares simple;" only 5 percent thought it "unimportant" (Markowitz, 1986).

However, in the light of this kind of evidence that consumers appear to prefer uniform charges, an important question concerns the intuition behind it. Also, even though presumably people prefer simplicity to complication, it is just one of the many trade-offs in choosing a pricing structure. There is some evidence, for instance from buses, that a single flat fare is more attractive than a differentiated structure, and that patronage is higher with it than one would otherwise expect. But presumably this is not an overriding objective; people may, for example, be able to handle two different fares by times of day if the benefits are great enough. Evidently, the question ultimately is about 'optimal degrees of simplicity'?

Other examples concern telephone and telecom services (which are relevant also because they are another example of a network-based industry). Train, Ben-Akiva, and Atherton

(1989) find that many consumers who must choose among different tariffs for local telephone service often prefer a service with a fixed monthly fee over one with a charge for each call, even if for the number of calls they make the fixed-fee tariff is more expensive than the metered tariff. Internet services, including America On Line, charge a flat monthly fee. This is an interesting case because the firm already is computerised, making it cheap for the firm to charge by the hour, and to vary the charges at peak periods. Furthermore, it appears that consumers value some durable goods because they allow consumers to incur a low marginal cost for service. Personal computers and digital cameras share this feature. The same trend of fixed tariffs is observable in the market for mobile phones (e.g. in the UK).

However, the picture provided by research is far from obvious. There also are a number of examples in railways, airplanes, telephone and telecommunications suggesting that users are ready to face rather complex pricing schemes. One can also argue that the situation has changed a lot during the last 10-15 years. Now information can be more easily accessible, by e-mail, phone etc., so that users may more easily select their optimal usage. also, there may always be some friction which must be allowed: users may complain at the beginning but ultimately may accept complex pricing schemes. The available research simply is not sufficient to provide final answers.

3 Barriers to pricing – classification

An important distinction when considering barriers to transport pricing is between barriers and constraints that may prevent first-best marginal cost pricing, and thus necessitate second-best pricing, and barriers in a more fundamental sense preventing any sensible attempts to implement second-best pricing or even marginal cost-based policy packages also including other enabling measures. We can thus think of barriers to pricing in transport on two levels:

(I) barriers or constraints preventing first-best marginal cost pricing
(II) barriers preventing implementation of second-best pricing.

Type I barriers do not prevent pricing as such but only the detailed differentiations over time and space, and across different types of vehicles / users, needed for first-best marginal cost pricing. They are in other words factors defining the nature of second-best pricing (with the goal to approximate the first-best). It is commonly thought that such barriers are so fundamental that it is realistic to consider first-best as a benchmark only. Second-best pricing, and more generally policy packaging, is then a way to side-step the barriers. As is well know, barriers or constraints preventing (first-best) marginal cost pricing may be technological, institutional or acceptability related. Project AFFORD, for example, considered these issues (Milne, Niskanen and Verhoef, 2000, 2001b).

This paper will focus on type II barriers, i.e. barriers which are relevant when trying to implement second-best pricing measures or more generally marginal cost-based pricing policy packages. Given the need for second-best pricing, it is demonstrated (e.g. by AFFORD) that policy packaging is an optimal approach in two senses. First, broader policy packages are better than individual measures at approximating first-best pricing, and thus generate higher welfare benefits. Second, they can be more acceptable than individual pricing measures. Furthermore, appropriate policy packages should typically include, besides pricing measures, also measures related to the use of revenues. Therefore, in many cases, the question of the barriers to pricing may be extended to cover also the barriers to optimal uses of revenues from transport pricing.

AFFORD classified barriers which may prevent implementation of second-best pricing as follows (Milne, Niskanen and Verhoef 2001a):

1. inappropriate or insufficient legislation
2. inappropriate organisational structures
3. contradictory policies elsewhere
4. opposition from non-governmental interest groups
5. low socio-political acceptability (behaviour of politicians and governments)
6. low public acceptability (voters).

Types 1-3 are institutional (structural) barriers and types 4-6 are acceptability related (behavioural) barriers. The latter are directly related to behaviour (strategic or not) of relevant agents. Besides AFFORD, these issues have been investigated in the PATS and PRIMA projects.

Another important dimension, relevant to both the institutional and acceptability related barriers, concerns the time dimension (the "stage dimension" in the TENASSES project): the temporal development of policy from conceptualisation and planning, through decision-making, to implementation and operation.

4 Institutional (structural) barriers

4.1 Inappropriate or insufficient legislation

Marginal cost-based transport pricing, when implemented, must be compatible with the overall legal structure. Existing legislation may be insufficient to support marginal cost-based pricing and associated redistribution mechanisms, including laws which may even support contradictory objectives and policies elsewhere and/or explicitly prevent certain measures. With regard to the prevailing legislation, it is useful to distinguish between two key strands: (i) laws required to support specific marginal cost-based pricing measures which are not currently operational (in an appropriate form to encourage efficiency); and

(ii) laws governing the structures of institutions / organisations and the relationships between them.

Regarding (i), insufficient legislation may affect the ability of marginal cost-based road pricing to differentiate between different types of users, and/or between users (similar or dissimilar) in time. One important reason why legal barriers may affect, or even prevent, the implementation of marginal cost road pricing can be a potential conflict with laws and policies at the national level. Such laws, affecting the ability to charge marginal cost-based prices may include constitutional provisions guaranteeing freedom of movement (road tolls) or privacy (electronic road pricing). In some instances prevailing legislation relating to civil liberties may hinder the enforcement of electronic systems, by restricting the power to collect and use electronic data.

The relevant laws and policies may also be related to fiscal taxation. As discussed in Milne, Niskanen and Verhoef (2001a), for example in The Netherlands a practical problem is the legislative requirement that the moment of paying a tax should not affect the level of the tax (which aims to protect income tax payers from uncertainty concerning the total sum to be paid provided it is paid within the legal term). This is clearly at tension with the ideal of time-varying tolls in congestion pricing. Another illustration of the importance of legislative feasibility in The Netherlands concerns the car-pool lane between Amsterdam and Amersfoort, which, after a few months of operation in the early 1990's, had to be made available for everybody because a court ruled that the concept of 'car-pool lanes' has no legal interpretation in The Netherlands.

Regarding (ii), laws which provide for the competitive operation of privately owned (urban and interurban) public transport services may have an important effect on both the potential number (and nature) of institutions that would need to be included within a multi-modal transport pricing system, and on the degree of control that government agencies can exert over user fares.

At a more general level, although current national legislation often requires user prices for certain elements of urban transport to be based on competitive commercial principles (e.g. U.K. bus fares) or on a non-profit cost coverage approach (e.g. publicly operated parking in Madrid), we are unaware of any current example of national legislation which requires that any element of urban transport pricing should be based explicitly on marginal cost approaches.

4.2 Inappropriate organisational structures

The new institutional economics approach emphasises transactions costs and institutions as key factors influencing policy outcomes. (For the seminal work, see North (1990)). The U.S. Congress with its committee structure is a well studied institution in this respect. For example, the selection process for committee membership may lead committees to be composed of "preference outliers" who are unrepresentative of Congress as a whole but who have gatekeeping control over legislation. Thus, a policy which is assigned to a transportation committee may fail, but were it assigned to an environmental committee it would pass. Dixit (1997) discusses U.S. tax reform and international trade policies under GATT and the World Trade Organization as examples of policy areas that demonstrate the importance of a transaction-cost politics approach. In discussing tax reform, Dixit describes how deliberate changes in congressional committee structure could change outcomes: concentrating power in a single appropriations committee internalises expenditure trade-offs and thus may reduce spending; spreading the power among multiple committees can introduce common-property and externality problems that lead to greater spending.

Considering the implementation of marginal cost-based pricing (and associated redistribution mechanisms), prevailing organisational structures may be inappropriate or non-optimal. Project AFFORD considered these issues in relation to urban transport pricing (but many of the results appear to be easily extended to other modes). It concluded that the existing organisational structures for urban transport may be far more complex and disaggregate than would be desirable for implementing a comprehensive marginal cost-based transport pricing system across an urban region, in many European situations (Milne, Niskanen and Verhoef, 2001a). In particular, urban transport commonly falls within the responsibilities of local government agencies, implying that any coherent transport pricing system for the full urban region will require agreement among representatives of several geographically separate units who are accountable to different electorates. However, this can be difficult, for example because of conflict over economic development between different cities in a region; this may be one of the most significant barriers to changes in prices, and consequent changes in travel patterns, necessitated by a move to marginal cost based pricing.

Another key barrier is the common practice of separate responsibilities for management of different travel modes. so, typically, pricing roads and public transport are considered independently (this e.g. is the situation more or less in France). The institutions responsible for providing and operating public transport services have little, or no, say in private road transport (and vice versa) and their pricing policy objectives and approaches may be wholly unrelated. Conflict may also appear between public and private operation (both private operators of public transport, and possible private operators of road pricing/tolls/parking). Therefore, when adopting an efficient, comprehensive, multi-modal urban transport pricing system requires agreement between disparate institutions, the chances for success may be poor. Enforcement capability and willingness is a more general constraint; it relates not only to technology. At present, the impact of this is best gauged by proposals to introduce road pricing schemes, which have, in general, attempted to side-step institutional complexity by constraining the areas affected to very compact city centres. The corollary is that the resulting road pricing systems may be expected to have little effect on city-wide travel.

A third key barrier related to organisational structures arises from tensions between different levels of government. Here, the barriers to marginal cost pricing relate to: (a) the politics of the general financial relationships between different government levels (which may involve complex arguments and power struggles overriding issues of ideology); and

(b) the prevailing precedent for pricing road transport (which typically involves annual licensing of vehicles and taxes on the purchase of fuel, both of which provide significant unhypothecated revenues to general national funds).

Any major change in existing revenue streams and money flows between governmental levels would, almost inevitably, result in conflicts based on the perceived changes in the balance of power they implied. In particular, national governments might be expected to oppose vigorously any significant reductions in revenues from existing transport taxation due to hypothecation, or any attempts to constrain the flexibility to use the revenues in different ways.

Regarding the different levels of government, common practice is, with reason, for detailed urban transport issues and implementations to be dealt with at the local and/or regional level, while interurban transport and general strategic transport policy-making is normally the responsibility of the national government. It is also important to acknowledge the difference between capital and provincial cities, because the former tend to receive more involvement at the detailed urban level from national government.

4.3 Contradictory policies elsewhere

AFFORD concluded that prevailing national policies – economic and/or transport-related – in the EU are often contradictory to the attempts to introduce marginal cost-based pricing principles for urban transport (also more generally). In most cases, the main policies towards pricing road transport appear to be motivated by the desire to raise revenues, while those towards public transport pricing appear to be motivated by the desires to cover service costs and encourage usage. In the case of private road transport, there is, typically, a balance between competing objectives of reducing the perceived congestion and environmental impacts of traffic growth, while accommodating existing mobility levels (to avoid negative impacts for the urban economy). In the case of urban public transport, the focus tends to be on providing efficient service to support the economic health of the city and on addressing equity concerns for the poorer and less mobile members of society.

There may also be conflicts between transport pricing policy and policy on infrastructure, management, land use and information. In theory in an integrated strategy, pricing measures should be reinforced by management and information measures. The former may lead to changes in marginal costs, while the latter will improve the awareness of true costs. Conversely, pricing policies should send signals which help determine the appropriateness of investment in infrastructure and land use. In practice, these interactions are often overlooked, and rarely fully understood. As a result, policies on these other measures may well be inconsistent with those on pricing. Also, historically, the development of automobile has been driven by political forces (unemployment, etc) and not by transportation issues.

In recent years, however, policies which attempt to develop integrated approaches to urban transport have become more popular and tend to view increasing the cost of road use as a mechanism both for restraining growth in road use and acquiring resources for improving the public transport alternatives (that is, a carrot and stick approach). While not wholly inconsistent with efficiency principles, in some respects these policy-making approaches are, in practice, contradictory to marginal cost-based pricing. In particular: (i) any resulting user pricing would probably be decided more on the basis of politically acceptable unit charges which would provide revenue streams sufficient to fund particular projects, not on calculations of external costs; and (ii) revenues generated within the urban transport sector are most likely to be redistributed there, providing alternatives to road travel but attempting to support (and, perhaps, even increase) current mobility levels.

5 Acceptability related (behavioural) barriers

5.1 Opposition from non-governmental interest groups

The economic theory of regulation, also called the private interest theory, sees policy as resulting from competition among interest groups, with each attempting to capture rents for itself at the expense of more dispersed groups (e.g. Olson 1965, Stigler 1971, Peltzman 1976 and Becker 1983). This approach contrasts with the public interest approach to policy, in which government is supposed to correct market failures and maximise social welfare. A nice survey of the approach is provided by Kroszner and Strahan (2000), on which the following builds.

Pressure groups may become active if government proposes a policy which hurts some and helps others (and changes in pricing policies will undoubtedly have uneven effects), or may become active to encourage government to adopt some policy. So, for example, some pressure groups may oppose increased prices for transportation, and may lobby for reduced prices after they are adopted.

The effectiveness of the interest groups varies with several factors. First, cohesive groups may find it easier to organise and to overcome free-rider problems among their members. For example, trucking companies may be more active in opposing charges on trucks than will commuters in opposing congestion tolls. Though the ability of a group to organise often declines with its size, some organisations, such as labour unions and environmental groups, developed effective lobbying bodies through carefully crafted incentives that provide a variety of benefits to members (see Olson 1995). Once again, unorganised commuters may be less important politically than are organised environmentalists or truckers. Second, groups tend to be more effective in opposing a policy not only when the costs imposed by a policy are concentrated among their members, but also when the benefits from the policy are diffuse.

AFFORD conclusions much reflected these views. It suggested that non-governmental interest groups may oppose marginal cost-based pricing policies more commonly than similar organisations act for their support. A strong theoretical argument supporting this view is based on the asymmetry between winners and losers due to marginal cost-based pricing policies: typically, the intensity of welfare changes for the losers is larger than for the winners, suggesting that potential losers are more likely to create organisations to oppose the policies than are potential gainers to support them.

Boot, Boot and Verhoef (1999) present a simple model to illustrate this argument and to draw together fundamental insights regarding legal and institutional barriers such as may arise from opposition by organisations involved in (affecting or being affected by) the implementation of marginal cost pricing. The model has been applied to the Randstad case in The Netherlands.

This kind of model can generate plausible insights and explanations regarding the opposition from non-governmental interest groups to the implementation of marginal cost-based pricing. In particular, the model suggests the following three hypotheses:

- The probability that the organisations representing the losers object, and the intensity of objection, are larger than for the winners.
- The organisations have an incentive to exaggerate expected losses and/or neglect possible gains, in order to maximise their share in the revenue allocation, should implementation materialise. In other words, due to a strategic behaviour the resistance may seem even greater than it actually is. Support for the measure may bear the risk of signalling likely acceptance of a smaller share of the revenue allocation.
- The failure to even attempt to influence the pricing scheme in the organisation's population as much as possible is unattractive when the organisation's representatives are judged by the extent to which they serve their population. So strong opinions voiced by organisations during the phase of negotiations on any scheme's details should be the rule rather than the exception. If this is true, legal and institutional barriers can be expected with certainty, and should not be treated as a 'surprising disappointment'.

In addition to the aspects presented above, AFFORD concluded that opposition from non-governmental interest groups who oppose marginal cost-based policies and measures may arise from:

- insufficient communication regarding the objectives and potential efficiency benefits (and dangers) of marginal cost-based pricing policies;
- insufficient communication and true conflicts of interest regarding distributional issues (precisely who wins and who loses); and
- insufficient effort and resources to cater for, and, perhaps, compensate those who might be expected to be worse off as a result of marginal cost-based urban transport pricing policies.

5.2 Low socio-political acceptability (behaviour of politicians and governments)

Many political scientists and some economists emphasise the importance of beliefs and of ideology to explain government policy. Kalt and Zupan (l984) conclude that a senator's ideology, rather than the economic interests of his state, is the best predictor of how he will vote on an issue with obvious impacts on firms. Poole and Rosenthal (1997), who systematically analyse patterns of voting in the US Congress, find that ideology is the key to explaining roll-call voting. They have had much success in accounting for a wide variety of votes on economic regulation and deregulation which are not well explained by private interest group variables or by party politics.

Also, consideration of uncertainty may have impact on social choice. Fernandez and Rodrik (1991) show how, given uncertainty about the distribution of gains and losses from a project, the majority voting rule can be biased against it. More specifically, they show: (a) An efficiency-enhancing policy reform may be rejected, (b) An inefficient reform may be accepted, but once the results are known it will be rescinded in a second vote.

AFFORD identified reasons for the low socio-political acceptability – manifested in the behaviour of politicians and government organisations – as follows (Milne, Niskanen and Verhoef, 2001a):

- the fact that marginal cost pricing (or the goal of economic efficiency) is not universally accepted by relevant academic disciplines (including economics), and that politicians and civil servants representing the relevant organisations are not convinced by (or even familiar with) its principles;
- the need for (local) governments to justify their policies in terms of practical – and often detailed and local specific – arguments, rather than in terms of arguments referring to efficiency and equity (fairness) benefits at a general (aggregate, abstract) level, i.e. the criteria emphasised in the context of marginal cost pricing;
- the interests of individuals working within government organisations with a stake in preserving the institutional status quo.

The results of the AFFORD questionnaire (and case city reports) show that, in general, policy-makers remain unconvinced that marginal cost-based pricing approaches are both feasible and desirable in practice. In particular, policy-makers come from a wide range of core discipline backgrounds, many of which advocate significantly different perspectives to those put forward by welfare economics. Thus, as the traditional practical pricing and decision-making culture in transport (and many other sectors) is not immediately consistent with marginal cost pricing approaches, there is an undeniable tendency for policy-makers to dismiss the theoretical arguments of efficiency as an academic irrelevance.

Evidently, the majority of policy-makers involved in urban transport pricing at all levels are not, primarily, motivated by a commitment to marginal cost-based pricing approaches and are, in many cases, sceptical of the applicability of the detailed economic theory to the real world urban environments. In some cases, this scepticism may be attributed directly to issues raised within the academic community; in others it may be based more on the lack of clear compatibility between theoretical academic concepts and pragmatic policy-making concerns (e.g. addressing issues of social equity and acceptability).

One key problem appears to be that the theoretical basis for marginal cost pricing involves some rather complex (and abstract) economic concepts that are neither common in public understanding of urban transport issues nor, necessarily, shared and valued by all relevant academic disciplines. Therefore, perceptions of marginal cost pricing are affected by a lack of knowledge and/or consensus within the majority of (government and interest group-based) institutions at all levels, throughout the EU.

In the academic and conceptual policy-making community, the basic principles of welfare economics are generally embraced (either explicitly or implicitly). However, there is rather less agreement on the specific issues relating to the role of marginal cost-based pricing in practical policy-making. In particular, though most people appear to accept the validity of first-best pricing as a useful theoretical benchmark for textbook illustrations of transport efficiency, opinion widely vary in how this very simple theory is affected by the violation of many of its supporting assumptions in the (second-best) real world.

AFFORD showed that the politicians, planners and managers interviewed tend to think of core issues and barriers in terms of socio-political acceptability rather than in terms of legal and institutional feasibility. This cannot be considered too surprising, because most legal and institutional barriers could potentially be removed at national level if sufficient socio-political acceptability exists. AFFORD also considered the potential interdependence of the low socio-political acceptability on the institutional status quo. That is, while in many cases changing the legal and institutional / organisational structures first might be the key to gaining the required socio-political acceptance, such a change does not appear likely without gaining the required acceptance first. This may partly explain why, in the minds of policy-makers (as demonstrated by the questionnaire), acceptability issues and institutional issues seem to get easily mixed. The existing studies about socio-political acceptability of marginal cost pricing (or the studies focusing on the legal and institutional barriers) have not really addressed this important issue.

5.3 Low public acceptability (consumers, voters)

Public acceptability is a major barrier for implementing new pricing measures and/or increasing existing prices, charges and taxes on the transport sector. Many empirical studies show that the public support and acceptability of pricing measures is low. This section reviews existing research on the factors which influence public acceptability of pricing measures. We follow Schlag and Teubel (1997) who identify the following factors / issues:

- perception of transport related problems
- attribution of responsibility to solve transport related problems
- mobility related attitudes and social norms
- awareness of policy options / measures
- perceived effectiveness of measures
- revenue allocation
- equity and fairness

- personal outcome beliefs

Perception of transport related problems / Attribution of responsibility to solve transport related problems / Mobility related attitudes and social norms

The research has addressed two sets of questions: (1) how are the level of citizens' perception, attribution of responsibility and attitudes; and (2) how do these affect public acceptability. Also, the research has considered the citizens' perceptions as compared to those of policy-makers and transport providers.

Many empirical studies consider citizens' perception or awareness of transport related problems. The results of AFFORD and PATS projects are reported in Schade and Schlag (2000) and Link et al. (2000) respectively. Other studies include Steg and Vlek (1996), Deakin et al (1996), and Ison (2000). All these studies demonstrate significant awareness of transport related problems, in particular of environmental problems and congestion. (These studies also consider awareness of policy-makers and transport providers.) However, Jones (1998) reports, differently, that people argue against urban road pricing with the statement "Urban road pricing is not needed" (although this statement may rather be a strategic response of those opposing road user charges). AFFORD explored differences in the perception of several transport related problems in four European cities, and found that the most serious problems perceived by respondents are air pollution, congestion, and lack of parking space. They also found that citizens expect a worsening of these problems.

The citizen surveys in AFFORD found that people attribute the responsibility for solving transport related problems to the state and transport providers but deny the need and the feasibility for their own actions such as reducing trips. This is consistent with studies addressing mobility related attitudes and social norms. Steg and Vlek (1996) report results according to which interviewees saw no possibility to reduce car use; they argued that they already use the car as little as possible or that the alternatives are unattractive. Moreover, the respondents were unwilling to relinquish the freedom the car provides and were not willing to reorganise their lifestyles to accommodate less car use.

Link et al. (2000) studied attitudes of citizens regarding mobility. The responses show that people consider roads as a basic public service to which they are entitled. However, they also value public transport as important for guaranteeing personal mobility. Similarly, an important question is the availability of alternative modes / routes to the one(s) charged. Both the focus group discussions and the citizen surveys show that people value public transport highly but they consider it as too expensive and/or infrequent to effectively replace private transport. Schade and Schlag (2000) show that a majority of citizens finds it difficult to reduce car trips substantially.

Awareness of options to control problems / Perceived effectiveness of measures

The research has here addressed two sets of questions: (1) what is the level of citizens' awareness of options and their perceptions of effectiveness of measures; and (2) how do these affect the level of public acceptability. In addition, similarly as above, the research has considered citizens' awareness and perceptions as compared to those of policy-makers and transport providers.

Generally, the empirical literature shows that people are much less aware of the possibilities of pricing policies to solve traffic related problems than of other policies. Link et al. (2000) has explored the understanding of pricing issues by citizens, policy makers and transport providers. According to surveys, transport pricing is not really understood by citizens, and any increase of taxes and charges is seen as a form of money raising and considered as wrong. However, PATS found that policy-makers and transport providers seem to understand the rather complex relations between objectives of pricing, appropriate pricing principles and use of revenues from pricing better than one would have assumed.

Several studies find that known measures are more acceptable than less known (let alone unknown) measures (Franzen 1997, Link et al. 2000). This suggests that information campaigns and also knowledge on successful pricing policies somewhere else can enhance acceptability considerably. (An alternative interpretation is that the more popular policies have been adopted, which is why they are known.) However, this does not mean that pricing measures which are accompanied by high-quality information campaigns will be accepted. Rather, information is a necessary but not sufficient precondition for implementing pricing measures successfully.

According to findings from the empirical studies reviewed, citizens do not believe that pricing and taxation measures would solve transport related problems such as air pollution and congestion. Jones (1998) reports statements such as "Pricing will not get people out of their cars." Similar doubts were expressed in the citizen surveys carried out within AFFORD. In Link et al. (2000) doubts on the effectiveness of pricing measures were expressed both in focus group discussions (doubts that higher pricing would deter drivers from using their cars) and in the citizen surveys (doubts that pricing measures will ease congestion). However, we have to be cautious with this finding. People may, for example, state that they do not consider a measure as suitable for solving a problem since they generally do not like the measure (problem of strategic answers). Interestingly, Ison (2000) who conducted a survey with key stakeholders in the UK (local authorities, transport interest groups and academics) found that these stakeholder considered urban road pricing as one of the most effective instrument to solve transport problems in UK cities (82% of respondents). Banning / restricting vehicles in central areas, however, was ranked slightly higher under the aspect of effectiveness (87% of respondents).

Thorpe et al. (2000) explore the relationship between packages of measures citizens find (i) most effective in reducing private car use, and (ii) most acceptable. They found that a combination of zone-access controls (e.g. restraint measures) and improved public transport is perceived to be most effective, but is not considered to be the most acceptable policies. A clear majority considered a combination of road user charges and improved public transport the most acceptable and the second-best effective package. Ison (2000) performed a similar analysis with UK decision makers and found that while urban road pricing was considered as one of the most effective measures, it would on the other hand not be acceptable. In terms of acceptability, public transport improvements (including lower public transport fares) and park and ride schemes were preferred.

Revenue allocation

The existing research suggests that some form of hypothecation of revenues for guaranteeing mobility seems to be necessary for making transport pricing measures acceptable. Goodwin's suggestion of the "rule of three" is a widely cited example for this (Goodwin 1989). Small (1992) proposes a package broadly similar to this.

While hypothecation is a necessary condition for public acceptability, it may not be sufficient. Marcucci (2001) identifies a difference of opinion between Button (1994) and Banister (1994) regarding the prospects of overcoming opposition to road pricing by allocating the revenues in an effective way. Button appears to view suitably designed allocation as a sufficient condition for gaining acceptability, whereas Banister considers it only necessary. Marcucci (2001) also observes that while the costs of road pricing are direct, obvious and immediate, the potential benefits derived from use of revenues is delayed and may not be credible.

All empirical studies reviewed here support the importance of proper revenue allocation. When analysing the impacts of allocation of revenues on acceptability of pricing measures two dimensions seem to be important (see Thorpe et al. 2000): (i) to explore citizen's preferences for the use made of revenues; (ii) to identify the impact of guaranteeing citizens' preferred revenue allocation on acceptability of the pricing measure.

Jones (1991) deals with both aspects. He reports of surveys of 2400 people in the UK who were asked about their attitudes to a series of measures that would reduce urban traffic problems. When asked independently they responded significantly against measures to charge road users to enter highly congested urban areas. The respondents were then offered a package based around road pricing that offered a charge on motorists that entered a congested area that was then used to fund better public transport, traffic calming and better facilities for walking and cycling. When offered this, 57% would support road charging and 34% would oppose. Ison (2000) and Thorpe et al (2000) obtain similar results on the positive impact guaranteeing the respondent's preferred revenue allocation on acceptability.

AFFORD asked respondents on their preferred use of revenues and the revenue allocation they expected to be the most probable one in practice. The results show a considerable diversion between expected use of revenues and desired use of revenues. This finding emphasises that earmarking of revenues for transport specific purposes must be credible. Although some studies found a positive impact of guaranteeing a certain revenue use on acceptability, caution is needed when interpreting these results. Stated preference exercises on acceptability of urban road pricing in Sweden and France carried out within the PATS project find that the level of charges has the principal influence on acceptability while a certain use made of revenues only in some cases leads to higher acceptance.

Equity and fairness / Personal outcome beliefs

Equity can be defined as distribution of costs and benefits to whatever groups of citizens or types of actors (Guiliano, 1994). Examples of studies on welfare-distributional effects (identifying winners and losers) of road pricing are Cohen (1987), Arnott et al. (1994), and Fridström et al. (2001). However, none of these studies have assessed acceptability in the light of winner and loser groups identified by general equilibrium models.

More empirical results can be found related to the rather fuzzy concept of fairness. According to the findings of the empirical surveys in the PATS project, perceived fairness has on the one hand to do with the question of whether pricing measures are introduced on top of already existing taxes and charges, e.g. whether there is a strong feeling of an additional burden. Link et al. (2000) found evidence of a widespread belief of citizens that transport is already too heavily taxed. This is reinforced by a belief that governments are not always completely transparent or forthright in their motivations for increasing transport prices. This is often coupled with a feeling of resignation and fatalism that governments will anyway charge transport users without caring for the "victims," exploiting their position as monopolists.

On the other hand, fairness considerations do not only refer to the issue of additional burden but also to the question who should pay. Link et al. (2000) demonstrate that this issue is obviously subject to controversy. While a general agreement in all types of surveys performed was that the price should reflect the real costs of transport, there were diverging opinions on the treatment of environmental friendly modes. For example, policy makers and transport providers partly suggested that these modes should pay less while others suggested an equal treatment of all modes. Respondents in the focus groups argued that pricing was aimed at reducing emissions and insisted that therefore all polluters should pay. The citizens expressed a strong agreement for charging lorries more than cars and for introducing lower charges for "green modes," coupled, however, with less support for making heavier users of roads pay more.

Regarding personal outcome beliefs (regarding transport costs, travel times etc.), public attitude surveys show that respondents are clear that increases in transport prices would bear heavily on particular groups, such as regular car users. Schade and Schlag (2000) reports that a majority of respondents expect disadvantages from the urban road pricing strategies presented to them. Also Link et al. (2000) found widespread support for arguments on likely negative impacts such as restriction of mobility, higher living costs in city centres etc. These negative outcome beliefs have also to be seen in the context of doubts that the measures will work effectively to solve transport related problems.

6 Concluding comments

This paper has reviewed existing literature on barriers to transport pricing, and marginal cost-based pricing in particular. An overall conclusion is that the research, both theoretical and empirical, is in its infancy.

Policy implications

Efficiency considerations, with economic efficiency understood in a broad (and rather abstract) sense, are the prime motive for marginal cost-based pricing. The research reviewed in this paper has reported of the fact that other and more concrete objectives may currently be perceived as more important in many real-world situations. These goals represent tangible things, which may relate to the efficiency concept or may not. Another important feature of marginal cost pricing (and of efficient solutions) is detailed differentiation (in space and over time and between different types of travellers). However, for various reasons, people may not like too detailed differentiation but may prefer simplified pricing schemes.

Typically, these facts of life create fundamental barriers to marginal cost pricing in transport. (Of course, the more concrete objectives and people's preference for simplified pricing schemes could be viewed as barriers themselves.) This paper has distinguished between institutional (structural) barriers and acceptability related (behavioural) barriers.

It is not easy to make clear or concrete policy conclusions regarding these barriers on the basis of the existing research. One obvious policy question is how best to deal with particular barriers and whether certain barriers are capable of being overcome. Regarding the institutional or structural barriers, institutional reforms of course are needed. Also, it is evident that such reforms can always be done, if only there is sufficient political and public support. So, at the end of the day, the most fundamental barrier in a truly democratic society may be that people don't support it.

An obvious policy question then is how to increase acceptability, political and public. Obvious answers here are to provide appropriate information, compensations to those who suffer as a result of the policy, etc. But this may be a long way, or may not be sufficient (or feasible). Therefore, the question arises whether public acceptability barriers need always to be overcome. Or, could the right or feasible policy in some cases be just to implement pricing reform and hope or expect that people will, maybe not immediately but eventually, get used to things?

On one hand, saying that policy should not be introduced before support is achieved seems hard to argue against in a democratic society (whatever that actually means). One may thus think that a majority support could be deemed necessary as part of democracy. However, both empirical observations and theoretical consideration suggest that just implementing the reform may, after all, be justified i.e. a right policy. For example in Norway, 51% support clearly wasn't a prerequisite for introducing the Toll Rings. Second, it has been shown (theoretically) how a majority may initially oppose implementation of a policy, but once it is adopted, a majority may favour it.

Directions for future research

This paper, while reviewing the literature on the barriers to transport pricing, and marginal cost-based pricing in particular, has covered different aspects of marginal cost pricing: efficiency and equity impacts, legal and institutional barriers, and social and political acceptability. The paper has emphasised that these broad sets of issues should not be considered in isolation, but in combination.

Regarding future research, an important general conclusion concerns a call for integration of these partial sets of questions surrounding marginal cost-based pricing, to consider the interaction between the different sets of issues. We are only beginning to understand that there exist important but largely unanswered questions surrounding the interaction between these areas or sets of issues. It is also obvious that solving these issues requires interdisciplinary approaches (teams).

At a more concrete level, research should be able to provide results concerning, for example, (1) fine measures of welfare effects (at a disaggregated level); (2) political analysis of pricing and of the strategic issues involved (environment, productivity, mobility, oil, urban development, employment, etc.); (3) implementation of pricing (at local, state or European level, and in a private or public or mixed oligopoly situation); and (4) the marketing of pricing and role of price in the product mix (price is only one dimension for the users, while the others such as quality of service, reliability, information, etc. are intrinsically related).

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