



The acceptability of road pricing: Evidence from two studies in Vienna and four other European cities



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ABSTRACT

Road pricing is an effective means of influencing car usage. Based on recent literature and empirical research, an established model was applied to five European cities. Not surprisingly, there is low acceptability for coercive measures like road pricing in general, but a closer look reveals a more differentiated picture. The impact of several factors on eventual acceptability was analysed. Consequently, critical factors can be identified in order to develop more effective strategies. Moreover, the role of trials is discussed. Acceptability is higher, if the necessity for a measure has well been communicated and if personal benefits can be expected. The results indicate that the underlying model can be regarded as a very valid measurement tool for acceptability of coercive traffic demand management measures. The paper also has implications for designing and successfully implementing urban road pricing schemes.

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1. Introduction

Due to increasing traffic problems, the topic of road pricing has been intensively discussed, recently, and the body of literature has also grown substantially in the last decade (Attard and Ison, 2010; Azari et al., 2013; Börjesson et al., 2012; Calthrop et al., 2000; De Borger and Proost, 2012; Eliasson, 2009; Eliasson et al., 2009; Fujii et al., 2004; Glaister and Graham, 2006; Goh, 2002; Hensher and Li, 2013; Jaensirisak et al., 2005; Li and Hensher, 2012; Rizzi, 2014; Schade and Schlag, 2004; Tillema et al., 2010; Ubbels and de Jong, 2009; Ubbels and Verhoef, 2006; Verhoef et al., 2008). There are two major reasons why this topic continues to attract further attention: first, road pricing is an efficient way of alleviating traffic congestion (=‘congestion charging’), simultaneously reducing environmental impact and generating revenues; second, while its efficiency is generally appreciated, researchers have realised that the low acceptability of road pricing is the main obstacle to its implementation (Frey, 2003; MC-ICAM, 2003; Sikow-Magny, 2003). Cases that support the first argument are the congestion charges in London (UK), Stockholm (Sweden) and Singapore where road pricing has been used successfully to reduce traffic and to improve the local environment. Following this success it was generally expected that it would be more widely applied (for example in Britain) (Nash, 2007). A case in point corroborating the second argument is Edinburgh (Scotland), where a road pricing

scheme was put to a public referendum and rejected, as it was not acceptable for a majority of voters. (Hensher and Pucket, 2005). Road pricing, being efficient on the one hand and not acceptable on the other hand, motivated this research in order sort out relevant impact factors and thus, how the acceptability might be raised.

The large scale project “Acceptability of Fiscal and Financial Measures and Organisational Requirements for Demand Management” (AFFORD) was an in-depth research into the acceptability of road pricing in the cities of Athens, Como, Dresden and Oslo (Schade and Schlag, 2000). Based on its recognised methodology, a replication study was conducted in Vienna. Whereas the choice of the cities included in the original study lies at the discretion of its authors, Vienna was chosen for the replication as at the time the survey was carried out the introduction of urban road pricing was imminent. Moreover, some of Vienna’s framework conditions (like the – to some extent – harmonised legislation within the Common Market) are well comparable to the other cities. Another major reason for the choice lies in the fact that Vienna was ranked highest in the 2009 quality of life study by Mercer (2009) and that the authors are familiar with the city itself. Bearing in mind that a replication in all cities where the original study was carried out was not possible, the choice of a fifth (different but still comparable) city was preferred.

Table 1 gives an overview of some important characteristics of the five cities in focus (Brockhaus, 2014).

For the analyses the heuristic model, based on the theory of planned behaviour (Ajzen, 1991; Schade and Schlag, 2000) was used in order to detect which factors actually determine acceptability. The aim of this paper is threefold: (1) to compare and

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Table 1
Overview of some important characteristics of the five European cities.

Vienna, AT	Athens, EL	Como, IT	Dresden, DE	Oslo, NO
<ul style="list-style-type: none"> • 41 km², 1.7 M inh., density: approx. 4100 inh./km² • High standard of living • High share of public transport • Important in national and international transport, underground, airport • High parking fees within the inner districts 	<ul style="list-style-type: none"> • 450 km², 3.7 M inh., density: approx. 8200 inh./km² • 1/3 of Greek population • Important in national and international transport, connection to sea transport, underground, airport 	<ul style="list-style-type: none"> • 37 km², 82,000 inh., density: approx. 2200 inh./km² • Close to the Italian border to Switzerland • Important in regional transport 	<ul style="list-style-type: none"> • 328 km², 525,100 inh., density: approx. 1600 inh./km² • Important role in regional and long-distance transport, airport • former part of the German Democratic Republic 	<ul style="list-style-type: none"> • 454 km², 613,300 inh., density: approx. 1350 inh./km² • Important in national and international transport, underground, airport • Since 1990 urban road pricing already in place

discuss the results of both studies and to draw some conclusions from the findings, (2) thereby deepening the evidence on factors actually influencing acceptability as well as to (3) assess the underlying model in terms of validity and usability. Most of the research design remained unchanged for the replication, though, some specific elements were altered slightly to take into consideration specific conditions in Austria (Steininger et al., 2005).

The rest of the article is organised as follows. After the introduction in Sections 1 and 2 presents the research background and the theoretical framework. Section 3 describes the methodological approach used while Section 4 presents the results which are then discussed in Section 5. Finally, some conclusions are drawn.

2. Research background and theoretical framework

User charges comprise all fees that arise for the utilisation of particular items or services. In terms of road infrastructure, there can be either a fixed rate or variable charges dependent on the period of use or the distance driven. Charges can also be imposed in conjunction with congestion parameters like for High Occupancy Toll (HOT) lanes. Here, prices vary according to the actual traffic speed to keep traffic on the HOT lane flowing at all times. Moreover, such a variable road use charge covering at least the marginal external costs could be regarded as an instrument for the internalisation of social costs (O'Mahony et al., 2000). To implement a fair cost regime, Rothengatter (1998) also favours user charges instead of a system of taxes and subsidies. These should be framed by a set of regulatory measures (incentives and restrictions) in order to enhance the sustainability of the traffic system. The discussion regarding the “right” calculation, allocation and the volume of external costs is, however, still on-going (De Rus and Romero, 2004; Dittrich and Markwardt, 2003; Persson and Song, 2010; Shepherd, 2008; Steininger, 2002; Tsekeris and Voß, 2009; Verhoef, 1994, 2000; Verhoef et al., 1995).

The literature on the acceptability of road pricing includes a substantial number of studies which examine attitudes towards road user charges, even if these are presented under a variety of guises such as “support”, “acceptance”, “in favour of” and “public opinion” (Jones, 1991, 1995, 1998). The review offered by Jaensirisak et al. (2005) presents a thorough and detailed summary of these. It concludes that it is possible to achieve a high level of acceptance if a scheme is designed appropriately; that it is essential to analyse the correlation between the level of toll rates and the level of acceptability; and, that the distinction between users and non-users has rarely been considered before. The latter point has been addressed in the meantime by referendum voting models (Hensher et al., 2013). Since 2005, further studies looking at attitudes to road user charges have been

conducted and are therefore not included in Jaensirisak et al. (2005)'s review. Dill and Weinstein (2007), for instance, ran a project which included two telephone surveys exploring the (hypothetical) support of Californian residents for both tax and fee options as means to fund transportation. Another study, conducted in the Netherlands by Schuitema and Steg (2008), analysed how the acceptability of transport pricing policies was affected by revenue use. Kottenhoff and Freij (2009) used primary and secondary data of passenger counts, evaluations of customer satisfaction, travel surveys and interviews to evaluate the role of public transport for the acceptability and feasibility of urban road pricing. Their results confirmed that in Stockholm congestion charging was introduced successfully at least in part thanks to a trial which included improved public transport. The development of somewhat more positive attitudes towards congestion charging during this trial phase was also analysed by Winslott-Hiselius et al. (2009), who found that approximately half of the respondents of their survey conducted across the country had an increasingly positive attitude towards road pricing both during and after the trial scheme. Moreover, they also discovered that the general attitudes portrayed by the media reflected a change in public perception, and likewise improved with the progress of the trial period. A further aspect of the study, which sought reasons for this positive shift in attitudes, showed that the interviewees' personal experience of the scheme helped them to understand how it affected their own well-being. Consequently, they concluded that “difficult” policy measures such as congestion charging may be phased in more easily and effectively by starting with a trial scheme than by simply offering information which does not have a direct impact on individual experience. Further to this, cost-benefit analysis of the Stockholm case showed a significant social surplus (Eliasson, 2009).

Odeck and Brathen (1997, 2002) investigated changing users' attitudes towards the Oslo toll ring from 1989 to 1995. They found that users' attitudes towards tolls became gradiently positive as their benefits accrued to users through the improved infrastructure. Odeck and Brathen (2008) give an overview of the toll systems and their expected development. A recent study in 2010 (Odeck and Kjekreit, 2010) included a survey to a non-hypothetical (that is already existing) toll scheme. The results indicate how acceptability reacts to clearly perceivable benefits and underlying transport problems.

3. Methodological approach

3.1. Basic model

For measuring acceptability of road pricing schemes, a heuristic model based on the theory of planned behaviour (Ajzen, 1991;

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