



Co-introduction of charges on urban roads and motorways in metropolitan areas: a model-based investigation

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Abstract

This paper explores the relationship between charges on motorways and on other types of road. It draws on a model-based study of different pricing scenarios which was conducted within an EU-funded investigation of differentiated infrastructure charges (the DIFFERENT project). The scenarios covered strategies ranging from full charging on all roads irrespective of category, on motorways only, on motorway access roads, on urban roads only, and at cordons. A number of different charge levels were tested. The test results suggested that positive impacts and revenues are maximised by applying charges to each link which reflect the contribution to externalities made by the marginal user of that link - irrespective of whether it is a motorway link or an urban link. However, when implementation costs are taken into account, the best performing scheme was a cordon charge combined with a per-km charge for use of motorways outside the cordon. Fixed per-km charges on motorways or on urban roads are much less effective than charges which are differentiated to reflect congestion on individual links. The introduction of charges only on motorways produces little benefit and causes unwanted diversion to urban roads, and although the introduction of a charge designed to protect the level of service enjoyed by strategic motorway traffic succeeds in achieving that goal, it yields little revenue and has little overall impact on delay or other externalities. The paper highlights the practical implications of these results and notes that, although it is likely to be easier to gain political support for introducing charges on motorways than on other types of road, the benefits from so doing are generally lower than can be obtained by introducing charges on congested urban roads.

Keywords: Road pricing; Model; Motorway; Metropolitan; Differentiation.

1. Introduction

1.1. Background and scope

Tolls are commonly applied on motorways. They are generally designed to yield a revenue stream to offset the costs of the original construction or ongoing maintenance

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