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Spatial graduation of fuel taxes; consequences for cross-border and domestic fuelling

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Abstract

Substantial differences exist among fuel taxes between various countries. These differences represent a form of fiscal competition that has undesirable side effects because it leads to cross-border fuelling and hence to extra kilometres driven. One possible way of dealing with this problem of low fuel taxes in neighbouring countries is to introduce a spatial differentiation of taxes: low near the border and higher farther away. This paper contains an empirical analysis of the consequences of such a spatial graduation of fuel taxes for The Netherlands. Impacts on fuelling behaviour, vehicle kilometres driven, tax receipts, and sales by owners of gas stations are analysed. The appropriate slope of the graduation curve in order to prevent fuel-fetching trips is also discussed. Our conclusion is that in a small country such as The Netherlands, a spatial graduation of fuel taxes will lead to considerable problems, even when the graduation curve is not steep that fuel-fetching trips are prevented. The reason is that – given their activity patterns – car drivers will change the location of their fuelling activity leading to substantial problems for owners of gas stations in areas with high taxes. © 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Spatial tax differentiation; Cross-border consumption; Tax competition; Fuel

1. Introduction

Fuel taxes are in many countries a major component of the fuel price. These taxes are a simple way for governments to collect money for construction, operation and maintenance of road networks and possibly serve as a source for general public expenditures. In addition, they provide

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an incentive for drivers to buy fuel-efficient cars and to reduce mileage in view of environmental effects related to fuel consumption.

One of the limitations of the present fuel tax is that it addresses the local externalities of car use in a very crude way. For example, it does not differentiate between transport in urban areas with high external costs in terms of noise, accidents and congestion, and rural areas where these costs are much lower. A spatial graduation of fuel taxes might be a means of overcoming this problem, but it has received little attention in actual policy making or in the research literature. Hau (1992, p. 16) briefly mentions it in his review of alternatives to congestion pricing: “Compared with a uniform fuel tax, a spatially differential fuel tax with non-uniform rates would respond better to congestion. But this too has its problems. Even though a differential fuel tax is administratively simple, it may result in wasteful ‘fuel-fetching’ journeys, and would work only, for example, if distances between urban and rural areas were sufficiently large”. Indeed, the risk of unintended fuel-fetching trips is a problem that has to be taken seriously: it might easily destroy the potentially positive effects of fine-tuning the taxation of external effects of road transport.

There is yet another reason why spatial graduation of fuel taxes may be relevant. The lack of co-ordination in fiscal policies of various countries – or more generally, fiscal competition between countries – may lead to rather large gaps between the fuel taxes of neighbour countries. In such a situation, a spatial graduation may be used to prevent cross-border fuel-fetching trips. A country with high fuel taxes could discourage fuel fetching in neighbouring countries with low fuel taxes by introducing border zones with lower taxes. Or, to give an opposite example, a country may introduce low fuel taxes near its border in order to induce drivers from neighbouring countries to shift their fuelling behaviour; the effect would be an increase of the share of foreigners in its tax base.

Note that in the case of border regions, spatial graduation in the high tax country is designed to *prevent* cross-border fuel-fetching trips, whereas in the case of an urban-rural graduation of fuel taxes mentioned above, the opposite may occur, since in this situation, graduation may be *inducing* fuel-fetching trips. This is an intriguing contrast which will be further elaborated in this paper since the introduction of graduation to prevent cross-border fuel-fetching may lead to a domestic fuel-fetching problem when drivers adjust their fuelling behaviour towards low cost zones.

In the literature, little is found about the fuelling behaviour of car drivers. Since fuel is an almost homogeneous product, one may expect car drivers to be highly sensitive to price differences across gas stations. Given the rather high spatial density of gas stations, most drivers will pass various stations during their trips so that they would in principle be free to select the cheapest one without incurring additional transport costs. There are, however, factors that discourage such a pattern. First, perceived quality differences (for example, between brand and non-brand stations) may lead one to choose a more expensive station. The presence of extra facilities (shop, garage) will also add to a differentiation among suppliers, thus implying lower price sensitivity. In addition, suppliers may develop saving campaigns to discourage their customers from going to competitors. Finally, there is a category of drivers that does not care about price differences as long as they are rather small.

A sine qua non-condition for the successful introduction of a spatial graduation of fuel taxes is that the graduation profile should not be too steep. The slope should be so moderate that drivers would lose in terms of generalised costs by making specific fuel-fetching trips. In Section 4 we

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