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Can we leave road pricing to the regions? -The role of institutional constraints☆

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ABSTRACT

Many countries still use federal fuel taxes as the main instrument to charge for road use. Recently, urban road pricing and regional distance charging have gained momentum, increasing opportunities for future decentralized decision-making. However, whether leaving road pricing decisions to regional authorities is a good idea is not a priori clear. Previous political economy models have suggested that in the large majority of cases decentralization yields higher welfare than federal pricing decisions. In this paper, we extend a political economy model of a two-region federation to show that this conclusion does not hold once we allow for commonly observed institutional constraints on federal decision making. We show that requiring user prices to be uniform across regions greatly improves the efficiency of centralized decision making. The same holds when federal decisions are the result of a legislative bargaining process among elected regional representatives. Under these institutional constraints, federal decisions may easily outperform decentralization, even when the opposite would hold in the absence of the constraints. The model also explains under what conditions such constraints will automatically be embedded in the federal constitution. Specifically, if regions are symmetric and drivers have a majority in both regions, they will voluntarily transfer power to the federal level, provided the relevant policy restrictions (uniform pricing or legislative bargaining) are constitutionally imposed. However, if drivers have a majority in one region only, the region where non-users have a majority will never agree to transfer decision power to the federal level.

1. Introduction

In most countries, road use is still mainly charged via federal gasoline and diesel taxes.[1] Recently, however, there has been a tendency to partially move from fuel taxes towards other pricing instruments. For example, a few cities (London, Stockholm, Milan) have implemented congestion pricing. Moreover, in Europe, distance-based charging for trucks has been introduced in Germany, and implementation in other countries is planned in the near future (e.g., Belgium in 2016). With further technological progress, one can expect more diffusion of congestion pricing and kilometer charges, implying a larger potential for regional decision-making in the future. The reason is that, whereas regional variation of gasoline and diesel taxes is difficult because of tax competition between regions and countries, this is less the case for congestion charging or kilometer taxes. Indeed, fuel taxes can be avoided by buying fuel outside the region; local congestion or distance-based taxes can only be avoided by not using the regional infrastructure at all.

The expected developments described above raise the question under what conditions the pricing of road use is best left to the regions, and under what conditions it is better to keep it under federal control.[2] In a previous paper (De Borger and Proost (forthcoming)), we made a first attempt to answer this question in a political economy model of a two-region federation in the tradition of the second-generation literature on fiscal federalism (see, for example, Lockwood (2002), Besley and Coate (2003), and Oates (2005)).[3] In each region, we distinguished between users and non-users of the local road infrastructure; drivers in each region were assumed to use the road infrastructure in both

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[1] In the US, individual states can add their own gas and diesel tax to federal fuel taxes. Such regional differentiation is limited by tax competition, especially when regions or states are small, see below.

[2] Note that the model does not only apply to states that have an explicitly federal structure (Belgium Germany, Spain, etc.); it applies to all political structures with multi-layered governments. For example, the model can also be used to study decision making of a regional government versus local urban governments.

[3] This literature is mainly interested in comparing centralized versus decentralized provision of local public goods. Our model focuses on pricing decisions.

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regions, generating spill-overs between regions (drivers from outside the region that use the local infrastructure). Assuming standard voting procedures and lump sum redistribution of toll revenues, two forces drive policy decisions: within each region, there is revenue sharing between users and non-users; between regions, spillovers imply the potential for tax exporting, implying high prices for road use if there are many users from outside the region. It was shown that in most relevant cases decentralized decisions result in higher overall welfare than centralized, federal decisions. The only exception occurs when two conditions jointly hold: drivers in each region have a very large political majority, and in each region the share of local residents in the use of the local infrastructure is approximately 50% (the remaining 50% coming from outsiders). The intuition for this finding is easy: large driver majorities imply that revenue sharing with non-users is hardly an issue, and approximately equal shares of locals and outsiders in total road use in a region imply that at the central level incentives for decisions that favor the own region disappear. The model also showed that in many cases driver majorities will prefer small or zero tolls.

Our earlier analysis left some important questions unanswered, however, and it raised a number of further issues. First, if decentralized pricing decisions are in almost all relevant cases welfare-superior to centralized decisions, why do we observe so many instances of centralized transport decision-making? Congestion, accidents, and some types of pollution are local problems that seem to require local solutions. Now that decentralized pricing decisions are feasible, one would have expected more widespread implementation of pricing of road infrastructure that spatially differentiate according to local conditions. Second, although most decisions on road user pricing are still taken at the central level, these pricing policies are often implemented under specific institutional constraints. For example, in most countries federal fuel taxes are restricted to be uniform across the country. Similarly, the kilometer charges introduced for trucks in Germany are uniform; they do not differentiate according to local conditions. In other federal countries, there is no uniformity constraint, but pricing for road use is the result of intensive bargaining between regions; the introduction of kilometer charges in Belgium – to be implemented in 2016 – is a clear example. Are these institutional restrictions on the decision-making process only driven by political motivations, or are they also welfare-increasing in the sense that they improve the outcomes of the political process? Could it be that particular institutional constraints strongly enhance the welfare performance of centralized decisions, so that stimulating decentralized regional decision making might not be good idea after all? Third, if indeed centralization yields higher welfare under specific institutional constraints, under what conditions will regions be willing to give up regional authority and agree on transferring political decision power to the central level?

In this paper, we extend the analysis of De Borger and Proost (forthcoming) to explore the implications of imposing institutional constraints on federal decision making, focusing on the role of uniform pricing constraints and legislative bargaining. We then reconsider the relative welfare performance of centralized versus decentralized decisions. The analysis not only contributes to explaining some of the questions raised above, it also identifies under what conditions the pricing of road use should be centralized or, on the contrary, under what conditions it is best left to the regions.

A brief description of the main results follows. First, requiring user prices to be uniform across regions greatly improves the efficiency of centralized decision making. The same holds when decision making is organized by a bargaining process between elected regional representatives. Second, provided these constitutional constraints are imposed, centralized decisions may easily outperform decentralization. We find that this is especially the case when drivers have the political majority and there are large spill-overs across regions. Third, we show that if regions are symmetric and drivers have a majority, both regions will agree to transfer decision power to the central level, provided a uniform pricing constraint across regions is imposed on the decision-making process. The same holds if the constitution prescribes that centralized decisions should be the result of negotiation between elected regional representatives. However, if people that do not drive are a majority in a given region we find that they will never agree to transfer decision power to the central level. We argue below that these findings are not inconsistent with empirical observations.

The paper relates to several strands of literature. First, it builds upon the 'second generation' literature on fiscal federalism (Persson and Tabellini, 2000; Lockwood, 2002; Besley and Coate, 2003; Oates, 2005) that has focused on both cooperative (for example, legislative bargaining) and non-cooperative (for example, decisions according to a minimum winning coalition) decision-making procedures. Second, our paper complements a number of recent studies that have emphasized the role of constitutional constraints. For example, Lorz and Willmann (2005) add a constitutional bargaining stage where regions negotiate the degree of centralization (in essence, what goods will be supplied centrally) as well as the associated regional cost shares (modeled by introducing side-payments between regions), showing that the level of centralization will be inefficiently low. Hickey (2013) shows that uniform taxation and federal bicameralism are institutions that facilitate federation formation. Most recently, Kessler (2014) studies the role of communication in federal political structures, showing that uniform provision of local public goods may be the result of the difficulties of credible transmission of information from the regional to the federal level. Finally, our model is related to the small but growing literature on the political economy of pricing of transport services. Although these studies typically focus on pricing in a setting with a single government (Borck and Wrede, 2005; Brueckner and Selod, 2006; De Borger and Proost, 2012), there are exceptions. For example, Knight (2004) uses a legislative bargaining framework to explain the allocation of highway funds in the US, showing that elected representatives may use their political power at the federal level to favor their own region, and the empirical results support his prediction. More recent studies analyze the political economy of various types of urban road pricing in a multi-government setting (see, e.g., Brueckner (2015) and Russo (2013)).

Structure of the paper is the following. In Section 2 we provide a summary of the model developed in our earlier paper and review its main findings. In Section 3, we use the model to study in detail the role of two commonly observed institutional restrictions on federal decision-making: a uniform pricing constraint, and legislative bargaining whereby centralized decisions are the result of negotiations between elected representatives of the regions. In Section 4, we analyze under what conditions such institutional constraints will automatically develop. A final section provides a summary and reviews the potential policy implications of our findings.

2. Centralized versus decentralized transport decisions: a simple model

In this section, we describe the model used for the analysis. As we start with the same basic model as De Borger and Proost (forthcoming), we summarize their model description and some of the results that we need for purposes of comparison later in this paper.

2.1. Model setting

We use a setting with two regions, indexed $i = 1,2$. We assume regions have the same population R, and that demand and cost functions are the same in both regions. In each region, there are two groups: a group of road users D_i, which we will call drivers in what follows, and a group N_i of 'non-drivers'; these are inhabitants that do not use any road infrastructure (for example, they may not own a car). Drivers make two types of trips: trips in the home region and trips in the other region. To simplify the exposition without affecting the qualitative