Introduction to the Special Issue on Funding Transportation Infrastructure

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There is growing concern around the world about insufficient capacity and poor condition of transportation infrastructure. Congestion on roads and at airports, bottlenecks at seaports and railway terminuses, the dilapidated state of highways and other problems are mounting. Traditional revenue sources such as property and fuel taxes are unlikely to suffice in the future either to pay for adequate maintenance or to fund investments in new and improved infrastructure. Shortages of funds, and increasing support for the user pays principle, are behind calls to give an increased role to user charges such as highway tolls and airport fees related to congestion and other user-imposed costs. And the private sector is increasingly being called upon to help design, finance, build, operate and maintain infrastructure — often through Public Private Partnerships.

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This special issue features papers that assess alternative ways to secure funding for maintenance and new investment in transport infrastructure and to support efficient and fair usage of it.¹ The world is now embroiled in an economic crisis that has spilled over from the financial sector to the “real” economy. This has prompted calls for large publicly-funded investments — notably in transportation infrastructure — as a way to sustain economic activity.² Such investments are consistent with Keynesian countercyclical fiscal policy. But many observers have cautioned that the mix of investments must be chosen judiciously in order to make the best use of scarce resources and to sustain longer-term economic growth. In choosing such investments, and appropriate ways of delivering them, it is necessary to recognize the extended gestation periods and long lifetimes of infrastructure projects, as well as the attendant risks in construction costs, operating costs and usage. One should also bear in mind that publicly funded projects are especially vulnerable to political misuse — as has been demonstrated with the US Federal Highway Fund (Knight 2004) and is, arguably, also the case for the Trans European Networks in the EU (see <http://www.econ.kuleuven.be/funding/>).

Together, the papers in this special issue contribute along several dimensions toward understanding the challenges of selecting, funding and operating transportation infrastructure projects. The first two papers take a general, theoretical perspective. Laetitia Andrieu, André de Palma and Nathalie Picard (2009) explain how risks should be incorporated into cost-benefit analysis of transport projects. They propose several approaches used in finance (such as “the value of risk”, which is used, *inter alia*, to regulate financial institutions), and provide examples to illustrate how these concepts can be applied to evaluate new infrastructure. Luc Leruth (2009) describes how governments are increasingly collaborating with the private sector to finance, build, and operate infrastructure. He reviews the rationale for public-private partnerships and — drawing on the principal-agent literature³ — explains how the financial burden and risks of projects should be shared.

The next three papers consider challenges that have arisen with private operation of infrastructure for particular transport modes and countries. Alain Fayard, David Meunier and Emile Quinet (2009) deal with motorway network concessions in France. They review the history of French motorways and discuss alternative approaches for the provision and management of motorway concessions with an emphasis on how service quality can be maintained and risks (particularly risks related to traffic forecasts) can be controlled.

Yoshitaka Fukui and Kyoji Oda (2009) describe how Japanese National Railways (JNR) was divided into six independent regional companies in 1987 as a resolution to JNR’s mounting debts. As an implicit subsidy the three smaller companies were granted financial assets and allowed to use the interest from them. But because interest rates in Japan have stagnated, the interest incomes have been much lower

¹ The idea for a special issue grew out of the European research project REVENUE on the optimal use of revenues from user charges (<http://www.revenue-eu.org/index.asp>). Results from the project are published in de Palma et al. (2007). A sequel project (FUNDING) was recently completed (<http://www.econ.kuleuven.be/funding/>).

² For example, transport projects account for more than half of the four trillion yuan stimulus package that China announced in November, 2008.

³ See, in particular, Laffont and Tirole (1993)

than envisaged, and the financial viability of the companies is in doubt. In the authors' opinion the reform of JNR was successful in several respects, but it failed to end a policy of supporting local rail service that cannot cover its costs and that yields few positive network or social externalities.

In the final paper of the trio Manuj Ohri (2009) describes the challenges facing the Indian Civil Aviation Sector as air traffic expands. He reviews existing modes of airport infrastructure provision in India that differ in the allocation of responsibilities and risks. He also identifies how Indian airports lag international airports in some operating and financial dimensions, and identifies possible areas for improvement.

The last two papers deal with different aspects of road transport. David Levinson, Feng Xie and Norah Montes de Oca (2009) investigate the timing and location of road link investments in the Minneapolis-Saint Paul metropolitan area. They compare official or "stated" decision rules for investment with "revealed" decision rules that are derived from a statistical analysis of historic investment data. They then use a network forecasting model to examine the effects of the decision rules on mobility and spatial accessibility over the road network. The final paper by John Hartman (2009) describes a laboratory experiment in which drivers choose between two parallel routes when an efficient toll is imposed on the more congested route. The experimental results match theoretical predictions in some respects, but a pure-strategy Nash equilibrium is not reached within the number of rounds that the game is played.

In summary, the papers in this special issue address various aspects of transportation infrastructure funding, risk allocation and management — both from a theoretical and from a mode-specific and country-specific perspective. Collectively, they focus on practical and institutional considerations as much as on formal theory and mathematical models. This mix of methodologies reflects the interdisciplinary nature of research on the selection, design and funding of transportation infrastructure across modes and around the world.

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