



UNification of accounts and
marginal costs for Transport Efficiency

**Towards an evidence-based charging policy
for transport infrastructure**

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Emile Quinet

Professor, Ecole nationale des ponts et chaussées, Paris

Meeting the challenge of competing European doctrines

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competing european doctrines

Emile QUINET
CERAS- ENPC
Paris

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- 1. The situation : the wide range of doctrines
- 2. An assessment in terms of economic analysis
- 3. How to reconcile?

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The situation (1) :
a survey achieved in the
framework of UNITE

- The questions :
 - Differences between the « standard » theory and the current teaching
 - Current doctrines of political authorities
 - Current situation in terms of present charging

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The situation (2) :
a survey achieved in the
framework of UNITE

- The reviewed countries :
 - Austria
 - France
 - Germany
 - Ireland
 - Switzerland
 - United Kingdom

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The situation (3):
the answers on teaching

- « Standard economic theory » (Social Marginal Cost +/- limits) is taught in the more advanced economic program
- It is often considered as theoretical
- In other courses (MBA level) less sophisticated methods are thought, based on cost allocation procedures

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The situation (4) :
the official doctrines

- They are sometimes not clearly expressed
- They rarely rely on SMC, viewed as too complicated
- They rely mainly on financial concerns, and are based on Long Run Marginal Cost (LRMC) or on Average Cost (AC)
- In several countries, a growing concern on environment, inducing interest on SMC
- Among the surveyed countries, there is a gap between As, G and Sw, clearly against SMC, and the other ones, more close to it

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The situation (5) : The real charging systems

- Large discrepancies between countries, and changes over time in each one
- Very limited use of SMC, just on some parts of the charging system
- The charging systems are based on public budget considerations more than on transport policy
- Air and sea charges are more or less calibrated to match the expenses
- Road charges rely mainly on fuel duties and tolls for some countries
- There is a big mess on rail charges

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The situation (6) : A synthesis

- Wide range of doctrines, linked to the specific situations of each country
- Large discrepancies between theoretical standard recommendations, official doctrines and current practices
- Importance of financing considerations
- Very little implementations of SMC
- Environment can help to implement SMC

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An assessment (1) : decision-makers against SMC

- Sophisticated and uneasily understood
- **Equity** concerns (captive users)
- **Finance** concerns : SMC leads to public budget deficits
- **Manipulability** due to unaccuracy of calculations (subsidy-seeking behaviours)

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An assessment (2) : The theoretical limits of SMC

- They can be partly matched with the decision-makers concerns
- On the ground of **efficiency** : imperfection of markets and taxes
 - Cost of public funds and financial issues
 - Non competitive markets
 - Various externalities
 - *Solutions* : two-parts tariffs, Ramsey-Boiteux pricing

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An assessment (3) : The theoretical limits of SMC

- On the ground of **equity** : redistribution considerations :
 - Captive markets
 - *Solutions* : weighted utilities, lump-sum transfers

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An assessment (4) : The theoretical limits of SMC

- On the ground of **manipulability** : problems of information and incentives
 - Screening of profitable services
 - Incentives for optimal investments
 - *Solutions* : devices of the Ramsey-Boiteux type, multiple-part tariffs, price-caps, institutional arrangements

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An assessment (6)

Do alternative concepts provide better answers?

- AC and LRMC avoid esoterism
- They seem to avoid uncertainty, but :
 - AC is arbitrary (break-down between categories of traffics)
 - LRMC needs to know the optimal investments
- They induce loss of efficiency
- Their incentive and manipulability virtues depends on institutional arrangements
- They do not solve distributional issues

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How to reconcile? (1)

- Should SMC be applied whatever the situation, or is it a general reference to be adapted to each situation?
- How far are we from the hypotheses underlying the SMC?
- vis-à-vis the present situation :
 - Should SMC improve the situation?
 - Is there so large a difference between SMC and other concepts?

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How to reconcile? (2)

- Whatever the solution, it needs :
 - a good knowledge of the cost function (in a first step : fixed and variable costs) in order to make SMC more easily understood and more accurate : it is the task of UNITE in its cost calculation part
 - A tool to assess the efficiency of the solution : the second task of UNITE in its accounting part

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How to reconcile? (3)

- Whatever the solution, its virtues depend on the institutions in which it is implemented :
 - Level of autonomy of the operator
 - Nature of the relations with the principal
 - Geographical and modal scopes of the operators
 -in order to create an invisible hand inducing the operator to set up the « right » charges

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Detailed answers to the survey about countries views and practices on infrastructure charging

(Extracts from deliverable D4)

Table 1: What are the differences between the picture given by the theoretical review and the current teaching at universities about transport?

Country	Answer
Austria	Marginal cost pricing is taught in the context of microeconomics but is not considered as a possible implementation principle. Pricing has been discussed first as a funding generator.
France	Economic theory is taught in the more advanced economics courses in universities; but in other courses (equivalent to MBA) less sophisticated methods are taught; they are based on principles of cost allocation.
Germany	Marginal cost pricing is considered as a theoretically interesting approach but not as an important input for transport pricing in practice. Comments on the White Paper on Infrastructure Charging (CEC, 1998) ¹ were very critical from the academic world as well as from representatives of the relevant parts of the public administration.
Ireland	Not known. Transport economics is not widely taught.
Spain	Students generally are shown the main principles of economics theory. But most of transport courses in Spain are more often offered by engineering schools and tend to stress more the technical analysis.
Switzerland	Transport economics is not widely taught. The two national technical universities in Zurich and Lausanne offer courses in transport science, but the approach is rather engineering and planning than economics. In the last years, transport economics has been the subject of two National Research Programmes, which included research on the question of different pricing approaches in transport.
United Kingdom	Advanced theoretical courses cover classical economic theory, but there is still a tendency to teach traditional cost allocation procedures.

¹ Commission of the European Communities (1998) *Fair Payment for Infrastructure Use: A Phased Approach to a Common Transport Infrastructure Charging Framework in the EU*, White Paper, COM (1998) 466 final. European Commission, Brussels.

Table 5: What are the current doctrines expressed by the political authorities (Government, Parliament, etc.) on the subject of transport infrastructure pricing?

Country	Answer
Austria	The priority objective of environmental protection was implemented through regulatory and pricing measures. Nevertheless, pricing measures introduced so far serve first of all for the generation of funds for the general budget and the financing of the transport infrastructure, though a on-going project on road transport infrastructure costs will most probably result in an opening of the discussion about this issue.
France	The doctrine has varied over the years. About twenty years ago, the principle was that freight should pay the marginal cost, and passenger traffic should pay the full cost. More recently, the main stream of ideas shifted towards the use of long run marginal cost principle, based on concerns about the manipulability of short run marginal cost and on (intermodal) equity considerations.
Germany	The current pricing doctrine is dominated by financing issues and not by considerations referring to marginal cost pricing. The discussion on environmental taxation relates more easily to MC pricing.
Ireland	There is no move for pricing of inter-urban road networks (with the exception of tolled bridges, for the purposes of project finance). There is no pressure for road pricing in Dublin, although studies have been commissioned in the past (e.g. with a view to developing finance sources for light rail). For other sectors, there is no political momentum behind changes in charging policy.
Spain	The previous administration launched plans based on publicly financed investments. After 1996, the new government has shifted the balance slightly towards a model of charging infrastructure costs to users.
Switzerland	Recently, it has become clear that short run marginal cost pricing is considered as an interesting economic approach but not as central future guideline. In practical transport policy short run efficiency is not considered as a very important objective of pricing in comparison with financing and environmental objectives. Environmental costs play a role in pricing policy. However, the basic idea of marginal cost pricing is not considered as feasible because of uncertainties in the calculation of marginal costs. Short run marginal cost pricing has become an issue within the context of railway reform (as a baseline for track pricing).
United Kingdom	There is a tradition going back to the 1960s in favour of long run marginal cost pricing, combined with a current strong encouragement towards congestion pricing for both road (delegated to local authorities for urban roads) and rail, which may be taken to indicate a move towards short run marginal costs. There is a minimal interest in charging issues in the ports, aviation or inland waterways sectors.

Table 6: What is the real situation of present infrastructure pricing?

<p>Au</p>	<p>Road: The taxation of fuel is not earmarked. There is a purchase tax and an annual vehicle tax. At the local level, there are parking fees. Passengers cars and light goods vehicles (< 12 t) have to buy a vignette to use the motorways. On 5 roads and several tunnels there are road tolls. In addition to the tolls, heavy goods vehicles >12 t pay an annual road user charge ("STRABA"). Furthermore, an eco point system for transit traffic through Austria exists. A distance-related charge ("Maut") for vehicles >3.5 t is planned by 2002 on motorways and other trunk roads for funding the extension and maintenance of the high-ranking road network, operated by a state owned company.</p> <p>Rail: The infrastructure access charge is a tariff based on two variable parameters: train-km and gross-ton-km. It is not based on marginal cost estimates.</p> <p>Air and Inland Waterways: The level of the charge is derived from total cost estimates and not from marginal cost considerations.</p>
<p>Fr</p>	<p>Road: Road is charged through many devices: fuel taxes, toll motorways, vignettes, parking fees. Though not determined by the same authority, their main motivations are financial and not economic. The outcome is that, roughly, road as a whole covers its charges, but with a lot of discrepancies between categories of traffic.</p> <p>Rail: Rail transport is subsidised, the infrastructure charges cover about 25% of the total expenses. Charges approximately follow the Ramsey-Boiteux principle.</p> <p>Air and sea transport: They roughly pay their expenses, as they are run by (public) firms and do not receive much subsidy from public authorities.</p>
<p>G</p>	<p>Road: The main pricing scheme is the taxation of fuel. An annual vehicle tax is levied by the different states in Germany. At the local level parking fees are levied. Heavy goods vehicles using the German motorways pay for the Eurovignette. Only part of the revenues from the duties on fuel is earmarked for the financing of road infrastructure costs.</p> <p>For the short to medium term the approach is to base the financing of infrastructure more on user and less on budgetary funding. Distance-related user charges should be introduced on motorways for heavy goods vehicles (> 12 t), then extended to other road types. The introduction of road pricing for cars has been rejected. The level of the user charge will be derived from estimates of total and not marginal infrastructure costs. In the short- or medium-term buses and light goods vehicles will have to buy a time-dependent vignette to use the German motorways. For road passengers cars a motorway vignette is in discussion.</p> <p>Rail: In 1998 a two-part tariff system of infrastructure access charges was introduced. It shows similarities to a marginal cost pricing scheme subject to a budget constraint. However, the German cartel office rejected this pricing system. A new system will have to be elaborated.</p>
<p>Ir</p>	<p>Road: generally uncharged.</p> <p>Rail: user tariffs have been determined over time, generally maintaining parity with bus and coach services. Infrastructure cost coverage has not been sought, nor has any specific infrastructure pricing policy been developed.</p>

Table 6(ctd): What is the real situation of present infrastructure pricing?

Sp	<p>Road: There are no developed pollution or congestion charges, and vehicles pay for the use of roads through taxes on fuel, annual licenses and other charges.</p> <p>Rail: the public railway company is in a process of transformation towards a model of separation, but it is not clear yet what are the plans for the agency that in the future will be in charge of managing infrastructure.</p> <p>Seaport and Airports: They are generally self-financed through their revenues, so for those modes users cover for infrastructure costs.</p>
Swi	<p>Road: the main pricing instruments are: fuel taxes (whose revenues are partly earmarked for the financing of road infrastructure), annual vehicle taxes (levied at the cantonal level), parking fees (levied at the local level), an annual earmarked vignette on cars for the use of the national motorways. A new Heavy Vehicle Fee will be introduced in 2001 the level of which depends on truck characteristics (weight, emission technology, etc.) and on the need to finance rail investments</p> <p>Rail: The charge should not be lower than the marginal cost incurred with the use of a "standard" part of the network. In addition, a contribution margin can be levied to contribute to cost recovery.</p> <p>Inland waterways: Relevant are only the charges levied in the Rhine harbours of Basle. They are not based on any marginal cost estimates.</p> <p>Airports : Landing charges are oriented at financial considerations and include environmental considerations (the noise emissions of the aircraft).</p>
UK	<p>Road: annual vehicle licence duty and fuel tax; there is no explicit link between these and costs although relative environmental damage estimates are used to establish differentials.</p> <p>Rail: Infrastructure charges for franchised passenger operators are based on a two-part tariff; the rail regulator has recently allowed Railtrack to increase the variable part of the tariff bringing it more into line with marginal cost, but maintaining revenue neutrality.</p> <p>Airports and seaports: there is minimal government involvement in charge setting. There is no regulation of port prices, and ports are generally under private ownership in a competitive marketplace. The Civil Aviation Authority regulates airport charges for major airports, with an emphasis on infrastructure cost recovery rather than the application of economic principles for charging.</p>