SUBSIDIARITY AND TRANSPORT POLICY CO-ORDINATION IN THE EUROPEAN UNION

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SUMMARY

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1. INTRODUCTION

The concept of "subsidiarity" is defined as the principle according to which decisions should be taken at the lowest decision-making level possible, given the objective pursued. For pricing policy in the transport sector, subsidiarity is understood to mean that while, for example, levying charges and taxes on heavy goods vehicles is within the competence of the European Union (EU) because such vehicles compete in an international market, determining the principles for an urban pricing scheme is best dealt with by national or local authorities. As regards transport infrastructure policy, it is stated in the EC Treaty that the Union would not be able to take decisions on projects without the agreement of the Member State concerned. It should, however, be noted that subsidiarity is not a static notion but it evolves with time; transport policy having been brought into the discussion only in 1996 under the Maastricht Treaty.

Perhaps because of the vagueness of the definition, applied research on subsidiarity and on (de)centralisation of decisionmaking in the transport sector has been rare. Proost and Sen (2003) have explored implications for a pricing policy whereby multiple levels of government have different degrees of powers and control over the instrument, as in the case of Brussels. De Borger *et al.* (2003) have assessed a similar setting in the context of Belgium and its neighbouring countries. Regarding infrastructure, several research projects[1], funded under the EU's 4th and 5th Framework Programmes, have attempted to define and measure network effects which occur in a neighbouring country, while Roy assessed the bias in cost-benefit analysis resulting from the omission of benefits to users in neighbouring countries in the case of the PBKAL project[2].

This paper aims at exploring how the concept of subsidiarity could be interpreted in two interlinked transport policy domains: infrastructure investment policy and charging policy. The paper is structured as follows. It starts by giving a brief overview of recent EU proposals to revise existing legislation regarding TEN investment and charging policies. Next, the occurrence of deficits from following marginal cost-based charging by mode is assessed, and efficient rules to cover this are presented. The paper then briefly discusses the empirical results of recent research projects, which assess the socio-economic impacts of investments and charging and concludes by advancing proposals for a combined investment and charging policy, taking subsidiarity into account.

2. INVESTMENT AND PRICING POLICIES AND SUBSIDIARITY

2.1. EU infrastructure investment and pricing policies

Creating a dynamic EU economy and fostering deeper integration of the national economies depends on a properly functioning transport system. Increasing transport volumes, a lack of

interoperability between the transport modes and systems, poor interconnections between national networks plus a fall in real investment are leading to bottlenecks and inefficient functioning of the EU transport system overall. This also leads to increased pollution and greenhouse gas emissions, in particular due to the continuously growing share of road transport. Furthermore, the peripheral countries of the European Union suffer not only from long distances and isolation, due to insufficient connections to the central markets of the EU, but also from congested networks in the centre. To address these problems, the European Commission has recently proposed two interlinked policy initiatives:

- The revision of the **Trans-European transport Network (TEN) Guidelines**[3] aims at concentrating funding on major trans-European axes serving long-distance and international traffic. Thirty priority projects on these axes have been identified and declared of European interest. The new Guidelines have a strong focus on the integration of the new Member States' networks as well as on non-road modes, with a view to modal rebalancing, curtailing congestion and the reduction of environmental pressure from road transport.

- The revision of the so-called **Eurovignette Directive**[4] foresees the possibility to charge heavy goods vehicles (HGV) on roads for the infrastructure (construction and maintenance) costs as well as accident costs caused by usage of the TEN network. To manage congestion and environmental effects, charges may be differentiated to reflect the damage caused. The revenues of the charging system should be earmarked to the benefit of the transport system as a whole, making financing of other modes thus possible.

Despite their clear interlinkages – financing of TEN investments – the development of these two policies has followed a different logic. The TEN package relies on national funding, given that only up to 10 per cent of investment costs can be covered from the TEN budget[5]. The package has not been put together under a given budget constraint but relies on increased resources for it to be successfully implemented[6]. Regarding the charging directive, it is not fully clear what the underlying economic logic is. On the one hand, the proposal aims at extending the principle of territoriality, by allowing all HGVs to be charged their share of investment costs. On the other hand, it allows the charging of investment costs either made by private investors or already financed by general taxation. In the first case, roads are assumed to be close to a private good (or a club good, see section 3.1.), whereas in the second case charges seem to have a revenue-raising logic.

2.2. Infrastructure planning and subsidiarity issues

In the case of transport infrastructure, it is the Member State and the regional or local authorities which bear the burden of the financing and manage the complex administrative procedures prior to construction authorisations, particularly public consultations. Even in the case of projects co-financed by the Cohesion Fund, which may provide up to 80 per cent of investment costs, the Member States concerned remain liable for the risks of non-compliance with the project objectives.

The EC Treaty confers on the Community the task of identifying projects of common interest and, where appropriate, contributing financially to their implementation. However, these powers are limited for a number of reasons:

- Projects of common interest require the approval of the Member State concerned[7];

- Since 1993, the average contribution by the Community has been less than 3% of the cost of the priority projects[8];

- Construction authorisations, which depend on compliance with a host of national rules and on expropriation, remain in the hands of the Member States, although Community directives on environmental impact assessments introduced some common requirements.

Past experience has shown that investments in the sections of the TEN which mainly benefit foreign traffic are typically not prioritised in national planning, and Community funding is seen as a necessary leverage to launch these projects. Transnational links have a low implementation rate of 24 per cent, as against 44 per cent for purely domestic links, and the most significant delays were concentrated on projects' cross-border sections[9].

3. METHODOLOGICAL APPROACH

3.1. Economic theory on pricing and financing

According to economic theory, investments in public goods should be carried out until the point where the sum of marginal benefits is equal to the marginal cost of the investment, while prices and taxes should reflect marginal costs[10], including external costs.

Setting prices equal to marginal cost will lead to efficiency[11] in resource allocation. For **private goods** with constant returns to scale, marginal cost is equal to average cost and full recovery of all costs, including investment cost, is automatically obtained. For **public goods,** the situation is different and cost recovery can rarely be attained. Depending on the sector and the existence of (dis)economies of scale in production, surplus revenues or deficits may occur. Surpluses are more likely for sectors with persistent congestion (impure public or club goods) while deficits are typical for sectors with high fixed investment costs and with little congestion (pure public goods).

According to the literature, such deficits (surpluses) should be covered (redistributed) by non-distortive lump-sum taxes. If such taxes are not feasible, as they typically are not in practice, economic theory suggests several options to cover financial deficits. These efficient charging rules vary depending on the organisation of the market, notably on the degree of regulation and competition. What is common to all such rules, irrespective of the type of good, is a variable element based on **marginal cost**. To complement marginal cost based prices, economic theory suggests the following efficient charging rules for the different types of good:

- *Pure public good*: general taxation, as it is not economically justified or technically possible (non-excludability) to add mark-ups to prices, because that would decrease demand beyond what is beneficial to society;

- *Impure public good*: general taxation, Ramsey pricing or fixed entry charges (two- or multi-part tariff). The optimal solution depends on the context, elasticity of demand by user segment, level of fixed costs in relation to variable costs of use, etc.;

- *Club good*[12]: two- or multi-part tariff consisting of an entry fee (fixed price) and user fee (marginal cost price). The fixed fee is set to cover the financing deficits, at the same time it ensures that supply is at an optimal level;

- *Private good*: marginal cost pricing (all costs are variable) typically leads to recovery of all costs but can in some cases generate deficits or surpluses depending on the degree of economies of scale. Profit-maximising prices are based on Ramsey pricing and include price discrimination where feasible.

All the above-mentioned schemes rely on marginal cost pricing as the basis. In Ramsey pricing a mark-up is added to the marginal cost price, which is inversely related to price elasticity and thus depends on the intensity of use. In a multi-part tariff system, a fixed charge is levied on each user, for example, as an entry fee to the system. The fixed price may be differentiated according to user characteristics.

Pricing and financing applications in the transport sector today rely to some extent on these principles. In many countries, road use charging is based on two-part tariffs with a variable element ─ fuel tax ─ and a fixed annual fee. It has to be noted, however, that fuel tax is a particularly poor proxy for internalising external costs caused by road use (see section 3.2.). On the other hand, differentiated prices for business *vs*. leisure are used in, for example, air travel and they go beyond pure differences in quality of service, thus reflecting the willingness to pay (cost elasticity) of different user groups.

3.2. Marginal costs in different regions of the EU

External costs of transport infrastructure use include infrastructure wear and tear (approximated often by maintenance costs), congestion, air pollution and noise, greenhouse gases and accidents. These vary considerably according to the place and time of driving as well as to the vehicle used.

The level of costs to be internalised depends strongly on the level of congestion and, to a lesser extent, on the effects on health of air pollution. Although marginal costs can vary constantly, average marginal costs in various regions can be approximated by population density, as presented in Table 1 for a typical heavy goods vehicle:

Table 1. **External costs**

Route type	Description	External costs (eurocent/km) for EURO-III heavy goods vehicle
Rural	Rural regions with low population density and very little congestion	5-10
Normal	Average population density regions	10-25
Mountain	Routes in environmentally sensitive mountain regions	20-40
Urban	Urban areas with high population density	20-40
Metropolitan	Metropolitan areas	40-70

Source: RECORDIT[13].

3.3. Deficits in the transport sector

Research has shown that marginal cost pricing can be implemented in a revenue-neutral way in the transport sector (see, e.g., ECMT, 2003; UNITE, 2004). Due to inherent differences between the modes and regions within Europe, the financial result will differ considerably by mode and by region. The result depends on the relative importance of two main factors:

- Economies of scale in production (fixed costs/operation costs, difference between average and marginal costs); and

- The degree of congestion (relationship between increases in traffic volumes and average speed/delay).

The lower the fixed costs and the higher the level of congestion, the more likely it is that financial surpluses will occur, and *vice versa*. A general assessment of possible surplus/deficit areas by mode is presented below. The financial result is, however, highly context-sensitive and depends on the (dis)economies of scale in production (investments) and use (congestion) in the specific situation.

- **Roads**: Efficient charging for the use of *urban roads* as well as some severely congested *interurban axes* would typically produce surpluses, because capacity cannot be expanded due to lack of space, which leads to persistent and high levels of congestion. On congested *interurban roads*, charging can often lead to recovery of investment costs, whereas for *roads in rural regions* and roads with very little congestion, if any, charging would lead to deficits, given the indivisibility of investment and high fixed costs;

- **Rail**: Given the important economies of scale in production and indivisibilities, it is likely that charging based on marginal cost would, in most cases if not always, lead to financing deficits[14];

- **Aviation and maritime**: Both sectors could cover investment costs in many cases, the main exceptions being regional ports and airports, which have low traffic volumes and whose main function is to ensure accessibility. The biggest hub airports and ports, which suffer from continuous congestion, might show considerable surpluses;

- **Inland waterways**: Given the considerable advantages that inland waterways provide to other sectors, such as irrigation or electricity production, it is possible that charging marginal costs only for transport users would lead to deficits in many cases.

4. EMPIRICAL RESULTS FROM THE EU 5TH FRAMEWORK PROGRAMME

4.1. TEN policy packages (IASON project[15])

The IASON project has developed tools to assess the socio-economic impacts of TEN and charging policies. The impacts are calculated in terms of the percentage of GDP. Two TEN packages were looked at:

(i) Implementation of the 29 priority projects[16] according to the Commission's initial proposal, with a total cost of approximately €225 billion;

(ii) Implementation of projects on the whole TEN network, the cost of which amounts to *ca.* €600 billion. Equity is also addressed in IASON by giving a different value to the parameter reflecting the inequality aversion of the decisionmaker.

Overall, the benefits of the all-TEN scenario exceed those of the 29 priority projects, 0.21 *vs*. 0.14 per cent of GDP respectively. This is particularly striking for the new Member States, for which the difference between the two alternatives is fourfold. However, given the difference in costs of the alternatives, €225 billion *vs.* 600 billion, implementing only the 29 priority projects seems to offer better value for money for the whole EU. Only with very strong inequality aversion would the opposite hold.

Implementing all projects on the overall TEN network has a strong equalising effect in the enlarged Union. The benefits are considerably higher in the new Member States[17], 0.46 *vs*. 0.24 per cent of GDP, which are typically less well-off than the EU-15 countries. On the other hand, the effects of implementing only the 29 priority projects are mixed in terms of equity. While the policy package shows a strong equalising effect for the "old" EU-15 Member States, the opposite holds for the new countries. As a consequence, the overall impact is somewhat unclear.

4.2. Financing of the TEN investments (TIPMAC project[18])

The cost of TEN investments varies considerably by country. In absolute terms, Italy, Spain and France show the highest investment costs, while Finland, Ireland and Sweden have the lowest. For investment costs relative to GDP, the highest figures are for Portugal, Spain, Northern Italy and Austria (>5.5 per cent) while the lowest relative costs are in Western Germany, Belgium, Sweden and Finland (<1.6 per cent). This is only partially reflected in the fuel excise duty increase, which is necessary to meet the increased investment volumes. This rise is the highest in Austria, Italy and Greece (>6.3 € cents/litre) and lowest in Germany, the UK and Belgium (<2.2 € cents/litre). These differences reflect variations in traffic volumes and the level of fixed investment costs in the various countries.

The TIPMAC project has looked at scenarios whereby the investments in the TEN priority projects[19] were financed either through increases in fuel excise duties or by levying marginal cost based charges on heavy goods vehicles.

According to TIPMAC, if investments are financed by increasing **fuel excise duties** – or through average cost pricing – impacts on GDP are positive but very small, if not insignificant. By 2010, GDP would increase by 0.2 per cent, while the stimulating effect would be somewhat higher in 2020, or 0.5 per cent. This occurs partly because of the economic dampening effect of the increase in fuel excise duties. The impacts of this scenario are negative in all peripheral countries of the Union because of their open economies and in particular their long distances from central markets.

Investments in the 29 priority TEN axes will increase GDP by 1.4 per cent by 2010, when only some of the projects will be implemented, and by 2.6 per cent by 2020, when all projects are to be completed if user fees (**marginal cost based charges**[20]) are applied which reflect congestion and environmental nuisances and cover the whole TEN network. This increase in GDP means a 0.11 per cent rise in the trend of GDP growth rate (2.5 per cent per annum). This is considerable, given the rather small share (10 per cent) of transport in the overall economy. The distributional impacts of this financing alternative are more or less geographically balanced, only Portugal and Spain would lose out somewhat. The highest benefits (>4 per cent GDP increase) would accrue to Ireland, France and Finland, the smallest to Belgium, Greece and the Netherlands (*ca.* 0.1 per cent increase).

4.3. Charging transit traffic

In De Borger *et al.* (2003), the potential revenues and inefficiencies are analysed when transit infrastructures are priced by regions or Member States. They found that monopoly pricing indeed generates important revenues for the Member State charging transit, but that the mark-up on top of marginal costs and the associated inefficiencies are, in the end, rather low when there is at least one competing alternative in another region or country. Although the inefficiency is rather small, it is a net transfer from the transit traffic to the governments operating the transit fees. From the economic point of view, this means, firstly, that equity[21] is the main issue rather than efficiency. A second implication is that transit countries which can charge the transit traffic may have sufficient incentives to invest, even if direct transport benefits for local users are small.

5. DISCUSSION OF THE RESULTS AND SUBSIDIARITY

Given the low priority set by Member States on integrating national transport networks with those of neighbouring countries and on cross-border sections of major axes, **stronger co-ordination at the EU level** would seem necessary, shifting decisionmaking upwards from the Member States. This would also ensure that those sections which mainly benefit foreign users receive appropriate priority in planning. However, the necessity for the Member States to give their approval to projects on their territory limits the possibilities for efficient co-ordination and planning at this stage. As a change to the Treaty does not seem likely, one way of gaining such powers in an indirect way could be a considerable increase in the EU budget for the TEN and priority projects offering a sufficiently strong leverage effect. Charging users, including transit traffic, could provide another way to create the

necessary incentives for cross-border investments, as shown in section 4.3. However, it should be ensured that the revenues are used for cross-border investments and not as a revenue-raising scheme.

Regarding financing and selection of TEN projects, the concentration of EU funding on main transnational axes, according to the recently adopted revision of the TEN policy, follows the objectives of the Single Market and of free movement of goods between Member States. Following this notion of subsidiarity, investments in other parts of the network are an issue for national or regional authorities. This notion is based more on "efficiency", given the focus on major axes and high traffic volumes, while "equity" is addressed only indirectly, through the involvement of the Member States and the European Parliament as co-legislators.

A **stronger focus on equity,** however, would also seem to be in line with the "European model" in the transport sector. Including equity along with efficiency as a priority for the TEN would put more emphasis on peripheral regions, which suffer from poor accessibility to the TEN and to central markets, and where user charging is not an answer because of low traffic volumes, high fixed investment costs and indivisibilities. This would be particularly relevant for the new Member States, as shown in section 4.1. For such a policy to be effective, a minimum level of service could be determined and agreed upon, to be offered to all EU citizens irrespective of their place of residence. This could only be carried out at the EU level.

The TEN policy seems to implicitly take into account the different possibilities for cost recovery of the individual transport modes. This is reflected by the focus given to investments in rail and, to a lesser extent, in inland waterways. However, the TEN package does not seem to address the **potential of financing gaps** within a mode and in different regions. First, the priority projects are located on major transnational axes, which carry the highest volumes of long-distance and international traffic, whereas the main financing deficits can be expected to occur in peripheral regions with low traffic volumes. Second, whilst the increased EU contribution for cross-border sections of the priority projects takes into account the low interest of Member States in financing these sections, it does not take into account the possibilities for user charging and the likely occurrence of financing deficits in different regions in Europe. The "Eurovignette" Directive would allow the levying of charges to meet investment needs. It would also allow the strengthening of the principle of territoriality and charging transit traffic (see section 4.3.). However, as shown in section 4.2., this would be detrimental to the peripheral economies, which suffer from long distances and relatively low traffic volumes.

To address both modal and regional differences, an efficient charging system, based on marginal cost pricing, as outlined in section 3.2., could be created at the EU level to complement funding from the national and EU budgets. In such a system, surplus revenues from congested regions, typically located in the centre of the EU, would be used to cover financing in regions suffering from deficits, which are often located on the EU's periphery.

NOTES

1. See, e.g., PROFIT http://europa.eu.int/comm/transport/extra/web/index.cfm or IASON http://www.wt.tno.nl/iason/

2. PBKAL, Paris-Brussels-Köln-Amsterdam-London high-speed rail project, is one of the priority projects of the Trans-European transport Networks.

3. The revised Guidelines were adopted by the Council and European Parliament in April 2004.

4. The proposal is currently being discussed by the co-legislators.

5. This share has been recently doubled to 20 per cent for projects crossing borders and natural barriers. For regions benefiting from the Cohesion or Structural funds, the EC contribution can be considerably higher.

6. When preparing the next EU budget for the period 2007-13, the Commission has clearly demonstrated its awareness of this issue and has therefore proposed a considerably higher budget for the TEN projects.

7. As provided for by Article 156 of the EC Treaty, despite the qualified majority rule laid down in the same Treaty for the Trans-European Networks.

8. For countries and regions eligible for the structural financial instruments, this share can be considerably higher. The countries or regions not eligible for the structural financial instruments qualify only for funding from the Trans-European Network budget, 40 per cent of which is allocated to the priority projects.

9. For further details, see Commission staff paper SEC(2003)1060, "Extended impact assessment of the proposal amending the amended proposal for a decision amending Decision No 1692/96/EC on the trans-European transport network".

10. Marginal cost is the cost incurred from the production of one more unit of the good. It comprises the cost of producing the good as well as possible external costs of the use.

11. Efficient resource allocation means that a given level of output can be reached with least input/cost or that, with a given input level, most output is obtained.

12. "Club good" is an impure public good but supplied privately, so it has to break even.

13. See www.recordit.org for details.

14. Marginal costs typically represent some 20-30 per cent of overall costs in the rail sector. Full cost recovery charging, on the other hand, would in many cases lead to too-high charges for users' willingness to pay.

15. IASON has been funded under the 5th Framework Programme for Research. The project comprised 12 institutions from seven countries and was co-ordinated by TNO-Inro, Netherlands, while the author of this paper was the scientific officer in charge of the project at the European Commission. In this paper, the results of the CGEurope model are used, developed by Prof. J. Bröcker from Kiel University, Germany. The model is a computable general equilibrium model. Further details of the model, the IASON project and deliverables can be obtained from the project website http://www.wt.tno.nl/iason/

16. In the final list, there are 30 priority projects, as the inland waterway axis, Seine-Scheldt, was added.

17. In addition to the 10 countries which joined the EU in May 2004, Romania and Bulgaria are among the 12 candidate countries covered by the new TEN Guidelines and IASON analysis.

18. TIPMAC has been funded under the 5th Framework Programme for Research. The project comprised six institutions from five countries, and was co-ordinated by Cambridge Econometrics, UK. The author of this paper was the scientific officer temporarily in charge of the project at the European Commission. Further details of the project and deliverables can be obtained from http://www.camecon.com/services/projects/Tipmac/Tipmac_project.htm.

19. The TIPMAC model covers only the EU-15 countries.

20. It is assumed that any surplus revenues are redistributed through lower labour taxes (the best use of surplus revenues is to decrease the taxes on the markets with the highest distortions – also called double dividend).

21. Equity in this paper means the distribution of net economic benefits either equally across regions or favouring poorer regions/households. The concept of "solidarity" is often used to the same effect.

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