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DECISION MAKING CRITERIA FOR NATIONAL ECONOMIC POLICY, TRANSPORTATION POLICY AND ROADS POLICY LEVELS

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Abstract

Public sector decisions on the development of the road transport system are made on three levels: national economic policy, transportation policy and roads policy. An important question is the appropriate framework and methodology for socio-economic assessment of proposed projects, programmes and policies. Much of the current research proposes various multi-criteria methods (MCA) as the preferred assessment methodology. The more traditional cost-benefit analysis (CBA) is considered insufficient to tackle the many complexities arising in the assessment. We argue that an extended socio-economic CBA should be the core method on all three policy levels. The paper lists the most important research topics that can be assessed by means of such an extended CBA.

INTRODUCTION

Public sector decisions aiming to develop road transportation system are of great variety, and are made by a number of different decision making units. Such decisions cover fiscal taxation of transport, the supply of public transport services, the supply of transport infrastructure and the regulation and pricing of use of road networks.

A basic requirement for rational decision making is an appropriate hierarchy of decision making units, and an appropriate division of responsibilities between them. Another important requirement is reliable information on the socio-economic impacts of the projects, programmes and policies under consideration. An important precondition to a systematic provision of such information, in turn, is the appropriate framework and methodology of socio-economic assessment.

In the assessment of large transport infrastructure projects, programmes and policies, different approaches have traditionally been used in different European countries (EURET, 1996). Differences exist in the extent of use of cost-benefit analysis vs. multi-criteria analysis, and in the extent of use of quantitative assessment by means of formal economic models vs. qualitative and descriptive methods. Inter-country differences also exist regarding the coverage of these analyses, in particular, regarding the treatment of the effects of infrastructure on economic development and employment, and on environment. The co-ordination of the project level analysis and of the assessment of programmes and policies is also organised differently in different countries.

In Finland, the so-called YHTALI guidelines, mainly relying on conventional cost-benefit analysis, were certified by the Ministry of Transport and Communications in 1994, and have been used as a framework in all modes (road, rail, water and air) since then. The guidelines are now under reconsideration, and some further specifications are expected to be made. So far these principles are required to be followed in pure investment projects only. However, the question whether the same principles apply to the assessment of non-investment type projects, and to the assessment of transport programmes and policies, has been on the agenda all the time. Or, if these principles are not the right ones, then what are?

At the European Union level, the increasing trends of traffic and, in particular, the international nature of transportation networks and traffic flows mean that there is a need to unify and harmonise assessment methods used in different countries. Also, as is indicated in the Common Transport Policy, there is a need to decide on an increasing number of projects, programmes and policies at the Community level. The Trans-European Transportation Networks (TENs) are just one example. These issues are given much attention in the Community's Transport Research Programme, and are being addressed in a number of ongoing EU projects.

This paper first discusses the hierarchy of transport-related decision making (section 2). We then discuss the appropriate assessment approach, framework and methodology (section 3). We conclude by identifying the most pertinent needs for further research (section 4).

HIERARCHY OF TRANSPORT-RELATED DECISION MAKING

Public sector decisions affecting the road transport system, and the transportation system in general, are made in most countries on three different levels (OECD, 1993):

(i) national economic policy level;
(ii) transport policy level; and
(iii) roads policy level.

A central though often implicit question on the national economic policy level concerns the allocation of resources between different sectors, for example between the transportation sector and other sectors. Decisions concerning such questions are typically taken in the Parliament. Decisions on the transport policy level focus on the allocation of resources between transport modes (road, rail, water and air). In most countries, the Ministry of Transport is the central actor here. The primary task on the roads policy level is to allocate resources between different types of activities and different regions. In Finland, the Finnish National Road Administration carries out such mode-specific decisions. Cities and municipalities, in developing the urban street network and public transport, also are important actors on this level.

A conventional view often expressed is that an additional level exists: that of the European Community. However, rather than being simply a fourth level, questions involving a European dimension are present on each of the three decision making levels. Decisions affecting the allocation of resources between the transportation and others sectors are made by the European Parliament and Council; the transportation policy and roads policy level questions are defined in the Common Transport Policy (CTP) and other related Commission documents. Furthermore, the dividing line between a European and a national policy on each level is determined by the notion of "subsidiarity": decisions should be taken and implemented where most appropriate.

Figure 1 illustrates the hierarchy of decision making, and the interaction of national decision making bodies and the European Community in defining and implementing policies on the three different levels.

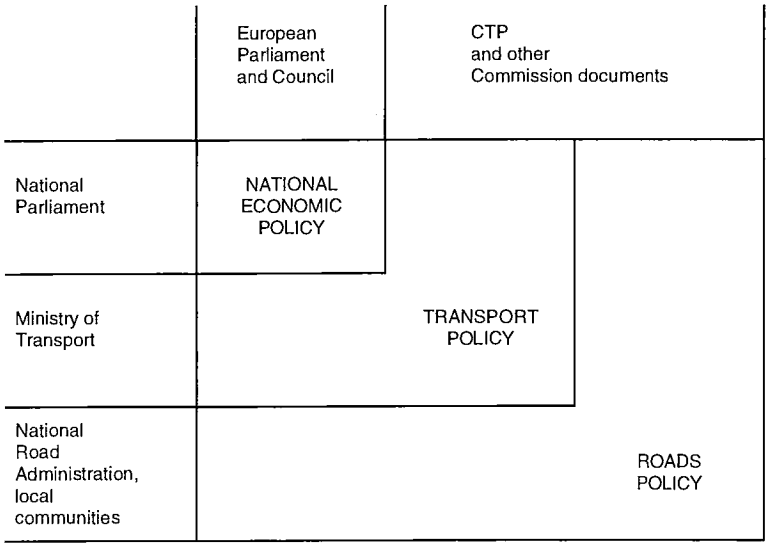

Figure 1 - Hierarchy of decision making

A variety of recent developments have caused the national economic policy and transportation policy levels to gain more attention than the roads policy level. This is due to increases in:

(i) transport-related environmental problems;
(ii) acceptance of sustainability as a policy target;
(iii) recognition that road capacity expansion can be no lasting solution to worsening congestion problems, due to scarce land and high cost;
(iv) awareness of network effects;

(v) interest in the potential role of transportation infrastructure as a factor promoting economic growth and employment; and
(vi) public sector deficits leading to budget cuts in the transportation sector.

On the other hand, at each of the three policy levels, questions with a European dimension have recently become more important. This is due to the international nature of:

(i) the issue of competitiveness and efficiency of the European economy;
(ii) network effects and the mechanisms between infrastructure provision and economic growth;
(iii) environmental, sustainability and congestion issues; and
(iv) the financing schemes and organisations involved in infrastructure provision.

FRAMEWORK AND METHODOLOGY FOR SOCIO-ECONOMIC ASSESSMENT

An important question is how the framework and methodology to be applied when assessing programmes should differ from those applied in the assessment of projects. In addition, the co-ordination of assessments on these two levels is also important.

The most commonly used assessment method on the roads policy level has been cost-benefit analysis (CBA). In the road sector (to some extent also in the other modes), CBA has been used over the years as a mechanical computation model or system, in Finland as in most European countries (EURET, 1996).

Such a mechanical CBA has recently been criticised by researchers, practical analysts and decision-makers. It is argued that CBA is incapable of tackling various complexities arising in practical project assessment and, in particular, fails to take into account a number of "new" impacts related to environmental, equity and distributional issues and other wider policy targets, which do not have market prices or widely accepted shadow prices.

EURET (1996, p. 81) speaks up for CBA: *"For the appraisal and ranking of projects, it is believed that the compensatory basis of cost-benefit analysis and linear multi-criteria models is the correct one... The overall effect of the recommended approach is to present scheme evaluation as an extended cost-benefit analysis... Monetary valuation in this form has advantages of transparency and communicability into political debate which purely multi-criteria methods may not... An additional argument for the money denominator is that it can facilitate, if necessary, comparison between social/economic valuations of schemes and financial assessments and potentially broad comparisons across sectors of the economy."*

However, a number of recent research reports propose various multi-criteria (MCA) methods as the preferred assessment methodology. Typically, these studies either start with the assumption that MCA is able to overcome the problems associated with CBA, or end up with this as their result.

We suggest that this approach and thinking contains two mistakes, or, at least two dangerous simplifications. First, it easily gives the impression that the problem is with the CBA itself rather than with the mechanical way it is used and the frequent misinterpretation of its results. Second, this literature presents CBA and MCA as alternatives. Although this interpretation is possible to some extent, it is more correct and more useful overall to consider these two analyses as complementing each other.

Regarding the first point, our view is that much of the criticism against mechanically performed CBA is justified, especially when its results, often comprising one single number (such as cost-benefit ratio, internal rate of return or net present value), are presented as if they are complete answers. This does not mean that this kind of CBA is not valid for "easy" projects. However, our view is that it would be wrong to throw the general approach and methodology of CBA overboard, to be replaced by MCA or by any other method (e.g. strategic environmental assessment, SEA). The problems of

valuation of the "new" impacts, of data quality, uncertainty etc. referred to above will also be encountered when applying MCA or any method.

Also, there seems to be much confusion caused by a rather careless use of the terminology. One should be explicit whether his or her interpretation and definition of CBA covers the phases of socio-economic assessment as a whole or is it only one part or phase within a complete project assessment framework.

Often the former interpretation is adopted, and CBA is characterised as providing an assessment framework and methodology to collect and arrange information for decision makers systematically. Of course, there is nothing wrong with this interpretation as such. We think, however, that it is better to restrict the notion of CBA to refer only to the aggregation of monetary values, and its related sensitivity analysis. This terminology clarifies the relationship between CBA and MCA. Thus, we prefer to see the actual use of CBA in the wider context of socio-economic project assessment framework.

Socio-economic assessment of projects, programmes and policies in the transportation sector must be considered in a wider context: that of assessments being carried out in other sectors and markets of the economy. CBA is often blamed for measuring "all impacts" in units of money. This kind of criticism is not very useful, and easily reveals lack of understanding on the side of its presenter. Instead, it would be more useful for the critics to present and answer the following fundamental questions:

(i) as a general rule, is it worthwhile to attempt to value the impacts of decisions as far as possible in the way that they are valued by consumers and citizens, or is it better to apply subjective weightings?
(ii) what should be the dividing line between objective valuation and subjective analysis?

If the answer to the first question is "yes", then CBA is the right approach. If the answer is "no", then, to be logical, one should also criticise the principles of the market economy more generally and ask the question: why should valuations in the transportation sector be based on different principles than in other sectors?

CBA also links the valuation issue explicitly to the behavioural model, whereas MCA prefers to use valuations perceived by analysts and policy makers. Obviously, an analyst using CBA has to accept that consumer valuations alone are not sufficient or even available. In particular, there may be strategic goals which are not reflected in market values or in contingent valuation studies. In such situations, we explicitly need valuations of the decision maker or the analyst. MCA, by definition, can only be a method to supplement CBA.

Our view is that CBA should continue to be the core methodology for socio-economic assessment of projects, programmes and policies. Moreover, it should be the core method on all three policy levels. The appropriate role of MCA should be to supplement it. The result may be called an extended socio-economic CBA. In addition, financial analysis and verbal descriptions are often needed.

RESEARCH PRIORITIES ON DIFFERENT DECISION MAKING LEVELS

There is an obvious need for both theoretical and practically oriented research in view of extending, deepening and applying the socio-economic CBA in decision making on different policy levels. Most pertinent questions relate to:

(i) assessment methodologies for policies and programmes;
(ii) the role of MCA and SEA in complementing CBA;
(iii) ex post analysis of ex ante assessments; and
(iv) application of socio-economic cost-benefit analysis in assessing important investment projects and policies.

In Table 1, the most urgent research priorities are arranged according to the hierarchical decision making system. They reflect the increased importance of the transportation policy and the national economic policy levels relative to the roads policy level (section 2). The table illustrates the hierarchy of research topics: the research topics identified on a higher decision making level are also present on the lower levels.

The research topics emphasise the central role of the socio-economic CBA on each decision making level (section 3). The information requirements on the three policy levels and existing research knowledge in Finland are analysed in Sikow-Magny and Niskanen (1995) and Niskanen et al. (1998).

Table 1 - Hierarchy of research topics

	National economic policy	Transport policy	Roads policy
Impact of transport infrastructure on economic growth and employment	X	X	X
Inclusion of environmental factors	X	X	X
Transportation system as part of the public sector	X	X	X
Formulation of a "new" transport policy		X	X
Assessment of projects and programmes as part of transport planning		X	X
Implementation of marginal cost pricing		X	X
The issue of cost recovery		X	X
Optimal length and quality of the road network			X
External benefits			X
Organisation of road production			X

National economic policy level

Impact of transport infrastructure on economic growth and employment. Understanding of the mechanisms through which transportation infrastructure provision contributes to local and national economic growth and employment, and quantification of these effects by economic modelling, are the most important priorities. Alternative qualitative approaches also need to be considered. More specifically, here we are looking at:

(i) links between the transport sector and growth and competitiveness of the economy;
(ii) the impact of development of the transportation system on the production structure and on key industries; and
(iii) the role of the transport system in the development of regional growth centres and their impact on the overall economy.

Inclusion of environmental factors. The operationalisation of the notion of sustainable development in the transport sector is of utmost importance. In this area there are three questions which need to be studied before other questions can be addressed. These are:

(i) implementation of international contracts on environmental quality in different sectors in the economy taking into account national policy targets;
(ii) cost efficient means to decrease environmental damage of transport, the roles of pricing, traffic management and telematics, technical standards and supply of transport services in achieving the targets; and

(iii) the relationship between transport and land use patterns and identification of the transport policy measures which are able to influence to produce the most efficient solution.

Transportation system as part of the public sector. There seems to be two organisational issues which, for obvious historical reasons, need to be addressed before the lower decision making. These are:

(i) the different transport modes in generating revenue to the treasury; and
(ii) the roles of the government and cities in defining the optimal transportation network and service level, in financing the necessary investments, and in managing traffic.

Transport policy level

Formulation of a "new" transport policy. Prioritisation of infrastructure investments has traditionally been a major part of transportation policy in Finland. However, given the recent developments in the economy and in the transportation sector, this is not necessarily true anymore. In the new situation, the following three topics in particular necessitate further research:

(i) economic functioning of the transportation market; and
(ii) definition of the content of the "new" transportation policy which takes into account the Common Transport Policy of the EU and relevant international contracts and which puts more emphasis on the role of the transportation sector in the economy, on environmental constraints and on the efficiency of transport policy measures in achieving policy objectives.

Assessment of projects and programmes as part of transport planning. Assessment of projects and programmes is closely related to the process of transport planning. In the planning process, programmes typically emerge first; then individual projects take their form as part of the programmes. Of course, the reverse can happen too. An important question to project assessment is to make appropriate allowance for relevant decisions being made at the programme level. No clear-cut guidelines exist to specify the division of responsibilities between the project level and the programme level. This has been considered a serious problem, in Finland and elsewhere. Thus, for project assessment, it is important to clarify the division of responsibilities between assessments on the programme and project levels, and to improve their co-ordination.

Implementation of marginal cost pricing. Economic theory shows that marginal cost pricing would lead to efficient use of transportation infrastructure. Before marginal cost pricing can be implemented in practice, research is needed in three areas:

(i) operationalisation of marginal cost based prices in practice;
(ii) determination of the level and socio-economic value of marginal costs for using different modes in different places at different times; and
(iii) assessment of distributional of impacts of marginal cost pricing on different socio-economic groups and productive sectors and definition of policy action to mitigate eventual negative impacts.

The issue of cost recovery. Marginal cost pricing will ensure efficiency in the use of transport infrastructure but will not necessarily lead to the full cost recovery of fixed infrastructure costs of the transport system. This financing question needs to be solved. Research is needed on the definition of financing principles for different modes, taking into account the distributional aspects and the role of different modes in fulfilling social objectives.

Roads policy level

Optimal length and quality of the road network. The following two research areas seem to be the most pertinent:

(i) analysis of differences in valuations in different regions in Finland and eventual implications for roads policy; and
(ii) measurement and value of reliability.

External benefits. External benefits of road traffic are often raised in policy discussion, also in Finland. However, their existence has not been proved and needs to be clarified.

Organisation of road production. In order to increase efficiency in the production and management in the road sector, more information of the following three areas is needed:

(i) economies of scope between construction, maintenance and planning;
(ii) analysis of total factor productivity and cost efficiency; and
(iii) optimal form of organisation and division of construction and maintenance work between the public and private sector.

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