



Cost-benefit analysis according to Sen: An application in the evaluation of transport infrastructures in France

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ABSTRACT

Made compulsory in France for major transport infrastructures, cost-benefit analysis is constantly being improved to achieve the best socio-economic evaluation possible. According to the philosopher and economist Amartya Sen, this analysis should meet two requirements: one ethical, the other democratic. We will examine the evaluation procedure in France and highlight the gap between its officially more democratic character and its still insufficiently ethical character, from the viewpoint of this dual requirement.

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“The discipline of cost-benefit analysis ... is, partly, a battle of giants, for there are heavyweight intellectuals on both sides, ... partly, a conversation between great soliloquists—very skilled in making their points, and somewhat less troubled than Hamlet (“To be,” say some, and “Not to be,” announce the others)”. (Sen, 2000: 931).

1. Introduction

In 2009, the French General Commission for Sustainable Development declared that the high speed rail programme, developed over the last 30 years in France, was cost-effective at the socio-economic level. This cost-effectiveness, which consists of time-saving and productivity gains, facilitated by high speed in the rail transport service, has a *global* aspect because it is important, according to the French Commission, “for the programme both as a whole and by zone” (CGDD, 2009). Why should one only judge a programme by its *collective surplus*, i.e. the difference between all the benefits and all the costs? In other words, why select only the programmes that generate, as Bentham said, “the greatest happiness of the greatest number”? Does this method not lead to the tyranny of the majority? The answer to these questions is provided by the method of calculation of the cost-benefit analysis (CBA).

1.1. Theoretical background

The theoretical foundations of CBA emerged in Europe in the 19th century and, firstly, in France with Dupuit (2009: 203–242). However, this method was first applied in the United States with the River and Harbour Act (1902). Then it was adopted by the UK (the third London airport), other developed countries (the Horstermeer Polder in the province of

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North Holland) and developing countries (HIV preventative programme). In the 1970s some countries, like France, used less CBA and more of other methods, such as the multicriteria analysis, which evaluates the projects quantitatively but also qualitatively. However, even in these countries, the use of CBA has not disappeared (Boiteux and Baumstark, 2001). So in France, in 1982, the Loi d'Orientation sur les Transports Intérieurs (LOTI), the Inland Transport Guidance Law, was required to use CBA to evaluate transport infrastructures. Moreover, some European directives (85/337/CEE) have encouraged the use of this method.

From a theoretical point of view, it was after the Second World War, driven by studies by Krutilla and Eckstein (1958), Prest and Turvey (1965) and Marglin (1967), that articles on CBA became more frequent. According to Prest and Turvey (1965: 686), the aim of the CBA process is to “maximise the present value of all benefits less of all costs, subject to specified constraints”. This method of optimal choice, based on the criterion of maximum social efficiency, needs to include, as Brent (2006: 5) points out, “the effects of the project on all the individuals in society, not just the parties directly involved”. In consequence, it is the global feature of CBA, coupled with the criterion of economic efficiency, which selects in the last resort only the projects that maximise the sum total of utility without consideration of the distribution of this utility.

This difficulty is well known by transport economists. Button (1982: 187) thus notes the gap between the theory and the practice in taking into account distribution by CBA: “Theoretically, distributional effects can be allowed for by weighting the costs and benefits according to the different groups affected. Unfortunately, it has been demonstrated at the theoretical level that in many investment situations the applications of such weights (which may, in particular, be based upon measures reflecting income tax liability) to cost and benefit items can still lead to the acceptance of projects which benefit the rich to the detriment of the poor”. For Quinet (1998: 253), the sole way of making the compensation effective is to implement a tradable permits system like the one in the environmental domain.

The economist and philosopher, Amartya Sen (2000), also notes the ethical problem of CBA. To solve it, he suggests taking into account the individuals’ “capabilities” in the economic evaluation. Capability refers to real freedom of choice, for example the real freedom that a person has to choose a lifestyle from all the different lifestyles that he can lead. In addition to capabilities, he advocates improving the democratic character of CBA, that is to say freedom of discussion and public debate. The importance of this character has already been underlined by the recent literature on transport evaluation (Tudela et al., 2006). Consideration of public opinion shows the evolution of CBA academic literature. To exemplify, let us look briefly at the *Transportation Research: Part A* literature (see Table A.1). The appraisal of non-economic attributes in CBA is not new. For the 1980s, CBA articles have examined various items which do not relate to the market, such as human life (Kamerud, 1983), time (El-Hanawi, 2002), noise (Saelensminde, 2004), and air pollution (Eliasson, 2009). Of course, consideration of these items has been influenced by the evolution of objectives in transport policies. Indeed, the appraisal of CO₂ emissions in CBA articles is linked with environmental requirements in transport policies. Recently, CBA literature (Gao et al., 2011; Beuvers et al., 2012; Peer et al., 2012) reflects on the CBA process itself.

But, until now, the association of capabilities and democracy has never been examined. And yet, we believe that this association could be successfully integrated into the transport sector and, more particularly, in reflections on the process of the economic evaluation of transport infrastructures. Take the concept of capability. At present, the evaluation process only takes into account a *limited* number of future economic or social consequences that are generated by a transport project. This number would be increased if the concept of capability were integrated into economic calculations, as it involves taking account of the various opportunities, real or distorted, that a transport project offers to individuals. Amongst these opportunities would be having fast and reliable mobility or the opportunity to access population catchment areas and job catchment areas. Consequently, taking into account the Senian concept of capability in CBA broadens the range of criteria that are generally mobilised by this method of evaluation, without, however, questioning this method. Because they can always be monetarised, capabilities do in fact fit into the CBA’s uni-criterion logic, and not the multi-criteria logic, which means that projects are classified on the basis of different criteria, ranked according to their degree of compatibility.

1.2. Aims and scope

The solutions suggested by Sen are, in part, applied by the United Kingdom, Germany, Italy and France when evaluating transport infrastructures. France’s example is interesting in this respect. On the one hand, French legislation on evaluating transport infrastructure does require a public debate before these major projects are developed, but, on the other hand, it ignores the evaluation of opportunities for individuals regarding transport. The French case therefore highlights the discrepancy in applying the freedoms imagined by Sen: freedom of lifestyle, freedom of discussion. Why does French legislation on evaluating major transport projects have this discrepancy? Why does it not undertake a more comprehensive development of freedoms?

To underline the gap between taking capabilities and public opinion into account in French policy on evaluating transport infrastructures, we will first look at three examples which illustrate the lack of consideration of capabilities: the High Speed Rail Lines (HSRL) North Europe, the HSRL Provence-Alpes Côte d’Azur (PACA) and the “Grand Paris” Project (Section 3). Then we will examine the 2002 Local Democracy Act to show the progress – at least theoretical – of this policy on freedom of expression (Section 4). Before tackling these factual elements, we will recall how Sen understands

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