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## The measurement of indirect effects in project appraisal

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### Abstract

Imperative for growth is dominating the present economic conditions also influencing decision-making to a large extent. Therefore, the analysis of economic impacts plays a more and more significant role in the selection of transport projects. However, ex-ante project appraisal is facing an increasing problem concerning the measurement of indirect economic effects. This paper aims to investigate the accurate way of quantifying such benefits via the analysis of theoretical issues, the review of existing approaches and a case study.

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### 1. Introduction

Current economic conditions have made remarkably important to select the most profitable development projects that best support economic growth. Therefore, ex-ante appraisal of projects plays a more and more significant role in decision-making. However, direct effects of a certain project can fairly be measured, accurately capturing indirect effects faces huge challenges. Cost-benefit analysis (CBA) and economic impact analysis (also known as Gross Value Added – GVA approach) are widespread methods in project appraisal both having different perspectives, thus different deficiency as well. CBA is said to be a robust framework, although, it is not able to incorporate all the benefits, and it does not provide any information concerning the effect on GDP. Whereas economic impact analysis estimates the change in total economic activity and the impact on labour market based on different econometric models or using

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multipliers provided by input-output models. Undoubtedly, the assessment of costs, social benefits and externalities are not included.

The appropriate measurement of indirect economic impacts in project appraisal is being widely discussed among professionals, though, consensus is still need to be reached. This paper first aims at further investigating theoretical questions concerning the accurate measurement of wider economic impacts avoiding double-counting. Among others, this study concentrates on the problem of distinguishing and separating effects on GDP and welfare.

Second, this paper attempts to review the different approaches in practice regarding the appraisal of indirect effects caused by transport projects. While in many countries the concept of CBA is prevailing, elsewhere the GVA approach has been given the priority, such as recently in the UK. Moreover, like in Hungary, many analyses mix the two technics together. However, applying multipliers in cost-benefit analysis not just yields substantial impact on the benefit-cost ratio thus crucially influencing decision-making, but raises remarkable theoretical problems to be discussed.

Third, this paper analyses two methodological problems via a case study. The first one investigates the relevance of wider impacts even in the case of a small-scale project. The goal of the second calculation is to shed light on a problem concerning multiplier effects. Finally, theoretical conclusions are derived.

## 2. Theoretical and methodological issues in evaluating transport projects' wider economic impacts

The field of transport appraisal where the methodology of CBA has evolved, offers appropriate opportunity for examining general methodological problems as well. In CBA, as it has been shown by several authors (e.g. revisited by Laird et al., 2014), prices are taken equal or a broadly approximate to marginal social cost, since the underlying assumption holds that perfect competition prevails on the secondary markets. That is, CBA conceptually excludes the appraisal of secondary markets from transport analysis. However, arguments exist suggesting the reconsideration of the approach in order to enhance the measurement of indirect effects, which is crucial in the evaluation of benefits.

Accordingly, several shortcomings of cost-benefit analyses make it necessary to enrich calculations. On the one hand, many general theoretical problems exist that still need to be solved (e.g. see Nash, 2010) such as the following:

- One of the economically most important ones is connected to the distribution of costs and benefits. Having known that the same amount of benefit is theoretically considered equal irrespective of the group of the society it belongs to, the question then arises as to what stakeholders should be given the priority by a higher weighting?
- The concept of willingness-to-pay (WTP) and willingness-to-accept (WTA) can also be methodologically criticized. From the respondent's rationality and sincerity to the so-called framing effect, many aspects of stated preference methods could be disputed. In this way, many inputs of the CBA contain a huge amount of uncertainty.
- Impacts linked to raising the additional public funds needed to finance projects are definitely proved to be high. First, all public expenditure, irrespective of the sector in which it is spent, has relevant opportunity cost, as public money can especially be considered a scarce resource. While the concept of alternative cost is a well-established element of economic theory, empirical application in analyses is still need to be improved. Second, the loss incurred by society originating from raising additional revenues to finance government spending induces huge additional costs too. The concept of marginal cost of public funds (MCF) attempts to measure this deadweight loss due to the distortion of resource allocation caused by taxation, however, its practical application is also a challenging issue to further examine.
- Some politically driven arguments criticize that CBA does not provide information on economic performance or employment. However, this can hardly be the scope of such a welfare-oriented approach.
- Gaining information regarding the effects of public spending on investments seems a reasonable claim apart from politically induced motives as well. This is hardly involved in CBA. The mentioned inclusion of multiplier effect in many Hungarian CBAs, although, in not a methodologically adequate way, presumably attempts to capture this impact.
- Moreover, even the role of CBA is often questioned, whether it is supporting or proving decisions in practice.

On the other hand, concerning transport specific benefits, completely covering all benefits is a serious and relevant question. It seems that traditionally monetized benefits, such as environmental, time, accident and vehicle operating cost savings are not able to capture all the real benefits caused by transport-related investments for the whole society,

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