Regional valuation of infrastructure and transport attributes for Swedish road freight

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Abstract. Is it possible to identify regional differences among shippers in their valuation of infrastructure improvements? In this study, the question is analysed using a random utility approach, where parameters are estimated by a logit model. Data consist of a Swedish stated-preference study from 1992. The results indicate that regional differences exist, but that a considerable heterogeneity in the empirical data means that in some cases the results are not robust. However, when industrial mix, shipping distance, and goods values are held constant, the analysis still indicates the existence of regional differences. Independently of the limitations in the results, the study has implications for any infrastructure benefit analysis where parameters from spatial averages are used. The results are based on short-term decisions, and one should recognise that parameters may vary in the mid- and long-term.

JEL classification: C51, R13, R42

1. Introduction

In this paper the hypothesis of a single value of time (VOT) for road freight transportation in Sweden is tested. A corroboration of the hypothesis will support the current practice of using a single VOT in cost benefit analysis (CBA) of freight transportation by road. The counter-hypothesis is that there are different values for time of freight transportation by road, depending on where a company is located, how far the goods are to be transported, what the value is of the transported goods, and which branch of industry the producing company belongs to. VOT is defined here as the price a company would be willing to pay to avoid a one-hour increase in transportation time for an average or “typical” truck transport. Such a “typical” transport was defined by

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each company in a stated-preference survey that provided the empirical data set used in the study.

To begin, we may observe that correct estimates of the value of time are important. Such estimates are currently used in Sweden in the applied CBA of large investments in infrastructure. CBA has long been used in assessing proposals for infrastructure projects. However, regardless of the long experience we in Sweden have in calculating the benefits of infrastructure, some elements of current CBA practice are controversial, as, e.g., Mohring (1976, 1993) and Layard and Glaister (1994) have pointed out.

An important aspect of the debate concerns the relationship between benefits to traffic on the links and benefits to traffic on the nodes in space, i.e., benefits to locations such as cities, benefits to locations such as rural areas, and benefits to economic aggregates such as nations. The calculated benefits of improvements in transportation to given locations are dependent, among other things, on the values attached by passengers and shippers to such attributes as transportation time, costs, delays, and services offered. In current CBA practice, the benefits to the nation as a whole of a proposed infrastructure project are estimated in light of the extent of traffic flow and of the value of such attributes. Less emphasis is given to the distribution of benefits over the national territory or to the resulting economic impacts changes in that distribution may have.

In accordance with this approach, the current CBA practice associated with Swedish freight infrastructure planning, as well as with the national transportation policy, is based on the assumption of spatially uniform valuations of infrastructure attributes among shippers. This, despite the fact that current CBA uses different freight attribute values for different countries. Why do values differ from one country to another? They may differ owing to the data available or the model chosen for estimation, or the behavioural assumptions made in that model. However, differences in values may also reflect existing differences between countries in the underlying factors that determine the value attached to particular attributes, factors such as industrial structure, transportation distance, and transportation network structure. These factors may thus determine the value of transport-related attributes in relation to the price and attributes of other goods, inputs, services, and facilities.

This discussion has implications both for Swedish national and for European transportation policies. What values should be used in the CBA that serves as a guidance for the European transportation policy? At least three major alternatives are possible. First, CBA may be based on calculations of average valuations of transport-related attributes to be derived from a new study covering the whole of the EU. Second, it may be based on a European average of the national values (which are also averages) of individual EU countries. Third, it may be based on national values for that part of the European network that is within each nation. From this perspective, an analogous question may be raised for analyses in Sweden. Should national averages always be used, or should observed differences among regions or actors within the country be taken into account?

Having raised these questions, we can now look at what empirical studies have shown. In the natural-resource-dependent Swedish economy, figures for freight flow per capita are relatively high in the sparsely populated north. Further, preliminary estimates by Transek consultants (1992) indicated that the average value attached to freight transportation time by Swedish shippers