The Value of Travel Time Changes:
A comparison of British and Danish National Studies

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Abstract

The value assigned to travel time changes is a key input for the evaluation and comparison of transport projects. Travel time savings are usually a major part of the benefits of a project, and therefore the value of travel time changes is crucial for cost-benefit analyses. It is common practice in several countries to carry out a national study to estimate an official value of travel time changes. For that purpose, a Stated Choice experiment is typically conducted. These experiments consist of offering individuals a number of hypothetical travel choice scenarios with several travel options, asking them to reveal their preferred one. In particular, most countries adopting this practice rely on Stated Choice designs which offer only two options that implicitly contain simple trade-offs between travel time and travel cost to individuals, based on a change in travel time and a change in travel cost from their reported actual trip. This particular experimental setting has some popularity but has also been criticised for being excessively simple (Daly and Tsang, 2009). In a second stage, individuals’ stated travel choices are typically analysed employing discrete choice models. However, while there seems to be a consensus across countries regarding the Stated Choice experiment design, the modelling approaches vary. Currently, the existing works differ in several aspects, from which we should highlight the assumptions regarding the error terms (additive versus multiplicative error terms) in the utility function. Traditionally, most empirical works have relied on the assumption that errors are additive to the observable component of the utility function (e.g. UK national study). More recently, other works have replaced this assumption by the multiplicative counterpart, which in practice translates into the specification of the utility function in logarithms (e.g. Danish study). Another notorious difference is the use of advanced heterogeneity models in more recent works.

Interestingly, all national studies based on the mentioned experimental setting have revealed a number of controversial results that currently constitute key issues of research on travel time valuation. On the one hand, the impact of the size of the travel time changes considered has suggested an apparent low valuation of small travel time changes. On the other hand, the value of travel time has been found to increase with journey length due to a reduced sensitivity towards travel cost, phenomenon known as “cost damping”. It is therefore natural to question whether, and to what extent, the construction of the
Stated Choice experiment design is playing a role on those results. The choice of the modelling approach is another key issue.

Motivated by the existing evidence, we are interested in developing our understanding of the issues that surround the value of travel time changes and its estimation. This paper constitutes a first step towards this objective. Here, we compare the official studies of two countries (UK and Denmark) which made use of the same Stated Choice design and a different approach. The UK study (Mackie et al., 2003) dates from 2003 and employed a “traditional” approach, employing a model with additive error terms, working in utility space and with no advanced heterogeneity techniques. The more recent Danish study (Fosgerau, 2006, 2007; Fosgerau et al., 2006), worked in logarithms and willingness-to-pay space and made use of advance heterogeneity techniques. The approach followed here is to apply their different modelling approaches to the two datasets separately. Therefore, we first construct two models that resemble the UK and the Danish selected models. These two models are then applied to the UK and the Danish datasets. The main outcome of the empirical work is a table with the results of the four possible combinations (where two of them approximate the results employed for the official values of travel time in the respective countries).

First, the analysis within countries allows us to compare the two approaches, which is an interesting task. This reveals differences in the value of time estimates between both approaches and in the treatment of the key issues around the value of travel time changes. Secondly, and perhaps more importantly, the comparison across countries highlights similarities in the key outputs of both models when applied to the different datasets; especially, in the estimates that determine the influence of the size of travel time changes and the current travel cost reported by the individuals. Overall, our research provides new evidence on the comparison of two popular approaches for valuing travel time and leaves a number of open questions on the nature and impact of the Stated Choice design.
References


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