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Travel Demand and Value of Time - Towards and Understanding of Individuals Choice Behavior

ABSTRACT

The specific purpose of this thesis is to inquire into problems related to the valuation of travel time savings. The thesis consists of an introductory overview and four papers. In the first two papers we focus on the possibility to obtain value of time estimates from travel mode choice models while in paper three and four we investigate how individuals respond to hypothetical questions.

The first paper tries to shed some light on whether or not the traditional multinomial logit model of travel mode choice can provide unbiased value of time estimates. With the traditional multinomial logit model we refer to a model in which the indirect utility function only includes travel time and travel cost as explanatory variables; the parameters of that function are assumed to be constant and the error terms are assumed to be independently and identically Gumbel distributed. We review the literature on travel demand modeling as well as the literature on decision making both on its own and in relation to travel behavior modeling. The conclusion we draw is that with the traditional specification the error term contains significant explanatory variables. Therefore, the assumptions regarding the error terms are likely to be violated which implies that the parameter estimates are probably biased.

The second paper is concerned with the specification of the systematic part of the utility function in a multinomial logit model of travel mode choice. Specifically we investigate whether differences in the appreciation of quality aspects such as safety (i.e. accident risk reduction) and reliable travel explain some variation in the time parameter for train and airplane users. In the estimation we compare the results from a multinomial logit model where a segmentation approach is used with those from a model where uniform parameter values are assumed. In addition, we compare the results from these models with those obtained from a random parameter logit model. The estimation results strongly suggest that, at least in our choice context, we can explain much of the variation in the value of saving travel time by accounting for the fact that other aspects, such as safe and reliable travel, influence the choice of travel mode.

Paper three in this thesis studies individuals' choice behavior when answering a hypothetical question regarding choice of travel mode. We investigate if individuals' choices, when confronted with an improvement of the train mode, can be explained with reference to their preferences and the circumstances of their previous journeys. In addition to the investigation into the determinants of travel mode choice, we explore whether or not previous experience of using train influences the choice behavior and the willingness to pay for the proposed comfort improvement of the train mode. The results reveal that past experience influences the choice behavior in both situations.

The fourth paper compares the response behavior and the value of time estimates obtained from two groups that received different hypothetical treatments. The treatments differ in context presented to the respondent: one treatment provides the respondent with several details about the choice, whereas the other is more parsimonious regarding such details. The response format of the questions also differs between the two treatments. Our results reveal significant differences in choice behavior between the two groups that we expect can be attributed mainly to the differences in context. These differences are similar to those previously observed between SP and RP data, i.e. the choice behavior of the group that received more information seem to be greatly influenced by other factors than the bid.

Keywords: Value of travel time, Non-market valuation, Random utility, Revealed preference, Stated preference, Taste heterogeneity, Heuristics, Hypothetical bias

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