

Use of internet panels versus en-route recruitment in value-of-time estimation

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Recently, a large project was undertaken to update the official values of time in both passenger and freight transport in the Netherlands and to deliver the first values of reliability based on an empirical foundation. This project has recently been completed.

To determine the passenger values of time (VOTs), more than 5,000 members of an existing on-line panel were interviewed using computerised stated preference interviews in November 2009. Specific target numbers of interviews were set (and reached) for: transport mode used (car, train/metro, bus/tram, airplane and recreational navigation), travel purpose (commuting, business, other), time-of-day (peak, off-peak) and presence of transfers (public transport only).

All respondents for passenger were drawn from an existing internet panel. This was the largest on-line panel of The Netherlands (240.000 participants), and with an expected response of around 40% large enough to cover all segments. Within each segment, the sample was drawn to be representative for the Dutch population in terms of income, job participation, age, gender and region (different access to internet is taken into account here).

The distribution over the segments does not have to be representative for the Dutch population or the distances travelled in The Netherlands. The target number of interviews per segment is based on the number that is minimally required for good and reliable model estimation and for the different values of time that this research should deliver at the end. As a result of this, while outcomes per stratum can be used directly, an expansion/re-weighting is required for outcomes over several or all segments (e.g. on the basis of national travel survey).

The market research firm invited members of its own on-line panel (in various survey waves) to participate in the survey, which could be started by clicking on a weblink. The members received a reward for successfully completing the interview (equivalent to €1.50).

All respondents were asked which modes they had used in the past three months, for which travel purpose, whether peak or off-peak, and how often they had made an interchange (for public transport). This was used to allocate respondents to questionnaires for specific segments, in particular where the interview target had not been reached yet.

Initial results for the values of time from models estimated on the 2009 survey were found to be implausibly low. One possible explanation was the sample of respondents obtained from this internet panel being biased with respect to their value of time. Within each segment (socio-economic, trip purpose, trip length, mode), the respondents that participate in such an online panel (which takes time, for a rather low monetary reward) might have a lower VOT than non-participants. Even after expansion, the resulting values of time would then be lower than the true values of time.

To investigate this hypothesis, another data set was collected in the first half of 2011. This consists of almost 1500 respondents recruited at petrol stations, parking garages, train stations, bus stop, airports and ports. This is the same recruitment method as used in earlier national value of time surveys of 1988/1990 and 1997/1998. Persons willing to participate were asked to answer an internet questionnaire, which was (almost) identical to the questionnaire used in 2009. We only asked one additional question to determine whether they were a member of an internet panel.

We estimated multinomial logit models (including advanced MNL models that yield a higher VOT for higher base time and cost levels and smaller VOTs for smaller changes in time and cost; also including socio-economic interaction terms), with separate values of time factor for panel members and non-panel members. Especially for the commute and business segments (car, train, bus, tram, metro), we found significant lower values for panel members than for non-panel members, even after correcting for the different distributions for the travel time and travel cost, and after inclusion of the socio-economic interactions. Results from panel latent class models will be presented as well.

We have similar findings for the airplane segment. For the other purposes segment (car/train/BTM) and the recreational navigation segment, we did not find any significant difference between panel and non-panel members.

We conclude that in the 2009 survey there was a bias towards low-VOT people, who are willing to give up time to participate in an internet panel and to fill out web questionnaires for a rather small reward.

The resulting values of time from the 2011 survey are much more in line with the values found on the basis of the earlier surveys in 1988 and 1997, which have always been regarded as very plausible values by the various transport sectors, and are not considered to be particularly high in an international perspective.

Our conclusion is that the most likely explanation is that the 2011 values are correct and that the 2009 values are biased downwards, mainly because persons with a lower value of time (in every socio-economic segment) have a higher probability of becoming a member of an internet panel.