

Hypothetical biases in the value of waiting time

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Research question & background

The value attached to reductions in waiting time (in short, “value of waiting time”) is a crucial ingredient in the design and appraisal of public transport networks. So far, valuations of waiting time have mostly been derived from stated preference surveys. In this study, we investigate hypothetical biases in the value of waiting time by comparing stated and revealed values attached to waiting time, both of which are derived in a controlled lab experiment. We shed light on the origin of these biases (in particular, the role of scheduling constraints) and effective ways of mitigation. The study results will not only inform future studies on the value of waiting time, but will also generalize to stated preference experiments that concern other scheduling-related attributes.

Design

The experimental measurement of the value of waiting time was a part of a larger experiment which also measured risk and time preferences and cognitive function of our student subjects. The experiment consisted of 8 experimental sessions scheduled to finish in the late afternoon after the end of all university classes. The measurement of the value of waiting time was at the end of each session. It was conducted using a multiple price list in which students had to make 80 choices between going home directly after the end of the experimental session, but earning no additional money to what they earned in the previous parts of the experiment, or waiting for a specific time after the end of the experimental session and earning a specified monetary compensation for it. Before the measurement, students had to complete a questionnaire asking them about their plans they had for the evening after the experiment. This way, we were not only able to measure their scheduling constraints, but also encouraged them to think about their opportunity costs before they were asked to value their time after the experiment.

The experiment was conducted with a total number of 149 subjects with 4 pairs of hypothetical and incentivized sessions run at the same time. In the incentivized treatment, one of the 80 choices was randomly selected and if waiting was chosen, the student remained in the lab for the specified time and received the stated compensation for it. In the hypothetical treatment, students were informed that none of the choices will be implemented, so they will be free to leave the lab directly after the experimental session and receive no additional money.

Preliminary results

The value of waiting was estimated using random effects models for panel data on a dataset of 149 respondents as well as on subsets consisting of 73 students with scheduling constraints and 76 students without scheduling constraints.

The average hourly values of the hypothetical and incentivized waiting time are \$7 and \$9, respectively. The resulting hypothetical bias of \$2 is substantial (hourly income of students is \$4–5) and highly statistically significant. In addition to that, we find that the hypothetical bias is mainly driven by respondents with scheduling constraints, while for students without scheduling constraints no significant hypothetical bias is evident.

Furthermore, we limit the analysis to respondents with scheduling constraints and find that the hypothetical bias is mainly driven by respondents who have a low score at the coding speed test: the hypothetical bias for the 34 students with below average coding speed score equals to \$5.5 and is statistically different from zero, while the bias for the 39 students who scored above average in the coding speed test is not statistically different from zero.

This implies that the hypothetical bias found in our data is mainly driven by people who would need to make important changes to their plans, if they had to wait in the lab after the experiment, but who also seem to be less able or willing to think about the consequences of these changes in a hypothetical setting.