

WILLINGNESS-TO-PAY FOR EXPRESSWAYS

by

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ABSTRACT

This study is about the willingness-to-pay (WTP) for an expressway service. For eliciting WTP, we have used a part of large scale congestion pricing survey and asked seven hypothetical questions to respondents who were users of the Hanshin Expressways networks. The questions asked respondents to choose between a toll road and surface streets with different travel times, travel time variability. A certain constraint about the arrival time at the destination was imposed. We used prospect theoretic concepts of reference time point as the zero asset position in place of the coupling time; and with respect to the reference point a late arrival is indexed as a loss, an early arrival is indexed as a gain. Using reported WTP, we have conducted different regression models in order to evaluate different hypotheses. To do so, we have divided the regression analyses into two groups with the first group comprised of the general regression analyses used for open-ended valuations, i.e., multiple regression and log-linear regression analysis. The second group of regression analyses, i.e., the stochastic frontier and Tobit regressions, bears the hypotheses that the reported WTP is a bit lower than the real WTP and for the expressway there is a upper limit capacity value which is similar to willingness-to-accept (WTA).

The first hypothesis is derived by a consideration that respondents might have a concealment value, which is the difference between real WTP and the reported WTP. We believe that it is generally lower than the real WTP and locate this hypothesis by using the stochastic frontier regression model. The results of the stochastic regression analysis support the existence of concealment value. As future research, we conclude that complex and flexible models to locate different concealments in different settings and an explicit frontier are needed. In this regard, explicit frontier might be the responds given to the alternative that bears the most loss or pure loss.

The second hypothesis is derived from the economic literature on equivalent and compensating variations, which refer to different valuations in welfare gain and welfare loss settings. The capacity value that might be similar to the WTA in the context of the welfare gain is assumed to be the upper limit for the Tobit regressions. In this regard, two capacity values have been employed; they are the values of 75th percentile and 90th percentile of the responds to the pure loss question presented to the respondents. As a result of the regression analyses, it is found that the best model is the Tobit model using the 90th percentile of the WTP values of the pure loss question.

Generally in the regression analyses, it has been found that the risky alternatives are ranked by WTP values proportional to their risk levels; in other words, a high risk level displays high WTP. Commuters who use the expressway everyday value the use of it higher than commuters who use the expressway two or three times a week. Females generally value the highway higher than the males.

Apart from the regression analyses, in the early sections preliminary analyses based on paired t-tests suggest that the gains decrease significantly at a distant position from the reference time point (coupling time) than a near location. Although similar inference cannot be found in the loss region, we have found that the loss is significantly higher than the gain for a similar interval in both of the gain region. The findings are supportive of the prospect theory in the context of route choices based on travel time variation and coupling time.