



EXERCISE SESSION 7

We have estimated a *binary logit* model for a route choice problem with two alternatives: the *highway* and the *peripheral* road. The deterministic parts of the utility functions of the two alternatives are specified as follows:

$$V_{highway} = ASC_{highway} + \beta_{time} \cdot time_{highway} + \beta_{cost} \cdot Toll_{highway} \quad (1)$$

$$V_{peripheral} = \beta_{time} \cdot time_{peripheral} + \beta_{cost} \cdot Toll_{peripheral} \quad (2)$$

where *time* is the travel time in minutes and *Toll* is the price of the toll in CHF. The parameters that we obtained are shown in Table 1.

Table 1: Estimated parameters for the binary logit model.

parameter name	value
$ASC_{highway}$	-0.5
β_{time}	-0.75
β_{cost}	-5

Exercise 1 Consider one individual for whom the attributes of the two alternatives are given in Table 2 and compute the following:

1. the utilities of the two alternatives;
2. the probability of each alternative to be chosen by the individual;
3. the disaggregate *direct* elasticities of the probability of the two alternatives with respect to travel time;
4. the disaggregate *cross* elasticities of the probability of the two alternatives with respect to travel time;
5. the value of time of this individual. Interpret the result.

Table 2: Attributes of the alternatives for one individual in the sample.

alternative	travel time (min)	toll (CHF)
<i>highway</i>	20	1.5
<i>peripheral</i>	35	0

Exercise 2 Consider the same individual as in Exercise 1. Assume now that the authorities decide to increase the toll by 0.5 CHF. What will be the impact of this increase in toll on the individual's surplus?

mbi/ ek/ afa / mp