

Choice with multiple alternatives – 5.2

Specification of the deterministic part

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Practice quiz: model

1 Model specification

Your colleague has specified a mode choice model with the following utility functions:

$$U_{\text{walk},n} = \text{ASC}_{\text{walk}} + \beta_{\text{distance}} \cdot \text{distance}_n + \varepsilon_{\text{walk},n} \quad (1)$$

$$U_{\text{bicycle},n} = \text{ASC}_{\text{bicycle}} + \beta_{\text{distance}} \cdot \text{distance}_n + \varepsilon_{\text{bicycle},n} \quad (2)$$

$$U_{\text{car},n} = \text{ASC}_{\text{car}} + \beta_{\text{time}} \cdot \text{time}_{\text{car},n} + \beta_{\text{cost}} \cdot \text{cost}_{\text{car},n} + \varepsilon_{\text{car},n} \quad (3)$$

$$U_{\text{bus},n} = \beta_{\text{time}} \cdot \text{time}_{\text{bus},n} + \beta_{\text{cost}} \cdot \text{cost}_{\text{bus},n} + \varepsilon_{\text{bus},n} \quad (4)$$

Answer the following questions:

1. Define the universal choice set \mathcal{C} .
2. Assuming that an individual n does not have a bicycle, what is the size of her choice set?
3. Write down the deterministic part of the utility of each alternative i in the choice set \mathcal{C} .
4. What type of model has your colleague used? Choose *one* of the options provided below:
 - logit,
 - probit,
 - I don't know.

2 Model parameters

Your colleague has estimated the parameters of the model presented in the previous step. The values of the estimates are shown in Table 1.

Parameter	value
ASC_{walk}	-2.42
ASC_{bicycle}	-3.62
ASC_{car}	-4.55
β_{distance}	-4.53
β_{time}	-2.76
β_{cost}	0.25

Table 1: Estimation results

Answer the following questions:

1. According to the estimation results, the higher the travel time of an alternative, the higher its utility.
 true,
 false.
2. According to the estimation results, the higher the travel cost of an alternative, the higher its utility.
 true,
 false.
3. According to the estimation results, the higher the travel distance of an alternative, the higher its utility.
 true,
 false.
4. Are the answers to questions 1, 2 and 3 consistent with common behavioral assumptions? Why?