



HOMEWORK WEEK 3

In a case study of transportation mode choice, the parameters of the utility functions have been estimated as follows:

$$U_{1n} = 1 - 0.03 \cdot tt_{1n} - 0.06 \cdot c_{1n} + 0.5 \cdot \text{income}_n + \varepsilon_{1n}$$
$$U_{2n} = -0.02 \cdot tt_{2n} - 0.0375 \cdot c_{2n} + 0.5 \cdot \text{university}_n + \varepsilon_{2n}$$

where tt_{in} is the travel time in minutes and c_{in} is the cost in CHF for respondent n , with $i \in \{\text{car}, \text{train}\}$. income_n takes value 1 if the respondent's monthly income is larger than 6000CHF and 0 otherwise, and university_n takes value 1 if the respondent went to the university and 0 otherwise. $\varepsilon_{1n}, \varepsilon_{2n} \stackrel{iid}{\sim} \text{EV}(0, 1)$.

Which of the following specifications are equivalent to the proposed one?

1.

$$U_{1n} = -0.03 \cdot tt_{1n} - 0.06 \cdot c_{1n} + 0.5 \cdot \text{income}_n + \varepsilon_{1n}$$
$$U_{2n} = 1 - 0.02 \cdot tt_{2n} - 0.0375 \cdot c_{2n} + 0.5 \cdot \text{university}_n + \varepsilon_{2n}$$

2.

$$U_{1n} = -0.03 \cdot tt_{1n} - 0.06 \cdot c_{1n} + 0.5 \cdot \text{income}_n + \varepsilon_{1n}$$
$$U_{2n} = -1 - 0.02 \cdot tt_{2n} - 0.0375 \cdot c_{2n} + 0.5 \cdot \text{university}_n + \varepsilon_{2n}$$

3.

$$U_{1n} = 1 - 0.03 \cdot tt_{1n} - 0.06 \cdot c_{1n} + 0.5 \cdot \text{income}_n - 0.5 \cdot \text{university}_n + \varepsilon_{1n}$$
$$U_{2n} = -0.02 \cdot tt_{2n} - 0.0375 \cdot c_{2n} + \varepsilon_{2n}$$

4.

$$U_{1n} = 1 - 0.03 \cdot tt_{1n} - 0.06 \cdot c_{1n} - 0.5 \cdot \text{university}_n + \varepsilon_{1n}$$
$$U_{2n} = -0.02 \cdot tt_{2n} - 0.0375 \cdot c_{2n} - 0.5 \cdot \text{income}_n + \varepsilon_{2n}$$

5.

$$U_{1n} = 1 - 0.03 \cdot tt_{1n} - 0.06 \cdot c_{1n} + 0.5 \cdot \text{university}_n + \varepsilon_{1n}$$
$$U_{2n} = -0.02 \cdot tt_{2n} - 0.0375 \cdot c_{2n} + 0.5 \cdot \text{income}_n + \varepsilon_{2n}$$