Choice with multiple alternatives – 5.2
Specification of the deterministic part

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Practice quiz: qualitative variables

Consider a mode choice model between car and metro. The specification includes an alternative specific constant for metro, the travel time for each alternative, and the level of comfort for metro. The level of comfort is a discrete variable that can take four values: *very comfortable*, *comfortable*, *rather comfortable* and *not comfortable*. Using the level *very comfortable* as the base case, it is included in the utility function through three dummy variables $z_{\mathrm{c},n}$, $z_{\mathrm{rc},n}$ and $z_{\mathrm{nc},n}$ defined as follows:

Level of comfort for n	$z_{\mathrm{c},n}$	$z_{\mathrm{rc},n}$	$z_{\mathrm{nc},n}$
very comfortable	0	0	0
comfortable	1	0	0
rather comfortable	0	1	0
not comfortable	0	0	1

The model specification is

$$\begin{aligned} V_{\mathrm{car},n} &= \beta\mathrm{time} \cdot \text{Travel time}_{\mathrm{car},n} \\ V_{\mathrm{metro},n} &= \mathrm{ASC}_{\mathrm{metro}} + \beta\mathrm{time} \cdot \text{Travel time}_{\mathrm{car},n} + \beta_{\mathrm{c}} \cdot z_{\mathrm{c},n} + \beta_{\mathrm{rc}} \cdot z_{\mathrm{rc},n} + \beta_{\mathrm{nc}} \cdot z_{\mathrm{nc},n}. \end{aligned}$$

The estimates of the parameters are

- $\mathrm{ASC}_{\mathrm{metro}}$: 0.55,
- β_{time}: -0.231,
- β_{c}: -0.90,
- β_{rc}: -1.00,

- β_{nc}: -2.00.

Consider now the exact same model, where the level *comfortable* is considered as the base case for the comfort variable.

1. Define the dummy variables and their coding.
2. Write the model specification.
3. Provide the estimates of the parameters.