

Multinomial Choices

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Exercise 1 Data Description

We consider the data “margarine” in the library `bayesm`, which is Household Panel Data on Margarine Purchases. A formal description of the data is available . Provide some descriptive evidence on the data.

- Average and dispersion in product characteristics.
- Market share, and market share by product characteristics.
- Mapping between observed attributes and choices.

Exercise 2 First Model

- We are interested in the effect of price on demand. Propose a model specification.
- Write the likelihood and optimize the model.
- Interpret the coefficient on price.

Exercise 3 Second Model

- We are interested in the effect of family income on demand. Propose a model specification.
- Write the likelihood and optimize the model.
- Interpret the coefficient on family

Exercise 4 Marginal Effects

Compute and interpret the marginal effects for the first and second models.

Exercise 5 IIA

In this section, we are interested in testing the properties of IIA. We consider the mixed logit setting.

- We are still interested in the effect of price and family income. Write and optimize the likelihood of the mixed logit. Denote by β^f the estimated coefficients.
- Consider an alternative specification, where we remove data from one choice. Estimate this model as well, and denote by β^r the estimated parameters.
- Compute the test statistics:

$$MTT = -2 [L_r(\beta^f) - L_r(\beta^r)] \sim \chi^2(||\beta^r) \quad (1)$$

- Conclude on IIA.