Econ 613: Applied Econometrics

Assignment 2: Multinomial Choices

Due on March 24th at 11 pm EST.

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 (price).
- Market share (choice frequency) and market share by product characteristics (choice frequency by price bins: below average, over average).
- Illustrate the mapping between observed attributes and choices. (Which customers are choosing which products?)

Exercise 2 First Model

- We are interested in the effect of price on demand. Propose a model specification. Please include a constant!
- 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:

$$MTT = -2\left[L_r(\beta^f) - L_r(\beta^r)\right] \sim \chi^2(||\beta^r) \tag{1}$$

- Conclude on IIA.