

Homework 1 – Estimating a Logit Model

(Due Monday Feb. 7th in class)

The objective of this homework is to learn how preference for brands and price influence customer decisions. For this we have information about household purchase data in one category where 2 major brands are competing. The retailer sets the price for each of these brands and each individual consumer makes a choice during each purchase trip. The data includes exactly 10 purchases per household.

For this homework you are required to:

- 1) Write the probability that each individual household makes a purchase of any of the brands in a particular purchase trip assuming the error term is distributed double exponential. Hint: Start writing the random utilities and specify any distributional assumption.
- 2) Write the complete data likelihood
- 3) Estimate the model. You can use the R code provided in class or use your favorite statistical software.
- 4) Interpret the results. Which brand (if any) is preferred? What about price sensitivity?

Dataset description:

The data set contains 5 columns and 3,000 rows. Each row represents one purchase trip for a particular household and has the following structure:

Customer Id purchase number choice price1 price2
where

- Customer id : household id (1-300)
- Purchase number: the cardinal number of the purchase for the household (1-10)
- choice : the chosen brand (1-2)
- Price1-Price2: the prices of products 1 and 2 at the time of purchase