

ECON 321, Assignment 10:

BP, Chapter 5: 5.4 The Logit Model

1. Skim Section 5.4.1. It gets a bit too technical for our purposes. What we need is just that there exists a random error distribution that produces a nicely behaved demand function based on the average utility \bar{v}_i that consumers receive from good i for goods $i = 1 \dots n$.

2. Now for Section 5.4.2, which is going to be a very short but difficult read. All this assignment asks you to do is take it line-by-line.

We take it as given, from part (1), that the α_i demand function exists. We define the mean utility of product i as given. It will help you to read this to remind you that ξ is the Greek letter xi, pronounced usually like “sigh” in economics. Also, that little thing in front of p_i is a gamma.

Now here’s the fun: show that $\log \alpha_i - \log \alpha_0$ really does equal what it says. I know, it seems like it would be too hard to do, but the magic of cancellations with the exp function makes it surprisingly easy. Don’t forget $\bar{v}_0 = 0$ by assumption.

So that’s demand. For supply, we need each firm to profit maximize. Read the rest of the section, writing down the profit function, the FOC, and the price. They’re all there, but you’ll need to write this down line-by-line to understand it.

3. Finally, read Section 5.4.4. We won’t need the formula, but make sure you understand the idea of the nested logit.