Estimation of Demand Model 4

BLP Approach 4 –Welfare Analysis and More Applications–

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Announcement 1 (/3): Course plan

- 12/3: Demand estimation 4
- 12/10: No lecture
- 12/17: Estimation of Dynamic Models 1
- (online make-up lecture): Estimation of Dynamic Models 2
  - will be available by 12/24
- 1/7: Student Presentation 1
- 1/14: Student Presentation 2
- 1/21: No lecture
- 1/28: Student Presentation 3

- PS 4 (demand estimation) due by **12/21** (submit to the mailbox in my office)
- PS 5 (dynamic estimation) due by 1/28

Announcement 2 (/3): Student Presentation

- See guideline posted on my website.
- I will send a google spread sheet where you can put (1) paper to be presented and (2) preferred date of presentation. Please do so by 12/10.
- I will announce a schedule of student presentation on 12/17.

Announcement 3 (/3): Seminar and Conference

- 12/13: Lecture and seminar by Pol Antras from Harvard
  - Theory and empirics in international trade
  - Lecture for (undergraduate) students: 10:40-12:10 @ Room 701
    - Title: Global Value Chains: The Economics of Spiders and Snakes
  - Seminar: 13:00-14:30 @ Room 710
    - Title: On the Geography of Global Value Chains
- 12/22: CREPE Conference on Program Evaluation at University of Tokyo
  - Empirical studies in microeconomics (health, labor, IO, development, etc)
  - Excellent lineup of speakers!
  - `http://www.crepe.e.u-tokyo.ac.jp/events/event20181222.html`

Introduction

1. Welfare analysis using demand model
   - framework in discrete choice models

2. One more application: Doi and Ohashi (2017, IJIO)
   - Evaluation of the JAL-JAS merger in 2002 in the Japanese airline industry
   - Nested logit demand model
   - Endogenous product characteristics.

Consumer Surplus under Discrete Choice Framework

- Consider the utility from alternative j

$$U_{nj} = \underbrace{\alpha_n p_j + \beta X_j}_{\equiv V_{nj}} + \epsilon_{nj}$$

  - α_n is the marginal utility of income
  - Note: We assume quasi-linear utility. α_n is independent from individual income.

- The expected consumer surplus is

$$E[CS_n] = \frac{1}{\alpha_n} E_{\{\epsilon_{nj}\}_j} \left[\max_j (V_{nj} + \epsilon_{nj}) \right]$$

- Small and Rosen (1981) show that under the logit-error structure

$$E[CS_n] = \frac{1}{\alpha_n} \log \left(\sum_{j=1}^{J} \exp(V_{nj}) \right) + C$$

where C is the constant. This is irrelevant in policy evaluation.

Consumer Welfare with Income Effects

- Herriges and Klings (1999, REStat), McFadden (1995)
- Let $U_{nj} = U(y_n - p_j, X_j, \epsilon_{nj})$. Consider the price change from p^0 to p^1 where $p^1 < p^0$
- Consider compensation variation CV_n.
- Approach 1 (ex-ante): CV_n is given by

$$E[\max_j U(y_n - p_j^0, X_j, \epsilon_{nj})] = E[\max_j U(y_n - p_j^1 - CV_n, X_j, \epsilon_{nj})]$$

- Approach 2 (ex-post): Draw $\{\epsilon_{nj}^{(k)}\}_j$ for $k = 1, \cdots, K$
  1. Get $CV_n^{(k)}$ by solving

$$\max_j U(y_n - p_j^0, X_j, \epsilon_{nj}^{(k)}) = \max_j U(y_n - p_j^1 - CV_n^{(k)}, X_j, \epsilon_{nj}^{(k)})$$

  2. Obtain $CV_n = K^{-1} \sum_k CV_n^{(k)}$.