Welfare or Well-Unfair: Incorporating Heterogeneous Income Into Normative Analysis

Nathan Mather

University of Michigan

2019

Outline

1. Show (or remind) us why typical welfare estimations are an imperfect tool for normative economics

2. Outline the general goal of what I hope to do

3. Show the idea of a method for Micro BLP type estimation

Motivating Example

(a) A Banana

(b) Jeff Bezos

(c) Me

Motivating Example

- Who should get the banana?
- Economists often use "How much are you willing to pay?"
- Jeff -"I mean it's one banana Nathan. What could it cost, $10? look I'd pay $100"[1]
- Nate - "I missed lunch and am really hungry, I would pay $5"[2]
- Who get's more welfare from the banana? Does Jeff get 20 times more welfare?
- Traditional Econ 101 essentially says yes

[1] Not an actual quote

[2] Also not an actual quote.

Justification For Willingness to Pay

- We are Maximizing the size of the "pie" and we can redistribute later
  - While this may be true in some sense the pie is typically not redistributed
- We are getting a sense of the "cost" of a policy and then the reader can decide which is better based on equity concerns
  - The equity trade off is pretty clear in the banana example
  - What about more complicated policies impacting various groups?

More Complicated Examples

- Deciding between a tax on rice and caviar
- Allowing a merger that raises the price of low quality goods but lowers price and cost of high quality goods
- Deciding on health-care mandates, subsidies or restrictions
- Replacing old technology with new
- In these examples the normative equity trade-offs are more burdensome for the reader

Main Goal

- Reduce the number of comparisons we leave to the reader
- i.e. reduce the dimensionality of the problem
- Make these policy trade-offs more comparable to the banana problem
- Create Normative parameter to capture the Equity Trade-off

Informing a Normative Choice

- Use something like the following:
  - For which X would the following make roughly the same difference? One thousand dollars to a family with an income like yours, or X dollars to a family with half your family's income?
- Provides us with a way to translate surplus from a given individual into a subjective welfare measure incorporating income
- Outcome is normative (as it shouold be)
- We can provide welfare analysis for a menu of different responses and report them back

Basic Idea

Let CS = Consumer Surplus, $D(i)$ = demand for consumer i, P = Price, K = Number of consumers, $\bar{M}$ = mean income, I_i = Income, W = Welfare

Discrete consumer surplus could be calculated like so:

$$CS = \sum_{Q=1}^{K} (D(i) - P)$$

But, from the answer to our above question we can derive a willingess to pay to "welfare" weights

$$N(i) = \frac{\bar{M}}{I_i^2}$$

Now we can derive a truly normative metric for welfare

$$W = \sum_{Q=1}^{K} (D(i) - P) \cdot \frac{\bar{M}}{I_i^2}$$

BLP Idea

- $\mu_{ij} = U_{ij} + \epsilon_{ij}$, $\mu_{i0} = \epsilon_{i0}$
- ϵ_{ij} i.i.d. $\sim$ type-1 extreme value distribution
- U_{ij} is linear in price with coefficient α_i

Now we can get compensating variation as

$$CV_i = \frac{V_i^1 - V_i^0}{\alpha_i} N(i)$$

where

$$V_i = ln(1 + \sum_{j=1}^{J} e^{U_{ij}})$$

Now we can take the expecation of this over observable demographics (including income which impacts our weights) and unobservable taste shocks

Discussion

- Welfare results are no longer in dollars. Only meaningful up to a normalization
  - I would argue this isn't as bad as it sounds
  - Everything is relative (Policy A vs what?)
  - Surplus is in dollars but the quantities are hard to wrap our heads around without a comparison to another market/policy anyway
- The weights will have to rely on parametric assumptions of preferences for equity
  - The current approach also relies on a parametric assumption that willingness to pay = welfare

Discussion

- We also care about other metrics like consumption, wealth, or health
  - Given the data, we could incorporate these issues as well
- Connection between willingness to pay and welfare may differ between different goods
  - In health-care, willingness to pay is basically ability to pay

Possible Paper Paths

- Rerun the analysis of past Micro BLP papers using this technique
- Try to estimate weights using exogenous shocks to income
- Tie the weights to a verifiable policy outcome. Like a target intergenerational transmission.

Thank You