Calibrating OG-India: Bequests

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Why do we need to model bequests?

- Accidental
  - Where do resources go when a household dies with savings?
- Intentional
  - How are resources transmitted across generation?
  - This can be important for wealth concentration

Bequests in theory

- The bequests show up in the budget constraint:

$$c_{j,s,t} + b_{j,s+1,t+1} = (1+r_t)b_{j,s,t} + w_t e_{j,s} n_{j,s,t} + \zeta_{j,s}\frac{BQ_t}{\lambda_j \omega_{s,t}} + \eta_{j,s,t}\frac{TR_t}{\lambda_j \omega_{s,t}} - T_{s,t}$$

- and the first order condition for the household's choice of savings:

$$(c_{j,s,t})^{-\sigma} = \chi^b_j \rho_s (b_{j,s+1,t+1})^{-\sigma} + \beta(1-\rho_s)\Big(1 + r_{t+1}\big[1 - \tau^{mtry}_{s+1,t+1}\big]\Big)(c_{j,s+1,t+1})^{-\sigma}$$
$$\forall j,t, \quad \text{and} \quad E+1 \leq s \leq E+S-1$$

Bequests in theory

- The parameter χ_j^b determines the utility agents get from leaving bequests
  - This is a what's called a "warm glow" preference
  - They derive utility from both intentional and unintentional bequests
    - Note that the utility from unintentional bequests is discounted by the survival probability, so a young household doens't have a strong incentive to save due to bequests
  - The subscript j denotes that the parameter may vary by lifetime income group

Bequests in theory

- The total amount of bequests are determined endogenously in the model
- What is exogenous to the model is how thoese bequests are transmitted across generation
- The model households are not linked across generations (i.e., we don't know which households were born to other households)
- Thus we represent the bequest transmission process in the following way:
    - Determine aggregate bequests in period t
    - Allocate these bequests across housholds of different ages and lifetime income groups according to the empirical distribution of bequests
    - This distribution is given by the ζ matrix

What do we want to estimate?

- We want to estimate the ζ matrix, with elements $\zeta_{j,s}$
- Each element of the ζ matrix represents the fraction of total bequests going to agents of a particular age and lifetime income group.
- Thus, it must be the case that:

$$\sum_J \sum_S \zeta_{j,s} = 1$$

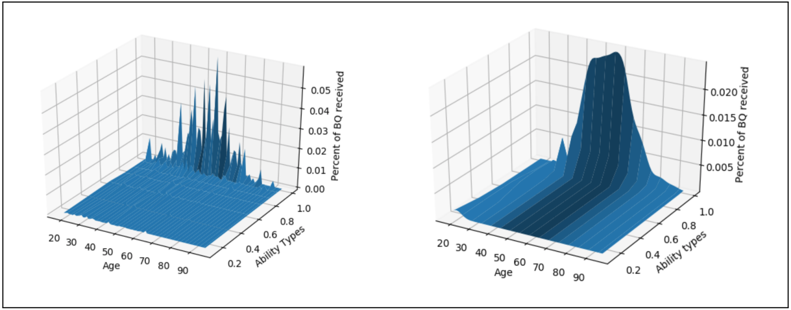
Data requirements

- Bequests received by age and income
  - Ideally, we want by age and lifetime income group
  - This would data noted in the process for calibrating lifetime income profiles
- From these data we can compute the share of total bequests going to each age and income group

Estimation

- To identify each $\zeta_{j,s}$, we can compute the share of total bequests going to each age and income group
- But the data are noisy and this can give some large outlying values
- We thus smooth out the means for each age and income group computed from the data with a kernal density estimator (KDE)

Kernal density estimates



Bequest Processes in OG-India

- There are two parameters that determine how bequests are transmitted across generations:
  1. `use_zeta`: whether ot use the ζ matrix or to distribute bequests within an ability group
  2. `zeta`: the ζ matrix, the fraction of transfers going to each group
- The default values of these are in `default_parameters.json`
- But either can be changed by the user passing new values in a dictionary when running the model

How should we calibrate ζ with Indian data?

Challenges:

- There doesn't seem to be great (any?) data on bequests
- Proposal: Assume bequests remain in same lifetime income group