Calibration of Household Consumption Parameters in the OLG Dynamic Scoring Model

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Abstract

This note outlines the process to calibrate the parameters of the households' preferences over consumption goods.

Step 1: Acquire the Consumption Data

Download the Consumer Expenditure Survey (CEX), years 2000-2013. You can find the data here: http://www.bls.gov/cex/pumdhome.htm. You will want to use Stata to manipulate the data, so please download the Stata data files. Also get the codebook(s) that accompany the data.

Step 2: Format the Data

Once you have each year's file, please append them together in one pooled cross-sectional dataset.

Next, put all the dollar amounts in constant, year 2013 dollars. Do this using the consumer price index (CPI). You can find the CPI deflators here: http://research.stlouisfed.org/fred2/series/CPIAUCSL (using the deflator for all items is fine for now). When doing this, you'll want to loop over the a list of variables in Stata to make the code more efficient.

I'm not sure of the data, but if there is not a variable for total household income (e.g., the sum of wage and capital income), please create that.

Step 3: Create Consumption Categories

Next, create consumption good categories. Let the categories be those in Table 1 below. Here, you'll want to create a "cross-walk" document. This will be a list of the detailed consumption goods in the CEX and which of the consumption goods categories we look at that they map into.

Step 4: Tabulate the Data

To see that things are looking like we might expect, do the following tabulations with the data:

Table 1: Consumption Goods Categories

#	Consumption Good Category
1	Food
2	Alcohol
3	Tobacco
4	Household fuels and utilities
5	Shelter
6	Furnishings
7	Appliances
8	Apparel
9	Public transportation
10	New and used cars, fees, and maintenance
11	Cash contributions and personal care (personal services)
12	Financial services
13	Reading and entertainment (recreation)
14	Household operations (nondurables)
15	Gasoline and motor oil
16	Health care
17	Education

1. Find the average dollar amount spent on each consumption category by calendar year. Plot these trends.

2. Find the fraction of income spent on each consumption category by calendar year. Plot these trends.

3. Find the average dollar amount spent on each consumption category by age of head of household. Plot these life-cycle profiles.

4. Find the fraction of income spent on each consumption category by age of head of household. Plot these life-cycle profiles.

5. Find the average dollar amount spent on each consumption category by income percentile (so create groups of people for each percentile of household income). Plot how consumption varies by income.

6. Find the fraction of income spent on each consumption category by income percentile (so create groups of people for each percentile of household income). Plot how consumption varies by income.

Step 5: Estimate Consumption Parameters

The calibration of the parameters of the composite consumption good is outlined in Fullerton and Rogers (1993). The process of estimating the parameters of the the constant elasticity of substitution (CES) function for preferences over corporate and non-corporate goods and for estimating the parameters of the Stone-Geary function describing preferences over goods from different consumption categories should be directly analogous (with differences being the number of industries considered and the vintage of the data used).

Step 6: Estimate Transition Matrix to Map Production Goods Income Consumption Goods

Note that these categories do not map directly into the production sectors we'll use in the model. To map production goods into consumption goods we use a fixed coefficient model summarized by the "transition matrix" Z. To estimate Z, we'll use the Survey of Current Business, "Make and Use Tables".

Notes

Steps 1-4 should be relatively straight forward, but I'm happy to answer any questions (jason.debacker@gmail.com, 770-289-0340). When we are at Step 5, you'll need to contact me and I can provide more details/guidance.

References

Fullerton, Don and Diane Lim Rogers, *Who Bears the Lifetime Tax Burden?*, The Brookings Institution, 1993.