Day 4 - Part 2: Social Transfers and Safety Nets

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Social Transfers and Safety Nets

To motivate this exercise, we will read: Alix-Garcia, Jennifer M., Katharine R. E. Sims, and Patricia Yañez-Pagans. 2015. "Only One Tree from Each Seed? Environmental Effectiveness and Poverty Alleviation in Mexico's Payments for Ecosystem Services Program." American Economic Journal: Economic Policy, 7 (4): 1-40.

Environmental Cash Transfers

To motivate this exercise, we will read: Alix-Garcia, Jennifer M., Katharine R. E. Sims, and Patricia Yañez-Pagans. 2015. "Only One Tree from Each Seed? Environmental Effectiveness and Poverty Alleviation in Mexico's Payments for Ecosystem Services Program." American Economic Journal: Economic Policy, 7 (4): 1-40.
In this problem we will replicate two main pieces of the paper. The first exercise will involve replicating a descriptive table that compares household level characteristics among beneficiaries and non-beneficiaries of the program. The second exercise will be to replicate the main results from the paper, which imply quantifying the causal effects of environmental subsidies on forest conservation metrics.

Exercise 1

1. Arrange the common properties sample. Take the dataset `onetree_data_eji021114v2.dta` and remove observations were at least one of the following variables are missing: `index_food`,`indexcons2011`, `indexhome2007`, `indexhome2011`, `tot_ganado2007`, `tot_ganado2011`, `smallanimals2007`, `smallanimals2011`, `liveinfra2007`, `liveinfra2011`, `aginput2007`, `aginput2011`, `agequip2007`, `agequip2011`, `d5000`, `hhsize`, `mpov05`, `elevmn`, `ejidatario`, `highrisk`. Name this dataset `common_properties.dta`.
2. Arrange the private properties sample. Take the dataset `onetree_data_priv021114v2.dta` and remove observations were at least one of the following variables are missing: `index_food`,`indexcons2011`, `indexhome2007`, `indexhome2011`, `tot_ganado2007`, `tot_ganado2011`, `smallanimals2007`, `smallanimals2011`, `liveinfra2007`, `liveinfra2011`, `aginput2007`, `aginput2011`, `agequip2007`, `agequip2011`, `d5000`, `hhsize`, `mpov05`, `elevmn`. Name this dataset `private_properties.dta`.
3. Arrange the matched sample. Take the dataset `common_properties` dataset and install the following user written command: `nnmatch`. Estimate a nearest neighbour matching were the independent variable is the household id, the treatment variable is the beneficiary status, and were control variables are *Total days worked in FMA 2007*, *Participated in FMA 2007* and *Participated in FMA 2007*. For this procedure, consider:
   (a) Estimate average treatment effects
   (b) Use the Mahalanobis metric
   (c) The number of matches per observation should be 5

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(d) The matching should be exact for regions

(e) Save the results in a dataset named `matched_coop.dta`

Then tag and remove from the sample observations whose distance metric is over the 95th percentile. Name the resulting dataset `matched_sample.dta`.

4. Separate each of the samples (`common_properties.dta`, `private_properties.dta`, `matched_sample.dta`) between beneficiaries and non-beneficiares. For each sample and beneficiary status compute the mean of the following variables: `index_food`, `indexcons2007`, `indexhome2007`, `tot_ganado2007`, `smallanimals2007`, `liveinfra2007`, `aginput2007`, `agequip2007`, `elevmn`, `slopemn`, `d5000`, `mpov05`. Within each sample and for each variable, calculate the normalized difference between beneficiaries and non-beneficiaries. Add the number of observations within each group.

Exercise 2

1. ***Baseline specification, point fixed effects***. Take the dataset `matchedpnts-maha-wreplace_final.dta`. Estimate the following regression:

$$\text{Mean Dry Season NDVI}ipst = \beta \times \text{Beneficiary}it + \delta \times \text{Rainfall}it + \alpha st + \alpha_i + \epsilon_{ipst}$$

The dependente variable measures mean dry season NDVI value for point i in parcel p, state s and year t. he variable beneficiary is equal to 1 if the point was enrolled in the program in the previous year's cohort. Controls include natural logarithms of dry season rainfall, rainfall in the other months prior to the dry season, standard deviation of rainfall across the year, and a dummy for being in the top tenth percentile of rainfall during hurricane season. State-year fixed effects are absorbed by α_{st}, and point level fixed effects are absorbed by α_i. Cluster standard errors at the parcel level.

2. ***Point fixed effects with time trend***. Exclude beneficiary status from the independent variables. Add a time variable and a a interaction between time and beneficiary status to the baseline specification.

3. ***Point fixed effects with recipient year***. Add an interaction between beneficiary status and years enrolled in the program to the baseline specification.

4. ***Parcel fixed effects***. From now on drop observations from 2003. Instead of point level fixed effects, now use parcel level fixed effects. This will allow us to use point level covariates as regressors. Add the following control variables to the baseline specification:

   (a) Categorical variable for forest type from INEGI series III

   (b) Dummy variable for forest type 'Bosque Mesofilo' (or if variable `vegcat` equals 3)

   (c) Km to nearest town

   (d) municipal poverty grade of point

   (e) in over exploited aquifer

   (f) score of available water (0 low, 9 high)

   (g) inside priority mountain

   (h) in majority indigenous municipio

   (i) mean NDVI of point in 2003

   (j) Log of elevation

   (k) Log of slope

5. ***Parcel fixed effects with time trend.*** Use the previous specification buy exclude beneficiary status from the independent variables. Add a time variable and a a interaction between time and beneficiary status to the baseline

6. ***Parcel fixed effects with recipient year.*** Add an interaction between beneficiary status and years enrolled in the program to the fourth specification.