Applied Economics- January 15th-16th, 2018

1) Provide an interpretation for the LATE estimator obtained from a fuzzy regression discontinuity approach (that is, a regression discontinuity approach in which there is no full compliance) .

Answer

The LATE estimator in a fuzzy RD approach has a "double local" interpretation. The first local refers to the impact around the cutoff. This refers to the external validity of the interpretation (only for individuals close to the cutoff). The second local refers to the fact that the estimated effect is only for those individuals that changed their status of treatment due to the instrument (the random assignment).

2) Consider that you want to estimate the impact of drug cartels on socioeconomic outcomes using data at the municipality level from Mexico (2400 municipalities available). You have data on socioeconomic outcomes and cartel presence at the municipality level in 2015 (a 0/1 variable)

Given that cartel presence may be endogenous in a model for current socioeconomic outcomes, you want to address this potential endogeneity concern by using an Instrumental Variable approach.

In order to do so you want to use Chinese presence in 1930 as an instrument for cartel presence today. Fortunately, there is information on Chinese presence in 1930 (the number of Chinese located in the municipality).You have already checked that there is a strong and significant correlation between Chinese presence in 1930 and cartel presence today (that is, the instrument is relevant). Please write formally the empirical strategy, explain which is your identification assumption, and discuss the validity or not of such assumption. If possible, provide a strategy to check the validity of the identification assumption.

Answer

We want to estimate the following model:

$$Socioeconomic\ Outcome_i = \alpha + \beta Cartel\ presence_i + \gamma X_i + \varepsilon_i$$

Where the parameter of interest is beta, and X is a matrix of controls at the municipality level. The IV approach addressed potential endogeneity of Cartel presence by using Chinese presence (and the set of controls) as instruments.

The identification assumption is that there is no direct link between Chinese presence in 1930 and socioeconomic outcomes today.

The exclusion restriction can be violated, for example, if the Chinese migrated into the best places. This conjecture can be checked by looking at the correlation between Chinese presence in 1930 and socioeconomic outcomes at that time.

Another reason would be if Chinese brought their organization with them, directly affecting socioeconomic outcomes today. In order to check this, it may be possible to use data from other

countries and look if there is correlation between Chinese presence in early XX century and good socioeconomic outcomes today.

3) The government of Argentina is building a market to trade fruits and vegetables in Trelew (Patagonia). All producers in the country can use the facility (the market), if they wish. Producers of vegetables and fruits are in general small producers (meaning that only producers from the surroundings would benefit from the new facility. Provide a non-experimental design that allows you to identify the causal impact of the facility on production. There is data available on production both at the farmer level and at the province level.

Answer

Since all individuals have the right to use the facility, a valid non-experimental design is to use the distance of the producer's farm to the facility as an instrument of treatment (using the market).

Another alternative (non-experimental) design is to use a synthetic controls approach using a long enough time historical data at the province level.