Population Economics Field Exam
Spring 2010

Instructions

You have 4 hours to complete this exam.

This is a closed book examination. No written materials are allowed. You can use a calculator.

YOU MUST ANSWER BOTH PARTS I AND II. EACH PART IS WORTH 100 POINTS. YOU MUST OBTAIN AT LEAST 75 POINTS IN EACH PART TO PASS THE POPULATION FIELD EXAM.

Please answer Parts A and B in separate booklets.

Part I

Population Economics (2 hours). Total Points: 100.

1- (25 points) General review questions

1. (5 points) What is the demographic transition and what theories are there to explain it? What is the evidence?
2. (5 points) What are the advantages and limitations of randomized trials in economics?
3. (5 points) Review the methods that are used for estimating the economic value of changes in life expectancy. In particular discuss the differences between methods that estimate "the value of a statistical life" and calibration methods such as the one used in Becker et al (2005).
4. (5 points) What are the theories on why socio-economic status and health are related?
5. (5 points) Briefly review the basics of propensity score estimation. What are the advantages of propensity score estimation compared to OLS?

2-(25 points) Empirical Application 1: Cutler and Miller (2005)

To estimate the effect of water cleaning technologies on mortality, Cutler and Miller estimate the following equation:

$$\ln(m_{c,t}) = \alpha + \beta_1 Filter_{c,t} + \beta_2 Chlorine_{c,t} + \beta_3 (Filter_{c,t} \times Chlorine_{c,t}) + \delta_c + \mu_t + \gamma_c t_{c,t} + \sum \rho_d d_{d\,c,t} + \sum \lambda_k \ln(m_{c,t-k}) + \varepsilon_{c,t} . \quad (1)$$

Where the dependent variable is the log of mortality in city c and year t, Chlorine and Filter are dummies equal to one if the technology has been implemented in a given city and year. This equation also includes city dummies, year dummies, city specific trends and city-level demographics.

1. (5 points) Why log mortality, is that the best functional form? How do we interpret coefficients?
2. (5 points) This specification does not contain a post*treated dummy. Explain why this is a DD. Why replace post with year dummies? Why have a dummy for each city?
3. (5 points) If we exclude city-level trends, what is the identifying assumption needed for the estimates to be unbiased?
4. (5 points) Why include other covariates? How should one chose them? Why add a city specific trend?
5. (5 points) What happens if the assumption that the timing is "exogenous" fails? How do the authors attempt to address this possibility?

3-(25 points) Empirical application 2: Card et al (2008)

To estimate the effect of having Medicare insurance on health care utilization and health outcomes Card et al estimate the following regression:

$$y_{ija} = X_{ija}\alpha_j + f_j(a) + C_{ija}\delta_j + u_{ija}$$

Where the dependent variable is a utilization (or health) measure for individual i in group j at age a, and C is dummy equal to one after age 65 (since individuals become eligible for Medicare at that age).

1. What is the forcing variable in this regression discontinuity design? Are there an issues related to the fact that this variable is age/time? Is it an issue that age is measured in years?
2. Is this a fuzzy or sharp design? Define both.
3. What is the key indentifying assumption?
4. What is the connection between RD and randomized experiments in general?
5. What are the limitations of the study?

4-(25 points) Empirical application 3: Miguel and Kremer (2004)

To estimate the effects of deworming externalities on health Miguel and Kremer estimate the following equation:

$$(1) \qquad Y_{ijt} = a + \beta_1 \cdot T_{1it} + \beta_2 \cdot T_{2it} + X'_{ijt}\delta + \sum_d (\gamma_d \cdot N^T_{dit}) + \sum_d (\phi_d \cdot N_{dit}) + u_i + e_{ijt}.$$

Where Y is the outcome for child i in school j at time t, T is a dummy equal to one is the school is treated at a given time, and X is a set of individual characteristics. The equation includes the number of kids treated within radius d of a given school (N^T), for different radii d, and controls for the total number of kids within a given radius (N).

1. What assumptions are needed to estimate the externalities associated with treatment across schools? In the Manksi (1995) framework, how is the identification problem being solved?
2. Using this equation, how do we compute the total externalities across schools? How do we compute the total intent-to-treat effects?
3. There are also possibly externalities within schools. How do the authors estimate those?
4. Explain what the effects of externalities would be on estimates of the effects of deworming from a randomized trial, if we were to simply compare the mean outcomes for treated and untreated schools.
5. The paper finds large effects on school absenteeism but no effects on cognitive scores. How could we explain this? Does this matter for interpreting the results and for doing cost benefit analyses of the benefits of deworming?