University of California, Davis   Date: 28 June 2005
Department of Economics   Time: 3 hours
PUBLIC ECONOMICS   Reading time: 20 minutes

PRELIMINARY EXAMINATION FOR THE Ph.D. DEGREE

> - **Please answer 4 of the following 5 questions.** Do **not** answer all 5 questions.
> - You **must** answer the Question 5 as one of your four questions.

Question 1.

a.   Describe what each of the following concepts measure: "Average Treatment Effect," "Effect of the Treatment on the Treated," and "Local Average Treatment Effect." Be as precise as (reasonably) possible.

b.   Suppose the treatment you are interested in is that of a government training program. If you have a randomized study, where you randomly deny some participants from getting access to the program, what effect are you able to measure?

Suppose you are interested in the impact of health insurance on health status. One way of estimating this is to estimate the following regression:

$$Y_{is} = \alpha + \beta_1 InsuranceStatus_{is} + \gamma FamilyBackground_{is} + \varepsilon_{is}$$

where $InsuranceStatus_{is}$ is an indicator for health insurance status (1=have insurance, 0=don't have insurance), and $FamilyBackground$ is a vector of observable family background characteristics such as race, family income, education level etc.

c.   Discuss one reason why β_1 might be an upwardly biased estimate of the impact of insurance. Discuss one reason why β_1 might be a downwardly biased estimate of the impact of insurance.

d.   Janet Curie and Jon Gruber (and coauthors) have a series of papers that examine the impact of Medicaid insurance on health (and other outcomes). Discuss their research design, and how it can overcome the problems in part (c). What conclusions do they come to regarding the impact of insurance on health? What are some limitations of their studies?

e.   Suppose that you have a "valid" instrument for $InsuranceStatus_{is}$, and that this instrument is a state-level instrument. Discuss why your inference for β_1 will not be correct, and what you can do to get correct inference.

Question 2.

In their 1991 article "Does Compulsory School Attendance Affect Schooling and Earnings?" Angrist and Krueger come up with a novel way of addressing the "ability bias" problem that has long plagued estimates of the wage return to education.

a.   Describe the "ability bias" problem.

b.   Describe the strategy that Angrist and Krueger employ to overcome this problem.

c.   How does this strategy affect their results and what do they conclude about ability bias?

d.   What might be some problems with their empirical strategy?

e.   In many of their models, their estimation method produces results of the returns to education that are higher than those that come from OLS. Discuss two reasons (unrelated to ability bias) why this might be the case.

f.   Discuss one other method used in the literature that attempts to overcome the ability bias problem in estimating the returns to education.

Question 3. The Willingness-To-Pay Locus.

1.   Mary Beth is uncertain about what both her income (c) and her preferences will be in the future. However, we need to evaluate her willingness to pay for a public park today.   Let $\delta=1$ if the park is built, and $\delta=0$ if it is not built. Her exogenous, uncertain income is e_1 in state 1 (which occurs with probability p_1) and e_2 in state 2 (which occurs with probability p_2). Her utility function, which also depends on the state of nature, is

$$u_1(c,\delta) = a + c^{.5} + \delta$$
$$u_2(c,\delta) = b + c^{.5} + \delta.$$

a.   Derive an equation which defines her willingness-to-pay locus.

b.   Set up an appropriate maximization problem and show that the fair bet point is the point where income is the same in both states of nature.

c.   Give an intuitive interpretation of your answer.

d.   Find the surplus point $S=(S_1,S_2)$ which represents *ex post* willingness to pay for the park.

e.   Finally, suppose that exogenous income is the same in both states of nature ($e_1=e_2$). Find her option price and option value for the park.

Question 4. Using Commodity Subsidies to Distribute a Budget Surplus.

Suppose the Alaskan government has a budget surplus, which it would like to distribute it to its citizens. Instead of using lump-sum subsidies the government would like to subsidize commodity purchases. Assuming that commodities are perfectly elastic in supply, the subsidies would reduce prices from p_i to $q_i = p_i - s_i$ $(i=2,...,k)$. Consumers have identical preferences and incomes, and the per capita amount to be distributed in this manner is A.

a.   Write down (but do not solve) an optimization problem for the government's choice of the subsidies $\{s_2,...,s_k\}$ to distribute the per capita amount A.

b.   Find the equivalent variation measure of the benefit to each consumer of receiving this pattern of commodity subsidies.

c.   Define deadweight loss in this situation.

d.   Using a fully-labeled diagram, explain why deadweight loss is *nonnegative* in the case of a subsidy.

Question 5. You must answer this question as one of your four questions.

Consider the country Developa, which is moving from developing country status to a developed country. The legislature calls a special session to debate whether "new deal" programs should be introduced in the country. In the first session they are considering introducing redistribution programs to provide basic income protection for low income households. You are hired as a consultant on this important issue.

a.   Discuss the justification for introducing a redistribution program, citing as many different justifications as possible.

b.   The senate of Developa decides on a program called A Hand Up. This program provides a maximum transfer of $1000 per year for each household. The transfer is phased out however—for each dollar they earn; the transfer is reduced by 50 cents. Suppose the country consists of 25% of families with low skill workers and 75% of families with moderate and high skill workers. The new program is financed by a new tax levied on the top 25% of families (using income). How will this program affect the incomes of the poor? Explain. How will this program affect the incomes of the rich? Explain. How is inequality affected (where inequality is defined as the relative income of the high vs. low income groups)?

c.   The new program – A Hand Up – is implemented as a pilot program in 10 villages and cites around the country. The program is available universally to the entire population in these areas. Data is collected for a 3-year period during the pilot program and data on participants and nonparticipants is available. We want to use this data to evaluate how A Hand Up affects labor supply. Suppose the pilot program is evaluated by regressing labor supply on a dummy equal to one if this family received a transfer from A Hand Up. Evaluate this methodology. Do you expect that the estimate of the effect of the program on labor supply to be biased? Why or why not? Discuss the expected direction of the bias.

d.   Propose an alternative methodology with the available data.

e.   Propose an alternative evaluation methodology assuming you could redesign the entire pilot program as desired. Explain why you think this is a superior approach.