Econ 741, M. Brown

Problem Set 1

due October 22, 2007

1. Taxation and Labor Supply

Eissa (1995), at http://www.nber.org/papers/w5023, may serve as a helpful guide for parts of this exercise. You will find a data set (ps1data.asc) posted on the class web page. These data are drawn from the National Longitudinal Survey of Youth (NLSY), and using these data you will estimate the impact of TRA86 on young married women.

You have data on married women in 1984 and 1988, at which time the members of the sample are 20-27 and 24-31 years old, respectively. The columns of data in ps1data.dat are as follows:

Col 1: age of respondent

Col 2: years of education of respondent

Col 3: family income excluding own income of respondent (assume this is constant from 1984 to 1988)

Col 4: labor force participation of respondent in 1984, 1=participate, 0=not participate

Col 5: labor force participation of respondent in 1988, 1=participate, 0=not participate

(a) The dimensions of the data are 1917 rows by 5 columns. Read the data into GAUSS and use the software to output descriptive statistics (mean, median, standard deviation, min and max) on each of the variables.

(b) Identify observations in the 75^{th}-85^{th} percentiles and 95^{th}+ percentiles of the income distribution represented. Using these groups as control and treatment, respectively, obtain a difference-in-differences estimate of the average impact of TRA86 on the labor force participation of high-income women. Did TRA86 increase the participation of high income women? (Ignore the issue of significance for this exercise, as I've given you a data set that's considerably smaller than what would be desirable to answer this question credibly.) What problems might this estimator have, and how might they be corrected (with an ideal data set)?

(c) Now incorporate the available demographic information in your estimate. Specifying the labor force participation equation as a Probit, derive a new difference-in-differences estimator that controls for individual characteristics age and education, as well as income category and pre-/post-tax reform status. Assume that age in 1988 = age in 1984 + 4, and that no respondent gains education between 1984 and 1988. Estimate your Probit using GAUSS (not a standard statistical package). The GAUSS library MAXLIK should allow you to maximize the likelihood of the set of observed outcomes given observed

characteristics derived under the assumption of the Probit specification. Does the labor force participation rate of the high-income women increase after TRA86? Significantly?

Important note: I have also posted a GAUSS program that uses MAXLIK to estimate the parameters of a likelihood expression. The program is example.txt. Note that this example DOES NOT evaluate the likelihood for a Probit; it's maximizing a very different kind of likelihood.

(d) What information would you require to estimate the response of the labor supply of these women to the tax reforms based on *individual variation in tax rates*? How would you change your Probit specification to do this?

2. Tax Incidence

On page 14 of the Fullerton and Metcalf chapter on tax incidence, the authors suggest the calculation of the economic incidence of a tax on wage when the statutory incidence is on workers rather than on firms. Solve the (simplest case, 1 sector) model for *both* the case in which the statutory incidence of the tax is on the firm and the case in which the statutory incidence is on the worker. How do your results on the economic incidence of the tax compare in these two cases, and what does this relationship demonstrate?

3. Mandate Incidence

In mid-2002, New Zealand introduced a government-sponsored parental leave program. Paid leave is guaranteed to working new parents, and the payments are made by the government. Suppose instead that the government of New Zealand mandated that employers offer paid leave to new parents, paying the 12 weeks of wages while a worker is on leave themselves.

(a) What effects on wages and employment among the workers of New Zealand after the implementation of the program would provide evidence that the mandate did not interfere with market efficiency, and why?

(b) What effects on wages and employment would indicate that the mandate had brought about a redistribution toward working parents?

(c) How would the efficiency and distributional effects of the policy change if the government paid the 12 weeks' wages to parents on leave, and supported the benefit through a FICA-style payroll tax on all workers?

Illustrate each of your answers with at least one graph.

4. Taxation and Labor Supply: Benefit Tax

(a) Consider the government transfer/negative income tax program represented in figure 3(d) from Moffitt 1990, and included in our lecture 3 notes. In your own graph, replicate

the consumer's budget constraint where the government guarantees the citizen a minimum of $$G$ of consumption, achieved as $C = WH + X$, where X is the government transfer & $X = max\{G - WH , 0\}$. What is the marginal benefit tax rate on earnings in this case for a worker earning less than $$G$?

(b) Now suppose the government decreases the transfer benefit by $$t$ < 1 for every $1 the citizen earns, so transfer X satisfies $X = max\{G - tWH, 0\}$. What is the lowest number of work hours for which the benefit is $0? What is the effect on work hours of the change from the dollar-for-dollar benefit tax in (a) to the t benefit tax in (b) for an individual with indifference curves I & I'? II & II'? III & III'? Why, in terms of income & substitution effects?

(c) What existing U.S. government transfer/negative income tax programs, if any, generate non-convex budget sets of the sort depicted in figure 3(d)?

(d) How might you estimate the effect of the negative income tax rate on beneficiaries' labor supply choices using an optimizing framework and maximum likelihood? Write the likelihood expression. What problems arise in this estimation?

5. Treatment effects

In Hahn, Todd and Van der Klaauw (2001), what two sets of assumptions not required for the identification of the treatment effect using the regression discontinuity technique in the case of constant treatment effects may be added to identify the treatment effect in the case of variable treatment effects? What are the relative merits of these two sets of assumptions?