E731 Labor Economics I: Homework #2

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You are encouraged to work in groups of 2 or 3, but no more than 3. If you work in groups you should turn in one assignment with all names on it. All members are given the same grade. Please use only one side of paper, and start each question on a new page. The assignment should be typed, 12 pt. font, 1" margins, single space, and all pages stapled. You should also include the program and final output for the empirical portion.

The assignment is due in class on **Wednesday November 9, 2016**.

1. The presence of pre-school children often complicates women's labor supply decisions because of the costs of child care. (In doing this problem, assume that the woman is the only adult in the household.)

a) Indicate how women's labor supply decisions may change when child care costs are present. (Hint: Draw some budget constraints. Consider different forms of child care costs, e.g. time versus money costs.)

b) Consider the following two proposals to assist low income women in covering the costs of child care:

1) a tax change allowing households with incomes below a certain level to deduct child care expenses from their taxes.
2) a per-child lump-sum government subsidy to families who have children in child care centers and whose family income is below a certain level.

Indicate how each of these proposals will affect the labor supply decision. As an economist, which of these would you recommend and why? (Again, draw budget constraints.)

2. A worker maximizes the intertemporal utility function:

$$U = \Sigma_t (1+\rho)^{-t}[\ \ln C_t - (\eta/(1+\eta))H_t^{(1+\eta)/\eta}]$$

subject to the lifetime budget constraint

$$\Sigma_t (1+r)^{-t}C_t = \Sigma_t (1+r)^{-t}W_t H_t$$

where C is consumption, H is hours, W is the real wage rate, $\rho$ is the subjective discount rate, and r is the real interest rate.

a) Show that the attendant labor supply function at time t is $\ln H_t = \eta \ln\lambda + \eta \ln W_t + e_t$, where $e_t$ is an additive error term.
b) What is the interpretation of $\lambda$? What is the assumed correlation between $\lambda$ and e? Explain.
c) How should $\eta$ be interpreted? What restrictions can be placed on the sign of $\eta$? Why?
d) Do hours or wages peak first when $\rho > r$? Derive and show with a graph.

3. In this question you will use the data set, MOM.DTA, that is described at the bottom of this document.

The task is to estimate MaCurdy's (1985) intertemporal model of labor supply under uncertainty using the data from Ziliak (1997) in MOM.DTA. The empirical model is $\ln H_{it} = \eta \ln\lambda_i + \eta \ln W_{it} + bt + x'_{it}\theta + e_{it}$

Controlling for the demographics in the data set, as well as year effects, estimate the ISE using:

1. Pooled OLS
2. Random Effects

3. Fixed Effects
4. First Differences
5. Two-Year Differences
6. First Difference IV (treating the wage as endogenous)
7. First Difference GMM (treating the wage as endogenous)
8. Dynamic First Difference GMM (i.e. lagged hours as a regressor and with endogenous wage)

a) Report the means, std deviations, mins, and maxs of each variable
b) Please report the ISE and explain how your estimates of the ISE change with each of the 8 estimators.

> Estimate 6), 7), and 8) with two different sets of instruments. Be sure to explain what instruments you use, and why, and whether they are any good. Also, distinguish the short-run from long-run ISE in 8).

c) Conduct a Hausman test comparing fixed versus random effects, and comparing first differences to first difference IV. Be sure to be clear stating the null hypothesis for each test and explain the results.
d) Re-estimate 6), 7), and 8) assuming that $e_{it}$ is a MA(1) error. What does this mean for estimation, and how does it affect your estimates of the ISE?

**FILENAME: MOM.DTA**

The data in the file MOM.DTA are used in the paper:

Ziliak, James P. 1997. "Efficient Estimation with Panel Data when Instruments are Predetermined: An Empirical Comparison of Moment-Condition Estimators," *Journal of Business and Economic Statistics* 15(4): 419–431.

The data contain a balanced panel of 5320 observations, 532 men over 10 years (1978-1987). The men are between the ages of 22-51 in 1978. The data are arranged as a rectangular file, i.e. person 1 w/ years 1978-87, person 2 w/ years 1978-87,etc... The variables as they appear in the columns of the data are:

lnhr lnwg kids ageh agsq disab id year

where

lnhr is natural log of annual hours of work
lnwg is natural log of the real wage
kids are the number of children living in the household
ageh is the age of the male
agsq is the square of ageh
disab is a dummy variable equal to 1 if the worker suffers from some work-limiting health problems
id is the person identifier
year is the year identifier.