E731 Labor Economics I: Homework #3

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This assignment uses data from the Current Population Survey on 84,913 single mothers with dependent children spanning 1979–2001. The next page has a description of the variables. 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 **Monday December 5, 2016**.

Using the sample of women, we wish to estimate a standard Mincer-type human capital log-real annual earnings function given as

$$ln(earnings_{it}) = \alpha + \beta educ_{it} + \gamma exper_{it} + \delta exper_{it}^2 + X_{it}\lambda + u_{it}$$

where ln(earnings)= natural log of inflation-adjusted annual labor market earnings, educ=education, exper=potential labor market experience (defined as age–education–6), exper^2=square of potential experience, *X* is a vector of demographics, and u=error term.

Let $u_{it} = \eta_i + \psi_t + \varepsilon_{it}$, where η_i is a cohort effect, ψ_t is a year effect, and ε_{it} is a random error that is conditionally heteroskedastic but independent across time, individuals, and cohorts.

(1) Among the set available in the data described below, what household demographics should be included in *X*? What is the assumed correlation between these variables and the model's error term?

(2) Define education as a continuous variable, i.e. 0, 1,2,…, and estimate this model via OLS. What are the estimated returns to schooling and experience? What do they mean?

(3) Test (and report the results of) the null hypothesis that schooling and experience are parallel.

(4) So far we have ignored the fact that a large percentage of the women in the sample have no earnings. Re-answer question (2) using

(A) the Tobit model
(B) a 2-step estimator based on the probit model

Be clear on how each model is identified and how estimated returns to schooling and experience change.

(5) Consider the revised model:

$$ln(earnings_{it}) = \alpha + \beta educ_{it} + \gamma exper_{it} + \delta exper_{it}^2 + X_{it}\lambda + \rho W_{it} + u_{it},$$

where W_{it} equals 1 if the mother is on AFDC/TANF and 0 otherwise. Using continuous schooling in the base case (2), and assuming that $E[\varepsilon_{it}|W_{it}] \neq 0$, estimate (and report) the effect of welfare on earnings using

(A) matching
(B) propensity score
(C) difference-in–difference
(D) IV
(E) control function

Be sure to state how do you identify the effect of AFDC on earnings.

Variables in CPS Data Set

_region

Code:		Recode:
	03-76	67-62	03-62
Northeast	1	0	1
North central/Midwest	2	1	2
South	3	2	3
West	4	3	4
Missing	9		9

_child18: number of kids under age 18
_child6: number of kids under age 6
_faminc: total nominal family income before taxes and in-kind transfers
_fnumper: total size of family unit
famwgt: family sampling weight
_educ: years of school completed through 1991

Code: 91-62
00 = NIU

Elementary
00 = 0 or K
01 = 1
02 = 2
03 = 3
04 = 4
05 = 5
06 = 6
07 = 7
08 = 8

High School
09 = 9
10 = 10
11 = 11
12 = 12

College
13 = 13
14 = 14
15 = 15
16 = 16
17 = 17
18 = 18+

_race:

Code:					Recode:
	03	02-96	95-88B	88-63	62	03-62
White only	1	1	1	1	0	1
Black only	2	2	2	2	1	2
Amer Indian, Alaskan Native only	3	3	3			3
Asian only	4					3
Hawaiian/Pacific Islander only	5					3
Asian/Pacific Islander		4	4			3
Other			5	3	2	3
White-Black	6					3
White-AI	7					3
White-Asian	8					3
White-Hawaiian	9					3
Black-AI	10					3
Black-Asian	11					3
Black-Hawaiian	12					3
AI-Asian	13					3
Asian-Hawaiian	14					3
W-B-AI	15					3

W-B-A	16	3
W-AI-A	17	3
W-A-HP	18	3
W-B-AI-A	19	3
2 or 3 races	20	3
4 or 5 races	21	3

AI American Indian and Alaskan Native
HP Hawaiian or Pacific Islander

In 1994 forward this is an edited variable with additional possible values of: -1 (blank) -2 (don't know) -3 (refused) -9 (no response)

_incwag: nominal earnings from wages and salary
year: year spanning 1979-2001
pov: equals 1 if poor
grdatn: years of school after 1991

Code:

03-92

Children	00
Less than 1st grade	31
1st, 2nd, 3rd or 4th grade	32
5th or 6th grade	33
7th or 8th grade	34
9th grade	35
10th grade	36
11th grade	37
12th grade or no diploma	38
High school graduate - High school diploma or equivalent	39
Some college but no degree	40
Associate's degree in college - occupational/vocational	41
Associate's degree in college - academic	42
Bachelor's degree (e.g., BA, BS, AB)	43
Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA)	44
Professional school degree (e.g.: MD, DDS, DVM, LLB, JD)	45
Doctorate degree (e.g., PhD, EdD)	46

In 1994 forward this is an edited variable with additional possible values of: -1 (blank) -2 (don't know) -3 (refused) -9 (no response)

state: ID for state

1	Alabama
2	Alaska
3	Arizona
4	Arkansas
5	California
6	Colorado
7	Connecticut
8	Delaware
9	District of Columbia
10	Florida

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11   Georgia
12   Hawaii
13   Idaho
14   Illinois
15   Indiana
16   Iowa
17   Kansas
18   Kentucky
19   Louisiana
20   Maine
21   Maryland
22   Massachusetts
23   Michigan
24   Minnesota
25   Mississippi
26   Missouri
27   Montana
28   Nebraska
29   Nevada
30   New Hampshire
31   New Jersey
32   New Mexico
33   New York
34   North Carolina
35   North Dakota
36   Ohio
37   Oklahoma
38   Oregon
39   Pennsylvania
40   Rhode Island
41   South Carolina
42   South Dakota
43   Tennessee
44   Texas
45   Utah
46   Vermont
47   Virginia
48   Washington
49   West Virginia
50   Wisconsin
51   Wyoming
```

pop: state population
urate: state unemployment rate
empl: state level of employment
shdem: fraction of state house that is Democrat
govd: equals 1 if Governor is a Democrat
ssdem: fraction of state senate that is Democrat
waiver: equals 1 the year a state waiver from AFDC rules was implemented
eetax: state earned income tax rate for AFDC program
eutax: state unearned income tax rate for AFDC program
afdc2: nominal AFDC max benefit for 2 person unit
afdc3: nominal AFDC max benefit for 3 person unit
afdc4: nominal AFDC max benefit for 4 person unit
stminwage: nominal state minimum wage
eitc1kid: EITC subsidy rate for 1 child family

eitc2kid: EITC subsidy rate for 2 or more child family
lths: equals 1 if less than high school education
hhs: equals 1 if high school education
mths: equals 1 if more than high school education
cpi01: personal consumption expenditure deflator with 2001 base year
cohed: dummy variable for 5-year by 3-education level cohort:

```
g cohed=0

replace cohed=1 if birthyr >=1979 & birthyr <=1983 & lths==1
replace cohed=2 if birthyr >=1979 & birthyr <=1983 & hhs==1
replace cohed=3 if birthyr >=1979 & birthyr <=1983 & mths==1
replace cohed=4 if birthyr >=1974 & birthyr <=1978 & lths==1
replace cohed=5 if birthyr >=1974 & birthyr <=1978 & hhs==1
replace cohed=6 if birthyr >=1974 & birthyr <=1978 & mths==1
replace cohed=7 if birthyr >=1969 & birthyr <=1973 & lths==1
replace cohed=8 if birthyr >=1969 & birthyr <=1973 & hhs==1
replace cohed=9 if birthyr >=1969 & birthyr <=1973 & mths==1
replace cohed=10 if birthyr >=1964 & birthyr <=1968 & lths==1
replace cohed=11 if birthyr >=1964 & birthyr <=1968 & hhs==1
replace cohed=12 if birthyr >=1964 & birthyr <=1968 & mths==1
replace cohed=13 if birthyr >=1959 & birthyr <=1963 & lths==1
replace cohed=14 if birthyr >=1959 & birthyr <=1963 & hhs==1
replace cohed=15 if birthyr >=1959 & birthyr <=1963 & mths==1
replace cohed=16 if birthyr >=1954 & birthyr <=1958 & lths==1
replace cohed=17 if birthyr >=1954 & birthyr <=1958 & hhs==1
replace cohed=18 if birthyr >=1954 & birthyr <=1958 & mths==1
replace cohed=19 if birthyr >=1949 & birthyr <=1953 & lths==1
replace cohed=20 if birthyr >=1949 & birthyr <=1953 & hhs==1
replace cohed=21 if birthyr >=1949 & birthyr <=1953 & mths==1
replace cohed=22 if birthyr >=1944 & birthyr <=1948 & lths==1
replace cohed=23 if birthyr >=1944 & birthyr <=1948 & hhs==1
replace cohed=24 if birthyr >=1944 & birthyr <=1948 & mths==1
replace cohed=25 if birthyr >=1939 & birthyr <=1943 & lths==1
replace cohed=26 if birthyr >=1939 & birthyr <=1943 & hhs==1
replace cohed=27 if birthyr >=1939 & birthyr <=1943 & mths==1
replace cohed=28 if birthyr >=1934 & birthyr <=1938 & lths==1
replace cohed=29 if birthyr >=1934 & birthyr <=1938 & hhs==1
replace cohed=30 if birthyr >=1934 & birthyr <=1938 & mths==1
replace cohed=31 if birthyr >=1929 & birthyr <=1933 & lths==1
replace cohed=32 if birthyr >=1929 & birthyr <=1933 & hhs==1
replace cohed=33 if birthyr >=1929 & birthyr <=1933 & mths==1
replace cohed=34 if birthyr >=1924 & birthyr <=1928 & lths==1
replace cohed=35 if birthyr >=1924 & birthyr <=1928 & hhs==1
replace cohed=36 if birthyr >=1924 & birthyr <=1928 & mths==1
replace cohed=37 if birthyr >=1919 & birthyr <=1923 & lths==1
replace cohed=38 if birthyr >=1919 & birthyr <=1923 & hhs==1
replace cohed=39 if birthyr >=1919 & birthyr <=1923 & mths==1
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worker: equals 1 if worked for pay
wage: nominal average hourly wage rate
allocate: equals 1 if earnings are imputed by Census Bureau
tottax: total tax payments from NBER TAXSIM (federal/state/fica)
hours: annual hours of work
pafdc: equals 1 if participate in AFDC/TANF