ECON 7800, Dr. Haimanti Bhattacharya **Assignment on IV [Total: 30 points]**

1. Use "card.dta"

(i) Estimate a ln(*wage*) equation by OLS with *educ, exper, exper*^{2}*, black, south, smsa, reg661* through *reg668,* and *smsa66* as explanatory variables. [1 point]

(ii) Regress *educ* on all explanatory variables from part (i) and the dummy variable *nearc4*. Does *nearc4* have a practically and statistically significant effect on educ? [3 points]

(iii) Estimate a log(*wage*) equation by IV, using *nearc4* as an instrument for *educ*. Compare the return to education to that obtained in part (i). [5 points]

(iv) Now use *nearc2* along with *nearc4* as instruments for *educ*. Estimate the first stage and comment whether *nearc2* or *nearc4* is more strongly related to *educ*. How do the second stage estimates compare with the earlier ones using one instrument? [5 points]

2. Use "mroz.dta"

(i) Estimate the following regression model by IV:
Dependent variable : ln(*wage*)
Explanatory variables : exper expersq educ
Instruments for educ: fatheduc huseduc motheduc [1 point]

(ii) Test the relevance of the instrumental variables in the first stage of the above estimation. [2 points]

(iii) Are the over-identifying restrictions satisfied by the above model? [2 points]

(iv) Now estimate the above model where the set of instrumental variables includes: fatheduc huseduc motheduc kidslt6 kidsge6. Compare the result with the model in part (i). [5 points]

3. Use "nls80.dta"

(i) Estimate the following regression model by IV:
Dependent variable : ln(*wage*)
Explanatory variables : exper tenure married south urban black educ iq
Explanatory variable with measurement error : iq
Instrumental variable for iq: kww [1 points]

(ii) Is KWW a relevant instrumental variable for IQ? [1 points]

(iii) Now estimate the following regression model by IV:
Dependent variable : ln(*wage*)
Explanatory variables : exper tenure married south urban black educ iq
Explanatory variables with measurement error : iq educ
Instrumental variables : kww meduc feduc [2 points]

(iv) Comment on the relevance and validity of the instruments in the model in part (iii). [2 points]