Scott Levy
ECO 772
Problem Set 3

---

(1) 9.4) $tvhours^* = \beta_0 + \beta_1 age + \beta_2 age^2 + \beta_3 Motheduc + \beta_4 fatheduc + \beta_5 sibs + u$

i) The CEV assumptions require that $tvhours = tvhours^* + e$, and e cannot be correlated with $tvhours^*$ or any of the other variables.

ii) I think the CEV assumptions are not likely to hold. I believe that e could be directly correlated with some of the variables, depending on who is doing the reporting. For example, the "age" variable, a younger child is less likely to report accurately for a variety of reasons. If e is correlated with an explanatory variable, the CEV will not hold.

(2) 15.2) $stndfnl = \beta_0 + \beta_1 atndrte + \beta_2 priGPA + \beta_3 ACT + u$

i) I don't think 'dist' and u would be correlated. Where a classroom ends up being located seems like it would be random.

ii) For 'dist' to be a valid IV for 'atndrte' they would need to be correlated, which seems likely. I know from personal experience, the greater distance between me and a classroom, the greater likelihood I may have lower attendance.

15.2) iii) Could we replace 'priGPA·atndrte' with 'priGPA·dist'?

③ 15.4) $gEMP_t = \beta_0 + \beta_1 gMIN_t + \beta_2 gPOP + \beta_3 gGSP + \beta_4 gGDP + u_t$

i) The OLS could be biased if unobserved factors (which would be part of the error term) end up being correlated with the minimum wage ($gMIN$)

ii) Since USMIN covers all states, not just the one state in the earlier part of this question, then I think that it is probably not correlated with the error term in any way.

iii) Because we know that $gMIN$ must be at least the same as $gUSMIN$, and if $gUSMIN$ increases it's likely $gMIN$ will increase as well by a similar amount.

④ 15.6) $y_1 = \alpha_0 + \alpha_1 z_1 + \alpha_2 z_2 + v_1$

i) ?

(5) C15.3)

i) Yes, I think it's possible that 'nearc4' could be correlated with unobserved ability. For example, people in that area may have been raised by parents who attended that school and settled down in that area, and these parents would presumably be highly educated.

ii) See attached STATA output, but yes, it appears IQ points on average are 2.59 points higher for someone who grew up near a 4 year college.

iii) See STATA output. When adding these additional variables, 'nearc4' is now much less correlated with IQ scores. This shows that it is important to include regions in this model.

iv) I believe parts ii and iii show that it is important to include SMSA66 and the regional dummies in the model.

(6) C15.5)

i) See STATA output. No, it is not statistically significant.

ii) See STATA output.

(7) C15.8)

i) If they have a 401k plan, they are 5.36% more likely to have an IRA.

ii) Most people that have one type of retirement are likely to have another. So it is likely that p401k could be correlated with the error term, presenting a problem.

iii) For e401k to be a valid IV for p401k, we would have to assume that most (or all) those who are eligible for a 401k plan choose to enroll in one. This is probably not the case.

iv) See STATA output. e401k increases the probability of p401k by about 69%. This seems to indicate that e401k could be a valid IV for p401k.

v) ?

(8) C15.9)

i) See STATA output.

ii) See STATA output.

iii) See STATA output.

⑨ C15.10

i) The 95% confidence interval is 0.088 to 0.114

ii) See STATA output. The coefficient on 'ctuit' is statistically insignificant.

iii) See STATA output. The estimated return to one year of education is about 13.7% higher.

iv) See STATA. An increase in tuition by $1,000 reduces years of education by 16.5%.

v) ?

vi) ?