CERGE-EI
Summer 2014
Econometrics II
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Homework #3

1. Let *grad* be a dummy variable for whether a student-athlete at a large university graduates in five years. Let $hsGPA$ and SAT be high school grade point average and SAT score. Let *study* be the number of hours spent per week in organized study hall. Suppose that, using data on 420 student-athletes, the following logit model is obtained:

   $$P(grad = 1|hsGPA, SAT, study) = \Lambda(-1.17 + .28 * hsGPA + .00075 * SAT + .015 * study)$$

   , where $\Lambda(z) = exp(z)/[1 - exp(z)]$ is the logit function. Holding $hsGPA$ fixed at 3.0 and SAT fixed at 1,100, compute the estimated difference in the graduation probability for someone who spent 8 hours per week in study hall and someone who spent 4 hours per week.

2. Introductory Wooldrdige(International edition) chapter 17, C1.

3. Introductory Wooldrdige(International edition) chapter 17, C2 plus:

   v) Calculate the share of correctly predicted for LPM/Logit/Probit models. Construct the prediction tables for all models.Comment.

   Note: you need to estimate LPM as well for question (i) In addition:

   In question (iv) compare the size of the discrimination effect for all three models: LPM, probit and logit.

   (v) For each of the three models: finnd the maximum and the minimum values of the predicted probability of a loan approval. Compare the values across the three models, and comment.

4. Advanced Wooldridge 15.3.

5. Advanced Wooldridge 15.7.

6. A latent variable y_i* i is generated by

   $$y_i^* = x_i\beta + \epsilon_i$$

   where ϵi is$N(0; \sigma_i^2)$ and $\sigma_i^2 = \gamma_0 + \gamma_1 x_i^2$ We observe $y - i$ where $y_i = 1(y_i^* > 0)$ and x_i. Write down the log-likelihood function of the model, in terms of the parameters: γ_0, γ_1 and β.

7. Cameron and Trivedi Exercise 15-3.

   Use data *fishing.dta* to replicate the results in the second column of Table 15.2 p. 493. Then use STATA command "sample" to draw a 50 % sub-sample (use "set seed" with the seed of your choice to drawyour own sample), reestimate the model under column 2, and answer questions to exercise 15-3.

Hint: look-up the following commands in STATA: probit, logit, sample.