Economics 8205-8206: 
Applied Econometrics I

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Assignment 3

Handed out: October 10, 2000
Due: October 19, 2000

Non-computer problems

1) Greene, Chapter 7, p. 312, problems 1 and 2.
   Note that Greene’s definition of $R^2$ is the same as our definition of $R^2_c$.

2) Restricted regression.
   a- Suppose that you want to estimate the coefficients from a model: $\mathbf{y} = \mathbf{X}\beta + \mathbf{u}$ s.t. $\mathbf{R}\beta = \mathbf{r}$. Solve for the restricted least-squares estimates of $\beta$ using a Lagrangian.
   b- Greene, Chapter 7, p. 313, problem 7.

3) Greene, Chapter 7, p. 315, problem 16.

Computer problems: turn in your source code and results

Use the Matlab data set assig3_pr3 for this problem.

4) Consider the model $\mathbf{y} = X_1\beta_1 + X_2\beta_2 + X_3\beta_3 + X_4\beta_4 + u$ s.t. $\beta_3 = \beta_1\beta_2$.
   a- Explain why you cannot estimate this model using OLS, and show how to estimate the model using NLS.
   b- Estimate the model using NLS. Find parameter estimates and confidence intervals for all parameters.
   c- Estimate the model using D&M’s linear one-step efficient estimation, p. 196. Compare your estimates to those from b.
   d- Perform a LR-type test that $\beta_4 = 0$.

Use the Matlab data set assig3_pr4 for this problem.

5) Consider the model $\mathbf{y} = X_1\beta_1 + X_2\beta_2 + X_3\beta_3 + X_4\beta_4 + X_5\beta_5 + u$.
   a- Perform a Wald test that $\beta_1 + 2\beta_2 = 3$ and $\beta_3 = 0$.
   b- Perform a LM test of the same restrictions. Using $s^2$ in this test, show that the tests are numerically identical.