Economics 662

November 19, 2020   **R. Davidson**

Assignment 3

The data for this assignment can be found here

https://russell-davidson.arts.mcgill.ca/e662/e662.as3.20.dat

There are 100 observations on four variables y, x_1, x_2, and x_3. Consider the linear regression

$$y_t = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + u,$$

which can be estimated by ordinary least squares. Perform this estimation for 17 different sample sizes: start with the first 20 observations in the file, then increment the sample size by 5 at each step, so as to estimate the model with sample sizes $n = 20, 25, 30, 35, \ldots, 95, 100$.

For each sample size, you are asked to test two hypotheses: $\beta_1 = 0$ and $\beta_1 = 0.1$. For each hypothesis and each sample size, obtain three P values, all of them for two-tailed tests. First, a P value based on Student's t distribution with the appropriate number of degrees of freedom. Next, a bootstrap test where bootstrap disturbances are resampled from rescaled restricted residuals, and, finally, a wild bootstrap test.

Construct two tables of results, one for each hypothesis. As a function of sample size, the numbers in the tables should be the P values for the three tests.

Explain carefully how you obtained your results. If you wish to submit your code, then please create a separate file with the code.

Have you any comments or observations to make after having seen your results?