

Homework 6. Due Wednesday October 25.

1. Davidson and MacKinnon 11.33. (I am not expecting you to memorize the density of the Weibull distribution, but you should be able to find hazard and survivor functions, if given a density.)
2. Derive W_1 , W_2 , and W_3 on page 423 in Davidson and MacKinnon. (This illustrates why the Wald test is not invariant to how a non-linear test is formulated.)
3. Adding a bit to the program `Econ8331_Tests.m`, do 100 simulations of the model and report the empirical size of the t-test, LR-test, Wald-test, and LM-test, respectively.
4. Use the program `Econ8331_Bootstrap.m` to estimate a linear regression model.
 - 1) Try samples $N=10, 20, 50, 100$ and run the program a few times. In this model, at what sample size does it look as if the bootstrap estimator of standard errors of the slope parameters is OK (similar to the parametric estimator).
 - 2) Try and vary the number of bootstrap replications. How many replications seems to be needed for the estimator to work?
 - 3) Try and simulate the model with error terms that are Cauchy distributed (use the ratio of standard normals). Those are pretty crazy and the parametric standard errors may be off. Keep $N=100$ and do a small Monte Carlo study (maybe 50 iterations, start with a low number and see what your computer can handle in not-too-long time) and report: a) the average parametric standard errors; b) the average bootstrap standard errors; c) the standard error of the estimated parameters across your Monte Carlo iterations (that is the true standard error, at least if the number of iterations is not too low). Is the bootstrap standard errors of the parametric OLS standard errors better for the model with Cauchy errors?