Finite Sample Performance of HAC Robust Wald Tests: Fixed-b Asymptotics and Moving Blocks Bootstrap

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In the presence of autocorrelation, least squares estimates of standard errors are incorrect. Heteroscedasticity-Autocorrelation Consistent(HAC) estimators consistently estimate the variance-covariance matrix, which can then be used for hypothesis testing. The test statistics are approximated to the usual chi-square distribution by a consistency assumption that rules out the impact of the kernel and bandwidth of the HAC estimator. In large samples, HAC test statistics are known to perform well, but in finite samples, they tend to over-reject the null hypothesis.

Using a new asymptotic theory, the fixed-b asymptotics, which depends on the bandwidth and kernel, this paper analyses the size of robust tests of multiple restrictions in finite samples. Simulation results indicate that regardless of the degree of autocorrelation, robust Wald tests exhibit size distortions which increase as the bandwidth increases.

The size distortions reduce significantly when the fixed-b asymptotics is used to approximate the limiting distribution of the test statistics. Compared to the bootstrap, the fixed-b asymptotics exhibit some size distortions which was not found to be associated with the bootstrap.