Least Absolute Deviation Estimation for Unit Root Processes with GARCH Errors

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Abstract

This paper considers a local least absolute deviation estimation for unit root processes with GARCH errors, and derives its asymptotic properties under only finite second order moment for both errors and innovations. When the innovations are symmetrically distributed, the asymptotic distribution of the estimated unit root is shown to be a functional of a bivariate Brownian motion and then two unit root tests are derived. The simulation results demonstrate that the tests outperform those based on the Gaussian quasi maximum likelihood estimators with heavy-tailed innovations and those based on the simple least absolute deviation estimators.

This is joint work with Guodong Li.