Unit-root Tests with Joint One-sided Restrictions

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This paper explores the possible power gains from utilising the knowledge about the sign of a deterministic term under the alternative hypothesis in testing for a unit root in AR models. The test problems of interest involve two parameters that are zero under the null and restricted to be negative under the alternative. One-sided test statistics are constructed from the likelihood ratio averaged over the parameter space, which can be interpreted as the optimal point test against
an average alternative. The asymptotic null distributions of the test statistics are shown to be free of nuisance parameters and the corresponding critical values are tabulated. The proposed tests are compared with Dickey-Fuller tests and two-sided Wald test by finite sample Monte Carlo experiments. In addition to having good size properties, the proposed tests appear to have superior power in a number of interesting cases.

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