STATIONARITY AGAINST INTEGRATION IN THE AUTOREGRESSIVE PROCESS WITH POLYNOMIAL TREND

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Abstract: We tackle the stationarity issue of an autoregressive path with a polynomial trend, and generalize some aspects of the LMC test, the testing procedure of Leybourne and McCabe. First, we show that it is possible to get the asymptotic distribution of the test statistic under the null hypothesis of trend-stationarity as well as under the alternative of nonstationarity for any polynomial trend of order r. Then, we explain the reason why the LMC test, and by extension the KPSS test, does not reject the null hypothesis of trend-stationarity, mistakenly, when the random walk is generated by a unit root located at -1. We also observe it on simulated data and correct the procedure. Finally, we describe some useful stochastic processes that appear in our limiting distributions.

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