Testing for Threshold Moving Average with Conditional Heteroscedasticity

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The recent paper by Ling and Tong (2005) considered a quasi-likelihood ratio test for the threshold in moving average models with i.i.d. errors. This article generalizes their results to the case with GARCH errors and a new quasi-likelihood ratio test is derived. The generalization is not di- rect since the techniques developed for TMA models heavily depend on the property of p.dependence which is no longer satisfied by the time series models with conditional heteroscedasticity. The new test statistic in this article is shown to converge weakly to a functional of a centered Gaussian process under the null hypothesis of no threshold and it is also proved that the test has nontrivial asymptotic power under local alternatives. Monte Carlo experiments demonstrate the necessity of our test when a moving average time series has a time varying conditional variance. As a further support, two real data examples are also reported.

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