



Tests for the existence of group effects and interactions for two-way models with dependent errors

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Abstract

In this paper, we propose tests for the existence of random effects and interactions for two-way models with dependent errors. We prove that the proposed tests are asymptotically distribution-free which have asymptotically size τ and are consistent. We elucidate the nontrivial power under the local alternative when a sample size tends to infinity and the number of groups is fixed. A simulation study is performed to investigate the finite-sample performance of the proposed tests. In the real data analysis, we apply our tests to the daily log-returns of 24 stock prices from six countries and four sectors. We find that there is no strong evidence to support the existence of substantial differences in the log-return across countries, nor to the existence of interactions between countries and sectors. However, there exists random effect differences in the daily log-return series across different sectors.

Keywords Interaction effects · Multivariate time series · Random effects · Spectral density · Two-way layout

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