

**Hallin, Marc; Puri, Madan L.**

**Optimal rank-based procedures for time series analysis: testing an ARMA model against other ARMA models.** (English) Zbl 0659.62111

*Ann. Stat.* 16, No. 1, 402-432 (1988).

This paper is a continuation of work by the authors and *J.-Fr. Ingenbleek* [*Ann. Stat.* 13, 1156-1181 (1985; [Zbl 0584.62064](#)) and *J. Time Ser. Anal.* 8, 409-424 (1987)] where they considered testing randomness against ARMA alternatives of dependence.

From the authors' summary: A distribution-free asymptotically most powerful test, based on a generalized linear serial rank statistic, is provided against contiguous ARMA alternatives with specified coefficients. In the case when the ARMA model in the alternative has unspecified coefficients, the asymptotic sufficiency (in the sense of Le Cam) of a finite-dimensional vector of rank statistics is established. The asymptotic sufficiency is used to derive an asymptotically maximin most powerful test, based on a generalized quadratic serial rank statistic. The asymptotically maximin optimal test statistic can be interpreted as a rank-based, weighted version of the classical Box-Pierce portmanteau statistic, to which it reduces, in some particular problems, asymptotically and under Gaussian assumptions.

Reviewer: [R.Mentz](#)

**MSC:**

[62M10](#) Time series, auto-correlation, regression, etc. in statistics (GARCH)  
[62G10](#) Nonparametric hypothesis testing

Cited in **1** Review  
Cited in **33** Documents

**Keywords:**

testing randomness; ARMA alternatives of dependence; distribution-free asymptotically most powerful test; generalized linear serial rank statistic; contiguous ARMA alternatives; asymptotic sufficiency; asymptotically maximin most powerful test; generalized quadratic serial rank statistic; Box-Pierce portmanteau statistic

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