Journal of the American Statistical Association ›
Volume 92, 1997 - Issue 438

Theory and Method

Testing and Locating Variance Changepoints with Application to Stock Prices

Jie Chen & A. K. Gupta

Pages 739-747 | Received 01 Jun 1995, Published online: 17 Feb 2012

Cite this article https://doi.org/10.1080/01621459.1997.10474026

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Abstract

This article explores testing and locating multiple variance changepoints in a sequence of independent Gaussian random variables (assuming known and common mean). This type of problem is very common in applied economics and finance. A binary procedure combined with the Schwarz information criterion (SIC) is used to search all of the possible variance changepoints existing in the sequence. The simulated power of the proposed procedure is compared to that of the CUSUM procedure used by Inclán and Tiao to cope with variance changepoints. The SIC and unbiased SIC for this problem are derived. To obtain the percentage points of the SIC criterion, the asymptotic null distribution of a function of the SIC is obtained, and then the approximate percentage points of the SIC are tabulated. Finally, the results are applied to the weekly stock prices. The unknown but common mean case is also outlined at the end.

Key Words:

Asymptotic distribution | Consistency | Cumulative sum | Hypothesis testing | Information criterion | Return series | Unbiased estimator

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