

A correlation break test based on self-normalization

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Abstract

We propose a new CUSUM-type test for a correlation break based on the self-normalization method. The self-normalization test is implemented much simpler than the existing tests based on the long-run variance which need to specify bandwidths and to evaluate complicated consistent estimators for the long-run variances. The limiting null distribution and consistency of the proposed test under an alternative are established. A Monte Carlo simulation demonstrates that the self-normalization test has reasonable size and comparable power, but the existing tests have severe size distortions for serially correlated and/or conditionally heteroscedastic samples. An analysis of returns and realized volatilities of some US, Europe and Japan stock prices by the proposed test indicates absence of correlation break during the period of global financial crisis while those by the existing tests indicate presence of it.

Keywords

Conditional heteroscedasticity; Correlation break; CUSUM test; Self-normalization; Serial dependence.