

Recurrence interval analysis of trading volumes

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We study the statistical properties of the recurrence intervals τ between successive trading volumes exceeding a certain threshold q . The recurrence interval analysis is carried out for the 20 liquid Chinese stocks covering a period from January 2000 to May 2009, and two Chinese indices from January 2003 to April 2009. Similar to the recurrence interval distribution of the price returns, the tail of the recurrence interval distribution of the trading volumes follows a power-law scaling, and the results are verified by the goodness-of-fit tests using the Kolmogorov-Smirnov (KS) statistic, the weighted KS statistic and the Cram $\{\{e\}\}$ r-von Mises criterion. The measurements of the conditional probability distribution and the detrended fluctuation function show that both short-term and long-term memory effects exist in the recurrence intervals between trading volumes. We further study the relationship between trading volumes and price returns based on the recurrence interval analysis method. It is found that large trading volumes are more likely to occur following large price returns, and the comovement between trading volumes and price returns is more pronounced for large trading volumes.

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