Recurrence plots and Hurst exponents for financial markets and foreign–exchange data

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October 1, 1999

Abstract

Selected data from Polish and USA stock and bond markets as well foreign–exchange data have been analysed by use of recurrence plots and the Hurst method. It has been found that there exist significant correlations in some of analysed data chains. Values of recurrence ratios and ratios of determinism calculated from recurrence diagrams increase significantly if one shuffles the data. The corresponding values of Hurst exponents are in the range 0.56 - 0.74 and they also decrease after shuffling. The lowest values of the Hurst exponent have been found for single shares at Polish stock market while the highest values are related to foreign–exchange data. The mean length of the cycle calculated from the behaviour of the Hurst exponent for Dow Jones index and S&P500 index is about 5 years while the Warsaw Stock Index WIG possesses the corresponding cycle of order of 11 months. The peformed analysis shows that in the economical dynamics the main role is played by stochastic behaviour but traces of deterministic origin can be also seen.

References

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