

## **Analysing the Behaviour of Local Hurst Exponent and Lyapunov Exponent for Prediction of Market Crashes**

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**Abstract :** In this paper, the local fractal properties and chaotic properties of financial time series are investigated by calculating two exponents, the Local Hurst Exponent: LHE and Lyapunov Exponent in a moving time window of a financial series. For the purpose of this paper, the Dow Jones Industrial Average (DIJA) and S&P 500, two of the major indices of United States have been considered. The behaviour of the above-mentioned exponents prior to some major crashes (1998 and 2008 crashes in S&P 500 and 2002 and 2008 crashes in DIJA) is discussed. Also, the optimal length of the window for obtaining the best possible results is decided. Based on the outcomes of the above, an attempt is made to predict the crashes and accuracy of such an algorithm is decided.

**Keywords :** local hurst exponent, lyapunov exponent, market crash prediction, time series chaos, time series local fractal properties

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