

INTERMITTENT, EXTREME AND PERSISTENT BEHAVIOUR OF FINANCIAL MARKETS

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We study the stochastic volatility of major financial markets around the world by using a definition of intermittency based on a form normally used in fluid dynamics [1]. We work with the historical time series data for the following major financial indices: London FTSE100, Nikkei 225, Dow Jones and the DAX. In each case we first calculate the daily log returns and then extract the appropriate intermittency exponents. The exponent values for the different markets are compared and contrasted. We also calculate an intermittency exponent for the averaged daily log returns for the constituent companies of the Nikkei 225 for 2002.

Furthermore, we investigate the frequency of ‘extreme’ returns in the various markets. By performing a thorough analysis of the empirical data, we argue that there is evidence to suggest that such events have become more frequent recently.

Finally, we monitor the ‘first passage crossing times’ of the share prices of the constituent companies making up the various indices mentioned above. As a result, we are able to study the persistence behaviour [2] of the financial markets [3] in question. We find clear evidence of a novel double-power law decay of the persistence. The long-time persistence exponent is estimated to be ~ 0.5 .

Keywords

Financial markets, physics concepts, data analysis, intermittency

References

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