

A statistical analysis of returns of elementary trends time series of financial indices: –Probability distribution, Symmetry and Correlations.–

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Non-stationarity of financial time series of prices entails the emergence of periods in which the value of the prices increases or decreases monotonically. We name this kind of non interrupted short time periods “elementary trends” [1] to distinguish them from usual trends which determine the general direction of a market. It is clear that elementary trends constitute global trends.

In this work, a set of different statistical analyses of time series of elementary trends lengths for different, representative financial indices is presented. Between these financial indices we can mention IPC (México), DJIA (USA), Nasdaq (USA) and Nikkei 225.

A suitable observable to be analysed, is obtained as follows: we construct the multi-scale time series of returns calculated from the corresponding elementary trends lengths time series and we perform a symmetry analysis, a distributional analysis and correlation and autocorrelation analyses and other statistical analysis of this observable. The symmetry analysis is performed by means of a distribution-free test statistic T_n for testing symmetry, derived by Einmahl and McKeague [2], based on the empirical likelihood approach [3].

Following the methodology above described, we obtain a “coarser grained” version of some stylized facts [4], that, to our knowledge, may be novel.

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References

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