MST analysis of random time series from different distributions

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Day1/Talk

The concept of a Minimum Spanning Tree (MST) is used to study the process of market integration for a large group of national stock market indices [1] and to study the clustering behaviour of a portfolio of stocks from the London Stock Exchange FTSE100 index [2].

We show how the moments of the distribution of correlations and of the distributions of distances in the MST evolve over time. The mean and the variance of the distribution of correlations are highly correlated, as are the skewness and kurtosis. However, the mean and skewness are anti-correlated.

As expected from the definition of distance, the mean of the distributions of distances in the MST is anti-correlated with the mean of the distribution of correlations. The mean and variance of the distribution of distances are anti-correlated as are the skewness and mean.

We then compare the MST for real data with that obtained for synthetic *random markets*. For *random markets* we generate random time series from a *Market Model* using both Gaussian and T-student statistics. The previously presented moments for real markets behave similar to those obtained for the *random markets*.

Finally, we produce MST combining the Stock Returns figures used previously with the Earnings Per Share (EPS) to allow further examination of the clustering obtained by the MST analysis. Using this new data, we identify several clusters and branches with very similar or extremely different EPS.

[1] R. Coelho, S. Hutzler, P. Repetowicz and P. Richmond, *preprint physics/0601189* (accepted to publish in Physica A, article in press)

[2] Ricardo Coelho, Claire G. Gilmore, Brian Lucey, Peter Richmond and S. Hutzler, *preprint physics/0607022*