

## **On Predictability and Profitability: Would AI Induced Trading Rules be Sensitive to the Entropy of Time Series?**

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The entropy rate of a dynamic process measures the uncertainty that remains in the next information produced by the process given complete knowledge of the past. It is thus a natural measure of the difficulty faced in predicting the evolution of the process.

The first question investigated here is whether stock price time series exhibit temporal dependencies that can be measured through entropy estimates. It is shown that the EOD price time series of the NYSE U.S. 100 stocks have significantly differing entropies and, based on surrogate testing, that there are some weak temporal dependencies in the time series. The BDS statistics and the autocorrelation suggest that these temporal dependencies are both linear and nonlinear.

Then we study the extent to which the return of Genetic Programming-induced financial trading rules is correlated with the entropy rates of the price time series. Experiments are conducted on EOD data of the stocks making up the NYSE US 100 index during the period 2000-2006.