



## Mutual information: a measure of dependency for nonlinear time series

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### Abstract

The main goal of the paper is to show how mutual information can be used as a measure of dependence in financial time series. One major advantage of this approach resides precisely in its ability to account for nonlinear dependencies with no need to specify a theoretical probability distribution or use of a mean-variance model.

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### 1. Introduction

The most known measure of dependence between two random variables is the coefficient of linear correlation, but its application requires a pure linear relationship, or at least a linear transformed relationship (see e.g. Refs. [1,2]), because it is nothing but a normalized covariance and only accounts for linear relationships. However, this statistics may not be helpful in determining serial dependence if there is some kind of nonlinearity in the data. In this context, it seems that a measure of

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