



MSc FINANCE AND INSURANCE

Chair of Quantitative Financial Modelling

ACADEMIC SEMINAR

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Wednesday, October 26th, 4 pm
Aula di Matematica, first floor

Market efficiency and dependence estimation

The efficient market hypothesis states that asset prices reflect all the information available to the investors. This theoretical constraint may not hold in practice: past and future price returns may be dependent to each other. Several statistical tools make it possible to determine whether a financial market is efficient or not, at a given time. In this presentation, we will focus on three of these tools: i) using information theory and Shannon's entropy, we will describe a simple way to quantify the predictive power of past information and a statistical test of market efficiency; ii) using copulas and nonparametric estimators of tail dependence coefficients, we will describe in a very general way the dependence between extreme events; iii) using Hurst exponents, we will explore a widespread indicator of market efficiency based on a parametric model.

Thursday, October 27th, 10 am
Aula di Matematica, first floor

From dependence modelling to trading strategies: a focus on fractional processes

The fractional Brownian motion (fBm) extends the standard Brownian motion by introducing some dependence between non-overlapping increments. Consequently, if one considers for example that log-prices follow an fBm, one can exploit the non-Markovian nature of the fBm to forecast future states of the process and make statistical arbitrages. We provide new insights into forecasting an fBm, by proposing theoretical formulas for accuracy metrics relevant to a systematic trader, from the hit ratio to the expected gain and risk. In addition, we answer some key questions about optimizing trading strategies in the fBm framework: which lagged increments of the fBm, observed in discrete time, are to be considered? If the predicted increment is close to zero, up to which threshold should one make an investment decision? We also propose empirical applications on high-frequency FX rates, as well as on realized volatility series, exploring the rough volatility concept in a forecasting perspective. We will then discuss extensions of the fBm model and their estimation issues, in several directions: time-varying Hurst exponents, random Hurst exponents, non-Gaussian distributions, presence of noise when estimating rough volatilities.