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## Origin of multiscaling in finance and robust and statistically significant estimators

*Thursday, 1 July 2021 12:40 (40 minutes)*

The multiscaling behaviour of financial time-series is one of the acknowledged stylized facts in the literature [1]. The source of the measured multifractality in financial markets has been long debated [2,3]. In this talk I will discuss the origin of multiscaling in financial time-series, investigate how to best quantify it [4,5] and I will introduce a new methodology that provides a robust estimation and tests the multi-scaling property in a statistically significant way [6].

I will show results on the application of the Generalized Hurst exponent tool to different financial time-series, and I will show the powerfulness of such tool to detect changes in markets' behaviours, to differentiate markets accordingly to their degree of development, to assess risk and to provide a new tool for forecasting [7]. I will also show an empirical relationship, to our knowledge the first one in the literature, which links a univariate property, i.e. the degree of multiscaling behaviour of a time series, to a multivariate one, i.e. the average correlation of the stock log-returns with the other stocks traded in the same market and discuss its implications [8].

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[2] J. W. Kantelhardt et al, *Physica A* 316 (2002) 87

[3] J. Barunik, T. Aste, T. Di Matteo, R. Liu, *Physica A* 391 (2012) 4234

[4] R. J. Buonocore, T. Aste, T. Di Matteo, *Chaos, Solitons and Fractals* 88 (2016) 38

[5] R. J. Buonocore, T. Di Matteo, T. Aste, *Phys. Rev. E* 95 (2017) 042311

[6] G. Brandi, T. Di Matteo, *Eur. J. Finance* (2021) DOI: 10.1080/1351847X.2021.1908391

[7] I. P. Antoniadis, G. Brandi, L. G. Magafas, T. Di Matteo, *Physica A* 565 (2021) 12556

[8] R. J. Buonocore, G. Brandi, R. N. Mantegna, T. Di Matteo, *Q. Finance* 20 (2020) 133

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