SOE 21: Financial Markets and Risk Management II

Time: Thursday 10:15–13:30 Location: H46

SOE 21.1 Thu 10:15 H46

Power Law Distribution in High Frequency Financial Data? - An Econometric Analysis — •Lora Todorova[1] and Bodo Vogt[2] — [1]Otto-von-Guericke-University Magdeburg, Faculty of Economics and Management, P.O. Box 4120, D-39016 Magdeburg, Germany — [2]Otto-von-Guericke-University Magdeburg, Faculty of Economics and Management, P.O. Box 4120, D-39016 Magdeburg, Germany

Power law distributions are very common in natural sciences. We analyze high frequency financial data from XETRA and the NYSE using maximum likelihood estimation and the Kolmogorov-Smirnov goodness-of-fit test to test whether the power law hypothesis holds also for that data. We find that the universality and scale invariance property of power law are violated. Furthermore, the returns of Daimler Chrysler and SAP traded simultaneously on both exchanges follow power law at one exchange but not at the other. These results put some questions on the no-arbitrage condition. Finally, we find that the exponential function provides a better fit for the tails of the sample distraibutions than the power law function.

SOE 21.2 Thu 10:45 H46

Optimal estimation of power laws with applications to socioeconomic data — •Faustino Prieto and Jose Maria Sarabia — University of Cantabria, Santander, Spain

Power laws appear widely in many branches of economics, finance, physics, computer science, demography and social sciences. The upper tail of many sets of data, including the size of cities, personal income, earthquakes, forest fires and many other examples all appear to follow power laws. A crucial point in the estimation of these laws is the correct choice of the truncation point. The aim of this paper is to investigate how to choice this truncation point from an optimal point of view. A new methodology based on the Akaike information criterion is proposed. An extensive simulation study is carried out in order to prove the existence of this optimal point, under different assumptions about the underlying population. Several kinds of populations are considered, including lognormal and populations with heavy tails. Finally, the methodology is used to optimal estimation of power laws in socioeconomic data sets, including city and business size data.

SOE 21.3 Thu 11:15 H46

Compensating statistical errors in the calculation of financial correlations — •Michael Christopher Münnix, Rudi Schäfer, and Thomas Guhr — Universität Duisburg-Essen

We present two methods to compensate statistical errors in the calculation of correlations on financial time series. The first method is based on asynchronous time series under the assumption of an underlying time series. The second method is based on the information loss due to the finite tick-size. We set up a model and apply it to financial data to examine the decrease of calculated correlations towards smaller return intervals (Epps effect). We show that these statistical effects are a major cause of the Epps effect. Hence, we are able to quantify and to compensate it using only trading prices, trading times and tick-sizes.

15 min. break

SOE 21.4 Thu 12:00 H46

Measurement of correlations in non-stationary financial time series — •Rudi Schäfer and Thomas Guhr — Fakultät für Physik, Universität Duisburg-Essen, Germany

The measurement of correlations between financial time series is of vital importance for risk management. We address an estimation error that stems from the non-stationarity of the time series. A method is introduced which removes local trends and variable volatility from the time series, while preserving correlations between different time series. We test this method in a Monte-Carlo simulation, and apply it to daily returns of the S&P 500 stocks.

SOE 21.5 Thu 12:30 H46

Estimation of the volatility of finance data by multiscale reconstruction — •Arnold Gräbeldinger and Joachim Peinke — Workgroup turbulence, wind energy and stochastic (TWiSt), University of Oldenburg, Department of physics, 26111 Oldenburg, Germany

With the recently developed method for multiscale reconstruction according to [1] it is possible to reproduce correct statistic properties of processes on different scales and to create a decent prediction of the current standard deviation. Based on the multiscale reconstruction, predictions for quasi-equidistant finance data are performed. Comparing to standard methods it shall be tried to obtain an improved measure for the volatility and in particular volatility clusters of finance data. In depth the requirements for this ansatz are reviewed, with a focus on the Markov properties of the underlying data.

[1] A. P. Nawroth. Stochastische Analyse und Modellierung von Finanz- und Turbulenzzeitreihen und ihren Ähnlichkeiten. Dissertation, Oldenburg, 2007.

SOE 21.6 Thu 13:00 H46

Do financial indices benchmark reality? — •Patrick Hedfeld — Markit, International Index Company, Goetheplatz 5, 60385 Frankfurt am Main

Mapping financial markets with indices is an essential need for investors in order to select sources of profit and loss. We seek a better understanding of certain systematic behaviour pattern and desireable properties in indices architecture. Our approach compares different designs and structures of indices in order to find relations between success and peril. This includes tracing, diversification, riskmanagement and modern financial theories.