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SOE: Fachverband Physik sozio-ökonomischer Systeme

SOE 3: Financial Models and Risk Management I

SOE 3.1: Vortrag

Montag, 20. März 2017, 11:15–11:30, GÖR 226

Auswahlstatus für diesen Beitrag: gemäß den Sitzungseinstellungen ▾

Complex network-based analysis of nonlinear dependencies in multidimensional financial time series — •Alexander Haluszczynski[1,2], Christoph Räth[3], and Lukas Kredler[2] — [1]Ludwig-Maximilians-Universität, Munich, Germany — [2]risklab GmbH, Munich, Germany — [3]Deutsches Zentrum für Luft und Raumfahrt, Forschungsgruppe Komplexe Plasmen, Weßling, Germany

Cross-correlation and mutual information based complex networks of the day-to-day returns of US S&P500 stocks between 1985 and 2015 have been constructed in order to investigate the mutual dependencies of the stocks and their nature. We show that both networks detect qualitative differences especially during (recent) turbulent market periods thus indicating strongly fluctuating interconnections between the stocks of different companies in changing economic environments.

A measure for the strength of nonlinear dependencies has been derived using surrogate data and led to interesting observations during periods of financial market crisis. In contrast to the prevailing view that dependencies reduce mainly to linear correlations during crisis it turned out that (at least in the crisis after 2008) nonlinear effects are significantly increasing.

Finally, we apply a Markowitz mean variance portfolio optimization and integrate the measure of nonlinear dependencies to scale the investment exposure. This leads to significant outperformance as compared to a fully invested portfolio.

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