AKSOE 13 Financial Markets and Risk Management I

Zeit: Mittwoch 10:00–12:30 Raum: TU P-N203

Hauptvortrag AKSOE 13.1 Mi 10:00 TU P-N203

Quantifying Extreme Risk - Critical Phenomena in Natural and Social Sciences — •Didier Sornette — CNRS-Univ. Nice and UCLA

Portfolio analysis, risk assessment, risk management and portfolio optimization require ideally to determine (1) the distributions of returns at different time scales and (2) the nature and properties of dependences between the different assets. This talk focuses on the multidimensional nature of financial risks and dependences by using concepts and tools that remain valid for large and extreme price moves. We will discuss the state of the art on (i) the different distributions of financial returns for various applications (VaR, stress testing) and (ii) the most important and useful measures of dependences, both unconditional and conditional and a study of the impact of conditioning on the size of large moves on the measure of extreme dependences with application to contagion. A large emphasis is put on the theory of copulas, their empirical testing and calibration, as they offer intrinsic and complete measures of dependences. The talk is based in the book "Extreme Financial Risks (from dependence to risk management" by Y. Malevergne and D. Sornette, Springer (2005).

— 15 min. Break —

AKSOE 13.2 Mi 11:00 TU P-N203

Evidence of non-uniform scale properties of financial data — •Andreas P. Nawroth and Joachim Peinke — Universität Oldenburg

The statistics of returns for financial assets are dependent on the time scale. This poses great challenges to risk management and other applications. We present a method of analysing the scale dependent complexity of financial data. This method is applied to different sets of financial data, namely individual stocks which are members of the German Stock Index DAX and the index itself. The high frequency datasets contain all trades during the years 1993-2003. In order to analyse the differences in the return distributions for different time steps, a measure of distance between the return probability density functions is introduced. This measure describes the change in the shape of the probability density function if one goes from one scale to another. We found evidence of a universal behaviour of the distance of the return distributions between different timescales. Evidence is given that the functional form of the distance measure depends on the scale itself. Especially for small scales a different regime is observed.

AKSOE 13.3 Mi 11:30 TU P-N203

Riskmanagement and Pricing for Insurance Portfolios with Exposure to Storms — •Magda Schiegl — Versicherungskammer Bayern, Maximilianstr. 53, D-80530 Munich

We observe number of claim distributions emerging from insurance portfolios with storm exposure to have fat tail distributions. As the distribution of severity of claims in such portfolios is much more rapidly decreasing than claim number distribution the later is the main source of risk.

We use mixed Poisson distributions to construct fat tailed number of claim distributions. We investigate the properties of the distributions as well as the dynamics of the underlying process by taking a variety of different sampling times. Our aim is to receive a probability distribution for the annual number of claims for a given portfolio. We combine analytical and numerical methods to reach this aim.

AKSOE 13.4 Mi 12:00 TU P-N203

Limited profit in predictable stock markets — •Roland Rothenstein and Klaus Pawelzik — Universität Bremen, Otto-Hahn-Alle 1, 28359 Bremen

It has been assumed that arbitrage profits are not possible in efficient markets, because future prices are not predictable. Here we show that predictability alone is not a sufficient measure of market efficiency because of the influence an order has on its dynamics. We instead propose to measure inefficiencies of markets in terms of the maximal profit an ideal trader who can perfectly predict the future behavior of the market can take out from a market. In a stock market model with an evolutionary selection of agents this method reveals that the mean relative amount of realizable profits P is very limited and we find that it decays with rising number of agents. Our results show that markets may self-organize their collective dynamics such that it becomes very sensitive to profit attacks which demonstrates that a high degree of market efficiency can coexist with predictability.