论文

基于多分形理论的动态VaR预测模型研究

魏宇

西南交通大学经济管理学院, 四川 成都 610031

Forecasting Model for Dynamic Value-at-Risk Based on Multifractal Theories

WEI Yu

School of Economics &Management, Southwest Jiaotong University, Chengdu 610031, China

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摘要 经济物理学(econophysics)的大量研究表明,金融市场的波动具有复杂的多分形(multifractal)特征,因此准确地测度和预测市场波动,对金融风险管理工作的意义重大。在已有多分形波动率(multifractal volatility)测度及其模型应用基础上,以上证综指10年的高频数据为对象,提出了基于多分形波动率的样本外动态风险价值(out-of-sample dynamic VaR)预测法。通过两种规范的后验分析(backtesting)结果表明,与8种主流的线性和非线性GARCH族模型相比,在高风险水平上,基于多分形波动率测度的VaR模型明显具有更高的样本外动态风险预测精度。

关键词： 多分形 波动率 样本外动态风险价值 预测 Backtesting

Abstract： Much literature in Econophysics reveals that the volatility in financial markets presents multifractal features. Thus, measuring and forecasting the market volatility accurately is very important for financial risk management. Based on the earlier research of multifractal volatility and its model, an out-of-sample dynamic VaR forecasting method is proposed in this paper. The empirical results on two backtesting techniques show that, on high-risk levels, VaR model based on multifractal volatility produces much better out-of-sample VaR forecasts than eight popular linear and nonlinear GARCH models.

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