

國立中央大學

統計研究所

學術演講

主 講 人：Professor Jong-Min Kim (University of Minnesota at Morris, USA)

講 題：The Copula Functional ARCH Directional Dependence for Intraday Volatility with High frequency Financial Data

時 間：107年12月11日 (星期二) 上午11:00~12:00

地 點：中央大學鴻經館M429室

茶 會：上午 10:30~11:00 地 點：鴻經館 510 室

ABSTRACT

This research proposes a copula directional dependence by using a bivariate Gaussian copula beta regression with the Hormann et al. (2013) functional ARCH(1) (fARCH) model to suit high-frequency time series that account for intraday volatilities. With simulated high-frequency data, we show how the copula fARCH directional dependence of intraday volatility can be useful in terms of graphical displays for tick-by-tick price changes in a day. We can perform a test of significance of the copula fARCH directional dependence of intraday volatility by the permutation test, p-value, and bootstrapping confidence interval. To validate our proposed method with real data, we use the Korea Composite Stock Price Index (KOSPI) and the HyundaiMotor (HD-Motor) company stock data with one minute high-frequency. We show that copula fARCH directional dependence of intraday volatility by B-spline basis function is superior to that by Fourier basis function in terms of the percent relative efficiency of bias and mean squared error. This research shows that the copula functional ARCH directional dependence of intraday volatility can be an important statistical method to illustrate the directional dependence of intraday volatility on the financial market.

Keywords: Directional dependence; Copula; Beta regression model; Functional ARCH model.

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