

# High-dimensional copula-based distributions with mixed frequency data

Andrew J. Patton<sup>\*</sup>

[andrew.patton@duke.edu](mailto:andrew.patton@duke.edu)

---

In this talk, I will propose a new general model for high-dimensional distributions of asset returns that utilizes mixed frequency data and copulas. The dependence between returns is decomposed into linear and nonlinear components, which enables the use of high frequency data to accurately measure and forecast linear dependence, and the use of a new class of copulas designed to capture nonlinear dependence among the resulting linearly uncorrelated, low frequency, residuals. Estimation of the new class of copulas is conducted using composite likelihood, making this approach feasible even for hundreds of variables. A realistic simulation study verifies that multistage estimation with composite likelihood results in small loss in efficiency and large gain in computation speed. In- and out-of-sample tests confirm the statistical superiority of the proposed models applied to daily returns on all constituents of the S&P 100 index.

*This talk is based on joint work with Dong Hwan Oh.*

---

<sup>\*</sup>Department of Economics, Duke University, 213 Social Sciences Bldg, Box 90097, Durham, NC 27708-0097, USA.