



# THE UNIVERSITY OF CHICAGO

Department of Statistics

## MASTER'S THESIS PRESENTATION

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Copula Methods for Multivariate Time Series

WEDNESDAY, February 14, 2018, at 9:30 AM  
Jones 304, 5747 S. Ellis Avenue

### ABSTRACT

One of the crucial issue in modeling multivariate time series is how to describe the dependence structure among variables. Defined as a connection function between the joint distribution and the corresponding marginal distributions, copula plays an important role in multivariate models. By making use of copulas, Copula Method has been considered a useful tool in modern statistical works, especially in financial multivariate time series. It allows us to model the series in two separate steps. First of all we determine the marginal distributions. This is quite a clear and standard process. Then we try to model the copula by examining the dependence structure. The estimates could also be generated in a multistage way. The process is exactly what was described above, namely multistage maximum likelihood estimation (MMLE). The MMLE achieves a reasonably satisfying estimate with far less numerical works than the traditional MLE, which is proved by prior works. In the presentation, the main idea of copula will be introduced as well as the construction and estimation of copula models. Further, a copula method application with regard to bivariate indices series will be presented.

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