

Université catholique de Louvain  
Institut de statistique

*Young Researchers Day*  
*5 February 2010*

## **Time-varying copulas: a survey**

*Olga Reznikova\*, Hans Manner*

### **Abstract.**

The aim of this paper is to bring together different specifications for copula models with time-varying dependence structure. Copula models are widely used now in financial econometrics and risk management. They are considered to be a competitive alternative to the Gaussian dependence structure. The dynamic structure of the dependence between the data can be modeled by allowing either the copula functions or the dependence parameter to be time-varying. First, we give here a brief description of eight different models, among which there are fully parametric, stochastic, semiparametric and adaptive methods. The purpose of this study is to compare the applicability of each particular model in different cases. Thus, we conduct a simulation study to show the performance of model selection and goodness-of-fit measures in terms of size and power for different setups and the ability of the models to estimate the (latent) time varying dependence parameter. Finally, we provide an illustration example by applying the competing models on the same financial dataset and compare their performance by means of Value-at-Risk.

### **Keywords.**

Dynamic copula, Goodness-of-Fit test, Time-varying parameter