

Härdle et al. (2014). Hidden Markov structures for dynamic copulae

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Objectives

- (i) Modelling multi-dimensional dependencies
 - ▶ Hidden Markov Model (HMM) for Hierarchical Archimedean Copulae (HAC)
 - ▶ Expectation maximization algorithm, statistical properties

- (ii) Empirical study
 - ▶ Simulations
 - ▶ Exchange rate series, rainfall process



Modelling multi-dimensional dependencies

- HMM for HAC - conditional density, likelihood function, dependency type variable is the underlying Markov variable
- Likelihood function, expectation maximization algorithm
- Consistency and asymptotic normality

Q: relaxing assumptions, extensions, testing and forecasting



Empirical study

- ▣ Simulations: estimation quality, comparison to the dynamic conditional correlation model, five-dimensional time series
- ▣ Exchange rate series: GBP/EUR, JPY/EUR, USD/EUR, daily data from 1999-2009
- ▣ Rainfall in Guangxi, Guangdong and Fujian, 1 June, 1957-2006

Q: implications, other markets, CRC649 projects



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